

World Crude Methodology

24 August 2016

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General methodology

ICIS continuously develops, reviews and revises its methodologies in consultation with industry participants. The product specifications and trading terms and conditions used are intended to reflect typical working practices in the industry.

ICIS publishes market assessments based on information gathered from market participants about: spot transactions, spot bid and offer levels, contract price negotiations, prices of related commodities, and relevant freight costs.

ICIS does not make retrospective adjustments or changes to price assessments based on information received after publication time or after any cut-off point specified in individual methodology documents.

ICIS regards all arm's-length transactions which meet its specification criteria as carrying equal weight.

ICIS uses proprietary models where necessary to normalise data to the typical specifications for cargo size and date ranges given for each commodity.

Some ICIS assessments are the product of calculation alone, for example in markets where insufficient market activity takes place to permit price assessment, or where a market itself habitually sets prices according to a formula. Such calculated assessments are noted as such in their detailed methodology specifications.

ICIS endeavours to cross-check all the transaction information it gathers. ICIS will not use information for assessment purposes where such checks call into doubt the accuracy of the original information, or where a transaction appears to have occurred under circumstances that render it non-repeatable or otherwise markedly unusual.

Rationale for crude oil methodology

All ICIS-published assessments in the crude oil market are so-called "market closing" assessments. That is, they are intended to represent the tradable value of a particular crude grade at the time commonly agreed by the marketplace to represent a daily physical market "close".

A closing value price assessment takes into account: confirmed deals, bids and offers; market direction; and market relationships with other like grades and related derivative instruments, where relevant, at the time of the close of business for each region.

The value published is intended to reflect the real transactable value of a commodity at the point of close. As such, bid and offer information at the close would take precedence over transactions done earlier in the day.

Where a confirmed deal is done for the same grade and loading range as confirmed bids and offers, and when all are declared to the market simultaneously, the deal will take precedence over the bids and offers.

ICIS takes into account a wide range of market input in making such choices, and reserves the right to exclude from its analysis any price information deemed unreliable or unrepresentative of the market. ICIS commits to describing the information it deemed reliable in the daily market comment accompanying its assessments, including transactions, bids, offers and other market information used in making these

assessments. This includes instances where ICIS typically assesses based on firm transaction or bid/offer information, but where that information was not available on a given day and alternative evidence was used.

Cargoes partially loading outside of the Assessed Trading Timeframe may be reflected in the assessment, but will not typically be used where there is deal/bid/offer information within the assessment period. Prompt loading cargoes will not be taken into consideration. Prompt loading is defined as a cargo with no loading days within the assessment period.

Where ICIS also publishes its single value assessments as a bid/offer, this represents a static range either side of the published single value assessment.

ICIS has adopted this “closing” methodology based on several decades of market observation and feedback, which have made it clear that market relationships (differentials) are of paramount importance to the smooth functioning of crude markets. Only a single-point-in-time snapshot can accurately map these differentials. Other measurement strategies, for example weighted averaging, are vulnerable to random variation in transaction levels and volume, which can give rise to distortions in the resulting differentials.

In addition, the volume of transactions for any given crude oil each day is unknowable in advance, and a volume-dependent methodology is exposed a) to the charge that lower volumes will result in less accurate prices and b) to the possibility of complete failure in the event no transactions occur.

The use of closing trade follows from the natural tendency of commodities markets to show higher levels of activity at the close of the day. In addition, the market’s knowledge that prices are based on the close provides a “virtuous circle” incentive for market participants to trade transparently during the same period of time as their competitors.

ICE Futures Brent Contract Expiry Methodology

The following is the standard methodology used by ICIS to assess the cash market value of the expiring front-month ICE Futures Brent contract.

For assessment purposes, the trading day shall be deemed to commence at 9:00am London time and finish at 7:30pm London.

ICIS makes five assessments on Expiry Day (as on every other business day):

- London Morning- 10:30 AM London
- London Midday – 12:30 PM London
- London Afternoon – 2:30 PM London
- London Snapshot – 4:30 PM London
- Exchange Close – 7:30 PM London

At each of these assessments, ICIS determines three values:

- The second-month ICE Futures Brent contract
- The EFP (Exchange of Futures for Physical) for such second-month
- The cash BFOE (Brent/Forties/Oseberg/Ekofisk) front-month to second-month spread

The value of the second month ICE contract shall be determined by the last trade immediately before each of the first four timestamps (or the mid-point of the last bid and offer, if the timing of such last trade is deemed as stale).

The value of the second month ICE contract at the Exchange Close shall be determined by the Settlement as published by ICE Futures.

The EFP shall be determined by the latest bid, offer or trade value as seen in the market. (Such value will be as reported to ICIS by major market brokers, e.g. PVM, ICAP, AALPHA, TULLETT-PREBON and/or oil companies/traders/brokers active in the market). The spread shall also be determined by the latest bid, offer or trade value as seen in the market.

(ICIS reserves the right to discount any bids or offers for either the EFP or cash spread, which are deemed to have been made too late to be actioned upon.)

The cash market value of the expiring front-month ICE Futures Brent contract shall be determined as follows:

- The second-month ICE contract
- Plus/minus the EFP for such second-month
- Plus/minus the cash front-month to second-month spread

However, in exceptional circumstances, ICIS reserves the right to use other relevant market data in the calculation of its assessment.

Crude Oil (ASIA-PACIFIC)

Specifications:

Country	Grade	API ^o	Sulphur	Loading port	Terms	Standard Cargo Size (bbl)
Indonesia	Cinta	32.70	0.11	Cinta, Java	FOB	100,000-200,000
Australia	Cossack	48.20	0.04	Cossack Pioneer FPSO	FOB	500,000-650,000
Sudan	Dar Blend	26.40	0.12	Bashayer Marine Terminal, Red Sea	FOB	600,000-1,000,000
Indonesia	Duri	20.29	0.21	Dumai Terminal	FOB	100,000-200,000
Russia	ESPO Blend	34.50	0.60	Kozmino	FOB	700,000-750,000

Indonesia	Minas	33.94	0.09	Dumai Terminal	FOB	100,000-200,000
Sudan	Nile Blend	32.76	0.05	Bashayer Marine Terminal, Red Sea	FOB	600,000-1,000,000
Australia	NW Shelf Condensate	62.30	0.01	Dampier Terminal	FOB	500,000-650,000
Malaysia	Tapis	45.00	0.02	Kerteh TCOT	FOB	300,000-600,000
Indonesia	Widuri	33.30	0.07	Widuri	FOB	100,000-200,000

The above API and sulphur specifications should be taken only as typical for the grade and not a guarantee of quality.

Asia Pacific crude grades are assessed at 16:30 Singapore time. In the absence of market information at that time, ICIS will use market information regarding deals/bids/offers or other evidence closest to that time during the same trading day.

With the exception of ESPO Blend, such assessments will be based on the market differential to Dated BFOE for each grade, applied to the value of the ICIS Asian Dated BFOE assessment.

ICIS assessments for Asian Dated BFOE are established at 16:30 Singapore time.

On occasion, e.g. on a public holiday, the open market trading session may take place at an earlier time, for example 12:00-12:30 Singapore time, in which case ICIS will make clear that its assessments are based on activity during this earlier session.

The Asian Dated BFOE assessment is calculated by applying the Dated to forward month BFOE differential established for the North Sea section in the previous session to the value of the relevant forward month BFOE value at the Singapore 16:30 Close. In the absence of any recent information regarding trades, bids and offers for any specific grade, ICIS will assess the differential to Asian Dated BFOE using typical market relationships with other like grades.

ESPO Blend assessments are based on the grade's market differential to second month Dubai forward contracts, as established in line with the Dubai measurement (see Arab Gulf section below). ICIS establishes the market differential based on available transaction/bid/offer information.

The Assessed Trading Timeframe for Asian grades is based on the full calendar month, two months ahead of the date of publication.

ICIS does not accept market information received after 20:00 Singapore time for these grades for use in its assessments. Information received after this time may be described in market comments but will not form part of the assessment process.

Crude Oil (ARAB GULF)

Specifications:

Country	Grade	API ^o	Sulphur	Loading port	Terms	Standard Cargo Size (bbl)
Dubai	Dubai	30.40	2.13	Fateh	FOB	N/A*
Oman	Oman	32.95	1.14	Mina al Fahal	FOB	N/A*
Abu Dhabi	Murban	39.73	0.79	Jebel Dhanna	FOB	500,000
Abu Dhabi	Das	39.20	1.30	Das Island	FOB	500,000
Abu Dhabi	Upper Zakum	33.9	1.84	Zirku	FOB	500,000
Qatar	Qatar Land	41.61	1.19	Mesaieed	FOB	500,000
Qatar	Qatar Marine	33.80	1.85	Halul Island	FOB	500,000

**Due to liquidity issues in the physical market, assessments for Oman and Dubai are based predominately on business activity in the paper markets. These markets principally comprise the Brent-Dubai exchange of futures for swaps (EFS) market, the over the counter (OTC) Dubai swaps market and the Dubai Mercantile Exchange (DME) Oman futures market. Contract sizes for these markets are in multiples of 1,000 bbl lots. Full-sized physical 500,000 bbl cargoes will be taken into consideration, as will 25,000 bbl Oman and Dubai partial cargoes, particularly during periods of illiquidity in front month and second month Dubai swaps spreads.*

The above specifications for API and Sulphur should be taken only as typical for the grade and not a guarantee of quality.

Arab Gulf crude grades are assessed at 16:30 Singapore time.

On occasion, e.g. on a public holiday, the open market trading session may take place at an earlier time, for example 12:00-12:30 Singapore time, in which case ICIS will make clear that its assessments are based on activity during this earlier session.

In the absence of market information at that time, ICIS will use market information regarding deals/bids/offers or other evidence closest to that time during the same trading day.

In the absence of any recent information regarding trades, bids and offers for any specific grade, ICIS will assess the price using recognised market relationships with other like grades.

The Assessed Trading Timeframe for Dubai, Oman and other Arab Gulf cargoes is based on the full calendar month, two months ahead of the date of publication.

ICIS does not accept market information received after 20:00 Singapore time for these grades for use in its assessments. Information received after this time may be described in market comments but will not form part of the assessment process.

Dubai

ICIS price assessments for Dubai cover three forward months, i.e. the front trading month plus two successive forward months, with the front trading month being the calendar month two months ahead of the date of publication. For example, in September, ICIS will assess November, December and January Dubai. The assessed months will roll forward on the 1st of each calendar month, or on the next working day should the 1st fall on a weekend or a holiday.

ICIS assesses the daily value of cash Dubai at 16:30 Singapore time.

On occasion, e.g. on a public holiday, the open market trading session may take place at an earlier time, for example 12:00-12:30 Singapore time, in which case ICIS will make clear that its assessments are based on activity during this earlier session.

In the absence of market information at that time, ICIS will use market information regarding deals/bids/offers or other evidence closest to that time during the same trading day.

ICIS marks the currently traded value of ICE Brent futures at the aforementioned times.

ICIS subtracts from the ICE Brent price the prevailing market value for Brent-Dubai EFS (Exchange of Futures for Swaps) as determined by transactions and/or bid and offer levels in order to derive a Dubai swap value. The Dubai swap value is equal to the forward Dubai cargo value two months ahead.

ICIS creates a forward curve for Dubai based on inter-month Dubai swap spreads determined by actual market transactions and/or bid and offer levels.

Oman

ICIS assessments for Oman crude cover the front trading month plus the succeeding forward month, with the front trading month being the calendar month two months ahead of the date of publication. For example, in September, ICIS will assess November and December Oman. The assessed months will roll forward on the 1st of each calendar month, or on the next working day should the 1st fall on a weekend or a holiday.

ICIS assesses the daily value of forward Oman months at 16:30 Singapore time.

On occasion, e.g. on a public holiday, the open market trading session may take place at an earlier time, for example 12:00-12:30 Singapore time, in which case ICIS will make clear that its assessments are based on activity during this earlier session.

In the absence of market information at that time, ICIS will use market information regarding deals/bids/offers or other evidence closest to that time during the same trading day.

Oman assessments will be based on the grade's market differential to Dubai added to the value of the ICIS Dubai assessment as established in line with the above.

The assessment for November Oman, for example, is based on November Dubai swaps (Jan Dubai cash) plus the November trade differential to Dubai quotes.

Abu Dhabi and Qatar

ICIS assesses Abu Dhabi and Qatar grades at 16:30 Singapore time.

On occasion, e.g. on a public holiday, the open market trading session may take place at an earlier time, for example 12:00-12:30 Singapore time, in which case ICIS will make clear that its assessments are based on activity during this earlier session.

In the absence of market information at that time, ICIS will use market information regarding deals/bids/offers or other evidence closest to that time during the same trading day.

Assessments for November Abu Dhabi and Qatari grades, for example, are based on November Dubai swaps (Jan cash) plus the Official Selling Price (OSP) price differential to Dubai quotes plus November trade differentials.

The OSPs for Abu Dhabi and Qatari crude grades are set retroactively and issued at the start of each month. For example, August Official prices for Abu Dhabi and Qatari crude are issued in early September.

Crude Oil (NORTH SEA)

Specifications:

Country	Grade	API ^o	Sulphur	Loading port	Terms	Standard Cargo Size (bbl)
UK	Brent	38.00	0.45	Sullom Voe	FOB	600,000
UK	Forties	38.7	0.79	Hound Point	FOB	600,000
Norway	Oseberg	37.8	0.27	Sture	FOB	600,000
Norway	Ekofisk	38.4	0.22	Seal Sands	FOB	600,000
Norway	Statfjord	39.5	0.22	Platform	CIF basis Rotterdam	800,000-855,000
Norway	Asgard	47.1	0.19	Platform	CIF basis Rotterdam	800,000-855,000
Norway	Gullfaks	37.5	0.22	Platform	CIF basis Rotterdam	800,000-855,000
UK	Flotta	36.9	0.83	Flotta	FOB	650,000

The above specifications for API and sulphur should be taken only as typical for the grade and not a guarantee of quality.

BFOE measurement

ICIS assesses the daily value of cash and dated BFOE (Brent, Forties, Oseberg, Ekofisk) at 16:30 London time each day as follows:

ICIS marks the currently traded value of ICE Brent futures at exactly 16:30 London time.

ICIS adds to or subtracts from the ICE Brent price the prevailing market value for EFP (Exchange of Futures for Physical) in order to derive a forward cash Brent price. EFP prices are assessed using market transactions and/or bid and offer levels.

ICIS creates an interpolated forward curve for BFOE Contracts for Difference (CfD) based on the CfD values determined by actual market transactions and/or bid and offer levels and offsets this curve against the forward cash physical price.

ICIS then applies the differential to this CfD curve of the cheapest of the four components of the BFOE pool to derive a Dated BFOE price. This differential is determined by market transactions, bids and offers.

(The BFOE price, by common market consent, is deemed always to be the lowest price among the four key crudes in the pool).

The differential of the relevant BFOE grade against the forward curve is determined using the level of trades, bids and offers at the close of the 16:00-16:30 open market trading window in London.

On occasion, e.g. prior to a public holiday, the open market trading session may take place at an earlier time, for example 12:00-12:30 London time, in which case ICIS will make clear that its assessments are based on activity during this earlier session.

ICIS does not accept market information received after 19:30 London time for these grades for use in its assessments. Information received after this time may be described in market comments but will not form part of the assessment process.

North Sea Crudes

ICIS assesses North Sea crude grades at 16:30 London time. In the absence of market information at that time, ICIS will use market information regarding deals/bids/offers or other evidence closest to that time during the same trading day.

While cargoes offered/sold on a Ship-to-Ship (STS) transfer basis are not covered by the standard methodology, ICIS reserves the right to take these into account in the calculation of its assessments.

The assessments are based on the market differential to Dated BFOE for each grade applied to the value of the ICIS Dated BFOE assessment as established in line with the above methodology. In the absence of any recent information regarding trades, bids and offers for any specific grade, ICIS will assess the differential to Dated BFOE using recognised market relationships with other like grades.

The Assessed Trading Timeframe is 10 days to one month forward from the date of publication.

The end of the Assessed Trading Timeframe will fall on the same day of the month as the assessed date, unless:

1. Publication day falls on the day before an English weekend or public holiday, in which case the timeframe lengthens by the number of ensuing weekend/public holiday days;

2. M+1 is shorter than M0 and does not contain a day of the month corresponding to the publication day, in which case the timeframe ends on the second to last day of M+1;
3. The end of the trading timeframe would fall on the last day of M+1, in which case it shortens to the second to last day of M+1;
4. Publication day is the last working day of month, and M+1 contains more days than the current month, in which case the assessed trading timeframe lengthens to the second to last day of M+1.

ICIS does not accept market information received after 19:30 London time for these grades for use in its assessments. Information received after this time may be described in market comments but will not form part of the assessment process.

Crude Oil (CIS)

Specifications:

Country	Grade	API ^o	Sulphur	Loading port	Terms	Standard Cargo Size (tonnes)
Russia	URALS NWE	32.00	1.30	Primorsk/Gdansk/ Ust-Luga	CIF basis Rotterdam	100,000
Russia	URALS MED (80)	32.00	1.30	Novorossiysk/ Yuzhny	CIF basis Augusta	80,000
Russia	URALS MED (140)	32.00	1.30	Novorossiysk/ Yuzhny	CIF basis Augusta	140,000
Azerbaijan	AZERI LT	34.50	0.15	Supsa/Ceyhan	CIF basis Augusta	80,000
Kazakhstan	CPC BLEND	43.50	0.55	CPC Terminal	CIF basis Augusta	80,000
Kazakhstan	KUMKOL	40.50	0.15	Batumi	CIF basis Augusta	50,000-100,000
Russia	SIBERIAN LIGHT	35.50	0.60	Tuapse	CIF basis Augusta	60,000-80,000

The above specifications for API and sulphur should be taken only as typical for the grade and not a guarantee of quality.

ICIS assesses CIS crude grades at 16:30 London time. In the absence of market information at that time, ICIS will use market information regarding deals/bids/offers or other evidence closest to that time during the same trading day.

Assessments will be based on the market differential to Dated BFOE for each grade, applied to the value of the ICIS Dated BFOE assessment. In the absence of any recent

information regarding trades, bids and offers for any specific grade, ICIS will assess the differential to Dated BFOE using recognised market relationships with other like grades. The Assessed Trading Timeframe is 10-25 days forward from the date of publication. ICIS does not accept market information received after 19:30 London time for these grades for use in its assessments. Information received after this time may be described in market comments but will not form part of the assessment process.

Crude Oil (MEDITERRANEAN)

Specifications:

Country	Grade	API ^o	Sulphur	Loading port	Terms	Standard Cargo Size (tonnes)
Libya	BREGA	39.80	0.20	Marsa al Brega	FOB	80,000
Libya	ES SIDER	36.50	0.41	Es Sider	FOB	80,000
Tunisia	ZARZAITINE	42.50	0.10	La Skhirra	FOB	60,000-80,000
Algeria	SAHARAN	45.50	0.10	Arzew	FOB	80,000
Iran	IRAN LT	33.75	1.40	Sidi Kerir	FOB	80,000
Iran	IRAN HVY	31.50	1.80	Sidi Kerir	FOB	80,000
Iraq	KIRKUK	35.50	2.00	Ceyhan	FOB	80,000

The above specifications for API and sulphur should be taken only as typical for the grade and not a guarantee of quality.

ICIS assesses Mediterranean crude grades at 16:30 London time. In the absence of market information at that time, ICIS will use market information regarding deals/bids/offers or other evidence closest to that time during the same trading day.

Assessments will be based on the market differential to Dated BFOE for each grade, applied to the value of the ICIS Dated BFOE assessment. In the absence of any recent information regarding trades, bids and offers for any specific grade, ICIS will assess the differential to Dated BFOE using recognised market relationships with other like grades. The Assessed Trading Timeframe is 10-25 days forward from the date of publication. ICIS does not accept market information received after 19:30 London time for these grades for use in its assessments. Information received after this time may be described in market comments but will not form part of the assessment process.

Crude Oil (WEST AFRICA)

Specifications:

Country	Grade	API ^º	Sulphur	Loading port	Terms	Standard Cargo Size (bbl)
Nigeria	Bonny Light	35.0	0.15	Bonny	FOB	900,000-1,000,000
Nigeria	Qua Iboe	36.0	0.1	Qua Iboe	FOB	900,000-1,000,000
Nigeria	Brass River	37.3	0.17	Brass River	FOB	900,000-1,000,000
Nigeria	Escravos	33.0	0.17	Escravos	FOB	900,000-1,000,000
Nigeria	Forcados	30.4	0.28	Forcados	FOB	900,000-1,000,000
Nigeria	Agbami	46.3	0.03	Agbami FPSO	FOB	900,000-1,000,000
Nigeria	Erha	31.8	0.21	Erha FPSO	FOB	900,000-1,000,000
Angola	Cabinda	32.6	0.12	Malongo	FOB	900,000-1,000,000
Angola	Girassol	29.8	0.34	Offshore Angola	FOB	900,000-1,000,000
Angola	Hungo	28.5	0.71	Kizomba A FPSO	FOB	900,000-1,000,000
Angola	Kissanje	28.2	0.44	Kizomba B FPSO	FOB	900,000-1,000,000

The above specifications for API and sulphur should be taken only as typical for the grade and not a guarantee of quality.

ICIS assesses West African crude grades at 16:30 London time. In the absence of market information at that time, ICIS will use market information regarding deals/bids/offers or other evidence closest to that time during the same trading day.

Assessments will be based on the market differential to Dated BFOE for each grade, applied to the value of the ICIS Dated BFOE assessment. In the absence of any recent information regarding trades, bids and offers for any specific grade, ICIS will assess the differential to Dated BFOE using recognised market relationships with other like grades. The Assessed Trading Timeframe is 45-75 days forward from the date of publication. ICIS does not accept market information received after 19:30 London time for these grades for use in its assessments. Information received after this time may be described in market comments but will not form part of the assessment process.

Crude Oil (AMERICAS)

Specifications:

Country	Grade	API ^º	Sulphur	Delivery Point	Terms	Standard Cargo Size (bbl)
USA	West Texas Intermediate (WTI)	38-40	0.3	Cushing, Oklahoma	FIP	Pipeline

USA	West Texas Intermediate (WTI)	38-40	0.3	Midland, Texas	FIP	Pipeline
USA	West Texas Sour (WTS)	32.8	1.98	Midland, Texas	FIP	Pipeline
USA	Light Louisiana Sweet (LLS)	35-40	0.4	St.James, Louisiana	FIP	Pipeline
USA	Heavy Louisiana Sweet (HLS)	32-33	0.3	Empire, Louisiana	FIP	Pipeline
USA	MARS	28.9	1.8	Clovelly, Louisiana	FIP	Pipeline
USA	THUNDER HORSE	33.7	0.7	Clovelly, Louisiana	FIP	Pipeline
USA	Magellan East Houston (MEH)	40-44	0.4	East Houston, Texas	FIP	Pipeline
USA	Southern Green Canyon (SGC)	28.7	1.81	Nederland, Texas	FIP	Pipeline

The above specifications for API and sulphur should be taken only as typical for the grade and not a guarantee of quality.

The benchmark West Texas Intermediate (WTI) at Cushing, Oklahoma consists of two front months' daily assessments rolled forward on the 25th or following business day of every month.

ICIS physical market assessment for WTI is based on the settlement value of the NYMEX futures contract at the Cushing, Oklahoma delivery hub, at 1:30pm Houston time.

ICIS assesses Americas crude grades based on information gathered from market sources. The differential to WTI for each grade is applied to the value of the ICIS WTI Cushing assessment in order to obtain an outright value.

In the absence of market information (deal evidence), ICIS will use bids/offers or other evidence such as a spreads (conversion) between grades and will be documented in the commentary.

For three days following the expiration of the spot NYMEX futures contract and before pipeline scheduling, ICIS will calculate the front-month value based on the spread (roll) to the second month obtained from market sources.

ICIS does not accept market information received after 17:00 Houston time for these grades for use in its assessments. Information received after this time may be described in market commentary but will not form part of the assessment process.

Other principles and guidelines

Changes to methodology

All markets evolve and ICIS has a duty to ensure its methodologies for market-reporting evolve in step with markets.

ICIS therefore regularly conducts internal reviews of the appropriateness of its methodologies.

Draft changes are then made public and comment requested from industry participants, with a minimum one-month notice period, except where, exceptionally a *force majeure* event (natural disaster, war, bankruptcy of a trading exchange etc.) makes necessary a shorter notice period.

ICIS is committed to reviewing all comments on proposed methodology changes, but in some cases may find it necessary to alter its methodologies against the wishes of some market participants.

In addition, ICIS has a formal methodology consultation process. The company commits to holding this consultation every three years for the World Crude Report. The date of the last consultation launched and the expiry date by which the company commits to conducting the next consultation can be seen at the top of the methodology document. Please also refer to the Methodology Consultation Process section of the company's Compliance Manual. This contains detailed flow charts documenting the internal and external review and consultation process.

Consistency

ICIS achieves consistency between its assessors in exercising their judgement by requiring all assessors to follow this detailed methodology as well as the company's Editorial Standards document. In addition, ICIS reporters are required to complete standard training before undertaking the work of a market reporter. Every reporter's work is peer reviewed and spot checked.

Data standards

ICIS has a public Data Standards Policy which covers the type and quality of information we ask market participants to report.

The following principles relate to ICIS crude market assessments and commentaries:

- *Where possible, please allow access to active market traders and allow them to comment on active news stories.*
- *Where possible, please provide market data from both front and back-office functions.*
- *Where possible, please provide complete data and not a subsection.*
- *Flag inter-affiliate transactions.*
- *Flag sleeve trade.*
- *Flag spread trades.*
- *When a source or contact leaves the organisation please contact ICIS to the replacement (ICIS requests that both the source and the organisation contacts them).*
- *Where information is not validated by the source (i.e. rumour) please indicate as such.*

Delivery locations for price assessments

Locations for ICIS crude assessments are chosen to reflect the concentration of liquidity on the traded markets.

Exercise of judgement

Apart from instances where data may be excluded (see below), ICIS will typically exercise judgement where market information about firm bids and offers or transactions is not available.

In most cases this will involve the application of spread trade information or prevailing market relationships, detailed in the specifications section for each grade in this document.

ICIS will also exercise judgement where only a bid or offer is available, or where a bid/offer spread is so wide as to be unhelpful in establishing tradable value. In both instances, spreads to other grades or prevailing market relationships will typically be used to assess the price. In these cases the assessment will still fall above the highest firm bid and below the lowest firm offer, as long as the bid and/or offer information meets all other criteria specified in this methodology.

Exclusion of data

In line with its Editorial Standards policy, ICIS reporters actively seek to identify anomalous market information and exclude it from the assessment process. For crude market assessments, this is done by the daily information gathering and verification process carried out by reporters, whereby market transaction, bid and offer information is confirmed and verified by multiple sources.

In assessing crude oil markets, ICIS takes into consideration only arms-length transactions between non-affiliated parties.

ICIS does not accept bids or offers that are not firm. Any bid or offer which is demonstrably not firm will be disregarded and further bids or offers from the same counterparty may also be disregarded.

ICIS also excludes from its assessments transactions where ICIS market reporters have reasonable grounds to doubt that a transaction is representative of typical market behaviour: for example, where a deal is concluded disregarding the best bid or offer on the market; where there is evidence that a market participant has disclosed only part of its market activity to ICIS; or where a transaction lies outside the prevailing range of typical market activity.

ICIS records instances of anomalous data and reviews these instances on a regular basis with a view to determining if a pattern exists.

Where market reporters have concerns over the behaviour of a market participant, this will be escalated using the ICIS Escalation Process for Compliance and Regulatory Issues. This can be found in the company's Compliance Manual.

Description of data used

For each assessment published in the World Crude Report, ICIS gives a concise description of which type of market data was used to form the assessment. This is done using a standardised key code. A single letter published alongside the assessment denotes the type of information used as the primary basis for the assessment. Any other type of information ICIS may have gathered for that grade can be considered as supporting and of secondary importance in the formation of the assessment.

The types of information used in the crude oil assessments are as follows:

- a) Transaction data
- b) Bids/Offers
- c) Other market data
- d) Official Selling Prices (OSP)
- e) Relationship with other grade assessments
- f) No new data, assessment unchanged

Grade specifications

Specifications are chosen to reflect the concentration of liquidity on the traded markets for each delivery location.

Key submitter dependency

Because of the sometimes thinly-traded nature of certain crude oils, and the existence of markets where there are a limited pool of active counterparties, ICIS does not employ minimum rules on the number of submitters.

Market communication

ICIS communicates with a broad range of market participants – traders, brokers, back-office employees, supply managers, operations personnel and company executives – to obtain market information.

ICIS communicates with participants by telephone, email, instant messenger and face to face. All instant messenger, email communication and notes of any face to face communication are archived and details of telephone communication are logged and data-based.

ICIS does not accept instant messenger communication from unknown parties, and reporters are required to verify a market participant's identity prior to using IM communication.

ICIS does not regard in any way as binding attempts by market participant companies to restrict ICIS communication with their employees. ICIS has a duty to its subscribers to obtain the maximum possible amount of market information. ICIS treats all communication from market participants as confidential.

ICIS reporters are bound by a Code of Conduct to report to their superiors any coercive or threatening communication from market participants, or any offers of inducements of any kind intended to influence an assessment.

Where improper communication appears to have taken place, ICIS will communicate in the first instance with senior management at the company or companies involved, and if necessary with relevant market authorities.

ICIS expects the highest standards of propriety from all market participants, and regards all communications from market participants as representative of the views of an individual's employer.

ICIS is committed to the highest levels of customer service, and has a formal feedback and complaints policy, which can be viewed here:

<http://www.icis.com/about/icis-feedback-policy>

Market data verification

ICIS will always make best endeavours to confirm bids, offers and transactions with the relevant party/parties. ICIS attempts to cross-check all market data received from a buy or sell-side participant with a participant's trading counterparty.

Where both counterparties to a transaction cannot or will not confirm the data, ICIS seeks corroboration from other market sources.

Where transaction or bid/offer information has been received from a trader rather than from a company's back office, ICIS always seeks confirmation from other sources.

Where ICIS has grounds to doubt an item of market data, it may request further evidence that a transaction has taken place, including documentary evidence.

ICIS treats transaction data received from active brokerages as confirmed.

On occasion, in markets with low liquidity and a low number of counterparties, ICIS may choose to use unconfirmed data, but only in so far as it is aligned with other market information and comes from a source deemed reliable by ICIS based on previous interactions.

Minimum data threshold

Because of the sometimes thinly-traded nature of some crude oils, ICIS does not have a minimum data threshold for its assessment methodologies in these markets. ICIS' crude oil methodology is designed to function accurately under all market conditions and to make use of parallel data where no direct transaction or bid/offer data is available.

Parallel data used is typically spread trade to other grades or, where this does not exist, prevailing market relationships with other grades. These procedures are explained within the specific grade methodologies above.

ICIS makes clear in its daily market comments whether it has assessed a price based on transaction or bid/offer data or whether it has used other forms of evidence or calculation.

Selection of participants

ICIS policy on general market data is that we welcome all information regardless of source or constitution as long as it is provided in good faith as true.

However, only active market participants verified as such by existing active industry participants and verified as a viable business by ICIS investigations will be allowed to contribute price data to ICIS for the purpose of assessing tradable market value under this methodology.

Unit prices and credit terms

All grades of crude are generally traded in US dollars/barrel and therefore all price assessments are quoted on this basis.

Typical credit terms for crude are 30 days from Bill of Lading date.

Volumes

For each crude grade ICIS publishes the standard cargo size, found in the specifications sections of this methodology document. Market information for cargoes conforming to these standards will be fully considered in the assessment process, providing the information conforms to all other specifications and conditions published in this methodology.

If ICIS has market information regarding cargoes outside of these published ranges, it will only be used in the absence of any standard-sized cargo information. In this case, ICIS will seek to establish whether there is a market price premium or discount for the non-standard cargo and apply this for the purpose of making its assessment.