



Crude/Condensate Assessment Methodology

Updated Aug 1, 2019

1. In the section of (Physical Crude/Condensate), rename CFR Shandong as DES Shandong

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Relevance of Rim Assessment Methodology

The purpose of all price assessments in reports issued by Rim Intelligence is to provide an indication to energy market players as to the levels at which transactions can take place so that trades can be done with high transparency and at reasonable prices. To achieve this purpose, we have set up “General Procedures for Price Assessment” as follows, and “Price Assessment Methodology” for each report. Detailed in the “General Procedures for Price Assessment” and “Price Assessment Methodology” for each report are processes and standards that we deem are necessary to achieve the above purpose. By following these processes and standards in making price assessments, we consider our Assessment Methodology to be appropriate.

Chapter 1: General Procedures for Price Assessment

Article 1: Purpose of price assessment

The purpose of all price assessments in our reports is to provide an indication to energy market players as to the levels at which transactions can take place so that trades can be done with high transparency and at reasonable prices.

Article 2: Conducting price assessment

To achieve the purpose outlined in Article 1, we have set up the following guidelines in our “General Procedures for Price Assessment”, and “Price Assessment Methodology” for each report. We follow these guidelines in making price assessments.

- Trades considered for price assessment
- Assessment window
- Priority in price assessment
- Selection of players providing market information
- Method of information gathering
- Establishment and role of supervisors
- Selection of supervisors
- Maintaining quality of review by supervisors
- Maintaining consistency in price assessment
- Reliability and adequacy of market information
- Making Assessment Methodology available
- Regular reviews of Assessment Methodology
- Amendments to Assessment Methodology
- Changes/Amendments to price assessment
- Quantity
- Reasons for using specific units for quantity (barrel etc.)

Article 3: Trades considered for price assessment

For each price index, our price assessment is based on quantities, delivery period and areas with the most liquidity. Further, details such as the value and quantity on which the assessment is based, market information which is used as a reference, and other platforms such as the Rim Trading Board and specific markets including trades carried out in Exchanges are included in the methodology of each report.

Article 4: Assessment window

For each price index, the time window considered appropriate for our price assessment is that which is deemed to be the most convenient and effective during trading hours in Asia, including Japan.

Article 5: Priority in price assessment

For each price index, among traded prices in transactions that take place between agreed parties or in other markets, bids and offers, the priority as to which price is considered first for assessment is determined and details are given in the methodology of each report.

Article 6: Selection of players providing market information

When selecting players to obtain information from, we take into account the quantity handled and the amount of influence on the market, without any bias towards buyers or sellers. We gather market information from many players including Majors, oil and gas producers, oil companies, traders, dealers and end-users. Each report team determines that there is no bias in the players it obtains information from in terms of area and the type of information they have. Should the player be deemed biased, the reporter and team leader may, after obtaining approval from the president, remove him from the list of players providing market information.

Article 7: Method of information gathering

Our reporters possess suitable quality and skill from a fair and neutral standpoint. Reporters carry out information gathering mainly by telephone but also by email and chat. To ensure the credibility of the player from whom information is gathered, the reporter will call the player's company directly to confirm that the player is indeed working for that company.

Article 8: Establishment and role of supervisor

Two or more supervisors are assigned to each report. Before each report is issued, at least one of the supervisors checks if the price assessment and its basis are in line with the Assessment Methodology and to ensure that consistency is maintained.

Article 9: Selection of supervisors

The supervisor has knowledge and experience in the product and market for which price assessment is conducted. The selection of supervisors requires approval from the board of directors. The supervisor is not involved in price assessment and writing of commentary for the report of which he is in charge.

Article 10: Maintaining quality of review by supervisors

For reports for which the supervisor is not the president, the president conducts regular spot checks to maintained the quality of the supervisor's review. After a spot check, a proof of the spot check will be kept.

Article 11: Maintaining consistency in price assessment

Besides reviews by supervisors, assessment simulation is conducted regularly to maintain consistency among reporters in price assessment.

Article 12: Reliability and adequacy of market information

Each reporter performing price assessment determines whether a trade was done by the parties involved and whether the information was suspicious or unusual by checking with the relevant parties and other multiple parties, with further investigation carried out if necessary. If unusual market information regarding a trade by parties involved or suspicious information is found, additional information gathering will be carried out before making a judgment as to whether or not to remove the information for consideration for price assessment. Major issues are to be reported promptly to the supervisor and the president. Of these, important professional judgments will be recorded in each report team's information gathering memo, assessment process sheet etc. If it is necessary to

check whether the information provided is suspicious, we may consider obtaining information from the back office.

For certain markets with low liquidity, market information for price assessment may be obtained from a single source. Even in such a situation, we follow processes detailed in our Assessment Methodology to determine if such market information can be used for price assessment. We do not disregard the information in making price assessment merely because it is obtained from a single source.

Players giving market information are expected to provide all relevant information that meets the conditions for price assessment stated in our Assessment Methodology, which is published on our website.

Article 13: Making our Assessment Methodology available

The Assessment Methodology approved by two or more members of the board of directors is published on our website, whereby external market players involved in trading, players providing market information and our subscribers can access.

Article 14: Regular reviews of Assessment Methodology

Our Assessment Methodology is reviewed at least once a year (during the board of directors' meeting held in October) or when substantial changes have taken place in the market. After each review, we may consider making amendments to our Assessment Methodology if deemed necessary. When reviewing our Assessment Methodology, we may consider views obtained from external market players and our subscribers.

Article 15: Amendments to Assessment Methodology

If amendments to our Assessment Methodology that affect the price assessment process are deemed necessary, discussions are conducted within each report team and amendments are submitted to two or more members of the board of directors for approval. After the amendments are approved by two or more members of the board of directors, a notice of the amendments and the effective date will be placed in our reports in principle one month before, but at least two weeks prior to the effective date.

After the amendments are approved by two or more members of the board of directors, the Assessment Methodology with the amendments reflected has to be approved by two or more members of the board of directors by the effective date.

When making amendments to our Assessment Methodology that affect the price assessment process, we accept inquiries regarding such amendments from external market players and our subscribers. These inquiries are, in principle, published in our reports or on our website, but if the party making the inquiries requests us not to do so, we may not disclose the details for confidentiality reasons.

For amendments to our Assessment Methodology that do not affect the price assessment process, after approval by two or more members of the board of directors, the amendments will be announced in our reports and effected promptly.

Article 16: Changes/Amendments to price assessment

Price assessments in our reports will not be amended after they are published, except for typing and spelling mistakes.

Chapter 2: Price Assessment Methodology for Crude/Condensate Report

Purpose of price assessment:

The purpose of price assessment is to reflect the actual market in which standard spot buying and selling take place on the day of publication.

Definition of price:

Even if no transactions take place, the value of a commodity may change. The price reflects the changing values of a commodity. The value of a commodity may change depending on supply/demand, production costs, the situation in other markets, and players' perspectives.

Assessment method:

Price assessment basically takes into account information on deals done, bids/offers and supply/demand situation obtained on the day of publication. Top priority is given to the latest deals done and bid/offer levels within the assessment window. In the absence of deals, bids and offers, buying and selling indications are used as a reference.

Values of commodities are determined by competition among sellers and buyers. Higher bids to be closer to market values than lower bids, and lower offers are considered to be closer to market values than higher offers.

Standard conditions such as cargo volume, loading or delivery period, quality and payment period are taken into account in price assessment.

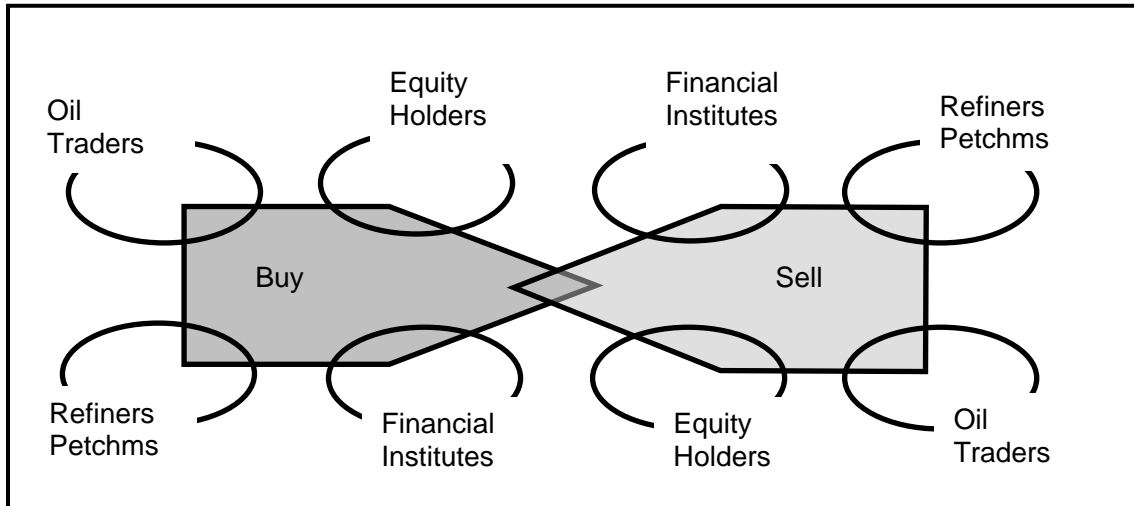
All price units for crude/condensate are in US dollar per barrel (\$/bbl). The oil industry typically trades by using the \$/bbl unit, and Rim follows this convention.

Tokyo Spot Crude/Condensate Assessments

<Cash/Paper Crude>

Rim assesses values of Cash WTI, Cash *BFO, JPN DTD, Cash Dubai and the following swaps contracts: Dubai, DME/Dubai, Murban OSP Swaps, JPN DTD/Dubai and Singapore Crack Margins, as of 15:30 Tokyo time. All prices are assessed based on information gathered through market research by Rim reporters each business day.

Structure of the Cash Crude (Futures/Forward) Markets



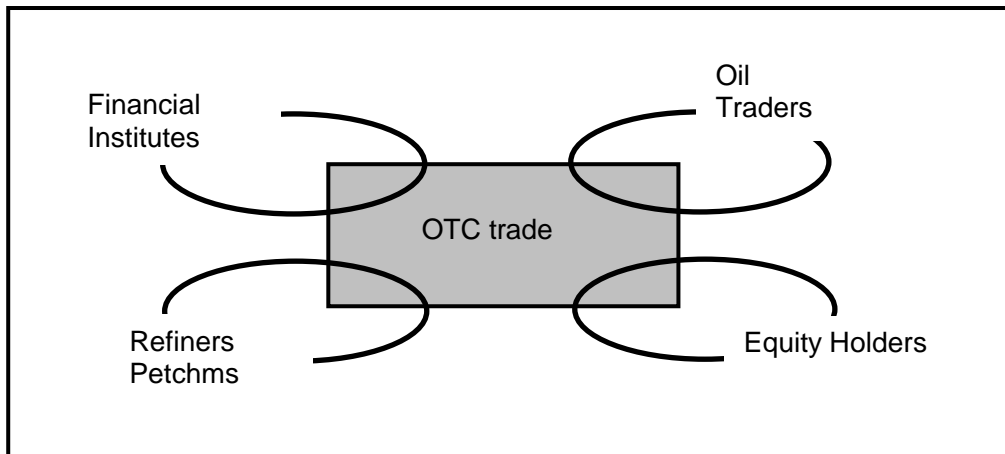
Rim understands that Cash Crude markets are structured with four groups of business parties: Oil Traders, Oil Refiners/Petrochemical firms, Financial Institutes and Equity Holders. A transaction takes place as buying interest and selling interest match with each other.

Rim defines the four Cash Crude market business parties as follows:

Oil Trader	A company that trades physical crude/condensate as its main trading item and derivative products based on crude values as a hedging tool against risks associated with its trading of physical crude/condensate.
Oil Refiner/ Petrochemical Firm	A company that buys physical crude/condensate as feed stocks to run its refining facilities and trades derivative products based on crude values as a hedging tool against risks associated with its purchases of physical crude/condensate. A Petrochemical Firm mainly buys condensate for use at its condensate splitters, but sometimes resells condensate.
Financial Institute	A company that trades derivative products based on crude values as one of its trading items. A Financial Institute that trades derivative products based on crude values typically holds positions in physical crude/condensate markets as well.

Equity Holder	A company that holds equity in oil and gas fields from which it produces and/or sells physical crude/condensate into the international market and trades derivative products based on crude values as a hedging tool against risks associated with sales of physical crude/condensate.
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Structure of the Paper Crude Market



Rim understands that the Paper Crude market is structured with four groups of business parties: Financial Institutes, Oil Traders, Oil Refiners/Petrochemical firms and Equity Holders. Rim assesses values of Paper Crude at which a standard transaction could take place through “over-the-counter” method of trade.

Rim defines the four business parties in the Paper Crude market as follows:

Oil Trader	A company that trades physical crude/condensate as its main trading item and derivative products based on crude values as a hedging tool against risks associated with its trading of physical crude/condensate.
Oil Refiner/ Petrochemical Firm	A company that buys physical crude/condensate as feed stocks to run its refining facilities and trades derivative products based on crude values as a hedging tool against risks associated with its purchases of physical crude/condensate. A Petrochemical Firm mainly buys condensate for use at its condensate splitters, but sometimes resells condensate.
Financial Institute	A company that trades derivative products based on crude values as one of its trading items. A Financial Institute that trades derivative products based on crude values typically holds positions in physical crude/condensate markets as well.
Equity Holder	A company that holds equity in oil and gas fields from which it produces and/or sells physical crude/condensate into the international market and trades derivative products based on crude values as a hedging tool against risks associated with sales of physical crude/condensate.

<Cash Crude>

•WTI

*WTI refers to the crude grade delivered at Cushing, Oklahoma in US.

Assessment Timing	Rim's assessment for WTI settles at 15:30 Tokyo time on the day of publication.
Price Unit and structure	All prices are in \$/bbl on FOB.
Time Window	During the period from the first day to the 25th of the month, the front-month refers to the following month and contracts for five months including the front-month are to be assessed. During the period from the 26th to the last day of the month, the front-month shifts to a month after the following month and contracts for four months including the front-month are to be assessed.
Standard Size	All prices are for cargoes of 500,000bbl. Values for contracts for smaller or larger volumes may also be considered.

•BFO

*BFO refers to the three crude grades, Brent, Forties and Oseberg.

Assessment Timing	Rim's assessment for BFO settles at 15:30 Tokyo time on the day of publication.
Price Unit and structure	All prices are in \$/bbl on FOB.
Time Window	The front-month refers to the front-month for Brent futures traded on the Intercontinental Exchange and contracts for four months including the front-month are to be assessed. The front-month shifts to the following month in line with the contract expiry for ICE Brent.
Standard Size	All prices are for cargoes of 500,000bbl. Values for contracts for smaller or larger volumes may also be considered.

•JPN DTD

*JPN DTD refers to Dated Brent as of 15:30 Tokyo time, which is derived from ICE Brent futures.

Assessment Timing	Rim's assessment for JPN DTD settles at 15:30 Tokyo time on the day of publication.
Price Unit	All prices are in \$/bbl.
Time Window	The front-month refers to the prior month of the front-month for Brent futures traded on the Intercontinental Exchange and contracts for five months including the front-month are to be assessed. The front-month shifts to the following month in line with the contract expiry for ICE Brent.
Standard Size	All prices are for cargoes of 500,000bbl. Values for contracts for smaller or larger volumes may also be considered.

•Dubai

*Dubai refers to Dubai traded in the physical market.

Assessment Timing	Rim's assessment for Dubai settles at 15:30 Tokyo time on the day of publication.
Price Unit and structure	All prices are in \$/bbl on FOB.

Time Window	The front-month refers to a month after the following month of the day of publication and contracts for four months including the front-month are to be assessed.
Standard Size	All prices are for cargoes of 500,000bbl. Values for contracts for smaller or larger volumes may also be considered.

<Paper Crude>

• Dubai Swaps

*Dubai Swaps refers to swap prices traded in association of Dubai.

When prevailing prices for Dubai lack in the market, reporters may use related indications such as the Exchange of Futures for Swaps (EFS) for WTI and Brent and the EFS values for Brent and Dubai to assess the swaps values.

Assessment Timing	Rim's assessment for Dubai Swaps settles at 15:30 Tokyo time on the day of publication.
Price Unit	All prices are in \$/bbl.
Time Window	The front-month refers to the current month of the day of publication. The front-month shifts to the following month on the first business day of the month. Contracts for five months including the front-month are to be assessed.
Standard Size	All prices are for contracts of 50,000-200,000bbl. Values for contracts for smaller or larger volumes may also be considered.

• DME/Dubai

*DME/Dubai refers to the price spread between DME Oman Swaps and Dubai Swaps.

Assessment Timing	Rim's assessment for DME/Dubai settles at 15:30 Tokyo time on the day of publication.
Price Unit	All prices are in \$/bbl.
Time Window	The front-month refers to the current month of the day of publication. The front-month shifts to the following month on the first business day of the month. Contracts for five months including the front-month are to be assessed.
Standard Size	All prices are for contracts of 25,000-500,000bbl. Values for contracts for smaller or larger volumes may also be considered.

• Murban OSP Swaps

*Murban OSP Swaps refers to the price spread between Dubai Swaps values and the monthly official selling price for Murban.

Assessment Timing	Rim's assessment for Murban OSP Swaps settles at 15:30 Tokyo time on the day of publication.
Price Unit	All prices are in \$/bbl.
Time Window	The front-month refers to the current month of the day of publication. The front-month shifts to the following month on the first business day of the month. Contracts for three months including the front-month are to be assessed.

Standard Size	All prices are for contracts of 25,000-500,000bbl. Values for contracts for smaller or larger volumes may also be considered.
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•JPN DTD/Dubai

*JPN DTD/Dubai refers to the price spread between JPN DTD and Dubai Swaps.

Assessment Timing	Rim's assessment for JPN DTD/Dubai settles at 15:30 Tokyo time on the day of publication.
Price Unit	All prices are in \$/bbl.
Time Window	The front-month refers to the prior month of the front-month for Brent futures traded on the Intercontinental Exchange. Contracts for four months including the front-month are to be assessed. The front-month shifts to the following month in line with the contract expiry for ICE Brent.
Standard Size	All prices are for contracts of 25,000-100,000bbl. Values for contracts for smaller or larger volumes may also be considered.

•Singapore Crack Margins

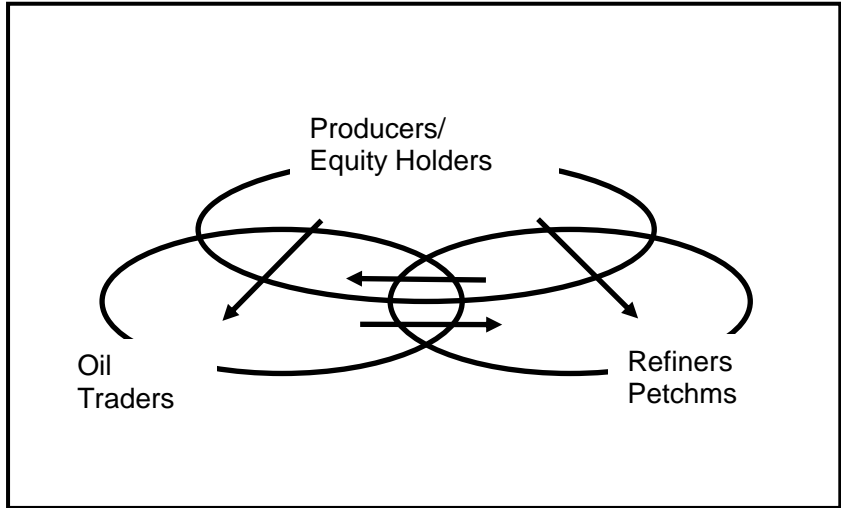
*Singapore Crack Margins refers to the price spread between swaps values of naphtha, jet fuel, gasoil(sulfur content of 0.001%), 180cst fuel oil(sulfur content of 3.5%) and 380cst fuel oil(sulfur content of 3.5%) against Dubai Swaps and DTD Brent.

Assessment Timing	Rim's assessment for Singapore Crack Margins settles at 17:30 Tokyo time on the previous day of publication.
Price Unit	All prices are in \$/bbl.
Time Window	The front-month refers to the current month of the day of publication up to the day that is 19 days before the end of the month. The front-month shifts to the following month the next day. Contracts for a maximum of three months including the front-month are to be assessed.
Standard Size	All prices are for contracts of 50,000bbl. Values for contracts for smaller or larger volumes may also be considered.

<Physical Crude/Condensate>

Rim assesses spot values of Crude/Condensate produced in the Middle East, Asia, Africa and Other by monitoring prices for certain grades transacted in the Middle East, Asia, Africa markets and other markets.

Structure of the Physical Crude/Condensate Market



Rim understands that the physical crude/condensate markets are structured with three groups of business parties: Producers/Equity holders, Traders and Refiners/Petrochemical firms. Rim assesses physical crude/condensate prices at which a standard spot transaction could take place. Meanwhile, Rim will scrap assessments of crude/condensate grades with low spot liquidity, or crude/condensate grades whose spot transactions did not emerge at least for six months.

Rim defines a standard physical crude/condensate spot market transaction as follows:

Case 1	A producer sells a crude/condensate cargo to a trader on a spot basis.
Case 2	A producer sells a crude/condensate cargo to a refiner/petrochemical firm on a spot basis.
Case 3	A trader sells a crude/condensate cargo to another trader or a refiner/petrochemical firm on a spot basis.
Case 4	A refiner/petrochemical firm sells a crude/condensate cargo to another refiner/petrochemical firm or a trader on a spot basis.

Rim defines the three business parties in the physical crude/condensate market as follows:

Producer	A company that produces and exports crude/condensate.
Equity Holder	A company that holds equity in oil and gas fields from which it produces and/or sells physical crude/condensate into the international market.
Oil Trader	A company that buys and sells physical crude/condensate in the international market.
Oil Refiner/ Petrochemical firm	A company that buys physical crude/condensate as feed stocks to run its refining facilities/condensate splitters.

(Physical Crude/Condensate Middle East)

Rim assesses spot values of the following grades based on deals, offers and bids reported by 15:30 Tokyo time. All prices are assessed based on information gathered through market research by Rim reporters each business day. Reporters take into account quality differences of the below-indicated crude/condensate grades, which vary occasionally reflecting market fundamentals of downstream refined oil products and petrochemical products.

Dubai, Oman, Murban, Umm Lulu, Das, Upper Zakum, Qatar Land, Qatar Marine, Al Shaheen, Banoco Arab Medium, Basrah Light, Basrah Heavy, D.F. Condensate (D.F.C), L.S. Condensate (L.S.C.), South Pars Condensate, Masila and Marib Light

Premiums and Discounts

Premiums/discounts for each grade are to be assessed based on official selling prices set or agreed on by governments or equivalent authorities, whole month Dubai quote values and JPN DTD values.

Outright Values

The outright price is comprised of two components; premiums or discounts and the official selling prices or benchmark crude values indicated in the table below. In the event that there are no transactions based on flat prices, reporters may use crude swaps values available in the market to assess the outright values.

Grade	Benchmark	Grade	Benchmark
Dubai	Whole month Dubai quote	Oman	OSP by Oman's Ministry of Oil & Gas and Whole month Dubai quote
Murban	OSP by Abu Dhabi National Oil Corp	Umm Lulu	OSP by Abu Dhabi National Oil Corp
Das	OSP by Abu Dhabi National Oil Corp	Upper Zakum	OSP by Abu Dhabi National Oil Corp
Qatar Land	OSP by Qatar Petroleum	Qatar Marine	OSP by Qatar Petroleum
Al Shaheen	Whole month Dubai Quote	Banoco Arab Medium	OSP for Arab Medium by Saudi Aramco

Basrah Light	OSP by Iraq's State Oil Marketing Organization	Basrah Heavy	OSP by Iraq's State Oil Marketing Organization
D.F. Condensate	Whole month Dubai Quote	L.S. Condensate	Whole month Dubai Quote
South Pars Condensate	Whole month Dubai Quote	Masila	JPN DTD
Marib Light	JPN DTD		

*D.F.condensate is Deodorised Field condensate

*L.S.condensate is Low Sulphur condensate

Assessment Window	Rim's assessment window for the Physical Crude/Condensate <Middle East Crude/Condensate> closes at 15:30 Tokyo time on the day of publication.
Price Unit and structure	All prices are in \$/bbl on FOB.
Time Window	Rim uses a discrete window for its assessment of Middle East crude/condensate. All prices are for cargoes to be loaded in the month after the following month of the day of publication. Prices for Dubai and Oman are for cargoes to be loaded three months after the day of publication as well as two months after the day of publication.
Standard Size	All prices are for cargoes of 500,000bbl. Values for contracts for smaller or larger volumes may also be considered.
Loading Ports	All prices are for cargoes to be loaded at main exporting ports of each grade.

(OSP Calculations Middle East)

Definition

OSP Calculations are reference values calculated based on the following formula.

Time Window

OSP Calculations are for cargoes to be loaded in the following month of the day of publication.

Formula

[Dubai Swaps prices for the following month of the publication day x 50% + Physical Oman prices to be loaded three months after the publication day (equal to Oman Swaps prices for the following month of the publication day) x 50%] + α

α refers to a premium or discount, excluding the benchmark Dubai and Oman crude prices, in the latest available price formulas set by oil producers.

Grades

Saudi Arabian Arab Super Light, Arab Extra Light, Arab Light, Arab Medium, Arab Heavy, Iraqi Basrah Light, Basrah Heavy, Kuwaiti Kuwait Super Light, Kuwait Export Blend, Iranian Light, Iranian Heavy

(Physical Crude/Condensate Africa)

Rim assesses spot values of the following grades based on deals, offers and bids reported by 15:30 Tokyo time. All prices are assessed based on information gathered through market research by Rim reporters each business day. Reporters take into account quality differences of the below-indicated crude/condensate grades, which vary occasionally reflecting market fundamentals of downstream refined oil products and petrochemical products.

Bonny Light, Brass River, Qua Iboe, Agbami, Cabinda, Djeno, Girassol, Hungo, Nemba, Dalia, Pazflor, Zafiro, Doba, Nile Blend and Dar Blend

Premiums and Discounts

Premiums/discounts for Bonny Light, Brass River, Qua Iboe, Agbami, Cabinda, Djeno, Girassol, Hungo, Nemba, Dalia, Pazflor, Zafiro, Doba, Nile Blend and Dar Blend are to be assessed based on JPN DTD values.

Outright Values

The outright price for Bonny Light, Brass River, Qua Iboe, Agbami, Cabinda, Djeno, Girassol, Hungo, Nemba, Dalia, Pazflor, Zafiro, Doba, Nile Blend and Dar Blend are comprised of two components; premiums or discounts and JPN DTD values. These are indicated in the table below. In the event that there are no transactions based on flat prices, reporters may use crude swaps values available in the market to assess the outright values.

Grade	Benchmark	Grade	Benchmark
Bonny Light	JPN DTD	Brass River	JPN DTD
Qua Iboe	JPN DTD	Agbami	JPN DTD
Cabinda	JPN DTD	Djeno	JPN DTD
Girassol	JPN DTD	Hungo	JPN DTD
Nemba	JPN DTD	Dalia	JPN DTD
Pazflor	JPN DTD	Zafiro	JPN DTD
Doba	JPN DTD	Nile Blend	JPN DTD
Dar Blend	JPN DTD		

Assessment Window	Rim's assessment window for the Physical Crude/Condensate <Africa> closes at 15:30 Tokyo time on the day of publication.
Price Unit and structure	All prices are in \$/bbl on FOB.

Time Window	Rim uses a discrete window for its assessment of African crude/condensate. If publication is from the first day to the 20th of the month, all prices are for cargoes to be loaded in the following month. If publication is from the 21th to the last day of the month, all prices are for cargoes to be loaded in the month after the following month.
Standard Size	All prices (Bonny Light, Brass River, Qua Iboe, Agbami, Cabinda, Djeno, Girassol, Hungo, Nemba, Dalia, Pazflor, Zafiro and Doba) are for cargoes of 950,000bbl. A price of Nile Blend and Dar Blend cargoes of 600,000bbl to 1,000,000 bbl. Values for contracts for smaller or larger volumes may also be considered.
Loading Ports	All prices (Bonny Light, Brass River, Qua Iboe, Agbami, Cabinda, Djeno, Girassol, Hungo, Nemba, Dalia, Pazflor, Zafiro, Doba, Nile Blend and Dar Blend) are for cargoes to be loaded at main exporting ports of each grade.

(Physical Crude/Condensate Other)

Rim assesses spot values of the following grades based on deals, offers and bids reported by 15:30 Tokyo time. The price is assessed based on information gathered through market research by Rim reporters each business day. Reporters take into account quality differences of the below-indicated crude/condensate grades, which vary occasionally reflecting market fundamentals of downstream refined oil products and petrochemical products.

• Sokol, Sakhalin Blend and ESPO

Premiums and Discounts

Premiums/discounts for Sokol and Sakhalin Blend are to be assessed based on whole month Dubai quote value on CFR Yosu, South Korea. For ESPO, it is to whole month Dubai quote values on FOB Kozmino, Russia.

Outright Values

The outright price for Sokol, Sakhalin Blend and ESPO are comprised of two components; premiums or discounts and whole month Dubai quote values. It is indicated in the table below. In the event that there are no transactions based on flat prices, reporters may use crude swaps values available in the market to assess the outright values.

Grade	Benchmark	price structure
Sokol	Whole month Dubai quote	CFR Yosu*
Sakhalin Blend	Whole month Dubai quote	CFR Yosu*
ESPO**	Whole month Dubai quote	FOB Kozmino

*The assessments for Sokol and Sakhalin Blend are based on CFR Yosu, but in case that deals or talks for other destinations are heard, Rim will assess the crude, considering the freight differentials between Yosu and the discharging ports.

**ESPO is East Siberian Pipeline Oil.

Assessment Window	Rim's assessment window for the Physical Crude/Condensate <Other Area> closes at 15:30 Tokyo time on the day of publication.
Price Unit and structure	For Sokol and Sakhalin Blend, the price is in \$/bbl on CFR Yosu. For ESPO, the price is on FOB Kozmino.
Time Window	Rim uses a discrete window for its assessment of other crude/condensate (Sokol, Sakhalin Blend and ESPO). All prices are for cargoes to be loaded in the month after the following month of the day of publication.
Standard Size	The price is for cargoes of 700,000 to 740,000bbl. Values for contracts for smaller or larger volumes may also be considered.
Loading Ports	The price is for cargo to be loaded at main exporting port of each grade.

• **Azeri, Urals, Forties, CPC Blend, Castilla Blend, WTI, Mars**

Premiums and Discounts

Premiums/discounts for Azeri are to be assessed based on JPN DTD values on CFR South East Asia, including Indonesia and Thailand. For Urals, Forties and CPC Blend, it is to JPN DTD values on CFR North East Asia, including Japan, South Korea and China. For Castilla Blend, WTI and Mars, it is to whole month Dubai quote values on CFR North East Asia, including Japan, South Korea and China.

Outright Values

The outright price for Azeri, Urals, Forties and CPC Blend are comprised of two components; premiums or discounts and JPN DTD values. The outright price for Castilla Blend, WTI and Mars is comprised of premiums or discounts and whole month Dubai quote values. These are indicated in the table below. In the event that there are no transactions based on flat prices, reporters may use crude swaps values available in the market to assess the outright values.

Grade	Benchmark	price structure
Azeri	JPN DTD	CFR South East Asia*
Urals	JPN DTD	CFR North East Asia**
Forties	JPN DTD	CFR North East Asia**
CPC Blend	JPN DTD	CFR North East Asia**
Castilla Blend	Dubai quote	CFR North East Asia**
WTI	Dubai quote	CFR North East Asia**
Mars	Dubai quote	CFR North East Asia**

*The assessments for Azeri are based on CFR South East Asia, but in case that deals or talks for other destinations are heard, Rim will assess the crude, considering the freight differentials between South East Asia and the discharging ports.

**The assessments for Urals, Forties, CPC Blend, Castilla Blend, WTI and Mars are based on CFR North East Asia, but in case that deals or talks for other destinations are heard, Rim will assess the crude, considering the freight differentials between North East Asia and the discharging ports.

For any of Azeri, Urals, Forties and CPC Blend, in case that deals or talks on FOB Mediterranean Sea (in case of Azeri, Urals and CPC Blend), North West Europe (in case of Urals and Forties) are heard, Rim may take such information into consideration to assess the crude on CFR, adding the freight cost from the Mediterranean Sea and North West Europe.

For Castilla Blend, in case that deals or talks on FOB Colombia are heard, Rim may take such information into consideration to assess the crude on CFR, adding the freight cost from Columbia.

For WTI and Mars, in case that deals or talks on FOB USA are heard, Rim may take such information into consideration to assess the crude on CFR, adding the freight cost from USA.

Assessment Window	Rim's assessment window for the Physical Crude/Condensate <Other> closes at 15:30 Tokyo time on the day of publication.
Price Unit and structure	For Azeri, the price is in \$/bbl on CFR South East Asia. For Urals, Forties, CPC Blend, Castilla Blend and WTI and Mars, the price is on CFR North East Asia.
Time Window	Rim uses a discrete window for its assessment of other crude/condensate (Azeri, Urals, Forties, CPC Blend, Castilla Blend, WTI and Mars). All prices are for cargoes to be delivered in the month after the following month of the day of publication.
Standard Size	The price for all grades is for cargoes of 1-mil to 2-mil bbl. Values for contracts for smaller or larger volumes may also be considered.
Loading Ports	The price is for cargo to be loaded at main exporting port of each grade in the Mediterranean Sea (in case of Azeri, Urals and CPC Blend), North West Europe (in case of Urals and Forties), Columbia (in case of Castilla Blend) and USA (in case of WTI and Mars).

(Physical Crude/Condensate DES Shandong)

Rim assesses spot values of the following grades based on deals, offers and bids reported by 15:30 Tokyo time. The price is assessed based on information gathered through market research by Rim reporters each business day. Reporters take into account quality differences of the below-indicated crude/condensate grades, which vary occasionally reflecting market fundamentals of downstream refined oil products and petrochemical products.

Brazilian Lula, Angolan Dalia, Congo's Djeno, East Siberian ESPO, Omani Oman

Premiums and Discounts

Premiums/discounts for Lula, Dalia, Djeno, ESPO and Oman are to be assessed based on ICE Brent values.

Outright Values

The outright price for Lula, Dalia, Djeno, ESPO and Oman is comprised of two components; premiums or discounts and ICE Brent values indicated in the table below. In the event that there are no transactions based on flat prices, reporters may use crude swaps values available in the market to assess the outright values.

Grade	Benchmark	price structure
Lula	ICE Brent	DES Shandong China
Dalia	ICE Brent	DES Shandong China
Djeno	ICE Brent	DES Shandong China
ESPO	ICE Brent	DES Shandong China
Oman	ICE Brent	DES Shandong China

Assessment Window	Rim's assessment window for the Physical Crude/Condensate <DES Shandong> closes at 15:30 Tokyo time on the day of publication.
Price Unit and structure	All prices are in \$/bbl on DES Shandong China.
Time Window	Rim uses a discrete window for its assessment of DES Shandong crude/condensate. All prices are for cargoes to be delivered in the month after the following month of the day of publication.
Standard Size	The price is for cargoes of 500,000 to 1,000,000bbl. Values for contracts for smaller or larger volumes may also be considered.
Loading Ports	The price is for cargo to be loaded at main exporting port of each grade.

(Physical Crude/Condensate Asia)

Rim assesses spot values of the following grades based on deals, offers and bids reported by 15:30 Tokyo time. All prices are assessed based on information gathered through market research by Rim reporters each business day. Reporters take into account quality differences of the below-indicated crude/condensate grades, which vary occasionally reflecting market fundamentals of downstream refined oil products and petrochemical products.

•Indonesian Crude/Condensate

Minas, Cinta, Widuri, Duri, Lalang, Handil Mix, Attaka, Belida, Ardjuna, Arun Condensate, Walio, Senipah Condensate, Banyu Urip

•Others

Tapis, Labuan, Kikeh, Miri, Kimanis, Cendor, Gippsland, Cossack, North West Shelf Condensate, Laminaria, Ichthys Condensate, Varanus, Kutubu, Daqing, Vincent, Pyrenees, Van Gogh, Bach Ho Light, Bach Ho Heavy, Rang Dong, Su Tu Den, T.G.T. (Te Giac Trang), Chim Sao

Premiums and Discounts

Premiums/discounts for each grade are to be assessed based on the Indonesian Crude Price (ICP), JPN DTD and the official selling prices set or agreed on by the Chinese government.

Outright Values

The outright price is comprised of two components; premiums or discounts and the official selling prices and published quotes indicated in the table below. In the event that there are no transactions based on flat prices, reporters may use crude swaps values available in the market to assess the outright values.

Grade	Benchmark	Grade	Benchmark
Indonesian Crude/Condensate	OSP by Indonesian government (Indonesian Crude Price), JPN DTD	Tapis	JPN DTD
Labuan	JPN DTD	Kikeh	JPN DTD
Miri	JPN DTD	Kimanis	JPN DTD
Cendor	JPN DTD	Gippsland	JPN DTD
Cossack	JPN DTD	NWS Condensate	JPN DTD
Laminaria	JPN DTD	Ichthys Condensate	JPN DTD
Varanus	JPN DTD	Kutubu	JPN DTD
Daqing	OSP by the Chinese government	Vincent	JPN DTD
Pyrenees	JPN DTD	Van Gogh	JPN DTD
Bach Ho Light	JPN DTD	Bach Ho Heavy	JPN DTD
Rang Dong	JPN DTD	Su Tu Den	JPN DTD
T.G.T.	JPN DTD	Chim Sao	JPN DTD

Assessment Window	Rim's assessment window for Physical Crude/Condensate <Asia Crude/Condensate> closes at 15:30 Tokyo time on the day of publication.
Price Unit and structure	All prices are in \$/bbl FOB.
Time Window	Rim uses a discrete window for its assessment of Asian crude/condensate. If publication is in the first half of the month, all prices are for cargoes to be loaded in the following month. If publication is in the second half of the month, all prices are for cargoes to be loaded in the month after the following month.
Standard Size	All prices are for cargoes of 200,000-600,000bbl. Values for contracts for smaller or larger volumes may also be considered.
Loading Ports	All prices are for cargoes to be loaded at main exporting ports of each grade.

(OSP Calculations Asia)

Definition

OSP Calculations are reference values calculated based on the following formula.

Time Window

OSP Calculations are for cargoes to be loaded in the same month of the day of publication.

Formula

$$\text{JPN DTD} + \alpha$$

α refers to a premium or discount, excluding the benchmark JPN DTD prices, in the latest available price formulas set by oil producers.

Grades

Brunei's Seria Light, Champion

(Rim Crude Index)

• Indonesian Crude Basket Prices

- Indonesian Light Crude Basket Price (ILCB)
- Indonesian Medium Crude Basket Price (IMCB)
- Indonesian Medium-Heavy Crude Basket Price (IMHCB)

	Crude grades of the basket price
ILCB	The average price of Belida, Attaka, Handil Mix
IMCB	The average price of Minas, Cinta, Widuri
IMHCB	The average price of Minas, Cinta, Widuri and Duri

*Indonesian Crude Basket Price is not a price assessment, but an average of some components from Rim price assessments.

•Rim Special Crude Basket Prices

- Crude Basket Price for China Products (BPCP)

Crude grades of the basket price	
BPCP	The average price of Dubai, JPN DTD, Cinta, to which the Chinese government refers when adjusting domestic retail prices for refined products.

*Crude Basket Price for China Products is not a price assessment, but an average of some components from Rim price assessments.

•Shanghai Crude Futures Index

- Shanghai Medium Sour Crude Index (SMSCI)

Crude grades of the index	
SMSCI	The index is shown in US dollar and Chinese yuan, based on delivered prices of Dubai, Oman, Abu Dhabi Upper Zakum, Qatar Marine, Iraqi Basrah Light, Yemeni Masila and Chinese Shengli, or deliverable crude grades for crude futures on the Shanghai International Energy Exchange (INE).

*Shanghai Medium Sour Crude Index is not a price assessment, but an average of some components from Rim price assessments.

Crude/Condensate Methodology for Rim Trading Board

Time	14:30~15:30 Tokyo time. Out of all bids/offers and deals transacted during the time window, we take the most recent deals and numbers into consideration for assessment.
Participants	Rim's crude/condensate team should be informed of all bids/offers and deal information via e-mail, telephone and instant messengers during the time window. When information is submitted through a broker, the broker should submit it to Rim. Players that are registered by Rim in advance are allowed to post bids/offers and deals to Rim Trading Board by themselves.
Items	The crude/condensate grades should be those that Rim assesses. However, Rim occasionally posts other crude/condensate grades that are not assessed by Rim, based on Rim's editorial judgment.
Standard size	As for physical cargoes, the minimum size should be 100,000bbl or above. For paper, 50,000bbl and above should be the minimum. Values for contracts for smaller volumes will not be considered.
Other conditions	<ol style="list-style-type: none"> 1) As to bids/offers and deals, spot differentials to each benchmark crude, (so-called floating prices) and/or fixed prices should be submitted. 2) Regardless of whether it is physical trade or paper trade, bids/offers and deals should be within the time window set by Rim. As for deals/bids/offers, which are conducted outside Rim's time window, Rim will decide whether to post them or not. 3) As to bids/offers, when a player hopes to set validity, the player should inform Rim of the intention and the details. 4) Apart from these items and policies, all guidelines are in line with Rim's Crude/Condensate Assessment Methodology.

Principle	<ol style="list-style-type: none"> 1) Rim occasionally reports information gathered from third party sources, instead of either the player that made a bid or offer, or the players that actually conducted deals. In this case, as long as Rim is able to confirm the information provided by the third party with the players that made bids/offers or the players that made the deal, Rim may update this information at Rim's discretion. 2) Regarding bids/offers and deals, Rim generally carries the company names involved. 3) Rim reserves the right to judge which information is posted. 4) Bids/offers should be firm. At Rim's discretion, Rim may impose a penalty on any players that make bids/offers within validity that intentionally does not implement the transaction, or repeatedly fails to do the transaction, when a counterparty is interested to do a deal at that level shown. 5) Rim refers bids/offers and deal information for assessment. However, Rim will take various factors, like market fundamentals and sentiment, into consideration when Rim determines assessment, therefore whether those bids/offers and deal information are fully reflected in assessment will be at Rim's discretion.
Disclaimer	<p>Rim Trading Board is for the sole purpose of providing information, not for any form of brokerage. Rim has no liability for the result or the process of the negotiation between sellers and buyers based on Rim Trading Board. All negotiations based on it should be made directly between sellers and buyers. Therefore all responsibilities for offers/bids and deals lie with the players involved.</p>