

Lithium



Methodology and price
specifications – January 2019

Mission statement

Fastmarkets is a leading commodity price reporting agency (PRA) covering the metals, mining, minerals and forestry products industries. Our products include Our products include Fastmarkets MB, Fastmarkets AMM, Fastmarkets IM, Fastmarkets RISI, Fastmarkets FOEX and Random Lengths. For more than 100 years we have been providing commodities price reporting services for use by market participants in their day-to-day commercial activities. These services include assessments and indices of commodity prices as well as news, research and commentary on the underlying markets.

Our mission is to meet the market's 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 MB 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 since 1913.

Fastmarkets MB 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 metals price reporting team. We have offices in London, New York, Pittsburgh, Shanghai, Hong Kong, Sao Paulo, Melbourne, Singapore, Mumbai, Dnepr, Istanbul and five other US locations.

The aim of this document is to provide a clear overview of Fastmarkets MB's lithium methodology and specifications for the prices it assesses.

If you have any questions, please contact Fastmarkets editorial director Alex Harrison at aharrison@fastmarkets.com.

Price discovery and methodology

Methodology rationale

Fastmarkets MB produces independent, fair and representative price assessments of lithium prices on a weekly basis.

The Fastmarkets MB rationale is to adopt and develop the price discovery process and the methodology described in the present guide to produce assessments that are a consistent and representative indicator of the value of the market to which they relate, for the trading period they measure.

During the price discovery process, the goal of the price reporters is to discover at what representative level market participants have concluded business, made offers or received bids over a certain defined trading period – generally the period since the conclusion of the previous price quotation (for instance, if data is submitted to a weekly price after 4pm on the day of the assessment, it will be included in the following week's assessment'). The time period, or window, identified to assess a market (eg, daily, bi-weekly, weekly) is determined by Fastmarkets MB after considering the number of data points that Fastmarkets MB can reasonably expect to collect on a consistent basis over the selected period to support the price assessment process.

Data collection

Data collection and quality

Fastmarkets MB reporters aim to talk to a broad sample of market participants specifically involved in the buying and selling of the mineral of interest, with a good representation of both sides of the market, including producers and consumers, as well as traders.

Data is collected from market participants directly involved in spot and contract business primarily by telephone, but also by email, digital messaging or direct submission. All input data received is kept confidential and stored in a secure network.

Fastmarkets MB encourages organisations to submit all their pricing data, especially all the concluded transactions. Depending on market liquidity Fastmarkets MB reserves the right to base its prices also on bids,

offers, deals heard and market participant assessments or indications of prevailing values.

Fastmarkets MB's Data Submitter Policy provides guidelines to ensure the high level of data quality and integrity that we expect from contributing organisations providing pricing data. The policy can be found on Fastmarkets MB's website or is available upon request.

Fastmarkets MB encourages data sources to provide data on all their concluded transactions and welcomes provision of data from employees in back office functions.

All data supplied to Fastmarkets MB is kept strictly confidential and Fastmarkets MB may sign Data Submitter Agreements (DSAs) with any data provider, if requested to do so.

Our price reporters use a number of methods to collect data, including phone calls, email, and digital messenger service.

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

Fastmarkets MB specifications detail the material's characteristics or quality, location and the incoterm accepted. The specifications are determined in consultation with market participants and follow industry conventions. Reporters ensure the information they receive matches these specifications.

Pricing guidelines

The exercise of judgment by price reporters

To produce the price assessment greater weighting is given to actual concluded transaction data, bids/offers are second in order of importance, followed by data sources' own assessment of the market when they have no business to report. Yet, other considerations might also intervene such as, the trustworthiness of a data source, based on past data submissions or their willingness to provide data on a consistent basis.

Fastmarkets MB seeks price information for trades with a relevant minimum lot size. When volume information is available, this is also taken into consideration in the assessment process, for instance typically a deal with a bigger volume will carry more weight in the price

reporter judgement than a smaller volume transaction. Yet, price reporters will also consider, for instance, to normalise or discard a price reported for a deal with an abnormally large or small volume.

As 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.

A pricing session typically includes bids/offers, contributors' assessment as well as concluded transactions. This means that market data will typically be contributed by several separate sources and that there is no key submitter dependency. Yet, should a significant proportion of the data (defined as more than 50% of the data points) on which the assessment is based be provided by a single source, the reporter, peer reviewer and the senior editorial person signing-off the price prior to publication will analyse the data and consider, if it is the case, to publish an assessment based on the data collected or rather not to move the price and roll it over from the previous session.

Data collection

Collection window

During the price discovery process, the price reporter aims to discover at what representative level market participants have concluded business, made offers or received bids over a defined time period, or window.

The window for lithium was determined after considering the number of data points that Fastmarkets MB can reasonably expect to collect on a consistent basis over the selected period to support the price assessment process, ensuring that the assessments produced is a reliable indicator for the physical market they relate to.

The price assessments are published at 4pm London time and the deadline for data submission is 3pm London time. Data received after this time will not be included in the price assessment.

Data normalisation

Occasionally, Fastmarkets MB receives price data for material with different specifications – for instance, different material quality, delivery terms or delivery location, different cargo size or payment terms. In such cases, when appropriate, Fastmarkets MB normalises data to its typical specifications.

A typical example is a data point that is adjusted due to Incoterms (International Commercial Terms) being different from Fastmarkets MB's specifications. For example, a data contributor will report a transaction done with a lithium consumer on a delivered basis, as opposed to the ex-works incoterm specified in Fastmarkets MB's methodology. In which case Fastmarkets MB will normalise the transaction's value by subtracting the cost of moving material to the consumer. To calculate that cost, Fastmarkets MB will ask the data contributor to net back the transaction to an ex-works basis as well as using its own cost estimate, which is regularly assessed and reviewed by its dedicated price reporters. Fastmarkets MB reserves the right to exercise editorial judgment to net transactions back to typical commercial terms.

Full details of data inputs prior and post normalisation are stored in MFastmarkets MB's electronic database MInD and may be accessed at any time for internal review and auditing purposes.

Data analysis

Assessment using specifications and expert judgment

Once data collection is complete, Fastmarkets MB reviews the data points applying its methodology and its expert judgment to set the price range to reflect the representative spread of prices at which business has been transacted, offered or bid, or indicated in the absence of business.

Before making an assessment, the following factors must be considered:

- Is the information received credible? If questionable: have we seen signed contracts (preferable), or has it been confirmed on both sides of the deal?
- If credible: were all the prices in a similar range? Were all the deals reported of a similar size?
- Do the reported deals all have the same terms and specifications?
- Did all the sources indicate the market was headed in the same direction? If not, why not?
- It is not unusual for different sources to report slightly different numbers but it is important, as far as possible, to understand why they are different.
- In the absence of trade, what are the prevailing bids/offers in the market? Did the source provide firm bids/offers or indicative numbers?
- What are the positions of the contributors?
- Are we confident about the freight or free-on-

charge costs?

- Has an adequate sample been obtained which correctly represents the market?

Once the above factors have been considered, Fastmarkets MB will produce a price assessment and set the price following the guidelines below.

Fastmarkets MB does not treat all collected information equally, but has a justification and rationale for how each piece of information obtained has been used. Greater weighting is given to actual concluded transaction data, but other data is also used: bids and offers are second behind transactions in order of importance, followed by deals indirectly reported to Fastmarkets MB (referred to as deals heard) and lastly by data sources' own assessments of the market when they have no business to report.

Other considerations might also intervene in the price assessment such as, the trustworthiness of a data source based on past data submissions, or their willingness to provide data on a consistent basis.

When no actual transactions can be collected, extra caution is applied during the price assessment process. Price reporters are encouraged to keep the price unchanged until actual transactions back up a change.

As a general rule, larger deals carry more weight, but Fastmarkets MB tries and ascertains what sort of discount a large lot size carries or what sort of premium a smaller deal would carry.

Fastmarkets MB will 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 low or high numbers, Fastmarkets MB can still use the data without it unduly influencing its assessment.

Criteria to discard pricing data

Fastmarkets MB will use its expert judgment to exclude outlying or unrepresentative numbers, and discount or discard prices that it believes may otherwise be questionable and unreliable.

Outliers will be investigated, and suspected attempts to unfairly influence the price assessments may result in the data provider being warned or excluded.

When a transaction appears questionable or well outside the range reported by other market participants, Fastmarkets MB may seek confirmation

of the claimed deal by requesting to see contracts or other signed paperwork before inclusion of the data in the price assessments. If this is refused, Fastmarkets MB will seek to corroborate the information it receives by matching trades. So if a seller tells us he has sold a certain amount at a certain level, we then try to speak to the buyer involved in the transaction to confirm the transaction.

If this is not possible, the data supplied may be excluded from the assessment process.

Fastmarkets MB reserves the right to exclude data that is not fairly presented or is believed may be an effort to distort the price assessments.

Data publication

Peer review process

All Fastmarkets MB's price assessments are set by a first reporter who covers that specific market, peer reviewed by a second reporter, and always signed-off and approved by a senior reporter or editor prior to publication.

This peer review process, which takes place in MInD is fully auditable and 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.

Price reporters are formally trained in the price discovery process and must abide by a written Code of Conduct and pricing procedures.

Consistency in the price discovery procedures
 At the end of the peer review process, Fastmarkets MB publishes its price assessments via MInD and onto its website and price book.

To enhance market transparency and to provide evidence of data inputs that support the price discovery process, Fastmarkets MB may publish trade logs for its lithium prices, while maintaining full counterparty confidentiality, pricing data and volume received from data contributors.

Fastmarkets MB also publishes weekly pricing rationales to explain price settlement and editorial judgement. These notes explain, for instance, why price reporters may conclude whether anomalous or suspicious data should be excluded; when reporters determine a price

and a price range based on market information; or when judgement is applied when the dataset collected is not considered suitably robust so that fall-back procedures need to be applied.

Methodology and price specifications review process

Fastmarkets MB continually develops and revises its methodologies in consultation with industry participants, aiming to adopt product specifications and trading terms and conditions that actually reflect and are representative of typical working practices in the industry.

Changes to the methodology and/or price specification are implemented following a consultation process which starts with Fastmarkets MB posting on its website an advance pricing notice providing clear details and a timeframe for the change proposed. The objective of the consultation process is to give market participants sufficient time and opportunity to provide feedback and views about the change proposed.

Price correction policy

Publication of price errors can occasionally happen for reasons that may include technical, input errors or incorrect application of the methodology.

To minimise as much as possible the inconvenience to our subscribers, Fastmarkets MB aims to investigate each error immediately as it becomes aware of it and to publish a correction promptly on its website through a pricing notice with an explanation of the reason for the correction.

Fastmarkets MB will publish a correction of a price only where it has established that undeniably there has been an error. Fastmarkets MB price assessments are produced based on the best data available at the time of the assessment. It will not retroactively change a price based on new information or additional submission of data received after a respective pricing session has closed.

Become a contributor to the price discovery process
Fastmarkets MB continually seeks to increase the number of market sources willing to take part in the price discovery process. The main condition

Fastmarkets MB requires from contributors is to be active participants in the spot market. Fastmarkets MB's Data Submitter Policy provides guidelines defining the high level of data quality and integrity that Fastmarkets MB expects from a contributing organisation providing pricing data. The policy can be found on Fastmarkets MB's website or upon request.

All data sources are subject to review before their data submitted is fully taken into account in the pricing process. 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.

Lithium carbonate min 99.5% Li₂CO₃ battery grade spot price

CHINA, JAPAN & SOUTH KOREA

Assessment:	US\$ per kg CIF China, Japan & South Korea
Delivery port:	Main Chinese Japanese & South Korean ports (other ports normalised)
Basis:	Cost, insurance and freight
Delivery window:	60 days
Min lot size:	5 tonnes
Quality:	Min 99.5% Li ₂ CO ₃ (delivery of Min 99.2% Li ₂ CO ₃ also accepted, qualified for use in battery applications)
Form:	Powder
Publication:	Weekly. Thursday, 4pm London

CHINA

Assessment:	CNY per tonne, ex works China
Origin:	China
Basis:	Ex-works, VAT included
Delivery window:	30 days
Min lot size:	5 tonnes
Quality:	Min 99.5% Li ₂ CO ₃ (delivery of Min 99.2% Li ₂ CO ₃ also accepted, qualified for use in battery applications)
Form:	Powder
Publication:	Weekly. Thursday, 4pm London

Lithium hydroxide monohydrate min 56.5% LiOH.H₂O battery grade spot price

CHINA, JAPAN & SOUTH KOREA

Assessment:	US\$ per kg CIF China, Japan & South Korea
Delivery port:	Main Chinese Japanese & South Korean ports (other ports normalised)
Basis:	Cost, insurance and freight
Delivery window:	60 days
Min lot size:	5 tonnes
Quality:	Min 56.5% LiOH.H ₂ O (qualified for use in battery applications)
Form:	Powder
Publication:	Weekly. Thursday, 4pm London

CHINA

Assessment:	CNY per tonne, ex works China
Origin:	China
Basis:	Ex-works, VAT included
Delivery window:	30 days
Min lot size:	5 tonnes
Quality:	Min 56.5% LiOH.H ₂ O (qualified for use in battery applications)
Form:	Powder
Publication:	Weekly. Thursday, 4pm London

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