

Methodology and specifications guide

European electricity assessments and indices

Latest update: October 2018

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INTRODUCTION

Platts methodologies are designed to produce price assessments that are representative of market value, and of the particular markets to which they relate. Methodology documents describe the specifications for various products reflected by Platts assessments, the processes and standards Platts adheres to in collecting data, and the methods by which Platts arrives at final assessment values for publication.

Platts discloses publicly the days of publication for its price assessments, and the times during each trading day in which Platts considers transactions in determining its assessments levels. This schedule of publication is available on Platts website, at the following link: <http://www.platts.com/HolidayHome>.

The dates of publication and the assessment periods are subject to change in the event of outside circumstances that affect Platts ability to adhere to its normal publication schedule. Such circumstances include network outages, power failures, acts of terrorism and other situations that result in an interruption in Platts operations at one or more of its worldwide offices. In the event that any such circumstance occurs, Platts will endeavor, whenever feasible, to communicate publicly any changes to its publication schedule and assessment periods, with as much advance notice as possible.

Platts methodologies have evolved to reflect changing market conditions through time, and will continue to evolve as markets change. A revision history, a cumulative summary of changes to this and previous updates, is included at the end of the methodology. Methodology is reviewed regularly to ensure it reflects current market reality. Such reviews are carried out by Platts reporters and their managers, supplemented and supported by price methodology specialists who operate separately from the reporting teams. Platts follows a clearly defined process for public consultation on material changes to its methodologies. This process is based on full transparency and communication with industry stakeholders aimed at gaining

market acceptance for any proposed introduction or changes to methodology. For more information on the review and approval procedures, please visit: <https://www.platts.com/methodology-specifications/moc/moc-change-process>

All Platts methodologies reflect Platts commitment to maintaining best practices in price reporting.

How this methodology statement is organized

This description of methodology for assessments is divided into seven major parts (I-VII) that parallel the entire process of producing the end-of-day price values.

- Part I describes what goes into Platts assessments, including details on what data market participants are expected to submit, the process for submitting data and criteria for timeliness of market data submissions, as well as the editorial collection of input data from market sources.
- Part II describes any security and confidentiality practices that Platts uses in handling and treating data, including the separation between Platts price reporting and its news reporting.
- Part III is a detailed account of how Platts collects bids, offers, trades and other market data, and what Platts does with the data to formulate its assessments. It includes descriptions of the methods that Platts uses for reviewing data, and the methods used to convert raw data into assessments. This also includes the procedures used to identify anomalous data. This section describes how and when judgment is applied in this process, the basis upon which transaction data may be excluded from a price assessment, and the relative importance assigned to each criterion used in forming the price assessment. This section describes the minimum amount of transaction data required for a particular price assessment to be published. This is based on reported transactions and other market information. Finally, this section describes how Platts addresses assessment periods

where one or more reporting entities submit market data that constitute a significant proportion of the total data upon which the assessment is based.

- Part IV explains the process for verifying that published prices comply with Platts standards.
- Part V lays out the verification and correction process for revising published prices and the criteria Platts uses to determine when it publishes a correction.
- Part VI explains how users of Platts assessments can contact Platts for clarification of data that has been published, or to share a complaint. It also describes how to find out more about Platts complaint policies.
- Part VII is a list of detailed specifications for the trading locations and products for which Platts publishes assessments for a particular commodity. This section describes why specific units of measurement are used, and what conversion factors are used to move between units of measurement, where relevant.

PART I: INPUT DATA

Platts objective is to ensure that input data that editors use as the basis for their price assessments is of the highest quality. Ensuring that data used in Platts assessments is of high quality is crucial to maintaining the integrity of Platts various price assessment processes.

Platts encourages entities that submit any input data for consideration in its assessment processes to submit all market data that they have which may be relevant to the assessment being made. Platts aim is to determine the full circumstances surrounding all reported transactional data, including details of quality, specifications, order sizes, dimensions, lead times and any locational and loading/delivery information. Platts uses that

information to determine a typical and repeatable market level for the commodity being assessed.

Reporting data to Platts

Platts assesses a variety of different markets and commodities. In some of these Platts receives information from back office functions. However, in many markets back office functions are not best placed to communicate relevant market data to Platts editors, and in these instances Platts has processes in place to ensure that data is corroborated either through reviews of entities participating in its process, or through source validation and publication of information.

As part of its standard editorial practise, Platts routinely reviews the companies participating in its price assessment processes. These reviews ensure the suitability of data and information that are used to formulate Platts end-of-day price assessments. These reviews are conducted on a regular basis, and may take into consideration an array of issues including, but not limited to, adherence to editorial guidelines, operational and logistical issues, as well as counterparty acceptance. Further details concerning Platts MOC Participation Guidelines can be found online at <https://www.platts.com/market-on-close>.

The reviews are not designed to impede a company's ability to bilaterally engage in market transactions; the objective at all times is to ensure the integrity of published price assessments. Platts does not disclose the nature or scope of routine reviews of data providers that participate in its price assessment activities.

Platts may consider verifiable data reported and published through the day as provided for publication by individual sources, through established editorial methods.

Platts has developed guidelines for Management of Sources that address source identification, source evaluation, source development, using source information and source dependency. Individual sources are verified as per Platts Source Management Guidelines.

Platts considers several criteria as whether to use source information. These criteria include:

- Company reputation
- Source position within a company
- Source understanding and knowledge of the market in question
- Ability of source to provide relevant, valuable information
- Ability of Platts to verify information with other sources
- Source credibility

What to report

Platts encourages all market participants to submit all data that may be relevant to Platts assessments, including but not limited to:

- Firm bids that are open to the marketplace as a whole, with standard terms
- Firm offers that are open to the marketplace as a whole, with standard terms
- Expressions of interest to trade with published bids and offers, with standard terms
- Confirmed trades
- Indicative values, clearly described as such
- Reported transactional activity heard across the market, clearly described as such
- Other data that may be relevant to Platts assessments

How to report

Platts accepts any reasonable method of delivery/communication for information provided for publication in real-time, including for bids, offers and transactions. Platts editors typically communicate with market participants through phone, eWindow (if relevant) and/or online instant messaging systems.

Platts tries to accommodate the communication needs of its customers and will endeavor to open any additional communication channels required. Other means of communication, such as emails during the assessment process, are acceptable but are considered to be atypical. If a market participant chooses to communicate with Platts editorial using such atypical means, this needs to be highlighted well ahead of the assessment process.

The following reporting methods are accepted by Platts editorial staff:

- Commonly used Instant Messaging software
- eWindow
- Telephone
- Email

Reporters covering the markets in Asia and the Middle East are contactable from around 09:30 to around 18:30 Singapore time, those covering Europe and Africa from around 09:30 to around 18:30 London time, and those covering the Americas from around 08:30 to around 17:30 Houston time.

MOC data publishing principles

The Platts Market on Close (MOC) assessment process establishes core standards for how data is collected and published, how data is prioritized by value, and ultimately how data is analyzed in the course of completing Platts assessments.

Transparency underpins Platts data publishing processes. Under Platts MOC guidelines for collecting and publishing data, Platts publishes market information including but not limited to firm bids and offers, expressions of interest to trade and confirmed trades that are received from market participants throughout the day.

This information is published in real-time, as it is received, on Platts information services. Platts publishes all information received so that it can be fully tested by the market at large. Information collected and published includes the identities of buyers and sellers, confirmed prices, volumes, location, and stated trading terms.

Platts assessments are designed to reflect repeatable market value at the close of the assessment process. Platts tracks market price evolution during the entire day, and publishes a wide range of data relating to market value as it does so. All data that has been published through the day is analyzed during the assessment process. Towards the close of the day, Platts focuses its assessment process to publish named firm bids and offers, expressions of interest to trade and confirmed trades, with all relevant details. This transparent data is prioritized in the assessment process, because it is available to the entire market for testing.

In order to ensure that all firm bids and firm offers that still stand at the close of the assessment process have been fully tested in the market at large, Platts has established clearly defined time cut-offs that apply when publishing firm bids and firm offers in the MOC process. Time cut-offs for the submission and subsequent publication of new bids and offers are applied so that MOC participants cannot bid or offer late in the process, and to ensure that every bid and offer published by Platts is logistically executable.

Bids and offers published by Platts are considered to be firm until Platts is informed otherwise, or until the close of the assessment process for the day, whichever comes first. Platts expects all participants in the MOC process to be contactable at all times.

Platts will consider all firm bids and offers as open to the market at large and executable unless informed otherwise by the counterparty submitting the market information. If no communication is made to Platts to withdraw or change the parameters of the bid or offer it is assumed that it is available to the marketplace. Platts seeks verification of any transaction originating from a bid or offer submitted for inclusion in the Platts MOC process.

Input data may also include fully and partially confirmed bids, offers and trades, notional trading values and other market information as provided for publication by individual sources, through established editorial methods.

Market reporters endeavor to verify all market information they receive, including by testing it within the market through the publishing process. Trades reported as executed are verified as being executed and Platts ensures that any firm bids/offers reported are available to the market as a whole.

Platts uses various techniques to confirm the quality of data it receives, including cross checks with counterparties as well as requests for supporting documentation. Platts eliminates data in the price assessment process that cannot be verified in the market to the extent deemed appropriate.

All Platts market reporters are trained to analyze the data they receive and to question sources to establish the fullest set of information possible around price data. Reporters are trained to seek a wide variety of information to test reported transactional activity, including the specific price agreed, the counterparty to the trade, the point of origin and destination for delivery of the commodity, the size of the transaction, any physical quality commitments agreed as part of the trade, the terms and conditions of a trade and when a trade was agreed.

Platts publishes the most relevant information collected that meets its methodological standards, typically through real-time information services and with as much transparency as possible in order to test information within the market.

MOC data submission process

Platts has specific guidelines around data submissions to ensure high quality of information in the assessment process. This includes detailed guidelines on timings for submissions, which can be found in the specific guide for each commodity process. The purpose of the time cut-offs is primarily to ensure logistical executability and standards of incrementability and repeatability to ensure an orderly assessment process. As such, they may be changed at short notice if evolving market conditions require.

To ensure proper dissemination of market information, new bids and offers for publication by Platts must be received by Platts no later than stated cut-off periods.

In order to ensure that all published data is fully tested in the market, Platts has established guidelines around how quickly bids and offers may be improved when they have been published, and by what amount. These incrementability guidelines define the quantum and speed at which bids and offers may typically be improved in the MOC assessment process. Incrementability does not apply to bids and offers that are moving away from market value, though Platts analyzes bids and offers that are moved lower, and higher, respectively, to ensure reasonability.

Platts may notify the market of any adjustment to the standard increments in the event of market volatility or a disruptive event. A market participant can withdraw a bid or offer from Platts MOC process at any time, so long as no other potential trading counterparty has indicated that it has interest to buy or sell into the bid/offer.

Platts expects that market participants bidding and offering in the MOC process should perform on their bid/offer with the first company of record to express interest to Platts for publication during the MOC process. In the event of a dispute on the timing, Platts will review its records and determine which company communicated to Platts first its intention to execute on a bid/

offer displayed on the Platts systems. Platts prioritizes data on the basis of timeliness. This sequence is critical for an orderly assessment process.

Platts editorial guidelines governing its assessment process require it must consider only those transactions, bids or offers where market participants perform under typical contractual terms. Platts accepts that individual companies may have trading limits with counterparties and that national legislation may prevent companies from dealing in materials of certain origins. Such counterparty issues are dealt with on a case-by-case basis.

All bids and offers are firm from the moment of submission.

Submissions of bids, offers or transactions should not be considered as received by Platts unless acknowledged as received by Platts. For communication initiated by phone Platts will consider the time when the trader actually communicated the bid/offer or transaction. Acknowledgment may take the form of “yes,” “OK,” “y,” “k,” or any other reasonable forms, including by sending back the published information. Platts recognizes the time of receiving a message of a company’s intent to buy/sell, as opposed to the time a message was sent by the trading party.

Bids and offers submitted on time but in an incomplete form, where the terms are only clarified after the cut-off deadline, will not be used in the assessment process.

As a general recommendation Platts advises market participants not to wait for the last possible minute before the cut-off deadlines for bids and offers, as the communication may not be completed on time.

A buyer or seller can communicate with Platts directly to express buying or selling interest. Platts may also take into consideration bids and offers made via a broker, provided the buyer or seller have communicated to Platts that they have authorized the broker to speak on their behalf.

Platts only considers for publication and assessment transactional interest that is expressed by participants for bids or offers that have already been published by Platts. Interest in bids or offers at prices that have not been published, and therefore may not be fully available for testing in the marketplace as a whole, may be disregarded. Should a buyer lower its bid or a seller increase its offer, an expression to trade at a previously published level will not be considered.

Platts editorial processes require full clarity when communicating bids/offers and intentions to trade. When expressing an intention to hit a bid or lift an offer in the MOC processes, any message should typically include the specific price of the trade and the name of the counterparty. Information may not be published if it is not sufficiently clear when communicated to Platts.

Following any trade, an intention to rebid or reoffer must be received by Platts as soon as is possible and within a reasonable time frame, as per incrementability guidelines.

Unless sellers/buyers expressly inform Platts of their continued interest to buy/sell after a deal, Platts will presume the original buyers or sellers are not there for additional volume.

A rebid or reoffer must match the initial position’s parameters, with the exception of price. A rebid or reoffer can be made at the same level or inferior to the traded price. For example Company B hits Company A’s bid for \$100/mt during the MOC. Company A can rebid at \$100/mt or below this level. If the MOC process for the market includes a “freeze” period at the close of the process, bids and offers may only be repeated at the last published price.

When there are multiple bids or offers at the same level, the first participant to reach that level should be the first to be traded. Subsequent deals will go to the second, third and fourth participant at the same level. When a participant is traded, any repeat of their bid/offer will move to the back of the bid/offer queue.

Platts will consider the first participant to express their interest in a bid or offer to be the counterparty for the subsequent trade. Platts will monitor time stamps in the event of a dispute to determine who the first buyer or seller was. In the event of a bid or offer being repeated, the queue of participants expressing interest in that position will be reset. Platts will not consider any interest expressed in a rebid or reoffer before the position is published to be executable during the MOC assessment process.

After a bid or offer is published, only price can be changed, while in certain markets volume may be adjusted to be multiples of a minimum volume. The quality or loading/delivery timing cannot be changed. Buyers or sellers can withdraw bids/offers at any time, provided no prior interest to transact has been expressed by any potential counterparty. If a participant trades another position during the MOC assessment process, they must communicate to Platts if they wish to withdraw their existing position following the trade. Otherwise, it is assumed the participant’s own position remains active.

All participants that have reported bids and offers for publishing in the Platts process are expected to promptly report any transactions stemming from available bids or offers reported to Platts as part of the MOC assessment process.

Platts synchronizes its computer clocks every day precisely, and will compare the time of any submitted bid, offer or transactional interest against this synchronized time. Please note that Platts applies the timing deadlines strictly.

For the purposes of clock synchronization, market participants may find the following internet link to be helpful: www.time.gov. This link offers an atomic clock reading for US time zones.

In markets where Platts eWindow is in operation, the eWindow clock will be used to determine the correct sequence of events when a bid or offer is amended, withdrawn, or traded by an interested counterparty. Bids or offers submitted by phone, or any other medium, such as instant messaging software, shall be

clocked at the time the bid, offer or trade indication is actually transmitted through the Platts eWindow system. As per Platts methodology, buyers or sellers can withdraw bids/offers at any time when communicating through eWindow, provided no prior interest to transact has been expressed by any potential counterparty. All bids and offers are firm from the moment submitted into Platts eWindow to the moment they are traded, the window period closes or the bid/offer is withdrawn from the system by the trader or a Platts editor.

Platts is an information company and it aims to publish any credible bid or offer reported to it. Platts makes no commitment to publish every bid or offer submitted to it, however. For instance, frivolous bids and offers may not be published.

Terms of trade such as quality, delivery port, timing of delivery/loading and price are fully up to the company submitting the bid or offer.

Platts cannot make any guarantee in advance about how and whether market information received and published but not fully adhering to its defined methodology will be incorporated in its final assessments.

Atypical bids, offers, trades

Platts may publish bids, offers and trades with atypical pricing terms, including benchmark bases and timing. Market information with atypical pricing inherently differs in value from the typical and commonly observable information in the market.

Bids and offers which are deemed as atypical relative to the market may not be fully taken into consideration for the assessment process. In the absence of an associated, liquid derivative instrument atypical pricing bases may be difficult or impossible to evaluate on an outright price equivalent.

Such bids/offers or transactions would be at best indicators of an overall market condition but they would not be seen as exact indicators of market price.

Any unusual condition or request regarding a commodity should be specified at the moment the initial bid or offer is made. Any unusual request that surfaces at the time a counterparty is ready to trade and that impedes the normal flow of a transaction could be seen as an impediment to trade.

Information reported by market participants that may have legal implications, including but not limited to potential libel, will not be published.

Market participants are encouraged to inform Platts when they cannot trade with another typical market participant due to performance, credit or legal issues before the cut off deadlines for initial bids and offers. Platts may ask market participants to provide supporting documentation to ensure the integrity of its assessment process.

Law

Contracts using English law are considered standard in the assessment process.

Embargoed products

Laws stating that nationals from specific countries may not buy products from embargoed countries may prevent market participants from lawfully executing transactions. A seller therefore may not assume that a buyer has the obligation to buy embargoed materials. Under Platts Market on Close assessment guidelines, commodities supplied from countries or entities that are subject to trading embargoes and sanctions recognized under international law should not be delivered against transactions concluded during the Platts MOC assessment processes. Bids and offers that contain statements surrounding delivery of embargoed materials will be considered by Platts for publication, and if published after review may be subject to normalization in value.

Late performance

Platts is aware that physical conditions regarding logistics which are beyond the control of the seller or buyer may result in lateness, quality issues or conditions seen as a deviation from the

original wording in the contract, for example late delivery/loading.

These deviations will be seen in the larger context of physical trading, and should not be seen as an indication of Platts condoning lateness.

Platts will review patterns of logistical performance, as adjustments due to late performance and/or quality issues should be extraordinary and not recurring events.

Participants who are intending to sell should not offer when there is a known and distinct possibility that loading/delivery may be delayed. If congestion or delays prevent performance under the contractual terms, the seller should make reasonable and timely efforts to supply from an alternative source, or the seller should engage in other measures to alleviate the buyer's exposure.

Equally, a buyer should not over-commit and then aggregate nominations in a way that makes it logistically impossible for the seller to perform.

Platts will take appropriate steps to ensure the integrity of its assessments if issues of non-performance should arise.

In summary, performance is paramount and all bids and offers must be firm and transactions should be performable within the contractual parameters.

Platts only recognizes bids, offers and transactions where no party claims a right to unilaterally cancel a transaction. If a transaction becomes difficult the party causing the issue must seek resolution including alternative loadings, qualities, dates or book outs.

Compensation

Platts publishes bids, offers and transactions on the basis that participants will fulfil the full value of the physical contract.

A party deemed to have underperformed or not performed

under the original contract is expected to compensate the affected party.

In almost all circumstances, the compensation is not, and should not be due to a flat price change, but should include parameters such as backwardation, logistics, and the inconvenience for the buyer in the case of a seller not performing, or contango, logistics and the inconvenience for the seller in the case of a buyer not performing. Compensation should not include consequential costs.

Such adjustments should be fair and in line with market practice, and should be reciprocal in the event that the inverse situation occurs in the future.

Compensation is subject to editorial review to ensure market practices and overall fairness in the transaction have been followed. Platts review may include an analysis of reasonable compensation. Platts views compensation as a part of full performance due under the parameters of a trade reported in the assessment process.

Force majeure

Force majeure is part of trading and may be invoked under very special circumstances. Platts editors will monitor the application of it to ensure that force majeure is not invoked frivolously.

Booking out trades

Booking out trades done during the Platts Market on Close assessment process is acceptable under exceptional circumstances. A stressed party may request to book out a trade, but its counterparty is under no obligation to accept such request.

In those exceptional cases where both counterparties agree to book out a trade, Platts expects the original spirit of the contract to be fulfilled where the non-performing party offers to buy/sell back the position and compensates the affected party.

In almost all circumstances, the adjustment is not and

should not be due to a flat price change, but should be to include parameters such as market structure, logistics and the inconvenience for the buyer or seller expecting a normal transaction. Such adjustments should be fair and in line with market practice, and should be reciprocal in the event that the inverse situation occurs in the future.

Furthermore, circle outs may occur when the original seller sells a parcel that is later sold into a third party that has a sale into the primary seller. Such "circle outs" are considered a normal part of trading as sometimes chains originate and finish at the same point.

Book outs and circle outs are subject to editorial review to ensure market practices and overall fairness in the transaction have been followed. Platts review may include proposals/arrangements to protect the integrity of its assessment process.

Review of trades

Platts may track all aspects of performance on trades reported during its MOC assessment process. Platts not only focuses on the performance of the transaction at the time of trade, but also on any significant issues stemming from such trades, including logistics and eventual delivery. Trades executed through the Platts Market On Close assessment process may be reviewed from time to time for performance completion. Platts therefore may request documentary material to determine performance and validity. Such material may include details of quality, location, vessel and laycan nominations. MOC trades may be subject to editorial review to ensure market practices and performance in the transaction have been followed.

A failure to meet Platts guidelines for participation and performance in the MOC may lead to an event driven review. Event driven reviews are designed to help ensure that transactional information and other data inputs used as the basis for Platts price assessments are representative of market value on an ongoing basis.

Post-deal tracking enables Platts to determine the actual

performance of the participants in the trade and the validity of their inputs. Platts may publish confirmation of trade performance information.

Specification

Platts assessments reflect typically traded qualities of commodities. Specifications are available in individual specifications guides, published on the Platts website www.platts.com.

Testing of products

Traded commodities are subject to standard testing techniques and protocols to determine contractual performance. Platts typically follows the standards already in place in the trading market, although it may monitor these to ensure that the standards are adequate.

Implied guarantees in specifications

Bids and offers submitted to Platts that include numerical specifications will be assumed to have a series of zeroes to the right of the decimal point or to the right of the last digit to the right of the decimal point.

As an example, a fuel oil cargo with a maximum guarantee of 0.1 Shell Hot Filtration will be considered as 0.1000 etc. If the specification guarantees are otherwise, the buyer or seller should specify it clearly to avoid potential disputes.

Merchantability

Platts only considers in its assessments commodities that are merchantable. Hence, buyers may assume that offers or transactions are for a commodity that is merchantable. Sellers must ensure their offers or transactions are for merchantable commodities.

PART II: SECURITY AND CONFIDENTIALITY

Data is stored in a secure network, in accordance with Platts policies and procedures. Platts assessments are produced

in accordance with Platts Market on Close assessment methodology. This means that all data for use in Platts assessments may be published by Platts editorial staff while assessing the value of the markets.

Platts does not have confidentiality agreements in place for information that is sent for use in its assessments.

PART III: DETERMINING ASSESSMENTS

The following section describes how Platts uses concluded and reported transactions, bids, offers and any other market information it has collected in the manner described in section one, to formulate its price assessments. Additionally, this section describes other information, including the normalization of market data, assumptions and extrapolations that are considered when making a final assessment.

MOC price assessment principles

Through the MOC assessment process, Platts considers market information gathered throughout the normal trading day, and publishes such information throughout the day. Platts analyzes all published information in determining its final published price assessments.

Platts seeks to establish and publish the value of markets that prevail at the close of the assessment process. Platts has aligned the timestamps reflected in its assessments with what typically is a period of high activity in the markets that Platts observes. Platts believes that aligning its price assessments to typical periods of greater market activity and liquidity provides a robust basis upon which to derive an assessment of market value. Timestamps for each assessment are included in the specifications guide for that assessment.

Platts has adopted the MOC methodology in order to provide complete clarity over the precise point in time reflected in its market assessments. Like the quality of a commodity, its delivery

location, delivery dates, contract terms, and the volume to be supplied, the time of commercial activity is an important attribute considered in Platts price assessments. The time that a bid or offer is shown to the market, or a transaction concluded, is vitally important in understanding the market value of the respective commodity, in the same way that the quality of the commodity, where it will be delivered and when it will be delivered are important factors. By clearly reflecting value at a defined point in time Platts is able to properly reflect outright and spread value.

The clarity established by providing a well-defined timestamp is also important for understanding the relationships between the markets that Platts assesses. By ensuring that all assessments within a region reflect market value at the same moment in time, spreads that exist between commodities are also able to be fully and properly reflected. For example, comparing the value of a raw material to a processed commodity is possible when both values have been determined at the same moment in time. By contrast, comparing the price of raw material in the morning, to processed material in the afternoon, might deeply impair the relationship between the commodities – particularly when the respective market prices move independently during the intervening period.

By providing clear timestamps for assessments, the Platts MOC process is designed to provide assessments that properly reflect outright and spread value during times of high volatility equally well as in times of modest volatility.

MOC guidelines are designed to avoid distortion of the final price assessments by eliminating inputs that are not fully verifiable, and by disregarding one-offs or unrepeatable transactions, or those that may distort the true market level. Transactions between related parties are, for instance, not considered in the assessment process.

Deals done below the level of prevailing bids or above the level of prevailing offers (i.e., selling through the bid or buying through the offer) will not be reflected in Platts assessments. Platts will only publish expressions of interest to trade with the most

competitive, tradeable bid or offer available.

Platts does not specify a minimum amount of transaction data, or a transaction data threshold, for the publication of its price assessments. Physical commodity markets vary in liquidity. Any particular market analyzed on its own will typically demonstrate rising and falling levels of transactional activity through time. Platts is committed to providing an assessment of value for every market that it covers, equally well in times of heightened or reduced liquidity.

Platts seeks to receive market information from as broad a cross section of the market as possible. If a very limited number of market-makers are active in the market, or if a limited number submit data that constitutes a significant proportion of the total data upon which the assessment is based, Platts will continue to seek fully transparent and verifiable data from the market at large and to apply Platts methodology principles of transparency and time sensitivity. Platts considers data for assessment of any market where a single company provides more than half of all available information to be one where such a company provides a significant proportion of data. For consideration in the MOC process such a company's bids or offers must be clearly available for execution by any other potential MOC trading counter party.

Normalization price adjustment techniques

Platts seeks to align the standard specifications for the markets it assesses and the timestamps reflected in its assessments with standard industry practice. However, physical commodity markets are generally heterogeneous in nature. Key attributes often vary from the base standard reflected in Platts assessments as material is supplied to market.

The quality, delivery location and other specific terms of trade may vary in the physical commodity markets assessed by Platts. This means that simple averages of trades may not produce a representative assessment value of a physically heterogeneous market.

Because of the complex nature of the physical markets, market data typically must be aligned with standard definitions to allow for a fully representative final published assessment. Platts aligns data collected through an analysis of the physical markets with its standard assessment specifications through a process called normalization.

Normalization is an essential price adjustment technique used to align reported market information to the base standard reflected in Platts price assessments.

Platts establishes the level of normalization by surveying markets and observing the economic impact of variance from the base standard. This is done by analyzing freight rates (for locational differences), quality premiums (for quality differences), the movements of all markets through time (for time differences) and other premiums associated with the size of trades and delivery terms.

Normalization for time may be done by analyzing movement in a related market observed through time, and that movement may provide a basis by which to align market value of an earlier reported bid, offer or transaction to market value at the MOC close. The alignment for time is essential to ensure that Platts price assessments reflect the prevailing value of a market at the close of the MOC process.

Prioritizing data

Transparency underpins Platts assessment process, just as it does Platts data publishing processes. Platts assessment process considers firm bids, firm offers and arms-length transactions that are transparent and open to sufficient, credible counterparties. Bids, offers or transactions that are not transparent may not be considered in the assessment process; bids above transparent offers or offers below transparent bids are not considered in the assessment process. Platts considers changes to bids or offers when those changes are made transparently and in normal increments.

When determining a final market assessment, Platts gives the greatest priority to fully verifiable and transparent market information. A firm bid or offer that has been published by Platts in accord with its data publishing standards, as outlined in part 1 above, and which still stands open to the marketplace at the close of the assessment process, will establish clear parameters for Platts final published assessments. Platts will typically assess market value between the best firm bid and best firm offer open to the market at the close. This ensures that Platts assessments reflect the transactable value at the close.

Completed, transparent transactions that are fully published by Platts are important in helping establish where trading interest prevails in the market, and may help determine where, in a bid/offer spread, Platts may assess value for publication.

Firm bids and offers that are available to the entire market may take precedence over trades that have been concluded earlier in the assessment process when establishing the value of the market, particularly if bids are available at the close above previously traded levels, or offers are available to the market below previously traded levels. Value is a function of time.

Similarly, firm bids and offers that are available to the entire market take precedence over transactional activity reported to Platts after completion.

The level of each bid or offer must stand firm in the marketplace long enough for any counterparty to transact; otherwise the bid or offer may be deemed non-executable. Platts may not consider bids, offers or transactions that are the result of market gapping. Gapping occurs when a bid and an offer are more than one increment apart and a trade occurs. Platts will analyse and evaluate such trades for their representative value. They may not be fully reflected in the final assessment.

Platts assessment guidelines are designed to avoid any distortion of the final price assessment and so inputs that are not verifiable and “one-off” or unrepeatable transactions may be

disregarded from the price assessment process.

Single transactions may be a reflection of market value. However single transactions need to be measured against the broad span of similar transactions. If for instance a buyer decides to trade an offer but is unwilling to buy more material offered at the same level if the seller reoffers it would be determined that the buyer failed the repeatability test. Equally if the seller does not reoffer, the seller fails the repeatability test. As such the transaction may not be fully reflected in the price assessment.

Similarly, Platts may not publish bids or offers that are provided through untested price levels. When transactions are concluded at levels that have not been fully tested by the market because price changes have been non incremental, Platts may determine that actual market value is between the last incremental bid and the transaction at the gapped level.

When no bid, offer or transaction data exists, Platts may consider other verifiable data reported and published through the day, including fully and partially confirmed trades, notional trading values and other market information as provided for publication. Platts may observe direct market activity as well as the effect of movements in related markets through spread differentials or blending and shipping economics, for example.

Platts takes into account representative transactions executed at arms-length in the open market occurring during the trading day, up to the close, and additionally taking into account bid and offer information submitted during this period. Platts editors may require direct verification from the principals to a reported bid, offer or deal when communicated through a third party, including a broker.

Assessment Calculations

Units of measurement

Platts publishes its assessments reflecting the currencies and units of measurement in which the products typically trade.

Commodities are generally internationally traded in US dollars, and Platts assessments are typically published in that currency as a result. Certain markets, such as regional markets, trade using local currency. Platts assesses the value of such markets as appropriate in local currency.

Commodities typically trade in volumetric or energy units, and Platts assessments for these markets reflect common practice in each market. The units and unit range considered for each individual Platts assessment of a physical market is described in the specification guide for each commodity.

In certain cases Platts converts its assessments to other currencies or units of measurement to allow for ease of comparison or analysis in regional markets. Such conversions are done using exchange rates published regionally. Conversion factors are described in the specifications guide for each commodity alongside individual assessment codes.

Use of judgment

Judgment guidelines promote consistency and transparency and are systematically applied by Platts. Where judgment is exercised, all information available is critically analyzed and synthesized. The various possibilities are critically analyzed and fully evaluated to reach a judgment.

Platts reporters follow specific methodology when exercising judgment or discretion during their assessment process. Platts editors apply judgment when determining (1) whether information is suitable for publication, (2) when and how to normalize data and (3) where to assess final value. All such judgment is subject to review by Platts editorial management for adherence to the standards published in Platts methodologies.

Judgment may be applied when analyzing transactional data to determine if it meets Platts standards for publication; judgment may also be applied when normalizing values to reflect differences in time, location, and other trading terms when comparing transactional data to the base standard reflected in Platts assessments.

To ensure all assessments are as robust as possible, Platts editorial systems are backed by a strong corporate structure that includes managerial and compliance oversight.

An evaluation process is conducted before publication on every benchmark assessment by a competent peer or manager. The price assessments are reviewed and the exercise of judgment is further discussed and verified during this process. Finally, assessments that are used as benchmarks are supported by assessment rationales. These rationales explain the application of judgment and are published together with the relevant price assessment, offering full transparency to the market.

To ensure the consistent exercise of discretion, Platts ensures that reporters are trained and regularly assessed in their own and each other's markets. Platts manages and maintains internal training guides for each of the different products assessed which aim to ensure Platts price assessments are produced consistently

Every assessment of a benchmark, including the use of discretion, is reviewed and approved by a competent peer or manager prior to publication.

Reporters are trained to identify potentially anomalous data. Platts defines anomalous data as any information, including transactions, which is inconsistent with or deviates from our methodology or standard market conventions.

As a publisher owned by S&P Global, independence and impartiality are at the heart of what Platts does. Platts has no financial interest in the price of the products or commodities on which it reports. Platts aim is to reflect where the actual market level is.

Platts focuses primarily on assessing the value of a commodity trading in the spot market. A spot price for a physical commodity is the value at which a standard, repeatable transaction for merchantable material takes place, or could

take place, in the open market at arms' length. Platts spot price assessments reflect this value at precisely the close of the assessment process.

Platts overall objective is to reflect the transactable value of the commodity assessed. In cases where the apparent value of the commodity includes extra optionalities, the intrinsic value of the commodity may be masked. In such cases, Platts reporters may use judgment to normalize bids, offers or transactions with such extraneous elements to the base market standard, or may exclude them altogether. Optionalities that may mask the value of the commodity include but are not limited to loading or delivery options held by the buyer or seller, size option tolerances exercisable by the buyer or seller, or quality specifications.

Outright, differential and spread prices

Platts assesses the outright value of a commodity, as well as differentials when it trades with reference to a benchmark. Platts analyzes all data collected and published by Platts throughout the day. Final assessments are above firm bids, and below firm offers, that stand at the close of the Market on Close assessment process. This is true for outright values and differentials.

Platts physical price assessments use a variety of inputs, including outright price bids/offers, floating price bids/offers, spread price bids/offers (including EFPs, EFSs etc.) and combinations of fixed and floating prices. Platts' objective is to assess the prevailing tradable outright price of the commodity at the close of the market assessment period. In the event of an observed conflict between outright values and differentials or spreads, outright values prevail in Platts final published assessments.

Platts establishes the hedgable, outright value of floating and spread price indications by applying them to the observable, prevailing value of underlying relevant derivatives instruments. In the event of conflicts observed between the outright values derived from floating and spread prices with different underlying references, Platts takes into account considerations that include

the relative liquidity of each relevant derivatives market, and the typicality of a given spread or floating price, when exercising judgement around whether to prioritize one particular floating price or spread over another.

Platts may publish bids, offers and trades with atypical pricing terms, including benchmark bases and timing. Market information with atypical pricing inherently differs in value from the typical and commonly observable information in the market.

Bids and offers which are deemed as atypical relative to the market may not be fully taken into consideration for the assessment process. In the absence of an associated, liquid derivative instrument atypical pricing bases may be difficult or impossible to evaluate on an outright price equivalent.

Such bids/offers or transactions would be at best indicators of an overall market condition but they would not be seen as exact indicators of market price.

Timing

Platts produces time-sensitive assessments that reflect the value of the markets it covers precisely at the close of the price assessment process in each region. By providing clear timestamps for every region the Platts assessment process is designed to provide price assessments that properly reflect outright and spread value.

As an example, gasoline has a value, naphtha has a value and the gasoline versus naphtha spread has a value, and all three match when measured at the same time. By contrast, a system of averages can lead to distortions in the gasoline versus naphtha spread if the distribution of deals done for gasoline and naphtha differs over the averaging period. Thus if gasoline trades actively at the beginning of the assessment period and naphtha trades actively at the end of the assessment period in a rising market, the assessed spread value resulting from an averaging process will not be reflective of actual market value. This distortion can arise even if the value of spread trades in

their own right has remained constant. The MOC approach drastically reduces the possibility of such distortions.

Assessments reflect typical loading and delivery schedules for each market assessed. The standard loading and delivery periods are included in the individual specifications guide for each commodity.

Market structure, such as backwardation and contango, is also factored into the Platts assessment process. If a company offers a parcel loading 15 days forward, the offer may provide market information for the Platts assessment for parcels loading 15 days forward. Platts would still need to assess days 16 through 30 (in a 15-30 day market) and publish an assessment that reflects market value 15-30 days forward ahead of the day of assessment.

Market structure

Platts is very stringent in following timings for loading or delivery due to the variability in market value across time. This variability increases as the market structure, backwardation or contango, in the markets increases.

Platts factors in the backwardation/contango and reflects its impact on the published assessment. The assessment reflects the value of the commodity normalized to the center of the loading/delivery window. In a contango market, the excess of prompt material causes the front period to be significantly lower in value than material available at the end of the window. In a backwardated market the tightness of supply causes the prompt material to be at a higher price than material available at the end of the window.

Platts methodology eliminates any arbitrary movement in assessments caused simply by the different loading/delivery ranges traded. By normalizing prices to the mid-point of a clearly defined date range, the consistency of prices is maintained. The day-to-day changes in the price assessments therefore reflect an actual price move in the value of the commodity, rather than an artificial change because a cargo happens to be loading/

delivering in the front period of the window rather than the back period, or vice versa.

The date ranges reflected by Platts reflect the prevailing trading practices in the region. By not taking very prompt days into consideration, transactions reflecting distressed prices are excluded. The definition of this period varies according to specific markets.

Determination of backwardation or contango

In calculating market structure, the prices of tradable instruments, including derivatives such as futures and swaps, may be used.

Typical calculations include a determination made for the difference in price over a month; a granular value is then calculated from this for each day.

Outright and floating price information

The three main factors used in the commodities markets for price determination are:

- Outright price
- Differentials
- Derivatives

These three factors — outright price, premiums and derivatives – converge in a spot price. Platts may use all three in its assessments.

Outright price: The ultimate question in the mind of an end-user, producer, trader or broker is price. Outright prices are the simple statement of a price at which something can be bought or sold, with the entire value stated – for example, an offer of a cargo of iron ore at \$100/mt. Price in turn determines expense, processing margin, profit, loss, etc. The spot market trades actively on an outright price basis and a floating price basis.

Platts takes both into account in its assessments. Platts will publish activity on both a fixed and floating basis.

Differentials: Many transactions are carried out in relation to a benchmark. In this case a differential, also known as a premium/discount is generated. Differentials can arise if the quality, volumes or loading times for a given transaction differ from the benchmark. In addition, floating price transactions are done in relation to assessments that will be published in the future – for example, a bid for a cargo at \$10/mt above the Platts assessment of that same commodity, as published immediately before, during and after delivery of the cargo. Premiums usually rise when the market's backwardation steepens, and the steeper the curve, the greater the premium. In a contango situation, premiums have a tendency to turn into discounts.

Derivatives: Derivatives are a major determinant in price; they trade frequently and throughout the day. These markets are very reactive and may provide market participants with timely information on market conditions. They can react to arbitrage conditions or movements in overseas markets as well as local conditions. Derivatives may allow companies to adapt their price exposure because they enable market participants to transform floating prices to fixed or fixed to floating.

PART IV: PLATTS EDITORIAL STANDARDS

All Platts employees must adhere to the S&P Global Code of Business Ethics (COBE), which has to be signed annually. The COBE reflects S&P Global's commitment to integrity, honesty and acting in good faith in all its dealings.

In addition, Platts requires that all employees attest annually that they do not have any personal relationships or personal financial interests that may influence or be perceived to influence or interfere with their ability to perform their jobs in an objective, impartial and effective manner.

Market reporters and editors are mandated to ensure adherence to published methodologies as well as internal standards that require accurate records are kept in order to document their work.

Platts has a Compliance function that is independent of the editorial group. The Compliance team is responsible for ensuring the quality and adherence to Platts policies, standards, processes and procedures. The Compliance team conduct regular assessments of editorial operations, including checks for adherence to published methodologies.

S&P Global Platts appoints an independent, external auditor with appropriate experience and capability to review and report on its adherence to this stated methodology. The annual report is published online at <https://www.platts.com/regulatory-engagement>.

PART V: CORRECTIONS

Platts is committed to promptly correcting any material errors. When corrections are made, they are limited to corrections to data that was available when the assessment was calculated.

PART VI: REQUESTS FOR CLARIFICATIONS OF DATA AND COMPLAINTS

Platts strives to provide critical information of the highest standards, to facilitate greater transparency and efficiency in physical commodity markets.

Platts customers raise questions about our methodologies and the approach we take in our price assessments, proposed methodology changes and other editorial decisions in relation to our price assessments. These interactions are strongly valued by Platts and we encourage dialog concerning any questions a customer or market stakeholder may have.

However, Platts recognizes that occasionally customers may not be satisfied with responses received or the services provided by Platts and wish to escalate matters. Full information about how to contact Platts to request clarification around an assessment, or make a complaint, is available on our website, at: <http://www.platts.com/ContactUs/Complaints>.

PART VII: DETAILED SPECIFICATIONS

PLATTS UK ASSESSMENTS (GTMA, GBP/MWh)

	Base	Peak	--Euro Equivalents--	
	Base	Peak	Base	Peak
Day ahead	AADET00	AADFC00	AADEY00	AADFE00
Day ahead + 1	AADET27	AADFC27	AADEY27	AADFE27
Day ahead + 2	AADET28	AADFC28	AADEY28	AADFE28
Weekend	AADNN00		AADNP00	
Month ahead	AADGP00	AADGV00	AADGT00	AADIJ00
Month ahead + 1	AADNS00	AADXH00	AADNU00	AADXJ00
Month ahead + 2	AADXL00	AADXP00	AADXN00	AADXR00
Quarter ahead	AADXU00	AADXZ00	AADXW00	AADYB00
Quarter ahead + 1	AADYD00	AADYK00	AADYF00	AADZP00
Season ahead	AADZS00	AAEYV00	AAESW00	AAEZB00
Season ahead + 1	AAEZD00	AAFPM00	AAFPL00	AAFPN00
Season ahead + 2	AAIJX00	AAIJY00	AAIKB00	AAIKC00
Season ahead + 3	AAIJZ00	AAIKA00	AAIKD00	AAIKE00
Season ahead + 4	AASTR00	AASTT00	AASTQ00	AASTS00
Year ahead	FUKZY01	FUKYY01	FUKXY01	FUKWY01

Platts UK electricity standard specifications

Platts assesses over-the-counter trade under the Grid Trade Master Agreement contract for the day ahead, weekend, next three months, next two quarters, next five seasons and the year ahead.

Standard contract definitions

Platts assessments are based on standard contract definitions and volumes.

Delivery: Prices are for firm delivery on the high-voltage grid network of England, Wales and/or Scotland. This includes the Scotland-Northern Ireland interconnector but not Northern Ireland itself. Distribution network costs are not included. All

prices are for physically delivered trades.

Lot size: Qualifying trades are 50-100 MW for prompt (day-ahead and weekend delivery) and 5 MW-20 MW for forwards.

Timing (London time): Baseload = 23:00-23:00, Peak = 07:00-19:00.

EFA Block definitions (London time)

Block 1 = 23:00-03:00

Block 2 = 03:00-07:00

Block 3 = 07:00-11:00

Block 4 = 11:00-15:00

Block 5 = 15:00-19:00

Block 6 = 19:00-23:00.

Day-ahead = Baseload for delivery from 23:00 the day of trade until 23:00 the day after. Peaks for delivery 07:00-19:00 the day following trade.

NOTE: In the event of no confirmed peakload UK day-ahead trades before the 11:00 am London time market close, Platts will assess the implied value of the day-ahead peakload contract using OTC prices for Block 3+4 (07:00-15:00) and Block 5 (15:00-19:00).

Weekend = Baseload for delivery from 23:00 Friday until 23:00

on Sunday.

All forward months, quarters and years are calendar months, quarters and years.

Winter = The period from October-March.

Summer = The period from April-September

NOTE: The UK market also has off-peak contracts (19:00-07:00 London time) and overnight contracts (23:00-07:00 London time). These contracts do not form part of Platts assessments.

Platts assessment ranges

Platts publishes a single value for each of its UK electricity assessments in European Power Daily and on European Power Alert.

Platts also publishes a low-high range around its assessments for UK electricity symbols in Market Data categories EE and PE, unless otherwise stated. The low and high reflect a fixed value either side of the assessment. Low-high ranges are standardized as follows:

- Primary assessments in GBP/MWh: +/- 15 pence.

When Platts assessments are published

Platts market-on-close assessments reflect market value at the

end of the normal trading cycle. For UK power we define this as:

All day-ahead contracts – 11:00 am London time.

All daily prompt and forward contracts – 16:30 London time.

Day-ahead assessments are published after 16:30 London time alongside Platts forward electricity assessments.

On certain days ahead of some UK Bank Holidays, such as Christmas Eve and New Year's Eve, Platts assesses the 16:30 market-on-close price earlier than normal, at 12:00 noon London time. This is to take account of typically much lower liquidity and the earlier end of trade.

Units: All UK prices are quoted in GBP/MWh with Eur/MWh equivalents.

Platts converts its UK electricity assessments from GBP/MWh to Eur/MWh to allow for ease of comparison or analysis in regional markets. Such conversions are done using published exchange rates.

Platts day-ahead assessments are databased both by trade date and by flow date.

Platts publishes day-ahead power market assessments for Monday to Friday and a single weekend assessment for Saturday and Sunday. On Fridays, the day-ahead price reflects Monday's delivery date.

Platts publishes forward power assessments for the UK on all UK working days. Assessments for UK bank holidays and the first working day following a UK bank holiday weekend are published on the last working day before the bank holiday.

European Power Daily: UK Monthly Averages

Platts publishes monthly averages for day-ahead and month-ahead. For day-ahead, monthly averages are calculated on a flow-date and trade-date basis.

For a flow-date monthly average an August 1 day-ahead assessment would be included in the August average, although the contract traded on July 31. UK flow-date averages calculate Saturday and Sunday values based on Friday assessments of weekend delivery.

UK day-ahead assessments cover working days only and the trade-date monthly averages therefore include Friday assessments of Monday delivery but do not include weekends. The trade-date calculations do not include day-ahead+1, day-ahead+2, day-ahead+3 and day-ahead+4 prices assessed ahead of UK bank holidays.

Roll dates

All weekly, monthly, quarterly, seasonal and annual power contracts roll on the first working day of each new calendar period.

Continental European power coverage

Platts publishes power settlement prices from the European Energy Exchange (EEX) for Germany, France and Italy, with specifications and roll dates as listed on EEX. Platts publishes power settlement prices from OMIP for Spain, with specifications and roll dates as listed on OMIP.

Platts fuel spread calculations incorporate these power settlement prices.

PLATTS DAILY SPARK SPREADS

	45% Efficiency	50% Efficiency
UK (GBP/MWh)		
Day ahead	UKHDA00	AAKBA00
Month ahead	UKHMA00	AAKBC00
Month ahead + 1	UKHM200	UKFM200
Quarter ahead	UKHQ100	UKFQ100
Quarter ahead + 1	UKHQ200	UKFQ200
Season ahead	UKHS100	UKFS100
Season ahead + 1	UKHS200	UKFS200
Season ahead + 2	UKHS300	UKFS300
Season ahead + 3	UKHS400	UKFS400

	45% Efficiency	50% Efficiency
UK (Eur/MWh)		
Day ahead	UEHDA00	UEFDA00
Month ahead	UEHMA00	UEFMA00
Month ahead + 1	UEHM200	UEFM200
Quarter ahead	UEHQ100	UEFQ100
Quarter ahead + 1	UEHQ200	UEFQ200
Season ahead	UEHS100	UEFS100
Season ahead + 1	UEHS200	UEFS200
Season ahead + 2	UEHS300	UEFS300
Season ahead + 3	UEHS400	UEFS400

	45% Efficiency	50% Efficiency
German (Eur/MWh)		
Day ahead	GEHDA00	AAKBI00
Month ahead	GEHMA00	AAKBK00
Month ahead + 1	GEHM200	GEFM200
Quarter ahead	GEHQ100	GEFQ100
Quarter ahead + 1	GEHQ200	GEFQ200
Year ahead	EHYA00	GEFYA00

	45% Efficiency	50% Efficiency
Italian (Eur/MWh)		
Month ahead	ITKMA00	ITFMA00
Quarter ahead	ITKQA00	ITFQA00
Year ahead	ITSYA00	ITSYB00

	45% Efficiency	50% Efficiency
Spanish (Eur/MWh)		
Day ahead	PVSPA00	PVSPB00
Month ahead	SPHMA00	SPFMA00
Month ahead + 1	GAPDE00	GAPDF00
Quarter ahead	GAPDA00	GAPDB00
Quarter ahead + 1	GAPEA00	GAPEB00
Year ahead	GAPFA00	GAPFB00
Year ahead+1	GAPFE00	GAPFF00

Spark spreads

Platts spark spreads are indicative prices giving the average difference between the cost of gas and the equivalent price of electricity.

Prices are quoted daily for the UK, German, Italian, and Spanish markets and reflect a High Heating Value (HHV).

Spark spreads for each Continental European countries are based on Platts assessments of relevant national gas contracts with the exception of Germany which is based on TTF gas assessments, and third-party power price settlements. Spark spreads for the UK are based on Platts assessments of power and gas contracts.

The day-ahead gas and power assessments used to calculate the UK and German day-ahead spark spreads reflect the next

UK working day.

Platts calculates the spark spread for gas-fired plants with efficiencies of 45% and 50% for all of the markets listed above, and 60% for all markets except Spain.

The full formula is as follows: Power price – (Gas price/fuel efficiency)

PLATTS DAILY CLEAN SPARK SPREADS

	--Clean spark spread--		--Clean spark spread (CPS)--	
	45% Efficiency	50% Efficiency	45% Efficiency	50% Efficiency
UK (GBP/MWh)				
Day ahead	UEIDA00	CKFDA00	CKHDA00	CKGDA00
Month ahead	UEIMA00	CKFMA00	CKHMA00	CKGMA00
Month ahead + 1	UEIM200	CKFM200	CKHM200	CKGM200
Quarter ahead	UEIQ100	CKFQ100	CKHQ100	CKGQ100
Quarter ahead + 1	UKIM200	CKFQ200	CKHQ200	CKGQ200
Season ahead	UKIQ100	CKFS100	CKHS100	CKGS100
Season ahead + 1	UEIQ200	CKFS200	CKHS200	CKGS200
Season ahead + 2	UKIM300	CKFS300	CKHS300	CKGS300
Season ahead + 3	UEIS400	CKFS400	CKHS400	CKGS400
UK (Eur/MWh)				
Day ahead	UKIDA00	CEFDA00	CEHDA00	CEGDA00
Month ahead	UKIMA00	CEFMA00	CEHMA00	CEGMA00
Month ahead + 1	UKIQ200	CEFM200	CEHM200	CEGM200
Quarter ahead	UEIS100	CEFQ100	CEHQ100	CEGQ100
Quarter ahead + 1	UEIS200	CEFQ200	CEHQ200	CEGQ200
Season ahead	UKIS100	CEFS100	CEHS100	CEGS100
Season ahead + 1	UKIS200	CEFS200	CEHS200	CEGS200
Season ahead + 2	UKIS300	CEFS300	CEHS300	CEGS300
Season ahead + 3	UKIS400	CEFS400	CEHS400	CEGS400
German (Eur/MWh)				
Day ahead	GEIDA00	CGFDA00		
Month ahead	GEIMA00	CGFMA00		
Month ahead + 1	GEIM200	CGFM200		
Quarter ahead	GEIQ100	CGFQ100		
Quarter ahead + 1	GEIQ200	CGFQ200		
Year ahead	GEIYA00	CGFYA00		
Italian (Eur/MWh)				
Month ahead	ITIQA00	CIFMA00		
Quarter ahead	ITIMA00	CIFQA00		
Year ahead	CIFYA00	CIFYB00		

PLATTS DAILY CLEAN SPARK SPREADS

Spanish (Eur/MWh)

Day ahead	PVCSA00	PVCSB00
Month ahead	SPGMA00	SPIMA00
Month ahead+1	GAPDG00	GAPDF00
Quarter ahead	GAPDC00	GAPDD00
Quarter ahead + 1	GAPEC00	GAPED00
Year ahead	GAPFC00	GAPFD00
Year ahead+1	GAPFG00	GAPFH00

Clean spark spreads

Platts clean spark spreads are indicative prices giving the difference between the combined cost of gas and emissions, and the equivalent price of electricity on a HHV basis.

Prices are quoted daily for the UK, German, Italian and Spanish markets.

German clean spark spreads are based on TTF gas assessments, equivalent third-party German power assessments and EU emissions Allowance (EUA) prices.

Italian and Spanish clean spark spreads are based on Platts assessments of relevant national gas contracts and third-party power and EUA prices.

UK clean spark spreads are based on Platts assessments of UK national power and gas contracts and third-party EUA prices.

Platts calculates the clean spark spread for gas-fired plants with efficiencies of 45% and 50% for all markets, and 60% for all markets excluding Spain, and an emissions intensity of 0.053942 tCO₂e/MMBtu HHV

(thermal basis, before combustion).

The full formula for German, Italian and Spanish clean spark spreads is as follows: Platts spark spread – (EUA emissions price * emissions intensity factor 0.053942 * energy conversion 3.412141 / fuel efficiency)

The full formula for UK clean spark spreads is as follows: Platts UK spark spread in GBP/MWh - (EUA emissions price in euro/mt converted to GBP * emissions intensity factor 0.053942 * energy conversion 3.412141 / fuel efficiency)

Platts also publishes UK CPS clean spark spreads that incorporate the cost of the UK government's Carbon Price Support (CPS) levy at the following confirmed rates:

Year Levy in GBP/mt

April 1, 2014- March 31, 2015	9.55
April 1, 2015- March 31, 2016	18.08
April 1, 2016 - March 31, 2017	18.00
April 1, 2017 - March 31, 2018	18.00
April 1, 2018 - March 31, 2019	18.00
April 1, 2019 - March 31, 2020	18.00

The full formula for UK CPS clean spark spreads is: Platts UK spark spread in GBP/MWh - (EUA emissions price in euro/mt converted to GBP + CPS levy in GBP/mt * emissions intensity factor 0.053942 * energy conversion 3.412141 / fuel efficiency)

Emissions roll dates

The EUA component of Platts clean fuel spreads reflects a December annual expiry date. Platts clean fuel spread calculations will typically reference the emissions contract most relevant to the delivery period for the fuel legs of the spread. In the UK, seasonal clean fuel spreads that include delivery during winter periods which touch on two calendar years will use an average of two emissions contracts for the 'clean' component of the spread.

Platts clean fuel spread calculations incorporate three emissions contracts ahead with specifications and roll dates as listed on the European Energy Exchange (EEX).

PLATTS DAILY DARK SPREADS

35% Efficiency		35% Efficiency		35% Efficiency	45% Efficiency
UK (Eur/MWh)		UK (GBP/MWh)		German (Eur/MWh)	
Month ahead	CDUTM00	Month ahead	CDUZM00	Month ahead	CDGTM00
Month ahead + 1	CDUTM27	Month ahead + 1	CDUZM27	Month ahead + 1	CDGTM27
Quarter ahead	CDUTQ00	Quarter ahead	CDUZQ00	Quarter ahead	CDGTQ00
Quarter ahead + 1	CDUTQ27	Quarter ahead + 1	CDUZQ27	Quarter ahead + 1	CDGTQ27
Season ahead	CDUTS00	Season ahead	CDUZS00	Year ahead	CDGTY00
				Year ahead + 1	CDGTY27
				Year ahead + 2	CDGTY28

Dark spreads

Platts dark spreads are indicative prices giving the average difference between the cost of coal and the equivalent price of electricity on any given day.

UK dark spreads are based on Platts CIF ARA coal assessments and UK electricity assessments. German dark spreads are based on Platts CIF ARA coal assessments and third-party German electricity settlement prices.

The formula for UK and German dark spreads uses an energy conversion factor of 6.978 (converting 1 metric ton of coal into MWh) and a fuel efficiency factor (coal) of 35% and 45% (Germany only).

The full formula is as follows: Baseload power price in euro – (((coal price in US dollar ÷ exchange rate) ÷ energy conversion factor) ÷ fuel efficiency factor)

PLATTS DAILY CLEAN DARK SPREADS

	35% Efficiency	CPS
UK (Eur/MWh)		
Month ahead	CCUTM00	CCHTM00
Month ahead + 1	CCUTM27	CCHTM27
Quarter ahead	CCUTQ00	CCHTQ00
Quarter ahead + 1	CCUTQ27	CCHTQ27
Season ahead	CCUTS00	CCHTS00

	35% Efficiency	CPS
UK (GBP/MWh)		
Month ahead	CCUZM00	CCHZM00
Month ahead + 1	CCUZM27	CCHZM27
Quarter ahead	CCUZQ00	CCHZQ00
Quarter ahead + 1	CCUZQ27	CCHZQ27
Season ahead	CCUZS00	CCHZS00

	35% Efficiency	45% Efficiency
German (Eur/MWh)		
Month ahead	CCGTM00	CCGUM00
Month ahead + 1	CCGTM27	CCGUM27
Quarter ahead	CCGTQ00	CCGUQ00
Quarter ahead + 1	CCGTQ27	CCGUQ27
Year ahead	CCGTY00	CCGUY00
Year ahead + 1	CCGTY27	CCGUY27
Year ahead + 2	CCGTY28	CCGUY28

Clean dark spreads

Platts clean dark spreads are indicative prices giving the average difference between the cost of coal and emissions, and the equivalent price of electricity on any given day.

Prices are quoted for the UK and German markets.

UK clean dark spreads are based on Platts CIF ARA coal assessments and UK electricity assessments and third-party EUA prices. German clean dark spreads are based on Platts CIF ARA coal assessments and third-party German electricity settlement prices and EUA prices.

The formula for the UK and German clean dark spreads uses an energy conversion factor of 6.978 (converting 1 metric ton of coal into MWh), a fuel efficiency factor (coal) of 35% and 45% (Germany only) and an emissions

intensity factor of 0.973 mtCO₂/MWh.

The full formula is as follows: Baseload power price in euro – (((coal price in US dollar ÷ exchange rate) ÷ energy conversion factor) ÷ fuel efficiency factor) – (EUA price in euro x carbon intensity factor)

Platts also publishes UK CPS clean dark spreads that incorporate the cost of the UK government's Carbon Price Support (CPS) levy at the following confirmed rates:

Year Levy in GBP/mt	
April 1, 2014 - March 31, 2015	9.55
April 1, 2015 - March 31, 2016	18.08
April 1, 2016 - March 31, 2017	18
April 1, 2017 - March 31, 2018	18
April 1, 2018 - March 31, 2019	18
April 1, 2019 - March 31, 2020	18

The full formula for UK CPS clean dark spreads is: Platts UK dark spread in GBP/MWh at 35% fuel efficiency - (EUA emissions price in euro/mt converted to GBP + CPS levy in GBP/mt * emissions intensity factor 0.973).

Emissions roll dates

The EUA component of Platts clean fuel spreads reflects a December annual expiry date. Platts clean fuel spread calculations will typically reference the emissions contract most relevant to the delivery period for the fuel legs of the spread. In the UK, seasonal clean fuel spreads that include delivery during winter periods which touch on two calendar years will use an average of two emissions contracts for the 'clean' component of the spread.

Platts clean fuel spread calculations incorporate three emissions contracts ahead with specifications and roll dates as listed on the European Energy Exchange (EEX).

PLATTS COAL SWITCHING PRICE INDICATOR (CSPI)

	UK (p/th)	UK (Eur/MWh)	Netherlands (Eur/MWh)
Month ahead	EUKVM00	EUKTM00	EDUTM00
Quarter ahead	EUKVQ00	EUKTQ00	EDUTQ00
Year ahead	EUKVY00	EUKTY00	EDUTY00

Coal switching price indicator (CSPI)

Platts Coal Switching Price Indicator (CSPI) calculates the threshold at which gas prices are more competitive than coal prices as input fuel in power generation. When the gas price is higher than the CSPI, CCGT generation is more expensive than coal-fired generation and vice versa.

Platts CSPI data is quoted for the UK and the Netherlands and is expressed in Eur/MWh and for the UK only in p/th.

Platts CSPI data is based on the Platts CIF ARA coal forward curve assessment that corresponds to each CSPI delivery period and on third-party EUA prices (see “Emissions roll dates” above).

For the UK CSPI, Platts incorporates the cost of the UK government’s CPS levy (see table in CPS clean dark spreads section above). For the calendar year ahead UK CSPI, a time-weighted average of the CPS will be used to reflect the presence of two confirmed UK CPS rates for any given calendar year.

For the Dutch CSPI, Platts incorporates the cost of the Dutch coal tax at Eur0.00/mt, reflecting the introduction of a tax exemption on coal-fired power plants with an efficiency of 38%

or higher from 2016 onward and following Platts analysis of minimum operating efficiencies of the Dutch coal-fired power plant fleet.

Previous Dutch coal tax rates were Eur14.40/mt for calendar year 2015 and Eur14.27/mt for calendar year 2014

Platts calculates the CSPI using the following carbon emission factors: gas 0.18404 mtCO2/MWh; coal 0.34056 mtCO2/MWh (thermal basis, before combustion).

Platts calculates the CSPI using the following efficiencies: UK CCGT 45% and 50% HHV; UK coal 35% LHV; Dutch CCGT 45% and 50% HHV; Dutch coal 40% LHV.

The full CSPI formula is as follows:

UK CSPI_EUR (Eff = 50%, Eff = 45%) = Eff * [Coal_Price/35% + (EF_Coal/35% - EF_CCGT/Eff)* (EUA_Price + UK_CPS)]

UK CSPI_p (Eff = 50%, Eff = 45%) = UK CSPI_EUR (Eff = 50%, Eff = 45%) * EURGBP * 2.9307

Dutch CSPI (Eff = 50%, Eff = 45%) = Eff * [Coal_Price/40% +

(EF_Coal/40% - EF_CCGT/Eff)* (EUA_Price + Dutch_CT/40%)]

Formula Definitions:

Coal_Price = Platts CIF ARA coal price assessment as quoted in USD/mt and converted into Eur/MWh

EUA_Price = EUA prices as listed on EEX and quoted in Eur/mt

EF_CCGT = Emissions factor CCGT

EF_Coal = Emissions factor coal

UK_CPS= UK Carbon Price Support

Dutch_CT= Dutch coal tax

UK CSPI_EUR = UK Coal Switching Price Indicator, quoted in Eur/MWh

UK CSPI_p = UK Coal Switching Price Indicator, quoted in p/th

Dutch CSPI = Dutch Coal Switching Price Indicator, quoted in Eur/MWh

GENERATING FUEL COST COMPARISONS

	/MWh	Plus CO2	Total /MWh	GBP	--Profit/loss-- Eur	\$
UK baseload (GBP)						
Gas						
Next month	AANFJ00	AANFK00	AANFL00	AANFM00	AANFN00	AANFP00
Next quarter	AANFW00	AANFX00	AANFY00	AANFY00	AANFZ00	AANGA00
Coal						
Next month	AANGG00	AANGH00	AANGJ00	AANGK00	AANGL00	AANGM00
Next quarter	AANGU00		AANGV00	AANGW00	AANGX00	AANGY00
Fuel oil 1%S (peak load)						
Next month	AANHE00	AANHF00	AANHG00	AANH00		
Next quarter	AANHN00c		AANHP00	AANHQ00		
NW Europe baseload (Eur)						
Gas						
Next month	AANFQ00	AANFR00	AANFS00	AANFU00	AANFT00	AANFV00
Next quarter	AANGB00		AANGC00	AANGE00	AANGD00	AANGF00
Coal						
Next month	AANGN00	AANGP00	AANGQ00	AANGS00	AANGR00	AANGT00
Next quarter	AANGZ00		AANHA00	AANHC00	AANHB00	AANH00
Fuel oil 1%S (peak load)						
Next month	AANHJ00	AANHL00	AANH00		AANHM00	
Next quarter	AANHR00		AANHS00		AANHT00	

Cross-fuel comparisons

Platts cross-fuel comparisons are indicative prices of the costs of burning oil, gas and coal in power stations. In each case, the price of the fuel for spot and forward delivery is converted into an equivalent electricity price, quoted in Eur/MWh, GBP/MWh and \$/MWh. The conversions assume the following plant efficiencies:

Natural Gas: 50%, Coal: 35%, Fuel Oil: 32%.

The data uses the following kg CO2/MMBtu rates: 53.937 for natural gas, 99.64 for coal, and 72.5 for oil.

Coal and distillates are priced at ARA.

The standard specifications and sources of each fuel type can be found in the following documents listed on <http://www.platts.com/methodology-specifications>:

Natural gas - Platts European Natural Gas Methodology and Specifications

Coal - Platts Coal Methodology and Specifications

Fuel oil - Platts European Oil Products Methodology and Specifications

REVISION HISTORY

October 2018: Platts has replaced the use of EEX German/Austrian (DE/AT) power price component in with Germany-only (DE-only Phelix) settlement prices. Platts also launched Spanish day-ahead spark spread and clean spark spreads with both 45% and 50% efficiency.

July 2018: Platts launched Spanish spark and clean spark spreads for the Month-ahead, +1, Year-Ahead +1 and Italian Year-ahead, with both 45% and 50% efficiency.

May 2018: Platts removed references to German, French, Italian and Spanish prompt and forward price assessments following the discontinuation of these markets on May 29, 2018. Platts also updated the fuel spread sections of this methodology guide to change the source of European power prices from Platts assessments to third-party exchanges.

May 2018: Platts completed an annual update to the European Electricity methodology and specifications guide. In this update, Platts revamped the guide to introduce greater consistency of layout and structure across Platts' published methodology guides. Platts also reviewed all content during this update.

March 2018: Platts removed references to Belgian and Dutch weekly power assessments and spark spreads following the discontinuation of these markets on March 5, 2018.

October 2017: Platts launched Spanish spark and clean spark spreads for the Quarter-ahead, Quarter-Ahead +1 and Year-ahead, with both 45% and 50% efficiency.

October 2017: Platts discontinued French Month-ahead+1, Month ahead+2, Year ahead+1, and Year ahead+2 base and peak power assessments. Platts also replaced French Saturday and Sunday power prices with the Weekend assessment for the flow date price data set. In addition, Spanish Day-ahead,

Weekend, Month-ahead+1 and Quarter-ahead +2 baseload assessments were also discontinued. From October 2, French and Spanish Week-ahead contracts are only assessed on the last working day of the week.

May 2017: Platts updated the clean fuel spread sections of this methodology guide to change the source of European emissions prices from Platts assessments to third-party exchange.

February 2017: Platts removed references to duplicate UK index symbols which were discontinued on February 3, 2017.

January 2017: Platts completed an annual update to the European Electricity methodology and specifications guide. In this update, Platts revamped the guide to introduce greater consistency of layout and structure across Platts' published methodology guides. Platts also reviewed all content during this update and introduced code lists. Methodologies for market coverage were not changed.

January 2017: Platts discontinued prompt power assessments for Switzerland, the Netherlands and Belgium. Platts also discontinued forward assessments of Dutch peakload contracts and Dutch quarter-ahead + 1 baseload and moved to weekly reporting for remaining Dutch and Belgian power assessments and associated spark and clean spark spreads. Platts discontinued the following calculated indices: Platts Power Index (German PPI); Continental European Forward Power Price indices; PEP and CONTI indices.

November 2016: Platts clarified the day-ahead definition for European spark spreads.

October 2016: Platts discontinued UK week-ahead and week-ahead+1 base and peak power assessments.

October 2016: Platts updated the Spark Spreads section of this guide to reflect the renaming of its Spanish gas assessments to PVB (formerly AOC).

September 2016: Platts updated the Currency conversions section of this guide. The source and timestamp for the foreign exchange data used to convert Platts European electricity assessments to foreign currency equivalents was revised from Tullett Prebon at 16:00 London time to Platts 16:30 London time assessment. Platts also removed references to the previous calculations for exchange rates. Prior to June 2014, exchange rates were published with a working-day time lag, with the previous day's exchange rate close used in calculations.

August 2016: Platts updated this guide to remove references to CEE and Turkish power assessments and to Turkish dark and spark spreads. Platts discontinued assessments of the Czech, Hungarian, Polish and Turkish power markets. Turkish dark and spark spreads were also discontinued. Price history remains available in Market Data categories EE, PE and EM.

November 2015: Platts introduced additional German dark spread indicators, with a fuel efficiency factor of 45%.

September 2015: Platts discontinued its assessments of German month-ahead+4 and month-ahead+5 baseload and peakload electricity contracts.

March 2015: Platts discontinued publishing cross-fuel comparisons containing Gasoil 0.1% sulfur content and Fuel Oil 3.5% sulfur content.

December 2014: Platts updated the plant efficiencies and rates in its cross-fuel comparisons on December 16, 2014. Previous plant efficiencies were: Gas 49% (UK) and 54% (western Europe), Fuel Oil: 32%, Gasoil: 32%, Coal: 34%. Previous kg CO₂/MMBtu rates were 101.5 for coal, 55 for natural gas and 72.5 for oil.

April 2014: Platts revised the emissions intensity factor used in its spark spreads to 0.053942 tCO₂e/MMBtu HHV from 0.055 with effect from April 1, 2014. The energy conversion factor (coal) used in dark spreads was revised to 6.978 from 7.1 and the emissions intensity factor used in clean dark spreads was

revised to 0.973 mtCO₂/MWh from 0.96.

March 2014: Platts discontinued its assessment of the UK April Annual contract.

January 2014: Platts moved its day-ahead timestamp to 11:00 am from midday as of January 2, 2014.

November 2013 – September 2014: Platts transitioned its UK forward power assessments to the Gregorian calendar from the EFA calendar. The last EFA roll date was September 29, 2014, and the first Gregorian roll date was November 3, 2014.

November 2013: Platts launched assessments of EFA-Gregorian “gap” products covering the following dates: September 29-30, 2014 and March 30/31, 2015. Assessments were only published in the event of trade or firm and verifiable indications of market value.

November 2009: Forward time stamp alignment to 16:30 London time as of November 1.