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ARGUS NATURAL GAS AMERICAS

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LAST UPDATED: FEBRUARY 2012

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

Methodological principles

Argus Media operates a price reporting service that is recognized throughout the world for its impartial, reliable and accurate coverage of key energy commodity markets. Argus prices are used extensively in indexes for crude oil and products, as well as other markets such as coal and emissions.

Index method and verification

The *Argus Natural Gas Americas* (Argus NGA) report covers major traded natural gas markets and publishes indexes based on reported trades in the following regions of North America: North-east, Midcontinent, Gulf, and Rockies/West.

Argus Natural Gas Americas natural gas prices are based on data submitted to Argus voluntarily by the risk-management divisions or non-commercial departments of market participants. As part of the data series for its indexes, Argus will publish the total trade volume, number of transactions, high price, low price, mid-range (defined below) and volume weighted price.

Argus reserves the right to exclude trades from the absolute range of trade should a transaction fall well outside the channel of trade. Trades that deviate by more than three standard deviations from the mean of trades reported for index pricing points will be reviewed by Argus editors for possible exclusion. Data providers may be asked to verify the trade to ensure it was not reported in error.

All data submitted will be treated confidentially and used only to establish the index. The Argus natural gas indexes and the implementation of Argus' price reporting methodologies will be audited at least annually by the company's compliance officer. 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 arm's length).

Argus will not use subjective judgments to calculate its daily natural gas indexes in the US. Argus currently only incorporates data reported directly to it by market participants. Argus indexes do not include information obtained separately from exchanges.

Assessments

In the event that insufficient volume is received at a data point to form an index for the monthly markets, Argus may publish an assessment based upon other market information. Argus will assess the range within which natural gas could have traded, based on bids and offers through bid week, movements at other hubs and index locations, using basis differentials and extensive polling of market participants. In addition to data on physical trades, Argus examines market fundamentals to determine assessments, but initially uses physical market trade data. Argus will clearly indicate where an assessment rather than an index has been published.

Relationship to industry

Our methodology has been developed in consultation with the industry to provide a valued service. Argus seeks to report the market in the way it is traded. We do not believe it is our role to change the way that industry participants seek to trade or hedge. Our goal is to develop indexes that are reliable and consistent enough to be used as price benchmarks in spot trade and term contracts. Argus editors and managers understand the needs of our clients for robust price reporting and are willing to discuss our methodology at any time.

Code of conduct and compliance

Argus operates according to the best practices in the publishing field, including editorial integrity, independence and thorough compliance procedures throughout the firm. We want to be the preferred provider by industry participants that are held to equally high standards.

Argus has a code of conduct that applies to all staff. This strict ethics policy can be found on our website at www.argusmedia.com. Included in this policy are restrictions against staff trading in any energy commodity, from trading in any 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 trade lists used in the price index formation process.

Any questions about Argus indexes and methodology should be addressed to Caroline Gentry on 713 429 6330 (caroline.gentry@argusmedia.com) or David Givens on 202-349-2891 (david.givens@argusmedia.com).

Markets covered

Argus Natural Gas Americas publishes index data series for Day-ahead and Month-ahead (bid week) supply in North America. A list of trading locations for which indexes are published is attached.

Day-ahead and weekend gas

Day-ahead indexes are for gas flow in the next working day after the day of publication or for subsequent weekends and other public holidays or non-trading days in the same month. The day of publication is the transaction date. On Fridays or the day before a public holiday or a day when gas is not traded, the day-ahead index will include gas trades for delivery through the next working day, including Saturday, Sunday and any holiday.

A day-ahead index will never span different months. So in the event the last day of the month falls on a Friday, the day before a holiday or a non-trading day, the balance of the month will be traded the second to last trading day of the current month, and the first days of the subsequent month will be traded on the last trading day of the current month.

The day-ahead index data series includes a volume weighted average based on trade data received, as well as the high and low trade prices, the number of trades and the total volume at each index location. When no data is received for an index location, it will be left blank.

Flow-date series

A separate flow-date series will show the volume-weighted average only, dated according to flow-date instead of transaction date. This will be a 365-day series, so data will be filled forward from the previous working day for each day of the weekend, public holiday or non-trading day. For indexes traded in Canadian dollars, the next working day following a Canadian holiday that is a working day in the US will be treated in the same way as US hubs, using data from the previous US working day. If there is insufficient liquidity at a Canadian dollar hub on the Canadian holiday, the flow-date series will use data from the previous Canadian working day, but the day-ahead series will be left blank.

Calculation method

Data received from the back offices, risk management and non-commercial divisions of market participants is collated using software developed by Argus to map each company's own nomenclature for the hubs and index locations to a standard naming convention.

Using this data, the volume weighted index price is calculated by dividing the sum of the product of the total price and volume at each index location by the total volume. In the following, where P represents price and V is volume,

$$\text{Index price} = \frac{\text{Sum } (P \times V)}{\text{Sum } (V)}$$

The volume weighted price will be rounded to the nearest half cent.

Trades reported in Canadian dollars will be converted to US \$/mmBtu using the Bank of Canada Noon Day Rate.

Cash basis

For each day-ahead and bid week volume weighted price, the difference to the Argus Henry Hub volume weighted price will be shown.

Bid week delta

For each day-ahead volume weighted price, the difference to the corresponding bid week index published on the first working day of the current month will be shown. Where a day-ahead index has no corresponding bid week index, N/A will be indicated.

National and regional averages

The Argus North America Index represents an arithmetic average of all of the index locations published in the Argus Natural Gas Americas report each day. The regional averages represent an arithmetic average of each index in the five regions covered in the report.

Low/high and mid-range

The low and high represent the lowest and highest trades of the day, after outliers have been discarded (see below).

The Argus mid-range is a determination of the trading range of the day centered on the volume-weighted average. The mid-range spans 50 percent of the width of the high and low trade of the day. If not enough transactions are reported at varying prices, a mid-range is not produced.

The mid-range is calculated as follows. The difference between the high and low trade is divided by four, producing a quarter of the low/high spread. The volume-weighted average is rounded to the nearest half-cent. A quarter of the low/high spread is subtracted from and added to the rounded volume-weighted average to produce the low and high of the mid-range.

In the event that the mid-range should fall outside of the high and low, the outlying mid-range high or low is changed to be the same as the absolute high or low, accordingly.

The Argus natural gas bid week index

Bid week indexes are based on trading conducted in the last five working days of each month. Transactions comprising bid week indexes are all fixed price trades and any physical basis trades received among market participant data that were conducted in bid week. Physical basis trades will be included if they are transacted on the first three days of bid week and use the Nymex month-ahead expiration price on the third day of bid week to set the price.

The Argus natural gas bid week index will be published on the first day of delivery, i.e. the first working day after bid week. If no transactions are received for a pricing point, an assessment may be made. In the event that there is insufficient information to form an assessment, no assessment will be made and the index left blank.

Monthly average

A monthly average of the daily day-ahead indexes will be published on the first working day of the month for the previous month. The monthly average for a given month will be calculated using daily flow-date data gathered each day dated the first day of each month and ending with data from the last date of the month for which the monthly average is being calculated. The monthly average of the Henry Hub basis differential for each daily index location will be published with the outright monthly averages on the first day of each month for the previous month.

Providing data to Argus

Argus requests that data providers submit data from the risk office or non-commercial department separate from the trading floor. Reporting companies should follow the procedures set out below.

- Each transaction should include location of trade, date, beginning and ending flow date, volume, price and whether it was a buy or sell transaction. While Argus understands that many contracts prohibit the disclosure of counterparty information, please indicate the name of the trading platform or broker used, if possible.
- Report all fixed-price transactions, including day-ahead, monthly bid week, balance of month and forward trades. Include all trades whether or not Argus publishes an index for each hub or index location. Send data to gasdeals@argusmedia.com and gas@argus.myzen.co.uk
- Reported trades should refer to deliveries into the pipeline on a dry basis and should specify the receipt point.
- Day-ahead trades include all trades done for delivery through the following business day, before the 11.30 a.m. Central Prevailing Time cut-off deadline. Day-ahead trade data should be sent to Argus by 4 p.m. Eastern Prevailing Time daily.
- Monthly bid week trades include all transactions done on the last five working days of a month for delivery the following month. Include any physical basis trades done on the first three days of bid week and settled with the price of Nymex month-ahead gas at the end of the third day. Bid week data should be sent by 6 p.m. Eastern Prevailing Time on the first four days of bid week and 2 p.m. Eastern Prevailing Time on the last day of bid week, or all five days of bid week data can be sent in one e-mail on the last day.
- Any balance of month transactions should be clearly marked as to their flow dates.
- Forward trades should indicate clearly if they are physical or financial.
- Provide the name and contact information for at least two rep-

resentatives from the reporting office who can answer questions about the data submitted.

- Report complete data, advising Argus as soon as possible of any omissions or errors.

Outliers, corrections and duplicates

Trades that deviate by more than three standard deviations from the mean of trades reported for index pricing points will be reviewed by Argus editors for possible exclusion. Under certain conditions, trades that deviate from the mean by more than two standard deviations may also be excluded based on skewness, kurtosis and volumetric information.

Argus will not accept additional trade data submitted after the cut-off times listed above. Only errors in the index resulting from mistakes in data received that is later corrected will be accepted in a possible re-calculation of the index. Recalculations using corrected data that may have a significant impact on a price point's index will be considered on an individual basis. If Argus learns of an error, its data manager or other senior official will assess whether the error had an impact on an index or assessment. If correcting the error will not make a significant difference to the published figures, a correction will not be issued. In all cases, Argus should be made aware of any errors in data submitted.

A significant error is deemed to be one that has a price impact greater than 2 cents from the published index price that was reported within one week of the trade date for a liquid trading point. For errors reported later than one week or at less liquid trading points, a senior Argus official or editor will decide whether the error is significant based on other factors including: the absolute price change, whether the error affected the range of the day, how many counterparties are affected and the impact on volume. Errors reported more than one month after the transaction date will not be considered without evidence of significant inaccuracies in the Argus data series if the mistake is not rectified.

If the index changes by more than 2-cents, all data that changes as a result of the correction including high/low, mid-range, volume and number of trades will be corrected and a notice published in the pdf report and sent to data subscribers.

Double-Counting: Because few data contributors provide counterparty information, it is very difficult to match the buy and sell side of a transaction to prevent double counting. Therefore, Argus indexes may include both sides of the same transaction. This should not skew the index in any significant way. If the industry starts reporting more information on time of transaction, Argus will be in a better position to report volume more representative of actual gas flow.