

Crude Oil Methodology

September 2013



ICIS continuously develops, reviews and revises its methodologies in consultation with industry participants. Product specifications and trading terms and conditions used aim to reflect typical working practices prevalent in the industry.

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

ICIS includes in its price assessment generation process only information gathered up to the published market close time for each commodity and assessed period.

ICIS does not make retrospective adjustments or changes to price assessments based on information subsequently received.

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

ICIS uses proprietary models where necessary to normalize 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 habitually itself 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 prevailing 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 aims to reflect the real transactable value of a commodity at the point of close. As such it may involve analytical choices between for example "last

done" trades and prevailing 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. (See also, Exercise of Judgement).

ICIS has adopted this "closing" methodology based on several decades of market observation and feedback, which have made 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.

Selection of Participants

Only active market participants verifiable by industry are selected to contribute market data to ICIS. New participants are cross referenced by counterparties in the market.

Market Data Verification

ICIS will always make best endeavours to confirm bids, offers and transactions with the relevant party/parties.

Credit terms

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

ASIA PACIFIC

Specifications

Country	Grade	API[®]	Sulphur	Loading Port	Terms	Typical Size (bbl)
Indonesia	Cinta	32.70	0.11	Cinta, Java	FOB	100-200,000
Australia	Cossack	48.20	0.04	Cossack Pioneer FPSO	FOB	650,000
Sudan	Dar Blend	26.40	0.12	Bashayer Marine Terminal, Red Sea	FOB	600,000 to 1m
Indonesia	Duri	20.29	0.21	Dumai Terminal	FOB	200,000
Russia	ESPO Blend	34.50	0.60	Kozmino	FOB	730,000
Indonesia	Minas	33.94	0.09	Dumai Terminal	FOB	200,000
Sudan	Nile Blend	32.76	0.05	Bashayer Marine Terminal, Red Sea	FOB	600-650,000
Australia	NW Shelf Condensate	62.30	0.01	Dampier Terminal	FOB	650,000
Malaysia	Tapis	45.00	0.02	Kerteh TCOT	FOB	300-600,000
Indonesia	Widuri	33.30	0.07	Widuri	FOB	100-200,000

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

Asia Pacific crude grades are assessed based on the levels of trades, bids and offers throughout the whole trading day, including the open market trading window, in order to assess the market value for such grades at the close of business.

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

ICIS assessments for Asia Dated BFOE are established at 5.30 p.m. in Singapore, during British Summer Time (BST) and at 6.30 p.m. when UK switches to Greenwich Mean Time (GMT). The Asian Dated BFOE assessment is calculated by the 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 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 recognised market relationships with other like grades.

ESPO Blend assessments are based on the grade's prevailing differential to second month Dubai forward contracts as established in line with the Dubai measurement (see Arab Gulf below).

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

Cargoes loading outside of the Assessed Trading Timeframe may be reflected in the assessment, but prompt loading cargoes offered or sold at a distressed discount will not be taken into consideration.

ARAB GULF

Specifications

<u>Country</u>	<u>Grade</u>	<u>API^o</u>	<u>Sulphur</u>	<u>Loading Port</u>	<u>Terms</u>	<u>Typical Cargo Size (bbl)</u>
Dubai	Dubai	30.40	2.13	Fateh	FOB	500,000
Oman	Oman	32.95	1.14	Mina al Fahal	FOB	500,000
Abu Dhabi	Murban	39.73	0.79	Jebel Dhanna	FOB	500,000
Abu Dhabi	L Zakum	40.47	1.04	Das Island	FOB	500,000
Abu Dhabi	Umm Shaif	36.73	1.44	Das Island	FOB	500,000
Qatar	Qatar Land	41.61	1.19	Mesaieed	FOB	500,000
Qatar	QatarMarine	33.80	1.85	Halul Island	FOB	500,000

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

Arab Gulf crude grades are assessed based on the levels of trades, bids and offers throughout the whole trading day, including the open market trading window, in order to assess the market value for such grades at the close of business.

ICIS assessments for Arab Gulf grades are established at 5.30 p.m. in Singapore, during British Summer Time (BST) and at 6.30 p.m. when UK switches to Greenwich Mean Time (GMT).

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.

Cargoes loading outside of the Assessed Trading Timeframe may be reflected in the assessment, but prompt loading cargoes offered or sold at a distressed discount will not be taken into consideration.

Dubai measurement

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 5.30 p.m. in Singapore, during British Summer Time (BST) and at 6.30 p.m. when UK switches to Greenwich Mean Time (GMT).

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 as reported by market participants and brokers 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 intermonth Dubai swap spreads determined by actual market transactions and/or bid and offer levels as reported by market participants and brokers.

The assessment of front month Dubai is based on levels of trades, bids and offers throughout the whole trading day, including during the open market window, in order to assess the market value at the close of business.

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.

The price of forward Oman months is assessed based on trades, bids and offers, throughout the whole trading day, including activity in the open market trading

window. Oman assessments will be based on the grade's prevailing differential to Dubai added to the value of 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 Qatari crude

The price of Abu Dhabi and Qatari grades are assessed based on trades, bids and offers, including activity in the open market trading window in order to determine the market value for such grades at the close of business.

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 plus any expected adjustments ahead of the release of the OSP if deemed accurate enough.

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.)

NORTH SEA

Specifications

<u>Country</u>	<u>Grade</u>	<u>API°</u>	<u>Sulphur</u>	<u>LoadingPort</u>	<u>Terms</u>	<u>Typical Cargo Size (bbl)</u>
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	855,000
Norway	Asgard	47.1	0.19	Platform	CIF basis Rotterdam	855,000
Norway	Gullfaks	37.5	0.22	Platform	CIF basis Rotterdam	855,000
UK	Flotta	36.9	0.83	Flotta	FOB	650,000

The above specifications 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) transactions in order to derive a forward cash Brent price. EFP prices are assessed using actual market transactions and/or bid and offer levels as reported by market participants and brokers.

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 as reported by market participants and brokers, 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.

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

Such 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.

North Sea crudes

North Sea crude grades are assessed based on the levels of trades, bids and offers throughout the whole trading day, including the open market trading window, which closes at 16:30 London time, in order to assess the market value for such grades at the close of business. Such assessments will be based on the prevailing differential to Dated BFOE for each grade applied to the value of ICIS Dated BFOE assessment as established in line with the above. 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.

Cargoes loading outside of the Assessed Trading Timeframe may be reflected in the assessment, but prompt loading cargoes offered or sold at a distressed discount will not be taken into consideration.

CIS

Specifications

<u>Country</u>	<u>Grade</u>	<u>API^g</u>	<u>Sulphur</u>	<u>Loading Port</u>	<u>Terms</u>	<u>Typical Cargo Size (tonnes)</u>
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	AZERIT	34.50	0.15	Supsa/Ceyhan	CIF basis Augusta	80,000-140,000
Kazakhstan	CPC BLEND	43.50	0.55	CPC Terminal	CIF basis Augusta	80,000-140,000
Kazakhstan	KUMKOL	40.50	0.15	Batumi	CIF basis Augusta	50,000-100,000
Russia	SIBERIA N LIGHT	35.50	0.60	Tuapse	CIF basis Augusta	75,000

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

CIS crude grades are assessed based on the levels of trades, bids and offers throughout the whole trading day, including the open market trading window, which closes at 16:30 London time, in order to assess the market value for such grades at the close of business. Such assessments will be based on the prevailing differential to Dated BFOE for each grade applied to the value of ICIS Dated BFOE assessment as established in line with the above. 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.

Cargoes loading outside of the Assessed Trading Timeframe may be reflected in the assessment, prompt loading cargoes offered or sold at a distressed discount will not be taken into consideration.

MEDITERRANEAN

Specifications

<u>Country</u>	<u>Grade</u>	<u>API⁹</u>	<u>Sulphur</u>	<u>LoadingPort</u>	<u>Terms</u>	<u>Typical Cargo size (tonnes)</u>
Libya	BREGA	39.80	0.20	Marsa al Brega	FOB	80,000
Libya	ES SIDER	36.50	0.41	Es Sider	FOB	80,000
Algeria	ZARZAITINE	42.50	0.10	La Skhirra	FOB	60,000-140,000
Algeria	SAHARAN	45.50	0.10	Arzew	FOB	80,000-140,000
Syria	SYRIAN LT	36.85	0.80	Syria	FOB	80,000-140,000
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	80,000-140,000

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

Mediterranean crude grades are assessed based on the levels of trades, bids and offers throughout the whole trading day, including the open market trading window, which closes at 16:30 London time, in order to assess the market value for such grades at the close of business. Such assessments will be based on the prevailing differential to Dated BFOE for each grade applied to the value of ICIS Dated BFOE assessment as established in line with the above. 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.

Cargoes loading outside of the Assessed Trading Timeframe may be reflected in the assessment, but prompt loading cargoes offered or sold at a distressed discount will not be taken into consideration.

WEST AFRICA

Specifications

Country	Grade	API ^º	Sulphur	Loading Port	Terms	Typical Cargo Size (bbl)
Nigeria	Bonny Light	35.0	0.15	Bonny	FOB	950,000
Nigeria	Qua Iboe	36.0	0.1	Qua Iboe	FOB	950,000
Nigeria	Brass River	37.3	0.17	Brass River	FOB	900,000-950,000
Nigeria	Escravos	33.0	0.17	Escravos	FOB	950,000
Nigeria	Forcados	30.4	0.28	Forcados	FOB	950,000-1,000,000
Nigeria	Agbami	46.3	0.03	Agbami FPSO	FOB	975,000
Nigeria	Erha	31.8	0.21	Erha FPSO	FOB	950,000
Angola	Cabinda	32.6	0.12	Malongo	FOB	950,000
Angola	Girassol	29.8	0.34	Offshore Angola	FOB	1,000,000
Angola	Hungo	28.5	0.71	Kizomba A FPSO	FOB	950,000
Angola	Kissanje	28.2	0.44	Kizomba B FPSO	FOB	950,000

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

West African crude grades are assessed based on the levels of trades, bids and offers throughout the whole trading day, including the open market trading window, which closes at 16:30 London time, in order to assess the market value for such grades at the close of business. Such assessments will be based on the prevailing differential to Dated BFOE for each grade applied to the value of ICIS Dated BFOE assessment as established in line with the above. 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.

Cargoes loading outside of the Assessed Trading Timeframe may be reflected in the assessment, but prompt loading cargoes offered or sold at a distressed discount will not be taken into consideration.

AMERICAS

Specifications

<u>USA</u>	<u>Grade</u>	<u>API^o</u>	<u>Sulphur</u>	<u>Delivery Point</u>	<u>Terms</u>	<u>Typical Cargo Size (bbl)</u>
USA	West TexasIntermediate (WTI)	38-40	0.3	Cushing, Oklahoma	FIP	Pipeline
USA	West TexasIntermediate (WTI)	38-40	0.3	Midland, Texas	FIP	Pipeline
USA	West TexasSour (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	ANS	29-31	1.1	US West Coast	CIF	300,000 bbl
IRAQ	BASRAH LT	31-35	2.0	US Gulf	CIF	500,000 bbl

The above specifications 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 24th of every month.

A separate assessment for WTI is at Midland, Texas.

The final calculation is based on spot market deal evidence in the form of differentials to the WTI benchmark emerging during the day or during cash market trading ending at 14:15 Houston time. In the absence of deal evidence, bid/offers reported by at least two sources at the end of cash market trading will be used.

The differential for each grade is applied to the benchmark value in order to arrive at the assessed price. US grades are priced against front month WTI.

Basrah Light is priced against the second month WTI.

Exercise of judgement

Situations may arise in which the closing value of a particular instrument is not clear-cut. In these situations, ICIS reporters will be expected to exercise judgement, within the parameters of our published methodology and the following guidelines.

Where one or more transactions occur at the close, and these transactions fall within the prevailing bid-offer spread, the assessment will be transaction-based.

Where the prevailing market level for bids and offers differs from the “last known” transaction, the tradable closing value shall be deemed to lie between the bid and offer level, provided that the bid-offer level is established at least five minutes before the close.

Where a market bid-offer level is unclear, or one-sided, the assessor compares apparent bid-offer levels with values derived mathematically (“spreads”) from other like grades. If these spreads signal a level clearly different from that shown by the bid-offer level, the spread-derived value shall be used.

ICIS market reporters have standing instructions to refer all contentious assessments to supervisors.

“Minimum” data levels

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.

Market Behaviour

In assessing crude oil markets, ICIS takes into consideration arms-length transactions between non-affiliated parties where these transactions can be verified, and have been conducted in an orderly manner.

ICIS excludes from its assessments transactions reported to it 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 on the basis of a so-called “jump bid” or “jump offer”; 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 for whatever reason.

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

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 and email communication is archived and details of telephone communication are logged and databased.

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 attempts to cross-check all market data received from a buy or sell-side participant with a participant's trading counterparty.

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, reputable brokerages as "confirmed".

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/>.

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.