METHODOLOGY AND SPECIFICATIONS GUIDE

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ARGUS AMERICAS CRUDE

Contents:

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The most up-to-date *Argus Americas Crude* methodology is available on www.argusmedia.com

Methodology overview

Methodology rationale
Argus strives to construct methodologies that reflect the way the market trades. Argus aims to produce price assessments which are reliable indicators of commodity market values, free from distortion and representative of spot market values. As a result, the specific currencies, volume units, locations and other particulars of an assessment are determined by industry consensus to facilitate seamless bilateral trade and Argus mirrors these industry conventions.

In the Americas crude markets, Argus typically reflects physical market prices across the entire trading day as a low and high of deals done and in some markets a volume-weighted average of deals done. In illiquid markets and time periods, Argus assesses the range within which crude could have traded by applying a strict process outlined later in this methodology. In some markets, Argus also produces cumulative transaction averages across a month and cumulative daily averages. An entire day price is a reliable indicator of physical market values as it incorporates the broadest possible pool of spot market liquidity and has acceptance from industry. Argus applies crude basis differential transactions to the WTI settlement price to arrive at fixed prices because the futures settlement price is a representative futures price reference. This approach has been endorsed by industry acceptance. Certain markets are referenced to Brent crude at a certain time of day, and details are located in the sections below. See also section "Definition of trading day."

In order to qualify to set the low or high of the day, deals must meet the minimum volume, delivery, timing, and specification requirements in our methodology, and the deals must be bona fide. With the exception of volume, the same requirements apply to volume-weighted averages.

Definition of trading day
Argus defines the trading day by determining at what times the market can be said to contain a fair number of willing buyers and sellers. Outside of these time boundaries, markets are typically too illiquid to produce representative price indications and deals. These boundaries can vary in different markets, and will be under continuous review to maintain the accuracy of the assessments. The trading day is defined as follows:

US Gulf coast	7:00am – 3:00pm CT
US midcontinent pipeline	7:00am – 3:00pm CT
Canadian pipeline	7:00am – 3:30pm MT
Canada waterborne	8:00am – 3:30pm CT
Latin America waterborne	8:00am – 4:00pm CT
US west coast waterborne	7:00am – 4:00pm PT

For Canada, on days when the CME Nymex is closed but Canadian physical oil markets are open (eg US Thanksgiving, US Independence Day), Argus will not publish its Americas Crude Report (ACR), but it will gather Canadian deals and create volume-weighted indices and high/low market assessments for Canadian grades. These price assessments will be entered into the Argus price database as on any regular business day, and subscribers to Argus data will have access to the updated data as on any other business day. Only differential indices will be calculated on these days; outright prices will not be calculated because there will be no Nymex crude settlement to provide the fixed price component.

Argus will announce its publishing schedule in a calendar located at www.argusmedia.com. Argus may not assess prices on certain public holidays even when the exchanges are open, due to anticipated illiquidity in the cash spot markets.

Survey process
Argus price assessments are informed by information received from a wide cross section of market participants, including producers, consumers and intermediaries. Argus reporters engage with the industry by proactively polling participants for market data. Argus will contact and accept market data from all credible market sources including front and back office of market participants and brokers. Argus will also receive market data from electronic trading platforms and directly from the back offices of market participants. Argus will accept market data by telephone, instant messenger, email or other means.

Argus encourages all sources of market data to submit all market data to which they are a party that falls within the Argus stated methodological criteria for the relevant assessment. Argus encourages all sources of market data to submit transaction data from back office functions when and where possible.

Throughout all markets, Argus is constantly seeking to increase the number of companies willing to provide market data. Reporters are mentored and held accountable for expanding their pool of contacts. The number of entities providing market data can vary significantly from day to day based on market conditions. Should the number of entities providing market data repeatedly fall to a level that assessment quality may be affected, supervising editors will review the viability of the assessment.

For certain price assessments identified by local management, should more than 50pc of the market data upon which the assessment is based come from a single entity during any assessment period (defined as the minimum period covered, such as a day for a daily assessment), then the supervising editor will engage in an analysis of the market data with the primary reporter to ensure that the quality and integrity of the assessment has not been affected.
Argus has committed to deliver many of our final published prices to clients by a particular deadline each day. Because compiling and confirming transactions and other market data in advance of this deadline is a lengthy process, price assessment procedures must be concluded well before that deadline. As a result, for the Americas crude markets, Argus has instituted cut-off times for the submission of data by market participants. Argus will review all data received after the cut-off time and will make best efforts to include in the assessment

process all verifiable transactions and market data received after the cut-off time but reserves the right to exclude any market data from the process if received after the cut-off time.

Cut-off times

US Gulf coast and midcontinent	4:00 pm CT
US West coast waterborne	4:00 pm CT
Canadian pipeline	5:00 pm CT
Canadian waterborne	4:00 pm CT
Latin America	4:30 pm CT

Market data usage

In each market, Argus uses the methodological approach deemed to be the most reliable and representative for that market. Argus will utilize various types of market data in its methodologies, to include:

1. Transactions
2. Bids and offers
3. Other market information, to include spread values between grades, locations, timings, and many other data.

In many markets, the relevant methodology will assign a relatively higher importance to transactions over bids and offers, and a relatively higher importance to bids and offers over other market information. Certain markets however will exist for which such a hierarchy would produce unreliable and non-representative price assessments, and so the methodology must assign a different relative importance in order to ensure the quality and integrity of the price assessment. And even in markets for which the hierarchy normally obtains, certain market situations will at times emerge for which the strict hierarchy would produce non-representative prices, requiring Argus to adapt in order to publish representative prices.

Verification of transaction data

Reporters carefully analyze all data submitted to the price assessment process. This data includes transactions, bids, offers, volumes, counterparties, specifications and any other information that contributes materially to the determination of price. This high level of care applies regardless of the methodology employed. Specific to transactions, bids, and offers, reporters seek to verify the price, the volume, the specifications, location basis, and counterparty. In some transactional average methodologies, reporters also examine the full array of transactions to match counterparties and arrive at a list of unique transactions.

Several tests are applied by reporters in all markets to transactional data to determine if it should be subjected to further scrutiny. If a transaction has been identified as failing such a test, it will receive further scrutiny. For certain price assessments identified by local management, Argus has established internal procedures that involve escalation of inquiry within the source's company and escalating review within Argus management. Should this process determine that a transaction should be excluded from the price assessment process, the supervising editor will initiate approval and, if necessary, documentation procedures.

Primary tests applied by reporters

- Transactions not transacted at arms-length, including deals between related parties or affiliates.
- Transaction prices that deviate significantly from the mean of all transactions submitted for that day.
- Transaction prices that fall outside of the generally observed lows and highs that operated throughout the trading day.
- Transactions that are suspected to be a leg of another transaction or in some way contingent on an unknown transaction.
- Single deal volumes that significantly exceed the typical transaction volume for that market.
- Transaction details that are identified by other market participants as being for any reason potentially anomalous.
- Transaction details that are reported by one counterparty differently than the other counterparty.
- Any transaction details that appear to the reporter to be illogical or to stray from the norms of trading behavior. This could include but is not limited to divergent specifications, unusual delivery location and counterparties not typically seen.
- Transactions that involve the same counterparties, the same price and delivery dates are checked to see that they are separate deals and not one deal duplicated in Argus records.

Secondary tests applied by editors for transactions identified for further scrutiny

Transaction tests

- The impact of linkage of the deal to possible other transactions such as contingent legs, exchanges, options, swaps, or other derivative instruments. This will include a review of transactions in markets that the reporter may not be covering.
- The nature of disagreement between counterparties on transactional details.
- The possibility that a deal is directly linked to an offsetting transaction that is not publicly known, for example a "wash trade" which has the purpose of influencing the published price.
- The impact of non-market factors on price or volume, including distressed delivery, credit issues, scheduling issues, demurrage, or containment.

Source tests

- The credibility of the explanation provided for the outlying nature of the transaction.
- The track record of the source submitting the data. Sources will be deemed more credible if they
  - Regularly provide transaction data with few errors.
  - Provide data by Argus' established deadline.
  - Quickly respond to queries from Argus reporters.
  - Have staff designated to respond to such queries.
- How close the information receipt is to the deadline for information, and the impact of that proximity on the validation process.

Assessment guidelines

When insufficient, inadequate, or no transaction information exists, or when a transaction based methodology will not produce representative prices, Argus reporters will make an assessment of market value by applying intelligent judgment based on a broad array of factual market information. Reporters must use a high degree of care in gathering and validating all market data used in determining price assessments, a degree of care equal to that applying to gathering and validating transactions. The information used to form an assessment could include deals done, bids, offers, tenders, spread trades, exchange trades, fundamental supply and demand information and other inputs.

The assessment process employing judgment is rigorous, replicable, and uses widely accepted valuation metrics. These valuation metrics mirror the process used by physical commodity traders to internally assess value prior to entering the market with a bid or offer. Applying these valuation metrics along with sound judgment significantly narrows the band within which a commodity can be assessed, and greatly increases the accuracy and consistency of the price series. The application of judgment is conducted jointly with the supervising editor, in order to be sure that guidelines below are being followed. Valuation metrics include the following:

Relative value transactions

Frequently transactions occur which instead of being an outright purchase or sale of a single commodity, are instead exchanges of commodities. Such transactions allow reporters to value less liquid markets against more liquid ones and establish a strong basis for the exercise of judgement.

- Exchange one commodity for a different commodity in the same market at a negotiated value.
- Exchange delivery dates for the same commodity at a negotiated value.
- Exchange a commodity in one location for the same commodity at another location at a negotiated value.

Bids and offers

If a sufficient number of bids and offers populate the market, then the highest bid and the lowest offer can be assumed to define the boundaries between which a deal could be transacted.

Comparative metrics

The relative values between compared commodities are readily discussed in the market and can be discovered through dialogue with market participants. These discussions are the precursor to negotiation and conclusion of transactions.

- Comparison to the same commodity in another market center.
- Comparison to a more actively traded but slightly different specification commodity in the same market center.
- Analysis of prices in forward markets for physically deliverable commodity that allow extrapolation of value into the prompt timing for the commodity assessed.
- Comparison to the commodity's primary feedstock or primary derived product(s).
- Comparison to trade in the same commodity but in a different modality (as in barge versus oceangoing vessel) or in a different total volume (as in full cargo load versus partial cargo load).

Throughout this methodology, Argus will explain, in more detail and on a market by market basis, the criteria and procedures that are used to make an assessment of market value by applying intelligent judgment. Extensive subsections will be labeled with the header "Assessment Guidelines."

Volume minimums and transaction data thresholds

In establishing each methodology, Argus will list specific minimum volume for each assessment. Because of the varying transportation infrastructure found in all commodity markets, Argus typically does not establish thresholds strictly on the basis of a count of transactions, as this could lead to unreliable and non-representative assessments. Instead, minimum volumes are typically established which may apply to each transaction accepted, to the aggregate of transactions, to transactions which set a low or high assessment or to other volumetrically relevant parameters.

For certain price assessments identified by local management, Argus will seek to establish minimum transaction data thresholds and when no such threshold can be established Argus will explain the reasons. These thresholds will often reflect the minimum volumes necessary to produce a transaction-based methodology, but may also establish minimum deal parameters for use by a methodology that is based primarily on judgment.

Should no transaction threshold exist, or should submitted data fall below this methodology's stated transaction data threshold for any reason, Argus will follow the procedures outlined elsewhere in this document regarding the exercise of judgment in the price assessment process.

Minimum transaction thresholds for key assessments

			Minimum Transaction Thresholds	
Commodity	**Modality**	**Location**	**Low/high minimum volume**	**VWA aggregate minimum volume**
WTI Formula Basis month 1	Pipeline	Cushing, OK	na	1,000 b/d
Bakken	Pipeline	Clearbrook, MN	500 b/d	na
Bakken DAPL	Pipeline	North Dakota	500 b/d	1,000 b/d
Bakken Patoka	Pipeline	Patoka, IL	500 b/d	1,000 b/d
LLS month 1	Pipeline	St James, LA	1,000 b/d	3,000 b/d
Mars month 1	Pipeline	Clovelly, LA	1,000 b/d	3,000 b/d
WTS	Pipeline	Midland, TX	1,000 b/d	1,000 b/d
WTI Houston	Pipeline	MEH	500 b/d	1,000 b/d
WTI Midland	Pipeline	Midland, TX	1,000 b/d	1,000 b/d
Poseidon	Pipeline	Houma, LA	500 b/d	1,000 b/d
SGC	Pipeline	Nederland/ Texas City, TX	500 b/d	1,000 b/d
Western Canadian Select (WCS)	Pipeline	Cushing, OK	500 b/d	1,000 b/d

Crude quality

US and Canada pipeline grades are created by blending the output from many different fields flowing into a particular pipeline system. Production volumes and quality from individual fields can change, as can transportation logistics into or out of pipeline systems. Such changes inevitably alter the composition and quality of the final pipeline blend. Argus assessments for US and Canada pipeline crudes are not meant to reflect any fixed gravity or sulphur content. Instead, Argus assesses prevailing “stream quality” as it exits the pipeline system and is made available fob from the terminal, allowing the market to make determinations as to quality and value of pipeline grades.

For waterborne crude, Argus assesses the program quality as loaded by the producing entity. Argus does not apply escalators or de-escalators to its Americas crude assessments to compensate for variations in quality between individual cargoes.

For a list of typical crude properties, including API gravity and sulphur content, see the Americas crude quality table

Americas crude quality

Grade	°API	% sulphur
Pipeline		
US Gulf coast and midcontinent		
WTI Cash Cushing	37-42	<0.42
WTI CMA	37-42	<0.42
WTI Houston	42.2	0.13
WTI Midland	42.2	0.13
WTL Midland	48.0	0.05
WTI P-Plus	37-42	<0.42
White Cliffs	47-51	0.01-0.07
Pony Express Light	47-51	0.01-0.07
Grand Mesa Light	47-51	0.01-0.07
Saddlehorn Light	47-51	0.01-0.07
Bakken	42-44	0.18
Niobrara	39-44	0.39
Light Sweet Guernsey	40-46	<0.2
LLS	38.4	0.39
HLS	33.5	0.42
Thunder Horse	30.1	0.96
WTS	33-35	1.5-1.8
Poseidon	29.2	2.09
Mars	29.7	1.95
Southern Green Canyon	27.9	2.38
Canada		
Syncrude	32.3	0.18
WCS	20.8	3.63
Cold Lake	21	3.73
Condensate	59.3	0.08
MSW	41.8	0.37
LSB	37.9	1.14
LLB	21.2	6.47
AWB	22.5	3.76
CDB	22.3	3.66
Waterborne		
US Gulf coast		
WTI fob	40-44	<0.20
Bakken fob	42-44	0.18
US west coast		
ANS	32.0	0.96
Mexico		
Maya	21-22	3.4
Olmeca	38-39	0.73-0.75
Isthmus	32-33	1.8
Zapoteco	29-29.9	2.51
Brazil		
Buzios	28.4	0.3
Mero	29.6	0.31
Tupi	29.3	0.36
Colombia		
Vasconia	24-27	0.83
Castilla	19.1	1.8
Argentina		
Escalante	24.1	0.19
Medanito	39-44	<0.50
Ecuador		
Oriente	22-24	1.50-1.70
Napo	16-18	2.18-2.38
Guyana		
Liza	32	0.58
Unity Gold	34.5	0.41
Payara Gold	28	0.58
Canada		
Hibernia	34.1	0.56

**crude qualities are indicative only, last revised in November 2020, WTI fob US Gulf Coast last revised in September 2022*

Transparency and confidentiality
Argus values transparency in energy markets. As a result, we publish lists of deals in our reports that include price, basis, and volume information. The deal tables allow subscribers to cross check and verify the deals against the prices. Argus feels transparency and openness is vital to developing confidence in the price assessment process.

Argus asks for transaction counterparty names from contacts in order to confirm deals and to avoid double-counting in volume-weighted averages. But Argus does not publish counterparty names in the Americas crude markets. Many companies have existing confidentiality agreements with counterparties and can only reveal deals to the press if confidentiality is maintained. Maintaining confidentiality allows Argus to gather more information and create more robust assessments.

Basis differentials and absolute prices
In the Americas crude markets, differentials to futures benchmarks or to secondary benchmarks are the negotiated bids, offers, and transaction values. Argus fixed prices are derived by adding the assessed differentials to the benchmark price.

US pipeline differentials are applied to the WTI Formula Basis in order to derive fixed prices. The WTI Formula Basis is represented as a single outright price and is provided for two months forward. Waterborne Canadian grade Hibernia is priced against North Sea Dated. Certain Latin American grades utilize Ice Brent as a price reference. Mexican crude prices are published as a single value, with equivalent differentials derived against front-month Nymex crude futures, for easy comparison against other grades assessed around the Americas. Detailed explanations of the use of postings, calendar month averages, and the WTI Formula Basis are covered in individual sections in this document.

Argus publishes various price types for each commodity. These typically include

Differential Low: The low differential to a reference price.
Differential High: The high differential to a reference price.
Differential Weighted Average: A value arrived at by multiplying each deal's volume by its differential price, summing the resulting value for all deals in a grade on a given day, and dividing that final sum by the total volume. Expressed as a differential to a reference price.
Differential Month-to-Date Weighted Average: An average of the daily differential weighted averages since the first day of the current trade month up to and including the date of assessment. Expressed as a differential to a reference price.
Monthly Average: An arithmetic average of the daily differential and outright price assessments during the named trade month. Published on the second day after the end of the trade month.
Low: The "fixed" or "outright" price. Reference price plus differential low.
High: The "fixed" or "outright" price. Reference price plus differential high.
Weighted Average: The weighted average "fixed" or "outright" price. Reference price plus differential weighted average.
Delta: The change between today's absolute price and that of the previous trading day.

Forward curves
See Argus North American Crude Oil Forward Curves methodology.

Publications and price data
Argus crude prices for the Americas are published in the *Argus Americas Crude* report. These prices appear as a subset of the daily *Argus Crude* report which adds coverage of markets in Europe, Africa, the Mideast Gulf and Asia-Pacific. Other Argus publications also include some *Argus Americas Crude* pricing data. Among these publications are *Argus Latin Markets*, *Argus Global Markets*, *Argus Asphalt* and *Argus LatAm Energy*. The price data is available independent of the text-based report in electronic files that can feed into various databases. These price data are also supplied through various third-party data integrators. The Argus website also provides access to prices, reports and news with various web-based tools. All Argus prices are kept in a historical database and available for purchase. Contact your local Argus office for information.

Corrections to assessments
Argus will on occasion publish corrections to price assessments after the publication date. We will correct errors that arise from clerical mistakes, calculation errors, or a misapplication of our stated methodology. Argus will not retroactively assess markets based on new information learned after the assessments are published. We make our best effort to assess markets based on the information we gather during the trading day assessed.

If transaction information is submitted in error, and the company submitting informs Argus of the error within 24 hours of the original submission, Argus will make best efforts to correct the price data. After 24 hours, Argus will review both the material effect that the correction will have on the price data and the amount of time that has elapsed from the date of the published price data before deciding whether to issue a correction. After 30 days, submitters are not expected to file corrections to submitted data.

Ethics and compliance
Argus operates according to the best practices in the publishing field, and maintains thorough compliance procedures throughout the firm. We want to be seen as a preferred provider by our subscribers, who are held to equally high standards, while at the same time maintaining our editorial integrity and independence. Argus has a strict ethics policy that applies to all staff. The policy can be found on our website at www.argusmedia.com. Included in this policy are restrictions against staff trading in any energy commodity or energy related stocks, and

guidelines for accepting gifts. Argus also has strict policies regarding central archiving of email and instant messenger communication, maintenance and archiving of notes, and archiving of spreadsheets and deal lists used in the price assessment process. Argus publishes prices that report and reflect prevailing levels for open-market arm's length transactions (please see the Argus Global Compliance Policy for a detailed definition of arms length).

Consistency in the assessment process

Argus recognizes the need to have judgment consistently applied by reporters covering separate markets, and by reporters replacing existing reporters in the assessment process. In order to ensure this consistency, Argus has developed a program of training and oversight of reporters. This program includes:

1. A global price reporting manual describing among other things the guidelines for the exercise of judgment.
2. Cross-training of staff between markets to ensure proper holiday and sick leave backup. Editors that float between markets to monitor staff application of best practices.
3. Experienced editors overseeing reporting teams are involved in daily mentoring and assisting in the application of judgment for illiquid markets.
4. Editors are required to sign-off on all price assessments each day, thus ensuring the consistent application of judgment.

Review of methodology

The overriding objective of any methodology is to produce price assessments which are reliable indicators of commodity market values, free from distortion and representative of spot market values. As a result, Argus editors and reporters are regularly examining our methodologies and are in regular dialogue with the industry in order to ensure that the methodologies are representative of the physical market being assessed. This process is integral with reporting on a given market. In addition to this ongoing review of methodology, Argus conducts reviews of all of its methodologies and methodology documents on at least an annual basis.

Argus market report editors and management will periodically and as merited initiate reviews of market coverage based on a qualitative analysis that includes measurements of liquidity, visibility of market data, consistency of market data, quality of market data and industry usage of the assessments. Report editors will review:

- Appropriateness of the methodology of existing assessments
- Termination of existing assessments
- Initiation of new assessments

The report editor will initiate an informal process to examine viability. This process includes:

- Informal discussions with market participants
- Informal discussions with other stakeholders
- Internal review of market data

Should changes, terminations, or initiations be merited, the report editor will submit an internal proposal to management for review and approval. Should changes or terminations of existing assessments be approved, then formal procedures for external consultation are begun.

Changes to methodology

Formal proposals to change methodologies typically emerge out of the ongoing process of internal and external review of the methodologies. Formal procedures for external consultation regarding material changes to existing methodologies will be initiated with an announcement of the proposed change published in the relevant Argus report.

This announcement will include:

- Details on the proposed change and the rationale
- Method for submitting comments with a deadline for submissions
- Notice that all formal comments will be published after the given consultation period unless submitter requests confidentiality

Argus will provide sufficient opportunity for stakeholders to analyze and comment on changes, but will not allow the time needed to follow these procedures to create a situation wherein unrepresentative or false prices are published, markets are disrupted, or market participants are put at unnecessary risk. Argus will engage with industry throughout this process in order to gain acceptance of proposed changes to methodology. Argus cannot however guarantee universal acceptance and will act for the good order of the market and ensure the continued integrity of its price assessments as an overriding objective.

Following the consultation period, Argus management will commence an internal review and decide on the methodology change. This will be followed by an announcement of the decision in the relevant Argus report and include a date for implementation. In addition, publication of stakeholders' formal comments that are not subject to confidentiality and Argus' response to those comments will also take place. These formal comments should be published in a manner described by management but must be available to all market participants and stakeholders.

Updates to methodology

The Argus Americas Crude methodology is constantly updated and revised. The latest available methodology (which may supersede the one you are reading) is available at www.argusmedia.com.

Americas pipeline markets

WTI-related markets

West Texas Intermediate (WTI)

Assessment	Location	Low/High minimum volume	VWA aggregate volume minimum
WTI Cash Cushing	Cushing, OK	1,000 b/d	1,000 b/d
WTI CMA	Cushing, OK	1,000 b/d	1,000 b/d
WTI Midland	Midland, TX	1,000 b/d	1,000 b/d
WTI Midland Enterprise	Enterprise terminal, Midland, TX	1,000 b/d	1,000 b/d
WTI Houston	MEH	500 b/d	1,000 b/d
WTI P-Plus	Cushing, OK	500 b/d	1,000 b/d

WTI Cushing and WTI Formula Basis

The spot price for WTI at Cushing, Oklahoma is assessed four months forward. It reflects Nymex light sweet crude futures settlements at 1.30pm Central time. For the front-month assessment in the three days following expiration of Nymex futures, trades done for the Month-One/Month-Two WTI Cushing cash roll throughout the day are averaged on a volume-weighted basis. The resulting Cash Roll average is then applied to that day's price for WTI Nymex prompt month settlement, in order to derive the first-month WTI Cushing value. If trade in the cash roll falls short of the VWA Aggregate Volume minimum for WTI Cash Cushing on any of the three days following expiry, *Argus* will use an assessment of where the cash roll was valued by participants in the market that day. Assessments for cash WTI at Cushing roll to the next month on the fourth business day following expiration of the front-month Nymex light sweet crude futures contract (see sidebar).

For US pipeline assessments, outright prices are derived by adding differentials to Nymex settlement prices until their expiration. For the three days between futures expiration and pipeline scheduling, those differentials are added to the WTI Cushing spot assessment (see above).

Nymex expiration dates

Expiration dates for the Nymex light sweet crude futures contract are aligned with the scheduling deadline for shipments on US pipelines. For US pipelines, shipments must be scheduled no later than the 25th day of the preceding month. In the event that the 25th falls on a weekend or holiday, the pipeline scheduling deadline moves forward to the first business day before the 25th. The Nymex front-month crude futures expiration is three business days prior to that.

For example, 25 January 2010 fell on a Monday and was the deadline for scheduling February pipeline shipments. The February 2010 light sweet crude futures contract expired three business days earlier, on Wednesday 20 January. The 25th day of April 2010 fell on a Sunday, the deadline for scheduling May pipeline shipments was Friday, 23 April and the May 2010 futures contract expired three business days earlier, on Tuesday, 20 April

In order to facilitate the use of *Argus* prices, *Argus* combines Nymex futures and WTI spot prices into a single pricing series called the "WTI Formula Basis". This series represents the Nymex settlement up to and including futures expiry, then automatically switches to represent the mean of the first month WTI Cushing spot assessment for the three business days which precede pipeline scheduling. Companies using *Argus* to price US pipeline crudes need only reference the WTI Formula Basis in their contracts when needing to reference the WTI component of another crude. For example, the "fixed", "outright" or "absolute" price for LLS prompt month minus the WTI Formula Basis prompt month equals the LLS prompt month differential.

Reported differentials for White Cliffs, Niobrara and Bakken trades at Cushing, as well as Light Sweet Guernsey trades, will be normalized to account for any pump over or terminal fees that are not typically reflected in market differentials.

Calendar Month Averages

The US and Canadian markets use various Calendar Month Averages (CMA) of the light sweet crude futures settlement prices on Nymex or Ice as a reference for trading WTI and other grades.

US Markets

WTI at Cushing can trade at either a differential to a "Merc" Days average or a differential to a Calendar Days (also known as "Cal" Days or All Days) average. Both methods are based on the spread between the first and second, and between the first and third, Nymex light sweet crude futures contracts. This method is designed to arrive at a reference price that represents WTI on a calendar month basis instead of a trade month.

Merc Days: The most common CMA basis in the US is the Merc Days average, which is calculated using only days when the Nymex is open for business.

Calendar Days: The less common Calendar Days method extends the Nymex settlement prices from Friday, replicating it as the value for Saturday and Sunday. It then includes both work days and weekend days in the average. Market holidays carry over the value of the previous business day's settlement as well.

The *Argus* Diff to CMA assessment is a volume-weighted average of differentials traded against both the Merc Days and Calendar Days CMA bases, since the two methods typically yield numbers that differ only slightly from one another. *Argus* includes both in the single assessment to reflect the maximum amount of liquidity available, but keeps the policy under review should market conditions change.

Argus also publishes the spread, at the time of the settlement, between the Nymex light sweet crude futures contract and the Nymex CMA for two forward months.

Posted prices

Argus assesses WTI on a Postings-Plus basis, where the market trades a spot premium to the prompt WTI postings issued by Phillips 66. *Argus* does not publish the WTI postings issued by any company, but the Phillips 66 price can be found at this link: http://www.phillips66.com/EN/products/business/crude_oil/bulletin/Pages/index.aspx. (as of 3 January 2023).

US Gulf coast and midcontinent pipeline

US Gulf coast

Assessment	Location	Low/High minimum volume	VWA aggregate volume minimum
Bakken Beaumont/Nederland	Beaumont/Nederland	500 b/d	1,000 b/d
HLS	fob Empire, LA	1,000 b/d	1,000 b/d
LLS (Month One)	St. James LA†	1,000 b/d	3,000 b/d
LLS (Month Two)	St. James LA†	500 b/d	1,000 b/d
Mars (Month One)	fob Clovelly, LA	1,000 b/d	3,000 b/d
Mars (Month Two)	fob Clovelly, LA	500 b/d	1,000 b/d
Poseidon	fob Houma, LA	500 b/d	1,000 b/d
Southern Green Canyon	fob Nederland, TX or Texas City, TX	500 b/d	1,000 b/d
Thunder Horse	fob Clovelly, LA	1,000 b/d	1,000 b/d
Western Canadian Select (WCS) Houston	Houston area*	500 b/d	1,000 b/d
Canadian High TAN	Houston area*	500 b/d	1,000 b/d

**Houston area includes Nederland, Beaumont and Enterprise ECHO terminals*
† for LLS assessments, St. James includes the Capline, Locap, Plains, NuStar and Shell Sugarland terminals in St. James

Low and High Prices

Argus assesses the range of trade for each grade over the entire day. These assessments are displayed as differentials to the WTI Formula Basis (or CMA Nymex in the case of Canadian High TAN, WCS, Bakken at Clearbrook, Bakken DAPL, Bakken Patoka, Light Sweet Guernsey, and CMA Nymex plus the Diff to CMA Nymex for Bakken at Beaumont/Nederland) and as fixed prices.

WCS Cushing and WCS Houston are assessments of WCS and Cold Lake crudes. Transactions for WCS and Cold Lake will be included in the respective determination of the high and low range at each location. If the values of WCS and Cold Lake diverge, only transactions for the more consistently liquid of the two grades would be used.

DJ Light at Cushing is an assessment of Grand Mesa Light, Saddlehorn Light, White Cliffs and Pony Express Light crudes. Transactions for Grand Mesa Light, Saddlehorn Light, White Cliffs Cushing and Pony Express Light will be included in the respective determination of the high and low range at Cushing. If any of the values of Grand Mesa Light, Saddlehorn Light, White Cliffs Cushing and Pony Express Light diverge, only transactions for the most consistently liquid group of grades would be used.

Canadian High TAN at Cushing and Canadian High TAN at Houston are assessments of AWB and CDB crudes. Transactions for AWB and CDB will be included in the respective determination of the high and low range at each location. If the values of AWB and CDB diverge, only transactions for the more consistently liquid of the two grades would be used.

For HLS, Thunder Horse, WTI Midland, WTS, Poseidon and SGC, trades against WTI, LLS or Mars will be used to determine a high and low range on any given day. For all other grades listed above, only trades against WTI will be used to determine a high and low range. If there is insufficient trade for a particular grade on any given day, *Argus* will assess the range in which trade could have occurred based on various market indications. The assessed range will be published by *Argus* as the low-high range for that day.

Reported differentials for all assessed crude grades will be normalized to account for any pump over or terminal fees that are not typically reflected in market differentials.

In order to set the low or high of the daily range, a deal must meet a volume minimum established for each grade and listed in the table above.

US midcontinent

Assessment	Location	Low/High minimum volume	VWA aggregate volume minimum
WTI ex-pipe Cushing	ex-Basin pipeline, Cushing, OK	1,000 b/d	1,000 b/d
WTI CMA	Cushing, OK	1,000 b/d	1,000 b/d
WTI Houston	MEH	500 b/d	1,000 b/d
WTI Houston (Month Two)	MEH	500 b/d	1,000 b/d
WTI Midland	Midland, TX	1,000 b/d	1,000 b/d
WTI Midland (Month Two)	Midland, TX	500 b/d	1,000 b/d
WTI Midland Enterprise	Enterprise terminal, Midland, TX	1,000 b/d	1,000 b/d
WTL Midland	Midland, TX	1,000 b/d	1,000 b/d
WTI P-Plus	Cushing, OK	500 b/d	1,000 b/d
WTS (Month One)	Midland, TX	1,000 b/d	1,000 b/d
WTS (Month Two)	Midland, TX	500 b/d	1,000 b/d
Bakken DAPL	North Dakota	500 b/d	1,000 b/d
Bakken Patoka	Patoka, IL	500 b/d	1,000 b/d
Bakken	Clearbrook, MN	500 b/d	
Light Sweet Guernsey	Guernsey, WY	500 b/d	1,000 b/d
Bakken	Cushing, OK	500 b/d	1,000 b/d
Niobrara	Cushing, OK	500 b/d	1,000 b/d
DJ Light	Cushing, OK	500 b/d	1,000 b/d
White Cliffs	Cushing, OK	500 b/d	1,000 b/d
Western Canadian Select (WCS)	Cushing, OK	500 b/d	1,000 b/d
Canadian High TAN	Cushing, OK	500 b/d	1,000 b/d

Volume-Weighted Averages

Argus publishes volume-weighted averages of deals done through the entire trading day. For Bakken DAPL, Bakken Patoka, Light Sweet Guernsey, WCS and Canadian High TAN this includes trade conducted at a differential to Nymex CMA and for Bakken at Beaumont/Nederland trade at a differential to Nymex CMA plus the Diff to Nymex CMA. For WTL Midland and WTS Midland, this includes trade conducted at a differential to WTI Midland. For HLS, Thunder Horse, WTI Midland, WTS, Poseidon and SGC, this includes all trade done versus WTI, LLS or Mars. For deals done versus LLS, Mars or WTI Midland, *Argus* will convert those deals into a synthetic differential to WTI. Using Poseidon as an example, if Poseidon trades versus Mars then *Argus* will carry out the following steps:

1. Convert each Poseidon deal done at a differential to Mars into a differential to WTI:
   a Calculate the Mars volume-weighted average differential based on transactions versus WTI
   b Apply each Poseidon differential to Mars to the *Argus* Mars volume-weighted average differential
2. Calculate a volume-weighted average differential for deals done using all Poseidon deals done at a differential to WTI as well as all converted Poseidon deals from step 1. The resulting weighted-average differential will be expressed as a differential to WTI.
3. Apply the differential from step 2 to the WTI Formula Basis price.

Volume-weighted averages are published as a single differential to the WTI Formula Basis (or CMA Nymex in the case of Bakken DAPL, Bakken Patoka, Light Sweet Guernsey, WCS and Nymex CMA plus the Diff to Nymex CMA in the case of Bakken at Beaumont/Nederland), and as a single fixed price.

WCS Cushing and WCS Houston are assessments of WCS and Cold Lake crudes. Transactions for WCS and Cold Lake will be included in the respective calculation of the volume-weighted average differential at each location. If the values of WCS and Cold Lake diverge, only transactions for the more consistently liquid of the two grades would be used.

All bona fide deals reported to *Argus*, regardless of size, are factored into volume-weighted averages. However, *Argus* must have at least the minimum volume of total trade listed in the above table for a grade in order to calculate a volume-weighted average price. If a grade does not have a total traded volume of at least the minimum listed in the above table done on any given day as a differential to WTI, *Argus* will make an assessment of the range within which the grade could have traded. This assessment will be published by *Argus* as the volume-weighted average price for that day.

Differential Month-to-Date Weighted Average

Each day, in the US Gulf coast and midcontinent markets, *Argus* publishes an average of the prompt month volume-weighted average differentials for the trade month to date, including the day of publication. This value is rounded to two decimal places in the daily pricing table. At the conclusion of each trade month, *Argus* publishes a table of average trade-month values, both on a differential and fixed-price basis for US pipeline crudes. Because industry crude contracts typically specify pricing to the fourth decimal place, *Argus* shows these final calculations at the end of the trade-month to the fifth decimal place, so that any issues with rounding will not impact contract buyers or sellers of the crude.

Basis (Location)

Crudes are assessed fob at specific pipeline hubs where spot trade is centered.

Light Sweet Guernsey prices are assessed at six terminals in Guernsey, Wyoming: True Companies' Guernsey /Bridger Guernsey HUB, Plains' Ft Laramie, Kinder Morgan's HH, Enbridge's Platte, Silver Creek/Tallgrass' Powder River Gathering terminals and Tallgrass' Pony Express Terminal. Light Sweet Guernsey is an assessment of Light Sweet at Guernsey, Rocky Mountain Sweet, Powder River Sweet and Bakken Light Sweet crudes. Transactions for those four grades will be included in the respective determination of the high and low range for Light Sweet Guernsey.

Volume

Trades in the US pipeline market are transacted at volumes expressed as barrels delivered per calendar day (b/d) or total barrels per month. A trade reported as 1,000 b/d for the month of March would be equivalent to 31,000 barrels total delivered rateably over the calendar month of March. Trades such as cash rolls, strips and boxes that are reported as total volumes are divided by the total number of days in the "earliest of the specified delivery months to obtain an equivalent volume expressed in barrels delivered per calendar day (b/d).

Timing and Roll Dates

Prices are assessed for the forward month in which the crude will be delivered. Month One assessments end after that month's pipeline scheduling deadline has passed. All US pipeline assessments roll on the fourth business day following expiry of the Nymex light sweet crude futures contract, which is the same as the first business day following the pipeline scheduling deadline.

Argus rolls its Bakken Clearbrook price basis forward on Canadian pipeline nominations day, also called initial NOS deadline, typically falling around the 18th calendar day of the month. So, for example, assuming the pipeline nominations deadline for March injected barrels is 17 February, *Argus* daily prices reflect April as the front month beginning on 17 February. *Argus* considers a new trade month to have begun on each pipeline scheduling day.

Location spreads

Argus publishes location spreads for WTI to the Magellan East Houston (MEH) terminal for ECHO, Valero Junction, Speed Junction, Genoa Junction, Seabrook, Texas City, Corpus Christi, Moore Road and Beaumont/Nederland. These locational spreads are published as differentials to the MEH terminal, and are updated monthly based on the previous three months of trade.

Canada pipeline

Argus has structured Canadian crude oil assessments to reflect the unique market characteristics of each Canadian grade and to reflect the broadest possible array of market activity.

In Canada, *Argus* provides the following types of index prices:

Daily weighted average price: This method captures the entire day of deals done as a volume weighted average, which *Argus* publishes as a differential. This differential average is then applied to the day's CMA Nymex in order to provide an outright daily mark. This allows companies to connect their physical program with the hedging program on a daily basis.

Monthly average price: An arithmetic average of the daily differential price assessments between pipeline nominations day and the business day prior to the following pipeline nominations day.

Low/high price range: These prices reflect the full range of deals done each day. This range is essential to assessing value in illiquid markets and reflects the movement of prices over the trading day.

Argus values liquidity and seeks to reflect the breadth of the spot market. This leads *Argus* to create price indices that include deals done on all broker and exchange platforms, deals done bilaterally, and deals done through the entire trading day. With this price discovery methodology, *Argus* can provide a comprehensive total market index for all crudes assessed.

Crudes assessed according to volume-weighted average method:

Assessment	Density *kg/m³*	Pricing location	VWA aggregate volume minimum	Low/High minimum volume
Syncrude (SSP)	860	Pembina AOSP at Edmonton	5,000m³/month	2,500m³/month
Western Canadian Select (WCS)	925	Husky at Hardisty	5,000m³/month	2,500m³/month
Western Canadian Select (WCS)	925	Cushing, OK	1,000 b/d	500 b/d

Note: 1m³ = 6.28981 bl

Basis (Location)

- *Syncrude (SSP)* – This assessment reflects synthetic crude produced by Syncrude Canada and delivered at the Edmonton terminus of Pembina's AOSPL (Alberta Oil Sands Pipe Line Ltd). Deals for SSP in the Edmonton pipeline/tank facilities of Enbridge are also considered in the index.
- *Western Canadian Select (WCS) Hardisty* – This reflects WCS blend at Husky's facilities in Hardisty and includes in-line deals on the Enbridge pipeline system (EIL).

Volume-Weighted Averages

The daily weighted average price for these grades is set by the volume weighted average of all deals during the trading day. The volume weighted average is calculated by multiplying the price of each deal (reported as a differential) by the volume of the deal, then summing the results and dividing by the total volume traded on that grade throughout the day.

The daily weighted average is stated as a differential and as an outright price. The outright price is calculated by applying the weighted average differential price to the daily CMA Nymex.

There is no minimum volume threshold for including any individual deal in the daily volume weighted average. However, if the aggregate daily volume of trade for any grade fails to reach a specified minimum volume (see table), the daily volume weighted price for that day will reflect the mean of the low/high price range assessed for that grade on that day. The assessed range will be published by *Argus* as the low-high range for that day.

Low and High Prices

For every grade of crude assessed, Argus publishes a low and high of deals done throughout the entire trading day. In order to qualify to set the low or high of the day, deals must meet the minimum volumes as specified in this methodology (see table at right). In illiquid markets, Argus pricing represents an intelligent assessment of the range within which a crude grade could have traded during the entire trading day. The assessed range will be published by *Argus* as the low-high range for that day.

Trading day

Argus considers all bona fide deals done and reported during the period from 7am-3:30pm, prevailing time in Calgary (Mountain Time), in the calculation of its low, high, and daily weighted average prices.

Timing and Roll Dates

Argus rolls its price basis forward at 7:00am on pipeline nominations day, also called initial NOS deadline, typically falling around the 18th calendar day of the month. This date is the Crude Oil Logistics Committee's "Initial Notice of Shipment deadline". So, for example, assuming the pipeline nominations deadline for March injected barrels is February 17, *Argus* daily prices reflect April as the prompt month beginning on February 17. *Argus* considers a new trade month to have begun on each pipeline scheduling day.

Spot trade only

Argus indices are meant to be a reflection of spot trade done at a differential to WTI. Therefore, deals done as part of a strip or priced against another month or a grade other than WTI cannot be considered in the volume-weighted index. Deals priced against posted prices cannot be included in the index. Internal transfers between divisions of the same company cannot be considered as representative spot deals. Deals done conditional upon credit agreements or other pending arrangements will not be included in *Argus* price indices.

CMA Nymex

The CMA Nymex is calculated by extending the current day's Nymex prompt-month futures settlement for "Light Sweet Crude Oil (WTI)" until its expiry date, and extending the current day's second-month WTI settlement over the remaining days in the calendar month following prompt-month expiry. After the prompt month contract expires, the new prompt month is extended until the end of the calendar month. Because the CMA Nymex is a calculated value of a future price it will not correspond to the actual CMA, which can only be known retrospectively once the month in question has passed and actual WTI settlements for each day in that month can be averaged.

Other Canadian Crudes assessed

In addition to providing volume-weighted prices for the most actively traded petroleum liquids streams in western Canada, *Argus* provides assessments of prices for other less-actively traded streams shown below. On days in which trade occurs on these grades, *Argus* will set its price range based on the highest and lowest price achieved on trades during the day. In order to set the high or low for the range, a deal must reach a certain volume threshold, shown in the tables.

Canadian minimum volumes

Assessment	Pricing location	Low/High minimum volume
Condensate	Enbridge CRW pool at Edmonton and feeder lines	2,500m³/month
Mixed Sweet (MSW)	Enbridge at Edmonton	2,500m³/month
Lloyd Blend (LLB)	Hardisty	2,500m³/month
Light Sour Blend (LSB)	Enbridge or Westspur at Cromer	2,500m³/month
Cold Lake (CLK)	Hardisty	2,500m³/month
Access Western Blend (AWB)	Edmonton	2,500m³/month
Christina Lake (CDB)	Hardisty	2,500m³/month
CMA Nymex	Cushing, OK	
Note: 1m³ = 6.28981 bl		

Americas waterborne markets

US Gulf coast waterborne

US Gulf coast

Assessment	Location	Volume
WTI	fob USGC	500,000-800,000 bl
Bakken	fob Beaumont/Nederland	500,000-650,000 bl

Argus assesses the price of WTI and Bakken crude loading free on board (fob) at several locations along the US Gulf coast. Insurance and freight costs are not represented in these assessments.

Low and High Prices

Prices are the low and high range within which oil traded or could have traded in the trading day. Prices are published as differentials to the CMA Nymex, Ice Brent and the WTI Houston pipeline assessment, and as outright prices. WTI prices are also published as differentials to Dubai swaps. Bakken assessments are of the price of trade in cargoes between 500,000 bl and 650,000 bl in size. WTI assessments are of the price of trade in cargoes between 500,000 bl and 800,000 bl in size.

Outright prices

Argus calculates US Gulf coast waterborne outright prices by adding the differentials to the CMA Nymex to the prompt CMA Nymex price as determined by the US pipeline schedule.

Timing and roll dates

The timing of the price assessments is for the period 15-45 days ahead. Argus rolls its fob price basis forward on the US pipeline schedule, which typically runs from around the 26th calendar day two months prior to delivery to the 25th calendar day of the month before delivery. For example, assuming the pipeline schedule for March delivered barrels starts 26 January, Argus daily fob prices will reflect March as the front month beginning on that date and ending around 25 February.

WTI intramonth spreads

Argus publishes waterborne WTI assessments for specific 10-day (decade) loading windows during the named month. Loading windows are for five periods during the named months and all roll to the next trade month in line with the US pipeline schedule. Prices are assessed for cargoes loading between the 1st and 10th, the 11th and 20th and between the 21st and the end of the first named month and for cargoes loading between the 1st and 10th and between the 11th and 20th of the next named month.

Assessments are made on a prompt WTI Houston and month-two Ice Brent pricing basis relative to the month of loading.

Example:

Loading window	Basis
1-10 November	November WTI Houston January Ice Brent
11-20 November	November WTI Houston January Ice Brent
21-30 November	November WTI Houston January Ice Brent
1-10 December	December WTI Houston February Ice Brent
11-20 December	December WTI Houston February Ice Brent

US Gulf coast Aframax reverse lightering

See the Argus Tanker Freight methodology.

US west coast waterborne

US west coast

Assessment	Location	Minimum volume
ANS	cif US west coast	300,000 bl

Low and High Prices

Prices represent the low and high range within which oil traded or could have traded throughout the trading day. Prices are published as differentials to the CMA Nymex, concurrent Nymex and CMA Ice Brent, and as outright prices. ANS pricing represents cargo lots of 300,000 bl or above.

ANS delivery month VWA

Cumulative delivery month differentials are published as a differential to the Ice Brent CMA for the named month by calculating a volume-weighted average of all transactions for delivery in the named month that take place 10-60 days before the start of the named month. VWAs are published for the latest traded delivery month and three previous delivery months. Averages for actively traded delivery months are published as delivery month-to-date VWAs. The final VWA for each delivery month is determined on the last business day at least 10 days prior to the beginning of the corresponding calendar month.

Outright Prices

Argus calculates the ANS del USWC outright price by adding the ANS differential to the CMA Nymex to the projected CMA Nymex for the month of delivery. For the ANS del USWC, WTI concurrent outright price, Argus adds the ANS differential to the Nymex WTI settlement for the month of delivery.

Basis (Location)

Assessments are on a cif basis.

Timing

ANS prices are assessed for the named month of delivery between 10 and 60 days before the beginning of each delivery month. Prices roll forward as needed to accurately reflect current market discussion and trade but will never roll forward earlier than 60 days or later than 10 days before the beginning of the month.

Ice Brent CMA

Except for December, the Ice Brent CMA for a given month is equal to the current day's settlement for the Ice Brent crude futures contract two months forward from the given month.

The Ice Brent CMA for December is calculated by extending the current day's Ice Brent February futures settlement until it's expiry date and including the current day's Ice Brent March futures settlement for the final day. Because the Ice Brent CMA is a calculated value of a future price it will not correspond to the actual CMA, which can only be known retrospectively once the month in question has passed and actual Ice Brent settlements for each day in that month can be averaged.

Canadian waterborne

Canada

Assessment	Location	Timing	Minimum volume
Cold Lake	fob Vancouver	60-90 days forward	500,000 bl
High TAN	fob Vancouver	60-90 days forward	500,000 bl
Hibernia	fob Whiffen Head	10-45 days forward	500,000 bl

Low and High Prices

Prices represent the low and high range within which oil traded or could have traded throughout the trading day. Cold Lake and High TAN prices are published as differentials to Ice Brent and the CMA Nymex and as outright prices. Prices for Hibernia are published as differentials to the North Sea Dated assessment at 4:30pm London time, and as outright prices. High TAN prices are also published as differentials to Dubai swaps. Trades and discussion for partial-cargoes are not included in the assessment process. *Argus* prices represent only full-sized Aframax cargoes of 500,000 bl or more.

Basis (Location)

Cold Lake and High TAN assessments are for crude for loading out of Vancouver. Hibernia assessments are for crude loading at the Newfoundland Transshipment Terminal at Whiffen Head. Insurance and freight costs are not represented in these assessments.

Timing
Cold Lake and High TAN assessments are for loading 60-90 days ahead and their fob price basis rolls forward on the first working day of the calendar month. Hibernia assessments are a continuous series with no roll date. Prices represent physical cargoes that have loading dates 10-45 days forward, and their timing is referred to as Dated (abbreviated "Dtd" in the daily report).

Latin American waterborne

Latin America

Assessment	Location	Timing	Minimum volume
Castilla Blend	fob Colombia	10-60 days forward	1mn bl
Vasconia	fob Colombia	10-60 days forward	500,000 bl
Escalante	fob Argentina	10-60 days forward	500,000 bl
Medanito	fob Argentina	10-60 days forward	720,000 bl
Oriente	fob Ecuador	10-60 days forward	360,000 bl
Napo	fob Ecuador	10-60 days forward	360,000 bl
Liza	fob Guyana	10-60 days forward	1mn bl
Unity Gold	fob Guyana	10-60 days forward	1mn bl
Payara Gold	fob Guyana	10-60 days forward	1mn bl
Buzios	fob Brazil	30-70 days forward	1mn bl
Mero	fob Brazil	30-70 days forward	1mn bl
Tupi	fob Brazil	30-70 days forward	1mn bl

Low and High Prices
Prices represent the low and high range within which oil traded or could have traded in the trading day. Prices are published as differentials to Nymex light sweet crude futures, and as fixed prices. Prices are also published as differentials to Ice Brent crude futures.

For crudes out of Guyana, prices are published as differentials to North Sea Dated and Ice Brent crude futures.

Castilla Blend, Medanito, Napo and Oriente prices are also published as differentials to North Sea Dated swaps.

Castilla Blend, Napo and Oriente prices are also published as differentials to Dubai swaps.

Fob Brazil prices are published as differentials to North Sea Dated, at Brazilian ports.

Assessments are of the price of trade in cargoes no smaller than the minimum volumes listed above.

Mexico Formulas
Prices for Isthmus, Maya, Olmeca and Zapoteco for delivery to the Americas, Asia-Pacific, India and Europe are calculated using a formula for each grade and destination market. Prices are published as fixed prices and as differentials to the reference prices listed below. The K-Factor adjustments to formulas, revised monthly by Mexico, are also published.

Americas
Prices are published as fixed prices and as differentials to Nymex WTI and calculated as (0.65 WTI Houston pipeline) + (0.35 Ice Brent front-month settlement) + K Factor

Europe
Prices are published as fixed prices and as differentials to North Sea Dated and calculated as Ice Brent front-month settlement + K Factor

India
Prices are published as fixed prices and as differentials to North Sea Dated and calculated as Ice Brent front-month settlement + K Factor

Asia-Pacific
Prices are published as fixed prices and as differentials to Dubai and calculated as (Oman + Dubai)/2 + K Factor

Basis (Location)
All Latin American cargo assessments represent free on board (fob) prices at the country of origin. Insurance and freight costs are not represented in these assessments.

Timing
Mexican prices (Isthmus, Maya, Olmeca and Zapoteco) are calculated for the current calendar month. All other Latin American assessments represent a continuous series with no roll dates, for cargoes loading 10-60 days forward.

Freight

Freight rates are an average of the five most recent published values. See the Argus Tanker Freight methodology.

- USGC to east coast Canada 70,000t
- USGC/Caribbean to Singapore 130,000t
- USGC to China 130,000t
- USGC to China 270,000t
- USGC to UKC 70,000t
- USGC Aframax reverse lightering lumpsum

Updates

For the publication schedule check www.argusmedia.com.

The *Argus Americas Crude* methodology is constantly updated and revised. The latest available methodology (which may supersede the one you are reading) is available at www.argusmedia.com.