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ARGUS SOUR CRUDE INDEX

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

Introduction

Argus publishes a daily price series that represents the value of US Gulf coast medium sour crude by including transactions from three separate crude streams. The Argus Sour Crude Index (“ASCI”) pricing tool is designed primarily to serve buyers and sellers of imported crude that need a broader index of US Gulf coast medium sour crude value for use in long-term contracts.

Index calculation

The ASCI price creates a single daily volume-weighted average of aggregate deals done for the component crude grades as if they were one grade of crude. The components are Mars, Poseidon and Southern Green Canyon. Should aggregate trade in the component crude grades not achieve the established *volume minimum* (see below), the price published will default to a *proportional assessment* (see below).

The index is published both as a differential to WTI and as a fixed price. The fixed price will be arrived at by adding the differential index value to the *WTI Formula Basis* (see below) in the same manner as the existing volume weighted average prices produced by Argus in the US. In addition, the methodology of the indices addresses the difficulties associated with *stream disruptions* (see below) caused by weather events, and provides fallback structures based on *intelligent assessments* (see below).

Example of Argus Sour Crude Index

Date	Crude	Trade month	Basis	Differential price (\$/b)	Volume (b/d)	(Price)* (Volume)/ Total volume
19-Oct-09	Mars	Nov	November WTI	-3.80	2,000	-0.2645
19-Oct-09	Mars	Nov	November WTI	-3.75	1,000	-0.1305
19-Oct-09	Mars	Nov	November WTI	-3.75	1,000	-0.1305
19-Oct-09	Mars	Nov	November WTI	-3.75	1,000	-0.1305
19-Oct-09	Mars	Nov	November WTI	-3.75	1,000	-0.1305
19-Oct-09	Mars	Nov	November WTI	-3.75	1,000	-0.1305
19-Oct-09	Mars	Nov	November WTI	-3.75	2,000	-0.2610
19-Oct-09	Mars	Nov	November WTI	-3.75	2,000	-0.2610
19-Oct-09	Mars	Nov	November WTI	-3.75	2,000	-0.2610
19-Oct-09	Mars	Nov	November WTI	-3.70	1,000	-0.1288
19-Oct-09	Mars	Nov	November WTI	-3.70	1,000	-0.1288
19-Oct-09	Mars	Nov	November WTI	-3.70	1,000	-0.1288
19-Oct-09	Mars	Nov	November WTI	-3.70	3,733	-0.4807
19-Oct-09	Poseidon	Nov	November WTI	-3.75	2,000	-0.2610
19-Oct-09	Poseidon	Nov	November WTI	-3.70	1,000	-0.1288
19-Oct-09	Poseidon	Nov	November WTI	-3.60	2,000	-0.2506
19-Oct-09	SGC	Nov	November WTI	-3.85	2,000	-0.2680
19-Oct-09	SGC	Nov	November WTI	-3.85	2,000	-0.2680
Total volume:					28,733	
Argus Sour Crude Index differential:						-3.74
November WTI Formula Basis:						79.61
Argus Sour Crude Index price:						75.87

Deals included in the ASCI calculation are those done for the prompt month grade at a differential to the concurrent WTI prompt month, for example Mars for November delivery at November WTI -3.00. Trades done at a differential to the concurrent prompt month *WTI settlement* are counted in the ASCI price. Examples of excluded deals would be those done at a differential to postings, to another crude grade, to a forward month of the same grade, or to a forward month of WTI. On 30 June 2009, Argus began including SGC deals designated as delivered Texas City, Texas, in addition to deals designated as delivered Nederland, Texas. Prior to this date, deals designated as delivered Texas City were excluded from the ASCI price formation process.

Volume minimum

Combined volume in all three grades must reach 6,000 barrels per calendar day on a given trade day for the ASCI volume-weighted average to be calculated. The example below shows a total volume for all three grades combined of 28,733 barrels per calendar day on the trade day of 19 October 2009, and so the *volume minimum* is met. If the *volume minimum* is not met, Argus uses a *proportional assessment*. Argus reserves the right to adjust the *volume minimum* without notice should it determine that trading activity in the underlying components may harm the integrity of the index.

Proportional assessment

The *proportional assessment* would only be used if the *volume minimum* is not met. The price will be constructed using the individual volume-weighted average prices and assigning a proportionality based on prior trade. At the beginning of every trade quarter, Argus will assign each grade a percentage of the total traded volume in the prior six months. Those percentage values will apply for the following three months.

Example of *proportional assessment* calculation: On the first day of the April trade month, Argus will calculate the spot trade percentages of the total combined volume over the October-March trade months, such as 71pc Mars, 22pc Poseidon, 7pc SGC. For the April, May and June trade months, should the *volume minimum* not be reached on any given day, the ASCI price will be constructed by using the individual volume-weighted average prices for Mars, Poseidon and SGC using the 71pc, 22pc and 7pc proportionality.

In order to ensure that the proportions for the three grades add up to exactly 100pc after rounding, Argus will first round the Poseidon and SGC proportions to whole numbers and then subtract the sum of those percentages from 100 to obtain the Mars proportionality.

History of proportional assessment values

Dates inclusive	Mars	Poseidon	SGC
26 May 2009 – 25 November 2009	77%	16%	7%
30 November – 25 February 2010	69%	18%	13%
26 February – 25 May 2010	70%	19%	11%
26 May – 25 August 2010	71%	12%	17%

Component grades			
Grade	3Q 2009 °API Gravity	3Q 2009 % sulphur	Basis
Mars (Month 1)	28.9	1.93	FOB Clovelly, LA
Poseidon	30.9	1.72	FOB Houma, LA
Southern Green Canyon	28.7	2.36	FOB Nederland or Texas City, TX

After consultation with industry and with notice, Argus may adjust the proportions based on substantive shifts in trading activity, and will seek to implement such changes only at the beginning of trade months.

Stream disruptions

As a matter of course, when output from a pipeline ceases and the market for that grade becomes illiquid, Argus assesses the situation and decides whether to suspend the daily price or continue with an *intelligent assessment* (see below). Should output from one of the three pipelines be disrupted, and the market for that grade becomes illiquid, Argus will constitute the index from trade in the remaining two grades, subject to the existing *volume minimum* of 6,000 barrels per calendar day on a given trade day. The *proportional assessment* provision will be applied in the same proportion, and would rely on Argus' published prices for the component grades whether based on actual trade or intelligent assessment.

Example of *stream disruption*:

If Mars production is disrupted, Argus will create the index using trade in Poseidon and SGC. If that combined trade does not achieve 6,000 b/d, then the index will be based on a *proportional assessment*, such as 71pc Mars (in this case, an *intelligent assessment*), 22pc Poseidon, and 7pc SGC.

If all streams or a combination of streams are so disrupted as to damage the integrity of the index, or any given disruption becomes protracted, Argus will consult with industry to form an alternative index construction, based on other sour grades, import values or intelligent assessments.

Intelligent assessments

Crude oil markets do not always trade with high or consistent liquidity. When actual transactions are not available, a reporter must use intelligence and sound judgment to arrive at an *intelligent assessment* of the market's value. The Argus Sour Crude Index relies on such assessments when volume minimums are not met. In our existing methodology, Argus requires that the total volume transacted in an individual grade be 1,000 b/d or higher for Argus to calculate the individual grade's volume-weighted average. When volumes are below this minimum, the averages default to represent the midpoint of the low and high assessments.

Should transactional liquidity be low, examination of bids and offers can contribute to the assessment process:

- Analysis of the channel of bids and offers through the course of the day.

- Evaluation of the visibility and durability of bids and offers in the open market by cross-checking with market participants and intermediaries.

In order to further analyse the information gathered, or in the absence of bids and offers, other examination can include:

- Comparison of the market value relative to a more actively traded but slightly different quality crude in the same market centre or region.
- Comparison of market value to that of imported crude of similar quality.
- Analysis of forward curves for a physically deliverable commodity that allow extrapolation of value into the timing of the commodity assessed.
- Comparison of the market value relative to similar crude in another market centre.

These comparative values are readily discussed in the market and can be discovered through dialogue with market participants. When intelligent assessments are deployed in the construction of the Argus Sour Crude Index, they are based on this same rigorous process.

WTI Formula Basis

The Argus spot price for WTI at Cushing, Oklahoma, is assessed four months forward and matches exactly the Nymex light sweet crude futures settlements at 1.30 pm Central time. But during the three days following expiration of Nymex futures and before pipeline scheduling, the prompt month WTI Cushing price has no Nymex settlement, and so the price is arrived at using the following method:

Trades done for the Month 1/Month 2 cash roll throughout the day are averaged on a volume-weighted basis. The resulting cash roll average is then applied to that day's Month 2 price for WTI Cushing (equivalent to Nymex prompt month settlement), in order to derive the prompt month WTI Cushing value. If there are no cash roll trades on one 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.

In order to facilitate the use of Argus prices, Argus combines Nymex futures (before expiry) and WTI spot prices (after expiry) into a single pricing series called the *WTI Formula Basis*. This series represents the Nymex settlement up to and including expiry, then automatically switches to represent the mean of the WTI Cushing spot assessment for the three business days after expiry which precede pipeline scheduling. The Argus Sour Crude Index *differential* is added to the same month *WTI Formula Basis* to create the Argus Sour Crude Index price.

Argus price data codes

Description	G-code	PA-code	PA-code Price type
Argus Sour Crude Index (Fixed price)	GC6594A0M	PA0006594	4
Argus Sour Crude Index (Differential)	GC6594\$0M	PA0006594	49