

## **Rim Products Price Assessment Methodology**

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### Relevance of Rim Assessment Methodology

Rim Assessment Methodology is considered appropriate since it is based on the following:

#### 1. Purpose of price assessment

The purpose of price assessment in all of Rim's reports is to enable trades to take place at prices that are transparent and reasonable. We achieve that by indicating levels at which deals can be transacted among players in the energy market.

#### 2. Transactions taken into consideration

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.

#### 3. Time window taken into consideration

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 Asian trading hours including Japan.

#### 4. 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.

#### 5. Selection of players to gather information from

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 found to be suspicious or to be an exception, the reporter and team leader may, after obtaining approval from the president, remove him from the list of players to gather information from.

#### 6. Method of information gathering

The quality of reporters performing price assessments is vital. From a fair and neutral standpoint, the reporter has to exert due diligence on a regular basis to cultivate such quality and improve his skills. Reporters that have received such training will 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.

#### 7. Reliability and adequacy of market information

Each reporter performing price assessment determines whether information obtained from market players is adequate, whether the trade was done by the parties involved, whether the information was suspicious by checking with the relevant parties and other multiple parties, with further investigation carried out if necessary. If a piece of information is found to be suspicious, additional information gathering will be carried out before making a judgement as to whether or not to remove the information for consideration for price assessment. The player providing market information is expected to all information relevant that meets the conditions for price assessment stated in Rim's Assessment Methodology,

which is published on our website. If it is necessary to check whether the information provided is suspicious, we may consider obtaining information from the back office.

## 8. Supervisor

### Role of Supervisor

At least one independent supervisor is assigned to each report. Before each report is issued, the supervisor checks if the price assessment and its basis are in line with the Assessment Methodology. After the review is conducted, a proof of the review either in the form of an email sent by the supervisor to each team or a PDF copy signed by the supervisor is kept in the folder of each team.

### Maintaining quality of the review

Where necessary, the president conducts checks to determine if the supervisor's review is appropriate. After a spot check, a proof of the spot check in the form of a PDF document signed by the president will be kept in the folder of each team.

### Selection of supervisor

In principle, a supervisor is selected from outside the relevant report team and 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.

## 9. Maintaining consistency in price assessment

Internal training and thorough reviews by supervisors are conducted to maintain consistency in price assessment.

## 10. Making the Assessment Methodology available

The Assessment Methodology approved by the Board of Directors is uploaded on our website, whereby external market players involved in trading, players providing market information and our subscribers can access. The Assessment Methodology includes the following:

- Trades considered for price assessment
- Standard quantity
- Assessment window
- Priority for assessment
- Selection of players providing market information
- Method of information gathering
- Reliability and adequacy of market information
- Reasons for using specific units for quantity (barrel, BTU etc.)
- System of review by supervisor
- Trades not considered for price assessment
- Policy of maintaining consistency in price assessment
- Process of regular reviews and amendments to Methodology
- Amendments to price assessments

## 11. Regular reviews of Methodology

The 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, and revisions will be considered where necessary. When reviewing the Methodology, we obtain views from external market players and our subscribers. If necessary, we disclose the inquiries we pose to external parties in our reports or website but basically, their replies are not disclosed for confidentiality reasons. If, however, our sources agree, we may disclose their replies.

## 12. Amendments to Methodology

If amendments to the Methodology is deemed to be necessary, discussions are conducted within each report team and amendments are submitted to the Board of Directors for



approval. After the amendments are decided, the effective date of the amendments is clearly stated and changes to the Methodology will be announced on our website in principle one month before, but at least two weeks prior to the effective date.

### 13. Amendments/Changes to price assessment

Although typing and spelling mistakes may be amended, we do not change our price assessments with information provided after the price assessments are issued.



**Rim FOB Singapore Oil Products Price Assessment Methodology  
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**Price Assessment Principle**

**Rim price assessments indicate the current range in which a standard spot transaction could take place on the day of publication.**

**Rim understands values of commodities change even in the absence of deals. Rim defines prices as measures to indicate fluctuating values of commodities.**

**Rim understands values of commodities are determined by a variety of factors such as supply-demand fundamentals, production costs, conditions in other markets and players' speculation.**

**Rim understands the latest transactions, bids/offers and buying/selling interest represent current values of commodities.**

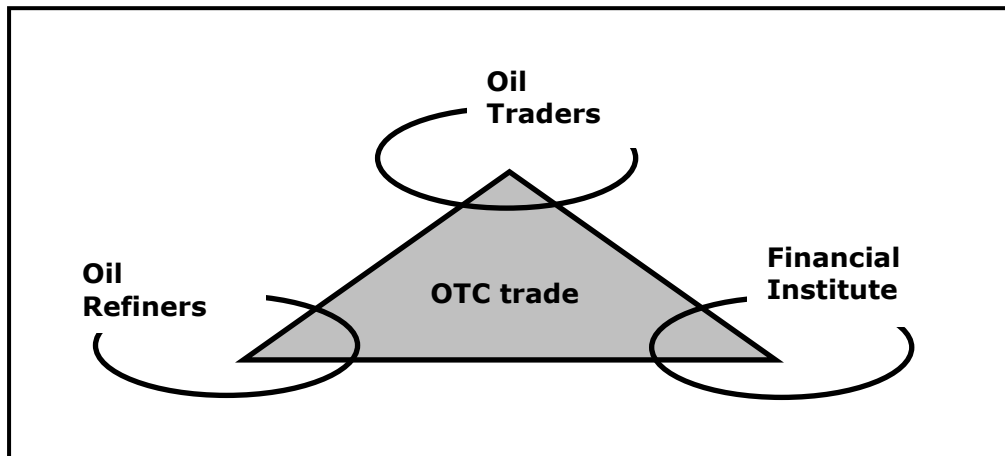
**Rim understands values of commodities are determined by competition among sellers and competition among buyers. Rim considers higher bids to be closer to the current values than lower bids. Rim considers lower offers to be the closer to current values than higher offers.**

**Rim understands prices for each transaction reported from any party are to be translated into prices based on standard terms and conditions such as cargo sizes, timing of delivery or loading, product specifications and payment terms.**

**SINGAPORE PRODUCTS PAPER SWAPS VALUES**

Rim assesses values of Singapore products paper swaps once a day at 5:30 PM Tokyo time. All values are for available swaps contracts for periodical average settlements based on daily price quotations for physical cargo assessments. All prices are assessed based on information collected in the course of market research by Rim reporters each business day.

**STRUCTURE of the SINGAPORE PRODUCTS PAPER SWAP MARKETS**



Rim understands that the Singapore Products Paper Swaps market is structured with three groups of business parties: Financial Institutes, Oil Traders and Oil Refiners. Rim assesses values of Singapore Products Paper Swaps at which a standard transaction could take place through “over-the-counter” method of trade. Trade takes place as buying interest and selling interest match with each other.

Rim defines the three Singapore Products Paper Swaps market business parties as follows:

|                            |  |
|----------------------------|--|
| <b>Oil Trader</b>          | A company that trades physical oil products as its main trading item and the Singapore Products Paper Swaps as a hedging tool against risks associated with its trading of physical oil products.  |
| <b>Oil Refiner</b>         | A company that produces and sells oil products as its main business operation and trades the Singapore Products Paper Swaps as a hedging tool against risks associated with its production and sales of physical oil products. Oil refiners also buy oil products to cover occasional shortfalls and trade the Singapore Products Paper Swaps to hedge against risks associated with purchases of physical oil products. |
| <b>Financial Institute</b> | A company that trades the Singapore Products Paper Swaps as one of its trading items. A Financial Institute that trades the Singapore Products Paper Swaps typically holds positions in physical oil products markets as well.   |



|                          |  |
|--------------------------|--|
| <b>Assessment Window</b> | Rim's assessment window for Singapore products paper swaps values closes at 5:30 PM Tokyo time.  |
| <b>Price Unit</b>        | Values for naphtha, jet/kerosene, gasoil, regrade are in \$/bbl on an FOB Singapore basis. Values for 180 and 380 HSFO are in \$/mt on an FOB Singapore basis.   |
| <b>Time Window</b>       | Rim assesses values of Singapore products paper swaps for three forward months. The front month starts from 20 days before the 1 <sup>st</sup> day of the next month.<br><br>Ex: the January swaps contract is no longer assessed on Jan 12.   |
| <b>Standard Size</b>     | Values of Singapore products paper swaps are for a contract for 50,000bbl, which Rim considers standard. Values for contracts for smaller or larger volumes are to be translated into estimated values that the contract could be worth if the contracts were for the standard volume. |

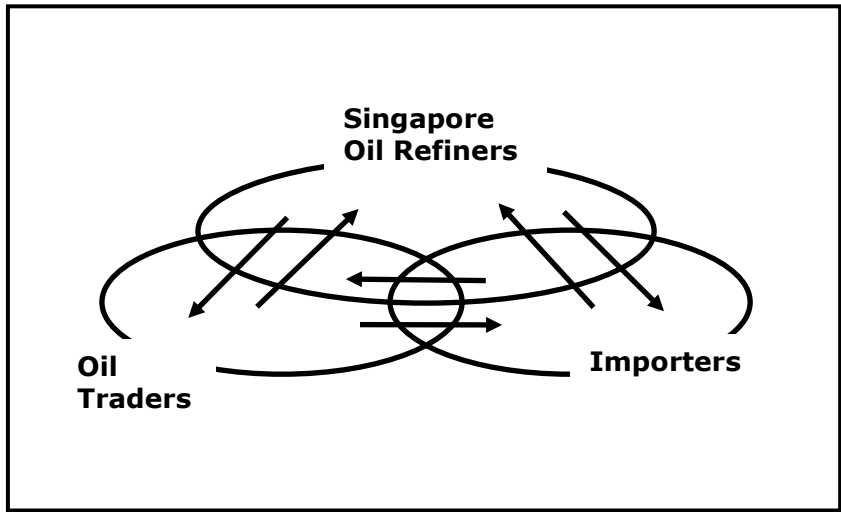
**FOB SINGAPORE SPOT PRICES**

Rim assesses FOB Singapore spot prices for physical cargoes of gasoline, naphtha, kerosene/A1 jet fuel, gasoil, fuel oil on a fixed price basis and a floating price basis.

In the absence of information of deals, bids and offers on a fixed price basis, the fixed price assessments indicate the price range in which a transaction on a floating price basis could be locked into with available derivative products, such as futures contracts and paper swaps based on periodical average of published quotations.

All prices are assessed based on information collected in the course of market research by Rim reporters each business day.

**STRUCTURE of the FOB SINGAPORE SPOT MARKET**



Rim understands that the FOB Singapore Physical Oil Products Market is structured with three groups of business parties: Singapore oil refiners, Oil traders and Asian importers/refiners. Rim assesses physical oil product prices at which a standard spot transaction could take place.

Rim defines the three business parties in the FOB Singapore Physical Oil Products Market as follows:

|                          |   |
|--------------------------|---|
| <b>Singapore Refiner</b> | A company that produces and sells oil products at its refining facilities in Singapore, and also buys oil products to cover occasional shortfalls.  |
| <b>Oil Trader</b>        | A company that buys and sells oil products in the international market.   |
| <b>Importer</b>          | A company outside of Singapore that buys on an FOB Singapore basis for resale into respective domestic markets. Refiners of countries other than Singapore are also considered to be importers. |

**Rim defines a standard FOB Singapore spot market transaction as follows:**

|        |   |
|--------|---|
| Case 1 | A Singapore refiner sells an oil products cargo to a trader on a spot basis.                  |
| Case 2 | A Singapore refiner sells an oil products cargo to an importer on a spot basis.               |
| Case 3 | A Singapore refiner sells an oil products cargo to another Singapore refiner on a spot basis. |
| Case 4 | A trader sells an oil products cargo to a Singapore refiner on a spot basis.                  |
| Case 5 | A trader sells an oil products cargo to an importer on a spot basis.                          |
| Case 6 | A trader sells an oil products cargo to another trader on a spot basis.                       |
| Case 7 | An importer sells an oil products cargo to a Singapore refiner on a spot basis.               |
| Case 8 | An importer sells an oil products cargo to a trader on a spot basis.                          |
| Case 9 | An importer sells an oil products cargo to another importer on a spot basis.                  |





**<Gasoline>**

Rim assesses FOB Singapore spot gasoline prices for 92 research octane number grade, 95 RON grade and 97 RON grade. The premiums are to periodical average of daily assessments for FOB Singapore spot 92 RON prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula: Premium + Value of Singapore 92RON = Fixed Value

\*Fixed Value of 92RON does not contain premium

|                                    |  |                  |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
|------------------------------------|--|------------------|------------------------|------------|--|--------------|----------------|--|---------------------------|----------------|-----------------|-----|------------------|-----|------------------|---------------------|------------------|---------|----------|------------------------------------|-------|--|----------------|-----------|--|--------------|---------------|--|-----------------|--------|--|--------------|---------|--|-------|----------------|--|
| <b>Assessment Window</b>           | Rim’s assessment window for FOB Singapore spot gasoline prices closes at 6:30 PM Tokyo time.   |                  |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
| <b>Price Unit</b>                  | FOB Singapore spot gasoline prices are in \$/bbl.  |                  |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
| <b>Time Window</b>                 | FOB Singapore spot gasoline prices are for cargoes to be loaded during the period from 20 to 35 days ahead from the publication day. The premiums are to Singapore 92RON gasoline prices.  |                  |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
| <b>Standard Size</b>               | FOB Singapore spot gasoline prices are for an MR-size cargo, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were with the standard volumes.   |                  |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
| <b>Loading Port</b>                | FOB Singapore spot gasoline prices are for cargoes to be loaded at major ports in Singapore.   |                  |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
| <b>Quality Specifications</b>      | <p>FOB Singapore spot gasoline prices are for cargoes of which quality is equivalent to the following specifications.</p> <table border="1"> <tr> <td>Research Octane Number</td> <td colspan="2">92, 95, 97</td> </tr> <tr> <td>Lead Content</td> <td colspan="2">Max 0.013gpb/l</td> </tr> <tr> <td rowspan="5">Distillation Temperature;</td> <td>10% evaporated</td> <td>Max 74 degree C</td> </tr> <tr> <td>50%</td> <td>Max 127 degree C</td> </tr> <tr> <td>90%</td> <td>Max 190 degree C</td> </tr> <tr> <td>Final Boiling Point</td> <td>Max 225 degree C</td> </tr> <tr> <td>Residue</td> <td>Max 2.0%</td> </tr> <tr> <td>Copper Corrosion 3h at 50 degree C</td> <td colspan="2">Max 1</td> </tr> <tr> <td>Sulfur Content</td> <td colspan="2">Max 0.05%</td> </tr> <tr> <td>Existent Gum</td> <td colspan="2">Max 4mg/100ml</td> </tr> <tr> <td>Benzene Content</td> <td colspan="2">Max 5%</td> </tr> <tr> <td>MTBE Content</td> <td colspan="2">Max 10%</td> </tr> <tr> <td>Color</td> <td colspan="2">Undyed, orange</td> </tr> </table> <p>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> |                  | Research Octane Number | 92, 95, 97 |  | Lead Content | Max 0.013gpb/l |  | Distillation Temperature; | 10% evaporated | Max 74 degree C | 50% | Max 127 degree C | 90% | Max 190 degree C | Final Boiling Point | Max 225 degree C | Residue | Max 2.0% | Copper Corrosion 3h at 50 degree C | Max 1 |  | Sulfur Content | Max 0.05% |  | Existent Gum | Max 4mg/100ml |  | Benzene Content | Max 5% |  | MTBE Content | Max 10% |  | Color | Undyed, orange |  |
| Research Octane Number             | 92, 95, 97   |                  |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
| Lead Content                       | Max 0.013gpb/l   |                  |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
| Distillation Temperature;          | 10% evaporated   | Max 74 degree C  |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
|                                    | 50%  | Max 127 degree C |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
|                                    | 90%  | Max 190 degree C |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
|                                    | Final Boiling Point  | Max 225 degree C |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
|                                    | Residue  | Max 2.0%         |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
| Copper Corrosion 3h at 50 degree C | Max 1  |                  |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
| Sulfur Content                     | Max 0.05%  |                  |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
| Existent Gum                       | Max 4mg/100ml  |                  |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
| Benzene Content                    | Max 5%   |                  |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
| MTBE Content                       | Max 10%  |                  |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |
| Color                              | Undyed, orange   |                  |                        |            |  |              |                |  |                           |                |                 |     |                  |     |                  |                     |                  |         |          |                                    |       |  |                |           |  |              |               |  |                 |        |  |              |         |  |       |                |  |



**<Naphtha>**

**FOB Singapore spot naphtha prices are calculated based on Rim CFR Japan spot naphtha price assessments. The formula is as follows:**

FOB Singapore spot naphtha prices =  
 [(CFR Japan naphtha)–(\*freight rates for the Singapore-Japan route)] / 9  
 \*The freight rates are for an MR tanker on the Singapore-Japan route.

**The differential between the netback fixed prices from CFR Japan prices and the swap values are considered to be relevant premiums for the day of publication.**

|                                 |   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
|---------------------------------|---|------------------|---------|----------------|------------|----------------|--------|---------------------------------|-----------|------------------|--------|----------------|--------|---------------------------------|-----------|
| <b>Assessment Window</b>        | Rim’s assessment window for FOB Singapore spot naphtha prices closes at 6:30 PM Tokyo time.   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| <b>Price Unit</b>               | FOB Singapore spot naphtha prices are in \$/bbl.  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| <b>Time Window</b>              | FOB Singapore spot naphtha prices in the publications released during the period from the first day to the 15 <sup>th</sup> of a month are for cargoes to be loaded during the period from the 9 <sup>th</sup> to the 24 <sup>th</sup> of the next month from the current month. FOB Singapore spot naphtha prices in the publications released during the period from the 16 <sup>th</sup> to last day of a month are for cargoes to be loaded during the period from the 25 <sup>th</sup> of the next month to the 8 <sup>th</sup> of a month after the next from the current month.  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| <b>Standard Size</b>            | FOB Singapore spot naphtha prices are for MR-size cargoes, which RIM considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were with the standard volumes.  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| <b>Delivery Port</b>            | FOB Singapore spot gasoline prices are for cargoes to be loaded at major ports in Singapore.  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| <b>Quality Specifications</b>   | <p>FOB Singapore spot naphtha prices are for cargoes of which quality is equivalent to “the open specifications”.</p> <table border="1"> <tr> <td>Paraffin Content</td> <td>Min 65%</td> </tr> <tr> <td>Sulfur Content</td> <td>Max 650ppm</td> </tr> <tr> <td>Olefin Content</td> <td>Max 1%</td> </tr> <tr> <td>Specific Gravity at 60 degree F</td> <td>0.65-0.74</td> </tr> </table> <p>Extract from the open specification<br/>         *Specifications for other properties are to meet specifications that are commonly required in international trading.</p> <p>REFERENCE: Full-range naphtha</p> <table border="1"> <tr> <td>Paraffin Content</td> <td>78-82%</td> </tr> <tr> <td>Olefin Content</td> <td>Max 1%</td> </tr> <tr> <td>Specific Gravity at 60 degree F</td> <td>0.68-0.70</td> </tr> </table> | Paraffin Content | Min 65% | Sulfur Content | Max 650ppm | Olefin Content | Max 1% | Specific Gravity at 60 degree F | 0.65-0.74 | Paraffin Content | 78-82% | Olefin Content | Max 1% | Specific Gravity at 60 degree F | 0.68-0.70 |
| Paraffin Content                | Min 65%   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Sulfur Content                  | Max 650ppm  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Olefin Content                  | Max 1%  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Specific Gravity at 60 degree F | 0.65-0.74   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Paraffin Content                | 78-82%  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Olefin Content                  | Max 1%  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Specific Gravity at 60 degree F | 0.68-0.70   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |



**<Jet/Kerosene>**

**Rim assesses FOB Singapore spot kerosene and A1 jet fuel prices. The premiums are to periodical average of daily assessments for FOB Singapore spot A1 jet fuel prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula:**

$$\text{Premium} + \text{Value of Singapore Paper Swaps} = \text{Fixed Value}$$

|                               |   |                  |
|-------------------------------|---|------------------|
| <b>Assessment Window</b>      | Rim's assessment window for FOB Singapore spot A1 Jet fuel/Kerosene prices closes at 6:30 PM Tokyo time.  |                  |
| <b>Price Unit</b>             | FOB Singapore spot kerosene prices are in \$/bbl.   |                  |
| <b>Time Window</b>            | FOB Singapore spot A1 jet fuel/kerosene prices are for cargoes to be loaded during the period from 20 to 35 days ahead from the publication day. The premiums are to Singapore paper swaps for the front month in Rim Singapore paper swaps assessment.       |                  |
| <b>Standard Size</b>          | FOB Singapore spot A1 jet fuel/kerosene prices are for MR-size cargoes, which RIM considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were with the standard volumes. |                  |
| <b>Delivery Port</b>          | FOB Singapore spot A1 jet fuel/kerosene prices are for cargoes to be loaded at major ports in Singapore.  |                  |
| <b>Quality Specifications</b> | FOB Singapore spot A1 jet fuel/kerosene prices are for cargoes of which quality is equivalent to the Joint Fuel System Check List, also known as Jet A-1 Check List. The JFSCCL is issued by International Air Transport Association.                         |                  |
|                               | Distillation Temperature;<br>Initial Boiling Point<br>10% Evaporated  | Max 205 degree C |
|                               | Flash Point   | Max 40 degree C  |
|                               | Sulfur Content  | Max 0.3%         |
|                               | Smoke Point with naphthalene content<br>of maximum 3.0%   | Minimum 19       |
|                               | Copper corrosion 2h at 100 degree C   | Maximum 1.0      |
|                               | Saybolt color   | Minimum 18       |
|                               | Extract from IATA's JFSCCL  |                  |
|                               | *Specifications for other properties are to meet specifications that are commonly required in international trading.  |                  |



**<Gasoil>**

Rim assesses FOB Singapore spot gasoil prices for grades with a sulfur content of 0.001%, 0.05% and 0.5%. The premiums are to periodical average of daily assessments for FOB Singapore spot gasoil (0.05% sulfur) prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula: Premium + Value of Singapore Paper Swaps = Fixed Value

|  |  |            |             |                 |  |  |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                              |  |                |         |            |        |           |       |          |
|--|--|------------|-------------|-----------------|--|--|------------------|--|------------|----------------|--|----------------------------|-----------------|--|---------------------------|----------|--|--------------|--------|--|------------------------------------|------------------------------|--|----------------|---------|------------|--------|-----------|-------|----------|
| <b>Assessment Window</b>                 | Rim's assessment window for FOB Singapore spot gasoil prices closes at 6:30 PM Tokyo time.   |            |             |                 |  |  |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                              |  |                |         |            |        |           |       |          |
| <b>Price Unit</b>                        | FOB Singapore spot gasoil prices are in \$/bbl.  |            |             |                 |  |  |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                              |  |                |         |            |        |           |       |          |
| <b>Time Window</b>                       | FOB Singapore spot gasoil prices are for cargoes to be loaded during the period from 20 to 35 days ahead from the publication day. The premiums are to Singapore paper swaps for the front month in Rim Singapore paper swaps assessment.  |            |             |                 |  |  |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                              |  |                |         |            |        |           |       |          |
| <b>Standard Size</b>                     | FOB Singapore spot gasoil prices are for MR-size cargoes, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were with the standard volumes.  |            |             |                 |  |  |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                              |  |                |         |            |        |           |       |          |
| <b>Delivery Port</b>                     | FOB Singapore spot gasoil prices are for cargoes to be loaded at major ports in Singapore.   |            |             |                 |  |  |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                              |  |                |         |            |        |           |       |          |
| <b>Quality Specifications</b>            | <p>FOB Singapore spot gasoil prices are for cargoes of which quality is equivalent to the following specifications.</p> <table border="1"> <tr> <td>Flash Point</td> <td colspan="2">Min 50 degree C</td> </tr> <tr> <td>Distillation Temperature; 90% evaporated</td> <td colspan="2">Max 360 degree C</td> </tr> <tr> <td>Pour Point</td> <td colspan="2">Max 5 degree C</td> </tr> <tr> <td>Cold Filter Plugging Point</td> <td colspan="2">Max -1 degree C</td> </tr> <tr> <td>Carbon Residue (10% btms)</td> <td colspan="2">Max 0.1%</td> </tr> <tr> <td>Cetane Index</td> <td colspan="2">Min 48</td> </tr> <tr> <td>Kinematic Viscosity at 40 degree C</td> <td colspan="2">Max 4.5 mm<sup>2</sup>/sec</td> </tr> <tr> <td rowspan="3">Sulfur Content</td> <td>0.001%S</td> <td>Max 0.001%</td> </tr> <tr> <td>0.05%S</td> <td>Max 0.05%</td> </tr> <tr> <td>0.5%S</td> <td>Max 0.5%</td> </tr> </table> <p>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> |            | Flash Point | Min 50 degree C |  | Distillation Temperature; 90% evaporated | Max 360 degree C |  | Pour Point | Max 5 degree C |  | Cold Filter Plugging Point | Max -1 degree C |  | Carbon Residue (10% btms) | Max 0.1% |  | Cetane Index | Min 48 |  | Kinematic Viscosity at 40 degree C | Max 4.5 mm <sup>2</sup> /sec |  | Sulfur Content | 0.001%S | Max 0.001% | 0.05%S | Max 0.05% | 0.5%S | Max 0.5% |
| Flash Point                              | Min 50 degree C  |            |             |                 |  |  |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                              |  |                |         |            |        |           |       |          |
| Distillation Temperature; 90% evaporated | Max 360 degree C   |            |             |                 |  |  |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                              |  |                |         |            |        |           |       |          |
| Pour Point                               | Max 5 degree C   |            |             |                 |  |  |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                              |  |                |         |            |        |           |       |          |
| Cold Filter Plugging Point               | Max -1 degree C  |            |             |                 |  |  |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                              |  |                |         |            |        |           |       |          |
| Carbon Residue (10% btms)                | Max 0.1%   |            |             |                 |  |  |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                              |  |                |         |            |        |           |       |          |
| Cetane Index                             | Min 48   |            |             |                 |  |  |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                              |  |                |         |            |        |           |       |          |
| Kinematic Viscosity at 40 degree C       | Max 4.5 mm <sup>2</sup> /sec   |            |             |                 |  |  |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                              |  |                |         |            |        |           |       |          |
| Sulfur Content                           | 0.001%S  | Max 0.001% |             |                 |  |  |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                              |  |                |         |            |        |           |       |          |
|  | 0.05%S   | Max 0.05%  |             |                 |  |  |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                              |  |                |         |            |        |           |       |          |
|  | 0.5%S  | Max 0.5%   |             |                 |  |  |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                              |  |                |         |            |        |           |       |          |



**<Fuel Oil>**

Rim assesses FOB Singapore spot fuel oil prices for the following grades; 180cst HSFO (3.5% sulfur) and 380cst HSFO (3.5% sulfur). The premiums are to periodical average of daily assessments for FOB Singapore spot 180cst HSFO (3.5% sulfur) prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula: Premium + Value of Singapore Paper Swaps = Fixed Value

|                               |   |                 |                |      |          |             |            |                 |            |            |                 |                |        |         |        |         |               |            |          |             |            |          |
|-------------------------------|---|-----------------|----------------|------|----------|-------------|------------|-----------------|------------|------------|-----------------|----------------|--------|---------|--------|---------|---------------|------------|----------|-------------|------------|----------|
| <b>Assessment Window</b>      | Rim's assessment window for FOB Singapore spot fuel oil prices closes at 6:30 PM Tokyo time.  |                 |                |      |          |             |            |                 |            |            |                 |                |        |         |        |         |               |            |          |             |            |          |
| <b>Price Unit</b>             | FOB Singapore spot fuel oil prices are in \$/mt.  |                 |                |      |          |             |            |                 |            |            |                 |                |        |         |        |         |               |            |          |             |            |          |
| <b>Time Window</b>            | FOB Singapore spot fuel oil prices are for cargoes to be loaded during the period from 20 to 35 days ahead from the publication day. The premiums are to Singapore paper swaps for the front month in Rim Singapore paper swaps assessment.   |                 |                |      |          |             |            |                 |            |            |                 |                |        |         |        |         |               |            |          |             |            |          |
| <b>Standard Size</b>          | FOB Singapore spot fuel oil prices are for MR-size cargoes, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were with the standard volumes.   |                 |                |      |          |             |            |                 |            |            |                 |                |        |         |        |         |               |            |          |             |            |          |
| <b>Delivery Port</b>          | FOB Singapore spot fuel oil prices are for cargoes to be loaded at major ports in Singapore.  |                 |                |      |          |             |            |                 |            |            |                 |                |        |         |        |         |               |            |          |             |            |          |
| <b>Quality Specifications</b> | <p>FOB Singapore spot fuel oil prices are for cargoes of which quality is equivalent to the following specifications.</p> <table border="1"> <tr> <td>Sulfur Content</td> <td>HSFO</td> <td>Max 3.5%</td> </tr> <tr> <td>Flash Point</td> <td>All Grades</td> <td>Min 66 degree C</td> </tr> <tr> <td>Pour Point</td> <td>All Grades</td> <td>Max 24 degree C</td> </tr> <tr> <td rowspan="2">Carbon Residue</td> <td>180cst</td> <td>Max 16%</td> </tr> <tr> <td>380cst</td> <td>Max 18%</td> </tr> <tr> <td>Water Content</td> <td>All Grades</td> <td>Max 0.5%</td> </tr> <tr> <td>Ash Content</td> <td>All Grades</td> <td>Max 0.1%</td> </tr> </table> <p>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> |                 | Sulfur Content | HSFO | Max 3.5% | Flash Point | All Grades | Min 66 degree C | Pour Point | All Grades | Max 24 degree C | Carbon Residue | 180cst | Max 16% | 380cst | Max 18% | Water Content | All Grades | Max 0.5% | Ash Content | All Grades | Max 0.1% |
| Sulfur Content                | HSFO  | Max 3.5%        |                |      |          |             |            |                 |            |            |                 |                |        |         |        |         |               |            |          |             |            |          |
| Flash Point                   | All Grades  | Min 66 degree C |                |      |          |             |            |                 |            |            |                 |                |        |         |        |         |               |            |          |             |            |          |
| Pour Point                    | All Grades  | Max 24 degree C |                |      |          |             |            |                 |            |            |                 |                |        |         |        |         |               |            |          |             |            |          |
| Carbon Residue                | 180cst  | Max 16%         |                |      |          |             |            |                 |            |            |                 |                |        |         |        |         |               |            |          |             |            |          |
|                               | 380cst  | Max 18%         |                |      |          |             |            |                 |            |            |                 |                |        |         |        |         |               |            |          |             |            |          |
| Water Content                 | All Grades  | Max 0.5%        |                |      |          |             |            |                 |            |            |                 |                |        |         |        |         |               |            |          |             |            |          |
| Ash Content                   | All Grades  | Max 0.1%        |                |      |          |             |            |                 |            |            |                 |                |        |         |        |         |               |            |          |             |            |          |



## **Rim FOB South Korea Oil Products Price Assessment Methodology**

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### **Price Assessment Principle**

**Rim price assessments indicate the current range in which a standard spot transaction could take place on the day of publication.**

**Rim understands values of commodities change even in the absence of deals. Rim defines prices as measures to indicate fluctuating values of commodities.**

**Rim understands values of commodities are determined by a variety of factors such as supply-demand fundamentals, production costs, conditions in other markets and players' speculation.**

**Rim understands the latest transactions, bids/offers and buying/selling interest represent current values of commodities.**

**Rim understands values of commodities are determined by competition among sellers and competition among buyers. Rim considers higher bids to be closer to the current values than lower bids. Rim considers lower offers to be the closer to current values than higher offers.**

**Rim understands prices for each transaction reported from any party are to be translated into prices based on standard terms and conditions such as cargo sizes, timing of delivery or loading, product specifications and payment terms**

**FOB SOUTH KOREA SPOT PRICES**

Rim assesses FOB South Korea spot prices for MR-size cargoes and small-tanker cargoes (5,000-6,000mt). Grades that are assessed are as follows:

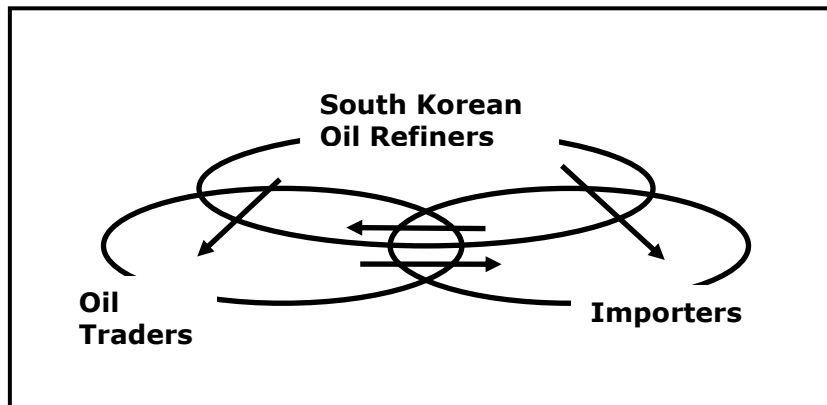
| <b>MR-size cargo</b>                | <b>Small tanker cargo</b> |
|-------------------------------------|---------------------------|
| 92RON gasoline                      | 91RON gasoline            |
| 92RON gasoline for blending purpose | Kerosene                  |
| Jet/Kerosene                        | Gasoil-0.001%S            |
| Gasoil-0.001%S                      | A-fuel oil                |
| Gasoil-0.05%S                       | LS A-fuel oil             |
| Gasoil-0.2%S                        | LSFO-0.3%S                |
| Gasoil-0.5%S                        |                           |
| Fuel oil-3.5%S (380cst)             |                           |
| LSFO-0.3%S                          |                           |

In the absence of information of deals, bids and offers on a fixed price basis, the fixed price assessments indicate the price range in which a transaction on a floating price basis could be locked into with available derivative products, such as futures contracts and paper swaps based on periodical average of published quotations.

All prices are assessed based on information collected in the course of market research by Rim reporters each business day.

<MR-size Cargo Price Assessment>

**STRUCTURE of the FOB SOUTH KOREA MR-size CARGO MARKET**



Rim understands that the FOB South Korea MR-size cargo oil products market is structured with three groups of business parties: South Korean oil refiners, Oil traders and Importers. Rim assesses FOB South Korea MR-size cargo prices at which a standard spot transaction could take place.



**Rim defines the three business parties in the FOB South Korea oil products market as follows:**

|                             |   |
|-----------------------------|---|
| <b>South Korean Refiner</b> | A company of South Korea that produces and exports oil products at/from its refining facilities in South Korea.   |
| <b>Oil Trader</b>           | A company that buys and sells oil products in the international market.   |
| <b>Importer</b>             | A company that imports oil products and resell into domestic markets. Refiners of countries other than South Korea are also considered to be importers. |

**Rim defines a standard FOB South Korea MR-size cargo spot market transaction as follows:**

|        |   |
|--------|---|
| Case 1 | A South Korean refiner sells an oil products cargo to a trader on a spot basis.                     |
| Case 2 | A South Korean refiner sells an oil products cargo to an importer on a spot basis.                  |
| Case 3 | A South Korean refiner sells an oil products cargo to another South Korean refiner on a spot basis. |
| Case 4 | A trader sells an oil products cargo to a South Korean refiner on a spot basis.                     |
| Case 5 | A trader sells an oil products cargo to an importer on a spot basis.                                |
| Case 6 | A trader sells an oil products cargo to another trader on a spot basis.                             |
| Case 7 | An importer sells an oil products cargo to a South Korean refiner on a spot basis.                  |
| Case 8 | An importer sells an oil products cargo to a trader on a spot basis.                                |
| Case 9 | An importer sells an oil products cargo to another importer on a spot basis.                        |



**<Gasoline>**

Rim assesses FOB South Korea spot gasoline prices for MR-size cargoes of the 92 research octane number grade (For car fuel and for Blending). The premiums are to periodical average of daily assessments for FOB Singapore spot 92RON gasoline prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula:  
 Premium + Value of Singapore 92RON Gasoline Prices = Fixed Value

|                                    |   |                  |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
|------------------------------------|---|------------------|----------------|------------------------|----------------------|--------------------------|----------------|-----------------|----------------|------------------|----------------|------------------|---------------------|------------------|---------|----------|------------------------------------|-------|----------------|---|---------------------------------|-------------------|--------------|---------------|-----------------|--------|-------|--------|
| <b>Assessment Window</b>           | Rim's assessment window for FOB South Korea spot gasoline prices for MR-size cargoes closes at 6:30 PM Tokyo local time.  |                  |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
| <b>Price Unit</b>                  | FOB South Korea spot gasoline prices for MR-size cargoes are in \$/bbl.   |                  |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
| <b>Time Window</b>                 | FOB South Korea spot gasoline prices for MR-size cargoes are for cargoes to be loaded during the period from 25 to 40 days ahead from the publication day. The premiums are to Singapore 92RON gasoline prices in Rim Singapore physical cargoes assessment.  |                  |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
| <b>Standard Size</b>               | FOB South Korea spot gasoline prices for MR-size cargoes are for cargoes with a 25,000-35,000mt lot, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were with the standard volumes.  |                  |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
| <b>Loading Port</b>                | FOB South Korea spot gasoline prices for MR-size cargoes are for cargoes to be loaded at major ports in South Korea.  |                  |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
| <b>Quality Specifications</b>      | <p>FOB South Korea spot gasoline prices for MR-size cargoes are for cargoes of which quality is equivalent to the following specifications.</p> <table border="1"> <tr> <td>Lead Content</td> <td>Max 0.013gpb/l</td> </tr> <tr> <td>Density at 15 degree C</td> <td>Min 0.72~0.74 mg/cm3</td> </tr> <tr> <td rowspan="5">Distillation Temperature</td> <td>10% evaporated</td> <td>Max 70 degree C</td> </tr> <tr> <td>50% evaporated</td> <td>Max 125 degree C</td> </tr> <tr> <td>90% evaporated</td> <td>Max 175 degree C</td> </tr> <tr> <td>Final Boiling Point</td> <td>Max 225 degree C</td> </tr> <tr> <td>Residue</td> <td>Max 2.0%</td> </tr> <tr> <td>Copper Corrosion 3h at 50 degree C</td> <td>Max 1</td> </tr> <tr> <td>Sulfur Content</td> <td>Max 0.05% (Car fuel)<br/>Max 0.001% (Blending)</td> </tr> <tr> <td>Vapor Pressure at 37.8 degree C</td> <td>0.45-0.80 Kgf/cm2</td> </tr> <tr> <td>Existent Gum</td> <td>Max 5mg/100ml</td> </tr> <tr> <td>Benzene Content</td> <td>Max 1%</td> </tr> <tr> <td>Color</td> <td>Yellow</td> </tr> </table> <p>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> | Lead Content     | Max 0.013gpb/l | Density at 15 degree C | Min 0.72~0.74 mg/cm3 | Distillation Temperature | 10% evaporated | Max 70 degree C | 50% evaporated | Max 125 degree C | 90% evaporated | Max 175 degree C | Final Boiling Point | Max 225 degree C | Residue | Max 2.0% | Copper Corrosion 3h at 50 degree C | Max 1 | Sulfur Content | Max 0.05% (Car fuel)<br>Max 0.001% (Blending) | Vapor Pressure at 37.8 degree C | 0.45-0.80 Kgf/cm2 | Existent Gum | Max 5mg/100ml | Benzene Content | Max 1% | Color | Yellow |
| Lead Content                       | Max 0.013gpb/l  |                  |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
| Density at 15 degree C             | Min 0.72~0.74 mg/cm3  |                  |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
| Distillation Temperature           | 10% evaporated  | Max 70 degree C  |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
|                                    | 50% evaporated  | Max 125 degree C |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
|                                    | 90% evaporated  | Max 175 degree C |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
|                                    | Final Boiling Point   | Max 225 degree C |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
|                                    | Residue   | Max 2.0%         |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
| Copper Corrosion 3h at 50 degree C | Max 1   |                  |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
| Sulfur Content                     | Max 0.05% (Car fuel)<br>Max 0.001% (Blending)   |                  |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
| Vapor Pressure at 37.8 degree C    | 0.45-0.80 Kgf/cm2   |                  |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
| Existent Gum                       | Max 5mg/100ml   |                  |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
| Benzene Content                    | Max 1%  |                  |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |
| Color                              | Yellow  |                  |                |                        |                      |                          |                |                 |                |                  |                |                  |                     |                  |         |          |                                    |       |                |   |                                 |                   |              |               |                 |        |       |        |



**<Jet/Kerosene>**

Rim assesses FOB South Korea spot A1 jet fuel/kerosene prices for MR-size cargoes. The premiums are to periodical average of daily assessments for FOB Singapore spot A1 jet fuel prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula: Premium + Value of Singapore Paper Swaps = Fixed Value

|                               |  |                  |
|-------------------------------|--|------------------|
| <b>Assessment Window</b>      | Rim's assessment window for FOB South Korea spot jet/kerosene prices for MR-size cargoes closes at 6:30 PM Tokyo local time.   |                  |
| <b>Price Unit</b>             | FOB South Korea spot jet/kerosene prices for MR-size cargoes are in \$/bbl.  |                  |
| <b>Time Window</b>            | FOB South Korea spot jet/kerosene prices for MR-size cargoes are for cargoes to be loaded during the period from 25 to 40 days ahead from the publication day. The premiums are to Singapore paper swaps for the front month in Rim Singapore paper swaps assessment.                            |                  |
| <b>Standard Size</b>          | FOB South Korea spot jet/kerosene prices for MR-size cargoes are for cargoes with a 25,000-35,000mt lot, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were within the standard volumes. |                  |
| <b>Delivery Port</b>          | FOB South Korea spot jet/kerosene prices for MR-size cargoes are for cargoes to be loaded at major ports in South Korea.   |                  |
| <b>Quality Specifications</b> | FOB South Korea spot jet/Kerosene prices for MR-size cargoes are for cargoes of which quality is equivalent to the Joint Fuel System Check List, also known as Jet A-1 Check List. The JFSCL is issued by International Air Transport Association.   |                  |
|                               | Distillation Temperature;<br>Initial Boiling Point<br>10% Evaporated   | Max 205 degree C |
|                               | Flash Point  | Max 40 degree C  |
|                               | Sulfur Content   | Max 0.3%         |
|                               | Smoke Point with naphthalene content<br>of maximum 3.0%  | Minimum 19       |
|                               | Copper corrosion 2h at 100 degree C  | Maximum 1.0      |
|                               | Saybolt color  | Minimum 18       |
|                               | Extract from IATA's JFSCL  |                  |
|                               | *Specifications for other properties are to meet specifications that are commonly required in international trading.   |                  |



**<Gasoil>**

Rim assesses FOB South Korea spot gasoil prices for MR-size cargoes of the grades with a sulfur content of 0.001%, 0.05%, 0.2% and 0.5%. The premiums are to periodical average of daily assessments for FOB Singapore spot (0.05% sulfur) prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula:  
 Premium + Value of Singapore Paper Swaps = Fixed Value

|   |   |             |                 |   |                  |            |                |                            |                 |                           |          |              |        |                                    |                 |                |         |            |        |           |       |          |       |          |
|---|---|-------------|-----------------|---|------------------|------------|----------------|----------------------------|-----------------|---------------------------|----------|--------------|--------|------------------------------------|-----------------|----------------|---------|------------|--------|-----------|-------|----------|-------|----------|
| <b>Assessment Window</b>                    | Rim's assessment window for FOB South Korea spot gasoil prices for MR-size cargoes closes at 6:30 PM Tokyo local time.  |             |                 |   |                  |            |                |                            |                 |                           |          |              |        |                                    |                 |                |         |            |        |           |       |          |       |          |
| <b>Price Unit</b>                           | FOB South Korea spot gasoil prices for MR-size cargoes are in \$/bbl.   |             |                 |   |                  |            |                |                            |                 |                           |          |              |        |                                    |                 |                |         |            |        |           |       |          |       |          |
| <b>Time Window</b>                          | FOB South Korea spot gasoil prices for MR-size cargoes are for cargoes to be loaded during the period from 25 to 40 days ahead from the publication day. The premiums are to Singapore paper swaps for the front month in Rim Singapore paper swaps assessment.   |             |                 |   |                  |            |                |                            |                 |                           |          |              |        |                                    |                 |                |         |            |        |           |       |          |       |          |
| <b>Standard Size</b>                        | FOB South Korea spot gasoil prices for MR-size cargoes are for cargoes with a 25,000-35,000mt lot, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were within the standard volumes.  |             |                 |   |                  |            |                |                            |                 |                           |          |              |        |                                    |                 |                |         |            |        |           |       |          |       |          |
| <b>Loading Port</b>                         | FOB South Korea spot gasoil prices for MR-size cargoes are for cargoes to be loaded at major ports in South Korea.  |             |                 |   |                  |            |                |                            |                 |                           |          |              |        |                                    |                 |                |         |            |        |           |       |          |       |          |
| <b>Quality Specifications</b>               | <p>FOB South Korea spot gasoil prices for MR-size cargoes are for cargoes of which quality is equivalent to the following specifications.</p> <table border="1"> <tr> <td>Flash Point</td> <td>Min 50 degree C</td> </tr> <tr> <td>Distillation Temperature;<br/>90% evaporated</td> <td>Max 360 degree C</td> </tr> <tr> <td>Pour Point</td> <td>Max 5 degree C</td> </tr> <tr> <td>Cold Filter Plugging Point</td> <td>Max -1 degree C</td> </tr> <tr> <td>Carbon Residue (10% btms)</td> <td>Max 0.1%</td> </tr> <tr> <td>Cetane Index</td> <td>Min 48</td> </tr> <tr> <td>Kinematic Viscosity at 40 degree C</td> <td>Max 4.5 mm2/sec</td> </tr> <tr> <td rowspan="4">Sulfur Content</td> <td>0.001%S</td> <td>Max 0.001%</td> </tr> <tr> <td>0.05%S</td> <td>Max 0.05%</td> </tr> <tr> <td>0.2%S</td> <td>Max 0.2%</td> </tr> <tr> <td>0.5%S</td> <td>Max 0.5%</td> </tr> </table> <p>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> | Flash Point | Min 50 degree C | Distillation Temperature;<br>90% evaporated | Max 360 degree C | Pour Point | Max 5 degree C | Cold Filter Plugging Point | Max -1 degree C | Carbon Residue (10% btms) | Max 0.1% | Cetane Index | Min 48 | Kinematic Viscosity at 40 degree C | Max 4.5 mm2/sec | Sulfur Content | 0.001%S | Max 0.001% | 0.05%S | Max 0.05% | 0.2%S | Max 0.2% | 0.5%S | Max 0.5% |
| Flash Point                                 | Min 50 degree C   |             |                 |   |                  |            |                |                            |                 |                           |          |              |        |                                    |                 |                |         |            |        |           |       |          |       |          |
| Distillation Temperature;<br>90% evaporated | Max 360 degree C  |             |                 |   |                  |            |                |                            |                 |                           |          |              |        |                                    |                 |                |         |            |        |           |       |          |       |          |
| Pour Point                                  | Max 5 degree C  |             |                 |   |                  |            |                |                            |                 |                           |          |              |        |                                    |                 |                |         |            |        |           |       |          |       |          |
| Cold Filter Plugging Point                  | Max -1 degree C   |             |                 |   |                  |            |                |                            |                 |                           |          |              |        |                                    |                 |                |         |            |        |           |       |          |       |          |
| Carbon Residue (10% btms)                   | Max 0.1%  |             |                 |   |                  |            |                |                            |                 |                           |          |              |        |                                    |                 |                |         |            |        |           |       |          |       |          |
| Cetane Index                                | Min 48  |             |                 |   |                  |            |                |                            |                 |                           |          |              |        |                                    |                 |                |         |            |        |           |       |          |       |          |
| Kinematic Viscosity at 40 degree C          | Max 4.5 mm2/sec   |             |                 |   |                  |            |                |                            |                 |                           |          |              |        |                                    |                 |                |         |            |        |           |       |          |       |          |
| Sulfur Content                              | 0.001%S   | Max 0.001%  |                 |   |                  |            |                |                            |                 |                           |          |              |        |                                    |                 |                |         |            |        |           |       |          |       |          |
|   | 0.05%S  | Max 0.05%   |                 |   |                  |            |                |                            |                 |                           |          |              |        |                                    |                 |                |         |            |        |           |       |          |       |          |
|   | 0.2%S   | Max 0.2%    |                 |   |                  |            |                |                            |                 |                           |          |              |        |                                    |                 |                |         |            |        |           |       |          |       |          |
|   | 0.5%S   | Max 0.5%    |                 |   |                  |            |                |                            |                 |                           |          |              |        |                                    |                 |                |         |            |        |           |       |          |       |          |



**<Fuel Oil>**

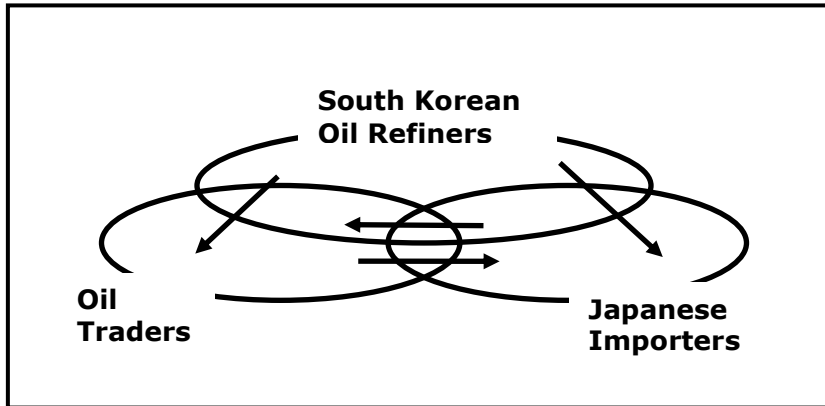
**Rim assesses FOB South Korea spot fuel oil prices for MR-size cargoes of the two grades; 380cst HSFO with a sulfur content of less than 3.5% and 180cst LSFO with a sulfur content of less than 0.3%. The premiums for HSFO are to periodical average of daily assessments for FOB Singapore spot 380cst HSFO (3.5% sulfur) prices and those for LSFO are to periodical average of daily assessments for FOB Singapore spot 180cst HSFO (3.5% sulfur) prices**

**Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula:** Premium + Value of Singapore Paper Swaps = Fixed Value

|                                    |   |                 |                |      |          |      |          |             |            |                 |                                    |            |            |            |            |                 |                |            |         |               |            |          |             |            |          |
|------------------------------------|---|-----------------|----------------|------|----------|------|----------|-------------|------------|-----------------|------------------------------------|------------|------------|------------|------------|-----------------|----------------|------------|---------|---------------|------------|----------|-------------|------------|----------|
| <b>Assessment Window</b>           | Rim’s assessment window for FOB South Korea spot fuel oil prices for MR-size cargoes closes at 6:30 PM Tokyo local time.  |                 |                |      |          |      |          |             |            |                 |                                    |            |            |            |            |                 |                |            |         |               |            |          |             |            |          |
| <b>Price Unit</b>                  | FOB South Korea spot fuel oil prices for MR-size cargoes are in \$/mt.  |                 |                |      |          |      |          |             |            |                 |                                    |            |            |            |            |                 |                |            |         |               |            |          |             |            |          |
| <b>Time Window</b>                 | FOB South Korea spot fuel oil prices for MR-size cargoes are for cargoes to be loaded during the period from 25 to 40 days ahead from the publication day. The premiums are to Singapore paper swaps (380cst 3.5%S HSFO) for the front month in Rim Singapore paper swaps assessment.   |                 |                |      |          |      |          |             |            |                 |                                    |            |            |            |            |                 |                |            |         |               |            |          |             |            |          |
| <b>Standard Size</b>               | FOB South Korea spot fuel oil prices for MR-size cargoes are for cargoes with a 25,000-35,000mt lot, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were within the standard volumes.  |                 |                |      |          |      |          |             |            |                 |                                    |            |            |            |            |                 |                |            |         |               |            |          |             |            |          |
| <b>Loading Port</b>                | FOB South Korea spot fuel oil prices for MR-size cargoes are for cargoes to be loaded at major ports in South Korea.  |                 |                |      |          |      |          |             |            |                 |                                    |            |            |            |            |                 |                |            |         |               |            |          |             |            |          |
| <b>Quality Specifications</b>      | <p>FOB South Korea spot fuel oil prices for MR-size cargoes are for cargoes of which quality is equivalent to the following specifications.</p> <table border="1"> <tr> <td rowspan="2">Sulfur Content</td> <td>HSFO</td> <td>Max 3.5%</td> </tr> <tr> <td>LSFO</td> <td>Max 0.3%</td> </tr> <tr> <td>Flash Point</td> <td>All Grades</td> <td>Min 66 degree C</td> </tr> <tr> <td>Kinematic Viscosity at 50 degree C</td> <td>All Grades</td> <td>Max 180cst</td> </tr> <tr> <td>Pour Point</td> <td>All Grades</td> <td>Max 24 degree C</td> </tr> <tr> <td>Carbon Residue</td> <td>All Grades</td> <td>Max 16%</td> </tr> <tr> <td>Water Content</td> <td>All Grades</td> <td>Max 0.5%</td> </tr> <tr> <td>Ash Content</td> <td>All Grades</td> <td>Max 0.1%</td> </tr> </table> <p>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> |                 | Sulfur Content | HSFO | Max 3.5% | LSFO | Max 0.3% | Flash Point | All Grades | Min 66 degree C | Kinematic Viscosity at 50 degree C | All Grades | Max 180cst | Pour Point | All Grades | Max 24 degree C | Carbon Residue | All Grades | Max 16% | Water Content | All Grades | Max 0.5% | Ash Content | All Grades | Max 0.1% |
| Sulfur Content                     | HSFO  | Max 3.5%        |                |      |          |      |          |             |            |                 |                                    |            |            |            |            |                 |                |            |         |               |            |          |             |            |          |
|                                    | LSFO  | Max 0.3%        |                |      |          |      |          |             |            |                 |                                    |            |            |            |            |                 |                |            |         |               |            |          |             |            |          |
| Flash Point                        | All Grades  | Min 66 degree C |                |      |          |      |          |             |            |                 |                                    |            |            |            |            |                 |                |            |         |               |            |          |             |            |          |
| Kinematic Viscosity at 50 degree C | All Grades  | Max 180cst      |                |      |          |      |          |             |            |                 |                                    |            |            |            |            |                 |                |            |         |               |            |          |             |            |          |
| Pour Point                         | All Grades  | Max 24 degree C |                |      |          |      |          |             |            |                 |                                    |            |            |            |            |                 |                |            |         |               |            |          |             |            |          |
| Carbon Residue                     | All Grades  | Max 16%         |                |      |          |      |          |             |            |                 |                                    |            |            |            |            |                 |                |            |         |               |            |          |             |            |          |
| Water Content                      | All Grades  | Max 0.5%        |                |      |          |      |          |             |            |                 |                                    |            |            |            |            |                 |                |            |         |               |            |          |             |            |          |
| Ash Content                        | All Grades  | Max 0.1%        |                |      |          |      |          |             |            |                 |                                    |            |            |            |            |                 |                |            |         |               |            |          |             |            |          |

<Small-Tanker Cargo Price Assessment>

**STRUCTURE of the FOB SOUTH KOREA Small-tanker CARGO MARKET**



Rim understands that the FOB South Korea small-tanker cargo oil products market is structured with three groups of business parties: South Korean oil refiners, Oil traders and Japanese importers. Rim assesses FOB South Korea small-tanker cargo prices at which a standard spot transaction could take place.

Rim defines the three business parties in the FOB South Korea oil products market as follows:

|                             |  |
|-----------------------------|--|
| <b>South Korean Refiner</b> | A company of South Korea that produces and exports oil products at/from its refining facilities in South Korea.      |
| <b>Oil Trader</b>           | A company that buys and sells oil products in the international market.  |
| <b>Japanese Importer</b>    | A Japanese company, such as trading houses and refiners, that imports oil products and resell into domestic markets. |

Rim defines a standard FOB South Korea small-tanker cargo spot market transaction as follows:

|        |   |
|--------|---|
| Case 1 | A South Korean refiner sells an oil products cargo to a trader on a spot basis.                     |
| Case 2 | A South Korean refiner sells an oil products cargo to a Japanese importer on a spot basis.          |
| Case 3 | A South Korean refiner sells an oil products cargo to another South Korean refiner on a spot basis. |
| Case 4 | A trader sells an oil products cargo to a South Korean refiner on a spot basis.                     |
| Case 5 | A trader sells an oil products cargo to a Japanese importer on a spot basis.                        |
| Case 6 | A trader sells an oil products cargo to another trader on a spot basis.                             |
| Case 7 | A Japanese importer sells an oil products cargo to a South Korean refiner on a spot basis.          |
| Case 8 | A Japanese importer sells an oil products cargo to a trader on a spot basis.                        |
| Case 9 | A Japanese importer sells an oil products cargo to another Japanese importer on a spot basis.       |



**<CFR Japan Equivalent Values>**

Rim indicates CFR Japan equivalent values, based on the small tanker cargo prices and assessment of spot freight rates of a 5,000-6,000mt clean tanker for the South Korea-to-Nagoya route. Rim also makes assessment of spot freight rates for the following routes as reference.

**RIM 5,000-6,000mt Clean Tanker Freight Assessment**

| <b>Benchmark</b>                  | <b>Reference</b>   |
|-----------------------------------|--|
| (South Korea to)<br><b>Nagoya</b> | (South Korea to)<br><b>Tomakomai (Hokkaido, North Japan)</b><br><b>Keihin (Tokyo Bay)</b><br><b>Kanmon (Kyushu, South Japan)</b> |

The CFR Japan equivalent values are calculated into Yen/kl, based on the following formula.

**Gasoline**

CFR Japan Equivalent Value =  
 [(FOB S Korea small-tanker prices) + (Freight)] x (Yen/\$) x 6.2898  
 + (Petroleum tax of Yen 2,540/kl) + (Import duty of Yen 934/kl)

**Kerosene**

CFR Japan Equivalent Value =  
 [(FOB S Korea small-tanker prices) + (Freight)] x (Yen/\$) x 6.2898  
 + (Petroleum tax of Yen 2,540/kl) + (Import duty of Yen 346/kl)

**Gasoil**

CFR Japan Equivalent Value =  
 [(FOB S Korea small-tanker prices) + (Freight)] x (Yen/\$) x 6.2898  
 + (Petroleum tax of Yen 2,540/kl) + (Import duty of Yen 750/kl)

**A-fuel oil**

CFR Japan Equivalent Value =  
 [(FOB S Korea small-tanker prices) + (Freight)] x (Yen/\$) x 6.2898

**<Gasoline>**

**Rim assesses FOB South Korea spot gasoline prices for small-tanker cargoes of the 91 research octane number grade. The premiums are to periodical average of daily assessments for FOB Singapore spot 92RON gasoline prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula: Premium + Value of Singapore 92RON Gasoline Prices = Fixed Value**

|                                    |  |                  |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
|------------------------------------|--|------------------|----------------|------------------------|------------------|---------------------------|----------------|-----------------|-----|-----------------|-----|------------------|---------------------|------------------|---------|----------|------------------------------------|-------|----------------|------------|---------------------------------|-------------------|--------------|---------------|-----------------|--------|-------|----------------|
| <b>Assessment Window</b>           | Rim's assessment window for FOB South Korea spot gasoline prices for small-tanker cargoes closes at 6:30 PM Tokyo local time.  |                  |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
| <b>Price Unit</b>                  | FOB South Korea spot gasoline prices for small-tanker cargoes are in \$/bbl.   |                  |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
| <b>Time Window</b>                 | FOB South Korea spot gasoline prices for small-tanker cargoes are for cargoes to be loaded during the period from 20 to 35 days ahead from the publication day. The premiums are to Singapore 92RON gasoline prices in Rim Singapore physical cargoes assessment.  |                  |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
| <b>Standard Size</b>               | FOB South Korea spot gasoline prices for small-tanker cargoes are for cargoes with a 5,000-6,000mt lot, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were with the standard volumes.  |                  |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
| <b>Loading Port</b>                | FOB South Korea spot gasoline prices for small-tanker cargoes are for cargoes to be loaded at major ports in South Korea.  |                  |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
| <b>Quality Specifications</b>      | <p>FOB South Korea spot gasoline prices for small-tanker cargoes are for cargoes of which quality is equivalent to the Japan Industrial Standard (JIS) K-2202 specification. The research octane number for gasoline that Rim assesses is greater than 91 and MTBE content of nil, levels that are widely accepted in Japan's oil industry as the standard.</p> <table border="1"> <tr> <td>Lead Content</td> <td>Max 0.013gpb/l</td> </tr> <tr> <td>Density at 15 degree C</td> <td>Min 0.783 mg/cm3</td> </tr> <tr> <td rowspan="5">Distillation Temperature;</td> <td>10% evaporated</td> <td>Max 70 degree C</td> </tr> <tr> <td>50%</td> <td>75-110 degree C</td> </tr> <tr> <td>90%</td> <td>Max 180 degree C</td> </tr> <tr> <td>Final Boiling Point</td> <td>Max 220 degree C</td> </tr> <tr> <td>Residue</td> <td>Max 2.0%</td> </tr> <tr> <td>Copper Corrosion 3h at 50 degree C</td> <td>Max 1</td> </tr> <tr> <td>Sulfur Content</td> <td>Max 0.001%</td> </tr> <tr> <td>Vapor Pressure at 37.8 degree C</td> <td>0.45-0.80 Kgf/cm2</td> </tr> <tr> <td>Existent Gum</td> <td>Max 5mg/100ml</td> </tr> <tr> <td>Benzene Content</td> <td>Max 1%</td> </tr> <tr> <td>Color</td> <td>Undyed, orange</td> </tr> </table> <p>Extract from JIS K-2202<br/> *Specifications for other properties are to meet specifications that are commonly required in international trading.</p> | Lead Content     | Max 0.013gpb/l | Density at 15 degree C | Min 0.783 mg/cm3 | Distillation Temperature; | 10% evaporated | Max 70 degree C | 50% | 75-110 degree C | 90% | Max 180 degree C | Final Boiling Point | Max 220 degree C | Residue | Max 2.0% | Copper Corrosion 3h at 50 degree C | Max 1 | Sulfur Content | Max 0.001% | Vapor Pressure at 37.8 degree C | 0.45-0.80 Kgf/cm2 | Existent Gum | Max 5mg/100ml | Benzene Content | Max 1% | Color | Undyed, orange |
| Lead Content                       | Max 0.013gpb/l   |                  |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
| Density at 15 degree C             | Min 0.783 mg/cm3   |                  |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
| Distillation Temperature;          | 10% evaporated   | Max 70 degree C  |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
|                                    | 50%  | 75-110 degree C  |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
|                                    | 90%  | Max 180 degree C |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
|                                    | Final Boiling Point  | Max 220 degree C |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
|                                    | Residue  | Max 2.0%         |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
| Copper Corrosion 3h at 50 degree C | Max 1  |                  |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
| Sulfur Content                     | Max 0.001%   |                  |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
| Vapor Pressure at 37.8 degree C    | 0.45-0.80 Kgf/cm2  |                  |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
| Existent Gum                       | Max 5mg/100ml  |                  |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
| Benzene Content                    | Max 1%   |                  |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |
| Color                              | Undyed, orange   |                  |                |                        |                  |                           |                |                 |     |                 |     |                  |                     |                  |         |          |                                    |       |                |            |                                 |                   |              |               |                 |        |       |                |

<Kerosene>

Rim assesses FOB South Korea spot kerosene prices for small-tanker cargoes. The premiums are to periodical average of daily assessments for FOB Singapore spot A1 jet fuel prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula: Premium + Value of Singapore Paper Swaps = Fixed Value

|   |   |             |                 |   |                  |                |            |             |          |                                    |       |
|---|---|-------------|-----------------|---|------------------|----------------|------------|-------------|----------|------------------------------------|-------|
| <b>Assessment Window</b>                    | Rim's assessment window for FOB South Korea spot kerosene prices for small-tanker cargoes closes at 6:30 PM Tokyo local time.   |             |                 |   |                  |                |            |             |          |                                    |       |
| <b>Price Unit</b>                           | FOB South Korea spot kerosene prices for small-tanker cargoes are in \$/bbl.  |             |                 |   |                  |                |            |             |          |                                    |       |
| <b>Time Window</b>                          | FOB South Korea spot kerosene prices for small-tanker cargoes are for cargoes to be loaded during the period from 20 to 35 days ahead from the publication day. The premiums are to Singapore paper swaps (A1 jet fuel) for the front month in Rim Singapore paper swaps assessment.  |             |                 |   |                  |                |            |             |          |                                    |       |
| <b>Standard Size</b>                        | FOB South Korea spot kerosene prices for small-tanker cargoes are for cargoes with a 5,000-6,000mt lot, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were within the standard volumes.   |             |                 |   |                  |                |            |             |          |                                    |       |
| <b>Loading Port</b>                         | FOB South Korea spot kerosene prices are for cargoes to be loaded at major ports in South Korea.  |             |                 |   |                  |                |            |             |          |                                    |       |
| <b>Quality Specifications</b>               | <p>FOB South Korea spot kerosene prices for small-tanker cargoes are for cargoes of which quality is equivalent to the Japan Industrial Standard (JIS) K-2203 specification. The Saybolt color scale for kerosene that Rim assesses is greater than 30, a level that is widely accepted in Japan's oil industry as the standard.</p> <table border="1"> <tr> <td>Flash Point</td> <td>Min 40 degree C</td> </tr> <tr> <td>Distillation Temperature;<br/>95% evaporated</td> <td>Max 270 degree C</td> </tr> <tr> <td>Sulfur Content</td> <td>Max 0.005%</td> </tr> <tr> <td>Smoke Point</td> <td>Min 23mm</td> </tr> <tr> <td>Copper Corrosion 3h at 50 degree C</td> <td>Max 1</td> </tr> </table> <p>Extract from JIS K-2203<br/>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> | Flash Point | Min 40 degree C | Distillation Temperature;<br>95% evaporated | Max 270 degree C | Sulfur Content | Max 0.005% | Smoke Point | Min 23mm | Copper Corrosion 3h at 50 degree C | Max 1 |
| Flash Point                                 | Min 40 degree C   |             |                 |   |                  |                |            |             |          |                                    |       |
| Distillation Temperature;<br>95% evaporated | Max 270 degree C  |             |                 |   |                  |                |            |             |          |                                    |       |
| Sulfur Content                              | Max 0.005%  |             |                 |   |                  |                |            |             |          |                                    |       |
| Smoke Point                                 | Min 23mm  |             |                 |   |                  |                |            |             |          |                                    |       |
| Copper Corrosion 3h at 50 degree C          | Max 1   |             |                 |   |                  |                |            |             |          |                                    |       |





**<Gasoil>**

**Rim assesses FOB South Korea spot gasoil prices for small-tanker cargoes of the grade with a sulfur content of 0.001%. The premiums are to periodical average of daily assessments for FOB Singapore spot gasoil (0.05% sulfur) prices by reporting services. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula:  
Premium + Value of Singapore Paper Swaps = Fixed Value**

|                               |   |                              |            |
|-------------------------------|---|------------------------------|------------|
| <b>Assessment Window</b>      | Rim's assessment window for FOB South Korea spot gasoil prices for small-tanker cargoes closes at 6:30 PM Tokyo local time.   |                              |            |
| <b>Price Unit</b>             | FOB South Korea spot gasoil prices for small-tanker cargoes are in \$/bbl.  |                              |            |
| <b>Time Window</b>            | FOB South Korea spot gasoil prices for small-tanker cargoes are for cargoes to be loaded during the period from 20 to 35 days ahead from the publication day. The premiums are to Singapore paper swaps (0.05%S gasoil) for the front month in Rim Singapore paper swaps assessment.          |                              |            |
| <b>Standard Size</b>          | FOB South Korea spot gasoil prices for small-tanker cargoes are for cargoes with a 5,000-6,000mt lot, which RIM considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were within the standard volumes. |                              |            |
| <b>Loading Port</b>           | FOB South Korea spot gasoil prices are for cargoes to be loaded at major ports in South Korea.  |                              |            |
| <b>Quality Specifications</b> | FOB South Korea spot gasoil prices for small-tanker cargoes are for cargoes of which quality is equivalent to the Japan Industrial Standard (JIS) K-2204 specification for No1 and No2 grades.  |                              |            |
|                               | Flash Point   | Min 50 degree C              |            |
|                               | Distillation Temperature;<br>90% evaporated   | Max 360 degree C             |            |
|                               | Pour Point  | Max 5 degree C               |            |
|                               | Cold Filter Plugging Point  | Max -1 degree C              |            |
|                               | Carbon Residue (10% btms)   | Max 0.1%                     |            |
|                               | Cetane Index  | Min 48                       |            |
|                               | Kinematic Viscosity at 40 degree C  | Max 4.5 mm <sup>2</sup> /sec |            |
|                               | Sulfur Content  | 0.001%S                      | Max 0.001% |
|                               | Extract from JIS K-2204<br>*Specifications for other properties are to meet specifications that are commonly required in international trading.   |                              |            |



**<A-Fuel Oil>**

Rim assesses FOB South Korea spot A-fuel oil prices for small-tanker cargoes of the two grades categorized by sulfur content: AFO (with a sulfur content less than 1.0%) and Low-sulfur AFO (with a sulfur content less than 0.1%). The premiums are to periodical average of daily assessments for FOB Singapore spot gasoil (0.05% sulfur) prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula: Premium + Value of Singapore Paper Swaps = Fixed Value

|                                    |   |             |                 |                                    |           |            |                |                |        |               |          |             |           |
|------------------------------------|---|-------------|-----------------|------------------------------------|-----------|------------|----------------|----------------|--------|---------------|----------|-------------|-----------|
| <b>Assessment Window</b>           | Rim's assessment window for FOB South Korea spot A-fuel oil prices for small-tanker cargoes closes at 6:30 PM Tokyo local time.   |             |                 |                                    |           |            |                |                |        |               |          |             |           |
| <b>Price Unit</b>                  | FOB South Korea spot A-fuel oil prices for small-tanker cargoes are in \$/bbl.  |             |                 |                                    |           |            |                |                |        |               |          |             |           |
| <b>Time Window</b>                 | FOB South Korea spot A-fuel oil prices for small-tanker cargoes are for cargoes to be loaded during the period from 20 to 35 days ahead from the publication day. The premiums are to Singapore paper swaps (0.05%S gasoil) for the front month in Rim Singapore paper swaps assessment.  |             |                 |                                    |           |            |                |                |        |               |          |             |           |
| <b>Standard Size</b>               | FOB South Korea spot A-fuel oil prices for small-tanker cargoes are for cargoes with a 5,000-6,000mt lot, which RIM considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were within the standard volumes.   |             |                 |                                    |           |            |                |                |        |               |          |             |           |
| <b>Loading Port</b>                | FOB South Korea spot A-fuel oil prices are for cargoes to be loaded at major ports in South Korea.  |             |                 |                                    |           |            |                |                |        |               |          |             |           |
| <b>Quality Specifications</b>      | <p>FOB South Korea spot A-fuel oil prices for small-tanker cargoes are for cargoes of which quality is equivalent to the Japan Industrial Standard (JIS) K-2205 specification for category 1. The sulfur level for A-fuel that RIM assesses is less than 1.0% for AFO and less than 0.1% for LSAFO, levels that are widely accepted in Japan's oil industry as the standard.</p> <table border="1"> <tr> <td>Flash Point</td> <td>Min 60 degree C</td> </tr> <tr> <td>Kinematic Viscosity at 50 degree C</td> <td>Max 20cst</td> </tr> <tr> <td>Pour Point</td> <td>Max 5 degree C</td> </tr> <tr> <td>Carbon Residue</td> <td>Max 4%</td> </tr> <tr> <td>Water Content</td> <td>Max 0.3%</td> </tr> <tr> <td>Ash Content</td> <td>Max 0.05%</td> </tr> </table> <p>Extract from JIS K-2204 Category 1<br/>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> | Flash Point | Min 60 degree C | Kinematic Viscosity at 50 degree C | Max 20cst | Pour Point | Max 5 degree C | Carbon Residue | Max 4% | Water Content | Max 0.3% | Ash Content | Max 0.05% |
| Flash Point                        | Min 60 degree C   |             |                 |                                    |           |            |                |                |        |               |          |             |           |
| Kinematic Viscosity at 50 degree C | Max 20cst   |             |                 |                                    |           |            |                |                |        |               |          |             |           |
| Pour Point                         | Max 5 degree C  |             |                 |                                    |           |            |                |                |        |               |          |             |           |
| Carbon Residue                     | Max 4%  |             |                 |                                    |           |            |                |                |        |               |          |             |           |
| Water Content                      | Max 0.3%  |             |                 |                                    |           |            |                |                |        |               |          |             |           |
| Ash Content                        | Max 0.05%   |             |                 |                                    |           |            |                |                |        |               |          |             |           |



**<Fuel Oil>**

**Rim assesses FOB South Korea spot fuel oil prices for small-tanker cargoes of 180cst LSFO with a sulfur content of less than 0.3%. The premiums are to periodical average of daily assessments for FOB Singapore spot 180cst HSFO (3.5% sulfur) prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula:  
Premium + Value of Singapore Paper Swaps = Fixed Value**

|                                    |  |             |                 |                                    |            |            |                 |                |         |               |          |             |          |
|------------------------------------|--|-------------|-----------------|------------------------------------|------------|------------|-----------------|----------------|---------|---------------|----------|-------------|----------|
| <b>Assessment Window</b>           | Rim’s assessment window for FOB South Korea spot fuel oil prices for small-tanker cargoes closes at 6:30 PM Tokyo local time.  |             |                 |                                    |            |            |                 |                |         |               |          |             |          |
| <b>Price Unit</b>                  | FOB South Korea spot fuel oil prices for small-tanker cargoes are in \$/mt.  |             |                 |                                    |            |            |                 |                |         |               |          |             |          |
| <b>Time Window</b>                 | FOB South Korea spot fuel oil prices for small-tanker cargoes are for cargoes to be loaded during the period from 20 to 35 days ahead from the publication day. The premiums are to Singapore paper swaps (180cst 3.5%S HSFO) for the front month in Rim Singapore paper swaps assessment.   |             |                 |                                    |            |            |                 |                |         |               |          |             |          |
| <b>Standard Size</b>               | FOB South Korea spot fuel oil prices for small-tanker cargoes are for cargoes with a 5,000-6,000mt lot, which RIM considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were within the standard volumes.  |             |                 |                                    |            |            |                 |                |         |               |          |             |          |
| <b>Loading Port</b>                | FOB South Korea spot fuel oil prices for small-tanker cargoes are for cargoes to be loaded at major ports in South Korea.  |             |                 |                                    |            |            |                 |                |         |               |          |             |          |
| <b>Quality Specifications</b>      | <p>FOB South Korea spot fuel oil prices for small-tanker cargoes are for cargoes of which quality is equivalent to the Japan Industrial Standard (JIS) K-2205 specification for category 3. The sulfur level for fuel oil that Rim assesses is less than 0.3%.</p> <table border="1"> <tr> <td>Flash Point</td> <td>Min 66 degree C</td> </tr> <tr> <td>Kinematic Viscosity at 50 degree C</td> <td>Max 180cst</td> </tr> <tr> <td>Pour Point</td> <td>Max 24 degree C</td> </tr> <tr> <td>Carbon Residue</td> <td>Max 16%</td> </tr> <tr> <td>Water Content</td> <td>Max 0.5%</td> </tr> <tr> <td>Ash Content</td> <td>Max 0.1%</td> </tr> </table> <p>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> | Flash Point | Min 66 degree C | Kinematic Viscosity at 50 degree C | Max 180cst | Pour Point | Max 24 degree C | Carbon Residue | Max 16% | Water Content | Max 0.5% | Ash Content | Max 0.1% |
| Flash Point                        | Min 66 degree C  |             |                 |                                    |            |            |                 |                |         |               |          |             |          |
| Kinematic Viscosity at 50 degree C | Max 180cst   |             |                 |                                    |            |            |                 |                |         |               |          |             |          |
| Pour Point                         | Max 24 degree C  |             |                 |                                    |            |            |                 |                |         |               |          |             |          |
| Carbon Residue                     | Max 16%  |             |                 |                                    |            |            |                 |                |         |               |          |             |          |
| Water Content                      | Max 0.5%   |             |                 |                                    |            |            |                 |                |         |               |          |             |          |
| Ash Content                        | Max 0.1%   |             |                 |                                    |            |            |                 |                |         |               |          |             |          |



## **Rim CFR China Oil Products Price Assessment Methodology**

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### **Price Assessment Principle**

**Rim price assessments indicate the current range in which a standard spot transaction could take place on the day of publication.**

Rim understands values of commodities change even in the absence of deals. Rim defines prices as measures to indicate fluctuating values of commodities.

**Rim understands values of commodities are determined by a variety of factors such as supply-demand fundamentals, production costs, conditions in other markets and players' speculation.**

**Rim understands the latest transactions, bids/offers and buying/selling interest represent current values of commodities.**

**Rim understands values of commodities are determined by competition among sellers and competition among buyers. Rim considers higher bids to be closer to the current values than lower bids. Rim considers lower offers to be the closer to current values than higher offers.**

**Rim understands prices for each transaction reported from any party are to be translated into prices based on standard terms and conditions such as cargo sizes, timing of delivery or loading, product specifications and payment terms.**

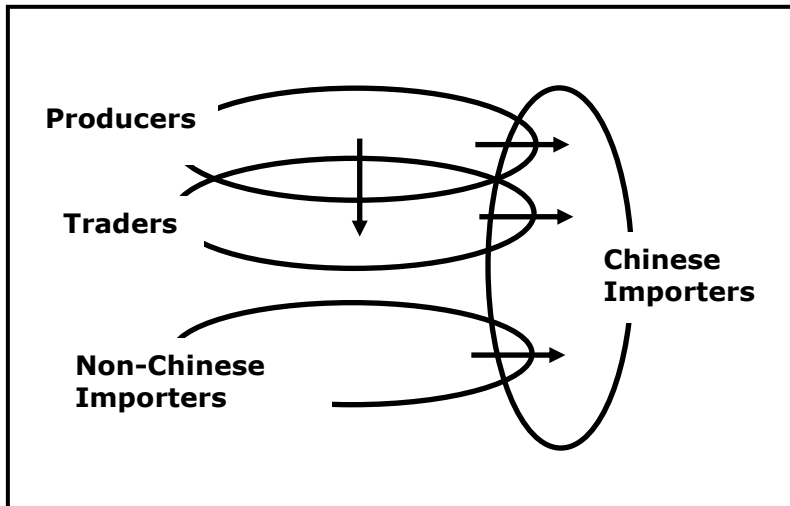
**CFR CHINA SPOT PRICES**

Rim assesses CFR China spot prices for physical cargoes of gasoline, gasoil and fuel oil on a fixed price basis and a floating price basis.

In the absence of information of deals, bids and offers on a fixed price basis, the fixed price assessments indicate the price range in which a transaction on a floating price basis could be locked into with available derivative products, such as futures contracts and paper swaps based on periodical average of published quotations.

All prices are assessed based on information collected in the course of market research by RIM reporters each business day.

**STRUCTURE of the CFR CHINA OIL PRODUCTS MARKET**



Rim understands that the CFR China market is structured with four groups of business parties: Producers, Traders, Non-Chinese Importers and Chinese Importers. Rim assesses physical oil product prices at which a standard spot transaction could take place.

Rim defines the four business parties in the CFR China oil products market as follows:

|                             |  |
|-----------------------------|--|
| <b>Producer</b>             | A company that produces and exports oil products.  |
| <b>Trader</b>               | A company that buys and sells oil products in the international market.  |
| <b>Non-Chinese Importer</b> | A company outside of China that imports oil products for resale into respective domestic markets, and also sells oil products on a CFR China basis with an aim to reduce its stocks or to yield profit from the sales. |
| <b>Chinese Importer</b>     | A company of China that imports oil products to meet its demanded supply into the domestic markets.  |



**Rim defines a standard CFR China oil products market transaction as follows:**

|        |   |
|--------|---|
| Case 1 | A producer sells an oil products cargo to a Chinese importer on a spot basis.             |
| Case 2 | A producer sells an oil products cargo to a trader on a spot basis.                       |
| Case 3 | A trader sells an oil products cargo to a Chinese importer on a spot basis.               |
| Case 4 | A non-Chinese importer sells an oil products cargo to a Chinese importer on a spot basis. |

**<Gasoline>**

Rim assesses CFR China spot gasoline prices for the 93 (North and East China) research octane number grade and the 92 (South China) research octane number grade. The premiums are to periodical average of daily assessments for FOB Singapore spot prices of 92RON gasoline. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula:

$$\text{Premium} + \text{Value of Singapore 92RON gasoline prices} = \text{Fixed Value}$$

|                               |   |  |
|-------------------------------|---|--|
| <b>Assessment Window</b>      | Rim's assessment window for CFR China spot gasoline prices closes at 6:30 PM Tokyo time.  |  |
| <b>Price Unit</b>             | CFR China spot gasoline prices are in \$/bbl.   |  |
| <b>Time Window</b>            | CFR China spot gasoline prices are for cargoes to be delivered during the period from 25 to 40 days ahead from the publication day. The premiums are to FOB Singapore spot prices of 92RON gasoline in Rim Singapore physical cargoes assessment. |  |
| <b>Standard Size</b>          | CFR China spot gasoline prices are for MR-size cargoes, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were the standard volumes.          |  |
| <b>Delivery Port</b>          | CFR China spot gasoline prices are for cargoes to be delivered into main ports in north, east and south China.  |  |
| <b>Quality Specifications</b> | CFR China spot gasoline prices are for cargoes of which quality is equivalent to the following specifications.  |  |
|                               | Research Octane Number  | 93 and 92                                      |
|                               | Lead Content  | Max 0.005gpb/l                                 |
|                               | Distillation Temperature;   | 10% evaporated                                 |
|                               |   | 50%  |
|                               |   | 90%  |
|                               |   | Final Boiling Point                            |
|                               |   | Residue  |
|                               | Copper Corrosion 3h at 50 degree C  | Max 1  |
|                               | Sulfur Content  | Max 0.005% (North, East)<br>Max 0.001% (South) |
|                               | Vapor Pressure at 37.8 degree C   | 0.75-0.90 Kgf/cm <sup>2</sup>                  |
|                               | Existent Gum  | Max 5mg/100ml                                  |
|                               | Olefin Content  | Max 35.0%                                      |
|                               | Aromatics Content   | Max 40.0%                                      |
|                               | Oxygen Content  | Max 2.7%                                       |
|                               | Benzene Content   | Max 2.0%                                       |
|                               | *Specifications for other properties are to meet specifications that are commonly required in international trading.  |  |



**<Gasoil>**

Rim assesses CFR China spot gasoil prices for gasoil with a sulfur content of 0.05%, supplied mainly from South Korea. The premiums are to the periodical average of daily assessments for FOB Singapore spot gasoil (0.05% sulfur) prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula:

$$\text{Premium} + \text{Value of Singapore Paper Swaps} = \text{Fixed Value}$$

|  |   |             |                 |  |                  |            |                |                            |                |                           |          |              |        |         |                  |                                    |                          |                |           |
|--|---|-------------|-----------------|--|------------------|------------|----------------|----------------------------|----------------|---------------------------|----------|--------------|--------|---------|------------------|------------------------------------|--------------------------|----------------|-----------|
| <b>Assessment Window</b>                 | Rim's assessment window for CFR China spot gasoil prices closes at 6:30 PM Tokyo time.  |             |                 |  |                  |            |                |                            |                |                           |          |              |        |         |                  |                                    |                          |                |           |
| <b>Price Unit</b>                        | CFR China spot gasoil prices are in \$/bbl.   |             |                 |  |                  |            |                |                            |                |                           |          |              |        |         |                  |                                    |                          |                |           |
| <b>Time Window</b>                       | CFR China spot gasoil prices are for cargoes to be delivered during the period from 25 to 40 days ahead from the publication day. The premiums are to Singapore paper swaps for the front month in Rim Singapore paper swaps assessment.  |             |                 |  |                  |            |                |                            |                |                           |          |              |        |         |                  |                                    |                          |                |           |
| <b>Standard Size</b>                     | CFR China spot gasoil prices are for MR-size cargoes, which RIM considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were the standard volumes.  |             |                 |  |                  |            |                |                            |                |                           |          |              |        |         |                  |                                    |                          |                |           |
| <b>Delivery Port</b>                     | CFR China spot gasoil prices are for cargoes to be delivered into main ports in east and south China.   |             |                 |  |                  |            |                |                            |                |                           |          |              |        |         |                  |                                    |                          |                |           |
| <b>Quality Specifications</b>            | <p>CFR China spot gasoil prices are for cargoes of which quality is equivalent to the following specifications.</p> <table border="1"> <tr> <td>Flash Point</td> <td>Min 55 degree C</td> </tr> <tr> <td>Distillation Temperature; 90% evaporated</td> <td>Max 355 degree C</td> </tr> <tr> <td>Pour Point</td> <td>Max 0 degree C</td> </tr> <tr> <td>Cold Filter Plugging Point</td> <td>Max 4 degree C</td> </tr> <tr> <td>Carbon Residue (10% btms)</td> <td>Max 0.3%</td> </tr> <tr> <td>Cetane Index</td> <td>Min 45</td> </tr> <tr> <td>Acidity</td> <td>Max 7mgKOH/100ml</td> </tr> <tr> <td>Kinematic Viscosity at 20 degree C</td> <td>Min 3.0, Max 8.0 mm2/sec</td> </tr> <tr> <td>Sulfur Content</td> <td>Max 0.05%</td> </tr> </table> <p>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> | Flash Point | Min 55 degree C | Distillation Temperature; 90% evaporated | Max 355 degree C | Pour Point | Max 0 degree C | Cold Filter Plugging Point | Max 4 degree C | Carbon Residue (10% btms) | Max 0.3% | Cetane Index | Min 45 | Acidity | Max 7mgKOH/100ml | Kinematic Viscosity at 20 degree C | Min 3.0, Max 8.0 mm2/sec | Sulfur Content | Max 0.05% |
| Flash Point                              | Min 55 degree C   |             |                 |  |                  |            |                |                            |                |                           |          |              |        |         |                  |                                    |                          |                |           |
| Distillation Temperature; 90% evaporated | Max 355 degree C  |             |                 |  |                  |            |                |                            |                |                           |          |              |        |         |                  |                                    |                          |                |           |
| Pour Point                               | Max 0 degree C  |             |                 |  |                  |            |                |                            |                |                           |          |              |        |         |                  |                                    |                          |                |           |
| Cold Filter Plugging Point               | Max 4 degree C  |             |                 |  |                  |            |                |                            |                |                           |          |              |        |         |                  |                                    |                          |                |           |
| Carbon Residue (10% btms)                | Max 0.3%  |             |                 |  |                  |            |                |                            |                |                           |          |              |        |         |                  |                                    |                          |                |           |
| Cetane Index                             | Min 45  |             |                 |  |                  |            |                |                            |                |                           |          |              |        |         |                  |                                    |                          |                |           |
| Acidity                                  | Max 7mgKOH/100ml  |             |                 |  |                  |            |                |                            |                |                           |          |              |        |         |                  |                                    |                          |                |           |
| Kinematic Viscosity at 20 degree C       | Min 3.0, Max 8.0 mm2/sec  |             |                 |  |                  |            |                |                            |                |                           |          |              |        |         |                  |                                    |                          |                |           |
| Sulfur Content                           | Max 0.05%   |             |                 |  |                  |            |                |                            |                |                           |          |              |        |         |                  |                                    |                          |                |           |



**<Fuel Oil>**

Rim assesses CFR China spot fuel oil prices for the 380cst HSFO (3.5% sulfur) grade, supplied mainly from Singapore and M100 fuel oil, supplied from Russia. The premiums are to the periodical average of daily assessments for FOB Singapore spot 380cst HSFO (3.5% sulfur) prices for the former and 180cst HSFO (3.5% sulfur) prices for the latter. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula:

$$\text{Premium} + \text{Value of Singapore Paper Swaps} = \text{Fixed Value}$$

|                               |  |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |
|-------------------------------|--|----------------|----------|-------------|-----------------|------------|-----------------|----------------|---------|---------------|----------|-------------|----------|----------------|----------|-------------|-----------------|------------|-----------------|----------------|---------|---------------|----------|-------------|-----------|
| <b>Assessment Window</b>      | Rim’s assessment window for CFR China spot fuel oil prices closes at 6:30 PM Tokyo time.   |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |
| <b>Price Unit</b>             | CFR China spot fuel oil prices are in \$/mt.   |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |
| <b>Time Window</b>            | CFR China spot fuel oil prices are for cargoes to be loaded during the period from 25 to 40 days ahead from the publication day. The premiums are to Singapore paper swaps for the front month in Rim Singapore paper swaps assessment.  |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |
| <b>Standard Size</b>          | CFR China spot fuel oil prices are for LR-size cargoes, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were with the standard volumes.  |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |
| <b>Delivery Port</b>          | CFR China spot fuel oil prices are for cargoes to be delivered into main ports in south China.   |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |
| <b>Quality Specifications</b> | <p>CFR China spot fuel oil prices are for cargoes of which quality is equivalent to the following specifications.</p> <p><b>【380cst HSFO】</b></p> <table border="1"> <tr> <td>Sulfur Content</td> <td>Max 3.5%</td> </tr> <tr> <td>Flash Point</td> <td>Min 66 degree C</td> </tr> <tr> <td>Pour Point</td> <td>Max 24 degree C</td> </tr> <tr> <td>Carbon Residue</td> <td>Max 16%</td> </tr> <tr> <td>Water Content</td> <td>Max 0.5%</td> </tr> <tr> <td>Ash Content</td> <td>Max 0.1%</td> </tr> </table> <p>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> <p><b>【M100 FO】</b></p> <table border="1"> <tr> <td>Sulfur Content</td> <td>Max 1.5%</td> </tr> <tr> <td>Flash Point</td> <td>Min 60 degree C</td> </tr> <tr> <td>Pour Point</td> <td>Max 24 degree C</td> </tr> <tr> <td>Carbon Residue</td> <td>Max 10%</td> </tr> <tr> <td>Water Content</td> <td>Max 2.0%</td> </tr> <tr> <td>Ash Content</td> <td>Max 0.14%</td> </tr> </table> | Sulfur Content | Max 3.5% | Flash Point | Min 66 degree C | Pour Point | Max 24 degree C | Carbon Residue | Max 16% | Water Content | Max 0.5% | Ash Content | Max 0.1% | Sulfur Content | Max 1.5% | Flash Point | Min 60 degree C | Pour Point | Max 24 degree C | Carbon Residue | Max 10% | Water Content | Max 2.0% | Ash Content | Max 0.14% |
| Sulfur Content                | Max 3.5%   |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |
| Flash Point                   | Min 66 degree C  |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |
| Pour Point                    | Max 24 degree C  |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |
| Carbon Residue                | Max 16%  |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |
| Water Content                 | Max 0.5%   |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |
| Ash Content                   | Max 0.1%   |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |
| Sulfur Content                | Max 1.5%   |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |
| Flash Point                   | Min 60 degree C  |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |
| Pour Point                    | Max 24 degree C  |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |
| Carbon Residue                | Max 10%  |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |
| Water Content                 | Max 2.0%   |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |
| Ash Content                   | Max 0.14%  |                |          |             |                 |            |                 |                |         |               |          |             |          |                |          |             |                 |            |                 |                |         |               |          |             |           |



## **Rim CFR Japan Oil Products Price Assessment Methodology**

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### **Price Assessment Principle**

**Rim price assessments indicate the current range in which a standard spot transaction could take place on the day of publication.**

**Rim understands values of commodities change even in the absence of deals. Rim defines prices as measures to indicate fluctuating values of commodities.**

**Rim understands values of commodities are determined by a variety of factors such as supply-demand fundamentals, production costs, conditions in other markets and players' speculation.**

**Rim understands the latest transactions, bids/offers and buying/selling interest represent current values of commodities.**

**Rim understands values of commodities are determined by competition among sellers and competition among buyers. Rim considers higher bids to be closer to the current values than lower bids. Rim considers lower offers to be the closer to current values than higher offers.**

**Rim understands prices for each transaction reported from any party are to be translated into prices based on standard terms and conditions such as cargo sizes, timing of delivery or loading, product specifications and payment terms.**

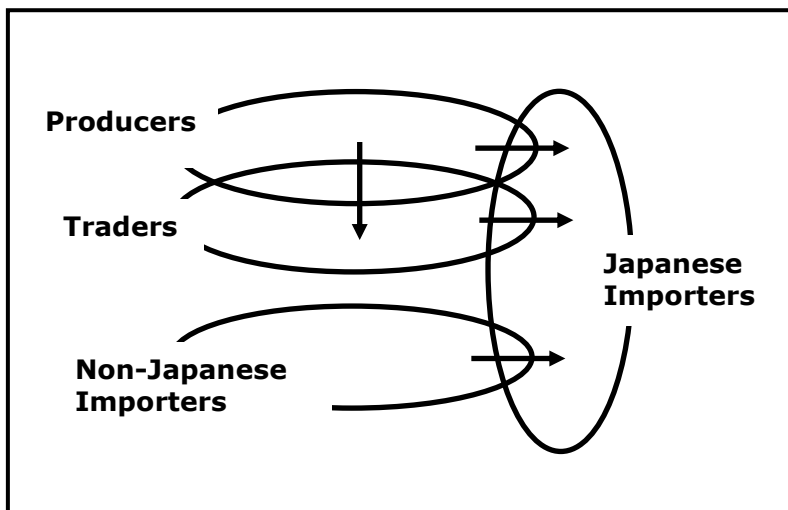
**CFR JAPAN SPOT PRICES**

Rim assesses CFR Japan spot prices for physical cargoes of naphtha, jet/kerosene, gasoil, low-sulfur waxy residue, and fuel oil on a fixed price basis and a floating price basis.

In the absence of information of deals, bids and offers on a fixed price basis, the fixed price assessments indicate the price range in which a transaction on a floating price basis could be locked into with available derivative products, such as futures contracts and paper swaps based on periodical average of published quotations.

All prices are assessed based on information collected in the course of market research by RIM reporters each business day.

**STRUCTURE of the CFR JAPAN OIL PRODUCTS MARKET**



Rim understands that the CFR Japan market is structured with four groups of business parties: Producers, Traders, Non-Japanese Importers and Japanese Importers. Rim assesses physical oil product prices at which a standard spot transaction could take place.

Rim defines the four business parties in the CFR Japan oil products market as follows:

|                              |  |
|------------------------------|--|
| <b>Producer</b>              | A company that produces and exports oil products.  |
| <b>Trader</b>                | A company that buys and sells oil products in the international market.  |
| <b>Non-Japanese Importer</b> | A company outside of Japan that imports oil products for resale into respective domestic markets, and also sells oil products on a CFR Japan basis with an aim to reduce its stocks or to yield profit from the sales. |
| <b>Japanese Importer</b>     | A company of Japan that imports oil products to meet its demanded supply into the domestic markets.  |



**Rim defines a standard CFR Japan oil products market transaction as follows:**

|        |   |
|--------|---|
| Case 1 | A producer sells an oil products cargo to a Japanese importer on a spot basis.              |
| Case 2 | A producer sells an oil products cargo to a trader on a spot basis.                         |
| Case 3 | A trader sells an oil products cargo to a Japanese importer on a spot basis.                |
| Case 4 | A non-Japanese importer sells an oil products cargo to a Japanese importer on a spot basis. |



**<Naphtha>**

**Rim assesses CFR Japan spot naphtha prices for the open-spec naphtha.**

|                                 |   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
|---------------------------------|---|------------------|---------|----------------|------------|----------------|--------|---------------------------------|-----------|------------------|--------|----------------|--------|---------------------------------|-----------|
| <b>Assessment Window</b>        | Rim's assessment window for CFR Japan spot naphtha prices closes at 6:30 PM Tokyo time.   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| <b>Price Unit</b>               | CFR Japan spot naphtha prices are in \$/mt.   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| <b>Time Window</b>              | CFR Japan spot naphtha prices and premiums are for cargoes to be delivered during the period in 3, 4 and 5 half-months ahead from the current half month.   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| <b>Standard Size</b>            | CFR Japan spot naphtha prices are for MR-size cargoes, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were the standard volumes.   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| <b>Delivery Port</b>            | CFR Japan spot naphtha prices are for cargoes to be delivered into main ports in Japan, such as Tokyo, Osaka, Nagoya.   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| <b>Quality Specifications</b>   | <p>CFR Japan spot naphtha prices are for cargoes of which quality is equivalent to "the open specifications".</p> <table border="1"> <tr> <td>Paraffin Content</td> <td>Min 65%</td> </tr> <tr> <td>Sulfur Content</td> <td>Max 650ppm</td> </tr> <tr> <td>Olefin Content</td> <td>Max 1%</td> </tr> <tr> <td>Specific Gravity at 60 degree F</td> <td>0.65-0.74</td> </tr> </table> <p>Extract from the open specification<br/>         *Specifications for other properties are to meet specifications that are commonly required in international trading.</p> <p>REFERENCE: Full-range naphtha</p> <table border="1"> <tr> <td>Paraffin Content</td> <td>78-82%</td> </tr> <tr> <td>Olefin Content</td> <td>Max 1%</td> </tr> <tr> <td>Specific Gravity at 60 degree F</td> <td>0.68-0.70</td> </tr> </table> | Paraffin Content | Min 65% | Sulfur Content | Max 650ppm | Olefin Content | Max 1% | Specific Gravity at 60 degree F | 0.65-0.74 | Paraffin Content | 78-82% | Olefin Content | Max 1% | Specific Gravity at 60 degree F | 0.68-0.70 |
| Paraffin Content                | Min 65%   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Sulfur Content                  | Max 650ppm  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Olefin Content                  | Max 1%  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Specific Gravity at 60 degree F | 0.65-0.74   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Paraffin Content                | 78-82%  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Olefin Content                  | Max 1%  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Specific Gravity at 60 degree F | 0.68-0.70   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |



**<Jet/Kerosene>**

**Rim assesses CFR Japan spot A1 jet fuel/kerosene prices. The premiums are to the periodical average of daily assessments for FOB Singapore spot A1 jet fuel prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula:**

$$\text{Premium} + \text{Value of Singapore Paper Swaps} = \text{Fixed Value}$$

|                               |  |                  |
|-------------------------------|--|------------------|
| <b>Assessment Window</b>      | Rim's assessment window for CFR Japan spot jet/kerosene prices closes at 6:30 PM Tokyo time.   |                  |
| <b>Price Unit</b>             | CFR Japan spot jet/kerosene prices are in \$/bbl.  |                  |
| <b>Time Window</b>            | CFR Japan spot jet/kerosene prices are for cargoes to be delivered during the period from 30 to 45 days ahead from the publication day. The premiums are to Singapore paper swaps for the front month in Rim Singapore paper swaps assessment. |                  |
| <b>Standard Size</b>          | CFR Japan spot jet/kerosene prices are for MR-size cargoes, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were the standard volumes.   |                  |
| <b>Delivery Port</b>          | CFR Japan spot jet/kerosene prices are for cargoes to be delivered into main ports in Japan, such as Tokyo, Osaka, Nagoya.   |                  |
| <b>Quality Specifications</b> | CFR Japan spot jet/kerosene prices are for cargoes of which quality is equivalent to the Joint Fuel System Check List, also known as Jet A-1 Check List. The JFSCCL is issued by International Air Transport Association.                      |                  |
|                               | Distillation Temperature;<br>Initial Boiling Point<br>10% Evaporated   | Max 205 degree C |
|                               | Flash Point  | Max 40 degree C  |
|                               | Sulfur Content   | Max 0.3%         |
|                               | Smoke Point with naphthalene content<br>of maximum 3.0%  | Minimum 19       |
|                               | Copper corrosion 2h at 100 degree C  | Maximum 1.0      |
|                               | Saybolt color  | Minimum 18       |
|                               | Extract from IATA's JFSCCL   |                  |
|                               | *Specifications for other properties are to meet specifications that are commonly required in international trading.   |                  |



**<Gasoil>**

**Rim assesses CFR Japan spot gasoil prices for gasoil with a sulfur content of 0.001%. The premiums are to the periodical average of daily assessments for FOB Singapore spot gasoil (0.05% sulfur) prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula:**

$$\text{Premium} + \text{Value of Singapore Paper Swaps} = \text{Fixed Value}$$

|                               |  |                       |
|-------------------------------|--|-----------------------|
| <b>Assessment Window</b>      | Rim's assessment window for CFR Japan spot gasoil prices closes at 6:30 PM Tokyo time.   |                       |
| <b>Price Unit</b>             | CFR Japan spot gasoil prices are in \$/bbl.  |                       |
| <b>Time Window</b>            | CFR Japan spot gasoil prices are for cargoes to be delivered during the period from 30 to 45 days ahead from the publication day. The premiums are to Singapore paper swaps for the front month in Rim Singapore paper swaps assessment. |                       |
| <b>Standard Size</b>          | CFR Japan spot gasoil prices are for MR-size cargoes, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were the standard volumes.   |                       |
| <b>Delivery Port</b>          | CFR Japan spot gasoil prices are for cargoes to be delivered into main ports in Japan, such as Tokyo, Osaka, Nagoya.   |                       |
| <b>Quality Specifications</b> | CFR Japan spot gasoil prices are for cargoes of which quality is equivalent to the following specifications.   |                       |
|                               | Flash Point  | Min 50 degree C       |
|                               | Distillation Temperature;<br>90% evaporated  | Max 360 degree C      |
|                               | Pour Point   | Max -2.5 degree C     |
|                               | Cold Filter Plugging Point   | Max -1 degree C       |
|                               | Carbon Residue (10% btms)  | Max 0.1%              |
|                               | Cetane Index   | Min 45                |
|                               | Kinematic Viscosity at 40 degree C   | Max 4.5 mm2/sec       |
|                               | Sulfur Content   | 0.001%S<br>Max 0.001% |
|                               | *Specifications for other properties are to meet specifications that are commonly required in international trading.   |                       |



**<Low-Sulfur Waxy Residue>**

Rim assesses CFR Japan spot cracked low-sulfur waxy residue prices for the grades with a sulfur content of 0.2%.

**\*The premiums are to the so-called Pertamina Price Formula for the assessment window as transactions are typically settled at a floating price based on the benchmark. Rim assesses the expected PPF for the delivery window. The expected values are determined based on market research that RIM conducts each business day. (SEE Rim FOB Indonesia LSWR Price Assessment Methodology)**

|                                 |  |                                 |               |                            |           |                           |         |            |                  |                |          |                |          |               |          |             |          |             |                  |
|---------------------------------|--|---------------------------------|---------------|----------------------------|-----------|---------------------------|---------|------------|------------------|----------------|----------|----------------|----------|---------------|----------|-------------|----------|-------------|------------------|
| <b>Assessment Window</b>        | Rim's assessment window for CFR Japan spot cracked LSWR prices closes at 6:30 PM Tokyo time.   |                                 |               |                            |           |                           |         |            |                  |                |          |                |          |               |          |             |          |             |                  |
| <b>Price Unit</b>               | CFR Japan spot cracked LSWR prices are in \$/bbl.  |                                 |               |                            |           |                           |         |            |                  |                |          |                |          |               |          |             |          |             |                  |
| <b>Time Window</b>              | CFR Japan spot cracked LSWR prices are for cargoes to be delivered during the period from 40-50 days ahead from the publication day. The premiums are to expected PPF for the FOB Indonesia LSWR prices assessment window (40-50 days out).  |                                 |               |                            |           |                           |         |            |                  |                |          |                |          |               |          |             |          |             |                  |
| <b>Standard Size</b>            | CFR Japan spot cracked LSWR prices are for 10,000mt to 40,000mt cargoes, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were within the standard volumes.   |                                 |               |                            |           |                           |         |            |                  |                |          |                |          |               |          |             |          |             |                  |
| <b>Delivery Port</b>            | CFR Japan spot cracked prices are for cargoes to be delivered into main ports in Japan, such as Tokyo, Osaka, Nagoya.  |                                 |               |                            |           |                           |         |            |                  |                |          |                |          |               |          |             |          |             |                  |
| <b>Quality Specifications</b>   | <p>CFR Japan spot cracked LSWR prices are for cargoes of which quality is equivalent to the following specifications.</p> <table border="1"> <tr> <td>Specific Gravity at 60 degree F</td> <td>0.8789-0.9309</td> </tr> <tr> <td>API Gravity at 60 degree F</td> <td>20.5-29.5</td> </tr> <tr> <td>Viscosity at 140 degree F</td> <td>100-350</td> </tr> <tr> <td>Pour Point</td> <td>Max 120 degree F</td> </tr> <tr> <td>Sulfur Content</td> <td>Max 0.2%</td> </tr> <tr> <td>Carbon Residue</td> <td>Max 8.0%</td> </tr> <tr> <td>Water Content</td> <td>Max 0.5%</td> </tr> <tr> <td>Ash Content</td> <td>Max 0.1%</td> </tr> <tr> <td>Flash Point</td> <td>Min 166 degree F</td> </tr> </table> <p>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> | Specific Gravity at 60 degree F | 0.8789-0.9309 | API Gravity at 60 degree F | 20.5-29.5 | Viscosity at 140 degree F | 100-350 | Pour Point | Max 120 degree F | Sulfur Content | Max 0.2% | Carbon Residue | Max 8.0% | Water Content | Max 0.5% | Ash Content | Max 0.1% | Flash Point | Min 166 degree F |
| Specific Gravity at 60 degree F | 0.8789-0.9309  |                                 |               |                            |           |                           |         |            |                  |                |          |                |          |               |          |             |          |             |                  |
| API Gravity at 60 degree F      | 20.5-29.5  |                                 |               |                            |           |                           |         |            |                  |                |          |                |          |               |          |             |          |             |                  |
| Viscosity at 140 degree F       | 100-350  |                                 |               |                            |           |                           |         |            |                  |                |          |                |          |               |          |             |          |             |                  |
| Pour Point                      | Max 120 degree F   |                                 |               |                            |           |                           |         |            |                  |                |          |                |          |               |          |             |          |             |                  |
| Sulfur Content                  | Max 0.2%   |                                 |               |                            |           |                           |         |            |                  |                |          |                |          |               |          |             |          |             |                  |
| Carbon Residue                  | Max 8.0%   |                                 |               |                            |           |                           |         |            |                  |                |          |                |          |               |          |             |          |             |                  |
| Water Content                   | Max 0.5%   |                                 |               |                            |           |                           |         |            |                  |                |          |                |          |               |          |             |          |             |                  |
| Ash Content                     | Max 0.1%   |                                 |               |                            |           |                           |         |            |                  |                |          |                |          |               |          |             |          |             |                  |
| Flash Point                     | Min 166 degree F   |                                 |               |                            |           |                           |         |            |                  |                |          |                |          |               |          |             |          |             |                  |





**<Fuel Oil>**

Rim assesses CFR Japan spot fuel oil prices for 380cst HSFO (3.5% sulfur) grade, 180cst LSFO (0.3% sulfur) grade, and M100 fuel oil. The premiums are to the periodical average of daily assessments for FOB Singapore spot 380cst HSFO (3.5% sulfur) prices for HSFO and for FOB Singapore spot 180cst HSFO (3.5% sulfur) prices for LSFO and M100. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula:

$$\text{Premium} + \text{Value of Singapore Paper Swaps} = \text{Fixed Value}$$

|                               |   |                 |
|-------------------------------|---|-----------------|
| <b>Assessment Window</b>      | Rim's assessment window for CFR Japan spot fuel oil prices closes at 6:30 PM Tokyo time.  |                 |
| <b>Price Unit</b>             | CFR Japan spot fuel oil prices are in \$/mt.  |                 |
| <b>Time Window</b>            | CFR Japan spot fuel oil prices are for cargoes to be loaded during the period from 30 to 45 days ahead from the publication day. The premiums are to Singapore paper swaps for the front month in Rim Singapore paper swaps assessment.       |                 |
| <b>Standard Size</b>          | CFR Japan spot fuel oil prices are for MR-size cargoes, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were with the standard volumes. |                 |
| <b>Delivery Port</b>          | CFR Japan spot fuel oil prices are for cargoes to be delivered into main ports in Japan, such as Tokyo, Osaka, Nagoya.  |                 |
| <b>Quality Specifications</b> | CFR Japan spot fuel oil prices are for cargoes of which quality is equivalent to the following specifications.  |                 |
|                               | Sulfur Content  | Max 3.5%        |
|                               |   | Max 0.3%        |
|                               | Flash Point   | Min 66 degree C |
|                               | Pour Point  | Max 24 degree C |
|                               | Carbon Residue  | Max 16%         |
|                               | Water Content   | Max 0.5%        |
|                               | Ash Content   | Max 0.1%        |
|                               | *Specifications for other properties are to meet specifications that are commonly required in international trading.  |                 |
|                               | <b>【M100 FO】</b>  |                 |
|                               | Sulfur Content  | Max 1.5%        |
|                               | Flash Point   | Min 60 degree C |
|                               | Pour Point  | Max 24 degree C |
|                               | Carbon Residue  | Max 10%         |
|                               | Water Content   | Max 2.0%        |
|                               | Ash Content   | Max 0.14%       |
|                               |   |                 |



## **Rim FOB Japan Oil Products Price Assessment Methodology**

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### **Price Assessment Principle**

**Rim price assessments indicate the current range in which a standard spot transaction could take place on the day of publication.**

**Rim understands values of commodities change even in the absence of deals. Rim defines prices as measures to indicate fluctuating values of commodities.**

**Rim understands values of commodities are determined by a variety of factors such as supply-demand fundamentals, production costs, conditions in other markets and players' speculation.**

**Rim understands the latest transactions, bids/offers and buying/selling interest represent current values of commodities.**

**Rim understands values of commodities are determined by competition among sellers and competition among buyers. Rim considers higher bids to be closer to the current values than lower bids. Rim considers lower offers to be the closer to current values than higher offers.**

**Rim understands prices for each transaction reported from any party are to be translated into prices based on standard terms and conditions such as cargo sizes, timing of delivery or loading, product specifications and payment terms.**

**FOB JAPAN SPOT PRICES**

Rim assesses FOB Japan spot prices for MR-size cargoes. Grades that are assessed are as follows:

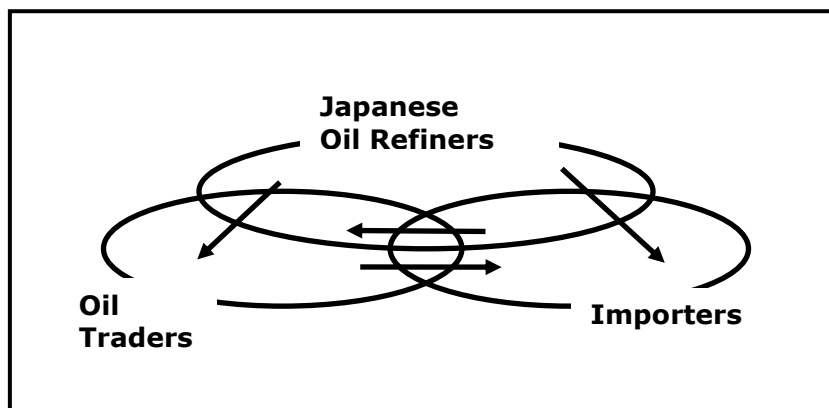
|   |  |
|---|--|
| <b>MR-size cargo</b>  |  |
| Jet/Kerosene<br>Gasoil CARB DIESEL<br>Gasoil-0.001%S<br>HSFO 380cst 3.5%S |  |

In the absence of information of deals, bids and offers on a fixed price basis, the fixed price assessments indicate the price range in which a transaction on a floating price basis could be locked into with available derivative products, such as futures contracts and paper swaps based on periodical average of published quotations.

All prices are assessed based on information collected in the course of market research by Rim reporters each business day.

**MR-size Cargo Price Assessment**

**STRUCTURE of the FOB JAPAN MR-size CARGO MARKET**



Rim understands that the FOB Japan MR-size cargo oil products market is structured with three groups of business parties: Japanese oil refiners, Oil traders and Importers. Rim assesses FOB Japan MR-size cargo prices at which a standard spot transaction could take place.

Rim defines the three business parties in the FOB Japan oil products market as follows:

|                         |   |
|-------------------------|---|
| <b>Japanese Refiner</b> | A company of Japan that produces and exports oil products at/from its refining facilities in Japan.   |
| <b>Oil Trader</b>       | A company that buys and sells oil products in the international market.   |
| <b>Importer</b>         | A company that imports oil products and resell into domestic markets. Refiners of countries other than Japan are also considered to be importers. |



**Rim defines a standard FOB Japan MR-size cargo spot market transaction as follows:**

|        |   |
|--------|---|
| Case 1 | A Japanese refiner sells an oil products cargo to a trader on a spot basis.                 |
| Case 2 | A Japanese refiner sells an oil products cargo to an importer on a spot basis.              |
| Case 3 | A Japanese refiner sells an oil products cargo to another Japanese refiner on a spot basis. |
| Case 4 | A trader sells an oil products cargo to a Japanese refiner on a spot basis.                 |
| Case 5 | A trader sells an oil products cargo to an importer on a spot basis.                        |
| Case 6 | A trader sells an oil products cargo to another trader on a spot basis.                     |
| Case 7 | An importer sells an oil products cargo to a Japanese refiner on a spot basis.              |
| Case 8 | An importer sells an oil products cargo to a trader on a spot basis.                        |
| Case 9 | An importer sells an oil products cargo to another importer on a spot basis.                |



**<Jet/Kerosene>**

Rim assesses FOB Japan spot A1 jet fuel/kerosene prices for MR-size cargoes. The premiums are to periodical average of daily assessments for FOB Singapore spot A1 jet fuel prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula:

$$\text{Premium} + \text{Value of Singapore Paper Swaps} = \text{Fixed Value}$$

|                               |  |                  |
|-------------------------------|--|------------------|
| <b>Assessment Window</b>      | Rim's assessment window for FOB Japan spot jet/kerosene prices for MR-size cargoes closes at 6:30 PM Tokyo local time.   |                  |
| <b>Price Unit</b>             | FOB Japan spot jet/kerosene prices for MR-size cargoes are in \$/bbl.  |                  |
| <b>Time Window</b>            | FOB Japan spot jet/kerosene prices for MR-size cargoes are for cargoes to be loaded during the period from 25 to 40 days ahead from the publication day. The premiums are to Singapore paper swaps for the front month in Rim Singapore paper swaps assessment.                            |                  |
| <b>Standard Size</b>          | FOB Japan spot jet/kerosene prices for MR-size cargoes are for cargoes with a 25,000-35,000mt lot, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were within the standard volumes. |                  |
| <b>Delivery Port</b>          | FOB Japan spot jet/kerosene prices for MR-size cargoes are for cargoes to be loaded at major ports in Japan.   |                  |
| <b>Quality Specifications</b> | FOB Japan spot jet/kerosene prices for MR-size cargoes are for cargoes of which quality is equivalent to the Joint Fuel System Check List, also known as Jet A-1 Check List. The JFSCL is issued by International Air Transport Association.   |                  |
|                               | Distillation Temperature;<br>Initial Boiling Point<br>10% Evaporated   | Max 205 degree C |
|                               | Flash Point  | Max 40 degree C  |
|                               | Sulfur Content   | Max 0.3%         |
|                               | Smoke Point with naphthalene content<br>of maximum 3.0%  | Minimum 19       |
|                               | Copper corrosion 2h at 100 degree C  | Maximum 1.0      |
|                               | Saybolt color  | Minimum 18       |
|                               | Extract from IATA's JFSCL  |                  |
|                               | *Specifications for other properties are to meet specifications that are commonly required in international trading.   |                  |



**<Gasoil>**

Rim assesses FOB Japan spot gasoil prices for MR-size cargoes of CARB DIESEL and gasoil with a sulfur content of 0.001%. The premiums are to periodical average of daily assessments for FOB Singapore spot (0.05% sulfur) prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula:

$$\text{Premium} + \text{Value of Singapore Paper Swaps} = \text{Fixed Value}$$

|  |   |                  |             |  |                 |  |  |                  |            |  |                |                            |  |                 |                           |  |          |              |             |        |         |        |                                    |  |                 |                |             |             |         |            |
|--|---|------------------|-------------|--|-----------------|--|--|------------------|------------|--|----------------|----------------------------|--|-----------------|---------------------------|--|----------|--------------|-------------|--------|---------|--------|------------------------------------|--|-----------------|----------------|-------------|-------------|---------|------------|
| <b>Assessment Window</b>                 | Rim's assessment window for FOB Japan spot gasoil prices for MR-size cargoes closes at 6:30 PM Tokyo local time.  |                  |             |  |                 |  |  |                  |            |  |                |                            |  |                 |                           |  |          |              |             |        |         |        |                                    |  |                 |                |             |             |         |            |
| <b>Price Unit</b>                        | FOB Japan spot gasoil prices for MR-size cargoes are in \$/bbl.   |                  |             |  |                 |  |  |                  |            |  |                |                            |  |                 |                           |  |          |              |             |        |         |        |                                    |  |                 |                |             |             |         |            |
| <b>Time Window</b>                       | FOB Japan spot gasoil prices for MR-size cargoes are for cargoes to be loaded during the period from 25 to 40 days ahead from the publication day. The premiums are to Singapore paper swaps for the front month in Rim Singapore paper swaps assessment.   |                  |             |  |                 |  |  |                  |            |  |                |                            |  |                 |                           |  |          |              |             |        |         |        |                                    |  |                 |                |             |             |         |            |
| <b>Standard Size</b>                     | FOB Japan spot gasoil prices for MR-size cargoes are for cargoes with a 25,000-35,000mt lot, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were within the standard volumes.  |                  |             |  |                 |  |  |                  |            |  |                |                            |  |                 |                           |  |          |              |             |        |         |        |                                    |  |                 |                |             |             |         |            |
| <b>Loading Port</b>                      | FOB Japan spot gasoil prices for MR-size cargoes are for cargoes to be loaded at major ports in Japan.  |                  |             |  |                 |  |  |                  |            |  |                |                            |  |                 |                           |  |          |              |             |        |         |        |                                    |  |                 |                |             |             |         |            |
| <b>Quality Specifications</b>            | <p>FOB Japan spot gasoil prices for MR-size cargoes are for cargoes of which quality is equivalent to the following specifications.</p> <table border="1"> <tr> <td>Flash Point</td> <td></td> <td>Min 50 degree C</td> </tr> <tr> <td>Distillation Temperature; 90% evaporated</td> <td></td> <td>Max 360 degree C</td> </tr> <tr> <td>Pour Point</td> <td></td> <td>Max 5 degree C</td> </tr> <tr> <td>Cold Filter Plugging Point</td> <td></td> <td>Max -1 degree C</td> </tr> <tr> <td>Carbon Residue (10% btms)</td> <td></td> <td>Max 0.1%</td> </tr> <tr> <td rowspan="2">Cetane Index</td> <td>CARB DIESEL</td> <td>Min 53</td> </tr> <tr> <td>0.001%S</td> <td>Min 48</td> </tr> <tr> <td>Kinematic Viscosity at 40 degree C</td> <td></td> <td>Max 4.5 mm2/sec</td> </tr> <tr> <td rowspan="2">Sulfur Content</td> <td>CARB DIESEL</td> <td>Max 0.0008%</td> </tr> <tr> <td>0.001%S</td> <td>Max 0.001%</td> </tr> </table> <p>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> |                  | Flash Point |  | Min 50 degree C | Distillation Temperature; 90% evaporated |  | Max 360 degree C | Pour Point |  | Max 5 degree C | Cold Filter Plugging Point |  | Max -1 degree C | Carbon Residue (10% btms) |  | Max 0.1% | Cetane Index | CARB DIESEL | Min 53 | 0.001%S | Min 48 | Kinematic Viscosity at 40 degree C |  | Max 4.5 mm2/sec | Sulfur Content | CARB DIESEL | Max 0.0008% | 0.001%S | Max 0.001% |
| Flash Point                              |   | Min 50 degree C  |             |  |                 |  |  |                  |            |  |                |                            |  |                 |                           |  |          |              |             |        |         |        |                                    |  |                 |                |             |             |         |            |
| Distillation Temperature; 90% evaporated |   | Max 360 degree C |             |  |                 |  |  |                  |            |  |                |                            |  |                 |                           |  |          |              |             |        |         |        |                                    |  |                 |                |             |             |         |            |
| Pour Point                               |   | Max 5 degree C   |             |  |                 |  |  |                  |            |  |                |                            |  |                 |                           |  |          |              |             |        |         |        |                                    |  |                 |                |             |             |         |            |
| Cold Filter Plugging Point               |   | Max -1 degree C  |             |  |                 |  |  |                  |            |  |                |                            |  |                 |                           |  |          |              |             |        |         |        |                                    |  |                 |                |             |             |         |            |
| Carbon Residue (10% btms)                |   | Max 0.1%         |             |  |                 |  |  |                  |            |  |                |                            |  |                 |                           |  |          |              |             |        |         |        |                                    |  |                 |                |             |             |         |            |
| Cetane Index                             | CARB DIESEL   | Min 53           |             |  |                 |  |  |                  |            |  |                |                            |  |                 |                           |  |          |              |             |        |         |        |                                    |  |                 |                |             |             |         |            |
|  | 0.001%S   | Min 48           |             |  |                 |  |  |                  |            |  |                |                            |  |                 |                           |  |          |              |             |        |         |        |                                    |  |                 |                |             |             |         |            |
| Kinematic Viscosity at 40 degree C       |   | Max 4.5 mm2/sec  |             |  |                 |  |  |                  |            |  |                |                            |  |                 |                           |  |          |              |             |        |         |        |                                    |  |                 |                |             |             |         |            |
| Sulfur Content                           | CARB DIESEL   | Max 0.0008%      |             |  |                 |  |  |                  |            |  |                |                            |  |                 |                           |  |          |              |             |        |         |        |                                    |  |                 |                |             |             |         |            |
|  | 0.001%S   | Max 0.001%       |             |  |                 |  |  |                  |            |  |                |                            |  |                 |                           |  |          |              |             |        |         |        |                                    |  |                 |                |             |             |         |            |



**<Fuel Oil>**

**Rim assesses FOB Japan spot fuel oil prices for MR-size cargoes of the 380cst HSFO with a sulfur content of less than 3.5%. The premiums are to periodical average of daily assessments for FOB Singapore spot 380cst HSFO (3.5% sulfur) prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula:**

$$\text{Premium} + \text{Value of Singapore Paper Swaps} = \text{Fixed Value}$$

|                               |   |                |          |             |                 |            |                 |                |         |               |          |             |          |
|-------------------------------|---|----------------|----------|-------------|-----------------|------------|-----------------|----------------|---------|---------------|----------|-------------|----------|
| <b>Assessment Window</b>      | Rim's assessment window for FOB Japan spot fuel oil prices for MR-size cargoes closes at 6:30 PM Tokyo local time.  |                |          |             |                 |            |                 |                |         |               |          |             |          |
| <b>Price Unit</b>             | FOB Japan spot fuel oil prices for MR-size cargoes are in \$/mt.  |                |          |             |                 |            |                 |                |         |               |          |             |          |
| <b>Time Window</b>            | FOB Japan spot fuel oil prices for MR-size cargoes are for cargoes to be loaded during the period from 25 to 40 days ahead from the publication day. The premiums are to Singapore paper swaps (380cst 3.5%S HSFO) for the front month in Rim Singapore paper swaps assessment.   |                |          |             |                 |            |                 |                |         |               |          |             |          |
| <b>Standard Size</b>          | FOB Japan spot fuel oil prices for MR-size cargoes are for cargoes with a 25,000-35,000mt lot, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were within the standard volumes.  |                |          |             |                 |            |                 |                |         |               |          |             |          |
| <b>Loading Port</b>           | FOB Japan spot fuel oil prices for MR-size cargoes are for cargoes to be loaded at major ports in Japan.  |                |          |             |                 |            |                 |                |         |               |          |             |          |
| <b>Quality Specifications</b> | <p>FOB Japan spot fuel oil prices for MR-size cargoes are for cargoes of which quality is equivalent to the following specifications.</p> <table border="1"> <tr> <td>Sulfur Content</td> <td>Max 3.5%</td> </tr> <tr> <td>Flash Point</td> <td>Min 66 degree C</td> </tr> <tr> <td>Pour Point</td> <td>Max 24 degree C</td> </tr> <tr> <td>Carbon Residue</td> <td>Max 16%</td> </tr> <tr> <td>Water Content</td> <td>Max 0.5%</td> </tr> <tr> <td>Ash Content</td> <td>Max 0.1%</td> </tr> </table> <p>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> | Sulfur Content | Max 3.5% | Flash Point | Min 66 degree C | Pour Point | Max 24 degree C | Carbon Residue | Max 16% | Water Content | Max 0.5% | Ash Content | Max 0.1% |
| Sulfur Content                | Max 3.5%  |                |          |             |                 |            |                 |                |         |               |          |             |          |
| Flash Point                   | Min 66 degree C   |                |          |             |                 |            |                 |                |         |               |          |             |          |
| Pour Point                    | Max 24 degree C   |                |          |             |                 |            |                 |                |         |               |          |             |          |
| Carbon Residue                | Max 16%   |                |          |             |                 |            |                 |                |         |               |          |             |          |
| Water Content                 | Max 0.5%  |                |          |             |                 |            |                 |                |         |               |          |             |          |
| Ash Content                   | Max 0.1%  |                |          |             |                 |            |                 |                |         |               |          |             |          |



## **Rim FOB Middle East Oil Products Price Assessment Methodology**

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### **Price Assessment Principle**

**Rim price assessments indicate the current range in which a standard spot transaction could take place on the day of publication.**

**Rim understands values of commodities change even in the absence of deals. Rim defines prices as measures to indicate fluctuating values of commodities.**

**Rim understands values of commodities are determined by a variety of factors such as supply-demand fundamentals, production costs, conditions in other markets and players' speculation.**

**Rim understands the latest transactions, bids/offers and buying/selling interest represent current values of commodities.**

**Rim understands values of commodities are determined by competition among sellers and competition among buyers. Rim considers higher bids to be closer to the current values than lower bids. Rim considers lower offers to be the closer to current values than higher offers.**

**Rim understands prices for each transaction reported from any party are to be translated into prices based on standard terms and conditions such as cargo sizes, timing of delivery or loading, product specifications and payment terms.**



**FOB MIDDLE EAST SPOT PRICES**

Rim assesses FOB Middle East spot prices for MR-size cargoes. Grades that are assessed are as follows:

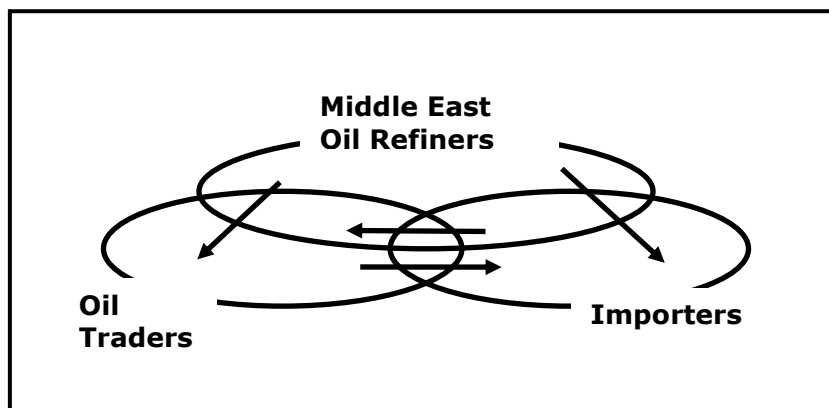
|   |  |
|---|--|
| <b>MR-size cargo</b>                                      |  |
| Naphtha<br>Kerosene<br>Gasoil-0.05%S<br>HSFO 180cst 3.5%S |  |

In the absence of information of deals, bids and offers on a fixed price basis, the fixed price assessments indicate the price range in which a transaction on a floating price basis could be locked into with available derivative products, such as futures contracts and paper swaps based on periodical average of published quotations.

All prices are assessed based on information collected in the course of market research by Rim reporters each business day.

**MR-size Cargo Price Assessment>**

**STRUCTURE of the FOB MIDDLE EAST MR-size CARGO MARKET**



Rim understands that the FOB Middle East MR-size cargo oil products market is structured with three groups of business parties: Middle East oil refiners, Oil traders and Importers. Rim assesses FOB Middle East MR-size cargo prices at which a standard spot transaction could take place.

Rim defines the three business parties in the FOB Middle East oil products market as follows:

|                            |   |
|----------------------------|---|
| <b>Middle East Refiner</b> | A company of Middle East that produces and exports oil products at/from its refining facilities in Japan.   |
| <b>Oil Trader</b>          | A company that buys and sells oil products in the international market.   |
| <b>Importer</b>            | A company that imports oil products and resell into domestic markets. Refiners of countries other than Japan are also considered to be importers. |



**Rim defines a standard FOB Middle East MR-size cargo spot market transaction as follows:**

|        |   |
|--------|---|
| Case 1 | A Middle East refiner sells an oil products cargo to a trader on a spot basis.                    |
| Case 2 | A Middle East refiner sells an oil products cargo to an importer on a spot basis.                 |
| Case 3 | A Middle East refiner sells an oil products cargo to another Middle East refiner on a spot basis. |
| Case 4 | A trader sells an oil products cargo to a Middle East refiner on a spot basis.                    |
| Case 5 | A trader sells an oil products cargo to an importer on a spot basis.                              |
| Case 6 | A trader sells an oil products cargo to another trader on a spot basis.                           |
| Case 7 | An importer sells an oil products cargo to a Middle East refiner on a spot basis.                 |
| Case 8 | An importer sells an oil products cargo to a trader on a spot basis.                              |
| Case 9 | An importer sells an oil products cargo to another importer on a spot basis.                      |

**<Naphtha>**

**FOB Middle East naphtha is assessed on a netback basis from CFR Japan. Rim also assesses a spot premium or discount to reflect the value of LR-size cargoes determined by a variety of information such as transactions, bids/offers and buying/selling interest.**

FOB Middle East spot naphtha prices =

[(CFR Japan naphtha)-(\*freight rates for the Middle East-Japan route)] / 9

\*The freight rates are for an LR tanker on the Middle East-Japan route.

|                                 |  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
|---------------------------------|--|------------------|---------|----------------|------------|----------------|--------|---------------------------------|-----------|------------------|--------|----------------|--------|---------------------------------|-----------|
| <b>Assessment Window</b>        | Rim’s assessment window for FOB Middle East spot naphtha prices closes at 6:30 PM Tokyo time.  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| <b>Price Unit</b>               | FOB Middle East spot naphtha prices are in \$/mt.  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| <b>Time Window</b>              | FOB Middle East spot naphtha prices in the publications released during the period from the first day to the 15 <sup>th</sup> of a month are for cargoes to be loaded during the period from the 9 <sup>th</sup> to the 24 <sup>th</sup> of the next month from the current month. FOB Singapore spot naphtha prices in the publications released during the period from the 16 <sup>th</sup> to last day of a month are for cargoes to be loaded during the period from the 25 <sup>th</sup> of the next month to the 8 <sup>th</sup> of a month after the next from the current month.   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| <b>Standard Size</b>            | FOB Middle East spot naphtha prices are for LR-size cargoes, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were with the standard volumes.   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| <b>Delivery Port</b>            | FOB Middle East spot gasoline prices are for cargoes to be loaded at major ports in Middle East.   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| <b>Quality Specifications</b>   | <p>FOB Middle East spot naphtha prices are for cargoes of which quality is equivalent to “the open specifications”.</p> <table border="1"> <tr> <td>Paraffin Content</td> <td>Min 65%</td> </tr> <tr> <td>Sulfur Content</td> <td>Max 650ppm</td> </tr> <tr> <td>Olefin Content</td> <td>Max 1%</td> </tr> <tr> <td>Specific Gravity at 60 degree F</td> <td>0.65-0.74</td> </tr> </table> <p>Extract from the open specification<br/>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> <p>REFERENCE: Full-range naphtha</p> <table border="1"> <tr> <td>Paraffin Content</td> <td>78-82%</td> </tr> <tr> <td>Olefin Content</td> <td>Max 1%</td> </tr> <tr> <td>Specific Gravity at 60 degree F</td> <td>0.68-0.70</td> </tr> </table> | Paraffin Content | Min 65% | Sulfur Content | Max 650ppm | Olefin Content | Max 1% | Specific Gravity at 60 degree F | 0.65-0.74 | Paraffin Content | 78-82% | Olefin Content | Max 1% | Specific Gravity at 60 degree F | 0.68-0.70 |
| Paraffin Content                | Min 65%  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Sulfur Content                  | Max 650ppm   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Olefin Content                  | Max 1%   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Specific Gravity at 60 degree F | 0.65-0.74  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Paraffin Content                | 78-82%   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Olefin Content                  | Max 1%   |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |
| Specific Gravity at 60 degree F | 0.68-0.70  |                  |         |                |            |                |        |                                 |           |                  |        |                |        |                                 |           |



**<Jet/Kerosene>**

**FOB Middle East Jet/Kerosene is assessed on a netback basis from FOB Singapore assessment. Rim also assesses a spot premium or discount to reflect the value of cargoes determined by a variety of information such as transactions, bids/offers and buying/selling interest.**

FOB Middle East spot jet/kerosene prices =  
 (FOB Singapore jet/kerosene)-(\*freight rates for the Middle East-Singapore)  
 \*The freight rates are for an LR tanker on the Middle East-Singapore route.

|                               |   |                  |
|-------------------------------|---|------------------|
| <b>Assessment Window</b>      | Rim's assessment window for FOB Middle East spot A1 Jet fuel/Kerosene prices closes at 6:30 PM Tokyo time.  |                  |
| <b>Price Unit</b>             | FOB Middle East spot jet/kerosene prices are in \$/bbl.   |                  |
| <b>Time Window</b>            | FOB Middle East spot A1 jet fuel/kerosene prices are for cargoes to be loaded during the period from 20 to 35 days ahead from the publication day. The premiums are to Middle East quotations.  |                  |
| <b>Standard Size</b>          | FOB Middle East spot A1 jet fuel/kerosene prices are for LR-size cargoes, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were with the standard volumes. |                  |
| <b>Delivery Port</b>          | FOB Middle East spot A1 jet fuel/kerosene prices are for cargoes to be loaded at major ports in Middle East.  |                  |
| <b>Quality Specifications</b> | FOB Middle East spot A1 jet fuel/kerosene prices are for cargoes of which quality is equivalent to the Joint Fuel System Check List, also known as Jet A-1 Check List. The JFSCCL is issued by International Air Transport Association.                         |                  |
|                               | Distillation Temperature;<br>Initial Boiling Point<br>10% Evaporated  | Max 205 degree C |
|                               | Flash Point   | Max 40 degree C  |
|                               | Sulfur Content  | Max 0.3%         |
|                               | Smoke Point with naphthalene content<br>of maximum 3.0%   | Minimum 19       |
|                               | Copper corrosion 2h at 100 degree C   | Maximum 1.0      |
|                               | Saybolt color   | Minimum 18       |
|                               | Extract from IATA's JFSCCL  |                  |
|                               | *Specifications for other properties are to meet specifications that are commonly required in international trading.  |                  |



**<Gasoil>**

**FOB Middle East gasoil (0.05%S) is assessed on a netback basis from FOB Singapore assessment. Rim also assesses a spot premium or discount to reflect the value of cargoes determined by a variety of information such as transactions, bids/offers and buying/selling interest.**

FOB Middle East spot gasoil prices =

(FOB Singapore gasoil)-(\*freight rates for the Middle East-Singapore)

\*The freight rates are for an LR tanker on the Middle East-Singapore route.

|   |  |           |             |                 |  |   |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                 |  |                |        |           |  |  |
|---|--|-----------|-------------|-----------------|--|---|------------------|--|------------|----------------|--|----------------------------|-----------------|--|---------------------------|----------|--|--------------|--------|--|------------------------------------|-----------------|--|----------------|--------|-----------|--|--|
| <b>Assessment Window</b>                    | Rim's assessment window for FOB Middle East spot gasoil prices closes at 6:30 PM Tokyo time.   |           |             |                 |  |   |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                 |  |                |        |           |  |  |
| <b>Price Unit</b>                           | FOB Middle East spot gasoil prices are in \$/bbl.  |           |             |                 |  |   |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                 |  |                |        |           |  |  |
| <b>Time Window</b>                          | FOB Middle East spot gasoil prices are for cargoes to be loaded during the period from 20 to 35 days ahead from the publication day. The premiums are to Middle East quotations.   |           |             |                 |  |   |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                 |  |                |        |           |  |  |
| <b>Standard Size</b>                        | FOB Middle East spot gasoil prices are for LR-size cargoes, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were with the standard volumes.  |           |             |                 |  |   |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                 |  |                |        |           |  |  |
| <b>Delivery Port</b>                        | FOB Middle East spot gasoil prices are for cargoes to be loaded at major ports in Middle East.   |           |             |                 |  |   |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                 |  |                |        |           |  |  |
| <b>Quality Specifications</b>               | <p>FOB Middle East spot gasoil prices are for cargoes of which quality is equivalent to the following specifications.</p> <table border="1"> <tr> <td>Flash Point</td> <td colspan="2">Min 50 degree C</td> </tr> <tr> <td>Distillation Temperature;<br/>90% evaporated</td> <td colspan="2">Max 360 degree C</td> </tr> <tr> <td>Pour Point</td> <td colspan="2">Max 5 degree C</td> </tr> <tr> <td>Cold Filter Plugging Point</td> <td colspan="2">Max -1 degree C</td> </tr> <tr> <td>Carbon Residue (10% btms)</td> <td colspan="2">Max 0.1%</td> </tr> <tr> <td>Cetane Index</td> <td colspan="2">Min 48</td> </tr> <tr> <td>Kinematic Viscosity at 40 degree C</td> <td colspan="2">Max 4.5 mm2/sec</td> </tr> <tr> <td rowspan="2">Sulfur Content</td> <td>0.05%S</td> <td>Max 0.05%</td> </tr> <tr> <td></td> <td></td> </tr> </table> <p>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> |           | Flash Point | Min 50 degree C |  | Distillation Temperature;<br>90% evaporated | Max 360 degree C |  | Pour Point | Max 5 degree C |  | Cold Filter Plugging Point | Max -1 degree C |  | Carbon Residue (10% btms) | Max 0.1% |  | Cetane Index | Min 48 |  | Kinematic Viscosity at 40 degree C | Max 4.5 mm2/sec |  | Sulfur Content | 0.05%S | Max 0.05% |  |  |
| Flash Point                                 | Min 50 degree C  |           |             |                 |  |   |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                 |  |                |        |           |  |  |
| Distillation Temperature;<br>90% evaporated | Max 360 degree C   |           |             |                 |  |   |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                 |  |                |        |           |  |  |
| Pour Point                                  | Max 5 degree C   |           |             |                 |  |   |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                 |  |                |        |           |  |  |
| Cold Filter Plugging Point                  | Max -1 degree C  |           |             |                 |  |   |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                 |  |                |        |           |  |  |
| Carbon Residue (10% btms)                   | Max 0.1%   |           |             |                 |  |   |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                 |  |                |        |           |  |  |
| Cetane Index                                | Min 48   |           |             |                 |  |   |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                 |  |                |        |           |  |  |
| Kinematic Viscosity at 40 degree C          | Max 4.5 mm2/sec  |           |             |                 |  |   |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                 |  |                |        |           |  |  |
| Sulfur Content                              | 0.05%S   | Max 0.05% |             |                 |  |   |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                 |  |                |        |           |  |  |
|   |  |           |             |                 |  |   |                  |  |            |                |  |                            |                 |  |                           |          |  |              |        |  |                                    |                 |  |                |        |           |  |  |



**<Fuel Oil>**

**FOB Middle East fuel oil (180cst/3.5%S) is assessed on a netback basis from FOB Singapore assessment.**

FOB Middle East spot fuel oil prices =

(FOB Singapore fuel oil)–(\*freight rates for the Middle East-Singapore)

\*The freight rates are for an LR tanker on the Middle East-Singapore route.

|                               |  |                 |                |      |          |             |            |                 |            |            |                 |                |        |         |  |  |               |            |          |             |            |          |
|-------------------------------|--|-----------------|----------------|------|----------|-------------|------------|-----------------|------------|------------|-----------------|----------------|--------|---------|--|--|---------------|------------|----------|-------------|------------|----------|
| <b>Assessment Window</b>      | Rim’s assessment window for FOB Singapore spot fuel oil prices closes at 6:30 PM Tokyo time.   |                 |                |      |          |             |            |                 |            |            |                 |                |        |         |  |  |               |            |          |             |            |          |
| <b>Price Unit</b>             | FOB Middle East spot fuel oil prices are in \$/mt.   |                 |                |      |          |             |            |                 |            |            |                 |                |        |         |  |  |               |            |          |             |            |          |
| <b>Time Window</b>            | FOB Middle East spot fuel oil prices are for cargoes to be loaded during the period from 20 to 35 days ahead from the publication day.   |                 |                |      |          |             |            |                 |            |            |                 |                |        |         |  |  |               |            |          |             |            |          |
| <b>Standard Size</b>          | FOB Middle East spot fuel oil prices are for LR-size cargoes, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were with the standard volumes.  |                 |                |      |          |             |            |                 |            |            |                 |                |        |         |  |  |               |            |          |             |            |          |
| <b>Delivery Port</b>          | FOB Middle East spot fuel oil prices are for cargoes to be loaded at major ports in Middle East.   |                 |                |      |          |             |            |                 |            |            |                 |                |        |         |  |  |               |            |          |             |            |          |
| <b>Quality Specifications</b> | <p>FOB Middle East spot fuel oil prices are for cargoes of which quality is equivalent to the following specifications.</p> <table border="1"> <tr> <td>Sulfur Content</td> <td>HSFO</td> <td>Max 3.5%</td> </tr> <tr> <td>Flash Point</td> <td>All Grades</td> <td>Min 66 degree C</td> </tr> <tr> <td>Pour Point</td> <td>All Grades</td> <td>Max 24 degree C</td> </tr> <tr> <td rowspan="2">Carbon Residue</td> <td>180cst</td> <td>Max 16%</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>Water Content</td> <td>All Grades</td> <td>Max 0.5%</td> </tr> <tr> <td>Ash Content</td> <td>All Grades</td> <td>Max 0.1%</td> </tr> </table> <p>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> |                 | Sulfur Content | HSFO | Max 3.5% | Flash Point | All Grades | Min 66 degree C | Pour Point | All Grades | Max 24 degree C | Carbon Residue | 180cst | Max 16% |  |  | Water Content | All Grades | Max 0.5% | Ash Content | All Grades | Max 0.1% |
| Sulfur Content                | HSFO   | Max 3.5%        |                |      |          |             |            |                 |            |            |                 |                |        |         |  |  |               |            |          |             |            |          |
| Flash Point                   | All Grades   | Min 66 degree C |                |      |          |             |            |                 |            |            |                 |                |        |         |  |  |               |            |          |             |            |          |
| Pour Point                    | All Grades   | Max 24 degree C |                |      |          |             |            |                 |            |            |                 |                |        |         |  |  |               |            |          |             |            |          |
| Carbon Residue                | 180cst   | Max 16%         |                |      |          |             |            |                 |            |            |                 |                |        |         |  |  |               |            |          |             |            |          |
|                               |  |                 |                |      |          |             |            |                 |            |            |                 |                |        |         |  |  |               |            |          |             |            |          |
| Water Content                 | All Grades   | Max 0.5%        |                |      |          |             |            |                 |            |            |                 |                |        |         |  |  |               |            |          |             |            |          |
| Ash Content                   | All Grades   | Max 0.1%        |                |      |          |             |            |                 |            |            |                 |                |        |         |  |  |               |            |          |             |            |          |



## **Rim FOB Indonesia LSWR Price Assessment Methodology**

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### **Price Assessment Principle**

**Rim price assessments indicate the current range in which a standard spot transaction could take place on the day of publication.**

**Rim understands values of commodities change even in the absence of deals. Rim defines prices as measures to indicate fluctuating values of commodities.**

**Rim understands values of commodities are determined by a variety of factors such as supply-demand fundamentals, production costs, conditions in other markets and players' speculation.**

**Rim understands the latest transactions, bids/offers and buying/selling interest represent current values of commodities.**

**Rim understands values of commodities are determined by competition among sellers and competition among buyers. Rim considers higher bids to be closer to the current values than lower bids. Rim considers lower offers to be the closer to current values than higher offers.**

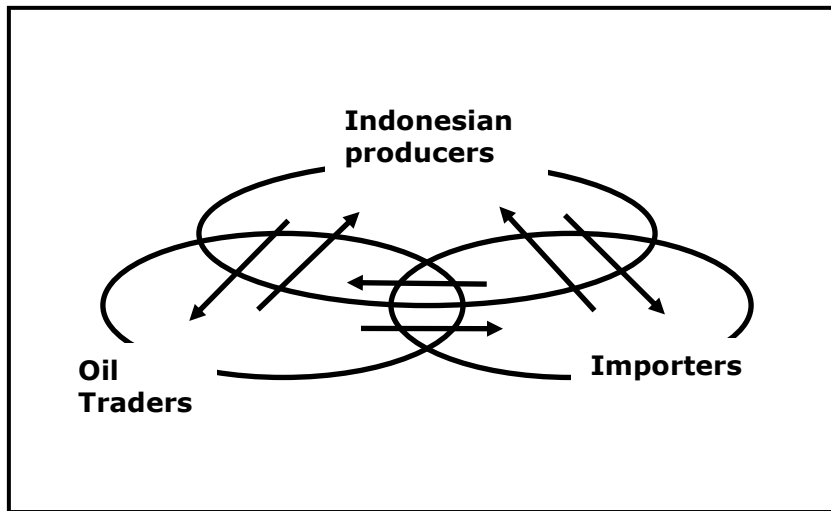
**Rim understands prices for each transaction reported from any party are to be translated into prices based on standard terms and conditions such as cargo sizes, timing of delivery or loading, product specifications and payment terms.**

**FOB INDONESIA SPOT LSWR PRICES**

Rim assesses FOB Indonesia spot mixed/cracked low-sulfur waxy residue prices on a fixed price basis and a floating price basis.

All prices are assessed based on information collected in the course of market research by Rim reporters each business day.

**STRUCTURE of the FOB INDONESIA SPOT LSWR MARKET**



Rim understands that the FOB Indonesia spot LSWR Market is structured with three groups of business parties: Indonesian producers, oil traders, importers. Rim assesses physical LSWR prices at which a standard spot transaction could take place.

Rim defines the three business parties in the FOB Indonesia mixed/cracked LSWR market as follows:

|                            |   |
|----------------------------|---|
| <b>Indonesian Producer</b> | A company that produces and sells mixed/cracked LSWR at its refining facilities in Indonesia. Indonesia’s state-owned Pertamina is considered to be the dominant producer of cracked LSWR. Equity holders that receive mixed/cracked LSWR through concession rights are also considered to be Indonesian producers. |
| <b>Oil Trader</b>          | A company that buys and sells oil products in the international market.   |
| <b>Importer</b>            | A company outside of Indonesia that imports mixed/cracked LSWR on an FOB Indonesia basis for its own use or resale into other parties in the domestic market. Refiners that buys mixed/cracked LSWR as feedstock for its refining facilities are also considered to be an importer.                                 |





**Rim defines a standard FOB Indonesia mixed/cracked LSWR market transaction as follows:**

|        |   |
|--------|---|
| Case 1 | An Indonesian producer sells a mixed/cracked LSWR cargo to a trader on a spot basis.                    |
| Case 2 | An Indonesian producer sells a mixed/cracked LSWR cargo to an importer on a spot basis.                 |
| Case 3 | An Indonesian producer sells a mixed/cracked LSWR cargo to another Indonesian producer on a spot basis. |
| Case 4 | A trader sells a mixed/cracked LSWR cargo to an Indonesian producer on a spot basis.                    |
| Case 5 | A trader sells a mixed/cracked LSWR cargo to an importer on a spot basis.                               |
| Case 6 | A trader sells a mixed/cracked LSWR cargo to another trader on a spot basis.                            |
| Case 7 | An importer sells a mixed/cracked LSWR cargo to an Indonesian producer on a spot basis.                 |
| Case 8 | An importer sells a mixed/cracked LSWR cargo to a trader on a spot basis.                               |
| Case 9 | An importer sells a cracked LSWR cargo to another importer on a spot basis.                             |

**UNDERSTANDING of PERTAMINA PRICE FORMULA**

Spot transactions for FOB Indonesia mixed/cracked LSWR are typically settled on a floating basis using the Pertamina Price Formula (PPF). In a transaction between parties other than Pertamina, the PPF refers to a formulated price by the parties similar to the method used by Pertamina. The Pertamina pricing method is widely understood as follows:

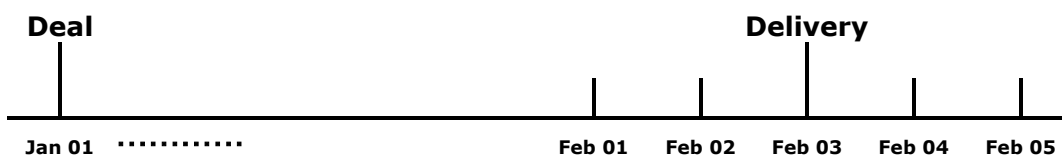
$$PPF = (\text{Average of daily assessments by price reporting services}) + 65\text{cts/bbl}$$

**Mixed/cracked LSWR cargoes ex-Indonesia are typically priced at a premium of \$1.00/bbl to the PPF. In most cases, PPF in the floating prices are the averaged value of daily price assessments published over a five-day period; two days before the loading day, the loading day, and two days after the loading day (two-one-two).**

**(Example)**

**Premise:**

**On Jan 1, a spot deal takes place at “PPF+\$1.00/bbl” for delivery on Feb 3. The buyer and seller agrees to take the two-one-two period for the PPF in the floating price deal.**





**Rim's Assessment Window**

| <b>Publication Day</b> | <b>Loading Period of cargoes to be assessed</b> |
|------------------------|---|
| <b>Jan 1</b>           | <b>Jan 31 – Feb 10</b>                          |
| <b>//</b>              | <b>//</b>                                       |
| <b>Feb 1</b>           | <b>Mar 3 – Mar 13</b>                           |
| <b>Feb 2</b>           | <b>Mar 4 – Mar 14</b>                           |
| <b>Feb 3</b>           | <b>Mar 5 – Mar 15</b>                           |
| <b>Feb 4</b>           | <b>Mar 6 – Mar 16</b>                           |
| <b>Feb 5</b>           | <b>Mar 7 – Mar 17</b>                           |

Rim understands the PPF in the deal price is calculated based on the average of daily price assessments published during the period from Feb 1 through Feb 5. This case could be interpreted that the buyer and seller on Jan 1 agreed that the value of a mixed/cracked LSWR cargo loaded on Feb 3 was \$1.00/bbl higher than values of a cargo to be loaded in early-to-mid March.

**Expected PPF for the Window**

For fixed values from indicated premiums, Rim assesses the expected PPF for the delivery window. The expected values are determined based on market research that Rim conducts each business day. Prices for Indonesian crude oil are also factored into the expected value of PPF for the delivery window since price trends for the two products are closely related.

Rim considers that a floating price based on PPF is equivalent to the fixed value derived from the following formula:

$$\text{Premium to PPF} + \text{expected PPF for the window} = \text{Fixed Value}$$

In the example case, the equivalent fixed value as of Jan 1 to the floating deal price of PPF+\$1.00/bbl is to be \$26.00/bbl, if the PPF for the window is expected at \$25.00/bbl.

|                               |   |
|-------------------------------|---|
| <b>Assessment Window</b>      | Rim's assessment window for FOB Indonesia spot mixed/cracked LSWR prices closes at 6:30 PM Tokyo time.  |
| <b>Price Unit</b>             | FOB Indonesia spot mixed/cracked LSWR prices are in \$/bbl.   |
| <b>Time Window</b>            | FOB Indonesia spot mixed/cracked LSWR prices are for cargoes to be loaded during the period from 30 to 40 days ahead from the publication day. The premiums are to expected PPF for the window.   |
| <b>Standard Size</b>          | FOB Indonesia spot mixed/cracked LSWR spot prices are for an MR-size cargo, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were with the standard volumes. |
| <b>Loading Port</b>           | FOB Indonesia spot mixed/cracked LSWR prices are for cargoes to be loaded at major ports in Indonesia.  |
| <b>Quality Specifications</b> | FOB Indonesia spot mixed/cracked LSWR prices are for cargoes of which quality is equivalent to the following specifications.  |



|  |  |                  |
|--|--|------------------|
|  | Specific Gravity at 60 degree F  | 0.8789-0.9309    |
|  | API Gravity at 60 degree F   | 20.5-29.5        |
|  | Viscosity at 140 degree F  | 100-350          |
|  | Pour Point   | Max 120 degree F |
|  | Sulfur Content   | Max 0.2%         |
|  | Carbon Residue   | Max 8.0%         |
|  | Water Content  | Max 0.5%         |
|  | Ash Content  | Max 0.1%         |
|  | Flash Point  | Min 166 degree F |
|  | *Specifications for other properties are to meet specifications that are commonly required in international trading. |                  |



## **Rim FOB Taiwan Oil Products Price Assessment Methodology**

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### **Price Assessment Principle**

**Rim price assessments indicate the current range in which a standard spot transaction could take place on the day of publication.**

**Rim understands values of commodities change even in the absence of deals. RIM defines prices as measures to indicate fluctuating values of commodities.**

**Rim understands values of commodities are determined by a variety of factors such as supply-demand fundamentals, production costs, conditions in other markets and players' speculation.**

**Rim understands the latest transactions, bids/offers and buying/selling interest represent current values of commodities.**

**Rim understands values of commodities are determined by competition among sellers and competition among buyers. Rim considers higher bids to be closer to the current values than lower bids. Rim considers lower offers to be the closer to current values than higher offers.**

**Rim understands prices for each transaction reported from any party are to be translated into prices based on standard terms and conditions such as cargo sizes, timing of delivery or loading, product specifications and payment terms.**

**FOB TAIWAN SPOT PRICES**

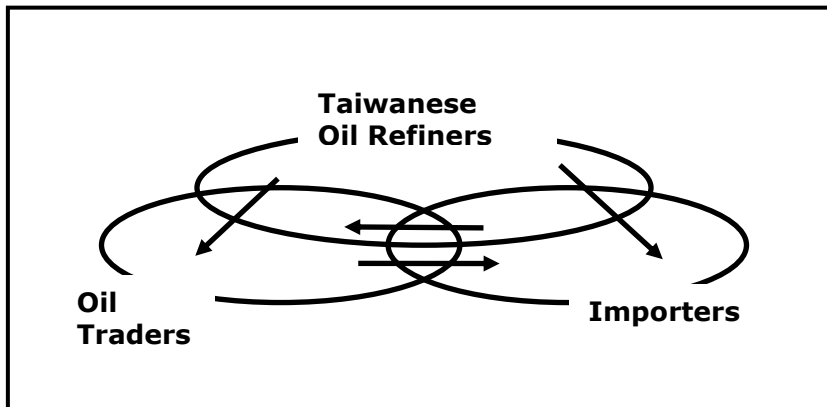
Rim assesses FOB Taiwan spot prices for MR-size cargoes. Grades that are assessed are as follows:

| <b>MR-size cargo</b> |  |
|----------------------|--|
| 93RON gasoline       |  |
| Jet/Kerosene         |  |
| Gasoil-0.001%S       |  |
| Gasoil-0.05%S        |  |
| Gasoil-0.2%S         |  |
| Gasoil-0.5%S         |  |

In the absence of information of deals, bids and offers on a fixed price basis, the fixed price assessments indicate the price range in which a transaction on a floating price basis could be locked into with available derivative products, such as futures contracts and paper swaps based on periodical average of published quotations.

All prices are assessed based on information collected in the course of market research by Rim reporters each business day.

**STRUCTURE of the FOB TAIWAN MR-size CARGO MARKET**



Rim understands that the FOB Taiwan MR-size cargo oil products market is structured with three groups of business parties: Taiwanese oil refiners, Oil traders and Importers. Rim assesses FOB Taiwan MR-size cargo prices at which a standard spot transaction could take place.

Rim defines the three business parties in the FOB Taiwan oil products market as follows:

|                          |  |
|--------------------------|--|
| <b>Taiwanese Refiner</b> | A company of Taiwan that produces and exports oil products at/from its refining facilities in Taiwan.  |
| <b>Oil Trader</b>        | A company that buys and sells oil products in the international market.  |
| <b>Importer</b>          | A company that imports oil products and resell into domestic markets. Refiners of countries other than Taiwan are also considered to be importers. |



**Rim defines a standard FOB Taiwan MR-size cargo spot market transaction as follows:**

|        |   |
|--------|---|
| Case 1 | A Taiwanese refiner sells an oil products cargo to a trader on a spot basis.                  |
| Case 2 | A Taiwanese refiner sells an oil products cargo to an importer on a spot basis.               |
| Case 3 | A Taiwanese refiner sells an oil products cargo to another Taiwanese refiner on a spot basis. |
| Case 4 | A trader sells an oil products cargo to a Taiwanese refiner on a spot basis.                  |
| Case 5 | A trader sells an oil products cargo to an importer on a spot basis.                          |
| Case 6 | A trader sells an oil products cargo to another trader on a spot basis.                       |
| Case 7 | An importer sells an oil products cargo to a Taiwanese refiner on a spot basis.               |
| Case 8 | An importer sells an oil products cargo to a trader on a spot basis.                          |
| Case 9 | An importer sells an oil products cargo to another importer on a spot basis.                  |

**<93RON gasoline>**

Rim assesses FOB Taiwan spot 93RON gasoline prices for MR-size cargoes. The premiums are to periodical average of daily assessments for FOB Singapore 92RON gasoline prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula: Premium + Value of Singapore fixed price = Fixed Value

|                                    |  |                  |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
|------------------------------------|--|------------------|--------------|----------------|--|------------------------|------------------|--|--------------------------|----------------|-----------------|----------------|------------------|----------------|------------------|---------------------|------------------|---------|--|------------------------------------|--|--|----------------|------------|--|---------------------------------|--|--|--------------|---------------|--|-----------------|----------|--|-------|--------|--|
| <b>Assessment Window</b>           | Rim's assessment window for FOB Taiwan spot jet/kerosene prices for MR-size cargoes closes at 6:30 PM Tokyo local time.  |                  |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
| <b>Price Unit</b>                  | FOB Taiwan spot 93RON gasoline prices for MR-size cargoes are in \$/bbl.   |                  |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
| <b>Time Window</b>                 | FOB Taiwan spot 93RON gasoline prices for MR-size cargoes are for cargoes to be loaded during the period from 25 to 40 days ahead from the publication day. The premiums are to Singapore 92RON gasoline fixed prices for the front month in Rim FOB Singapore cargoes assessment.   |                  |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
| <b>Standard Size</b>               | FOB Taiwan 93RON gasoline prices for MR-size cargoes are for cargoes with a 25,000-35,000mt lot, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were within the standard volumes.   |                  |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
| <b>Delivery Port</b>               | FOB Taiwan spot 93RON gasoline prices for MR-size cargoes are for cargoes to be loaded at major ports in Taiwan.   |                  |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
| <b>Quality Specifications</b>      | <p>FOB Taiwan spot 93RON gasoline prices for MR-size cargoes are for cargoes of which quality is equivalent to the following specifications.</p> <table border="1"> <tr> <td>Lead Content</td> <td colspan="2">Max 0.010gpb/l</td> </tr> <tr> <td>Density at 15 degree C</td> <td colspan="2">Min 0.720 mg/cm3</td> </tr> <tr> <td rowspan="5">Distillation Temperature</td> <td>10% evaporated</td> <td>Max 70 degree C</td> </tr> <tr> <td>50% evaporated</td> <td>Max 115 degree C</td> </tr> <tr> <td>90% evaporated</td> <td>Max 185 degree C</td> </tr> <tr> <td>Final Boiling Point</td> <td>Max 210 degree C</td> </tr> <tr> <td>Residue</td> <td></td> </tr> <tr> <td>Copper Corrosion 3h at 50 degree C</td> <td colspan="2"></td> </tr> <tr> <td>Sulfur Content</td> <td colspan="2">Max 0.025%</td> </tr> <tr> <td>Vapor Pressure at 37.8 degree C</td> <td colspan="2"></td> </tr> <tr> <td>Existent Gum</td> <td colspan="2">Max 4mg/100ml</td> </tr> <tr> <td>Benzene Content</td> <td colspan="2">Max 1.5%</td> </tr> <tr> <td>Color</td> <td colspan="2">Yellow</td> </tr> </table> <p>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> |                  | Lead Content | Max 0.010gpb/l |  | Density at 15 degree C | Min 0.720 mg/cm3 |  | Distillation Temperature | 10% evaporated | Max 70 degree C | 50% evaporated | Max 115 degree C | 90% evaporated | Max 185 degree C | Final Boiling Point | Max 210 degree C | Residue |  | Copper Corrosion 3h at 50 degree C |  |  | Sulfur Content | Max 0.025% |  | Vapor Pressure at 37.8 degree C |  |  | Existent Gum | Max 4mg/100ml |  | Benzene Content | Max 1.5% |  | Color | Yellow |  |
| Lead Content                       | Max 0.010gpb/l   |                  |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
| Density at 15 degree C             | Min 0.720 mg/cm3   |                  |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
| Distillation Temperature           | 10% evaporated   | Max 70 degree C  |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
|                                    | 50% evaporated   | Max 115 degree C |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
|                                    | 90% evaporated   | Max 185 degree C |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
|                                    | Final Boiling Point  | Max 210 degree C |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
|                                    | Residue  |                  |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
| Copper Corrosion 3h at 50 degree C |  |                  |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
| Sulfur Content                     | Max 0.025%   |                  |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
| Vapor Pressure at 37.8 degree C    |  |                  |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
| Existent Gum                       | Max 4mg/100ml  |                  |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
| Benzene Content                    | Max 1.5%   |                  |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |
| Color                              | Yellow   |                  |              |                |  |                        |                  |  |                          |                |                 |                |                  |                |                  |                     |                  |         |  |                                    |  |  |                |            |  |                                 |  |  |              |               |  |                 |          |  |       |        |  |



**<Jet/Kerosene>**

Rim assesses FOB Taiwan spot A1 jet fuel/kerosene prices for MR-size cargoes. The premiums are to periodical average of daily assessments for FOB Singapore spot A1 jet fuel prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula: Premium + Value of Singapore Paper Swaps = Fixed Value

|                               |   |                  |
|-------------------------------|---|------------------|
| <b>Assessment Window</b>      | Rim's assessment window for FOB Taiwan spot jet/kerosene prices for MR-size cargoes closes at 6:30 PM Tokyo local time.   |                  |
| <b>Price Unit</b>             | FOB Taiwan spot jet/kerosene prices for MR-size cargoes are in \$/bbl.  |                  |
| <b>Time Window</b>            | FOB Taiwan spot jet/kerosene prices for MR-size cargoes are for cargoes to be loaded during the period from 25 to 40 days ahead from the publication day. The premiums are to Singapore paper swaps for the front month in Rim Singapore paper swaps assessment.                            |                  |
| <b>Standard Size</b>          | FOB Taiwan spot jet/kerosene prices for MR-size cargoes are for cargoes with a 25,000-35,000mt lot, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were within the standard volumes. |                  |
| <b>Delivery Port</b>          | FOB Taiwan spot jet/kerosene prices for MR-size cargoes are for cargoes to be loaded at major ports in Taiwan.  |                  |
| <b>Quality Specifications</b> | FOB Taiwan spot jet/kerosene prices for MR-size cargoes are for cargoes of which quality is equivalent to the Joint Fuel System Check List, also known as Jet A-1 Check List. The JFSCCL is issued by International Air Transport Association.  |                  |
|                               | Distillation Temperature; Initial Boiling Point 10% Evaporated  | Max 205 degree C |
|                               | Flash Point   | Max 40 degree C  |
|                               | Sulfur Content  | Max 0.3%         |
|                               | Smoke Point with naphthalene content of maximum 3.0%  | Minimum 19       |
|                               | Copper corrosion 2h at 100 degree C   | Maximum 1.0      |
|                               | Saybolt color   | Minimum 18       |
|                               | Extract from IATA's JFSCCL  |                  |
|                               | *Specifications for other properties are to meet specifications that are commonly required in international trading.  |                  |



**<Gasoil>**

Rim assesses FOB Taiwan spot gasoil prices for MR-size cargoes of the grades with a sulfur content of 0.001%, 0.05%, 0.2% and 0.5%. The premiums are to periodical average of daily assessments for FOB Singapore spot (0.05% sulfur) prices. Rim considers that a floating price based on the periodical average equals the fixed value based on the following formula:  
 Premium + Value of Singapore Paper Swaps = Fixed Value

|   |   |                  |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |
|---|---|------------------|-------------|--|-----------------|---|--|------------------|------------|--|----------------|----------------------------|--|-----------------|---------------------------|--|----------|--------------|--|--------|------------------------------------|--|-----------------|----------------|---------|------------|--|--|--------|-----------|-------|----------|--|-------|----------|
| <b>Assessment Window</b>                    | Rim's assessment window for FOB Taiwan spot gasoil prices for MR-size cargoes closes at 6:30 PM Tokyo local time.   |                  |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |
| <b>Price Unit</b>                           | FOB Taiwan spot gasoil prices for MR-size cargoes are in \$/bbl.  |                  |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |
| <b>Time Window</b>                          | FOB Taiwan spot gasoil prices for MR-size cargoes are for cargoes to be loaded during the period from 25 to 40 days ahead from the publication day. The premiums are to Singapore paper swaps for the front month in Rim Singapore paper swaps assessment.  |                  |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |
| <b>Standard Size</b>                        | FOB Taiwan spot gasoil prices for MR-size cargoes are for cargoes with a 25,000-35,000mt lot, which Rim considers standard. Prices for smaller or larger cargoes are to be translated into estimated values that the prices could be if the cargoes were within the standard volumes.   |                  |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |
| <b>Loading Port</b>                         | FOB Taiwan spot gasoil prices for MR-size cargoes are for cargoes to be loaded at major ports in Taiwan.  |                  |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |
| <b>Quality Specifications</b>               | <p>FOB Taiwan spot gasoil prices for MR-size cargoes are for cargoes of which quality is equivalent to the following specifications.</p> <table border="1"> <tr> <td>Flash Point</td> <td></td> <td>Min 50 degree C</td> </tr> <tr> <td>Distillation Temperature;<br/>90% evaporated</td> <td></td> <td>Max 360 degree C</td> </tr> <tr> <td>Pour Point</td> <td></td> <td>Max 5 degree C</td> </tr> <tr> <td>Cold Filter Plugging Point</td> <td></td> <td>Max -1 degree C</td> </tr> <tr> <td>Carbon Residue (10% btms)</td> <td></td> <td>Max 0.1%</td> </tr> <tr> <td>Cetane Index</td> <td></td> <td>Min 48</td> </tr> <tr> <td>Kinematic Viscosity at 40 degree C</td> <td></td> <td>Max 4.5 mm2/sec</td> </tr> <tr> <td rowspan="4">Sulfur Content</td> <td>0.001%S</td> <td>Max 0.001%</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>0.05%S</td> <td>Max 0.05%</td> </tr> <tr> <td>0.2%S</td> <td>Max 0.2%</td> </tr> <tr> <td></td> <td>0.5%S</td> <td>Max 0.5%</td> </tr> </table> <p>*Specifications for other properties are to meet specifications that are commonly required in international trading.</p> |                  | Flash Point |  | Min 50 degree C | Distillation Temperature;<br>90% evaporated |  | Max 360 degree C | Pour Point |  | Max 5 degree C | Cold Filter Plugging Point |  | Max -1 degree C | Carbon Residue (10% btms) |  | Max 0.1% | Cetane Index |  | Min 48 | Kinematic Viscosity at 40 degree C |  | Max 4.5 mm2/sec | Sulfur Content | 0.001%S | Max 0.001% |  |  | 0.05%S | Max 0.05% | 0.2%S | Max 0.2% |  | 0.5%S | Max 0.5% |
| Flash Point                                 |   | Min 50 degree C  |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |
| Distillation Temperature;<br>90% evaporated |   | Max 360 degree C |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |
| Pour Point                                  |   | Max 5 degree C   |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |
| Cold Filter Plugging Point                  |   | Max -1 degree C  |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |
| Carbon Residue (10% btms)                   |   | Max 0.1%         |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |
| Cetane Index                                |   | Min 48           |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |
| Kinematic Viscosity at 40 degree C          |   | Max 4.5 mm2/sec  |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |
| Sulfur Content                              | 0.001%S   | Max 0.001%       |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |
|   |   |                  |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |
|   | 0.05%S  | Max 0.05%        |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |
|   | 0.2%S   | Max 0.2%         |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |
|   | 0.5%S   | Max 0.5%         |             |  |                 |   |  |                  |            |  |                |                            |  |                 |                           |  |          |              |  |        |                                    |  |                 |                |         |            |  |  |        |           |       |          |  |       |          |



# RIM Japan Domestic Waterborne Market Price Assessment Methodology

(Updated Mar 2015)

## Structure of the Japan Domestic Waterborne Market and Areas of Assessment

RIM assesses wholesale prices on an ex-terminal basis for cargoes from refineries and secondary terminals. For secondary terminals, a clear indication of the loading terminal is desirable. However, prices on a delivered basis may be taken as a reference. In such a case, the actual freight will be used to calculate the ex-terminal price.

RIM assesses two main areas: Tokyo Bay and Western Japan (including Hanshin and areas in the Osaka Bay area such as Wakayama, and Oita which is located west of Setouchi).

Regarding price differences between different areas, while supply/demand pertaining to one particular area is taken into account, caution is adopted so that prices do not vary significantly from actual market conditions. To reflect more realistically actual market situations, actual freight is considered. Because of this, even if traded prices and bids/offers are unchanged, RIM's assessment can move up or down due to differences between areas.

## Quantity

The assessment quantity is for 200 kiloliters and above per lot for Gasoline, Middle Distillates, High-sulfur C Fuel Oil. For Low-sulfur C Fuel Oil, the standard quantity is 1,000 kiloliters and above per lot although lots that are 500 kiloliters or more but less than 1,000 kiloliters may also be considered.

To reflect the different quantities traded in RIM's assessment, 50% is based on cumulative average and of the remaining 50%, priority is given to the number of trades with the average of such trades taken.

Rim Japan Domestic Waterborne Price = (Cumulative Average + Price Average)/2

## Lifting Period

Up till the 25th of the current month, trades for lifting in the current month are considered. From the 26th of the current month, RIM's assessment shifts to trades for lifting in the following month. If the 25th is a holiday, then the previous day will be the last day for trades lifting in the current month to be considered.

## Assessment Window

Price assessment for the current day is for deals done and bids/offers from 10am to 3pm Tokyo time. However, considering high volatility in the futures and paper swap markets, greater attention is given to trades and bids and offers between 2pm and 3pm Tokyo time, or close to this time.

## Priority in Assessment

In principle, assessment is prioritized as follows:

1. Deal done prices
2. Firm bids/offers
3. Buying/selling indications

However, while considering the appropriateness of (1), attention is also given to (2) and (3). In particular, for (2), priority is enhanced if the quantity, lifting period and place of lifting are clearly stated. To reflect more realistically actual market conditions, deals done at levels far from the bid-offer range of most market participants will not be considered in RIM's assessment.

Supply/demand, price movements in crude and products markets overseas, changes in exchange rates are basically reflected in traded prices and bids/offers. In fixed price



assessments, trades in the paper swap market are one of the main factors considered. Trades in the physical forward market are also taken into consideration. In addition, trades in Tokyo Commodity Exchange oil futures market are also taken as a reference.

### **Basic Principle of Assessment**

The basic principle of assessment is to reflect actual market conditions, that is, obtaining price levels where most market participants can buy or sell their cargoes. Extremely high or extremely low prices that deviate from such actual market conditions, even if traded in reality, may not be taken into consideration.

Information on deals done is classified into 3 types:

1. Confirmation obtained from both the buyer and the seller
2. Confirmation obtained from only the buyer or the seller but not both
3. Information from several reliable third-party sources

In terms of accuracy, (1) is the most ideal although, owing to various restrictions, many cases fall into (2). In principle, RIM's price assessment is based on (1) with (2) also being considered. However, (3) is not taken into account. Even when information is obtained directly from the buyer or seller, this will not be considered if found to be untrue.

The unit for quantity is kiloliter (kl) and the currency for transactions is in Japanese yen. This follows industry practice in the Japan domestic waterborne market, which uses kl for quantity.

### **Trades Considered in Assessment**

Outright spot trades with confirmation obtained from the buyer and seller will be taken into account. Term deals are not considered.

Package deals, location swaps and time swaps may be used as a reference but the assessment will not be solely reflecting these deals.

For deals done directly to end-users, prices often deviate significantly from actual market levels for various reasons. Consequently, while these prices may be used as a reference to determine market trends, RIM's assessment will not be based entirely on them.

### **Assessment Principles for Market-linked Floating Prices**

Concerning trades and bids/offers based on floating prices linked to monthly average prices (i.e. RIM-linked trades), if factors such as supply/demand and cost are unchanged, movements in the premium or discount will be reflected in the fixed price.

Although the premium and discount in floating-price trades is regarded to be reflecting the strength or weakness of the current market, it may be affected by three other factors:

1. Quality differences
2. Area differences
3. Commission

Concerning (1) and (2), assessment will be made separately from the bullish and bearish factors in the general market.

Monthly average prices, the basis for the "RIM price", for the 5 products: gasoline, kerosene, gasoil, A fuel oil and low-sulfur A fuel oil, are obtained as follows:

1. From the 26th of the previous month (the starting day of assessment for cargoes to be lifted in the current month) to the 10th of the current month, paper swap prices for the relevant month obtained by RIM's survey on each day will be used. For example, for lifting in June 2014, the June paper swap prices (mid-point value) on each day from May 26 to June 10 will be taken as the monthly average. For deals done at "+200yen/kiloliter",

200yen will be added to the paper swap price on that day to obtain the fixed price.

2. For June 11 to 25, the monthly average is obtained as follows: First, average prices from the 1st to the 25th (assuming prices from the previous day till the 25th remain the same) are used; Next, for the 26th till the end of the month, paper swap prices (mid-point value) for the following month obtained by RIM's survey will be used; the average of these two sets of prices forms the basis for the monthly average during this period.

However, for low-sulfur C fuel oil and high-sulfur C fuel oil, prices in the previous day's report are assumed to be the same till the end of the month and an estimated average is calculated based on this, which is considered the monthly average.

### **Quality**

Basically, RIM's price assessment applies to imported cargoes or domestically produced cargoes meeting Japan Industrial Standards (JIS) and generally accepted by the oil industry in Japan. Various considerations for different products are given below.

**Gasoline:** Research octane number (RON): 90 and above. Even though JIS and standards according to the quality assurance law specify 89 and above, the RON of cargoes available in the market is in reality 90 and above, which has become the industry standard. MTBE content: zero. Although JIS and the quality assurance law specify 7% and below, actual cargoes available have zero MTBE. Therefore, the RON and MTBE content of cargoes that RIM considers in its assessment meet industry standards.

**Kerosene:** Regarding color (Saybolt color), JIS and the quality assurance law specify +25 and above. However, +30 and above has become the actual industry standard. Therefore, RIM's assessment is based on color of +30 and above.

**Gasoil:** No.1 and No.2 gasoil as specified in JIS are regarded as being generally available in the market, RIM's assessment is based on No.1 and No.2 gasoil. No.3 and special No.3 gasoil used in cold areas during the winter season are not reflected in RIM's assessment as they are traded at a premium to No.1 and No.2 gasoil in view of quality differences. Basically, cargoes that are tax-exempted are used for price assessment while cargoes that are taxed are not considered.

**A fuel oil:** In Western Japan such as Mizushima, the so-called "White A" is traded at a premium to the normal A fuel oil due to quality differences. RIM's assessment does not reflect the premium per se. However, as changes in premium levels play a role in reflecting the supply/demand situation, this may be used as a reference in RIM's assessment.

**Low-sulfur C fuel oil:** RIM's assessment is basically for 0.3% sulfur although 0.2% and 0.4% are also considered. Only HPP products are used and LPP products are not considered. Tender prices to end-users, as indication of price movements, are used as a reference.

**High-sulfur C fuel oil:** RIM's assessment is basically for 3.0% sulfur but in reality, lower sulfur content of up to 2.5% is also considered. Small lots of less than 200 kiloliters are not reflected in the assessment although as an indication of supply/demand movements, the premium is used as a reference. Tender prices to end-users are treated in the same way as for low-sulfur C fuel oil.



### **Assessment principles for bids/offers on RIM Trading Board**

#### *Bids/Offers used in price assessment*

Bids/Offers shown on RIM Trading Board from 2pm to 3pm Tokyo time are considered in RIM's assessment. Bids/Offers and traded prices on RIM Trading Board are obtained by phone, email, instant messaging services such as Yahoo messenger, as well as by surveys conducted by RIM.

### **Assessment principles for physical trades on JOX**

#### *Period*

RIM's assessment considers prices for prompt delivery on JOX's screen. Trades switch to lifting in the following month from the 26th of each month.

#### *Assessment Window (from 2pm to 2.30pm)*

RIM's assessment reflects deals done on the screen up till 2.30pm based on firm bids/offers shown on the screen up till 2pm. Deals done or bids/offers indicated outside the assessment window are, in principle, not reflected in RIM's assessment. Even if a deal is done within the assessment window, it will not be considered if the price deviates too drastically from the bid-offer range or if confirmation is not obtained. If no deals are done, bids/offers will be used as a reference in RIM's assessment.

### **Assessment principles for Japan domestic products paper swap**

#### *Products*

7 products are considered: gasoline, kerosene, gasoil, A fuel oil, low-sulfur A fuel oil, low-sulfur C fuel oil, high-sulfur C fuel oil.

#### *Period*

Assessment is for the 3 months up to 3 months forward. Assessment for the front month of the 3 months will end on the 10th of the lifting month for the physical cargoes (brought forward in the case of holidays). From the 11th, assessment will shift to cargoes lifting in the following month. For example, for June 2014, assessment for the front month July contract starts from June 11 and finishes on July 10. From July 11, the front month shifts to the August contract.

#### *Factors*

In principle, the assessment window is from 2pm to 3pm Tokyo time. During this period, deals done and bids/offers in the paper swap market including RIM Trading Board, OTC, JOX, JOE are considered in RIM's assessment.