

Methodology and specifications guide

Asia Pacific and Middle East refined oil products

Latest update: March 2018

Introduction	2	Part VI: Requests for clarifications of data and complaints	15
How this methodology statement is organized	2		
Part I: Data quality and data submission	2	Part VII: Definitions of the trading locations for which Platts publishes daily indexes or assessments	16
What to report	3	Straits terminals	16
How to report	3	LPG	18
MOC data publishing principles	3	Gasoline	21
Part II: Security and confidentiality	8	Naphtha	24
		Jet fuel	27
		Gasoil	29
Part III: Calculating indexes and making assessments	8	FOB Singapore gasoil / diesel specifications	33
MOC price assessment principles	8	Additives in Singapore and the Middle East 10ppm	34
Normalization price adjustment techniques	9	Fuel oil	36
Prioritizing data	9	FSU FOB Singapore	38
Assessment Calculations	10	LSWR	39
Explanation of the MOPS Strip	12	Bunker fuel	40
Part IV: Platts editorial standards	14	Revision history	44
Part V: Corrections	15		

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 and indexes, 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 indexes, and the times during each trading day in which Platts considers transactions in determining its assessments and index 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.

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

How this methodology statement is organized

This description of methodology for indexes and 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 indexes and price values, including details on what data market participants are expected to submit, the process for submitting data and criteria for timeliness of market data submissions.
- 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 indexes and assessments. It includes descriptions of the methods that Platts uses for reviewing data, and the methods used to convert raw data into indexes and 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, and the criteria for determining which values are indexes, and which are assessments. 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 and indexes 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 indexes or assessments in this 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: DATA QUALITY AND DATA SUBMISSION

Platts objective is to ensure that the submission of transactional information and other data inputs 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 market 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 refined oil products being assessed.

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.

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.

What to report

- 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 information provided for publication in real-time across a wide variety of media. The following reporting methods are accepted by Platts editorial staff:

- Commonly used Instant Messaging software

- eWindow
- Telephone
- Email
- Fax

Platts accepts any reasonable method of delivery/communication for bids, offers and transactions. Platts editors typically communicate with trading companies through phone, eWindow 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.

Reporters covering the products markets in Asia and the Middle East are contactable from around 09:30 to around 18:30 Singapore time.

In support of Platts communication processes and in light of the announced discontinuation of the legacy Yahoo! instant messenger application in mid-2016, Platts began to use more broadly the ICE Instant Messenger tool for communication within the oil, petrochemical, RIN, biofuel markets and other adjacent spaces as needed. Additionally, Platts supports the web versions of Skype and the enterprise level Skype for Business for communication across any market. Platts remains open to accepting messages through other IM channels.

MOC data publishing principles

Platts assesses the value of oil globally using its Market on Close (MOC) assessment process. The 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 in the oil markets. Under Platts MOC guidelines for collecting and publishing data, Platts publishes market information including but not limited to firm bids and offers from named companies, 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 service, Platts Global Alert. 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.

MOC publishing process

Detailed guidelines on MOC timings can be found at <http://www.platts.com/IM.Platts.Content/MethodologyReferences/MethodologySpecs/Oil-timing-increment-guidelines.pdf>. The purpose of the time cut-offs is primarily to ensure logistical executability and standards of incrementability and repeatability to ensure orderly price discovery. 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.

Incrementability varies between each market assessed through the MOC assessment process and can be found at <http://>

www.platts.com/IM.Platts.Content/MethodologyReferences/MethodologySpecs/timingincrementguidelines.pdf.

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. All the Platts systems operate on a first come, first served basis. This sequence is critical for orderly price discovery.

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. 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.

All bids and offers are firm from the moment of submission. For information communicated directly to a reporter, rather than through the eWindow software, bids and offers for inclusion in the assessment process are to be submitted prior to the cut-off times as listed in the timings and increments guide.

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.

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.

Wide laycan dates should also be narrowed by the buyer/seller where applicable. In the case of middle distillate barges, buyers

should provide the volume at the time of lifting an offer, e.g.: “Buyer 1 wants Seller 1 ULSD barge offer at September +\$25/mt for 2kt”, would be best practice. Platts reserves the right not to publish indications to trade that do not meet the above conditions.

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.

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.

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 \$500/mt during the MOC. Company A can rebid at \$500/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 person to reach the market maker bid/offer level is the first person to be filled. Subsequent deals will go to the second, third and fourth market maker. When a market maker is filled, any repeat of their bid/offer will move to the back of the bid/offer queue.

In the event that more than one counterparty expresses his/her intention to execute a transaction based on an existing bid or offer, the logical counterparty should be the first party that demonstrated its intention to trade. Platts will monitor time stamps or any other available time mechanism in the event of a dispute with the aim of determining who the first potential buyer of record was. In the event of the market maker rebidding or reoffering, the queue of market takers expressing interest

in that position will 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 market maker takes out 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 market maker'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 retransmitted.

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

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.

Survey assessment methodology

Platts applies a survey assessment methodology where market conditions do not support an MOC assessment environment. Platts collects a wide variety of transactional and market information through a survey of participants, which typically includes communicating with sources via phone, email, and instant messaging, among other communication methods. Although the survey assessment methodology is in many respects similar to the MOC assessment methodology there are key distinctions between the assessment approaches.

In such environments, Platts collects as much data as possible, including bids, offers, interest to trade, transactions that have been previously concluded, and indications of value from participants in the market. Platts seeks to collect, confirm and analyze as much information as possible in survey markets, and encourages market participants to provide all relevant information. Platts publishes credible information collected that meets our methodological standards, typically through real-time information services and with as much transparency as possible. This information is considered when determining and completing a final assessment.

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.

Survey and MOC environments are linked. Survey assessment environments are a common ground for future MOC assessment environments, and Platts regularly reviews its survey environments to determine which may be suited to an MOC approach. Similarly, MOC environments are underpinned by data collected by surveying sources throughout the day, to ensure that Platts is aware of market value as the MOC process begins, and so that Platts has data to review when considering information

For analysis of the data, Platts survey methodologies will typically give priority to data collected that is confirmed and published, and which is most relevant to closing value in the markets covered.

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 shipping, terminals, tanks, or blending 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 only 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, shipping costs, and the inconvenience for the buyer in the case of a seller not performing, or contango, storage costs 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 proposals/arrangements to protect the integrity of its 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 backwardation, shipping costs 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 cargo 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 tracks all circumstances surrounding trades reported during its MOC assessment process, and any issues regarding performance. 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 of the product. 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 fuel quality, terminal, 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 will reflect typically traded qualities of products. Specifications are available in Section VII of this document and on the Platts website www.platts.com.

Testing of products

Products traded 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.

Platts FOB and CIF assessments reflect trades where the quality and quantity are established at loadport, except in cases of fraud and/or manifest error. This does not preclude a buyer from potentially having a valid claim if the original test of a loadport sample is proven to be inaccurate because the results of the original test cannot be repeated and/or reproduced within reasonable parameters through subsequent re-testing of the original loadport sample. Platts considers retesting of retained samples a necessary step to determine if the original test was fully reflective of the quality delivered, and sellers should not reject such requests for retesting. Buyers' requests to re-test the load port sample should be made only in cases where later testing differs from the load port test beyond repeatability and/or reproducibility.

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 products that are merchantable. Hence, buyers may assume that offers or transactions are for a product that is merchantable. Sellers must ensure their offers or transactions are for merchantable products.

PART II: SECURITY AND CONFIDENTIALITY

Data is stored in a secure network, in accordance with Platts policies and procedures. Platts refined oil product assessments are produced in accordance with Platts Market on Close assessment methodology. This means that all data for use in Platts refined oil product 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 refined oil product assessments.

PART III: CALCULATING INDEXES AND MAKING ASSESSMENTS

The following section describes how Platts uses the specific volume, 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. The typical period of high activity in oil markets tends to be in the afternoon in every major trading location around the world. Platts believes that aligning its price assessments to typical periods of greater market activity and liquidity provides a robust basis upon which to derive a reliable assessment of market value.

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 oil, 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 oil, 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 those products are also able to be fully and properly reflected. For example, comparing the value of gasoline to crude oil is possible when both values have been determined at the same moment in time. By contrast, comparing the price of gasoline in the morning, to crude oil in the afternoon, might deeply impair the relationship between the products – 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 oil 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 oil is supplied to market.

The quality of fuel supplied, delivery location, and other specific terms of trade may vary in the physical commodity markets assessed by Platts. This is one reason among many why data collected from the physical oil markets may not be simply averaged to produce a representative assessment value.

Because of the complex nature of the physical oil markets, oil 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 oil 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, 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 bid and best offer open to the market at the close of the MOC process. 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 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 the fact.

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 MOC guidelines are designed to avoid any distortion of the final price assessment and so inputs that are not verifiable are eliminated and “one-off” or unrepeatable transaction data 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 levels of resistance or price support. 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 MOC price assessment period 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.

Oil is generally 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.

Crude oil is typically traded in barrels or metric tons, and Platts publishes its assessments using these units of measurement as they prevail in practice. Likewise, refined oil products typically trade in barrels, metric tons, kiloliters or gallons, and Platts assessments for these markets reflect common practice in each market. The minimum and maximum volume considered for each individual Platts assessment of a physical market is described in section VII of this document.

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 section VII alongside individual assessment codes.

Editorial judgement

Platts reporters follow specific methodology when exercising editorial judgment 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.

The following section illustrates how these guidelines work when calculating indexes and making assessments.

To ensure the assessments are as robust as possible, Platts editorial systems are backed by a strong corporate structure that includes managerial and compliance oversight. To ensure reporters follow Platts methodological guidelines in a consistent manner, Platts ensures that reporters are trained and regularly assessed in their own and each other's markets.

Professional judgment guidelines promote consistency and transparency and are systematically applied by Platts. Where professional 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 manages and maintains internal training guides for each of the different products assessed which aim to ensure Platts price assessments are produced consistently. Platts price assessments are reviewed prior to publication and exercise of professional judgment is further discussed and verified during this process. Finally, consistent with the concept of proportionality, assessments that are referenced by derivatives contracts 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.

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 oil 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. In oil, Platts spot price assessments reflect this value at precisely the close of the MOC 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 may use its editorial judgment to factor out such extraneous elements from the value of the commodity, or it may decide not to use the bid, offer or transaction in its assessment process. 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 oil around the world, as well as differentials for oil 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 MOC price assessment process in Singapore, Tokyo, Dubai, London and Houston. 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 windows are specified under each data code.

Market structure, such as backwardation and contango, is also factored into the Platts assessment process. If a company offers a cargo loading 15 days forward, the offer may provide market information for the Platts assessment for cargoes 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.

Time gradient

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 backwardation or contango in the markets increases.

It is not uncommon in times of tight supply for the backwardation to be over \$15.00/mt per month or roughly the equivalent of \$0.50/mt per day. This means that cargoes loading one week apart can vary in price by close to \$3.50/mt, or possibly more, depending on the steepness of the price curve. Thus it is extremely important for Platts to follow pricing windows very methodically.

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 barrels causes the front period to be significantly cheaper than barrels available at the end of the window. In a backwardated market the tightness of supply causes the prompt barrels to be at a higher price than barrels 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

Platts assessments reflect fair market value and therefore take into consideration backwardation and contango. Where indications are on differing date ranges, a calculation is made to determine the value the market is assigning for the difference

between loading dates. In calculating this time gradient, 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.

The three main factors used in the Asian and Middle East products market for price determination are:

- Outright price
- Premiums
- Derivatives

Outright price

The ultimate question in the mind of an end-user, producer, refiner, 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 naphtha at \$400/mt. Price in turn determines expense, refining 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.

Premiums/discount

Many transactions are carried out in relation to a benchmark. In this case a differential, also known as a premium/discount is generated. Premiums/discounts 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 of 380CST fuel oil at \$10/mt above the Platts MOPS 380CST Singapore, as published immediately before, during and after delivery of the cargo.

Premiums will usually rise when the market's backwardation steepens, and the steeper the curve, the greater the premium. In a contango situation, premiums will have a tendency to turn into discounts.

Derivatives

Derivatives are a major determinant in price. Derivatives trade freely in an over the counter market and can trade at any time. Paper markets are very reactive and may provide market participants with timely information on market conditions. Derivatives can react to arbitrage conditions or movements in overseas markets as well as local conditions.

Derivatives are risk-management tools. Derivatives allow companies to adapt their price exposure because they enable market participants to transform floating prices to fixed or fixed to floating. Derivatives are also used as a speculative tool. Derivative market values and indications are carried in real-time on Platts Global Alert.

Buyers and sellers may show buying and selling interest for all derivatives assessed by Platts through MOC processes in the same way as is done in physical markets.

The spot market

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

For instance, if a physical fuel oil cargo trades at \$250.00/mt for a 30,000 metric ton parcel loading 15-19 days forward FOB Straits, this trade gives a clear, direct indication of value in the spot market.

In the absence of outright prices, derivatives and prevailing premiums/discounts may be used in the assessments.

For example, if a fuel oil cargo loading in November trades at a premium of \$2.00/mt over Platts assessments in November, then Platts would determine the outright value of this trade in

conjunction with an assessment of the associated November derivative contract.

Explanation of the MOPS Strip

This explanation for the MOPS strip describes how it is determined, and its application in Platts' assessment process.

The Platts assessment process determines the value of physical commodities 15-30 days forward for many oil products loading in Singapore. Many of these commodities trade on an outright price basis – where the full price is known at time of trade -- or on a Platts-related, floating price basis – where much of the value is determined in reference to reference prices that will be published in the future.

When the value of commodities is clearly defined through outright price market activity, such activity can help establish value with a high degree of certainty. When there is a lack of outright price activity in a market, or when the most clearly defined market activity is being demonstrated on a floating price basis, it becomes critical to track the value the market assigns to future, yet-to-be published Platts assessments.

“MOPS” is an acronym that stands for the “Mean of Platts Singapore,” and typically refers to any contract mechanism that derives its value by referencing the average of a set of Singapore-based oil price assessments to be published by Platts in the future – over a week, a month, or any agreed period of time. In derivatives markets, a “strip” is any contiguous date series in the future. A “Summer Strip” might be April, May, June, July, August and September. An “Annual Strip” would typically be 12 consecutive months.

A “MOPS Strip” is the sequence of 16 days that represent the future loading dates reflected in Platts' Singapore oil product assessments.

The MOPS Strip published by Platts for certain oil markets represents the value the market assigns to future Platts

assessments, through trading in MOPS-related, monthly -derivatives. This value is determined by analyzing the -derivatives market.

A -derivative is a financially-settled contract traded in the over-the-counter market. Sometimes referred to as “paper”, a -derivative is a fixed price transaction, where the buyer is paid (or pays) the difference between the agreed strike price in the contract, and the actual average value of an underlying reference benchmark price. As an example, MOPS-related December “Singapore 180CST fuel oil derivative” settle their value from the average of assessments for the value of 180CST fuel oil, FOB Singapore, as published by Platts over the month of December.

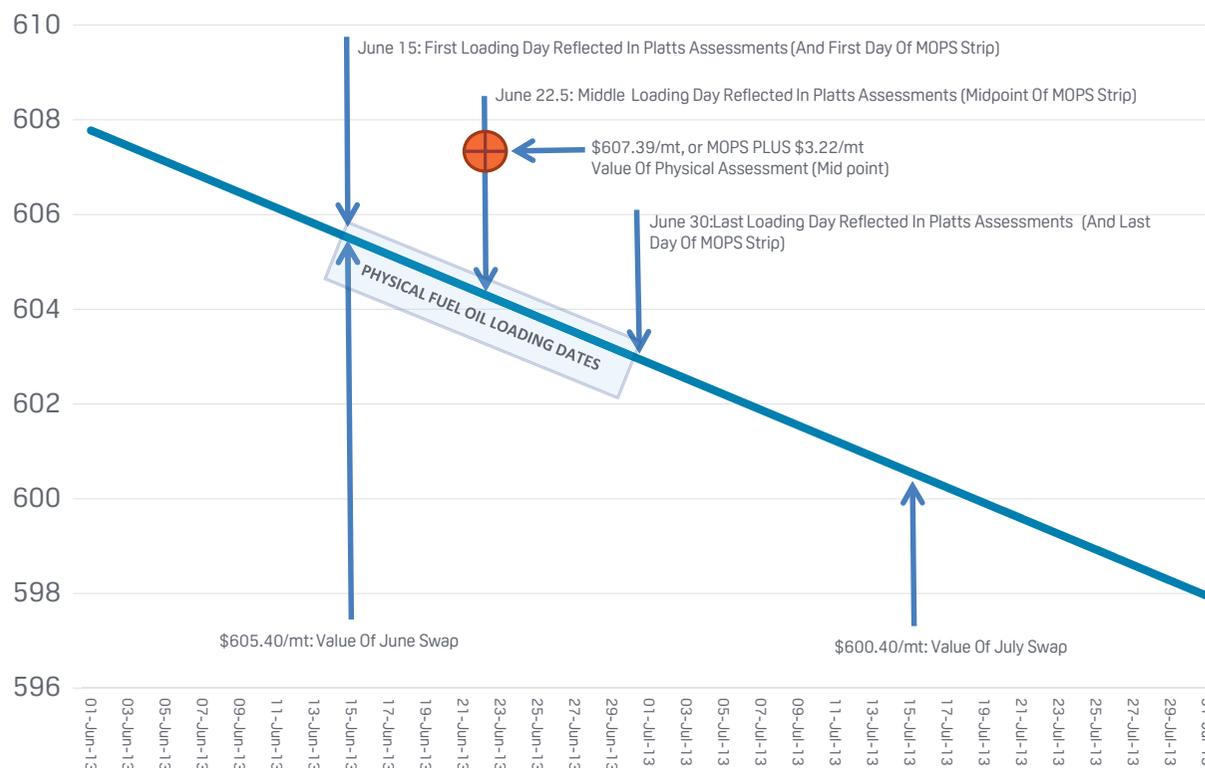
As financially settled contracts, derivatives derive their value from published benchmark assessments. They do not entail physical delivery of oil. For example, if a 1,000mt June derivative was bought at \$605/mt, the seller would pay the buyer \$10/mt (or \$10,000 in this example) if the underlying benchmark averaged \$615/mt over the month of June; the buyer would pay the seller \$10/mt (or \$10,000 in this example) if the reference price averaged \$595/mt. Derivatives, commonly used to hedge exposure to benchmark prices in the future, are generally traded for full months, and also the balance of the prevailing month.

The final, financial settlement of a derivative can only be completed when all the value that comprise the average are known (ie, after the last publishing day in June, for a swap that references the average of published prices in June).

Just like derivatives, Platts-related physical cargoes that trade on a floating price basis ultimately derive a final value over a pre-determined period of time in the future – usually around loading dates, with a premium or discount applied to reflect market structure, and possible differences in specification, location and trading terms.

The MOPS strip is used as a component in measuring the value of the physical market, when floating price trading is common. The strip represents an underlying, market-assigned

ILLUSTRATION OF THE MOPS STRIP



future value for the Platts assessments, and it is an important component in fully analyzing the price determination of physical cargoes when they are regularly traded on a floating price basis. While the value that Platts will publish in its assessments can never be known at the time of trading a cargo that will be delivered and priced in the future, a hedgable, proxy value for the relevant Platts assessments of the future can be extrapolated from derivatives markets, so long as the derivatives analyzed, and the floating price physical contract being valued, use the same Platts reference price for final settlement.

Platts therefore publishes a MOPS Strip in markets where physical cargoes trade at both fixed-price levels, and as premiums or discounts to the Platts assessment itself. It is published when there is a vibrant swaps market to serve as the basis for analysis. In Singapore, Platts publishes a MOPS strip value for jet fuel, naphtha, gasoil and fuel oil. There is no MOPS strip calculated for products where derivatives are not assessed by Platts.

By standing as a hedgable proxy value for the MOPS element of a floating price cargo, the MOPS strip is essential to

defining the flat-price equivalent value of a cargo that is traded as a premium or discount to the Platts assessment. The MOPS Strip defines the value of “MOPS” in the assessment formula: “physical value = MOPS plus premium (or discount).”

To fully understand the application of the MOPS strip, it is important to note that Platts’ physical price assessments for most Singapore cargoes are based on cargoes loading 15-30 days from the date of the price assessment itself. Hence, if today is May 31, the assessments will reflect the value of cargoes loading during June 15-30.

MOPS strip is the value of the Singapore derivatives market, effective for the mid-point date of the physical assessment. In this particular example, the mid-point of the assessed period is notionally June 22.5. This is a specific sample calculation for how the MOPS strip would be calculated:

180 CST High Sulfur Fuel Oil on May 31, 2013 (\$/mt)

June (paper): \$605.40

July (paper): \$600.40

June/July spread: +\$5.00 (backwardation)

Physical FOB Singapore 180CST (loading on June15-30):
\$607.39

Since there are 30.5 days between mid-June (30 days) and mid-July (31 days) – we calculate the daily backwardation value to be +0.1639 (from 5.00/30.5). Since there are seven and a half days between mid-June (June 15) and the mid-point date for physical assessment (June 22.5), the calculated MOPS strip value is:

$$= \$605.40 + (0.1639 \times -7.5)$$

$$= \$604.17$$

In terms of the application of MOPS strip in the Platts assessment process: the MOPS strip provides the third leg when triangulating the physical value of the market using the formula “physical value = MOPS plus premium (or discount).” The MOPS strip defines the value of “MOPS” in this equation. Again, this MOPS value is what the market has determined the future, yet to be published Platts assessments are able to be hedged at in the derivatives marketplace.

In an example, the difference between the physical value arrived at by the close of the assessment process and the MOPS strip yields either a positive value or a negative value. This is the ‘premium’ or the ‘discount’ at which the physical market is trading versus future Platts assessments. In this case:

Physical premium (or discount) = Physical assessment - MOPS strip

$$\text{Physical premium (or discount)} = \$607.39 - \$604.17$$

$$\text{Physical premium (or discount)} = \$3.22$$

In a second example, the reverse process also generates a value. If Platts assessed the physical market premium as being MOPS plus \$3.22, the following equation could be applied:

Physical assessment = MOPS plus premium (or discount)

$$\text{Physical assessment} = \$604.17 + \$3.22$$

$$\text{Physical assessment} = \$607.39$$

MOPAG Strip: From Oct 3, 2016, Platts began publishing assessments for Mean of Platts Arab Gulf or MOPAG Strip for 95 RON Gasoline, Gasoil, Jet Fuel and 380-cst Fuel Oil. The MOPAG strip value is derived from MOPAG swaps using the same broad methodology as shown above for the MOPS strip calculations – although the two strips reflect derivatives values over different periods. The MOPAG swaps settle on Platts

MOPAG netback assessments that reflect cargoes loading 20-40 days from the day of publication. Hence the MOPAG strip represents the derivative value 20-40 days forward. Platts uses Balance Month and Month 1 swaps to calculate the MOPAG strip value until the 10th calendar day of the month, following which Month 1 and Month 2 swaps are used to calculate the strip.

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’s internal auditor, an independent group that reports directly to the parent company’s board of directors, reviews the Platts risk assessment programs.

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 index or 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: DEFINITIONS OF THE TRADING LOCATIONS FOR WHICH PLATTS PUBLISHES DAILY INDEXES OR ASSESSMENTS

The following specifications guide contains the primary specifications and methodologies for Platts refined oil products assessments throughout Asia Pacific and the Middle East. The various components of this guide are designed to give Platts subscribers as much information as possible about a wide range of methodology and specification issues.

This methodology is current at the time of publication. Platts may issue further updates and enhancements to this methodology and will announce these to subscribers through its usual publications of record. Such updates will be included in the next version of the methodology guide. Platts editorial staff and managers will usually be ready to provide guidance when assessment issues require clarification.

STRAITS TERMINALS

Terminal	Location	No. of Berths	Maximum draft (m)	Maximum LOA (m)/vessel type	No. of tanks	Storage capacity (cu m)	Ownership	Platts Gasoline	Platts Jet	Platts Gasoil	Platts HSFO
Helios	Jurong Island	6+1 (VLCC)	18.5/24.5 (VLCC)	280/353 (VLCC)	18	503408	55% Oiltanking GmbH/ 45% Macquarie	No	No	No	Yes
Universal	Jurong Island	6	23	333/VLCC	78	2360000	65% Hin Leong; 35% PetroChina	Yes	Yes	Yes	Yes
Horizon	Jurong Island	7	16.5	333/VLCC	59	1243990	JV between Horizon Terminals Ltd (52%) and four partners SK Corp, Independent Petroleum Group, Boreh International, Martank	Yes	Yes	Yes	Yes
Tankstore	Pulau Busing, Bukom Island	11	17.1	360	107	2000000	100% PB TANKER (Kuo International (Pte) Ltd)	Yes	Yes	Yes	Yes
SRC	Jurong Island	7	15	290/up to 105,000dwt		1904762	50% Chevron; 50% PetroChina (through SPC)	Yes	Yes	Yes	Yes
Oiltanking	Jurong Island	11	15.7	335	80	1305444	55% Oiltanking GmbH/ 45% Oystercatcher	Yes	Yes	Yes	Yes
Shell Bukom	Pulau Bukom	9				3900000	100% Shell	Yes	Yes	Yes	Yes
XOM Jurong	Jurong	5				2310000	100% ExxonMobil	Yes	Yes	Yes	Yes
XOM PAC	Jurong Island	6				1700000	100% ExxonMobil	Yes	Yes	Yes	Yes
Tuas	Jurong	1	10.2 (without tide)	280	1	60000	100% Huaneng Power International	No	No	No	Yes
Vopak Sebarok	Pulau Sebarok	9	17.6	280/Half Laden VLCC	79	1263079	100% Vopak Terminals Singapore (69.5% Vopak; 30.5% PSA Corp)	Yes	Yes	Yes	Yes
Vopak Banyan	Jurong Island	7	15.5	260/Aframax	60	1025339	100% Vopak Terminals Singapore (69.5% Vopak; 30.5% PSA Corp)	Yes	Yes	Yes	Yes
Chevron Penjuru	Jurong	7	14.8	300	40	485600	100% Chevron	Yes	Yes	Yes	Yes
Power Seraya	Jurong Island	4	12.6	275/Suezmax	20	835000	100% YTL PowerSeraya	No	No	Yes	Yes
Senoko Power	Woodlands	1	12	277	7	260000	Senoko	No	No	Yes	No
SPC	Pulau Sebarok	3	17	297/120000 Dwt	13	220000	100% PetroChina	No	Yes	Yes	Yes
Exxon SCP Banyan facility	Jurong Island	3	17	290	2 tanks each for gasoil, jet/ kero	60,000 each for gasoil, jet/ kero	100% ExxonMobil	No	Yes	Yes	No
Tanjung Langsat (TLP, TgL1, Tanjung Langsat, Pasir TgL2)	Pasir Gudang, Johor	7	13.5	430/partially laden VLCC	52 (TLP: 10; LGT-1: 32; LGT-2: 10)	747000 (TLP Oil Terminal: 100,000; LGT-1: 476,000; LGT-2: 171,000)	TLP Oil Terminal: 100% Johor Corp; LgT-1 and LgT-2: 80% Centralized Terminals Sdn Bhd (55% Dialog, 45% MISC Bhd) and 20% Puma Energy (subsidiary of Trafigura)	Yes	Yes	Yes	Yes
Tanjung Bin	Tanjung Bin, Johor	6	17.5	fully-laden Suezmax or partially laden VLCC	41	890,000 and another 250,000 by mid-2015	100% VTTI	Yes	Yes	Yes	Yes
Tanjung Pengerang	Pengerang, Johor	6	24	350 (VLCC)	57	1284000	"90% Pengerang Terminals Sdn Bhd (51% Dialog Group Bhd, 49% Royal Vopak) + 10% SSI* (Johor)	Yes	Yes	Yes	No
Pasir Gudang (Far East Oil Terminal One)	Pasir Gudang, Johor	4	13.5	290 (Aframax)	16	231000	* SSI=State Secretary Inc. " Cosco-Feoso (S) Pte Ltd (JV between Cosco Holdings (S) Pte Ltd and Feoso Investment (S) Pte Ltd)	No	No	No	Yes
Oiltanking Karimun Terminal	Karimun Island, Indonesia	4	23	346/partially laden VLCC	30	730,000	Oiltanking GmbH and Gunvor Group	Yes	Yes	Yes	No

Terminal information provided for reference only and reflects most recent available data.

FOB Straits Nomination Standards

Platts editorial standards for the Market On Close assessment process for FOB Singapore fuel oil, gasoil, gasoline and jet fuel calls for best practices in all aspects of operational performance, including terminal and vessel nominations.

Location basis for bids, offers and trades: From July 1, 2015, Platts FOB Singapore assessments reflect “FOB Straits” bids, offers and transactions. For FOB Straits bids and offers, buyers and sellers should not state a specific loadpoint at the point of communication to Platts, and should proceed to nominate loading from one of the locations in Singapore and Malaysia that are already approved for the Platts Market on Close price assessment process.

Under this revised approach, from July 1, 2015, Platts no longer publishes FOB Singapore or FOB Malaysia bids, offers or transactions in its Market on Close assessment process. Platts only publishes bids and offers and transactions as FOB Straits.

From July 3, 2017, Platts began publishing standalone offers of oil product cargoes loading from PT Oiltanking Karimun Terminal, Indonesia, in the Singapore Market on Close assessment process for gasoil, jet fuel and gasoline. Platts publishes such offers on an FOB Indonesia (FOB ID) basis, where the seller must clearly state the loading point as FOB Karimun at the time of communicating their interest to Platts for publication. Platts does not publish FOB Indonesia bids. For trades reported on FOB Straits basis, sellers may not unilaterally nominate Karimun as a delivery point, though it may be agreed by mutual consent, and should deliver from approved terminals in Singapore and Malaysia.

For FOB Straits transactions, ten days prior to loading sellers should nominate one of the loadpoints in Singapore or Southern Malaysia for the products listed in the table below. Platts only publishes bids, offers and expressions of interest to trade for FOB Straits fuel oil, gasoline, gasoil and jet cargoes for which the

following standards would apply: sellers must declare a terminal ten days prior to the first day of the loading window, and buyers should nominate a single performing vessel seven days prior, with the buyer narrowing the loading window to three days, subject to loading terminal acceptance. All nominations should typically be communicated to counterparties by 5pm Singapore time.

If the nomination day falls on a weekend or a public holiday, nominations should be done on the business day prior to the weekend or public holiday. Buyers may submit multiple vessels for terminal vetting prior to nominating a performing vessel, and buyers may substitute the vessel prior to loading, subject to terminal acceptance.

Platts expects parties to be reasonable when exceptional circumstances require buyers to substitute vessels just prior to loading. Buyers should promptly communicate to sellers and terminals when vessel substitution is required. Sellers should not unreasonably withhold substitutions or hamper the established loading process. If the substituted vessel tendered the notice of readiness in time for loading, sellers should not put buyers on best endeavor basis.

Nomination of “non-commensurate” vessels should not expose the seller to incur additional costs associated with the large-sized vessels. The buyer has the right to nominate a non-commensurate vessel to load a cargo traded via the Singapore MOC assessment process, while the seller has the obligation to accept a commensurate vessel and try to accommodate a non-commensurate vessel if the terminal scheduling permits. The seller’s exposure to demurrage and laytime should not exceed the normal associated demurrage and laytime, if a commensurate vessel was nominated.

Any terminal nominated for performance on an FOB Straits transaction concluded during the Platts assessment process should typically be able to manage at least one co-load of standard-sized cargoes of 20,000 mt to 40,000 mt, for fuel oil,

and 100,000 barrels to 250,000 barrels for jet fuel and gasoil.

For instance, a vessel which is already carrying 20,000 mt of fuel oil should be able to load at least another 20,000 mt from a second terminal, without draft restrictions hindering a vessel’s ability to leave the port.

Cost differences between Singapore and Malaysia:

Nominations for loading out of a terminal in Malaysia should not cause undue financial harm to a buyer, relative to receiving a nomination out of a Singapore terminal. Any demonstrable incremental costs incurred by the buyer from a Malaysian terminal nomination, including cabotage for onward deliveries into Malaysia itself, should be costs borne by the seller in the MOC process.

Reviews of MOC terminals and trade data: It is critical for Platts to monitor the quality of the information submitted by companies wishing to participate in Platts MOC processes, including any infrastructure that will form part of the execution of that information.

Platts routinely, and as part of standard editorial practice, reviews the infrastructure reflected 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, operational and logistical issues, as well as counterparty acceptance.

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 such routine reviews.

LPG

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
Propane Refrigerated CFR Japan 30-45 days	AAVAK00	AAVAK03			CFR	Japan	30-45 days	11,000	44,000	US\$	Metric Tons	
Propane Refrigerated CFR Japan 45-60 days	AAVAL00	AAVAL03			CFR	Japan	45-60 days	11,000	44,000	US\$	Metric Tons	
Propane Refrigerated CFR Japan 60-75 days	AAVAM00	AAVAM03			CFR	Japan	60-75 days	11,000	44,000	US\$	Metric Tons	
Propane Refrigerated CFR Japan 30-60 days cargo	PMAAV00	AAAVR00			CFR	Japan	30-60 days	11,000	44,000	US\$	Metric Tons	
Propane CFR Japan 30-60 days vs Saudi Propane CP strip 20-40 days	PMAAX00	PMUEI03			CFR	Japan	30-60 days	11,000	44,000	US\$	Metric Tons	
Propane CFR Korea 30-60 days vs Saudi Propane CP strip 20-40 days	PMABK00	PMABK03			CFR	South Korea	30-60 days	11,000	44,000	US\$	Metric Tons	
Propane Refrigerated CFR South China 20-35 days cargo	AABAK00	AABAM00			CFR	China	20-35 days	11,000	44,000	US\$	Metric Tons	
Propane CFR South China 20-35 days vs Saudi Propane CP strip 5-15 days	AABAI00	AABAI03			CFR	China	20-35 days	11,000	44,000	US\$	Metric Tons	
Propane Refrigerated CFR Taiwan 20-35 days cargo	AABAN00	AABAQ00			CFR	Taiwan	20-35 days	11,000	44,000	US\$	Metric Tons	
Propane CFR Taiwan 20-35 days vs Saudi Propane CP strip 5-15 days	AABA000	AABA003			CFR	Taiwan	20-35 days	11,000	44,000	US\$	Metric Tons	
Propane Refrigerated CFR North Asia Zone 30-60 days cargo	AAJTQ00	AAJTR00			CFR	Japan/Korea/China/Taiwan	30-60 days	11,000	44,000	US\$	Metric Tons	
Propane FOB AG 20-40 days cargo	PMUDM00	PMUDN03			FOB	Arab Gulf	20-40 days	11,000	44,000	US\$	Metric Tons	
Propane FOB AG 20-40 days cargo Month to Date	PMUD000	PMUDP03			FOB	Arab Gulf	20-40 days	11,000	44,000	US\$	Metric Tons	
Propane FOB AG 20-40 days cargo vs Propane Saudi CP strip 20-40 days	PMABF00	PMUEJ03			FOB	Arab Gulf	20-40 days	11,000	44,000	US\$	Metric Tons	
Propane FOB AG cargo vs Saudi Propane CP M1	AAKZA00	AAKZA03			FOB	Arab Gulf	20-40 days	11,000	44,000	US\$	Metric Tons	
Propane Saudi CP strip 20-40 days AG loading to Japan-Korea	AAKZC00	AAKZC03								US\$	Metric Tons	
Propane Saudi CP strip 5-15 days AG loading to China-Taiwan	AAKZE00	AAKZE03								US\$	Metric Tons	
Propane FOB Saudi Arabia CP	PTAAM10				FOB	Saudi Arabia				US\$	Metric Tons	
Butane Refrigerated CFR Japan 30-45 days	AAVAN00	AAVAN03			CFR	Japan	30-45 days	11,000	44,000	US\$	Metric Tons	
Butane Refrigerated CFR Japan 45-60 days	AAVA000	AAVA003			CFR	Japan	45-60 days	11,000	44,000	US\$	Metric Tons	
Butane Refrigerated CFR Japan 60-75 days	AAVAP00	AAVAP03			CFR	Japan	60-75 days	11,000	44,000	US\$	Metric Tons	
Butane Refrigerated CFR Japan 30-60 days cargo	PMAAF00	AAAVQ00			CFR	Japan	30-60 days	11,000	44,000	US\$	Metric Tons	
Butane CFR Japan 30-60 days vs Saudi Butane CP strip 5-15 days	PMAAH00	PMUEL03			CFR	Japan	30-60 days	11,000	44,000	US\$	Metric Tons	
Butane CFR Korea 30-60 days vs Saudi Butane CP strip 20-40 days	PMABL00	PMABL03			CFR	South Korea	30-60 days	11,000	44,000	US\$	Metric Tons	
Butane Refrigerated CFR South China 20-35 days cargo	AABAU00	AABAS00			CFR	China	20-35 days	11,000	44,000	US\$	Metric Tons	
Butane CFR South China 20-35 days vs Saudi Butane CP strip 5-15 days	AABAT00	AABAT03			CFR	China	20-35 days	11,000	44,000	US\$	Metric Tons	
Butane Refrigerated CFR Taiwan 20-35 days cargo	AABBH00	AABBK00			CFR	Taiwan	20-35 days	11,000	44,000	US\$	Metric Tons	
Butane CFR Taiwan 20-35 days vs Saudi Butane CP strip 5-15 days	AABBI00	AABBJ00			CFR	Taiwan	20-35 days	11,000	44,000	US\$	Metric Tons	
Butane Refrigerated CFR North Asia Zone 30-60 days cargo	AAJTT00	AAJTU00			CFR	Japan/Korea/China/Taiwan	30-60 days	11,000	44,000	US\$	Metric Tons	
Butane FOB AG 20-40 days cargo	PMUDR00	PMUDS03			FOB	Arab Gulf	20-40 days	11,000	44,000	US\$	Metric Tons	
Butane FOB AG 20-40 days cargo Month to Date	PMUDQ00	PMUDT03			FOB	Arab Gulf	20-40 days	11,000	44,000	US\$	Metric Tons	
Butane FOB AG 20-40 days cargo vs Butane Saudi CP strip 20-40 days	PMABG00	PMUEK03				Arab Gulf	20-40 days	11,000	44,000	US\$	Metric Tons	

LPG

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
Butane FOB AG cargo vs Saudi Butane CP Mo01	AAKZB00	AAKZB03			FOB	Arab Gulf	20-40 days	11,000	44,000	US\$	Metric Tons	
Butane Saudi CP strip 20-40 days AG loading to Japan-Korea	AAKZD00	AAKZD03								US\$	Metric Tons	
Butane Saudi CP strip 5-15 days AG loading to China-Taiwan	AAKZF00	AAKZF03								US\$	Metric Tons	
Butane FOB Saudi Arabia CP	PTAAF10				FOB	Saudi Arabia				US\$	Metric Tons	
LPG Refrigerated 11:11 CFR Singapore-Japan 30-45 days	AASG000	AASG003			CFR	Singapore/Japan	30-45 days	22,000	44,000	US\$	Metric Tons	
LPG Refrigerated 11:11 CFR Singapore-Japan 45-60 days	AASGP00	AASGP03			CFR	Singapore/Japan	45-60 days	22,000	44,000	US\$	Metric Tons	
LPG Refrigerated 11:11 CFR Singapore-Japan 60-75 days	AASGQ00	AASGQ03			CFR	Singapore/Japan	60-75 days	22,000	44,000	US\$	Metric Tons	
LPG Refrigerated 11:11 CFR Singapore-Japan 30-60 days cargo	AASGN00	AASGN03			CFR	Singapore/Japan	30-60 days	22,000	44,000	US\$	Metric Tons	
LPG Pressurized CFR Philippines 7-15 days	AAWUX00	AAWUX03			CFR	Philippines	7-15 days	1,800	2,500	US\$	Metric Tons	
LPG Pressurized CFR Philippines vs Saudi Propane-Butane CP Mo01	AAWUY00	AAWUY03			CFR	Philippines	7-15 days	1,800	2,500	US\$	Metric Tons	
LPG Pressurized CFR Vietnam 7-15 days	AAWUV00	AAWUV03			CFR	Vietnam	7-15 days	1,800	2,500	US\$	Metric Tons	
LPG Pressurized CFR Vietnam vs Saudi Propane-Butane CP Mo01	AAWUW00	AAWUW03			CFR	Vietnam	7-15 days	1,800	2,500	US\$	Metric Tons	
LPG Pressurized FOB East China 7-15 days	AAWUZ00	AAWUZ03			FOB	China	7-15 days	1,800	2,500	US\$	Metric Tons	
LPG Pressurized FOB East China vs Saudi Propane-Butane CP Mo01	AAWVA00	AAWVA03			FOB	China	7-15 days	1,800	2,500	US\$	Metric Tons	
LPG Pressurized FOB Singapore 7-15 days	AAWVD00	AAWVD03			FOB	Singapore	7-15 days	1,800	2,500	US\$	Metric Tons	
LPG Pressurized FOB Singapore vs Saudi Propane-Butane CP Mo01	AAWVE00	AAWVE03			FOB	Singapore	7-15 days	1,800	2,500	US\$	Metric Tons	
LPG Pressurized FOB South China 7-15 days	AAWVB00	AAWVB03			FOB	China	7-15 days	1,800	2,500	US\$	Metric Tons	
LPG Pressurized FOB South China vs Saudi Propane-Butane CP Mo01	AAWVC00	AAWVC03			FOB	China	7-15 days	1,800	2,500	US\$	Metric Tons	

LPG

Platts assesses the value of large cargoes of propane and butane supplied on refrigerated tankers in both the Middle East and the Asia Pacific regions. Additionally, Platts publishes assessments for the small-cargo LPG market in the Asia Pacific, reflecting the value of mixed LPG cargos carried in pressurized ships.

Platts considers outright prices and floating prices in its assessments. Floating price transactions are most commonly based on a premium or discount to Saudi Aramco's monthly export Contract Prices (CPs) for propane and butane.

Platts Asia and Middle East propane and butane assessments reflect specifications that conform to typical specifications issued by Saudi Aramco, including: minimum 95% propane content, maximum 4% butane content and maximum 0.1% olefin content. Butane specifications reflected in Platts assessments conform to typical specifications issued by Saudi Aramco, including: maximum 2% propane content, maximum 29% isobutane content, minimum 68% normal butane content and maximum 0.1% olefin content.

Platts assessments reflect standard terms and conditions for FOB spot transactions lifting from the Arab Gulf and CFR spot transactions into Japan, Korea, South China and Taiwan main ports (see locations). Cost and Freight are

typically defined by Incoterms. Platts' assessments reflect transactions based on letter of credit as needed with typically 30-day terms.

Refrigerated LPG: In the refrigerated LPG markets, propane and butane are typically supplied on Very Large Gas Carriers (VLGCs), which are typically 44,000 mt, and commonly segregated into four tanks of 11,000 mt each on each ship. Each tank will typically contain wither propane or butane. Platts refrigerated assessments reflect the value of refrigerated propane and refrigerated butane as stand-alone, minimum 11,000 mt trade sizes. Multiples of 11,000 mt, up to 44,000 mt, are considered for assessment and normalized for size as needed. Additionally, Platts also assesses the value of combination refrigerated

cargoes where propane and butane are both committed for delivery, typically in evenly split, 22,000 mt cargo sizes.

In Asia's delivered markets, Platts assesses cargoes for delivery in three half-month cycles. The cycles generally fall 30-45 days forward, 45-60 days forward and 60-75 days forward on the first day of every roll. Assessments roll forward on the first business day of a new month, and the first business day after the 15th of every month. As an example, from April 1 until April 15, Platts assessments would be for H1 May, H2 May and H1 June. On April 16 (or the first publishing day after the 15th), assessment cycles move forward by a half month to become H2 May, H1 June and H2 June. Platts' headline cargo assessment is produced by averaging the first two half-month assessments.

In the Middle East spot LPG market, Platts assesses the outright value of spot cargoes for loading on an FOB basis, 20-40 days after the date of assessment. Platts also publishes an assessment of the premium or discount for spot cargoes loading 20-40 days forward in the Middle East, and spot premiums for cargos loading one month forward. These premiums and discounts reflect the value to be applied to the prevailing Saudi Aramco Contract Price during dates of loading.

Refrigerated freight rate assessments: Platts publishes three assessments for the cost of freight along major shipping routes in the refrigerated LPG markets. These assessments are published in dollars per metric ton, and reflect the cost of shipping refrigerated LPG in VLGCs. Platts surveys the market and reflect spot charter fixtures in the assessments, for cargoes loading 20 or more days after the date of assessment. The three routes assessed are Persian Gulf to Japan, Persian Gulf to South China and Persian Gulf to East China. For the purposes of normalization, "Persian Gulf" reflects the port of Ras Tanura, with spot fixtures for nearby loading locations including Qatar and Bahrain normalized where needed. "Japan" deliveries are normalized to Chiba for freight assessments, while "East China" and "South China" are normalized to Shanghai and Guangzhou/

Shenzhen respectively.

FOB AG: Export terminals including Ras Tanura and Yanbu in Saudi Arabia, and any safe port in Qatar

CFR Singapore-Japan: Platts' 11:11 refrigerated LPG cargo assessments reflect the value of cargoes delivered to main ports from Singapore to Japan.

CFR Japan: Import terminals at main ports including Kashima, Yokkaichi and Oita

CFR Korea: Import terminals at main ports including Yeosu and Ulsan

CFR South China/Taiwan: Import terminals, and floating storage vessels off China main ports including Shenzhen, Zhuhai, Shantou, Mai Liao and Kaohsiung

CFR North Asia: Average value of CFR Japan and CFR South China assessments

Pressurized LPG: In the pressurized markets, Platts assesses the values of mixed LPG cargoes in Asia, reflecting a typical mix of 30% propane, 70% butane.

Platts assessments reflect the value of mixed, pressurized LPG cargoes for delivery CFR South China, CFR East China, CFR Vietnam (basis CFR Ho Chi Minh City) and CFR Philippines (basis CFR Bataan). Platts also assesses the value of such cargoes loading from East China (basis FOB Shanghai); South China (basis FOB Shenzhen) and FOB Singapore. These pressurized cargo assessments reflect the value of parcels to be delivered 7-15 days forward from the date of publication. These values are published as outright price assessments. Platts also publishes an assessment for the premium or discount for cargoes relative to the Saudi Aramco Contract Price that prevails at the time the cargo is delivered or loaded.

Pressurized freight rate assessments: Platts publishes five assessments for the cost of freight along significant shipping routes in the Asia Pacific region's pressurized LPG markets. These assessments are published in dollars per metric ton, and reflect the cost of shipping pressurized LPG in small tankers typically carrying between 1,000 mt and 3,000 mt of mixed LPG. Platts surveys the market and reflects spot charter fixtures in the assessments, for cargoes loading 7 or more days after the date of assessment. The routes assessed are (1) Thailand to the port of Guangzhou, (2) Thailand to the port of Guanxi, (3) Thailand to the port of Shantou, (4) Japan to the port of Shanghai and (5) Korea to the port of Shanghai. For assessment purposes, "Thailand" loadings are normalized to Map Ta Phut, "Korea" loadings are normalized to Ulsan/Onsan, and "Japan" to the port of Chiba.

Asia Strip: Platts publishes two strip values for the Saudi CP, based on the official CP for the current month and forward CP values derived from the swaps market. These values provide a marker for the value of CP relative to the CFR delivery dates for Japan/Korea and China/Taiwan.

CFR Vietnam: Pressurized LPG storage terminals in Vietnam, normalized to Ho Chi Minh City

CFR Philippines: Pressurized LPG storage terminals in Philippines, normalized to Bataan

FOB East China: Pressurized LPG storage terminals in East China, normalized to Shenzhen

FOB South China: Pressurized LPG storage terminals in South China, normalized to Shenzhen

FOB Singapore: Pressurized LPG storage terminals in Singapore

GASOLINE

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
Gasoline Unl 90 FOB South China	AAICU00	AAICV00			FOB	China	15-30 days	50,000	150,000	US\$	Barrels	8.5
Gasoline Unl 91-92 C+F Japan Cargo	PGACW00	PGACW03			C+F	Japan		50,000	150,000	US\$	Barrels	8.5
Gasoline Unl 92 FOB Spore Cargo	PGAAY00	PGAAY03			FOB	Singapore	15-30 days	50,000	150,000	US\$	Barrels	8.5
Gasoline Unl 92 MOPS strip	AAXEQ00	AAXEQ03				Singapore				US\$	Barrels	8.5
Gasoline Unl 92 FOB Spore Cargo vs Gasoline Unl 92 MOPS strip	AAXER00	AAXER03			FOB	Singapore	15-30 days	50,000	150,000	US\$	Barrels	8.5
Gasoline Unl 92 FOB Spore Cargo vs Naphtha MOPS strip	AAPKG00	AAPKG03			FOB	Singapore	15-30 days	50,000	150,000	US\$	Barrels	8.5
Gasoline Unl 92 FOB Spore Cargo \$/mt	AAXNA00	AAXNA03			FOB	Singapore	15-30 days	5,000	20,000	US\$	Metric Tons	8.5
Gasoline 92 RON Unl MOP West India \$/bbl	AARBP00	AARBP03			FOB	India		50,000	150,000	US\$	Barrels	8.5
Gasoline 92 RON Unl MOP West India \$/mt	AARBQ00	AARBQ03			FOB	India		5,000	20,000	US\$	Metric Tons	8.5
Gasoline Unl 92 C+F Australia Cargo	AACZF00	AACZB00			C+F	Australia		50,000	150,000	US\$	Barrels	8.5
Gasoline Unl 93 FOB South China	AAICW00	AAICX00			FOB	China	15-30 days	50,000	150,000	US\$	Barrels	8.5
Gasoline Unl 95 FOB Spore Cargo	PGAEZ00	PGAEZ03			FOB	Singapore	15-30 days	50,000	150,000	US\$	Barrels	8.5
Gasoline Unl 95 FOB Spore Cargo vs Naphtha MOPS strip	AAPKF00	AAPKF03			FOB	Singapore	15-30 days	50,000	150,000	US\$	Barrels	8.5
Gasoline 95 RON Unl MOP West India \$/bbl	AAQWH00	AAQWH03			FOB	India		50,000	150,000	US\$	Barrels	8.5
Gasoline 95 RON Unl MOP West India \$/mt	AAQWI00	AAQWI03			FOB	India		5,000	20,000	US\$	Metric Tons	8.5
Gasoline Unl 95 C+F Australia Cargo	AACZH00	AACZG00			C+F	Australia		50,000	150,000	US\$	Barrels	8.5
Gasoline Unl 95 C+F Japan Cargo	PGAQQ00	PGAQR03			C+F	Japan		50,000	150,000	US\$	Barrels	8.5
Gasoline Unl 95 FOB Korea Cargo	PGAQO00	PGAQP03			FOB	South Korea	15-30 days	50,000	150,000	US\$	Barrels	8.5
Gasoline 95 RON Unl CFR Arab Gulf vs MOPAG Gasoline	AAWUK00	AAWUK03			CFR	Arab Gulf	20-40 days	200,000	300,000	US\$	Barrels	8.5
Gasoline 92 RON Unl FOB Arab Gulf Cargo	AAGJA00	AAGJA03			FOB	Arab Gulf	20-40 days	200,000	300,000	US\$	Barrels	8.5
Gasoline 95 RON Unl FOB Arab Gulf Cargo	AAICJ00	AAICJ00			FOB	Arab Gulf	20-40 days	200,000	300,000	US\$	Barrels	8.5
Gasoline 95 RON Unl FOB Arab Gulf vs MOPAG Gasoline	AAWUJ00	AAWUJ03			FOB	Arab Gulf	20-40 days	200,000	300,000	US\$	Barrels	8.5
Gasoline 95 RON FOB Fujairah Cargo	AFUJA00	AFUJA03			FOB	Fujairah	20-40 days	200,000	300,000	US\$	Barrels	8.5
Gasoline 95 RON MOPAG Strip	AFUJB00	AFUJB03				Arab Gulf				US\$	Barrels	8.5
Gasoline Unl 97 FOB Spore Cargo	PGAMS00	PGAMS03			FOB	Singapore	15-30 days	50,000	150,000	US\$	Barrels	8.5
Gasoline Unl 97 FOB Spore Cargo vs Naphtha MOPS strip	AAPKE00	AAPKE03			FOB	Singapore	15-30 days	50,000	150,000	US\$	Barrels	8.5

Gasoline

Singapore gasoline assessments: Platts FOB Singapore assessments reflect “FOB Straits” bids, offers and transactions. For FOB Straits bids and offers, buyers and sellers should not state a specific loadpoint at the point of communication to Platts, and should proceed to nominate loading from one of the locations in Singapore and Malaysia that are already approved for the Platts Market on Close price assessment process.

Platts FOB Singapore gasoline assessments reflect standard industry specifications, which are summarized in the table in this section. The specifications listed are not comprehensive on all possible specification elements, and cargoes reflected in Platts assessment processes must at all times be deemed to fall within industry standards, including merchantability of the product. Grades which are not widely merchantable - for instance, gasoline with unusual additives, including MMT and secondary butyl acetate or unusually high quantities of certain additives or

blendstocks which are not typical - will not be reflected in the assessments. Platts is currently considering any addition of SBAC above trace as deeming the gasoline atypical.

With effect from July 1, 2016 Platts lowered the Reid Vapor Pressure specification to a maximum of 9.5 PSI, from 10 PSI currently. Platts also reduced the maximum benzene content from 5% to 2.5%. In addition, Platts move all three gasoline grades down to a maximum of 350 ppm (0.035%), from 500 ppm

(0.05%) currently for sulfur. These changes reflected evolving quality standards in Singapore, where gasoline trading reflects supply and demand across the Asia Pacific and Middle East regions.

With effect from January 1, 2014, Platts raised the minimum T50 distillation temperature threshold for Singapore gasoline assessments to 80 degrees Celsius, from the previous 75 degrees Celsius. Platts also introduced a new minimum density requirement of 0.720 g/ml. These changes reflected evolving quality standards in Singapore, where gasoline trading reflects supply and demand across the Asia Pacific and Middle East regions.

Transactions, bids and offers of a minimum of 50,000 barrels are

FOB AG GASOLINE SPECIFICATIONS

Property	Standard
Research Octane Number	Min 92, Min 95
Motor Octane Number	Min 82, Min 85
Appearance	Clear
Colour	Undyed
Corrosion, Copper Strip (3 Hrs. at 50 °C)	Max 1
Density at 15°C kg/cu-m	0.72-0.78
Distillation	
10% vol recovered at (°C)	Max 65
50% vol recovered at (°C)	Max 120, Min 80
90% vol recovered at (°C)	Max 180
End point (°C)	Max 210
Residue, vol%	Max 2
Doctor Test	Negative
Gum, Existent (mg/100 ml)	Max 4
Induction Period (minutes)	Min 480
Lead Content (g/L)	Max 0.013
Reid Vapour Pressure at 37.8° C	Max 9
Sulfur, wt%	Max 100 ppm
Allowed Oxygenate/MTBE (If added) MTBE content of 10.0)	Max 15 (of which maximum
Alcohol	No additions of any alcohol
Aromatics, vol%	Max 35
Benzene, vol%	Max 1
Olefins, vol%	Max 18
Odor	Marketable
Additives	No metal additives; no metal octane boosters

considered for assessment. The maximum cargo size for any one bid or offer is 150,000 barrels. These assessments reflect gasoline for loading 15 to 30 days forward from the date of publication. Market participants should specify loading for a five-day date range at the time of providing a bid or offer for publication in the Platts assessment process.

China gasoline assessments: Platts gasoline assessments reflect cargoes for loading FOB South China. Assessments reflect 25,000-30,000 mt cargoes. This market typically trades at a differential to naphtha or to Singapore 92 RON unleaded assessments. Platts' China assessments are expressed in USD/mt, using a conversion factor of 8.5.

South Korea gasoline assessments: Platts assesses 95 RON unleaded FOB Korea. This market typically trades on a naphtha related basis.

Japan gasoline assessments: Platts 91-92 RON unleaded gasoline, for delivery on a C+F Chiba basis, is assessed as a netforward into Japan, using the FOB Singapore 92 RON unleaded gasoline as a base. A freight rate for 30,000 mt tankers is used. The freight value is divided by 8.5 and added to the Singapore base assessment.

Platts 95 RON unleaded C+F Chiba assessment is determined by assessing the gasoline market delivered into the Chiba region in Japan. This market typically trades at a differential to naphtha.

Australia gasoline assessments: Platts assesses Australian 92 and 95 RON unleaded on a C+F Melbourne/Sydney basis. These assessments are determined on a netforward basis from FOB Singapore 92 and 95 RON unleaded assessments using a freight rate for 30,000 mt tankers. Freight rates are published daily in Platts Clean Tankerwire. See "Platts Netback Methodology in Asia and the Middle East," at the end of this document, for more information on how these values are calculated.

India gasoline assessments: The Mean of Platts West India

FOB SINGAPORE GASOLINE SPECIFICATIONS

Property	Standard
Research Octane Number (RON)	Min 92, Min 95, Min 97
Lead content, gpb/l	Max 0.013
Density@15oC, g/ml	Min 0.72
Reid Vapor Pressure (PSI)	Max 9.5
Distillation, degree C	
Initial Boiling Point	Report
10% evaporated	Max 74
50% evaporated	Max 127, Min 80
90% evaporated	Max 190
Final Boiling Point	Max 225
Residue, %vol	Max 2.0
Loss, % vol	2
Odor	Marketable
Existent gum, mg/100ml	Max 4
Benzene content, %vol	Max 2.5
Sulfur, % wt	Max 0.035
Doctor Test	Negative
or Mercaptan sulfur, ppm	Max 15
Mercaptan sulfur, % wt	Max 0.0015
Copper corrosion (3 hours at 50 deg C)	Max 1
Induction period, minutes	min 240
Oxygenates content, % vol	Max 14.0 (of which maximum Max MTBE content of 10.0)
Aromatics, % vol,	Report
Color Undyed	Undyed, Light Yellow
Alcohol	No additions of any alcohol
Metallic Additives	None added
Acetone	Max 100 ppm

Netbacks (MOPWIN) assessment for 92 and 95 RON gasoline are derived by deducting freight costs from the assessments for the same products in Singapore. Although West India has a surplus of oil products for export, there remains only a sporadic flow of spot cargoes and insufficient local price formation to support independent spot prices on FOB West India basis. Platts therefore launched direct freight netbacks from the active trading hubs of Singapore and Japan, where daily prices are established from transparent and firm bids, offers and transactions between many active buyers and sellers. West Coast India – Singapore clean freight assessments used for generating the netback values can be found on Platts Global Alert.

Middle East gasoline assessments: Platts' benchmark gasoline netback assessment is for 92 RON and 95 RON unleaded gasoline on an FOB Arab Gulf basis. These assessments are determined on a netback basis from FOB Singapore 92 RON and 95 RON unleaded assessments using a freight rate for 35,000 mt tankers. Freight rates are published daily in Platts Clean Tankerwire. See "Platts Netback Methodology in Asia and the Middle East," at the end of this document, for more information on how these values are calculated.

On September 1, 2016 Platts launched Middle East netback assessment for 92 RON gasoline, published under the heading "FOB Arab Gulf (\$/barrel)" and labelled as "Gasoline 92 unleaded". On August 1, 2017, Platts launched the assessment for 92 RON gasoline cash differential for cargoes loading in the Middle East. These assessments are published as a spot market premium/discount to Platts' existing MOPAG 92 octane Middle East netback assessment and reflect the value of 92 octane gasoline cargoes, typically 200,000 to 300,000 barrels each, for loading or delivery 20 to 40 days forward from the date of assessment. Platts considers bids, offers, transactions, and reports of

transactions when assessing this local spot market differential.

Middle East gasoline assessments (premiums): Platts assesses spot premiums for FOB and CFR gasoline cargoes. These assessments, which are published as a spot market premium/discount to Platts' existing 95 octane Middle East netback assessment, reflect the value of 95 octane gasoline cargoes, typically 200,000 to 300,000 barrels each, for loading or delivery 20 to 40 days forward from the date of assessment. Platts considers bids, offers, transactions, and reports of transactions when assessing this local spot market differential. On January 7, 2015, Platts announced a series of changes to its Middle East products assessments, following a broad period of industry feedback and discussion. These changes included amending the laycan, volumes and locations reflected in the assessments. Platts has no plans to change or amend the methodology for its outright FOB Arab Gulf oil products netback assessments.

Cargoes loading from the following Gulf ports would be considered for inclusion in the assessments: Jubail, Jebel Ali, Mina Al Ahmadi, Quoin Island, Shuaiba, Ras Tanura, Ruwais,

Mina Abdulla, Sohar, Bahrain, Fujairah, Ras Laffan and any safe and sound port within this geographic area. The assessments would be normalized to loadings in Fujairah for all products and in Bandar Abbas for Gasoline 95 CFR.

FOB Fujairah gasoline assessments (outright): From October 3, 2016 Platts began assessing outright values for 95 RON gasoline cargoes on an FOB Fujairah basis. The assessment reflects the value of 95 RON gasoline cargoes, typically 200,000 to 300,000 barrels each, for loading 20 to 40 days from the date of assessment. Market participants should specify loading for a five-day date range at the time of submitting a bid or offer for publication. The outright assessment equals the sum of Middle East 95 RON gasoline spot differentials (premium/discount) and the MOPAG 95 RON gasoline strip. The MOPAG strip is calculated using 95 RON gasoline derivatives that settle on Platts Middle East 95 RON gasoline netback assessments. From October 3, Platts started publishing assessments for MOPAG 95 RON gasoline derivatives for Balance Month, Month 1 and Month 2, as well as the MOPAG 95 RON gasoline strip.

NAPHTHA

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
Naphtha C+F Japan Cargo 30-45 Days	PAAAE00	PAAAE03			C+F	Japan	30-45 days	25,000		US\$	Metric Tons	9
Naphtha C+F Japan Cargo 45-60 Days	PAAAF00	PAAAF03			C+F	Japan	45-60 days	25,000		US\$	Metric Tons	9
Naphtha C+F Japan Cargo 60-75 Day	PAAG00	PAAG03			C+F	Japan	60-75 days	25,000		US\$	Metric Tons	9
Naphtha C+F Japan Cargo	PAAD00	PAAD03			C+F	Japan	45-75 days	25,000		US\$	Metric Tons	9
Naphtha MOPJ strip C+F JAPAN (\$/mt)	AAXFH00	AAXFH03				Japan				US\$	Metric Tons	9
Naphtha C+F Japan vs Naphtha MOPJ strip	AAXFI00	AAXFI03			C+F	Japan	45-75 days	25,000		US\$	Metric Tons	9
Naphtha C+F Japan Premium/Discount	PAADI00	PAADJ03			C+F	Japan	30-60 days	25,000		US\$	Metric Tons	9
Naphtha C+F Korea Cargo	PAADE00	PAADF03			C+F	South Korea	30-60 days	25,000		US\$	Metric Tons	9
Naphtha C+F Korea Cargo Premium/Discount	PAADG00	PAADH03			C+F	South Korea	30-60 days	25,000		US\$	Metric Tons	9
Naphtha FOB Arab Gulf Cargo	PAAAA00	PAAAA03			FOB	Arab Gulf				US\$	Metric Tons	9
Naphtha FOB Arab Gulf vs MOPAG Naphtha	AAPKH00	AAPKH03			FOB	Arab Gulf	20-40 days	25,000		US\$	Metric Tons	9
Naphtha FOB Singapore Cargo	PAAP00	PAAP03			FOB	Singapore	15-30 days	100,000	250,000	US\$	Barrels	9
Naphtha MOPS strip	AAPKA00	AAPKA03				Singapore				US\$	Barrels	9
Naphtha CFR Singapore	AAOV00	AAOV03			CFR	Singapore	15-30 days	50,000	150,000	US\$	Barrels	9
Naphtha CFR Singapore vs Naphtha MOPS strip	AAOVG00	AAOVG03			CFR	Singapore	15-30 days	50,000	150,000	US\$	Barrels	9
Naphtha LR2 FOB Arab Gulf Cargo	AAIDA00	AAIDB00			FOB	Arab Gulf				US\$	Metric Tons	9
Naphtha MOP West India \$/bbl	AAQW00	AAQW03			FOB	India				US\$	Barrels	9
Naphtha MOP West India \$/mt	AAQWK00	AAQWK03			FOB	India				US\$	Metric Tons	9
Naphtha CFR Singapore	AAOV00	AAOV03			CFR	Singapore	15-30 days	50000	150000	US\$	Barrels	9
Naphtha CFR Singapore vs Naphtha MOPS strip	AAOVG00	AAOVG03			CFR	Singapore	15-30 days	50000	150000	US\$	Barrels	9

Naphtha

Japan naphtha: Platts assesses the value of naphtha for delivery on a C+F basis into Japan, reflecting three major half-month time cycles, and an additional single “cargo” value reflecting two of these cycles. The three half-month cycles assessed are generally: 30-45 days forward; 45-60 days forward and 60-75 days forward. Assessments roll forward on the first business day of a new month, and the first business day after the 15th of every month. For example, on April 1, Platts assesses H2 May, H1 June and H2 June. These assessments would be rolled on the first business day after April 15. They would then read as H1 June, H2 June and H1 July.

The main cargo assessment for Japan (Mean of Platts Japan, or

MOPJ) reflects the lows and the highs of the second and third published cycles. This maintains a consistency in the rollovers and sets the benchmark as a 45-75 day market.

Platts also assesses a spot premium or discount to reflect the value of cargoes delivered into Japan. The differential reflects the delivery of 25,000 mt cargoes in the first and second CFR Japan cycles, and is expressed as a differential against MOPJ.

Following industry feedback, S&P Global Platts began reflecting a maximum of 3 ppm carbon disulfide in its assessments for naphtha delivered to Japan for cargoes delivered in the second half of November 2017 onwards. The change was in-line with naphtha market changes in the region in the second half of 2017.

South Korea naphtha: Platts assesses the value of naphtha for delivery on a C+F basis into South Korea (Mean of Platts Korea, or MOPK) as a cash differential against MOPJ, and expressed as an outright price. Platts also assesses a spot premium or discount to reflect the value of cargoes delivered into South Korea. The differential reflects the delivery of 25,000 mt cargoes in the 30-60 days from the date of assessments, and is expressed as a differential against MOPJ.

Platts amended the minimum paraffin level to a minimum of 70%, from the current 65%, in its assessments of naphtha cargoes delivered to South Korea, effective October 2, 2017. In addition, Platts reflected a maximum of 3 ppm carbon disulfide in its assessments for naphtha cargoes delivered to South Korea.

PLATTS CFR JAPAN NAPHTHA SPECS

Paraffins	Min 65%
Specific gravity at 60 deg F	0.65-0.74 g/m
RVP	Max 13 psi
Sulfur	Max 650 ppm
Initial boiling point	Min +25 deg C
Final boiling point	Max 204 deg C
Chlorine content	Max 1 ppm
Mercury	Max 1 ppb
Arsenic	Max 20 ppb
Olefins	Max 1%
N-paraffins	Min 30%
Colour	Min +20 saybolt
Lead	Max 150 ppb
Oxygenates	Max 50 ppm TAME, MTBE and/or ETBE
Carbon Disulfide	Max 3 ppm

CFR SINGAPORE NAPHTHA SPECS

Property	Unit	Test Method	Specification
Density	kg/l	ASTM D 4052	Min 0.660
Research Octane	Number	ASTM D 2700	Min 72.0
Total sulfur	wt.ppm	ASTM D 5453	Max 250.0
Benzene content	%v ol	ASTM D 5580	Max 2.5
Distillation 50% evaporated	deg C	ASTM D86	Min 50
Lead	wt.ppb	ICP-MS	13 Max.
Arsenic	wt.ppb	ICP-MS	20 Max
Initial Boiling Point	deg C	ASTM D86	25 min
Final Boiling Point	deg C	ASTM D86	204 Max
Mercury	wt.ppb	UOP 938	Report
Paraffins	%v ol	ASTM D 6839	Report
Olefins	%v ol	ASTM D 6839	Report
Naphthenes	%v ol	ASTM D 6839	Report
Aromatics	%v ol	ASTM D 6839	Report
Oxygenated Compounds	%v ol	ASTM D 6839	0.2 max
Mercaptan sulfur	wt%	ASTM D 3227	Max 0.001
RVP	psi	ASTM D 6378	Max 13.0

Middle East naphtha: Platts' benchmark Middle Eastern assessments are established as a freight netback. The FOB Arab Gulf assessments (for both 55,000 mt (Naphtha) and 75,000 mt (Naphtha LR2), are assessed as freight netbacks from MOPJ. Platts uses its daily assessments of the freight market (published in the Platts Clean Tankerwire) to determine the netback. See "Platts Netback Methodology in Asia and the Middle East," at the end of this document, for more information on how these values are calculated.

PLATTS CFR SOUTH KOREA NAPHTHA SPECS

Paraffins	Min 70%
Specific gravity at 60 deg F	0.65-0.74 g/m
RVP	Max 13 psi
Sulfur	Max 650 ppm
Initial boiling point	Min +25 deg C
Final boiling point	Max 204 deg C
Chlorine content	Max 1 ppm
Mercury	Max 1 ppb
Arsenic Max	Max 20 ppb
Olefins	Max 1%
N-paraffins	Min 30%
Colour	Min +20 saybolt
Lead	Max 150 ppb
Oxygenates Max 50 ppm TAME, MTBE and/or ETBE	Max 50 ppm TAME, MTBE and/or ETBE
Carbon Disulfide	Max 3 ppm

Middle East naphtha (differentials): Platts assesses spot differentials for FOB Arab Gulf naphtha cargoes. These assessments, which are published as a spot market premium/discount to Platts' existing Middle East 55,000 mt naphtha netback assessment, reflect the value of naphtha cargoes, typically 25,000 mt each, for loading or delivery 20 to 40 days forward from the date of assessment. Platts considers bids, offers, transactions, and reports of transactions when assessing this local spot market differential. On January 7, 2015, Platts announced a series of changes to its Middle East products assessments, following a broad period of industry feedback and discussion. These changes included amending the laycan, volumes and locations reflected in the assessments.

Cargoes loading from the following Gulf ports would be considered for inclusion in the assessments: Jubail, Jebel Ali, Mina Al Ahmadi, Quoin Island, Shuaiba, Ras Tanura, Ruwais, Mina Abdulla, Sohar, Bahrain, Fujairah, Ras Laffan and any safe and sound port within this geographic area. The assessments would be normalized to loadings in Fujairah for naphtha.

India naphtha: The Mean of Platts West India Netback (MOPWIN) assessment for naphtha is derived by deducting freight costs from the assessments for the same product in Japan. Although West India has a surplus of oil products for export, there remains only a

sporadic flow of spot cargoes and insufficient local price formation to support independent spot prices on FOB West India basis. Platts therefore launched direct freight netbacks from the active trading hubs of Singapore and Japan, where daily prices are established from transparent and firm bids, offers and transactions between many active buyers and sellers. West Coast India – Singapore clean freight assessments used for generating the netback values can be found in the Platts Clean Tankerwire.

Naphtha (Singapore): The benchmark FOB Singapore naphtha assessment is established using a freight netback from Japan. Platts converts the naphtha assessed in Japan in dollars per metric ton to dollars per barrel, using a conversion factor of 9. The calculation is as follows:

((First published cycle in Japan minus Singapore-Japan freight)/9) -\$0.05 /barrel

The assessed freight is for a medium range vessel of 30,000 mt. Port charges, otherwise imposed in Japan, are deducted in the FOB Singapore naphtha assessment and are set at 5 cents per barrel.

Please also note that the implicit contango or backwardation between the cycles is also taken into account.

Platts FOB Singapore naphtha assessments are for 15-30 days from publication on a rolling basis.

Thus on April 20, Platts would be assessing May 5 through May 20.

In a typical example:

As for April 15:

Price in Japan: 1349.00-1349.50 (2nd half May)

Less freight: 30.000

FOB Singapore: 1319.25

Barrel basis: 146.58

Less costs: 146.53 or 146.50-146.55

On the day of the rollover of the cycles in Japan, that is, on the 1st and the 16th of the month, the FOB Singapore assessment will absorb the backwardation or contango of the lapsed cycle in Japan for five days inclusive of Saturday and Sunday. For example, on April 16, the contango between second half May and first half June is \$0.25/mt and remains constant throughout the five days. Platts factors in this contango on declining scale until April 20:

Day of month:	1st	2nd	3rd	4th	5th	6th onwards
Day of month:	16th	17th	18th	19th	20th	21st onwards
	100%	80%	60%	40%	20%	0

Spot CFR Singapore Naphtha: This assessment reflects the growth of naphtha imports into Singapore, with a significant volume used for blending into gasoline grades. The new assessment reflects cargoes delivering into any approved Platts FOB Straits terminal 15-30 days ahead of the date of publication and of parcel size in the range 50,000 to 150,000 barrels. Platts publishes the assessment as both an outright value and as a differential against the FOB Singapore Naphtha MOPS Strip. Specifications can be found in the table below.

CFR delivery standards: For CFR Singapore assessments, buyers should nominate terminal for delivery 10 days before the first day of delivery dates agreed at time of trade. The seller should narrow the five-day delivery range to a three-day delivery range seven days before the first day of the narrowed delivery range. Platts also expects the seller to nominate the performing vessel seven days before the first day of the narrowed delivery range.

CFR deviations: A CFR buyer has the right to request a deviation of the ship to another port, provided the shipowner

has granted, or has the ability to grant, the deviation to the charterer. Any incremental expenses associated with the deviation are borne by the buyer as he/she is initiating the request for the deviation. Charges incurred because of the deviation must be transparent and be granted at cost and in line with normal market practices. Platts will monitor such charges if they result in anomalies.

Platts discontinued its FOB Singapore naphtha cash differential and flat price spot naphtha assessments with effect from July 1, 2016. Platts proposed this discontinuation in a subscriber note published November 9, 2015. The following FOB Singapore naphtha assessments were discontinued: FOB Singapore spot naphtha (under the code AAOVE00), FOB Singapore naphtha premium (under the code PAADC00), Monthly Average FOB Singapore spot naphtha (under the code AAOVE03) and Monthly average FOB Singapore naphtha premium (under the code AAFDE00).

JET FUEL

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
Jet Kero FOB Spore Cargo	PJABF00	PJABF03			FOB	Singapore	15-30 days	100,000	250,000	US \$	Barrels	7.9
Jet Kero MOPS strip	AAPJZ00	AAPJZ03				Singapore				US \$	Barrels	7.9
Jet Kero FOB Spore vs Jet Kero MOPS strip	PJACU00	AAFDB00			FOB	Singapore	15-30 days	100,000	250,000	US \$	Barrels	7.9
Jet Kero MOP West India \$/bbl	AAQWL00	AAQWL03			FOB	India		100,000	250,000	US \$	Barrels	7.9
Jet Kero MOP West India \$/mt	AAQWM00	AAQWM03			FOB	India		10,000	30,000	US \$	Metric Tons	7.9
Jet Kero C+F Australia Cargo	AAFIY00	AAFIZ00			C+F	Australia		100,000	250,000	US \$	Barrels	7.9
Jet Kero C+F Japan Cargo	PJAA00	PJAA03			C+F	Japan		100,000	250,000	US \$	Barrels	7.9
Jet Kero C+F Japan Cargo vs Jet Kero MOPS strip	PAADK00	PAADL03			C+F	Japan		100,000	250,000	US \$	Barrels	7.9
Jet Kero FOB Korea Cargo	PJADG00	PJADH03			FOB	South Korea	15-30 days	100,000	250,000	US \$	Barrels	7.9
Jet Kero FOB Korea Cargo vs Jet Kero MOPS strip	PJADI00	PJADJ03			FOB	South Korea	15-30 days	100,000	250,000	US \$	Barrels	7.9
Jet Kero C+F South China Cargo	PJABQ00	PJABQ03			C+F	China		25000	45000	US \$	Metric Tons	7.9
Jet Kero C+F South China Cargo vs Jet Kero MOPS strip	AAWTW00	AAWTW03			C+F	China		25000	45000	US \$	Metric Tons	7.9
Jet Kero FOB Arab Gulf Cargo	PJAAA00	PJAAA03			FOB	Arab Gulf				US \$	Barrels	7.9
Jet Kero FOB ArabGulf vs MOPAG Jet Kero	PJACV00	AAFDF00			FOB	Arab Gulf	20-40 days	200,000	300,000	US \$	Barrels	7.9
Jet Kero LR2 FOB Arab Gulf Cargo	AAKNZ00	AAKOA00			FOB	Arab Gulf				US \$	Barrels	7.9
Jet Kero FOB Fujairah Cargo	AFUJF00	AFUJF03			FOB	Fujairah	20-40 days	200,000	300,000	US \$	Barrels	7.9
Jet Kero MOPAG Strip	AFUJG00	AFUJG03				Arab Gulf				US \$	Barrels	7.9

Jet fuel

All Platts Asia and Middle East jet fuel assessments reflect standard commercial Jet-A1 specifications, as defined by UK Ministry of Defence in DEFSTAN 91-091, unless otherwise stated.

Singapore jet fuel: Platts FOB Singapore assessments reflect “FOB Straits” bids, offers and transactions. For FOB Straits bids and offers, buyers and sellers should not state a specific loadpoint at the point of communication to Platts, and should proceed to nominate loading from one of the locations in Singapore and Malaysia that are already approved for the Platts Market on Close price assessment process.

Specific gravity is typically 0.8 g/m. Singapore smoke point is typically 19-21, and premiums may be paid for higher smoke point and discounts for lower smoke point. Color specification for FOB Straits cargoes reflects a minimum of 18 Saybolt color guarantee.

The Singapore physical assessment reflects transactions, bids and offers of a minimum of 100,000 barrels, maximum 250,000 b, loading 15-30 days from date of publication. Market participants should specify loading for a five-day date range at the time of submitting a bid or offer for publication.

The FOB Singapore premium/discount assessment takes into account physical cargo activities 15 to 30 days from date of publication.

Middle East jet fuel: FOB Arab Gulf is assessed on a netback basis from the benchmark FOB Singapore assessment using 55,000 mt and 80,000 mt (LR2) ship freight rates. Freight rates reported in the Platts Clean Tankerwire are used. See “Platts Netback Methodology in Asia and the Middle East,” at the end of this document, for more information on how these values are calculated.

Middle East jet fuel (Differentials): Platts assesses spot differentials for FOB Arab Gulf jet fuel cargoes. These assessments, which are published as a spot market premium/discount to Platts’ existing Middle East jet fuel netback assessment, reflect the value of jet fuel cargoes, typically 200,000 to 300,000 barrels each, for loading or delivery 20 to 40 days forward from the date of assessment. Platts considers bids, offers, transactions, and reports of transactions when assessing this local spot market differential. On January 7, 2015, Platts announced a series of changes to its Middle East products assessments, following a broad period of industry feedback and discussion. These changes included amending the laycan, volumes and locations reflected in the assessments.

Cargoes loading from the following Gulf ports would be considered for inclusion in the assessments: Jubail, Jebel Ali, Mina Al Ahmadi, Quoin Island, Shuaiba, Ras Tanura, Ruwais, Mina Abdulla, Sohar, Bahrain, Fujairah, Ras Laffan and any safe

and sound port within this geographic area. The assessments would be normalized to loadings in Fujairah for jet fuel.

FOB Fujairah jet fuel assessments (outright): From October 3, 2016 Platts began assessing outright values for jet fuel cargoes on an FOB Fujairah basis. The assessment reflect the value of jet fuel cargoes, typically 200,000 to 300,000 barrels each, for loading 20 to 40 days from the date of assessment. Market participants should specify loading for a five-day date range at the time of submitting a bid or offer for publication. The outright assessment equals the sum of Middle East jet fuel spot differentials (premium/discount) and MOPAG jet fuel strip. The MOPAG strip is calculated using jet fuel derivatives that settle on Platts Middle East jet fuel netback assessments. From October 3, Platts also started publishing assessments for MOPAG jet fuel derivatives for Balance Month, Month 1 and Month 2, as well as the MOPAG jet fuel strip. India jet fuel: The Mean of Platts West India Netback (MOPWIN) assessment for jet is derived by deducting freight costs from the assessments

for the same product in Singapore. Although West India has a surplus of oil products for export, there remains only a sporadic flow of spot cargoes and insufficient local price formation to support independent spot prices on FOB West India basis. Platts therefore launched direct freight netbacks from the active trading hubs of Singapore and Japan, where daily prices are established from transparent and firm bids, offers and transactions between many active buyers and sellers. West Coast India – Singapore clean freight assessments used for generating the netback values can be found in the Platts Clean Tankerwire.

Japan jet fuel: Jet fuel typically sold into Japan is around 20-21 Saybolt color. Platts surveys the market to determine the tradable levels for delivered medium- ranges vessels with the assessment made for C+F Chiba, Japan. Most cargoes trade on a Mean of Platts Singapore (MOPS) basis plus a differential.

South Korea jet fuel: Korea jet fuel is assessed on a FOB Korea

basis, reflecting cargoes for loading 15-30 days forward from the date of publication. Most cargoes trade on a Mean of Platts Singapore (MOPS) basis plus a differential.

China jet fuel: China jet fuel is assessed on a C+F basis main ports including Qing Huang Dao, Shanghai and Huangpu. Assessments reflect medium range vessels ranging from 25,000 to 45,000 mt each. Cargoes reflect saybolt color of minimum 20. Cargoes typically trade based on the mean of Platts Singapore (MOPS.)

Australia jet fuel: Australian jet fuel is assessed on a C+F Sydney/Melbourne basis, for medium range vessels. The assessments are based on Singapore plus applicable freight. See “Platts Netback Methodology in Asia and the Middle East,” at the end of this document, for more information on how these values are calculated.

GASOIL

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
Gasoil FOB Spore Cargo	POABC00	POABC03			FOB	Singapore	15-30 days	150,000	250,000	US\$	Barrels	7.45
Gasoil FOB Spore Cargo sulfur ppm	POABCSF				FOB	Singapore				US\$	Barrels	NA
Gasoil MOPS strip	AAPJY00	AAPJY03				Singapore				US\$	Barrels	7.45
Gasoil MOPS strip sulfur ppm	AAPJYSF					Singapore				US\$	Barrels	NA
Gasoil FOB Spore Cargo vs Gasoil MOPS strip	POAIC00	AAFDC00			FOB	Singapore	15-30 days	150,000	250,000	US\$	Barrels	7.45
Gasoil FOB Spore Cargo vs Gasoil MOPS strip sulfur ppm	POAICSF				FOB	Singapore				US\$	Barrels	NA
Gasoil .001% S (10ppm) FOB Spore Cargo	AAOVC00	AAOVC03			FOB	Singapore	15-30 days	150,000	250,000	US\$	Barrels	7.45
Gasoil .001% S (10ppm) FOB Spore vs Gasoil MOPS strip	AAOVD00	AAOVD03			FOB	Singapore	15-30 days	150,000	250,000	US\$	Barrels	7.45
Gasoil .001% (10ppm) MOP West India \$/bbl	AAQWN00	AAQWN03			FOB	India		150,000	250,000	US\$	Barrels	7.45
Gasoil .001% (10ppm) MOP West India \$/mt	AAQW000	AAQW003			FOB	India		150,000	250,000	US\$	Barrels	7.45
Gasoil .001% S (10ppm) CFR Australia Cargo	AAQUD00	AAQUD03			FOB	Australia		150,000	250,000	US\$	Barrels	7.45
Gasoil .005% S (50ppm) FOB Spore Cargo	AAPPF00	AAPPF03			FOB	Singapore	15-30 days	150,000	250,000	US\$	Barrels	7.45
Gasoil .005% S (50ppm) FOB Spore Cargo vs Gasoil MOPS strip	AAPPH00	AAPPH03			FOB	Singapore	15-30 days	150,000	250,000	US\$	Barrels	7.45
Gasoil .001% (10ppm) FOB Arab Gulf Cargo	AAIDT00	AAIDT03			FOB	Arab Gulf				US\$	Barrels	7.45
Gasoil .001% (10ppm) FOB Arab Gulf vs MOPAG Gasoil	AAIDU00	AAIDU03			FOB	Arab Gulf	20-40 days	200,000	300,000	US\$	Barrels	7.45
Gasoil .005% (50ppm) FOB Arab Gulf Cargo	AASGJ00	AASGJ03			FOB	Arab Gulf				US\$	Barrels	7.45
Gasoil .005% (50ppm) FOB Arab Gulf vs MOPAG Gasoil	AASGK00	AASGK03			FOB	Arab Gulf	20-40 days	200,000	300,000	US\$	Barrels	7.45
Gasoil .05% (500ppm) FOB Arab Gulf Cargo	AAFEZ00	AAFFG00			FOB	Arab Gulf				US\$	Barrels	7.45
Gasoil .05% (500ppm) FOB Arab Gulf vs MOPAG Gasoil	AAFFD00	AAFFE00			FOB	Arab Gulf	20-40 days	200,000	300,000	US\$	Barrels	7.45
Gasoil .05% (500ppm) MOP West India \$/bbl	AAQWP00	AAQWP03			FOB	India		150,000	250,000	US\$	Barrels	7.45
Gasoil .05% (500ppm) MOP West India \$/mt	AAQWQ00	AAQWQ03			FOB	India		150,000	250,000	US\$	Barrels	7.45
Gasoil .05% S (500ppm) FOB Spore Cargo	AAFEX00	AAFEY00			FOB	Singapore	15-30 days	150,000	250,000	US\$	Barrels	7.45
Gasoil .05% S (500ppm) FOB Spore Cargo vs Gasoil MOPS strip	AAFFB00	AAFFC00			FOB	Singapore	15-30 days	150,000	250,000	US\$	Barrels	7.45
Gasoil .20% S (2000ppm) C+F South China Cargo	AALEK00	AALEL00			C+F	China		10,000	30,000	US\$	Metric Tons	7.45
Gasoil .25% (2500ppm) FOB Arab Gulf Cargo	AACUA00	AACUB00			FOB	Arab Gulf				US\$	Barrels	7.45
Gasoil .25% (2500ppm) FOB Arab Gulf vs MOPAG Gasoil	AACUC00	AACUD00			FOB	Arab Gulf	20-40 days	200,000	300,000	US\$	Barrels	7.45
Gasoil .25% (2500ppm) MOP West India \$/bbl	AAQWR00	AAQWR03			FOB	India		150,000	250,000	US\$	Barrels	7.45
Gasoil .25% (2500ppm) MOP West India \$/mt	AAQWS00	AAQWS03			FOB	India		150,000	250,000	US\$	Barrels	7.45
Gasoil .25% S (2500ppm) FOB Spore Cargo	AACUE00	AACUF00			FOB	Singapore	15-30 days	150,000	250,000	US\$	Barrels	7.45
Gasoil .25% S (2500ppm) FOB Spore Cargo \$/mt	AAXNB00	AAXNB03			FOB	Singapore	15-30 days	150,000	250,000	US\$	Barrels	7.45
Gasoil .25% S (2500ppm) FOB Spore Cargo vs Gasoil MOPS strip	AACQI00	AACTZ00			FOB	Singapore	15-30 days	150,000	250,000	US\$	Barrels	7.45
Gasoil C+F Japan Cargo	POABF00	POABF03			C+F	Japan		150,000	250,000	US\$	Barrels	7.45
Gasoil C+F Japan Cargo sulfur ppm	POABFSF				C+F	Japan				US\$	Barrels	NA
Gasoil C+F Japan Cargo vs Gasoil MOPS strip	AAWVG00	AAWVG03			C+F	Japan		150,000	250,000	US\$	Barrels	7.45
Gasoil FOB Arab Gulf Cargo	POAAT00	POAAT03			FOB	Arab Gulf				US\$	Barrels	7.45
Gasoil FOB Arab Gulf Cargo sulfur ppm	POAATSF				FOB	Arab Gulf				US\$	Barrels	NA
Gasoil FOB Arab Gulf vs MOPAG Gasoil	POAID00	AAFDG00			FOB	Arab Gulf	20-40 days	200,000	300,000	US\$	Barrels	7.45
Gasoil FOB Arab Gulf vs MOPAG Gasoil sulfur ppm	POAIDSF				FOB	Arab Gulf				US\$	Barrels	NA

GASOIL

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
Gasoil LR2 FOB Arab Gulf Cargo	AAKBT00	AAKB000			FOB	Arab Gulf				US\$	Barrels	7.45
Gasoil LR2 FOB Arab Gulf Cargo sulfur ppm	AAKBT5F				FOB	Arab Gulf				US\$	Barrels	NA
Gasoil FOB Fujairah Cargo	AFUJK00	AFUJK03			FOB	Fujairah	20-40 days	200,000	300,000	US\$	Barrels	7.45
Gasoil 10ppm FOB Fujairah Cargo	AFUJP00	AFUJP03			FOB	Fujairah	20-40 days	200,000	300,000	US\$	Barrels	7.45
Gasoil MOPAG Strip	AFUJL00	AFUJL03				Arab Gulf				US\$	Barrels	7.45
Gasoil FOB Korea Cargo	POAIE00	POAIF03			FOB	South Korea	15-30 days	150,000	250,000	US\$	Barrels	7.45
Gasoil FOB Korea Cargo sulfur ppm	POAIESF				FOB	South Korea				US\$	Barrels	NA
Gasoil FOB Korea Cargo vs Gasoil MOPS strip	POAIG00	POAIH03			FOB	South Korea	15-30 days	150,000	250,000	US\$	Barrels	7.45
Gasoil FOB Korea Cargo vs Gasoil MOPS strip sulfur ppm	POAIG5F				FOB	South Korea	15-30 days			US\$	Barrels	NA
Gasoil FOB Okinawa Cargo	POAIW00	POAIX03			FOB	Japan	15-30 days	150,000	250,000	US\$	Barrels	7.45
Gasoil FOB Okinawa Cargo sulfur ppm	POAIWSF				FOB	Japan				US\$	Barrels	NA
Gasoil FOB Okinawa Cargo vs Gasoil MOPS strip	POAIY00	POAIZ03			FOB	Japan	15-30 days	150,000	250,000	US\$	Barrels	7.45
Gasoil FOB Okinawa Cargo vs Gasoil MOPS strip sulfur ppm	POAIY5F				FOB	Japan	15-30 days			US\$	Barrels	NA
Gasoil LP C+F South China Cargo	POAFA00	POAFA03			C+F	China		10,000	30,000	US\$	Metric Tons	7.45
Gasoil LP C+F South China Cargo sulfur ppm	POAFASF				C+F	China				US\$	Metric Tons	NA
Gasoil LP C+F South China Cargo vs Gasoil MOPS strip	AABJZ00	AABKA00			C+F	China		10,000	30,000	US\$	Metric Tons	7.45
Gasoil LP C+F South China Cargo vs Gasoil MOPS strip sulfur ppm	AABJZ5F				C+F	China				US\$	Metric Tons	NA

Gasoil

Gasoil (Singapore): Platts FOB Singapore assessments reflect “FOB Straits” bids, offers and transactions. For FOB Straits bids and offers, buyers and sellers should not state a specific loadpoint at the point of communication to Platts, and should proceed to nominate loading from one of the locations in Singapore and Malaysia that are already approved for the Platts Market on Close price assessment process.

Platts’ Singapore physical gasoil assessments reflect a minimum of 150,000 barrels, maximum 250,000 barrels, loading 15-30 days from the date of publication. Market participants should specify loading for a five-day date range at the time of submitting a bid or offer for publication in the assessment process.

On July 15, 2011, Platts announced that it would rename its flagship Singapore “0.5%S Gasoil” assessment on January

3, 2012 as Singapore “Gasoil.” The renaming will facilitate gradual transition of the Asian gasoil benchmark to lower sulfur specifications over the coming years, reflecting changing supply and demand trends across the region.

With effect from January 2, 2018 Platts amended the maximum sulfur content specified for the flagship Singapore Gasoil assessment to 10 ppm from the earlier 0.05% (500 ppm). At the same time, Platts lowered the maximum sulfur specification of its flagship Arab Gulf Gasoil netback assessment to 10 ppm. The lower sulfur specifications reflect changing supply and demand trends across the regions.

Grades which are not widely merchantable - for instance, gasoil with contaminants that are banned in certain major importing countries, including fatty acid methyl esters (FAME) - will not be reflected in the assessments. Platts understands that Indonesia, Australia, Japan and Sri Lanka all restrict FAME content in gasoil imports to “nil”.

On January 22, 2015, Platts concluded a review of the merchantability of additives reflected in its FOB Singapore gasoil assessments. As a result of this review, Platts has published a list of additives that will be reflected in the assessment process. This list follows a study of submissions from market participants, and is intended to provide clarity to market participants regarding which additives are generally considered to be merchantable and accepted for cargoes delivered through the Platts Market on Close assessment process in Singapore. Platts assessments for FOB Singapore ‘Gasoil’ (10 ppm) reflect the inclusion of additives in cargoes that have been historically acceptable for delivery FOB Singapore. Fuel additives that have been broadly delivered and accepted in FOB Singapore trades reported through the Platts MOC assessment process continue to be reflected in the assessments, and are included in this list. Gasoil delivered through the Platts MOC assessment process is expected to be additive-free, or contain the additives described in this list.

The full list of additives is included in the table below.

Gasoi 10 ppm: Minimum of 150,000 barrels, maximum 250,000 barrels, loading 15-30 days from the date of publication. Specifications as defined in table.

Gasoi 50 ppm: Minimum of 150,000 barrels, maximum 250,000 barrels, loading 15-30 days from the date of publication. Specifications as defined in table.

Gasoi 0.05% sulfur: Minimum of 150,000 barrels, maximum 250,000 barrels, loading 15-30 days from the date of publication. Specifications as defined in table.

Gasoi 0.25% sulfur: Minimum of 150,000 barrels, maximum 250,000 barrels, loading 15-30 days from the date of publication. Specifications as defined in table.

China gasoi: The minimum volume assessed is 100,000 barrels or 10,000-15,000 mt. The sulfur content of the gasoi cargoes assessed for delivery into China is 10ppm and 0.20% maximum. Ports are South China-Huangpu, Hong Kong, Shenzhen. Deals into other areas are tracked but prices are different. Gasoi into North China may command a higher price due to geographical location. Assessment window is 15-30 days from date of publication.

Japan gasoi: Japan gasoi is assessed on a FOB Japan basis reflecting cargoes with 10 ppm sulfur maximum. C+F Japan gasoi reflects cargoes with 10 ppm sulfur maximum in line with motor fuel specifications in the country. Platts surveys the market to determine the tradable levels for cargoes loading/delivering 15-30 days forward. Most cargoes trade on a Mean of Platts Singapore (MOPS) basis plus a differential.

South Korea gasoi: Korea gasoi is assessed on a FOB Korea basis reflecting a 10 ppm sulfur maximum grade. Platts surveys the market to determine the tradable levels for cargoes loading 15-30 days forward.

Middle East gasoi: FOB Arab Gulf gasoi reflects gasoi with a maximum of 10 ppm sulfur, and is assessed as a netback to the Singapore Gasoi assessment, using 55,000 mt and 80,000 mt (LR2) freight rates. Freight rates reported in the Platts Clean Tankerwire are used for this netback. See "Platts Netback Methodology in Asia and the Middle East," at the end of this document, for more information on how these values are calculated. The FOB Arab Gulf 0.25% sulfur, 0.05% sulfur and 0.005% sulfur assessments are derived by applying assessed spot premiums for those grades to the primary Gasoi assessment, minus the spot premium for standard 10 ppm gasoi itself.

Gasoi 0.005% sulfur (outright): Derived by applying spot differential assessed for 0.005% sulfur to the primary FOB AG Gasoi netback, minus the assessed spot AG differential for Gasoi itself.

Gasoi 0.05% sulfur (outright): Derived by applying spot differential assessed for 0.05% sulfur to the primary FOB AG Gasoi netback, minus the assessed spot AG differential for Gasoi itself.

Gasoi 0.25% sulfur (outright): Derived by applying spot differential assessed for 0.25% sulfur to the primary FOB AG Gasoi netback, minus the assessed spot AG differential for Gasoi itself.

Middle East gasoi spot differentials: Platts assesses spot differentials for gasoi. These assessments, which are published as a spot market premium/discount to Platts' existing Middle East gasoi netback assessment, reflect the value of gasoi cargoes, typically 200,000 to 300,000 barrels each, for loading or delivery 20 to 40 days forward from the date of assessment. Platts considers bids, offers, transactions, and reports of transactions when assessing this local spot market differential. On January 7, 2015, Platts announced a series of changes to its Middle East products assessments, following a broad period of industry feedback and discussion. These changes included amending the laycan, volumes

and locations reflected in the assessments. Platts assesses premiums for the following grades: Gasoi 10 ppm sulfur, Gasoi 0.005% sulfur, Gasoi 0.05% sulfur and Gasoi 0.25% sulfur.

Cargoes loading from the following Gulf ports would be considered for inclusion in the assessments: Jubail, Jebel Ali, Mina Al Ahmadi, Quoin Island, Shuaiba, Ras Tanura, Ruwais, Mina Abdulla, Sohar, Bahrain, Fujairah, Ras Laffan and any safe and sound port within this geographic area. The assessments would be normalized to loadings in Fujairah for gasoi.

FOB Fujairah Gasoi and Gasoi 0.001% sulfur assessments (outright): From October 3, 2016 Platts began assessing outright values for Gasoi and Gasoi 0.001% sulfur cargoes on an FOB Fujairah basis. The assessments reflect the value of Gasoi and Gasoi 0.001% sulfur, typically 200,000 to 300,000 barrels each, for loading 20 to 40 days from the date of assessment. Market participants should specify loading for a five-day date range at the time of submitting a bid or offer for publication. The outright assessments equal the sum of the Middle East Gasoi or Gasoi 0.001% sulfur spot differentials (premium/discount) and the MOPAG Gasoi strip. The MOPAG Gasoi strip is calculated using Gasoi derivatives that settle on Platts Middle East Gasoi netback assessments. From October 3, Platts also started publishing assessments for MOPAG Gasoi derivatives for Balance Month, Month 1 and Month 2, as well as the MOPAG Gasoi strip.

India gasoi: The Mean of Platts West India Netbacks (MOPWIN) assessments for 10 ppm, 500 ppm and 0.25% sulfur gasoi are derived by deducting freight costs from the assessments for the same product in Singapore. Although West India has a surplus of oil products for export, there remains only a sporadic flow of spot cargoes and insufficient local price formation to support independent spot prices on FOB West India basis. Platts therefore launched direct freight netbacks from the active trading hubs of Singapore and Japan, where daily prices are established from transparent and firm bids, offers and transactions between many active

buyers and sellers. West Coast India – Singapore clean freight assessments used for generating the netback values can be found in the Platts Clean Tankerwire.

Australia gasoil: Platts assesses 10 ppm gasoil on a C+F Sydney/Melbourne basis, in US dollars per barrel. The assessment reflects cargoes for medium range vessels. The assessments are based on Singapore plus applicable freight. See “Platts Netback Methodology in Asia and the Middle East,” at the end of this document, for more information on how these values are calculated.

FOB SINGAPORE GASOIL / DIESEL SPECIFICATIONS

	Max	Unit mg KOH/g	0.001%S	0.005%S	0.05%S	0.25%S	Test Methods ASTM D664	
			10 ppm	50 ppm	500 ppm	2500 ppm		
Acid Number, Total			0.3	0.5	0.5	0.5		
Appearance @ 25°C	Pass Procedure 1	Visual test	Clear & bright, without undissolved sediment or free water	Clear & bright, without undissolved sediment or free water	Clear & bright, without undissolved sediment or free water		ASTM D4176 Proc 2	
Ash content	Max	% weight	0.01	0.01	0.01	0.01	ASTM D482, EN ISO 6245	
Cetane Index	Min	Range 0-100	46	48	48	48	ASTM D4737, EN ISO 4264	
Cetane Number	Min	Range 0-100	51				ASTM D613, EN ISO 5165	
Conradson Carbon Residue (10% distillation)	Max	% mass	0.2	0.2	0.2	0.1	ASTM D4530, EN ISO 10370	
CFPP (Cold filter plugging point)	Max	°C	Minus 5				EN 116 / IP 309	
Cloud point	Max	°C	Minus 1				ASTM 2500, ISO 3015-92, JIS K 2269-87, EN 23015	
Colour	Max	Grade	2	2	2	2	ASTM D1500 / IP 196	
Conductivity @ 20°C	Min	pS/m	150				ASTM D2624, EN ISO 6297:1997	
Copper corrosion (3 hrs @ 50°C)	Max	Class	1	1	1	1	ASTM D130, EN ISO 2160	
Density @ 15°C	Min-	Max	g/ml	0.820-0.845	0.82-0.86	0.82-0.86	0.82-0.86	ASTM D4052, EN ISO 3675
Distillation T90 (90% recovered)	Max	°C				360	ASTM D86, EN ISO 3405:1998	
Distillation T95 (95% recovered)	Max	°C	360	360	370		ASTM D86, EN ISO 3405:1998	
Distillation volume recovered @ 250°C	Max	%	65				EN ISO 3405:1998	
Distillation volume recovered @ 350°C	Min	%	85				EN ISO 3405:1998	
Filter blocking tendency	Max		2				ASTM D2068, IP 387	
Flash point	Min	°C	66	66	66	66	ASTM D93, EN 22719	
Fatty acid methyl esters (FAME)	Max	%	NIL	NIL	NIL	NIL	ASTM D7371	
Kinematic viscosity @ 40°C	Min-	Max	cSt	2.0-4.5	2.0-4.5	2.0-4.5	2.0-4.5	ASTM D445, EN ISO 3104
Lubricity (HFRR) (WSD 1,4) @ 60°C	Max	microns	460	460	460	460	ASTM D6079, IP 450, ISO 12156-1	
Odour			Merchantable					
Oxidation stability	Max	mg/L	25				ASTM D2274, EN ISO 12205	
Particulate matter	Max	mg/kg	24				EN 12662	
Polyaromatic hydrocarbons (PAHs)	Max	% weight	11	11			IP 391:1995	
Pour point	Max	°C		9	9	9	ASTM D97	
Sulfur content	Max	ppm	10	50	500	2500	ASTM D5453, EN ISO 20846/7 & 20884	
Water content	Max	mg/kg	200				EN ISO 12937	
Water & sediment	Max	% volume	0.05	0.05	0.05	0.05	ASTM D2709	

ADDITIVES IN SINGAPORE AND THE MIDDLE EAST 10PPM

Additive type	Manufacturer	Name
Antioxidant	Lanxess	BAYNOX Solution 20%
Antioxidant	Dorf Ketal	DORF 410C
Antioxidant	Dorf Ketal	SR 1546
Antioxidant	Ondeo Nalco	EC 3053A
Antioxidant	Betz	Spec-Aid 8Q5400
Antioxidant	Lanxess	Vulkanox 4005
Antioxidant; Metal Deactivator	Innospec	DGS-139
Metal Deactivator	Afton	HiTEC 4705E
Antioxidant	Afton	HiTEC 4733
Cetane Improver	Cepro Micet	2-Ethyl Hexyl Nitrate
Cetane Improver	Deepak Nitrite	2-Ethyl Hexyl Nitrate
Cetane Improver	Eurenco	2-Ethyl Hexyl Nitrate
Cetane Improver	Octel/ Innospec	2-Ethyl Hexyl Nitrate
Cetane Improver	Octel	Octel C1-0801
Cetane Improver	Very One	2-Ethylhexyl Nitrate
Cetane Improver	Dorf Ketal	Cepro 100
Cetane Improver	Innospec	CI-0801
Cetane Improver	WRT BV	HFA 3033
Cetane Improver	Afton	HiTEC 4103W
Cetane Improver	Lubrizol	Lubrizol 8090
Cetane Improver	Total	Total RV100
Cetane Improver	Zenteum	Zenteum ZR688
Cetane Improver	Kutch Chemical	2-Ethyl Hexyl Nitrate
Cetane Improver	Nalco	Nalco EC5308A
Cold Flow Improver	Total	7000L
Cold Flow Improver	Total	CP 7134 L
Cold Flow Improver	Dorf Ketal	SR1637
Cold Flow Improver	Dorf Ketal	SR1647
Cold Flow Improver	Dorf Ketal	SR 1609
Cold Flow Improver	Infineum	Infineum R420
Cold Flow Improver	Infineum	Infineum R765
Cold Flow Improver	Total	CP 7000L
Cold Flow Improver	Clariant	Dodiflow 4028
Cold Flow Improver	Clariant	Dodiflow 4032
Cold Flow Improver	Clariant	Dodiflow 4313
Cold Flow Improver	Clariant	Dodiflow 6087
Cold Flow Improver	Clariant	Dodiflow 4985
Cold Flow Improver	Clariant	Dodiflow 5251
Cold Flow Improver	Clariant	Dodiflow 4744
Cold Flow Improver	Clariant	Dodiflow 3905
Cold Flow Improver	Dorf Ketal	SR 1690
Cold Flow Improver	Infineum	Infineum R587
Cold Flow Improver	Infineum	Infineum R590
Cold Flow Improver	Infineum	Infineum R773
Cold Flow Improver	Infineum	R274
Cold Flow Improver	Infineum	R275D
Cold Flow Improver	BASF	Keroflux 6170
Cold Flow improver	BASF	Keroflux 6206
Cold Flow Improver	BASF	Keroflux 6214
Cold Flow Improver	Innospec	OFI 7650
Cold Flow Improver	CHIMEC	CH6835
Conductivity Improver	Dorf Ketal	SR 1795
Conductivity Improver	Innospec (formerly Octel)	Stadis 425

Additive type	Manufacturer	Name
Conductivity Improver	Innospec (formerly Octel)	Stadis 450
Conductivity Improver	Nalco	Nalco EC5580A
Conductivity Improver	Baker Hughes	T3514
Corrosion Inhibitor	Innospec	DCI-4A
Corrosion Inhibitor	Nalco	Nalco 5403
Corrosion Inhibitor	Afton	AvGuardTM CI/LI
Flow Improver	Sanyo Chemicals	Carroyl MD-336K
Flow Improver	Dorf Ketal	SR1649
Flow Improver	Dorf Ketal	SR1651
Flow Improver	Infineum	Infineum R222
Flow Improver	Infineum	Infineum R240
Flow Improver	Infineum	Infineum R241
Flow Improver	Infineum	Infineum R375
Flow Improver	Infineum	Infineum R395
Flow Improver	Infineum	Infineum R396
Flow Improver	Infineum	Infineum R570
Flow Improver	Infineum	Infineum R567K
Flow Improver	Infineum	Infineum R571
Flow Improver	Infineum	Infineum R594
Flow Improver	Infineum	Infineum R747
Flow Improver	Infineum	Infineum R756+R773
Flow Improver	Infineum	Infineum R779
Flow Improver	Infineum	Infineum R575
Flow Improver	Sunhib	Sunhib S-206
Flow Improver / Lubricity	Infineum	Infineum R216
Lubricity Improver	Dorf Ketal	SR2008
Lubricity Improver	Dorf Ketal	SR2010
Lubricity Improver	WRT bv	HFA 7025
Lubricity Improver	Infineum	Infineum R655
Lubricity Improver	Lubrizol	LZ539M
Lubricity Improver	Chevron Texaco	ODA 78010
Lubricity Improver	Octel	OLI 5500
Lubricity Improver	Infineum	Infineum R671
Lubricity Improver	Nalco	Nalco EC5713A
Lubricity Improver	Baker Petrolite	Tolad 5051C
Lubricity Improver	NOF Corporation Japan	LE 772W
Lubricity Improver	Sanyo Chemicals	Sanfric FM-6C
Lubricity Improver	Infineum	Infineum R650
Lubricity Improver	Nalco	Nalco EC5719A
Lubricity Improver	Total	PC 32
Lubricity Improver	Baker Hughes	T9121
Lubricity Improver	Afton	HiTEC 4140A
Lubricity Improver	Infineum	Infineum R650D
Lubricity Improver	Infineum	Infineum R655D
Metal Deactivator	Innospec	DMD-2
WAFI Cold Flow	Infineum	Infineum R705
WAFI Cold Flow	Infineum	Infineum R727
WAFI Cold Flow	Infineum	Infineum R734+R231
WAFI Cold Flow	Infineum	Infineum R734+R344
WAFI Cold Flow	Infineum	Infineum R709
MDFI Cold Flow	Infineum	Infineum R225
WASA Cold Flow	Infineum	Infineum R799

FOB MOPAG GASOIL SPECIFICATIONS

Acid Number, Total		Max	Unit mg KOH/g	0.001%S 10 ppm 0.3	Test Methods ASTM D664
Appearance @ 25°C	Pass Procedure 1		Visual test	Clear & bright, without undissolved sediment or free water	ASTM D4176 Proc 2
Ash content		Max	% weight	0.01	ASTM D482, EN ISO 6245
Cetane Index	Min		Range 0-100	46	ASTM D4737, EN ISO 4264
Cetane Number	Min		Range 0-100	51	ASTM D613, EN ISO 5165
Conradson Carbon Residue (10% distillation)		Max	% mass	0.2	ASTM D4530, EN ISO 10370
CFPP (Cold filter plugging point)		Max	°C	Minus 5	EN 116 / IP 309
Cloud point		Max	°C	Minus 1	ASTM 2500, ISO 3015-92, JIS K 2269-87, EN 23015
Colour		Max	Grade	2	ASTM D1500 / IP 196
Conductivity @ 20°C	Min		pS/m	150	ASTM D2624, EN ISO 6297:1997
Copper corrosion (3 hrs @ 50°C)		Max	Class	1	ASTM D130, EN ISO 2160
Density @ 15°C	Min-	Max	g/ml	0.820-0.845	ASTM D4052, EN ISO 3675
Distillation T90 (90% recovered)		Max	°C		ASTM D86, EN ISO 3405:1998
Distillation T95 (95% recovered)		Max	°C	360	ASTM D86, EN ISO 3405:1998
Distillation volume recovered @ 250°C		Max	%	65	EN ISO 3405:1998
Distillation volume recovered @ 350°C	Min		%	85	EN ISO 3405:1998
Filter blocking tendency		Max		2	ASTM D2068, IP 387
Flash point	Min		°C	66	ASTM D93, EN 22719
Fatty acid methyl esters (FAME)		Max	%	NIL	ASTM D7371
Kinematic viscosity @ 40°C	Min-	Max	cSt	2.0-4.5	ASTM D445, EN ISO 3104
Lubricity (HFRR) (WSD 1,4) @ 60°C		Max	microns	460	ASTM D6079, IP 450, ISO 12156-1
Odour				Merchantable	
Oxidation stability		Max	mg/L	25	ASTM D2274, EN ISO 12205
Particulate matter		Max	mg/kg	24	EN 12662
Polyaromatic hydrocarbons (PAHs)		Max	% weight	11	IP 391:1995
Pour point		Max	°C		ASTM D97
Sulfur content		Max	ppm	10	ASTM D5453, EN ISO 20846/7 & 20884
Water content		Max	mg/kg	200	EN ISO 12937
Water & sediment		Max	% volume	0.05	ASTM D2709

FUEL OIL

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
FO 180 CST 3.5% S FOB Spore Cargo	PUADV00	PUADV03			FOB	Singapore	15-30 days	20,000	40,000	US\$	Metric Tons	6.35
FO 180 CST 3.5% S FOB Spore Cargo vs FO 180 CST MOPS strip	AAGZF00	AAGZG00			FOB	Singapore	15-30 days	20,000	40,000	US\$	Metric Tons	6.35
FO 180 CST 2.0% S FOB Spore Cargo	PUAXS00	PUAXS03			FOB	Singapore	15-30 days	20,000	40,000	US\$	Metric Tons	6.35
FO 180 CST 2.0% S FOB Spore Cargo vs FO 180 CST MOPS strip	AAWTT00	AAWTT03			FOB	Singapore	15-30 days	20,000	40,000	US\$	Metric Tons	6.35
FO 180 CST FOB Arab Gulf Cargo	PUABE00	PUABE03			FOB	Arab Gulf		20,000	40,000	US\$	Metric Tons	6.35
FO 180 CST FOB Arab Gulf vs MOPAG 180 CST	AAXJA00	AAXJA03			FOB	Arab Gulf	20-40 days	20,000	40,000	US\$	Metric Tons	6.35
FO 180 CST vs FO 380 CST FOB Arab Gulf	PPXDM00	AAFDI00			FOB	Arab Gulf	15-30 days	20,000	40,000	US\$	Metric Tons	6.35
FO 180 CST 3.5% S C+F Japan Cargo	PUACJ00	PUACJ03			C+F	Japan		20,000	40,000	US\$	Metric Tons	6.35
FO 180 CST 3.5% S FOB Korea Cargo	PUBDP00	PUBDQ03			FOB	South Korea	15-30 days	20,000	40,000	US\$	Metric Tons	6.35
FO 180 CST 3.5% S FOB Korea Cargo vs FO 180 MOPS strip	PUBDR00	PUBDS03			FOB	South Korea	15-30 days	20,000	40,000	US\$	Metric Tons	6.35
FO 180 CST 3.5% S MOPS Strip \$/mt	AAPJX00	AAPJX03				Singapore				US\$	Metric Tons	6.35
FO 380 CST 3.5% S FOB Spore Cargo	PPXDK00	PPXDP03			FOB	Singapore	15-30 days	20,000	40,000	US\$	Metric Tons	6.35
FO 380 CST 3.5% S FOB Spore Cargo sulfur ppm	PPXDKSF				FOB	Singapore		20,000	40,000	US\$	Metric Tons	NA
FO 380 CST MOPS Strip \$/mt	AAPJW00	AAPJW03				Singapore				US\$	Metric Tons	6.35
FO 380 CST 3.5% S FOB Spore Cargo vs FO 380 CST MOPS strip	PPXDL00	AAFDD00			FOB	Singapore	15-30 days	20,000	40,000	US\$	Metric Tons	6.35
FO 380 CST 3.5% FOB Arab Gulf Cargo	AAIDC00	AAIDD00			FOB	Arab Gulf		20,000	40,000	US\$	Metric Tons	6.35
FO 380 CST FOB Arab Gulf vs MOPAG 380 CST	AAXJB00	AAXJB03			FOB	Arab Gulf	20-40 days	20,000	40,000	US\$	Metric Tons	6.35
FO 380 CST FOB Fujairah Cargo	AFUJQ00				FOB	Fujairah	20-40 days	20,000	40,000	US\$	Metric Tons	6.35
FO 380 CST MOPAG Strip	AFUJR00					Arab Gulf				US\$	Metric Tons	6.35
FO 380 CST 3.5% S FOB Korea Cargo	PUBDY00	PUBDZ03			FOB	South Korea	15-30 days	20,000	40,000	US\$	Metric Tons	6.35
FO 380 CST 3.5% S FOB Korea Cargo vs FO 380 MOPS strip	PUBEA00	PUBEB03			FOB	South Korea	15-30 days	20,000	40,000	US\$	Metric Tons	6.35
FO 180 CST MOPAG Strip	AAYBD00	AAYBD03			Ex-wharf	Fujairah	5-15 days			US\$	Metric Tons	6.35
FO 380 CST Ex-wharf Fujairah	AAYBF00	AAYBF03			Ex-wharf	Fujairah	5-15 days	2,000	7,000	US\$	Metric Tons	6.35
Ex-wharf Fujairah 380 CST vs MOPAG 180 CST strip	AAYBG00	AAYBG03			Ex-wharf	Fujairah	5-15 days	2,000	7,000	US\$	Metric Tons	6.35

Fuel oil

Singapore fuel oil: Platts FOB Singapore assessments reflect “FOB Straits” bids, offers and transactions. For FOB Straits bids and offers, buyers and sellers should not state a specific loadpoint at the point of communication to Platts, and should proceed to nominate loading from one of the locations in Singapore and Malaysia that are already approved for the Platts Market on Close price assessment process.

All fuel oil assessments are typically based on cracked material. In Singapore, the HSFO 180 and 380 CST assessments reflect transactions, bids and offers for parcels of a minimum of 20,000

mt, maximum 40,000 mt per transaction, loading 15-30 days from the date of publication. Market participants should specify loading for a five-day date range when submitting bids and offers for publication.

Any terminal nominated for performance on an FOB Straits fuel oil transaction concluded during the Platts assessment process should be able to receive an Aframax-sized vessel, which typically weighs 80,000 to 120,000 deadweight tons when fully loaded. The terminal should typically be able to manage at least one co-load of standard-sized cargoes of 20,000 mt to 40,000 mt. For instance, a vessel which is already carrying 20,000 mt of fuel oil should be able to load at least another 20,000 mt from a

second terminal, without draft restrictions hindering a vessel's ability to leave the port.

Platts assesses 2.0% and 3.5% sulfur 180 CST, and 3.5% sulfur 380 CST FOB Singapore fuel oil.

Following a detailed review of the market relationship between medium sulfur and low sulfur fuel oil FOB Singapore, Platts amended its methodology for assessing FOB Singapore 180 CST 2% sulfur cargoes. With effect from January 2, 2014, Platts assesses this value by applying a standard quality premium to its benchmark FOB Singapore HSFO 180 CST 3.5% sulfur assessment. Platts established this quality premium at 2.25%

of the base value of FOB Singapore HSFO 180 CST 3.5%. For example, if Platts assesses the value of HSFO 180 CST 3.5% at \$600/mt, the quality premium would be \$13.50/mt and the outright price assessment for 180 CST 2% would be \$613.50/mt. Platts made this adjustment to reflect the fact that liquidity in the medium sulfur fuel oil market has diminished to very low levels across Asia. The value reflects the relative premiums for the medium sulfur fuel over the period 2011-2013.

SINGAPORE'S STANDARD SPECS FOR 380 CENTISTOKE FUEL OIL

Property	Standard
Sulfur Max	3.5%
Kinematic viscosity Max	380 CST
Specific gravity at 15 C kg/l Max	0.991
Flash point Min	66 deg C
Pour point Max	24 deg C
Ash on a weight basis Max	0.10%
Conradson carbon residue (CCR) Max	18%
Vanadium Max	300 parts per million (ppm)
Sodium Max	100 ppm
Aluminium + Silicone Max	80 ppm
Water by distillation volume Max	0.50%
Sediment by extraction Max	0.10%
Total existent sediment	0.10%

SINGAPORE'S STANDARD SPECS FOR 180 CENTISTOKE FUEL OIL, 3.5% SULFUR

Property	Standard
Sulfur Max	3.5%
Kinematic viscosity Max	180 CST
Specific gravity at 15 C kg/l Max	0.991
Flash point Min	66 deg C
Pour point Max	24 deg C
Ash on a weight basis Max	0.10%
Conradson carbon residue (CCR) Max	16%
Vanadium Max	200 parts per million (ppm)
Sodium Max	100 ppm
Aluminium + Silicon Max	80 ppm with aluminium at Max 30 ppm
Water by distillation volume Max	0.50%
Sediment by extraction Max	0.10%
Total existent sediment	0.10%

Platts announced on March 12, 2012 that it would amend the sulfur content reflected in its 380 CST high sulfur fuel oil FOB Singapore and FOB Arab Gulf cargo assessments from July 2, 2012. Platts decreased the maximum specified allowable sulfur to 3.5% maximum standards, lower from the previous ceiling of 4% sulfur maximum standard. These changes aligned sulfur in assessed HSFO cargoes with standard quality in the bunker fuel market, which is the predominant end-use for 380CST fuel oil cargoes in Singapore.

Any fuel oil cargo delivered as a result of a transaction completed and reported during the Platts Market on Close assessment process should be merchantable, including 180CST fuel oil, which regularly moves within the utility and bunker markets. Among other characteristics, fuel oil should not contain Used Lubricants Oil (ULO), which would render fuel oil undeliverable into the bunkering market. Platts does not reflect fuel oil cargoes in its assessment process where ULOs are determined to be present.

South Korea fuel oil: Platts assesses 180 and 380 CST cargoes FOB South Korea. The assessments reflect parcels of around 30,000 mt loading 15-30 days forward. These cargoes typically trade linked to Mean of Platts Singapore, 180 CST 3.5% sulfur

SINGAPORE'S STANDARD SPECS FOR 180 CENTISTOKE FUEL OIL, 2.0% SULFUR

Property	Standard
Sulfur Max	2.0%
Kinematic viscosity Max	180 CST
Specific gravity at 15 C kg/l Max	0.991
Flash point Min	66 deg C
Pour point Max	24 deg C
Ash on a weight basis Max	0.10%
Conradson carbon residue (CCR) Max	16%
Vanadium Max	95 parts per million (ppm)
Sodium Max	65 ppm
Aluminium + Silicon Max	80 ppm with aluminium at Max 30 ppm
Water by distillation volume Max	0.50%
Sediment by extraction Max	0.10%
Total existent sediment	0.10%

assessment. Platts also assesses premiums/discounts to the Mean of Platts Singapore for each grade. Following an extensive review, Platts confirmed in January 2014 it would discontinue its FOB Korea 1.5% sulfur 180 CST fuel oil assessment with effect from April 1, 2014. The discontinuation of this assessment reflects the fact that this grade is no longer typically sold from this location.

Japan fuel oil: Platts assesses 180 CST cargoes delivered into the Chiba area. The C+F Japan assessment is a netforward from the FOB Singapore 180 CST assessment using 80,000 mt freight rates published in the Platts Dirty Tankerwire. See "Platts Netback Methodology in Asia and the Middle East," at the end of this document, for more information on how these values are calculated. The assessments reflect parcels of around 30,000 mt loading 15-30 days forward. These cargoes typically trade linked to Mean of Platts Singapore, 180 CST 3.5% sulfur assessment.

Following an extensive review, Platts confirmed in January 2014 that the FOB Okinawa 1.5% sulfur 180 CST and 3.5% sulfur 180 CST fuel oil assessments would be discontinued with effect from April 1, 2014. The discontinuation of these assessments reflects the fact that these grades are no longer typically sold from this location.

Middle East fuel oil: The Arab Gulf fuel oil 180 CST assessment is a netback to Singapore using 80,000 mt freight rates. Freight rates reported in the Platts Dirty Tankerwire are used to derive the FOB Arab Gulf fuel oil assessment. Density in the Arab Gulf varies and assessments include 0.96-0.975 kg/l. See "Platts Netback Methodology in Asia and the Middle East," at the end of this document, for more information on how these values are calculated.

The Arab Gulf fuel oil 380 CST assessment is assessed as a netback to Singapore using 80,000 mt freight rates. Freight rates reported in the Platts Dirty Tankerwire are used to derive the FOB Arab Gulf fuel oil assessment. See "Platts Netback Methodology in Asia and the Middle East," at the end of this document, for

more information on how these values are calculated.

Middle East fuel oil spot premiums: Platts assesses spot premiums for fuel oil. These assessments, which are published as a spot market premium/discount to Platts' existing Middle East fuel oil netback assessments, reflect the value of fuel oil cargoes, typically 20,000 to 40,000 mt each, for loading or delivery 20 to 40 days forward from the date of assessment. Platts considers bids, offers, transactions, and reports of transactions when assessing this local spot market differential. On January 7, 2015, Platts announced a series of changes to its Middle East products assessments, following a broad period of industry feedback and discussion. These changes included amending the laycan, volumes and locations reflected in the assessments. Platts assesses premiums for the following grades: HSFO 180 CST (premium to 180 CST netback) and HSFO 380 CST (premium to 380 CST netback). Cargoes loading from the following Gulf ports would be considered for inclusion in the assessments: Jubail, Jebel Ali, Mina Al Ahmadi, Quoin Island, Shuaiba, Ras Tanura, Ruwais, Mina Abdulla, Sohar, Bahrain, Fujairah, Ras Laffan and any safe and sound port within this geographic area. The assessments would be normalized to loadings in Fujairah for fuel oil.

FOB Fujairah 380 CST Fuel Oil assessment (outright): From October 3, 2016 Platts began assessing outright value for 380 CST Fuel Oil cargoes on an FOB Fujairah basis. The assessment reflects the value of 380 CST fuel oil cargoes, typically 20,000 to 40,000 mt each, for loading 20 to 40 days from the date of assessment. Market participants should specify loading for a five-day date range at the time of submitting a bid or offer for publication. The outright assessment equals the sum of Middle East 380 CST Fuel Oil spot differentials (premium/discount) and MOPAG 380 CST strip. The MOPAG strip is calculated using 380 CST Fuel Oil derivatives that settle on Platts Middle East 380 CST Fuel Oil netback assessments. From October 3, Platts also started publishing assessments for MOPAG 380 CST Fuel Oil derivatives for Balance Month, Month 1 and Month 2, as well as the MOPAG 380 CST Fuel Oil strip.

FSU FOB SINGAPORE

Vessel name	Vessel's operator	Vessel's delivered date	Imo number	Flag	Vessels anchored location	Type of hull	Summer Deadweight
Speranza	Vitol Asia Pte Ltd	10-May-93	9002609	Panama	Tanjung Pelepas, Johor province of southern Malaysia	Double Hull	299,700
Energy Star *	BP Singapore Pte Ltd and Gunvor Singapore Pte Ltd	31-Mar-97	9118393	Thailand	Tanjung Pelepas, Johor province of southern Malaysia	Double Hull	309,966
Fortune Star *	Mercuria Energy Trading Pte Ltd	31-Mar-99	9183374	Thailand	Tanjung Pelepas, Johor province of southern Malaysia	Double Hull	298,023
Amity Star *	Mitsui & Co Energy Trading Singapore Pte Ltd	1-Feb-93"	9006605	Thailand	Tanjung Pelepas, Johor province of southern Malaysia	Double Hull	291,381
Jubilee Star	Nathalin Shipping Pte Ltd	14-Nov-96	9118381	Thailand	Tanjung Pelepas, Johor province of southern Malaysia	Double Hull	309,892

*with effect from February 15, 2016

FOB Fujairah 380 CST Fuel Oil ex-wharf: From April 3, 2017 Platts began assessing Fujairah ex-wharf 380 CST fuel oil on an outright basis and a floating price basis. The assessment reflects spot trading activity in 5,000 mt parcels of 380 CST fuel oil for lifting five to 15 days from the date of publication. Platts considers bids, offers and trades for volumes between 2,000 mt and up to a maximum of 7,000 mt, with values normalized to 5,000 mt where needed. Market participants should specify loading for a three-day date range at the time of submitting a bid or offer for publication. The outright assessment equals the sum of Ex-wharf Fujairah 380 CST Fuel Oil spot differentials (premium/discount) and the MOPAG 180 CST strip. Platts also publishes assessments for MOPAG 180 CST Fuel Oil derivatives for Balance Month, Month 1 and Month 2, at 4:30 pm and 5:30 pm Singapore time as well as a forward strip value for five-15 days at 5:30 pm Singapore time.

From August 1, 2017 Platts amended the timestamp for the Fujairah ex-wharf fuel oil assessments to 5:30 pm Singapore time or 01:30 pm Fujairah time, to more closely reflect peak trading activity.

Parcels may be delivered via inter-tank transfers where possible, or to the buyer's nominated vessel/barge from an onshore terminal or offshore vessel within the port limits of Fujairah. The buyer should nominate the barge/vessel between two to five working days in advance of the load date as per current industry practices at the various load terminals. The seller should notify the buyer of barge acceptance promptly and within a reasonable time. But the acceptance is subjected to terminal availability. Seller should supply material that is merchantable.

Floating Storage Units: Platts included the tanker Jubilee Star as an additional delivery point to its Market on Close assessment process for FOB Singapore fuel oil from July 3, 2017. Platts had earlier reviewed and approved the tankers Speranza, Energy Star, Amity Star and Fortune Star as additional delivery points to the FOB Singapore fuel oil assessment process in 2015. The standards applicable to approved floating storage units require that sellers specifically name the vessel used as delivery point at the time of providing an offer for publication in the Platts MOC assessment process. Any vessel accredited for the FOB Singapore fuel oil assessment process would be on a FOB FSU basis only, and cannot be nominated into a FOB Straits transaction reported during the MOC process except by mutual agreement between counterparties.

LSWR

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
LSWR FOB Indonesia Cargo	AAUGR00	AAUGR03			FOB	Indonesia	15-30 days	100,000	300,000	US\$	Barrels	6.6
LSWR FOB Indonesia Cargo vs FO 180 MOPS strip	AAWTX00	AAWTX03			FOB	Indonesia	15-30 days	100,000	300,000	US\$	Barrels	6.6
LSWR Mixed/Cracked FOB Indonesia Cargo	PPAPU00	PPAPU03			FOB	Indonesia	15-30 days	100,000	300,000	US\$	Barrels	6.8
LSWR Mixed/Cracked FOB Indonesia Cargo vs FO 180 CST MOPS strip \$/bbl	AAHXR00	AAHXS00			FOB	Indonesia	15-30 days	100,000	300,000	US\$	Barrels	6.8

LSWR

Platts assesses LSWR Mixed/Cracked and V-1250 (currently named simply “LSWR” in Platts publications) grades of Low Sulfur Waxy Residue, on an FOB Indonesia basis. Platts observes activity in the V-1250 market, and applies normalization procedures where necessary for assessment purposes. Platts is constantly monitoring liquidity in all existing and likely future grades of LSWR, and may amend the underlying specifications of its “LSWR” assessment to reflect prevailing market trends through time.

LSWR Mixed/Cracked: Liquidity in traditional LSWR Mixed/Cracked is very low, owing to refinery upgrades across the region, which have minimized production of LSWR other than V-1250 quality. As a result of low liquidity, Platts’ LSWR Mixed/Cracked assessment is established by applying a steady, quality-based premium to the tradable V-1250 grade of LSWR. Platts continues

to invite comment regarding the continuation of its LSWR Mixed/Cracked price assessment.

Liquidity in traditional LSWR Mixed/Cracked is very low, owing to refinery upgrades across the region which have minimized production of LSWR other than V-1250 quality. As a result of low liquidity, Platts’ LSWR Mixed/Cracked assessment is established by applying a steady, quality-based premium to the tradable V-1250 grade of LSWR. Platts continues to invite comment regarding the continuation of its LSWR Mixed/Cracked price assessment.

The mixed-cracked assessment reflects a maximum sulfur content of 0.2%; API gravity of 20.5-29.5; maximum pour point 120; and viscosity 36-150 CST maximum at 50 degrees Celsius.

LSWR: Platts launched a new assessment for a new, more prevalent grade of Indonesian Low Sulfur Waxy Residue on October 1, 2010, which at that time was V-500. The assessment is labelled simply as “LSWR.” From August 1, 2012, Platts amended the specifications of its FOB Indonesia Low Sulfur Waxy Residue assessment to reflect a higher viscosity grade of fuel known as V-1250, as announced June 27, 2012 and in line with previous announcements from Platts on the intended evolution of the assessment. The assessment continues to be labelled as LSWR, and reflects typical V-1250 specifications: maximum sulfur content of 0.35%, maximum viscosity of 321 CST at 140 degrees Fahrenheit, and maximum pour point of 130 degrees Fahrenheit. The new specification includes a higher density, at 0.95 kg/l, than the previous V-500 specification, at 0.93 kg/l.

Counterparties regularly bid, offer and trade LSWR on a differential basis against Mean of Platts Singapore 180 CST HSFO assessment around cargo loading dates. This is in line with trading practices for other residual fuel oil grades in Asia.

Market participants should specify a five-day loading date range in bids and offers provided for publication in the assessment process, although bids for a wider date range may be permitted owing to developments in loading programs, where the seller has the option to choose five days upon expression of interest to trade. At least 10 days prior to loading, the seller must declare the terminal, when no load port is stated at the point of sale. The buyer must nominate a vessel at least seven days prior to loading, at which time the buyer also narrows the loading window to three days, subject to terminal acceptance. In cases where the load terminal is stated at point of sale, the buyer must still nominate the vessel at least seven days prior to loading.

Platts uses a barrels to metric ton conversion rate of 6.8 for LSWR Mixed-Cracked, and 6.6 for LSWR. Quality tests show cargoes of mixed/cracked LSWR loading FOB Indonesia typically show an API gravity of 21.4, which derives a barrels/mt conversion factor of 6.8. Due to the change in density in LSWR, when Platts updated the specification to V-1250, Platts amended the published conversion rate between \$/barrel and \$/mt for LSWR from 6.8 to 6.6.

LSWR V-1250 TYPICAL SPECIFICATIONS

	Unit	Limit		Test method ASTM / IP / ISO
		Min	Max	
Specific Gravity at 60/60 deg F			0.95	D 1298
Kinematic Viscosity at 140 deg F CST			321	D 445
Viscosity Redwood at l/140 deg F second			1300	IP 70
Sulfur Content	% Wt		0.35	D 2622/1552/4294
Carbon Conradson Residue	% Wt		10	D 189/524
Water Content	% Vol		0.5	D 95
Ash Content	% Wt		0.1	D 482
Flash Point PMCC	deg F	160		D 93
Pour Point	deg F		130	D 97

BUNKER FUEL

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
Bunker FO 180 CST Dlvd Busan	PUAGP00	PUAGP03			Delivered	Busan	3-7 days	500	1500	US\$	Metric Tons	6.35
Bunker FO 180 CST Dlvd Colombo	PUAGR00	PUAGR03			Delivered	Colombo	3-7 days	500	1500	US\$	Metric Tons	6.35
Bunker FO 180 CST Dlvd Fujairah	PUAXQ00	PUAXQ03			Delivered	UAE	3-7 days	500	1500	US\$	Metric Tons	6.35
Bunker FO 180 CST Dlvd Hong Kong	PUACC00	PUACC03			Delivered	Hong Kong	3-7 days	300	1500	US\$	Metric Tons	6.35
Bunker FO 180 CST Dlvd Japan	PUACK00	PUACK03			Delivered	Japan	3-7 days	300	2500	US\$	Metric Tons	6.35
Bunker FO 180 CST Dlvd Khor Fakkan	PUACO00	PUACO03			Delivered	UAE	3-7 days	500	1500	US\$	Metric Tons	6.35
Bunker FO 180 CST Dlvd Kuwait	PUACP00	PUACP03			Delivered	Kuwait	3-7 days	500	1500	US\$	Metric Tons	6.35
Bunker FO 180 CST Dlvd Mumbai	AASSG00	AASSG03			Delivered	India	3-7 days	500	1500	US\$	Metric Tons	6.35
Bunker FO 180 CST Dlvd Shanghai	AARKC00	AARKC03			Delivered	China	3-7 days	300	2500	US\$	Metric Tons	6.35
Bunker FO 180 CST Dlvd Singapore	PUADW00	PUADW03			Delivered	Singapore	3-7 days	500	1500	US\$	Metric Tons	6.35
Bunker FO 180 CST Ex-Wharf Singapore	AAFET00	AAFEU00			Ex-Wharf	Singapore	3-15 days	1,000	6000	US\$	Metric Tons	6.35
Bunker FO 180 CST Dlvd South Korea	PUADT00	PUADT03			Delivered	South Korea	3-7 days	300	2500	US\$	Metric Tons	6.35
Bunker FO 180 CST Dlvd Sydney	PUAEA00	PUAEA03			Delivered	Australia	3-7 days	500	1500	US\$	Metric Tons	6.35
Bunker FO 180 CST Dlvd West Japan	AARJY00	AARJY03			Delivered	Japan	3-7 days	300	2500	US\$	Metric Tons	6.35
Bunker FO 380 CST Dlvd Busan	PUAGQ00	PUAGQ03			Delivered	Busan	3-7 days	500	1500	US\$	Metric Tons	6.35
Bunker FO 380 CST Dlvd Colombo	PUAGS00	PUAGS03			Delivered	Colombo	3-7 days	500	1500	US\$	Metric Tons	6.35
Bunker FO 380 CST Dlvd Fujairah	PUAXP00	PUAXP03			Delivered	UAE	3-7 days	500	1500	US\$	Metric Tons	6.35
Bunker FO 380 CST Dlvd Hong Kong	PUAER00	PUAER03			Delivered	Hong Kong	3-7 days	500	1500	US\$	Metric Tons	6.35
Bunker FO 380 CST Dlvd Japan	PUAEV00	PUAEV03			Delivered	Japan	3-7 days	300	2500	US\$	Metric Tons	6.35
Bunker FO 380 CST Dlvd Khor Fakkan	PUAEX00	PUAEX03			Delivered	UAE	3-7 days	500	1500	US\$	Metric Tons	6.35
Bunker FO 380 CST Dlvd Kuwait	PUAEY00	PUAEY03			Delivered	Kuwait	3-7 days	500	1500	US\$	Metric Tons	6.35
Bunker FO 380 CST Dlvd Melbourne	PUAWL00	PUAWL03			Delivered	Australia	3-7 days	500	1500	US\$	Metric Tons	6.35
Bunker FO 380 CST Dlvd Mumbai	AASSH00	AASSH03			Delivered	India	3-7 days	500	1500	US\$	Metric Tons	6.35
Bunker FO 380 CST Dlvd Shanghai	AARKD00	AARKD03			Delivered	China	3-7 days	500	2500	US\$	Metric Tons	6.35
Bunker FO 380 CST Dlvd Singapore	PUAFT00	PUAFT03			Delivered	Singapore	3-7 days	500	1500	US\$	Metric Tons	6.35
Bunker FO 380 CST Ex-Wharf Singapore	AAFER00	AAFES00			Ex-Wharf	Singapore	3-15 days	1,000	6000	US\$	Metric Tons	6.35
Bunker FO 380 CST Dlvd South Korea	PUAFR00	PUAFR03			Delivered	South Korea	3-7 days	300	2500	US\$	Metric Tons	6.35
Bunker FO 380 CST Dlvd West Japan	AARJZ00	AARJZ03			Delivered	Japan	3-7 days	300	2500	US\$	Metric Tons	6.35
Bunker FO 500 CST Dlvd Singapore	AAVU000	AAVU003			Delivered	Singapore	3-7 days	500	1500	US\$	Metric Tons	6.23
Bunker FO 500 CST Ex-Wharf Singapore	AAVUP00	AAVUP03			Ex-Wharf	Singapore	3-15 days	1,000	6000	US\$	Metric Tons	6.23
Marine Diesel Dlvd Japan	POACI00	POACI03			Delivered	Japan	3-7 days	50		US\$	Metric Tons	7.45
Marine Diesel Dlvd West Japan	AARKA00	AARKA03			Delivered	Japan	3-7 days	50		US\$	Metric Tons	7.45
Marine Gasoil Dlvd Busan	AARKJ00	AARKJ03			Delivered	Busan	3-7 days	50		US\$	Metric Tons	7.45
Marine Gasoil Dlvd Colombo	AARKK00	AARKK03			Delivered	Colombo	3-7 days	50		US\$	Metric Tons	7.45
Marine Gasoil Dlvd Fujairah	AARKH00	AARKH03			Delivered	UAE	3-7 days	50		US\$	Metric Tons	7.45
Marine Gasoil Dlvd HongKong	AATXL00	AATXL03			Delivered	Hong Kong	3-7 days	50		US\$	Metric Tons	7.45
Marine Gasoil Dlvd Khor Fakkan	AARKI00	AARKI03			Delivered	UAE	3-7 days	50		US\$	Metric Tons	7.45
Marine Gasoil Dlvd Kuwait	AAXCV00	AAXCV03			Delivered	Kuwait	3-7 days	50		US\$	Metric Tons	7.45
Marine Gasoil Dlvd Melbourne	AARKG00	AARKG03			Delivered	Australia	3-7 days	50		US\$	Metric Tons	7.45
Marine Gasoil Dlvd Mumbai	AASSI00	AASSI03			Delivered	India	3-7 days	50		US\$	Metric Tons	7.45
Marine Gasoil Dlvd Shanghai	AARKE00	AARKE03			Delivered	China	3-7 days	50		US\$	Metric Tons	7.45

BUNKER FUEL

Assessment	CODE	Mavg	Pavg	Wavg	CONTRACT BASIS	LOCATION	DELIVERY PERIOD	MIN SIZE	MAX SIZE	CURRENCY	UOM	CONV
Marine Gasoil Dlvd Singapore	AALMZ00	AALNA00			Delivered	Singapore	3-7 days	50		US\$	Metric Tons	7.45
Marine Gasoil Dlvd SouthKorea	AAVBN00	AAVBN03			Delivered	South Korea	3-7 days	50		US\$	Metric Tons	7.45
Marine Gasoil Dlvd Sydney	AARKF00	AARKF03			Delivered	Australia	3-7 days	50		US\$	Metric Tons	7.45
MFO-180 Hualien/Suao Dlvd Spot CPC Taiwan	CB1AM00				Delivered	Taiwan				US\$	Metric Tons	
MFO-180 Kaohsiung Dlvd Spot CPC Taiwan	CB1AP00				Delivered	Taiwan				US\$	Metric Tons	
MFO-180 Keelung Dlvd Spot CPC Taiwan	CB1AN00				Delivered	Taiwan				US\$	Metric Tons	
MFO-180 Taichung Dlvd Spot CPC Taiwan	CB1AQ00				Delivered	Taiwan				US\$	Metric Tons	
MFO-380 Hualien/Suao Dlvd Spot CPC Taiwan	CB3AL00				Delivered	Taiwan				US\$	Metric Tons	
MFO-380 Kaohsiung Dlvd Spot CPC Taiwan	CB3AN00				Delivered	Taiwan				US\$	Metric Tons	
MFO-380 Keelung Dlvd Spot CPC Taiwan	CB3AM00				Delivered	Taiwan				US\$	Metric Tons	
MFO-380 Taichung Dlvd Spot CPC Taiwan	CB3AP00				Delivered	Taiwan				US\$	Metric Tons	
MFO-80 Hualien/Suao Dlvd Spot CPC Taiwan	CB8BC00				Delivered	Taiwan				US\$	Metric Tons	
MFO-80 Kaohsiung Dlvd Spot CPC Taiwan	CB8BE00				Delivered	Taiwan				US\$	Metric Tons	
MFO-80 Keelung Dlvd Spot CPC Taiwan	CB8BD00				Delivered	Taiwan				US\$	Metric Tons	
MFO-80 Taichung Dlvd Spot CPC Taiwan	CB8BF00				Delivered	Taiwan				US\$	Metric Tons	
Marine Diesel Hualien/Suao Dlvd Spot CPC Taiwan	CBDAC00				Delivered	Taiwan				US\$	Metric Tons	
Marine Diesel Kaohsiung Dlvd Spot CPC Taiwan	CBDAE00				Delivered	Taiwan				US\$	Metric Tons	
Marine Diesel Keelung Dlvd Spot CPC Taiwan	CBDAD00				Delivered	Taiwan				US\$	Metric Tons	
Marine Diesel Taichung Dlvd Spot CPC Taiwan	CBDAF00				Delivered	Taiwan				US\$	Metric Tons	
Marine Gasoil Hualien/Suao Dlvd Spot CPC Taiwan	CBGAM00				Delivered	Taiwan				US\$	Metric Tons	
Marine Gasoil Kaohsiung Dlvd Spot CPC Taiwan	CBGAP00				Delivered	Taiwan				US\$	Metric Tons	
Marine Gasoil Keelung Dlvd Spot CPC Taiwan	CBGAN00				Delivered	Taiwan				US\$	Metric Tons	
Marine Gasoil Taichung Dlvd Spot CPC Taiwan	CBGAQ00				Delivered	Taiwan				US\$	Metric Tons	
Low Sulfur Marine Gasoil Dlvd Fujairah	AAXYP00				Delivered	Fujairah	3-7 days	50		US\$	Metric Tons	
Low Sulfur Marine Gasoil Dlvd Hong Kong	AAXYQ00				Delivered	Hong Kong	3-7 days	50		US\$	Metric Tons	
Low Sulfur Marine Gasoil Dlvd Shanghai	AAXYR00				Delivered	Shanghai	3-7 days	50		US\$	Metric Tons	
Low Sulfur Marine Gasoil Dlvd Singapore	AAXY000				Delivered	Singapore	3-7 days	50		US\$	Metric Tons	
Low Sulfur Marine Gasoil Dlvd South Korea	AAXYS00				Delivered	South Korea	3-7 days	50		US\$	Metric Tons	
Low Sulfur Marine Diesel Oil Dlvd Tokyo Bay	AAXYT00				Delivered	Tokyo Bay	3-7 days	50		US\$	Metric Tons	
Low Sulfur Marine Diesel Oil Dlvd West Japan	AAXYU00				Delivered	West Japan	3-7 days	50		US\$	Metric Tons	

Platts netback methodology in Asia and the Middle East (2018 rates)

The following document contains the methodology for product netbacks and netforwards used in Asia-Pacific.

Please note that the flat rates are changed once a year on the first working day of the new year and are applicable till the last working day of the year.

Platts publishes freight spot assessments for dirty and clean tankers. The freight assessments are published primarily as percentages against a Worldscale (WS) rate.

In the following examples, the base rate is multiplied against the spot market multiplier to obtain the actual freight cost. For example, a Worldscale rate of 200 implies a freight rate that is twice the base rate.

This document outlines Platts' freight methodology for gasoline, naphtha, fuel oil, gasoil/jet kero and Australian netback assessments.

Gasoline freight methodology

Singapore to Jebel Ali at 10.93

(Quoin Island to Singapore + Jebel Ali to Quoin Island)

FOB AG 95 RON:

Jebel Ali to Quoin Is	= 0.71
Quoin Is to Singapore	= 9.13
Jebel Ali port charges	= 1.09
	— —
TOTAL	= 10.93
	— —

Formula: Freight = Spot WS x 10.93/ 8.5

TO CONVERT BETWEEN METRIC TONS AND BARRELS use 8.5.

Naphtha freight methodology

1. Singapore netback

Freight rate methodology for Singapore to Japan:

Base rate from Singapore to Chiba, Japan equals \$9.34/mt

Formula: Freight = Spot WS x 30 / 26.25 x 9.34

2. Arab Gulf netback

Quoin Island to Chiba/Yokohama base rate equals \$17.83/mt

Jubail/Mina Al Ahmadi to Quoin Island	2.06 + 0.27 = 2.33
Shuaiba/Ras Tanura to Quoin Island	2.03+0.27= 2.30
Ruwais/Mina Abdulla to Quoin Island	2.41
	— — — — —
	7.04 / 3 = 2.35

AG to Chiba = Base rate Quoin Island to Chiba/Yokohama 17.83

plus average of 6 ports to Quoin Island 2.35

Total: \$20.18/mt

Formula: Freight = Spot WS x 55 / 52.50 x 20.18

For Naphtha LR2 netback:

Spot 75,000 mt: Freight = Spot WS x 20.18

Fuel Oil freight methodology

1. Japan netback

Singapore to Chiba/Yokohama, Japan: The freight rate is \$9.07/mt. This amount is multiplied by the Worldscale rate between Singapore and Japan. The amount is then added to the Singapore fuel oil assessment.

Formula: Freight = Spot WS x 10.40

2. Arab Gulf netback

Quoin Island to Singapore: \$9.13/mt plus \$1.70/mt for the additional expense to the loading port (In this case, Mina al Ahmadi is used as a typical port). This yields a net freight cost of \$10.83/mt. This amount of \$/mt should be used for the AG freight netback calculation.

Formula: Freight = Spot WS x 10.83

Gasoil/Jet/Kerosene freight methodology

Singapore - Arab Gulf netback calculations:

Quoin Island to Singapore base rate: \$9.13/mt

Jubail to Quoin Island base rate (+port charges)	1.05+ 0.27 = 1.32
Bahrain to Quoin Island base rate:	1.42
Ras Tanura to Quoin Island base rate:	0.96+0.27=1.23
Mina al-Ahmadi to Quoin Island base rate:	1.7
	—————
	5.67/ 4 = 1.42

AG to Singapore = Base rate Quoin Island to Singapore 9.13

Plus average of four-port discharge 1.42

Total: \$10.55/mt

Formula: Freight = Spot WS x10.55

For Gasoil LR2 netback:

Formula: Freight = Spot 75,000 mt WS x10.55

The final calculation is divided by 7.45 for gasoil and 7.9 for jet kero to convert \$/mt into \$/b.

Australian netback assessments

Base freight rate from Singapore to Melbourne/Sydney, Australia is \$15.27/mt.

To obtain the actual freight Platts will determine the spot rate from Singapore to Australia times 15.27 and then the result will be divided by the conversion rate to convert \$/mt into \$/b.

1) C+F Australian Mogas:

Freight = Spot WS x 15.27 / 8.5

2) C+F Australia Gasoil:

Freight = Spot WS x 15.27 / 7.45

3) C+F Australia Jet:

Freight = Spot WS x 15.27 / 7.9

REVISION HISTORY

March 2018: Platts updated the guide to remove reference to FSU Jade Palms as Platts no longer reflects deliveries from the tanker in its FOB Singapore fuel oil assessments effective Feb 21, 2018. Platts also added new gasoil 10 ppm additives to the list of approved additives. Platts removed references to certain Taiwanese and Saudi Arabian posted bunker prices whose publication was discontinued March 1, 2018. CFR South Korea naphtha specifications were updated to reflect changes effective Oct 2, 2017 that raised the minimum paraffin level to 70% from the earlier 65%. Platts also removed guidance on bunkers from the guide as it has been moved to the Global Bunkers Guide.

January 2018: Platts updated this guide to reflect changes in the sulfur specification reflected in its Singapore, Arab Gulf, Korea and China gasoil assessments to a maximum of 10 ppm, effective January 2, 2018. Platts updated the 2018 freight netback calculations for all products. Platts also added reference to SCP Banyan facility's inclusion in the FOB Straits MOC process for gasoil and jet/kero assessments from November 1, 2017. Platts updated the list of additives reflected in 10ppm assessments to reflect two Baker Hughes additives. The update also removes reference to Hong Kong marine gasoil delivered bunker assessments that were discontinued November 1, 2017.

October 2017: Platts completed an annual update to the Asia & Middle East Refined Oil Products Guide in September 2017: Platts updated the guide to added methodology descriptions for new delivered LSMGO and LSMDO assessments launched at Asian ports starting June 1, 2017. Platts updated the base freight rates for its Middle East product netback assessments to reflect a flat rate change for AG-Singapore naphtha and gasoil product routes. These updated rates were effective for netbacks published from May 3, 2017 onwards. The revision also added Platts decision to begin publishing offers of oil products from PT Oiltanking Karimun Terminal in Indonesia from July 3, 2017, and made edits for style and increased brevity to the FOB Straits

section of this guide. Platts added a new gasoil 10 ppm additive to the list of approved additives. Platts added methodology descriptions for new MOPAG 92 RON cash differentials assessments launched on August 1, 2017. Platts clarified the maximum cargo size reflected in bids and offers for gasoline. Platts also updated the gasoline specifications reflected in its 92 RON and 95 RON cargoes loading in the Middle East. The update also reflects change in timestamp for Fujairah ex-wharf fuel oil assessments. Further, the update adds Jubilee Star to the list of approved FSUs reflected as additional delivery points in the Platts FOB Singapore fuel oil assessments. The update also reflects change to the CFR Japan naphtha and CFR South Korea naphtha specification. Platts updated jet fuel references to reflect Defence Standard 91-091 as defined by the UK Ministry of Defence and the Joint Fueling System Checklist, following an update to the numbering system used by UK Ministry of Defence and the Joint Fueling System Checklist.

March 2017: Platts updated this guide to add the newly launched FOB Fujairah 380 CST Fuel Oil ex-wharf assessment, and the discontinuation of Taiwan CPC's posted term prices for bunker fuels and publication of daily spot bunker prices by CPC. Platts also updated the unit of measurement for MOPS Strip naphtha from metric tons to barrels. Platts also updated the size of vessel for under its Middle East gasoline assessments from 30,000 mt to 35,000 mt.

January 2017: Platts added a new gasoil 10 ppm additive to the list of approved additives - Infineum R567K. Platts also updated the base freight rates for its Asian and Middle East product netback assessments to reflect published 2017 rates.

October 2016: Platts completed an annual update to the Asia & Middle East Refined Oil Products Guide in October 2016: Platts updated the guide to added methodology descriptions for new assessments launched on October 3, 2016, reflecting independent outright values for gasoline, jet fuel, gasoil and fuel oil on a FOB Fujairah basis. Platts also added explanations for related MOPAG derivatives and MOPAG strips for these products.

Platts updated the Worldscale flat basis rate used to calculate FOB Arab Gulf assessments for gasoil and jet/kerosene, following an announcement from the Worldscale Association on a Bahrain port tariffs increase. Platts updated the grade to add previously published clarifications that fuel oil delivered through the MOC assessment process should not include ULO. The guide was also updated to include FSUs that were approved as additional delivery points for fuel oil cargoes, and new bunker assessments for delivered bunker fuel at Busan, India and Sri Lanka. Platts added one new gasoil 10 ppm additive to the list of approved additives. Platts updated the gasoline specification to reflect Reid Vapor Pressure specification to a maximum of 9.5 PSI, from the current 10 PSI. Platts reduced the maximum benzene content from 5% currently to 2.5% volume and moved all three gasoline grades down to a maximum of 350 parts per million (0.035%), from 500 ppm (0.05%) previously. Platts also discontinued the assessments of FOB Singapore spot naphtha (under the code AAOVE00), FOB Singapore naphtha premium (under the code PAADC00), Monthly Average FOB Singapore spot naphtha (under the code AAOVE03) and Monthly average FOB Singapore naphtha premium (under the code AAFDE00).

March 2016: Platts updated a typographical error on naphtha Arab Gulf netback calculation. Platts also added four new gasoil 10 ppm additives to the list of approved additives.

January 2016: Platts updated this guide to incorporate the 2016 freight netback calculations for all products, as well as an updated list of floating storage units reflected in its FOB Singapore fuel oil assessment process.

December 2015: Platts updated this guide to incorporate new CFR Singapore naphtha assessments, which included a specification table contained in this methodology guide. Platts also added new additives to the Platts approved gasoil additives list. Platts updated this guide to reflect approval of gasoil loadings from Power Seraya for inclusion in the FOB Straits. Platts completed reviews to include the Speranza and Jade Palms tankers as additional delivery points in its FOB

Singapore fuel oil assessment process, Platts confirmed it would include the FSUs in its Market on Close assessment process with effect from September 25, 2015. Platts also updated its description of its MOC trade review process.

July 2015: Platts completed an annual update to the Asia & Middle East Refined Oil Products Guide in July 2015. In this update, Platts reviewed all content. Platts updated guidance around how to report information and expectations for contactability. Platts also consolidated guidance regarding review of reported trades. In the specifications section of the guide, Platts updated this guide to reflect changes to its Singapore assessments for gasoline, jet fuel, gasoil and fuel oil through the FOB Straits price discovery process. Platts also updated the description of CFR Japan LPG and naphtha assessment cycles. Platts clarified its description of Aframax vessels in its fuel oil assessments. Platts clarified the language around post-deal tracking and “gapping.” Platts also made minor typographical edits throughout.

May 2015: Platts updated this guide to reflect changes to Middle East premium assessments, the launch of Gasoil 10 ppm Middle East assessments, clarification around additives in Gasoil 10 ppm assessments and clarification around the Taiwan CPC posted bunker prices. This methodology guide was also updated to include further description of Platts’ processes and practices in survey assessment environments. The guide was also updated to reflect changes to the Worldscale flat basis rate used to calculate FOB Arab Gulf assessments. Platts also made minor edits throughout.

December 2014: Platts updated this guide to incorporate changes to nomination procedures for terminals for FOB Singapore trades reflected in the MOC process. Platts also

amended an error in the listing of volumes reflected by Singapore ex-wharf assessments. Platts updated the guide to include guidelines around trade of non-competitive bids and offers. And Platts updated the base freight rates for its Asian netback assessments to reflect published 2015 Worldscale rates.

November 2014: Platts updated this guide to incorporate standards for compensation expectations for late performance. Similar guidance had been present in methodologies published before August 2013.

September 2014: Platts updated this guide to reflect the discontinuation of spot premiums for second month loading for butane and propane FOB Middle East, and to reflect the amendment of the C+F Japan gasoil assessment to a specification of maximum 10 ppm sulfur. Platts removed an erroneous reference to a Singapore ex-wharf marine gasoil, which Platts does not assess.

June 2014: Platts completed an annual update to the Asia & Middle East Refined Oil Products Guide in June 2014. In this update, Platts reviewed all content. The guide was updated to rename “Asia Proxy” as “Asia Strip” for LPG strip values; further clarify and differentiate Singapore’s naphtha netback and spot naphtha assessment; incorporate published guidance around contaminants and FAME in Singapore gasoil assessments; break out definitions for gasoil assessments and netbacks in the Middle East; remove references to previously discontinued fuel oil assessments for China; indicate discontinued fuel oil assessments for South Korea and Japan; remove a reference to discontinued bunker fuel postings from Chimbusco; and remove a reference to Pasir Gudang in the bunker fuel assessment section. Platts consolidated guidelines around publishing information during the MOC assessment process into the

MOC Data Publishing Principles section, and incorporated clarification guidance about how to express interest in bids and offers that were published in January 2014 and May 2014. Platts also made minor typographical edits throughout.

January 2014: Platts updated this guide to note changes to its bunker fuel assessment publication schedule; add 500CST bunker fuel specifications; note changes to Singapore gasoline specifications for distillation and density; changes to its Singapore 2% sulfur fuel oil assessment methodology; discontinuation of China fuel oil assessments; and the 2014 freight netback calculations for all products.

December 2013: Platts updated the units of measurement reflected for West India and the Middle East in the gasoline assessment definitions table contained in this methodology guide.

November 2013: Platts updated this guide, making minor edits through the text. Platts also noted plans to update its methodology for 2% sulfur fuel oil in Singapore with effect from January 2014. Platts also noted plans to discontinue all China fuel oil assessments from January 2014. This update also notes a planned change to specifications reflected in Platts Singapore gasoline assessments from January 2014.

August 2013: Platts revamped all Oil Methodology And Specifications Guides, including its Asia Pacific & Middle East Refined Oil Products guide, in August 2013. This revamp was completed to enhance the clarity and usefulness of all guides, and to introduce greater consistency of layout and structure across all published methodology guides. Methodologies for market coverage were not changed through this revamp, unless specifically noted in the methodology guide itself.