

OPIS

A DOW JONES COMPANY

OPIS APAC Solar Weekly Pricing and Methodology

Methodology and specifications
Effective August 2022



A DOW JONES COMPANY

Contents

Introduction	3
Daily Price Discovery Process	5
Product Specifications	5
Price Assessment Laycans	6
Price Assessment Criteria	6
Judgment guidelines	7
Market data application	7
Verification of transaction data	7
Scrutiny of transactions	8
Anomalous or suspicious market data	8
Additional checks and analysis	8
Comparative markets	9
Compliance and ethics	9
Price Assessment Disputes	9
Price Assessment Revisions	10
Corrections to price assessments	10
Methodology Review	11
Review of methodology	11
Changes to methodology	11

Introduction

This statement of methodology reflects fundamental principles that form the foundation of **OPIS APAC Solar Weekly Report**. It includes detailed information on process, data collection, terms and conditions of price acceptance and product specifications.

The overarching goal of OPIS weekly solar price assessments is to provide market participants with a **trusted and independent benchmark**. OPIS has no stake in any commodity transactions, is not funded by solar industry initiatives, and strictly adheres to antitrust guidelines determined by independent legal counsel.

As part of the price assessment process, OPIS solar market editors are required to exercise best judgment and **adherence to the methodology** to ensure the reliability of the data and market compilation process.

The methodology is continually evolving to reflect changing market realities and OPIS takes full responsibility for keeping this statement current.

The OPIS APAC Solar Weekly Report lists weekly spot market price assessments for all four segments of the photovoltaic (PV) supply chain,

namely polysilicon, wafers, cells and modules. The following products are assessed:

- **Polysilicon China Domestic**
 - Multi
 - Mono
- **Polysilicon CIF China/Taiwan/Vietnam/Malaysia**
 - Mono
- **Wafers FOB China**
 - Multi
 - Mono
- **Cells FOB China**
 - Multi
 - Mono
- **Modules China Domestic**
 - Multi
 - Mono
- **Modules FOB China**
 - Multi
 - Mono

All price assessments are subject to compliance with standard trading conditions regarding **quality, cargo size, loading/delivery ports, loading/delivery periods and credit terms** as determined by standard market conventions where applicable. For OPIS standard trading conditions and criteria please refer to the *Methodology Product table*.

Product	Specifications	Cargo Size	Loading period	Weekly	Currency	Unit	Basis	Location
Polysilicon (Multi)	Merchantable	Minimum: One 20-foot container	Within 30 days from publication date	x	RMB	/kg	Domestic	China
Polysilicon (Mono)	Grade 1 Polysilicon	Minimum: One 20-foot container	Within 30 days from publication date	x	RMB	/kg	Domestic	China
Polysilicon (Mono)	Equivalent to Wacker PCL NCS [see more in "Quality/Specifications" section]	Minimum: One 20-foot container	Within 30 days from publication date	x	\$	/kg	CIF	Asia (China/Taiwan/Vietnam/Malaysia)

Wafers (Multi)	Size:157mm; Thickness 170-175 µm	Minimum: 1 MW	Within 30 days from publication date	x	\$	/pc	FOB	China
Wafers (Mono)	Size: M10/G12; Thickness: 155-160 µm	Minimum: 1 MW	Within 30 days from publication date	x	\$	/pc	FOB	China
Cells (Multi)	Efficiency: >18.8% (>4.62W)	Minimum: 1 MW	Within 30 days from publication date	x	\$	/wp	FOB	China
Cells (Mono)	Size: M10/G12; Efficiency: >22.8% (>7.53W)	Minimum: 1 MW	Within 30 days from publication date	x	\$	/wp	FOB	China
Modules (Multi)	Average power output: 335Wp	Minimum: 1 MW	Within 30 days from publication date	x	RMB	/wp	Domestic	China
Modules (Mono)	Average power output >540Wp; Size: M10; Bifacial	Minimum: 1 MW	Within 30 days from publication date	x	RMB	/wp	Domestic	China
Modules (Multi)	Average power output: 335Wp	Minimum: 1 MW	Within 30 days from publication date	x	\$	/wp	FOB	China
Modules (Mono)	Average power output >540Wp; Size: M10; Bifacial	Minimum: 1 MW	Within 30 days from publication date	x	\$	/wp	FOB	China

Weekly Price Discovery Process

The Asian price assessment methodology seeks to capture transactions, bids and offers through the trading week ending 2.00 pm Singapore time Tuesday.

OPIS pricing editors will proactively poll market participants via electronic instant messaging (such as ICE Chat, WeChat, Skype, Telegram, WhatsApp), email, telephone, or face-to-face conversation to discover price data throughout each standard trading day of the week.

Market Editors will always attempt to collect data from a broad cross section of the PV sector, including producers, consumers, traders, and brokers, so that OPIS is not reliant on one source for data.

To meet publication deadline, OPIS reserves the right not to include transactions received **after 2.00pm** Singapore time Tuesday for consideration in the week's final price

assessment process. Information received beyond this time will be used at the market editor's discretion only.

Market participants are encouraged to report transactions, **real-time** bids and offers and live market bid-offer ranges directly to OPIS. The expressions of bids and offers are regarded as open and executable to the **market at large**. OPIS will attempt to gather as much price information from the marketplace as possible and from as many sources as it can so that data is not being provided from any one source. OPIS reserves the right to **re-publish** the market information collected, and closely track the evolution of indicative values throughout the business day. All data collected is **time-stamped** and **archived** for review.

Delivery/Loading Periods

OPIS tracks market activity throughout the Asia Pacific business day to derive an assessment of spot market prices levels for specified

delivery/loading periods as outlined in the Methodology Product table

Quality/Specifications

When applicable, OPIS will take into account prices of similar product grades during the assessment process.

For example, the Polysilicon [Mono] CIF Asia assessment reflects the Wacker PCL NCS grade. But when deriving the assessment, the editor might also take into account price movements of the Hemlock DMS grade or the OCI ST500 grade.

Assessment Calculations

In addition to the weekly spot assessments, OPIS also publishes two weekly averages—the Polysilicon Marker (PLM) and the Chinese Module Marker (CMM) using the below formulas:

PLM (Polysilicon Marker) is the weighted average of international / non-China polysilicon prices at 3:1 for International excl Hemlock and Wacker US to US-made polysilicon

CMM (Chinese Module Marker) is the weighted average at 1:4 for Multi and Mono PERC module FOB China prices

Price Assessment Criteria

OPIS prices are assessed based on the range of confirmed physical cargoes transacted and reported during the Asia Pacific trading week ending 2.00 pm Singapore time Tuesday for the relevant assessment loading/delivery period. Where only one deal has been confirmed, that will form the price assessment range for the day. Where there is a range of deals for the same month, the lowest and highest traded values will form the range.

Highest priority will be given to transactions that are transparent and open to any reputable counterparty with proper financial and logistical resources. For a deal to be used in the price assessment, it must be confirmed by a source

that has been vetted and deemed an approved market source for the product in question by OPIS. A good faith attempt will always be made to "confirm" both sides of any transaction (meaning that the buyer and seller in the transaction have been identified and corroborate the price and terms of the sale). Deals of all types that are confirmed to OPIS with the stipulation that they are not for wider publication will not be used within the price assessment.

All transactions are to be "physical" product; the sale of "paper" product (meaning a financial arrangement where no physical volume is expected or required to be exchanged) will not be included in the price range.

Any transaction that has logistic restrictions, quality or specification issues, different currency, load size, shipping terms to those specified in the methodology product table or any other special considerations will not be used to directly determine the posted range. Bids and offers that are restrictive to select buyer or seller will be ranked lower as compared to bids and offers that are transparent and open to the market at large.

All buy/sell transactions; time and/or location swaps; any transactions having options which could meaningfully impact the commercial value; will be ignored if discovered, regardless of the price assigned.

If a transaction appears to be "out of market" (meaning significantly different in price than would be expected based on other recently confirmed price points), OPIS may elect to ignore the transaction following review of the data. OPIS will also review prior expressions of buying and selling interests to examine the circumstances leading to the trade to determine the integrity of the transaction.

Transactions must be conducted at arm's length whereby the buyer and seller are not

related in any way by means of share ownership or affiliation in each other's company.

All bona fide transactions can be considered for index compilation, regardless of whether it is concluded by a natural buyer (end-user), seller (producer) or trader. If a transaction is identified by OPIS or market participants as anomalous or suspicious, it will be excluded from the assessment process until the situation can be clarified. This can include repetitive transactions between two parties within a single trading session, whereby the parties alternately buy and sell from each other.

On days when there have been no confirmed transactions a "notional" price will be posted. A notional price reflects the market editor's best estimate of price or price range where a transaction could have occurred between an interested buyer and interested seller. The main guide for assessment will be prevailing bids and offers if any have been reported. Highest priority will be given to bids and offers that are transparent and open to any reputable counterparty with proper financial and logistical resources.

Both repetitive and incremental bids and offers that conform to standard market conventions, as well as retracted bids and offers, will be included for consideration in the OPIS price assessment process.

Judgment guidelines

As part of the price reporting process, market editors are required to use their professional judgment, to ensure the reliability of the data and price assessment compilation process. OPIS has set forth guidelines throughout this Methodology to ensure that the use of judgment is consistent and fair. These guidelines can be found in the following sections of this Methodology:

- Anomalous or suspicious transactions
- Additional checks and analysis
- Comparative markets

- Transactions and survey weightings

OPIS has developed Editorial Standards that details the process for compiling each specific price assessment. In addition, OPIS has developed a programme of training and oversight of market editors that helps ensure uniformity in the application of judgment. The key elements of this programme include:

1. An initial course of training that explains and defines the parameters for the exercise of judgment
2. Suitably sourced staffing to ensure proper backup for sick days, vacations, etc.
3. Oversight of reporting teams by experienced market editors that are involved in daily mentoring and assisting in the application of judgment
4. A requirement that market editors sign-off on all price assessments

Market data application

The specifications defined in the methodology and data used to compile each price assessment is deemed to be the most representative for that market. OPIS will utilize various types of market data in compiling its price assessments, including:

- Transactions
- Bids and offers
- Other market information

Transaction information is the preferred source of data for the price assessments. However, depending on the liquidity of the markets being assessed, other information can be and is used, such as bids and offers and other market information. This can be in combination with transactions, or can substitute transactions, depending on the market liquidity and specific market circumstances.

Consequently, in most markets there will be a relatively higher rank given to transactions over bids and offers and other market information in the compilation process.

Verification of transaction data

Market editors carefully evaluate all data gathered before it is used in the price compilation process. These data inputs include transactions, bids, offers, volumes, counterparties, specifications, and any other information that contributes materially to the determination of a price assessment. Specific to transactions and bids and offers, market editors seek to verify and validate the price, volume, specifications, and location basis, and with regard just to transactions, the counterparties. Market editors examine all the reported transactions to avoid duplication.

To promote transparency in the markets, OPIS seeks to inform the market of any deals it identifies and significant movements of bids and offers through the relevant OPIS publications.

Scrutiny of transactions

OPIS has created guidelines that control the exercise of judgment by its market editors. Market editors are trained to identify anomalous or suspicious transactional data that merit further investigation to verify if they are bona fide data for inclusion in the index compilation process. If a transaction has been identified by a market editor as anomalous or suspicious, it will be escalated to the markets editor. Further checks and analysis will be conducted by the market editor when an anomalous or suspicious transaction is identified for further examination.

Anomalous or suspicious market data

The following types of market data have been identified by OPIS as potentially anomalous or suspicious:

- Transactions not transacted at arm's length, including deals between related parties or affiliates

- Transaction prices that fall outside of the generally observed bids and offers that operated throughout the trading period
- In the absence of observed bids and offers, transaction prices that deviate significantly from transactions seen for that trading period
- Assessments of fair value that fall outside the reasonable parameters set by transactional information
- Transactions that are suspected to be a leg of another transaction or in some way contingent on an unknown transaction [excluding EFP¹ and sleeve trades²].
- Transactions, bids and offers that deviate from the typical transaction volumes seen in that market.
- Any other transaction details that appear to stray from the usual trading behaviour seen in that market, including, but not limited to:
 - repeated trading activity in periods or pools of potentially low liquidity, such as the margins of the defined trading window (such as very early or very late deals),
 - Counterparties not typically seen, – divergent specifications and – unusual delivery locations.
 - Or specific delivery location in a port range that may have time specific issues affecting price.
 - This will include transactions that are identified by other market participants as being, for any reason, potentially anomalous
 - Discrepancy in transaction details reported by counterparties

Additional checks and analysis

The markets editor and market editor(s) will undertake the following transactional and source analysis when a potentially anomalous

¹ . An EFP deal is initially executed at a fixed price and is then broken down into two parts: one part being a physical deal done on an index basis, while a paper position of equivalent size is taken in the same direction as the physical deal. This is done in a way that adds up to the same as the

strike price and all elements of the EFP deal are executed at the same time.

² . Sleeve deals are deals executed using a third-party credit sleeve because the buyer and seller are unable to transact directly because of credit issues. The third-party credit sleeve is not exploiting an arbitrage opportunity.

or suspicious transaction is identified for further examination.

They will assess the following transaction-based factors:

- The nature of the linkage of the perceived anomalous or suspicious transaction to other possible transactions
- The differences between counterparties on transactional details
- The impact of other factors on price and/or volume, including scheduling and logistic issues, and credit issues, where applicable

The markets editor will also assess the following source-based factors:

- Whether the explanation provided by the source for the outlying nature of the transaction is plausible
- The credibility of the sources³
- Whether the timing of the provision of information impacts the verification and validation process.

Should this process determine that a transaction be excluded from the price assessment process, the markets editor will approve the exclusion and document the rationale. For price assessments used to settle derivatives, OPIS has established internal procedures that involve escalating review within OPIS management and, if necessary, notification and escalation of inquiry within the source's company.

Comparative markets

There exist tight price correlations between certain markets and the premiums and discounts between these markets, which are constantly assessed and compared by market participants. By polling and entering dialogue with the market participants, market editors can quantify these relative values. Accordingly, in certain assessments when no relevant or

insufficient market data exists, market editors will assess market value using some or all the following comparative metrics.

- Comparison to another market hub for the same quality of product
- Comparison to a more actively traded but slightly different specification or quality in the same market hub
- Other metrics, such as demand and supply data.

Compliance and ethics

OPIS has implemented extensive compliance policies and procedures in accordance with the best practices of the price reporting industry. These include a comprehensive ethics policy that applies to all the Editorial Price Reporting staff. The Editorial Standards is an expression of OPIS' intent to set out ideals for the ethical conduct of OPIS Price Reporting personnel in the performance of their product price assessment activities. This Editorial Standards Code of Conduct is supported by the Conflicts of Interest Statement. (Make sure there is clickable link)

Price Assessment Disputes

Every spot price editor at OPIS understands that his or her top priority is calling market assessments fairly. Our methodologies are crafted after careful consultation with our customers and applied by our editors to ensure maximum transparency and accuracy.

Still, we understand there may be times when spot price customers wish to question, dispute or comment on a price assessment and/or our methodologies. As a valued OPIS spot price customer, you have the right to:

- a prompt reply to any inquiry regarding price assessments and/or methodology within two trading days

³ . Sources will be deemed more credible if they (i) adhere to the reporting standards outlined in this Methodology; (ii) quickly respond to queries from market editors; and (iii) have staff designated to respond to such queries.

- a full consideration by senior OPIS spot market personnel of any request for a correction or adjustment of a price assessment as well as any suggested changes to spot price methodology and complete confidentiality.

In the event of an **assessment dispute**, the disputing party should inform OPIS of their complaint by the following business day via telephone call, email or instant messaging platforms and all complaints will be acknowledged in writing within one business day. Editorial contact details can be found in the report. The party should, within one business day, supply OPIS with **evidence** of mishandling and/or misinformation of material data that had directly resulted in the distortion of the price assessments.

The appropriate OPIS personnel will reply to complaints with two (2) spot trading days via email. This reply may or may not be a resolution of the complaint, but it will acknowledge receipt of the complaint and assure the complainant that he or she can expect an answer in a timely manner. Upon review and verification of the data, and OPIS may then publish a price revision. OPIS guarantees complete confidentiality of the data provider in the price dispute.

Upon review and verification of the data, and OPIS may then publish a price revision. OPIS guarantees complete **confidentiality** of the data provider in the price dispute.

Price Assessment Corrections

Corrections to Price Assessments

If warranted by the circumstances, OPIS may publish corrections to price assessments after the publication date. OPIS will typically correct material errors that arise from the improper entry of information, the erroneous calculation of market data, misreported

information, or the incorrect application of the stated methodology. However, OPIS will not retroactively assess markets based solely on new information learned after the publication date of the relevant price assessment. Corrections to price assessments will be conducted in accordance with the Price Assessments Correction policy.

In some circumstances the daily report will be re-issued.

Methodology Review

Review of methodology

OPIS price assessment methodology is constantly scrutinized internally for clarity, relevance and comprehensiveness by market editors across the OPIS group. Methodology changes involve a robust polling of the marketplace to ensure all points of view are considered prior to any changes being considered or made.

Internally, all methodologies are reviewed on an annual basis, within the OPIS group and records of any proposed methodology change are stated in a central electronic file.

OPIS also encourages industry participants to propose improvements or revisions to daily price assessment methodology via e-mail, telephone, and instant messaging. Based on the input received, OPIS senior leadership within the oil products group will decide whether to accept or reject suggestions made by stakeholders for methodology changes.

Once a spot methodology change is contemplated, OPIS will reach out to stakeholders in the form of a formal note delivered via email soliciting feedback on the change.

Feedback may be given via post, email or telephone and the opportunity to comment on any contemplated spot methodology change is

open for no less than four (4) weeks and generally not more than six (6) weeks.

In the case of methodology additions, a draft notice is sent out to customers with a deadline for comments set at a maximum of two (2) weeks.

OPIS will publish stakeholder comments received with our responses regarding proposed methodology changes on our website and will respect commenter confidentiality when requested.

To ensure that they are representative of the market being assessed, OPIS conducts reviews of its methodologies on both an internal and external basis. OPIS conducts a formal review of all its methodologies and attendant documents on at least an annual basis. Externally, OPIS is in regular contact with market participants as such market participants are not only well-situated to know the particulars of the market but have a vested interest in the implementation of accurate and relevant methodologies. When conducting its reviews, OPIS will consider a myriad of factors, including, but not limited to, activity in the market, visibility of market data and current and anticipated industry usage of the price assessment.

If the review process recommends a material change to the methodology, or termination of an existing benchmark, the markets editor will submit a proposal to OPIS Editorial management for review.

Changes to methodology

If either an internal or external review of a methodology results in a potential material change to the methodology or cessation of a benchmark, OPIS will begin formal procedures for external consultation. Materiality is subject to professional judgment and considers the impact of the proposed change on the decision making of stakeholders. The Methodology Changes and Cessation Policy can be found here:

<https://www.opisnet.com/about/methodology>

Contacts

Complaints

Steve Tan

OPIS Risk and Compliance Director

OPIS_Compliance_Team@opisnet.com

OPIS Customer Care

energycs@opisnet.com

International: +1-301-284-2000

North America: 1-888-301-2645

Toll- free within the U.S.]