

Shanghai Metals Market Price Assessment Methodology

Zinc concentrate (Zn 50%) treatment charge (TC) in Yunnan

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1. Guidelines to SMM price assessment methodology

Shanghai Metals Market (“SMM”) is an independent service provider that does not participate in trades. SMM is a market observer that engages buyers and sellers in the commodities market. By consulting with industry independent participants, SMM drafts the methodology, examines and revises it regularly based on the specifications and terms of trade that are generally used in the market, with equal weighting given to transactions that meet the standards. SMM attaches equal importance to normal transactions that meet the specifications and standards. SMM reserves the right to exclude from its price assessment any price data information deemed to be less reliable or unrepresentative.

SMM publishes spot metals prices (or indices, etc., including markets in China or outside of China) on a daily basis, commonly referred to as SMM prices. SMM has formulated corresponding methodologies for the published SMM prices, which have been published on SMM's official website www.smm.cn for reference. The methods and procedures for the formation and release of SMM prices are specified in these methodologies, and SMM prices are formed and released in strict accordance with the regulations of these methodologies.

To reflect the actual trades in the spot market, SMM will update the methodology for SMM price assessments and publish all the revisions on our website www.metal.com (English) or www.smm.cn (Chinese) 28 days ahead of the changes. For queries or suggestions on the methodology, please contact SMM customer services (please find contact information on the SMM official websites). **Please read this paragraph in conjunction with the SMM Methodology Review and Change Policy, and the SMM Complaint Policy.**

This document specifies the standards and management methods for the Zinc concentrate (Zn 50%) treatment charge (TC) in Yunnan. These standards are formulated to establish a transparent and verifiable SMM price setting mechanism and provide market participants with an important pricing indicator.

The Committee maintains oversight of the SMM Benchmark methodology and its compilation process, ensuring that SMM prices and indexes reflect as closely as possible the objective conditions of physical markets of relevant commodities. The Committee will immediately point out any problem it finds, and propose external consultations and modifications to the existing methodologies or processes, in order to improve the quality of prices or indexes published by SMM. The Committee can only propose changes to the methodologies and processes used in future Benchmark assessments, rather than modifying the already published prices or indexes.

2. SMM Market Price Assessment Methodology Zinc concentrate (Zn 50%) treatment charge (TC) in Yunnan

2.1 Definition

The SMM Zinc concentrate (Zn 50%) (hereinafter referred to as zinc concentrates) treatment charge (TC) in Yunnan is assessed and reported based on the methodology defined in this document. As a benchmark, it can be referred to by market participants as their settlement price for spot zinc concentrate trade. The price reflects the indicative range of the actual transaction price when TCs of the zinc concentrate in Yunnan is released every week. The price is mainly based on the supply and demand of zinc concentrate in the country in that week, and the actual transaction price is based on the actual transaction price of the mining enterprise transported to the warehouse of the local smelter factory.

2.2 Introduction of price assessment

SMM collects data information used to evaluate TCs of the zinc concentrate by means of standard acquisition (that is, the collection of raw data information that complies with the SMM Data Standards Policy), from including the bid and offer of the buyer and seller that were not traded on the same day, and the actually traded price of spot transaction provided by the price submitters. The amount of each transaction or quotations that can be deemed as the TCs of the zinc concentrate. Transactions will be no less than 100 Metal mt. Data collection, assessment (calculation) and daily management of SMM TCs of the zinc concentrate are conducted by the SMM zinc business team, which consists of 2 price analysts (A and B) and a price manager.

The price of SMM is designed to reflect the real transaction level of a certain commodity within a certain period of time. Due to the different grades of zinc concentrates in different mines, there are differences in treatment charge. It will also be included as a reference, and converted into zinc concentrate (Zn 50%) treatment charge (TC) in accordance with the general deduction method in the market. During the assessment process, we may consider other information. However, actual transactions will always take precedence. Please read this paragraph with the SMM Benchmark Guidelines on Hierarchy of Data Inputs.

2.3 Source of raw price data

2.3.1 Collecting from price data submitters

Please note that the following standards and procedures need to be read together with the For more information, please refer to the Submitter Exclusion or Inclusion policy.

2.3.1.1 Criteria for price data submitters

SMM will select representative market participants from the industry chain in Yunnan as targeted price submitters for SMM zinc concentrates (zinc: 50) TCs assessment (data providers, including mines, traders and in Yunnan smelters).

SMM will take reasonable care to determine and verify the authenticity and reliability of price provider. The procedure SMM adopts is designed to minimise the risk of using any abnormal price data and oppose any manipulation of the Benchmark.

The SMM policy includes, but is not limited to, steps to take as follows:

- Collect relevant public domain documents (such as business licenses) for each price submitter and verify the authenticity of the documents.
- Ensure that each price submitter engages zinc concentrates transaction, procurement, sales or production zinc ingots industry chain.

SMM will ensure that each employee who is designated as the contact of the contributor has the right to directly access the relevant data in the company, and has the necessary authority and capability to submit the data to the price analyst of SMM in a timely manner.

SMM will validate the reputation of each contributor by communicating with other reputable market participants.

2.3.1.1.1 Criteria for zinc concentrate producers

- a. Smelters should have zinc concentrates capacity of above 500 mt on an annualised basis; conduct standardised transactions smoothly across channels with stable sales performance; possess operational integrity, and enjoy good reputation in the market, in the view of SMM.
- b. Zinc concentrates should provide objective and honest feedback on their zinc ingot production and sales, including output, operating rate, quality of the zinc concentrates, sales price, sales volume, buyers and inventory, and be able to engage with SMM Operational Teams in accordance with the SMM Benchmark Submitter Code of Conduct.
- c. Industry chain should have a sound understanding of and insight into the macro economy, current status of zinc industry and trades of the zinc concentrates market, and be able to engage with SMM Operational Teams in accordance with the SMM Benchmark Submitter Code of Conduct.

2.3.1.1.2 Criteria for traders

- a. Traders should have over two years of experience in spot zinc concentrate. Zinc concentrate spot trading with an annual purchasing or sales volume of above 1,000 mt; conduct standardised transactions smoothly across channels with stable purchasing and sales performance; possess operation integrity, influence and

reputation in the market.

- b. Traders should provide objective and honest feedback on their zinc concentrates procurement and sales, including quality, prices and volumes for purchase and sales, procurement sources, buyers, and inventory, and be able to keep good contact with SMM Operational Teams accordingly.
- c. Traders should have a sound understanding of and insight of the macroeconomics, zinc industry status quo and trading in zinc concentrates market, and be able to engage with SMM price analysts.

2.3.1.1.3 Criteria for smelters

- a. Smelters should have an annual zinc concentrates purchasing volume of above 1,000 mt, conduct standardised transactions smoothly across channels with stable purchasing performance and possess operation integrity, influence and reputation ore concentrates market.
- b. Traders should provide objective and honest feedback on their zinc concentrates procurement, including quality, prices and volumes for Purchasing, procurement sources and inventory, and be able to keep good contact with SMM Operational Teams accordingly.
- c. Traders should have a sound understanding of and insight of the macroeconomics, zinc industry status quo and trading in zinc concentrates market, and be able to engage with SMM price analysts.

2.3.1.2 Formation and adjustment of the price submitter list

SMM selects price contributing companies based on the above criteria to produce a stable list. SMM signs a formal agreement with each price contributing company to ensure the accuracy and timeliness of the data provided as well as protect confidential information of the price submitter. At the same time, SMM will protect the corporate secrets of the contributors. SMM arranges a full-time price analyst to collect the information, and communicates regarding the market situation related to price information. SMM will continuously evaluate each contributor according to the above criteria, and adjust the list of contributors based on the evaluation results. For contributors whose evaluation results do not meet the above standards, SMM will notify them to rectify within a time limit and exclude them from the list for the time being. If the contributor refuses to rectify or does not meet the standard after rectification within 30 days after the rectification notice is issued, SMM will terminate its qualification as a contributor.

The updated list of zinc concentrates price submitters is as follows:

| Company type | Company Name |
|--------------|---|
| Mine | Yunnan Haolong Industrial Group |
| Mine | Gejiu City Tianhong mining Co., Ltd. |
| Mine | Yunnan Hualian Zinc Indium Co., Ltd. |
| Smelter | Yunnan Chihong Zn & Ge Co., Ltd. |
| Smelter | Yunnan Jinding Zinc Industry Co., Ltd. |
| Smelter | Yunnan Yuntong Zinc Co., Ltd. |
| Smelter | Yunnan Luoping Zinc & Electricity Co., Ltd. |
| Smelter | Mengzi Mining and Metallurgy Co., Ltd. |

Notes: These companies are in no particular order. SMM will amend the list based on the selection criteria in this document.

Data providers will not receive incentives, rewards or benefits from SMM for providing data.

2.3.1.3 Process of price data collection

SMM's Operational Teams will collect TCs for zinc concentrates. TCs for zinc concentrates price data from price submitters by means of phone, fax, email, QQ, WeChat and other forms of communication before 17:00 every Friday China Standard Time ("CST") on every trading day. (Price data that are submitted after 17:00 every Friday CST will not be included in price assessment on the day. The data will include traded prices within the week, and the most likely traded prices. All communication content on instant messengers, WeChat messaging and emails as well as face-to-face communication will be recorded, while phone communication via phone calls will also be recorded in summary and input into the database. Price data must be a typical, repeatable transaction between unaffiliated market participants (completely financially and legally independent).

SMM's Operational Teams shall abide by business ethics while reporting to their manager about any threat by market participants or any offer and bid that could

undermine or influence the assessment during the price collection process.

Price data provided by the submitters to SMM should include at least the following kinds of information. Price analysts should encourage the price submitter to report as much detailed information as possible, not just the minimum requirements specified:

Zinc concentrate specification

Zn 50%

Volume

The minimum transaction size is set at 100 mt in zinc content.

2.3.2 Collecting price data from other submitters

SMM's policy on collecting market information and data is that SMM welcomes all information from various sources or organisations, as long as the data submitter provides them for good faith and authentic purposes. However, the data submitter is required to accept the SMM code of conduct on data submitters. SMM does not accept instant messaging requests from unidentified individuals. SMM price analysts are required to confirm the identity of market participants at least in accordance with the procedures specified in 2.3.1.1 before conducting instant messaging communication with the data submitter.

2.4 Detailed formation process and related regulations

2.4.1 Data collection

SMM Price analysts will collect price data and information based on the standards mentioned above. And a preliminary raw dataset is finally generated after taking into account major factors, such as supply and demand, inventory levels, and other major political, economic, and natural factors.

2.4.2 Data normalisation

SMM Price analysts will normalise the preliminary data results.

Different treatments varying with different grades of zinc concentrates in different mines, are shown as follows:

A deduction of 20 yuan/mt with zinc content will be used in the excess or deficiency content based on a benchmark grade of 50%. TCs will be lowered by 20 yuan/mt with zinc content for every 1% increase in the grade, and TCs will be lowered by 20 yuan/mt with zinc content for every 1% decline in the grade.

Finally, there is standard transaction range for zinc concentrate (Zn 50%) treatment charge (TC) in Yunnan.

The price data will be recorded both electronically and in writing. All electronic and written records are archived by analysts and kept at least five years in a secure network environment and physical environment. For more details, please refer to the

SMM Recordkeeping Policy.

2.4.3 Information data analysis, verification and screening

SMM will endeavour to verify all the market data obtained by the buyer/seller with the counterparty of the buyer/seller. SMM will perform multi-party verification on information provided by the buyers/sellers with their counterparties, and will cross-validate with other relevant participants if the buyers and sellers are unable or unwilling to provide the information.

SMM will exclude any questionable, irreproducible or apparently abnormal quote and transaction in the price evaluation process, and note the reason for removal in the original data set, which will also be kept at least five years. For instance, SMM ensures that only transactions and quotes made between financially and legally independent parties will be included in the price evaluation process. SMM price analysts will compare and analyse data submitted by SMM price submitters, verifying whether the prices show trends that run counter to the wider market. The cases include but are not limited to:

Traded prices are significantly higher/lower due to the inclusion of special circumstances or special services

A company's quotes are intentionally higher/lower due to a special sales plan or policy of the company

A company's bids reflect its prospects for the market price and is intentionally made public in advance

If any unusual submissions are found, SMM Price analysts need to investigate them. The SMM Price analysts will re-contact the price submitter to verify the accuracy, applicability and completeness of the submitted data. If it is confirmed that it is due to an error in the submission process, such as an input error, etc., SMM will correct the error and re-validate and screen. If there is no error in the submission process, it can be concluded that the data submitted by the price submitter is not a qualified data and needs to be removed from the original data set.

Finally, SMM will obtain a final data set based on the calculation model, and it will exist in the form of a range of TCs.

Although Minimal subjective judgement from analysts is required in the SMM price evaluation process, the established standards and procedures will be applied to manage the actions taken by SMM price analysts in screening the collected data, and to evaluate the data included in the price assessment is valid or if the abnormal data has been excluded. SMM price analysts in the zinc concentrate trading market is to ensure that only data that meets clear methodological requirements can be included in

the price evaluation process. In case of disagreement between two parties of the zinc concentrate transaction, after screening the original data set and removing disqualified data, SMM price analysts will make adjustments to the normalised data or the price assessment. The SMM Benchmark Management Committee regularly reviews the implementation of these procedures to ensure compliance with its published standards. To attain the highest possible standards, SMM Price analysts are trained and regularly appraised in their respective markets in which they are responsible for assessing prices. This ensures that SMM analysts follow the requirements of the methodology in a consistent manner.

2.4.4 Evaluation of published prices

On every Friday, SMM price analysts will fine-tune the adjustment direction and range based on their industry experience, supply and demand, and finally released the range of Zn 50% zinc concentrate TCs in Yunnan based on SMM research and adjustments as final results.

After years of tracking and gathering feedback, SMM applies a price-range strategy in assessing zinc concentrate TCs as other strategies have proven unreliable. For example, a tonnage weighted calculation will be easily affected by traded price and volumes. As trading volumes are unpredictable, the accuracy of price assessments can be affected by a few regions that account for the majority of market share when the trading volumes in those regions are overly large. The absence of trades resulting from contentious opinions between the parties can also lead to failures in price assessment.

2.4.5 Special circumstances

SMM reserves the right to exercise judgments when trading liquidity is thin. We will make the assessments based supply-demand relationships, bids and offers of market participants, if there is a lack of credible or verifiable market information, so as to make sure that the data samples used to evaluate the zinc concentrate TCs are sufficient and accurate. **For more details, please refer to the SMM Illiquid Market Management Policy and SMM Expert Judgment Policy.**

In addition, SMM will also make a price assessment when there is an absence or a lack of trades in the spot week. In these two cases, information of actual demand and supply, offers and bids will also be taken into consideration.

SMM will not set the minimum data in the zinc concentrate TCs assessment as sparse deals are sometimes heard in the market.

2.4.6 Price publication

The SMM Zn 50% zinc concentrate TCs assessment for Yunnan is published

every Friday (except for public holidays, in which case, the price will be released ahead of the holiday) on Chinese website www.smm.cn.

The deadline for price collection is before 17:00 CST every Friday, and the 30–60 minutes thereafter is used to verify and calculate the final zinc concentrate TCs.

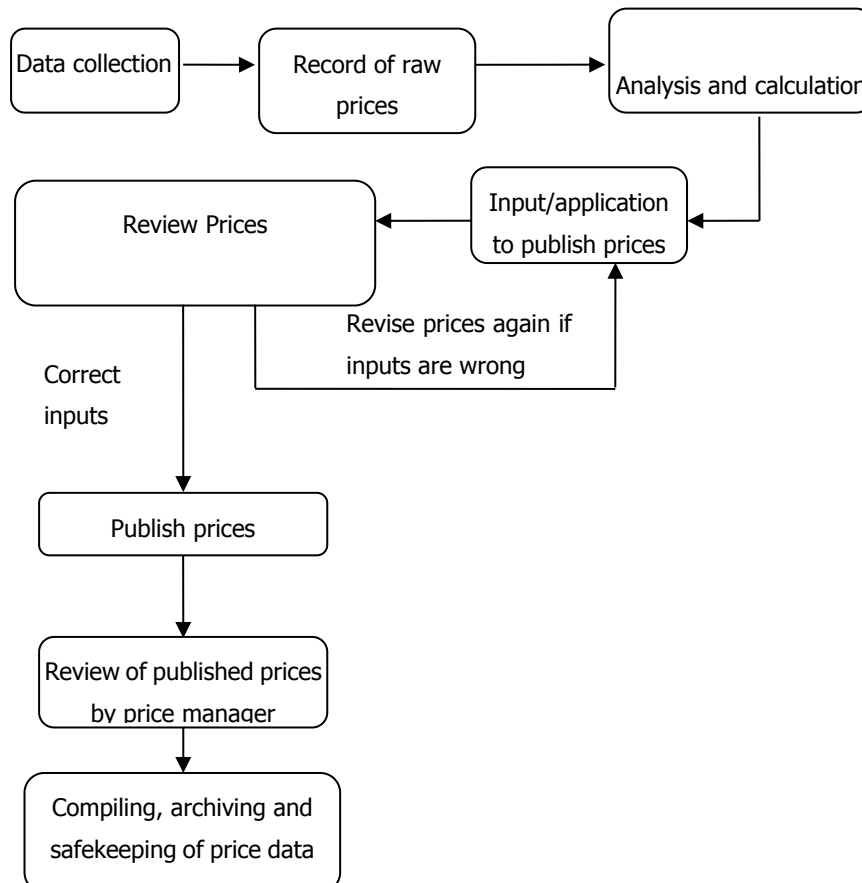
The time of the price publication may also be affected by emergencies and force majeure factors, such as power outages and natural disasters. In such cases, SMM will make every effort to inform the market of the delayed publication schedule as soon as possible. **For more details, please refer to the SMM Disaster Recovery Procedures.**

2.4.7 Modification of published prices

If there are any errors (mistake in calculation or errors caused by incorrect operations) after the price is published, SMM will immediately issue a correction statement to reflect the correct price. **For more details, please refer to the SMM Error Correction Policy.**

2.5 Price assessment process

SMM undertakes the zinc concentrate TCs assessments before 17:00 CST every Friday. The detailed process is as follows:



2.6 Adjustment to the price assessment methodology

SMM updates our methodologies on a regular basis to reflect a constantly changing metals trading market. Amendments will be made based on feedback by market participants, and an internal check will be also made regularly. We will follow the external consultation workflow to amend discrepancies in the methodology that may be less time-sensitive. Major revisions and updates will be published 28 days ahead of the changes, to seek opinions from market participants, unless there are unavoidable and unpreventable circumstances such as natural disasters, war or bankruptcy of the exchange, which will shorten the period. SMM promises to carefully look into any feedback to the adjustment of the price methodologies, and will amend the methodologies under certain circumstances even if some market participants do not approve of the changes. In addition, SMM has a formal methodology consultation process. Dates of the most recent and the next session are at the start of this document. **For more details, please refer to the SMM Methodology Review and changes Policy.**

3. Historical data

This paragraph should be read in conjunction with the SMM Record Retention Policy.

SMM's zinc concentrate TCs in Yunnan was recorded since April 10, 2015. Subscribers of SMM are able to access historical data from past three years.

For information on subscribing to historical price data, Please visit www.smm.cn.

4. Compliance with SMM Policies

All SMM employees must comply with the methodologies published by SMM, as well as follow SMM's internal standards and policies. They include the SMM Conflict of Interest Policy, SMM Whistleblowing Policy, SMM Error Correction Policy, SMM Methodology Review, Consultation and Modification Policy, and SMM Complaint Policy.