

# Cobalt Sulphate

## Price Index Methodology

**Last formal consultation: December 5, 2022 – December 20, 2022**

**Date of expiry: November 30, 2023**

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## 1. Introduction to SMM price assessments

Shanghai Metals Market (“SMM”) is an independent business intelligence service provider on the global commodity market that is not involved in trading activities. SMM is a market observer or organiser that engages and serves the buyers and sellers in the commodity market. By consulting with independent industry participants, SMM develops its own price assessment methodologies, and examines and revises them regularly based on the specifications, terms and conditions of trade that are generally used in the market, with equal importance given to transactions that meet our standards. SMM reserves the right to exclude any unreliable or unrepresentative price data from its price assessments.

SMM Price refers to metals’ physical prices or price indices in both the Chinese and overseas markets reported by SMM on a daily basis. All SMM prices are published with strict compliance to a set of defined methodologies, indicating how the prices are accessed and reported. These methodologies are published on our website [www.metal.com](http://www.metal.com) (English) or [www.smm.cn](http://www.smm.cn) (Chinese) for all market participants to understand and refer to.

In line with the actual trading activities in the physical market, SMM will update the methodologies for SMM Price (or index) assessments and publish all the revisions on our website [www.metal.com](http://www.metal.com) (English) or [www.smm.cn](http://www.smm.cn) (Chinese) 28 days ahead of the changes take effect except for special circumstances that lead to shorter notice period, especially force majeure like natural disasters, war and exchange bankruptcy. For queries or suggestions on the SMM methodologies, 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 changes policy, and the SMM Complaint Policy available at [www.metal.com](http://www.metal.com) (English) or [www.smm.cn](http://www.smm.cn) (Chinese).

SMM Price Administration Committee will review all SMM methodologies as well as the assessments and publication processes. The Committee maintains oversight of the SMM price methodologies and its compilation process, ensuring that SMM prices and indices 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 consulting and modifications to the existing methodologies or processes, in order to improve the quality of prices or indices published by SMM. The Committee can only propose changes to the methodologies and processes used in future SMM Price assessments, rather than modifying the already published prices or indices.

This document specifies the standards and management methods for the SMM cobalt sulphate price index assessment. These standards are formulated to establish a transparent and verifiable SMM price setting mechanism and provide market participants with an important pricing reference.

## 2. Guidelines to SMM cobalt sulphate price index assessment

### 2.1 Definition and significance

China boasts the largest cobalt sulphate market around the world, which means that China is playing an increasingly important part in shaping the global cobalt sulphate supply and demand balance. The price trend of Chinese cobalt sulphate has a great influence on the global trend as well. In answer to the call for a cobalt sulphate benchmark price that could reflect the Chinese cobalt sulphate market supply and demand balance objectively, authentically and timely, SMM has decided to launch the SMM Cobalt Sulphate Price Index, aiming at providing a solid reference for market players, research institutions and government departments to make scientific decisions by discovering the rules and causes of cobalt sulphate price dynamics.

The SMM Cobalt Sulphate Price Index is assessed and reported based on the methodology defined in this document. As a benchmark, it can be referred to by cobalt sulphate industry chain players (players engaging in raw materials, cobalt sulphate smelting, ternary precursor production,  $\text{Co}_3\text{O}_4$  production, ternary cathode material, battery, etc.) as an indicator for their settlement price of cobalt sulphate. The price index reflects the guide price of cobalt sulphate that are the most tradable at the time of publication on each full trading day. **The price index is based on the actual transaction and bid/offer of physical cobalt sulphate from the industry chain players (players engaging in cobalt sulphate smelting, ternary precursor production,  $\text{Co}_3\text{O}_4$  production, etc.), and is calculated with different weights of each price submitter.**

The SMM Cobalt Sulphate Price Index reflects the most representative cobalt sulphate prices for the day the index is published. The index is calculated as a weighted average by using the most tradable prices submitted by players across the cobalt sulphate industry chain in China. This document specifies the methodology of SMM Cobalt Sulphate Price Index calculation model in accordance with the IOSCO standard, as well as the process of collecting and treating transaction data, with the purpose of establishing an accurate, transparent and verifiable mechanism for SMM Cobalt Sulphate Price Index assessment.

### 2.2 Data collection

#### 2.2.1 Criteria for price data submitters

Please note that the following standards and procedures need to be read together with the **Submitter Exclusion or Inclusion policy** available at [www.metal.com](http://www.metal.com) (English) or [www.smm.cn](http://www.smm.cn) (Chinese).

SMM will select representative market participants from the industry chain as targeted price submitters (data providers include upstream smelters and downstream players) for SMM Cobalt Sulphate Price Index assessment.

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

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

- Collect relevant publicly available documents (such as business licenses) for each price submitter and verify the authenticity of the documents.
- Ensure that each price submitter engages in the transaction, procurement, sales or production of cobalt sulphate.

- Ensure that the contact person designated of the price submitter have direct access to relevant data in the corresponding company, and have the necessary authority and ability to submit the data to the price analyst of SMM in a timely manner.
- Invite other reputable market participants to help verify the credibility of price submitters.

**Criteria for smelters**

- a. The smelters should have stable cobalt sulphate production of above 600mt 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. Smelters should provide objective and honest feedback on their production and sales, including output, operating rate, quality of the product, sales price, sales volume, buyers and inventory, and be able to engage with SMM price analysts.
- c. Smelters should have a sound understanding of and insight into the macro economy, physical market situation and trades of the cobalt sulphate market, and be able to engage with SMM price analysts.

**Criteria for downstream users**

- a. Downstream users should have an annual cobalt sulphate purchasing volume of more than 600mt with stable production situation; conduct standardised transactions smoothly across channels with stable purchasing performance; possess operation integrity, influence and reputation in the market.
- b. Downstream users should provide an objective and honest feedback on their cobalt sulphate procurement, including quality of the product, purchase prices and volumes, procurement sources, and inventory, and be able to engage with SMM price analysts.
- c. Downstream users should have a sound understanding of and insight of the macro economy, keeping up with the latest updates of trading of the cobalt sulphate market, and be able to engage with SMM analysts.

**2.2.2 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 to protect confidential information of the price submitters.

SMM delegates specific price analysts to collect transaction data and data related market information from price submitters. SMM will continue to evaluate every price submitter based on the criteria above and make amendments to the lists for price contributing companies based on the results of evaluations. When a company fails to meet the criteria, it would be required to rectify within a certain period of time. If it refuses to rectify or fails to meet the criteria after within 30 days from the date of issue of the rectification notice, SMM will revoke its qualification for price submitting companies.

SMM will also collect price data information from other market participants apart from qualified SMM price submitters, please refer to section 2.2.5 for details.

The price submitters will not be rewarded with incentives, rewards or secret benefits simply for providing the data information.

**2.2.3 Process of price data collection**

In accordance with the agreement with price submitters, SMM price analysts will collect cobalt sulphate-related price data information from price submitters by means of phone, QQ, WeChat, fax, email and other forms of communication between 9:00-10:50 China Standard Time ("CST") on each trading day. (Price data that are submitted after 10:50 CST will not be included in price assessment on the day, while data that does not contain the required minimum information details will not be included, either, even if the data are submitted before the deadline.)

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 price analysts are subject to a **code of business ethics** when reporting to their supervisors the content of any coerced or threatened communication from market participants, or any kind of induced offer that seeks to influence the outcome of an assessment.

#### 2.2.4 Specification of cobalt sulphate

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

Cobalt sulphate: For details, please refer to *GB/T 26523-2011 Cobalt Sulphate*.

Chemical specification: Co  $\geq$  20.5%, Nickel content  $\leq$  0.001%,

Unit: RMB/mt in physical content.

Delivery location and method: mainstream trading places in China, delivery to the buyer's.

Payment method: credit + bank acceptance (based on the mainstream payment method according to SMM survey, and other payment methods will be converted to this standard).

SMM Price update: 11:00 CST every trading day

#### 2.2.5 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 2.2.1 before conducting instant messaging communication with the data submitter.

### 2.3 Detailed formation process and related regulations

### 2.3.1 Data review

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 offers and bids, physical market conditions, future market conditions, the macroeconomy, industry status, transactions, demand and supply, inventories, and political, economic, and natural factors.

In judging the price data collected, SMM will take into account the reasonableness of the submitted data from each company, including the relationship between the two trading parties, supply and demand in each segment of the market, specification and quality, freight and payment terms, in order to assess the cobalt sulphate price index. Prices resulting from transactions between affiliated enterprises, sell-offs under financial or legal pressure and any other non-repeatable trading practices will be excluded.

SMM analysts will investigate into the data submitted once any abnormal condition is detected. They will contact the price submitter to verify the accuracy, applicability and completeness of the data. If it is confirmed that errors, such as input errors, are made in the submission process, SMM price analysts will correct the error and conduct verification and screening. If no mistakes are found in the data submission process, it could be concluded that the data submitted is disqualified and further communication and confirmation with such submitter is required.

SMM is committed to using the best endeavours to confirm bids/offers, inquiries and transactions with the relevant parties and will do everything possible to cross-check all price data provided by a buyer/seller with the counterparty. Where neither party to a transaction is able or willing to confirm the data, SMM will seek cross-validation with other market participants. For example, the bid/offer is deliberately high or low due to a particular sales plan or policy within the company; or a bid/offer is deliberately announced to the market in advance due to a prediction of the market.

Minimal subjective judgment 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. **For more details, please refer to the SMM Guidelines for the Exercise of Expert Judgment available at [www.metal.com](http://www.metal.com) (English) or [www.smm.cn](http://www.smm.cn) (Chinese).** The experience of SMM price analysts in the cobalt sulphate trading market is to ensure that only data that meets clear methodological requirements can be included in the price evaluation process.

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.

### 2.3.2 Data normalisation

SMM price analysts will normalise the preliminary data results, and the finalised data will be in the form of a normalised price corresponding to each product.

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 available at [www.metal.com](http://www.metal.com) (English) or [www.smm.cn](http://www.smm.cn) (Chinese).**

### 2.3.3 Formation of price index and treatment of outlier



SMM Cobalt Sulphate Price Index is derived from a weighted average of the collected data after normalisation as well as each enterprise.

The initial weight of each enterprise is calculated from the amount of cobalt sulphate participated in each trading segment of cobalt sulphate chain by that company.

SMM will keep tracking and reviewing the weightings of enterprises and industry segments from time to time, adjusting or maintaining the weightings based on changes in the market supply and demand as well as in consultation with submitters and market players.

SMM will analyse the data information collected and the price index calculated on a daily basis after all the data information is collected and reserves the right to adjust the weights. The adjusted weights will be used to produce the final price index for that day. The regressed weights will be used as the initial weights for the next working day.

In addition to the above-mentioned weight reduction measures, SMM will investigate into submitters, whose submitted price data deviates significantly over a long period of time, to determine whether they have misled the SMM Cobalt Sulphate Price Index. Once verified, the company will be removed as a price submitter.

### 2.3.4 Assessment (calculation) of price index

The result obtained through prudent collection, standardization and weighed calculation will be published in the form of a price index at 11:00 CST on each trading day.

### 2.3.5 Price index publication

SMM will form the SMM Cobalt Sulphate Price Index in accordance with the following standards and regulations and publish on the SMM websites at [www.metal.com](http://www.metal.com) (English) or [www.smm.cn](http://www.smm.cn) (Chinese) at 11:00 CST on each working day, except for weekends and public holidays in China.

The time in between the deadline for price collection (10:50 CST) and the deadline for price publication (11:00 CST) daily is used to verify and calculate the final SMM Cobalt Sulphate Price Index.

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. **Please read this paragraph together with SMM Disaster Recovery Procedure available at [www.metal.com](http://www.metal.com) (English) or [www.smm.cn](http://www.smm.cn) (Chinese).**

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### 2.3.6 Modification of published prices

If there are any errors (mistake in calculation or errors caused by incorrect operations) after the price index 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 available at [www.metal.com](http://www.metal.com) (English) or [www.smm.cn](http://www.smm.cn) (Chinese).**

## 2.4 Review of key points

### 2.4.1 Product specification

Cobalt sulphate: in compliant with GB/T 26523-2011, Co  $\geq$  20.5%, nickel content  $\leq$  0.001%. For details, please refer to GB/T 26523-2011 *Cobalt Sulphate*.

### 2.4.2 Payment method

Credit + bank acceptance (based on the mainstream payment method according to SMM survey, and other payment methods will be converted to this standard).

### 2.4.3 Delivery place

The buyer's warehouse

### 2.4.4 Unit

RMB/mt

### 2.4.5 Form of existence

In the form of a price index (rebounded to one decimal place), tax included (13% VAT included)

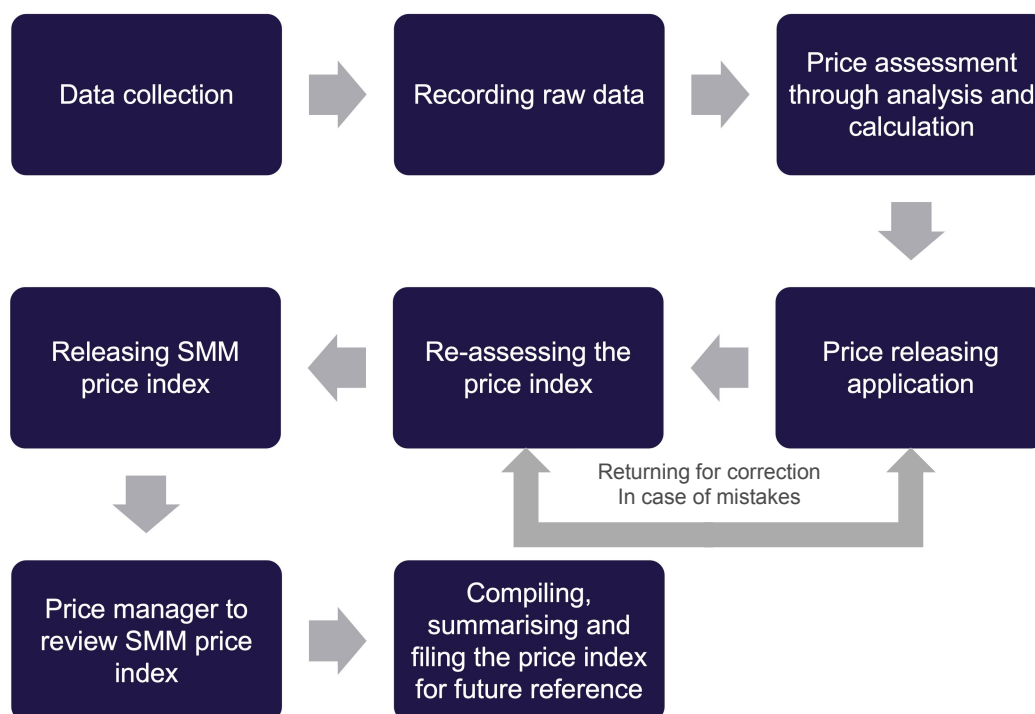
### 2.4.6 Time of publication

11:00 CST on each working day, except for weekends and public holidays in China



## 2.5 Price assessment process

SMM undertakes the cobalt sulphate price index assessments at 9:00-11:00 CST each working day. 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. We will arrange an official consultation of the SMM cobalt sulphate price index assessment at least once a year. 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, available at [www.metal.com](http://www.metal.com) (English) or [www.smm.cn](http://www.smm.cn) (Chinese).**



