

Rare earths



Methodology and price
specifications – March 2024

Mission statement

Fastmarkets Metals, Minerals And Mining is the leading global provider of pricing intelligence for the non-ferrous metal, steel, steelmaking raw materials, industrial minerals, ferrous and non-ferrous scrap markets, producing price assessments via Fastmarkets MB and Fastmarkets AMM since 1913 and 1882 respectively.

Fastmarkets Forest Products is the leading global provider of pricing intelligence for the global forest products industry, incorporating Fastmarkets RISI, Fastmarkets FOEX and Random Lengths.

And Fastmarkets Agriculture Products has delivered pricing transparency to opaque agriculture and energy markets in the form of market-moving reporting and commentary, trusted pricing and price forecasting since 1865.

Our mission is to meet our markets' data requirements honestly and independently, acting with integrity and care to ensure that the trust and confidence placed in the reliability of our pricing methodologies is maintained. We do not have a vested interest in the markets on which we report.

Introduction

Fastmarkets' reporters are required to abide by a **code of conduct** and clear pricing procedures during their market reporting and pricing activities. Fastmarkets is completely independent and has no vested commercial interest in any of the markets it prices.

We are the world's largest dedicated price-reporting team for metals and minerals, agricultural products and forest products. We have hubs in London, New York, Boston, San Francisco, Eugene, Charlottesville, Atlanta, Pittsburgh, Memphis, Sao Paulo, Beijing, Shanghai, Hong Kong, Singapore, Malaysia, Melbourne, Mumbai, Istanbul, Brussels and Helsinki.

The aim of this document is to provide a clear overview of Fastmarkets' methodology and specifications for the prices it assesses. If you have any questions, please contact Global Minors, Ores, Alloys and Industrial Minerals Editor Fleur Ritzema at fritzema@fastmarkets.com for metals and minerals,, Forest Products Senior VP of Indices Matt Graves at mgraves@fastmarkets.com for forest products or Editorial Director Tim Worledge at tim.worledge@fastmarkets.com for agricultural products.

Price discovery and methodology

Methodology rationale

Fastmarkets produces independent, fair and representative price assessments and indices of metals prices on a daily, bi-weekly, weekly, monthly or quarterly basis. Fastmarkets' rationale for adopting the price-discovery process described in this methodology document is to produce consistent and representative indicators of value for specific markets over defined trading periods.

Assessment objective

The assessor's intended aim is to reflect Fastmarkets' assessment price definition:

'The prevailing level at which a commodity of stated specification has, or could be expected to have transacted over a defined period of time.'

We summarize this for effective use as the prevailing 'tradeable level' of the market.

Time window

The time period, or window, identified to assess a market (e.g., daily, bi-weekly, weekly, fortnightly, monthly) is determined by Fastmarkets after considering the number of data points that Fastmarkets can reasonably expect to collect on a consistent basis over the selected period to support the price assessment process.

Unless otherwise specified, the assessed timeframe will be the period since the conclusion of the previous price quotation. If, for instance, the last price assessment published by Fastmarkets was on Friday 2-3pm London time and our next assessment is due on the following Friday at 2-3pm London time, we will accept price data for business conducted and reported to Fastmarkets between Friday afternoon of the last price assessment and the following Friday afternoon. Where deemed appropriate for a particular market, Fastmarkets may specify a narrower window of time closer to the publication date where activity is given greater consideration in the price assessment, though this is stated in the specifications relating to those prices.

Data contribution

Fastmarkets reporters aim to collect data from a broad sample of market participants specifically involved in the buying and selling of the metal of interest, with a good representation of both sides of the market,

including producers and consumers, as well as traders and intermediaries.

Data is collected from industry participants directly involved in the relevant market primarily by telephone but also by email, digital messaging, face-to-face interaction or by direct submission. All data supplied to Fastmarkets is kept confidential and stored in our secure online pricing database system MInD (Market Information Database). Fastmarkets may sign a Data Submitter Agreement (DSA) with any data provider, if requested to do so, to maximize the number of data points collected for inclusion in the assessment process. Any data received subject to a DSA will be used in the pricing assessment but will not be commented on.

Market participants may contribute data following a review by Fastmarkets of their activities. The aim is to ensure that submitters have sufficient visibility and understanding of the market in question to be able to provide reliable price data. We expect that data submitters taking part in the pricing process are authorized to report market data on behalf of their organizations. Fastmarkets encourages organizations to submit all their pricing data, especially all the concluded transactions. Price reporters generally speak to, and collect data from, front office staff directly involved in the commercial activity of buying and selling the relevant product(s). Fastmarkets also welcomes organizations to submit transaction data from authorized back-office functions. Fastmarkets' **Data Submitter Policy** provides guidelines to ensure the high level of data quality and integrity we expect from contributing organizations providing pricing data. The policy can be found on Fastmarkets' website, or is available on request.

Depending on market liquidity, Fastmarkets reserves the right to also base its prices on bids, offers, deals heard and market participant indications of prevailing tradeable values or other indications such as trigger prices that might prompt a sale or purchase.

Price specifications and reference units

Fastmarkets has clear specifications for all the price points that it covers. All the reference units, such as currency and volume, are in line with the trading conventions used in the recognized metals markets.

Fastmarkets' specifications detail the material's characteristics or quality, location, incoterm, payment terms and the minimum volume accepted. These specifications are determined in consultation with market participants and follow industry convention. Reporters ensure that the information they receive meet these specifications. Any data that does not fall within the stated ranges of the specification will not be eligible for consideration in the assessment.

Data analysis and producing the price assessment

Establishing a data hierarchy

To produce the price assessment, a consideration hierarchy is established based on an evaluation of first, the reporter's confidence in the data's reliability, and second, the significance of the data.

The confidence level, or trustworthiness, of a data point is generally based on the transparency of the activity whether it was reported by a party directly involved or was 'heard' activity, corroboration by other market participants and the level of detail provided by the data submitter, although there may be other contributory factors.

For indications of tradeable levels or other indication of willingness to sell or purchase, confidence may be determined based on the justification provided by the submitter, their visibility and activity level in the market, and their prior reliability. Factors that Fastmarkets may consider during times of low liquidity include, but are not limited to: market fundamentals such as changes in inventory levels, shipments, operating rates and export volumes; relative fundamentals of similar commodities in the same region; relative values of the same commodity in different regions; and changes in the value of the commodity's primary feedstock(s) or primary derived product(s). The significance of a data point is determined based

on its effectiveness in identifying the tradeable level of the market under assessment. Transactions are considered highest in the significance hierarchy, 'tight' bids/offers are of secondary importance, followed by data sources' own indications of a tradeable level when they have no business to report. Tight bids/offers are typically defined as those being within the range of transaction and/or indication data points, thereby helping narrow our assessment of the tradeable range. More speculative bids/offers, outside of the range of other data, would typically be of lowest significance. In some circumstances, firm bids higher than transactions or offers lower than transactions may be considered of high significance if deemed to demonstrate a clear directional change in market floor or ceiling levels.

The published assessment will typically be reflective of the highest-confidence and highest-significance data collected in that pricing session. In pricing sessions with little or no data of sufficient quality, extra caution will be applied and reporters may exercise their judgment to keep a price assessment unchanged as a fallback until activity can be confirmed with greater certainty.

When volume information is available, this is also taken into consideration in the assessment process. For instance, a deal with a bigger volume may typically be considered more significant than a smaller-volume transaction. But price reporters will also consider, for instance, normalizing or discarding a reported deal where it is suspected an abnormally large or small volume may have unduly distorted its price.

Fastmarkets will also compare the information received from a single source with the information provided by the same source in the previous pricing cycle. This way, if a source consistently gives lower or higher indications than the consensus, Fastmarkets can still use the data for directional context without it unduly influencing the assessment.

Normalization

Where necessary in certain assessments, data that falls within the stated specification ranges for consideration may be normalized to determine the equivalent price for the respective base specification if one exists. This may include, for instance, variances in material type or quality, delivery terms of location, payment terms or cargo size.

Data may be normalized to the base specification using either a statistical or judgement based method. Where patterns can be established over time, such as for price differences between product qualities, data may be

normalized using in-house developed models based on regression analysis of collected data. The analysis allows Fastmarkets to capture the value-in-use applied by the market to different qualities or terms and to normalize to a single base specification. Where a statistically derived adjustment factor is not possible for a particular variable, editorial judgment may be applied to normalize prices using third party data (such as broker rates for freight adjustments or exchange prices for QP adjustments), or by surveying market participants for an appropriate adjustment.

Where prices cannot be normalized with sufficient confidence or precision, such data may be discarded from the assessment. Fastmarkets' aim is to balance the requirement to keep assessments reflective of their base specifications with the need to source a sufficiently robust data set for consideration.

Minimum data threshold

Since commodity markets differ in liquidity levels at different periods, the methodology does not set any minimum number, or threshold, of transactions to be gathered on which to base the assessment.

In each pricing session, reporters aim to source data from a suitably diverse set of market participants. In the unlikely situation that more than half of the pricing data collected in a session is provided by a single source, the assessor may refer to data collected in the previous pricing session to avoid a dependency on a single entity providing an unacceptably significant (50% or more) proportion of data.

Criteria for discarding pricing data and the removal of outliers

Fastmarkets price assessments are intended to reflect the 'open and competitive' market level. Reporters therefore may apply expert judgment to exclude data deemed unrepresentative, questionable or unreliable prior to consideration in the final assessment. Data that falls outside of the respective assessment specifications, or which cannot be normalized to a base specification with sufficient confidence, is also discarded. Decisions to discard data points are recorded in the form of a written rationale in our internal pricing database, where they are reviewed and approved under the two-tier peer review process.

Data may be discarded as outliers based on the identification of external factors that may be distorting the price. Price-affecting side terms, inconsistencies in information reported, or suspected motivation to unfairly influence the price discovery process would typically be grounds for removal of data, as would

activity not considered to have taken place at 'arm's length'. Outliers will be investigated; more detail may be requested to determine possible reasons behind an anomalous price, and efforts will be made to identify the counterparty to cross-verify information. Suspected attempts to influence the assessment unfairly may result in the data provider being warned or excluded. Fastmarkets reserves the right to see contracts and signed paperwork before inclusion of the data in the assessment. If this is refused, the data supplied may be excluded from the assessment process.

Data publication

Peer review process

All Fastmarkets' price assessments are set by a first reporter who covers that specific market, peer reviewed by a second reporter, and always signed-off by a senior reporter or editor prior to publication. This peer review process, which takes place in Fastmarkets' MInD system and is fully auditable, is in place to make sure that pricing procedures and methodologies are correctly and consistently applied and to ensure integrity and quality of the published prices. Relevant information, including all price inputs and editorial judgements, are securely retained in MInD for at least five years to maintain a full audit trail. Price reporters are formally trained in the price discovery process and must abide by a written Code of Conduct and Pricing Procedures.

For certain prices Fastmarkets also publishes pricing rationales to explain the assessment, describing why a particular price or range was determined based on the market information collected. These notes explain for instance whether any data has been excluded and why, information on the data collected and whether fallback procedures have been applied.

Publication

At the end of the peer review process, Fastmarkets MB and AMM publish their price assessments via MInD and on the Fastmarkets Dashboard and on product-specific websites and in the Price Book. Fastmarkets RISI, FOEX and Random Lengths publish their price assessments on the Intelligence Center, mobile app and in dedicated newsletters.

Most Fastmarkets assessments (aside from a small number of single-figure assessments) are quoted as ranges reflecting Fastmarkets' evaluation of the market's prevailing tradeable level over the observation window.

To enhance market transparency and to provide

evidence of data inputs that support the price discovery process, Fastmarkets may publish trade logs in accordance with industry demand (while maintaining full counterparty confidentiality) detailing pricing data and volumes received from data contributors.

Fastmarkets' price assessments are published at the time and frequency stated under each individual specification. The pricing schedules vary according to markets and locations in which they are assessed. For more details on the pricing holiday calendar and alternative pricing dates for each assessment or index, refer to [Fastmarkets' Pricing Holidays](#) schedule on Fastmarkets.com or on the RISI, FOEX and Random Lengths websites.

Corrections and delays

If an assessment is published incorrectly, it will be rectified and republished as soon as possible. A pricing notice explaining the reasons for the correction will also be published promptly.

Fastmarkets uses several procedures and measures to avoid delays in the publication of its assessments. In the event of a delay, however, Fastmarkets will inform subscribers as soon as possible.

In the event of late publication, only data that has been received within the correct standard timeframe will be included in the assessment. No assessment will be amended due to the emergence of new data or market activity after the initial publication. Retrospective changes to the published values will only be made in cases of technical, administrative or interpretation error in line with [Fastmarkets' Correction Policy](#).

Methodology and price specification review process

Methodology review and pricing notices

Fastmarkets aims to continually develop and periodically review its methodologies in consultation with industry participants, with the objective to adopt product specifications, trading terms and conditions that reflect and are representative of typical working practices in the industries it serves.

Fastmarkets carries out a formal review and approval of its methodology and price specifications on an annual basis. The process is initiated by Fastmarkets publishing on its website an open consultation at least one month (or around 20 working days) before the annual methodology review is due, inviting market feedback over the duration of that period. The timeframe for the consultation and method of submission are both clearly stated.

Following a review of market participants' feedback, comments and suggestions, Fastmarkets concludes the consultation by publishing a notice stating whether or not any methodology changes are proposed. If suggested, changes are classified either as 'material' or 'immaterial'. Material changes are those that, once implemented, may result in fundamental changes to the published price. These include specification changes or structural changes to assessments. Immaterial changes are those that will not result in a different price level once they are implemented.

If a material change to the methodology is required, Fastmarkets includes in its pricing notice: the outline of the proposed change; the rationale or motivation for proposing such a change; and a proposed timetable for the date on which, if the change goes ahead, it would be implemented. If received feedback is considered insufficient to support a material change, Fastmarkets publishes a new notice extending the consultation and inviting comments on the new proposal.

A record of the methodology review is sent to the Risk & Compliance team. All comments received from the market are assumed to be confidential and are treated as such unless stated otherwise.

When Fastmarkets proposes a change to the methodology, it should be understood that no decision has yet been made and that the proposal to make a

change should not automatically be understood as confirmation that the change will happen.

For prices subject to EU Benchmark Regulation (BMR), any change to the methodology requires approval from the Managing Director of our benchmark administrator, Fastmarkets Benchmark Administration Oy.

Outside of the formal methodology review process, editors may from time to time suggest changes or additions to reflect market developments. As with the formal review, changes to the existing methodology will either be classed as 'material' or 'immaterial'. The process for implementing the change will be the same as outlined above for formal reviews. The minimum duration of one month (or around 20 working days) for the consultation process normally provides market participants sufficient opportunity to analyze and comment on the impact of the proposed change.

For more details on the formal review of the methodology and the consultation process to propose changes to the methodology, refer to Fastmarkets' [Methodology Review and Change Consultation Process](#) available on the Fastmarkets website.

Queries and complaints

Fastmarkets encourages engagement from the market on its pricing principles and methodology. The company promotes understanding of its pricing procedures and is committed to responding to requests for further information and clarification on a timely basis.

There are multiple channels for interaction with the pricing team including email, telephone and instant messenger services.

If a subscriber has an issue with the published prices, then they may contact the pricing team. In the event that the response is not satisfactory the issue may be escalated to the internal compliance department. For more details refer to Fastmarkets' [Complaint Handling Policy](#) available on Fastmarkets' website.

Fastmarkets takes all queries and complaints seriously and will seek to provide an explanation of the prices wherever possible. It is important to note, however, that input data remain confidential and cannot be provided to third parties.

Become a contributor to the price discovery process

Fastmarkets continually seeks to increase the number of market sources willing to take part in the price discovery process. The main condition Fastmarkets requires from contributors is for them to be active participants in the relevant market being priced.

Fastmarkets' Data Submitter Policy provides guidelines defining the high level of data quality and integrity that Fastmarkets expects from contributing organizations providing pricing data. Market participants that wish to provide pricing data and be part of the price discovery process should first read the Data Submitter Policy available on the Fastmarkets website. The Policy is communicated to all data submitters at least on an annual basis.

All data sources are subject to review before their data submitted is fully taken into account in the pricing process. Our Contributor Approval Policy (CAP) requires this review or probation period to last no more than three months. The aim is to make sure that submitters are trustworthy and have sufficient visibility and understanding of the market to be able to provide viable price data.

Rare earths

CHINA

MB-NDP-0001 Neodymium-Praseodymium oxide 99%, fob China, \$/kg

Quality: Powder, Neodymium-Praseodymium oxide 99%, no other elements specified

Quantity: No minimum tonnage

Location: fob China

Timing: Prompt, 30 days

Unit: USD/kg

Publication: Weekly, Thursdays 4pm London time

MB-DY-0001 Dysprosium oxide 99.5%, fob China, \$/kg

Quality: Powder, Dysprosium oxide 99.5%, no other elements specified

Quantity: No minimum tonnage

Location: fob China

Timing: Prompt, 30 days

Unit: USD/kg

Publication: Weekly, Thursdays 4pm London time

MB-TB-0001 Terbium oxide 99.99%, fob China, \$/kg

Quality: Powder, Terbium oxide 99.99%, no other elements specified

Quantity: No minimum tonnage

Location: fob China

Timing: Prompt, 30 days

Unit: USD/kg

Publication: Weekly, Thursdays 4pm London time

MB-GD-0001 Gadolinium oxide 99.99%-99.999%, fob China, \$/kg

Quality: Powder, Gadolinium oxide 99.99-99.999%, no other elements specified

Quantity: No minimum tonnage

Location: fob China

Timing: Prompt, 30 days

Unit: USD/kg

Publication: Weekly, Thursdays 4pm London time

MB-NDP-0002 Neodymium-Praseodymium metal (Nd 75% Pr 25%), fob China, \$/kg

Quality: Neodymium-Praseodymium metal (Nd 75% Pr 25%), no other elements specified

Quantity: No minimum tonnage

Location: fob China

Timing: Prompt, 30 days

Unit: USD/kg

Publication: Weekly, Thursdays 4pm London time

MB-DY-0003 Ferro-Dysprosium 80%, fob China, \$/kg

Quality: Ferro-Dysprosium 80% alloy, no other elements specified

Quantity: No minimum tonnage

Location: fob China

Timing: Prompt, 30 days

Unit: USD/kg

Publication: Weekly, Thursdays 4pm London time

MB-DY-0002 Dysprosium metal min 99%, fob China, \$/kg

Quality: Dysprosium metal min 99%, no other elements specified

Quantity: No minimum tonnage

Location: fob China

Timing: Prompt, 30 days

Unit: USD/kg

Publication: Weekly, Thursdays 4pm London time

MB-TB-0002 Terbium metal min 99.9%, fob China, \$/kg

Quality: Terbium metal min 99.9%, no other elements specified

Quantity: No minimum tonnage

Location: fob China

Timing: Prompt, 30 days

Unit: USD/kg

Publication: Weekly, Thursdays 4pm London time

EUROPE

MB-ND-0001 **Neodymium oxide 99.5%, cif
Rotterdam, \$/kg**

Quality: Powder, Neodymium oxide 99.5%, no
 other elements specified

Quantity: No minimum tonnage

Location: cif Rotterdam

Timing: Prompt, 30 days

Unit: USD/kg

Publication: Weekly, Thursdays 4pm London time

MB-RAE-0008 **Praseodymium oxide 99.5%, cif
Rotterdam, \$/kg**

Quality: Powder, Praseodymium oxide 99.5%,
 no other elements specified

Quantity: No minimum tonnage

Location: cif Rotterdam

Timing: Prompt, 30 days

Unit: USD/kg

Publication: Weekly, Thursdays 4pm London time

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Your investment actions should be solely based upon your own decisions and research and appropriate independent advice should be obtained from a suitably qualified independent adviser before any such decision is made.