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ARGUS NATURAL GAS AMERICAS

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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 wholesale natural gas markets and publishes indexes based on reported trades in the following regions of North America: Appalachia, Northeast, Louisiana/Southeast, East Texas, South Texas, Midcontinent, Upper Midwest, Rockies/Northwest, Canada and Southwest.

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 arms length transactions (please see the [Argus Global Compliance Policy](#) for a detailed definition of arms 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.

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 David Givens on 202-349-2891 (david.givens@argus-media.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 can be found on our website.

Argus Natural Gas Americas follows the publication schedule available on line at www.argusmedia.com.

Day-ahead and weekend gas

Day-ahead indexes are for gas flow the day after the day of publication. On the last day before a weekend, public holiday or other industry-agreed non-trading days, day-ahead indexes also include the weekend, public holiday and/or other industry-agreed non-trading days.

On occasion, particularly around holidays, the market may decide in advance not to conduct normal trade on what would otherwise have been a standard business day. For example, in advance of the 4th of July holiday in 2017, the market decided that Monday, 3 July 2017 would not be a standard trading day, and would effectively be considered part of a four-day holiday weekend.

On such days, Argus Natural Gas Americas is published as usual, but with all day-ahead price assessments and indexes republished unchanged from the previous report.

A day-ahead index will never span different months. In the event the last day of the month falls on a Friday, the day before a holiday or other non-trading day, the balance of the month will be traded on 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 data series for each index location includes a volume-weighted average price assessment based on trade data received, as well as the low and high trade prices, the number of trades, and the total volume at each index location. When no data is received for an index location, the volume-weighted average price assessment as well as the low and high trade prices will be left blank, and the number of trades and total volume will be published as zero.

Flow-date series

A separate flow-date series is available to subscribers in a related data file and shows 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.

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.

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 or where there was no day-ahead trade N/A will be indicated.

Regional averages

The regional averages are an arithmetic average of each index in the 10 regions covered in the report. Argus regional averages include groupings of index locations that have a geographic commonality, either as a supply source or market zone. Regional averages that include composite hubs will not be calculated based on both the composite hub and the individual hubs or zones which comprise the composite.

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 50pc of the width of the high and low trade of the day. If not enough transactions are reported at varying prices, the mid-range is set with the high two cents higher than the volume-weighted index price, and the low two cents lower than the volume-weighted index price.

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.

The Argus natural gas bid week index

Bid week indexes are based on trading conducted in the fifth, fourth and third business days before the start of the contract 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 for published hubs if they are transacted during bid week and use the Nymex month-ahead expiration price to set the differential to the Henry Hub.

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. The bid week index data series includes a volume weighted average midpoint, as well as the high and low, the number of trades and the total volume at each index location. If no transactions are received for an index location, an assessment may be made for the midpoint as well as the high and low.

Assessment of illiquid markets

Argus assesses daily and bid week prices when no transaction information has been reported for a given hub. Argus clearly indicates when an assessment, rather than an index, has been published and separate data sets for indexes and assessments are available to subscribers.

Daily markets

Argus began publishing price assessments for daily markets when no data is received on July 7, 2022.

Price indexes at selected locations, or reference hubs, are the primary source of information for the assessment of prices at illiquid locations.

A reference hub serves as a proxy for the illiquid market. For each hub, Argus selects one or more reference hubs, based on their historic price relationship, proximity, pipeline connections and other factors.

The relationship between the hub to be assessed and its reference hubs is tested and under continuous review. Reference hubs with unreliable relationships are not used in the assessment of prices at illiquid hubs.

If no fixed price trading occurs at any of an illiquid market's reference hubs, prices at other locations, or a relevant Argus regional average price may be used.

If Argus concludes that an unrepresentative price may result from the use of activity at other hubs, prices may be assessed using other market information including but not limited to supply, demand and transport fundamentals and the price of other related commodities.

Daily assessment price ranges

The absolute low and high prices for assessed hubs are based on the reported trades that comprise the reference hub indexes. The absolute low price for the assessed hub is two standard deviations below the assessment and the absolute high price for the assessed hub is two standard deviations above the assessment based on the distribution of trades at the reference hubs.

Mid-range prices are published as a range around the assessed midpoint half as wide as the absolute low-high range.

For example, a price assessed at \$5/mm Btu with an absolute range of \$4-6/mm Btu will have a mid-range of \$4.50-5.50/mm Btu.

Bid week markets

Since 2009, if no transactions are received for a bid week index location, an assessment may be made for the midpoint, the high and low price range, and the mid-range.

Monthly bid week assessments for hubs with no trade may be assessed using the same methodology employed in daily assessments. In addition, differentials to the Henry Hub futures prices of the Chicago Mercantile Exchange in the month-ahead market may be consulted. These differentials may be for physical or financial settlement. The use of reference hubs or differentials is based on the discretion of an experienced price analyst.

Monthly average of daily indexes

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.

If a daily day-ahead index was not published because a lack of reported trades, an assessed price will be used for the flow dates necessary to have a complete series for every day of the month for that location.

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@argus-media.com and gasdata@argusdata.com
- 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 NAESB (North American Energy Standards Board) nominations 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 fifth, fourth and third business days before the start of the contract month. Include any physical basis trades if they are transacted during bid week and use the Nymex month-ahead expiration price to set the differential to the Henry Hub. Bid week data should be sent by 6 p.m. Eastern Prevailing Time on the first two days of bid week and 2 p.m. Eastern Prevailing Time on the last day of bid week, or all three 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 representatives 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

Outliers

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. Another exclusion criterion is whether an outlier is further away from the next trade than the range of all the other trades.

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 that are part of the original data-set for the day that are later corrected will be accepted in a possible re-calculation of the index.

Corrections

Argus will on occasion publish corrections to price indexes after the publication date. We will correct errors that arise from clerical mistakes, calculation error, or a misapplication of our stated methodology.

Because of the large volume of data involved in the production of published prices, the corrections process is extensive, rules-based and not discretionary and is applied consistently.

Argus asks that data contributors send corrected data as soon as an error is recognized. Corrections can result when market participants that contribute data review their activity for a given daily or bid week cycle and find an error in one of the data fields for a transaction. Argus has found that errors can arise in fields for location, volume, price, trade date and flow dates, among others.

When corrected data are received, Argus recalculates affected indexes to determine whether the error is significant. A significant error is one that, if corrected, would change the published index price by more than 2pc. Errors not deemed significant are not corrected. The handling of significant errors depends, in part, on the amount of time that has passed since the publication of the affected index.

Whenever a correction is made, accompanying data series including low/high, mid-range, volume and number of trades are also corrected.

Within one week

If significant errors are reported within one week of publication, Argus will make best efforts to correct the affected indexes.

After one week

If significant errors are reported more than one week after publication but less than one month after publication, or reported for less liquid trading points, a senior Argus official or editor will also consider other factors including but not limited to the absolute price change, whether the error affected the published range of prices that day, the number of affected counterparties and the affect on total volumes when determining whether to issue a correction.

After one month

If significant errors are reported more than one month after publication, Argus will not issue corrections in the absence of evidence of significant inaccuracies in the Argus data series if the correction is not issued.

Corrected assessments

Argus will on occasion publish corrections to price assessments after the publication date. Similar to the approach to correcting volume-weighted averages, we will correct errors that arise from clerical mistakes, calculation errors or a misapplication of our stated methodology. When a volume-weighted average is corrected for a hub, Argus will examine if that hub is used as a reference hub in

any assessments. When a correction to a volume-weighted average would result in a change to a price assessment by more than 4pc, the assessment will also be corrected, along with the accompanying low, high and mid-range prices.

Double counting

Because few data contributors provide counterparty information, Argus indexes may include both sides of the same transaction. If the industry starts reporting more counterparty information, Argus will be in a better position to remove duplicate trades from indexes.

Error notification

When Argus determines that a correction is necessary to any element of any daily or bid week time series, customers are promptly notified.

The new, correct data elements will be published in a separate, stand-alone article in *Argus Natural Gas Americas* with the headline "Correction." The trade date of the corrected index is specified, along with the hub name and region, and the affected data elements, which may include the volume-weighted average or assessment, low price, high price, mid-range low price, mid-range high price, differential to the Henry Hub, volume and number of trades. If a regional average is corrected, the data elements are the regional average and its basis to the Henry Hub.

A separate data notice is sent to all data users that explains the details of the correction: the trade date, the hub and the specific data elements.

Dissemination of Argus indexes

Information is conveyed to clients in several forms: a PDF, a spreadsheet and in data feeds.

A column labelled "Index/Assessed" in the PDF indicates whether the prices for hubs listed for that trading day are based on volume-weighted averages or are assessments. When an assessment has been made, the publication will include a zero value (0) for trades and volume (MMBtu/day).

Indexes and assessments are published in two separate data series for subscribers.

Day-Ahead indexes

Day-Ahead Index

The original, legacy series that contains only volume-weighted averages that comply with Federal Energy Regulatory Commission requirements for inclusion in jurisdictional tariffs is called the "Day-Ahead Index" series. The Day-Ahead Index series shows no price when a volume-weighted average cannot be created. Relatedly, the volume and trade count in the Day-Ahead Index series will be zero (0) on days when an assessment has been made.

Day-Ahead Continuous Index

When the daily assessments were introduced in September 2022, Argus introduced its “Day-Ahead Continuous Index” data series, to allow market participants to easily understand price activity for the period. The Day-Ahead Continuous Index includes assessments along with volume-weighted averages. The Day-Ahead Continuous Indexes will always have a price listed for the indexes but will be zero (0) in the column for trades and the column for volume (MMBtu/day) for assessed hubs.

Day-Ahead Flow Date Index

Argus also publishes a separate time series for individual dates of flow for each day of the year, which is meant to accommodate invoicing for weekends and holidays when the use of day-ahead prices requires specific application. The flow date time series that contains only volume-weighted averages that comply with commission requirements for inclusion in jurisdictional tariffs is called the “Day-Ahead Flow Date Index” series. The “Day-Ahead Flow Date Index” series shows no price when a volume-weighted average cannot be created and zero (0) in the column for trades and the column for volume (MMBtu/day).

Day-Ahead Flow Date Continuous Index

Argus also provides a data series called “Day-Ahead Flow Date Continuous Index” that includes assessments along with volume-weighted averages. The Day-Ahead Flow Date Continuous Indexes will always have a price listed for the index but will be zero (0) in the column for trades and the column for volume (MMBtu/day) for assessed hubs.

Bid Week Indexes

Argus publishes Bid Week Indexes the first business day of the month.

Bid-Week Continuous Index

For the bid week markets, one data series, called the Bid-Week Continuous Index, includes assessments along with volume-weighted averages. The Bid Week Continuous Indexes will always have a price listed for the index but will be zero (0) in the column for trades and the column for volume (MMBtu/day) for assessed hubs.

Bid Week Non-Continuous

Argus’ bid week time series that contains only volume-weighted averages that comply with commission requirements for inclusion in jurisdictional tariffs is called the “Bid Week Non-Continuous” series. The Bid Week Non-Continuous series shows no price when a volume-weighted average cannot be created and is zero (0) in the column for trades and the column for volume (MMBtu/day).

Forward curve differentials to Henry Hub

See the [Argus North American Natural Gas Forward Curves methodology](#).

Intraday gas price assessments

Argus intraday gas price assessments are the marginal cost of natural gas for a typical gas-fired power generator during three same-day dispatch periods.

Argus calculates these prices assuming zero profit margin for generators, using the variable operating costs and the heat rate of the generator and using zonal hourly dispatch electricity prices from the PJM Interconnection.

Argus calculates intraday gas prices for three discrete periods and for three calculated heat rates.

Time periods

Argus publishes prices for three time periods:

- **24-hour:** 00:00-24:00 ET
- **Intraday 1 (ID1):** 15:00-24:00 ET
- **Intraday 2 (ID2):** 19:00-24:00 ET

Argus calculates period electricity prices for each zone as the arithmetic average of PJM zonal hourly dispatch prices during each of the three gas scheduling periods — 24-hour, ID1 and ID2.

Heat rates

The operational characteristics of each gas-fired generator are reviewed and updated at least annually by consulting industry sources.

The heat rate of each individual natural gas-fired generator, in combination with the installed capacity of each, is used to determine low and high heat rates and a capacity-weighted average gas heat rate for each of the PJM zones and pipeline hubs. The heat rates are updated at least annually.

Variable costs

Three different variable costs are also calculated for each power network zone or gas hub for each hour by combining non-fuel operating costs and emissions costs:

- **Gas cost for low heat rate:** the cost of gas based on the lowest heat rate from the last calendar quarter per zone
- **Gas cost for high heat rate:** the cost of gas based on the highest heat rate from the last calendar quarter per zone
- **Weighted average heat rate gas costs:** the cost of gas based on the weighted average heat rate for each zone

Electricity zone gas price assessments

For each calendar day, Argus publishes nine prices for each zone where gas-fired generators are located:

- **24-hour:** lowest generator gas price, highest generator gas price, gas price at the capacity-weighted average heat rate
- **Intraday 1 (ID 1):** lowest generator gas price, highest generator gas price, gas price at the capacity-weighted average heat rate
- **Intraday 2 (ID 2):** lowest generator gas price, highest generator gas price, gas price at the capacity-weighted average heat rate

Prices are published as at the burnertip of the power station.

For each zone, Argus averages the hourly LMP electricity prices during the three time periods — 24-hour, ID1 and ID2 — subtracts the variable costs and divides each of the resulting three prices by the lowest, highest and capacity-weighted average heat rates for the zone.

Pipeline hub price assessments

Argus calculates intraday pipeline hub prices with information from generators associated with each hub based on geographic proximity to the hub definitions of Argus day-ahead indices described below. Intraday prices for the Indiana Nipsco pipeline hub are associated with the Chicago Nipsco day-ahead index.

For each calendar day, Argus will publish nine prices for each pipeline hub where gas-fired generators are located:

- **24-hour:** lowest generator gas price, highest generator gas price, gas price at the capacity-weighted average heat rate
- **Intraday 1 (ID 1):** lowest generator gas price, highest generator gas price, gas price at the capacity-weighted average heat rate
- **Intraday 2 (ID 2):** lowest generator gas price, highest generator gas price, gas price at the capacity-weighted average heat rate

Prices are as at the pipeline hub location.

Hourly prices are calculated for each generator as the operating cost for the associated zone, divided by the heat rate for the generator, less the various costs for transporting gas to the burner tip of the power plant from the nearest liquid hub.

Only hourly generator prices at or above a historical delivered price threshold will be used for the calculation of intraday pipeline hub price assessments. If all hourly generator prices for all generators in a pipeline hub are below the historical delivered price threshold during a period, no prices will be published for that period. The delivered price threshold will be reviewed annually.

Low and high: the lowest and highest generator prices in each pipeline hub for each period — 24-hour, ID1 and ID2 — calculated as arithmetic averages of the hourly generator prices during each period.

Capacity-weighted average: the capacity-weighted average price for each pipeline hub for each period — 24-hour, ID1 and ID2 — calculated as an arithmetic average of hourly pipeline hub capacity-weighted average prices, using the hourly generator prices and total generation capacity for generators associated with the hub.

Markets covered

PJM zones

- Allegheny Power (APS)
- American Electric Power (AEP)
- Atlantic City Electric (AECO)
- American Transmission Service (FE)

- Baltimore Gas and Electric (BGE)
- Commonwealth Edison (ComEd)
- Dayton Power and Light (DAY)
- Delmarva Power and Light (DPL)
- Duke Energy Ohio and Kentucky (DUK)
- Duquesne Lighting (DUQ)
- East Kentucky Power Cooperative (EKPC)
- Jersey Central Power and Light (JC)
- Metropolitan Edison (ME)
- PECO Energy (PE)
- Pennsylvania Electric (PN)
- PPL Electric Utilities (PPL) Potomac Electric Power (PEP)
- Public Service Electric & Gas (PSE&G)
- Rockland Electric (RECO)
- UGI Utilities (UGI)
- Virginia Electric Power (VAP)

Pipeline hubs

- Chicago Citygates
- Col Gas, Appalachia
- Cove Point supply
- Eastern Gas Transmission, South Point
- Chicago Nipsco
- TETCO M-2 receipts
- TETCO M-3
- TGP zone 4 Marcellus
- TGP Zone 5 200 line delivered
- Leidy Line
- Transco zone 5 North
- Transco zone 6 non-NY
- Transco zone 6 non-NY North
- Transco zone 6 NY

Publication timing

Argus publishes intraday gas prices daily in accordance with the publishing schedule. Prices are published electronically for each calendar day since the previous publication day. Only prices for the previous publication day will be published in the Argus Natural Gas Americas pdf report.

PJM day-ahead gas price assessments

Argus PJM day-ahead gas price assessments are the marginal cost of natural gas for a typical gas-fired power generator during the next day's 24-hour dispatch period.

Argus calculates these prices assuming zero profit margin for generators, using the variable operating costs and the heat rate of each generator and zonal hourly day-ahead dispatch electricity prices from the PJM Interconnection.

Time periods

Argus publishes prices for the time period:

- 24-hour: 00:00-24:00 ET

Argus calculates electricity prices for each zone as the arithmetic average of PJM zonal hourly day-ahead dispatch prices as awarded for the next day's 24-hour power dispatch cycle.

Heat rates

The operational characteristics of each gas-fired generator are reviewed and updated at least annually by consulting industry sources.

The heat rate of each individual natural gas-fired generator, in combination with the installed capacity of each, is used to determine low and high heat rates and a capacity-weighted average gas heat rate for each of the PJM zones and pipeline hubs. The heat rates are updated at least annually.

Variable costs

Three different variable costs are also calculated for each power network zone or gas hub for each hour by combining non-fuel operating costs and emissions costs:

- **Gas cost for low heat rate:** the cost of gas based on the lowest heat rate from the last calendar quarter per zone
- **Gas cost for high heat rate:** the cost of gas based on the highest heat rate from the last calendar quarter per zone
- **Weighted average heat rate gas costs:** the cost of gas based on the weighted average heat rate for each zone

Electricity zone gas price assessments

For each calendar day, Argus publishes three prices for each zone where gas-fired generators are located:

- Lowest generator gas price
- Highest generator gas price
- Gas price at the capacity-weighted average heat rate

Prices are published as at the burnertip of the power generator.

For each zone, Argus averages the hourly LMP electricity prices during the next-day 24-hour period, subtracts the variable costs and then divides each of the resulting three prices by the lowest, highest and capacity-weighted average heat rates for the zone.

Pipeline hub price assessments

Argus calculates next day pipeline hub prices with information from generators associated with each hub based on geographic proximity to the hub definitions of the Argus day-ahead indices described below. Day-ahead prices for the Indiana Nipsco pipeline hub are associated with the Chicago Nipsco day-ahead index.

For each calendar day, Argus will publish three prices for each pipeline hub where gas-fired generators are located:

- Lowest generator gas price
- Highest generator gas price
- Gas price at the capacity-weighted average heat rate

Prices are as at the pipeline hub location.

Hourly prices are calculated for each generator as the operating cost for the associated zone, divided by the heat rate for the generator, less the various costs for transporting gas to the burner tip of the power plant from the nearest liquid hub.

Only hourly generator prices at or above a historical delivered price threshold will be used for the calculation of day-ahead pipeline hub price assessments. If all hourly generator prices for all generators in a pipeline hub are below the historical delivered price threshold during a period, no prices will be published for that period. The delivered price threshold will be reviewed annually.

Low and high: the lowest and highest generator prices in each pipeline hub for the 24-hour period, calculated as arithmetic averages of the hourly generator prices during the 24-hour period.

Capacity-weighted average: the capacity-weighted average price for each pipeline hub for the 24-hour period, calculated as an arithmetic average of hourly pipeline hub capacity-weighted average prices, using the hourly generator prices and total generation capacity for generators associated with the hub.

Markets covered

PJM zones

- Allegheny Power (APS)
- American Electric Power (AEP)
- Atlantic City Electric (AECO)
- American Transmission Service (FE)
- Baltimore Gas and Electric (BGE)
- Commonwealth Edison (ComEd)
- Dayton Power and Light (DAY)
- Delmarva Power and Light (DPL)
- Duke Energy Ohio and Kentucky (DUK)
- Duquesne Lighting (DUQ)
- East Kentucky Power Cooperative (EKPC)
- Jersey Central Power and Light (JC)
- Metropolitan Edison (ME)
- PECO Energy (PE)
- Pennsylvania Electric (PN)
- PPL Electric Utilities (PPL) Potomac Electric Power (PEP)
- Public Service Electric & Gas (PSE&G)
- Rockland Electric (RECO)
- UGI Utilities (UGI)
- Virginia Electric Power (VAP)

Pipeline hubs

- Chicago Citygates
- Col Gas, Appalachia
- Cove Point supply
- Eastern Gas Transmission, South Point
- Chicago Nipsco
- TETCO M-2 receipts
- TETCO M-3
- TGP zone 4 Marcellus
- TGP Zone 5 200 line delivered
- Leidy Line
- Transco zone 5 North

- Transco zone 6 non-NY
- Transco zone 6 non-NY North
- Transco zone 6 NY

Publication timing

Argus publishes PJM day-ahead gas prices daily in accordance with the publishing schedule. Prices are published electronically for each calendar day since the previous publication day. Only prices for the previous publication day will be published in the Argus Natural Gas Americas print report. Prices for all calendar days can be found on Argus Direct.

LNG

Argus Natural Gas Americas includes daily and monthly-average delivered US Boston Harbor LNG prices, along with spread and arbitrage values. See the [Argus LNG Daily methodology](#).

Natural gas fractionation spreads

Fractionation spreads represent the difference between the value of natural gas and the value of natural gas liquids (NGLs) that will result from the fractionation process. Because the price of these commodities is specific for given locations, the spreads are created for the hubs of Mont Belvieu, Texas, and Conway, Kansas.

The daily Argus prices for ethane, propane, normal butane, iso-butane and natural gasoline are used for the Mont Belvieu spread. The prices for the ethane-propane mix, propane, normal butane, iso-butane and natural gasoline are used for the Conway spread. For further information on Argus NGL prices, please see the [Argus NGL Americas methodology](#).

Gross heating value as described in the document *Table of Physical Properties for Hydrocarbons and other Compounds of Interest to the Natural Gas Industry* (published by the Gas Processors Association of America) is used to determine the value of each NGL. The price of the NGL is divided by the gross heating value to produce the value of the NGL in US\$/mmBtu.

The amount of energy lost in fractionating gas to its liquid components is called the shrink. To calculate this, a natural gas price is multiplied by the thermal conversion. For Conway, the gas price is the Argus NGPL Midcontinent daily index. If this index is not published for a given day, the index for Panhandle Oklahoma mainline will be used. For Mont Belvieu, the gas price is the Argus Houston Ship Channel. If this index is not published for a given day, the index for Katy Hub will be used.

A margin results in subtracting the shrink from the NGL price in mmBtus. That is the fractionation spread, or value of making a component NGL from natural gas. The spread is also converted to US¢/gallon. To calculate a fractionation spread for a hypothetical barrel of NGLs, each NGL is weighted per its proportional composition of the barrel, and their values added together.

The proportions are:

Mont Belvieu	
Ethane non-LST	41.5%
Propane non-LST	28%
Normal butane non-LST	7%
Iso-butane non-LST	10%
Natural gasoline non-LST	13.5%

Conway	
Ethane-propane mix	41.5%
Propane	28%
Normal butane	7%
Iso-butane	10%
Natural gasoline	13.5%

These figures were updated on August 10, 2012 based on EIA 2011 natural gas plants field production figures*. The previous values were: ethane (for Conway, ethane-propane mix) 36.5pc; propane, 31.8pc; normal butane, 11.2pc; iso-butane, 6.2pc and natural gasoline 14.3pc. The combined shrink is calculated by adding together the amount of energy lost in fractionating the gas into each NGL. Subtracting the combined shrink from the combined value of NGLs in the barrel produces a per barrel fractionation spread. The spread per barrel is expressed in US\$/mmBtu and US¢/gallon.

*http://www.eia.gov/dnav/pet/pet_pnp_gp_dc_nus_mbb1_m.htm

Mexico IPGN prices

Argus republishes monthly natural gas reference indexes for the six regions of Mexico as defined by the Mexican Energy Regulatory Commission (CRE) and calculated using a methodology determined by the CRE using buy-sell transaction data submitted to it by marketers in a given month. The regions were determined by offer patterns, infrastructure, tariffs, flows, completed pipeline projects and deals that have been done.

The CRE has obligated permit holders for hydrocarbon sales to provide the transaction information for a given month no later than ten days after the start of the next month. The resulting indexes are published by the CRE around the fifth business day after the fifteenth business day of the month.

Argus republishes prices for:

- Region I: Baja California, Sonora, Sinaloa
- Region II: Chihuahua, Coahuila, Durango
- Region III: Nuevo León, Tamaulipas
- Region IV: Aguascalientes, Colima, Jalisco, Zacatecas
- Region V: Ciudad de México, Estado de México, Hidalgo, Guanajuato, Guerrero, Michoacán, Morelos, Puebla, Querétaro, San Luis Potosí, Tlaxcala
- Region VI: Campeche, Chiapas, Oaxaca, Quintana Roo, Tabasco, Veracruz, Yucatán

The CRE aggregates the trading data for each region to create a regional average, and also creates a national index that is also re-published by Argus. All CRE regional indexes are volume-weighted averages with a formula that is the same as that used by Argus for North American gas indexes as described in this methodology. The CRE, however, excludes from its index calculations trades at prices more than three deviations from the average.

US-Mexico border natural gas

Argus publishes prices for natural gas at certain areas on the U.S.-Mexico border. Prices are calculated by adding relevant daily volume-weighted transportation costs to daily prices at the nearest market centers in the US.

Transportation costs are calculated for each location as a volume-weighted average of capacity release costs — a shipper’s firm capacity resold to another party on either a temporary or permanent basis — and maximum tariff transportation costs. Argus calculates the capacity release transportation cost for scheduled volumes up to the total released capacity at each location using transactions disclosed on the public electronic bulletin boards of pipelines regulated by the Federal Energy Regulatory Commission (FERC).

The transportation cost calculations assume released capacity volumes are always the first to flow. Where capacity release transactions do not exist, or for scheduled volumes exceeding the total released capacity, Argus calculates the transportation costs as the maximum tariff transportation costs. Argus calculates the maximum tariff transportation costs by combining the fuel charge, the commodity charge and the demand charge for firm transportation, also called the reservation rate, where applicable and available. These charges are sourced from tariffs filed at the Texas Railroad Commission or at FERC.

Argus uses scheduled flow information for the most recent evening nomination cycle obtained from electronic bulletin boards of interstate pipelines and the Mexican government. If evening cycle flow information is unavailable for any day, data from the most current nomination cycle available will be used.

South Texas-Mexico

Calculated daily by adding the Argus South Texas regional average price to the weighted average of transportation costs based on scheduled volumes being shipped to six pipeline border crossings in Texas.

Intrastate pipelines: Kinder Morgan Border to McAllen, Kinder Morgan Texas to Roma and NetMexico to Rio Grande. Argus uses the commodity charge and demand charge in tariffs filed by these pipelines at the Texas Railroad Commission to calculate the maximum tariff transportation costs.

Interstate pipelines: Tennessee Gas Pipeline to Alamo and to Rio Bravo, and Texas Eastern Transmission to Hidalgo. Argus uses the fuel charge, commodity charge and demand charge in tariffs filed by these pipelines at FERC to calculate the maximum tariff transportation costs.

West Texas-Arizona-Mexico

Calculated daily by adding the Argus Permian Basin day-ahead price to the weighted average of transportation costs for scheduled volumes shipping on El Paso Natural Gas to Douglas, Arizona, on Sierrita Gas Pipeline to Sasabe, Arizona and on El Paso Samalayuca lateral to Clint, Texas. For each location, Argus uses the fuel charge, commodity charge and demand charge in tariffs filed by these pipelines at FERC to calculate the maximum tariff transportation costs.

California-Mexico

Calculated daily by adding the Argus SoCal Gas Co price to the weighted average of transportation costs for scheduled volumes shipping on North Baja pipeline to a crossing point near Ogilby, California. Argus uses the fuel charge, commodity charge and demand charge in tariffs filed by this pipeline at FERC to calculate the maximum tariff transportation costs.

Mexico assessments

Argus publishes assessments for three locations in Mexico by adding transportation costs to prices at the US-Mexico border.

Transportation tariffs are published by the Sistransgas system operator or in the Daily Official Journal of the Federation of the United States of Mexico.

Los Ramones

The price of gas delivered from the NET Mexico Pipeline in the US to the Los Ramones point at the end of Phase I of the Los Ramones pipeline in Nuevo Leon state. Calculated as the Argus South Texas-Mexico assessment plus the Sistransgas tariff for firm transportation on the Los Ramones Phase I pipeline. The low is set 5¢/mn Btu below the calculated value and the high 5¢/mn Btu above the calculated value.

El Encino

The price of gas delivered in the El Encino area in the state of Chihuahua, Mexico, where several pipelines serve end-users and power plants.

Regional pipelines are operated as part of the national Sistransgas system operator or are operated independently, each with its own tariff.

The index is calculated using combinations of Argus regional gas price assessments and the cost of shipment along four routes from west Texas and six routes from south Texas. The west Texas routes typically produce lower delivered prices than the south Texas routes and the assessment is typically published as the lowest and highest of the four west Texas routes. When one or more of the south Texas routes produces a lower price, the assessment is published as the lowest and fourth-lowest of the 10 calculated delivered prices.

Baja California

The price of gas delivered to the Mexican state of Baja California. The minimum and maximum values of four transportation routes are used for the low and high of the range, and the assessment price is the median value.

Trading locations

Appalachia

Col Gas, Appalachia (daily and bid week)

Deliveries into Columbia Gas Transmission pipeline north of Leach, Kentucky. Included are TCO Interruptible Paper Pool and TCO Segmentation Pool. Although the pipeline's definition of the pool is west of the Lanham compressor station in Kanawha County, West Virginia, gas traded at this virtual point can be delivered as far north as western New York.

Eastern Gas Transmission, North Point (daily and bid week)

The North Point on Eastern Gas Transmission is an area designated as being north of the Valley Gate, Pennsylvania, junction in Armstrong County, Pennsylvania, proceeding north and east into New York state crossing the Hudson River and terminating in Rensselaer County, near Albany, Troy and Schenectady, New York.

Eastern Gas Transmission, South Point (daily only)

The South Point index for daily business comprises deliveries south of the Valley Gate, Pennsylvania, junction on two Eastern Gas Transmission pipelines originating in West Virginia and Ohio.

Leidy Line (daily and bid week)

Receipts downstream of the Leidy/Wharton storage facilities in Clinton and Potter counties in Pennsylvania to Station 505 in Hunterdon County, New Jersey. This index does not include transactions at Leidy at interconnects with Columbia Gas Transmission, Eastern Gas Transmission, National Fuel Gas Supply, Texas Eastern Transmission and Transcontinental Gas Pipe Line, which are included in the Leidy Hub index.

Millennium receipts (daily and bid week)

Receipts into Millennium Pipeline downstream of the Corning compressor station in Steuben County, New York, and upstream of the Ramapo interconnect in Rockland County, New York.

TGP station 313 (daily only)

Receipts within Tennessee Gas Pipeline's zone 4 300 line west of compressor station 315 in Tioga County, Pennsylvania, up to but not including the compressor station 219 in Mercer County, Pennsylvania. The index includes portion of Line 300 from station 313 in Potter County, Pennsylvania to the border with New York state.

TGP zone 4 Marcellus (daily and bid week)

Includes receipts in Pennsylvania on the 300 line between compressor stations 315 and 321.

TGP zone 4 200 line (daily and bid week)

Receipts into Tennessee Gas Pipeline's 200 line in Ohio and Pennsylvania, as well as transactions at TGP's Station 219 pool. This replaces a previous index at TGP zone 4 Ohio.

TETCO M-2 receipts (daily and bid week)

The index will comprise receipts in market zone 2 of Texas Eastern Transmission, specifically: on the 24-inch line, from the interconnection at the Illinois-Indiana border near Southern Indiana Electric & Gas to the terminus of the line east of Sarahsville, Ohio; and on the 30-inch line, from the Kentucky-Tennessee border to the terminus

of the zone in western Pennsylvania. This index changed from an all-zone index to include receipts only on September 10, 2012. Previously it was called TETCO M-2.

Northeast

Algonquin Citygates (daily and bid week)

Deliveries from Algonquin Gas Transmission to citygates in Massachusetts, Connecticut and Rhode Island.

Cove Point supply (daily only)

Deliveries into the pipeline serving the Dominion Energy Cove Point LNG terminal in Lusby, Maryland. Includes all points of receipt into the Dominion Energy Cove Point terminal. The primary systems delivering gas to the Cove Point terminal are Eastern Gas Transmission, Columbia Gas Transmission and Washington Gas Light.

Iroquois, Waddington (daily and bid week)

Includes deliveries at the Waddington, New York, interconnect with the TransCanada mainline at the Canadian border into the Iroquois system.

Iroquois zone 2 (daily and bid week)

Zone 2 on Iroquois Gas Transmission commences south of the Wright compressor station in Delanson, New York, and terminates at the Hunts Point area of Bronx County, New York.

Niagara (daily only)

Deliveries or receipts on the Niagara Spur Loop Line, a pipeline operated by Tennessee Gas Pipeline in Niagara County, New York. Deliveries are either to Tennessee or National Fuel Gas Supply on the US side and TransCanada Pipeline on the Canadian side.

Portland NGTS delivered (daily only)

Deliveries off of the Portland Natural Gas Transmission System in Massachusetts, Maine and New Hampshire.

TGP zone 5 200 line delivered (daily only)

Deliveries off of the 200 line of Tennessee gas pipeline in zone 5 in New York state downstream of compressor station 245 in Oneida County to the border with zone 6 in Massachusetts. Includes deliveries into storage, other pipelines, local distributors and to directly connected power plants.

TGP zone 6 200 line (daily and bid week)

Deliveries on the zone 6 200 Line on Tennessee Gas Pipeline in Connecticut, Massachusetts, New Hampshire and Rhode Island.

TETCO M-3 (daily and bid week)

Deliveries into zone M-3 on Texas Eastern Transmission, which commences at the Delmont compressor station in Westmoreland County, Pennsylvania, and terminates in New York City. Zone M-3 does not include transactions at the Leidy storage facility.

Transco zone 5 delivered (daily and bid week)

Deliveries from the pipeline in the area between the Georgia-South Carolina border, upstream of the suction side of station 140 located at Moore, South Carolina, and the Virginia-Maryland border, downstream of the discharge side of station 185 at Bull Run, Virginia.

Includes stations 145, 150, 155, 160, 165, 170, 175, 180, 185. Deliveries from Dominion's Cove Point LNG terminal are not included.

Transco zone 5 North (daily and bid week)

Deliveries in zone 5 of the pipeline upstream of the suction side of station 165 and downstream of the discharge side of station 185 at Bull Run, Virginia. Deliveries from Dominion's Cove Point LNG terminal also are not included.

Transco zone 5 South (daily and bid week)

Deliveries in zone 5 of the pipeline in the area between the Georgia-South Carolina border, upstream of the suction side of station 140 located at Moore, South Carolina, and downstream of the discharge side of station 165 in Pittsylvania County, Virginia. The definition includes stations 145, 150, 155 and 160, and also the North Carolina lateral that extends eastbound from station 165 and includes station 167. Deliveries from Dominion's Cove Point LNG terminal also are not included.

Transco zone 6 non NY (daily and bid week)

Deliveries on Transcontinental Gas Pipe Line from the start of zone 6 at the Virginia-Maryland border to the Linden, New Jersey, compressor station. The index does not include deliveries to Public Service Electric & Gas in New Jersey.

Transco zone 6 non NY north (daily and bid week)

Deliveries from Transco north of Station 195 in York, Pennsylvania, and excludes deliveries at the Leidy Hub, on the Leidy Line and to citygates downstream of Linden, New Jersey. Transco zone 6 NY (daily and bid week) Includes all New Jersey and New York natural gas deliveries downstream of the Linden compressor station in Linden, New Jersey, to the New York citygate, including those to Public Service Electric & Gas, Keyspan Energy and Consolidated Edison Co. of New York.

Transco zone 6 NY (daily and bid week)

Includes all New Jersey and New York natural gas deliveries downstream of the Linden compressor station in Linden, New Jersey, to the New York citygate, including those to Public Service Electric & Gas, Keyspan Energy and Consolidated Edison Co. of New York.

Louisiana/Southeast

ANR, Louisiana (daily and bid week)

Deliveries into ANR Pipeline's southeastern zone on either of two laterals starting offshore Louisiana. The laterals are the offshore east lateral, which brings gas through the Patterson, Louisiana, compressor station, and the offshore west lateral, which starts with the High Island Offshore System and brings gas through the Grand Cheniere compressor station. The zone for the index terminates at the Eunice station in Louisiana.

Columbia Gulf, La (daily and bid week)

This posting comprises the two south Louisiana lateral lines of Columbia Gulf Transmission onshore south Louisiana. The East Lateral delivers gas at Rayne from Venice, Louisiana, the onshore receipt point for gas produced offshore. The West Lateral includes receipts from points starting at Cameron, Louisiana, eastward to Rayne, and receipts of gas from offshore.

Columbia Gulf Mainline (daily and bid week)

Includes receipts on Columbia Gulf Transmission on the mainline in Louisiana and Mississippi. The Mainline System begins at the Rayne compressor station near Lafayette, Louisiana, and ends at Leach, Kentucky.

FGT Citygates (daily only, assessment)

Calculated by adding the Florida Gas zone 3 daily index to a volume-weighted average of transportation basis deals to the Florida market area which are reported to Argus separately by market participants. Transportation basis deals have a distinct price and volume for the value of natural gas transportation in an area starting in Santa Rosa county, Florida, and continuing to the terminus of Florida Gas Transmission. The volume-weighted average for the transportation basis deals is calculated at the close of each day for day-ahead trading.

Florida Gas, zone 2 (bid week only)

Receipts into Florida Gas Transmission zone 2, downstream of compressor station 7 in Acadia Parish, Louisiana, to station 8. Also includes deliveries from the White Lake Lateral and from the Chacahoula Lateral.

Florida Gas zone 3 (daily and bid week)

Receipts into Florida Gas Transmission downstream of compressor station 8 in East Baton Rouge Parish to the zone boundary in Santa Rosa County, Florida, on the upstream side of compressor station 12. Includes receipts into FGT from various pipelines in Mobile Bay.

Gillis (daily only)

The Gillis hub comprises a group of pipelines that deliver gas into Texas Eastern Transmission in the WLA Access zone east of the Vidor, Texas, compressor station up to but not including the Opelousas, Louisiana, compressor station. The pipelines include the Gillis lateral of Acadian Pipeline, Golden Pass Pipeline, Transcontinental Gas Pipe Line, Cameron Interstate pipeline, Creole Trail Pipeline, Trunkline Gas, Florida Gas Transmission, LA Storage Pipeline, LEAP Gathering Lateral Pipeline and Gulf Run Pipeline. Many of the facilities that comprise the Gillis hub are in Calcasieu Parish.

Gulf South Expansion (daily and bid week)

Receipts into Gulf South Pipeline in the part of its system beginning in northeast Texas north of Carthage and ending at the Rock Springs meter in eastern Alabama. The index includes receipts into the pipeline in pooling areas 16, 17, 18 and 19.

Henry Hub (daily and bid week)

The Henry Hub is located at Sabine Pipe Line's Henry Gas Processing Plant in Vermillion Parish, Louisiana. The hub interconnects the following pipelines: Acadian Gas Pipeline, Columbia Gulf Transmission, Dow Pipeline, Jefferson Island Storage Hub, Gulf South Pipeline, Natural Gas Pipe Line, Sea Robin Pipeline, Southern Natural Gas, Texas Gas Transmission, Transcontinental Gas Pipe Line, Trunkline Gas and Sabine's mainline.

NGPL Louisiana (bid week)

Includes all points of receipt into Natural Gas pipeline between compressor station 344 in Jefferson county, Texas, to the terminus of the line in Vermillion Parish, Louisiana, at Erath and the Henry Hub.

Pine Prairie (daily and bid week)

The Pine Prairie index covers deliveries to and receipts from the Pine Prairie Energy Center, a salt cavern storage facility in Evangeline Parish, Louisiana.

SoNat La (daily and bid week)

Receipts into Southern Natural Gas Company's zone 0 in Louisiana, which includes deliveries from three pipeline laterals in the state. The first eastern lateral begins at Plaquemines Parish in eastern Louisiana and extends northwest to an interconnect with the western pipeline lateral at Washington Parish near the Louisiana-Mississippi border. The second western Louisiana lateral runs from St. Mary Parish in southern Louisiana to Washington Parish, while the third lateral extends from the Texas-Louisiana border at Desoto Parish, including the Logansport compressor station, running northeast to the Mississippi border at East Carol Parish in northern Louisiana.

TETCO E La (daily and bid week)

Receipts from the Opelousas compressor station in east Louisiana, northward to points south of the Kosciusko compressor station in Mississippi. Deliveries into the 30-inch Venice line, which runs from the offshore Gulf of Mexico to the New Roads compressor station, just downstream of the Opelousas station in St. Landry Parish, Louisiana, are also included in this zone.

TETCO W La (daily and bid week)

Receipts into the pipe from the Vidor, Texas, compressor station up to, but not including, the Opelousas, Louisiana, station. The Cameron Line is included.

TGP La 500 Leg (daily and bid week)

Includes all points of receipt into the pipe's 500 Leg in zone L in southeast Louisiana which are south of station 534 in Purvis, Mississippi. Also included are all receipt points east of mainline valve 515 in Centerville, Louisiana, and receipt points east of Vermillion 245C on the Blue Water Header System in the Gulf of Mexico.

TGP La 800 Leg (daily and bid week)

Includes all points of receipt into the pipe's 800 leg in zone L south of compressor station 834 in Winnsboro, Louisiana, including all points of receipt on the west side of the mainline valve 515 in Centerville, Louisiana. Also included are all points of receipt west of Vermillion 245C on the southwest and west leg of the Blue Water Header System in the Gulf of Mexico as well as all points of receipt on the Kinder-Sabine Line No. 800-1, and all points of receipt on Linder-Natchitoches Line No. 510-1 south of Station 40 in Natchitoches, Louisiana.

TGP zone 1, 100 leg (daily only)

Receipts on Tennessee Gas pipeline on the 100 leg, which starts at Station 40 in Natchitoches, Louisiana, proceeds north through Arkansas and Mississippi and ends at Station 87 at Portland, Tennessee at the Kentucky border.

TGT zone 1 (daily and bid week)

Deliveries into Texas Gas Transmission starting south of the Pineville compressor station in Rapides Parish, Louisiana, continuing northeast to the beginning of zone 2 in Crockett County, Tennessee. TGT zone

1 has interconnects with ANR, Enable Energy, Crosstex, Mississippi River Transmission, Regency Intrastate Gas, Reliance Energy, Southern Natural Gas, Texas Eastern Transmission, Trunkline and Gulf South.

Transco, station 65 (daily and bid week)

Transactions at Transcontinental Gas Pipe Line's station 65 pooling point on the Louisiana-Mississippi border in St. Helena Parish, Louisiana.

Transco zone 3 (daily and bid week)

This zone on Transcontinental Gas Pipe Line includes receipts on all facilities located north of the compressor station No. 45 in Beauregard Parish, Louisiana, up to but not including compressor station 65 at St. Helena Parish, Louisiana. Also included are deliveries into Transco's Central Louisiana Gathering System and the Southeast Louisiana Gathering System. The zone includes stations 50, 60, 62 and 63.

Transco zone 4 (daily and bid week)

This zone on Transcontinental Gas Pipe Line includes receipts on facilities located north of compressor station 65 at St. Helena Parish, Louisiana, to the Georgia-South Carolina state boundary, excluding all of Transco's facilities located in zone 4A. The zone includes stations 70, 80, 90, 100, 105, 110, 115, 120, 125 and 130. The index also includes deliveries from BP's Destin pipeline. Zone 4A includes all of Transco's facilities located on the Mobile Bay Lateral north of compressor station 82 to an interconnection with Transco's mainline near Butler in Choctaw County, Alabama.

Trunkline Z1A (daily and bid week)

Trunkline zone 1A extends from the Longville compressor station in Louisiana to the Dyersburg station in Tennessee. Transactions done at the zone 1A pool are also included.

East Texas

Carthage (daily and bid week)

The Carthage hub in Panola County, Texas, owned and operated by DCP East Texas Holdings. The pipelines that can receive gas at the hub are Atmos Pipeline, Enable East, Energy Transfer Fuel, Enterprise Texas, Gulf South Pipeline, Lone Star Pipeline, Southern Natural Gas, Kinder Morgan Texas Pipelines, Mississippi River Transmission, Tennessee Gas Pipeline, Texas Eastern and Transmission Texas Gas Transmission.

Houston Ship Channel (all) (daily and bid week)

The Houston Ship Channel (all) index includes transactions for deliveries to end users in the Houston Ship Channel, deliveries from intrastate pipelines in Harris, Chambers, Galveston and Liberty counties in Texas, and trade at any virtual meter and paper pool in the area. The Ship Channel is an area from the north end of the Galveston Bay to the channel's turning basin.

Katy Hub (daily and bid week)

Enstor's Katy Storage Hub. Receipts and deliveries may be made from Tennessee Gas Pipeline, Oasis Pipeline, Transcontinental Gas Pipe Line, Natural Gas Pipe Line, Dow Pipeline, KM Texas Pipeline, Houston Pipe Line, Duke Energy, KM Tejas Pipeline, Atmos Texas Pipeline, Gulf South Pipeline and the Houston Ship Channel. Deliveries can be made to Trunkline Gas.

Moss Bluff (daily only)

Transactions at the Moss Bluff storage hub in Liberty County, Texas. The facility has interconnections with Enterprise Texas, Houston Pipeline, Kinder Morgan Texas, Kinder Morgan Tejas, Natural Gas pipeline and Texas Eastern Transmission.

NGPL, TexOk zone (daily and bid week)

Includes deliveries into Natural Gas Pipe Line from the Texas-Louisiana border in Jefferson County, Texas, to Montgomery County, Texas. The zone also includes the line segment to Cass County, Texas, and to Carter County, Oklahoma. NGPL's Gulf Coast pooling point is included.

TGP Zone 0 North (daily only)

Includes gas delivered upstream of compressor station 17 to the Zone 0 pooling point in Natchitoches Parish, Louisiana. Zone 0 North also includes the lateral from Carthage, Texas, ending in Natchitoches Parish.

Tolar hub (daily only)

Transactions at the Tolar Hub in Hood County, Texas. The hub connects the Worsham-Steed gas storage facility to Atmos pipeline, Enbridge, ETC Cleburne, North Texas pipeline and NorTex.

Transco zone 2 (daily and bid week)

This zone on Transcontinental Gas Pipe Line includes receipts at all facilities located north of the pipeline's compressor station No. 30 in central Wharton County, Texas, up to and including compressor station No.45 in Beauregard Parish, Louisiana. Also included in this zone are receipts into Transco's Southwest Louisiana Gathering System, North High Island System and Transco's facilities upstream or in the vicinity of the High Island Offshore System and the U-T Offshore System. The zone includes stations 35 and 40.

South Texas

Agua Dulce (daily only)

Comprised of transactions among many facilities in Nueces, Kleberg and San Patricio counties in Texas. The Agua Dulce hub in Nueces county connects the following pipelines: Houston Pipe Line, Gulf South Pipeline, Kinder Morgan Texas Pipelines, Natural Gas Pipe Line Co. of America, Transcontinental Gas Pipe Line, Tennessee Gas Pipeline, Gulf Coast Express Pipeline, TransTexas Gas, NetMexico, Valley Crossing Pipeline and EPGT Texas. Also included are transaction at the Banquete Hub in Nueces County. The hub, operated by Trailstone Group, connects Tennessee, NGPL, Kinder Morgan Tejas Pipeline, Southcross Pipeline, Whistler Pipeline and Enterprise Texas Pipeline. Also included are deliveries from the ExxonMobil King Ranch plant in Kleberg county. Transactions on the lean and rich systems of Lobo Pipeline in the two counties are also included. Also included is Corpus Christi Pipeline, which accepts deliveries at Sinton in San Patricio county from Enterprise Products, Kinder Morgan Tejas, NGPL, Tennessee, and Transco.

NGPL South Texas (daily only)

NGPL's South Texas Zone includes all deliveries into the pipeline starting in Jim Hogg County, Texas, downstream to Compressor Station 302 in Montgomery County, Texas.

TETCO South Texas zone (daily and bid week)

The South Texas zone comprises receipts in the following pipelines: the 30-inch line, which commences at the Mexico-Texas border and proceeds east to connections west of the Vidor, Texas, compressor station; and the 24-inch pipeline that runs from the Hagist Ranch compressor station to points south of the Huntsville compressor station.

TGP zone 0 South (daily and bid week)

The index comprises gas delivered into Tennessee from the Mexican border in McAllen county, Texas, through compressor station 17 in Wharton county, Texas.

Tres Palacios (daily only)

This index is comprised by transactions at the Tres Palacios hub in Matagorda County, Texas. The hub interconnects with the following pipelines: Central Texas Gathering System, the Channel Industries-Houston pipe line joint venture facilities, Enterprise Texas pipeline, Florida Gas transmission, the Kinder Morgan Houston Central processing plant complex, Natural Gas pipe line, Tejas pipeline, Tennessee gas pipeline and Texas Eastern transmission.

Transco zone 1 (daily and bid week)

This zone on Transcontinental Gas Pipe Line includes receipts at or south of the pipeline's compressor station No. 30 in Wharton County, Texas. The zone also includes Transco's 24-inch mainline from Wharton to Hidalgo County, Texas, the 24-inch McMullen lateral that commences in McMullen County, Texas, and offshore Gulf of Mexico production from the Padre Island and Central Texas Gathering System Laterals. The zone includes stations 4, 5 and 20.

Midcontinent

ANR, Oklahoma (daily and bid week)

Receipts in ANR Pipeline's Southwest Area, which comprises spurs commencing at the Custer compressor station in Custer County, Oklahoma, and the Sherman plant at the Texas-Oklahoma border. These spurs meet at the Southwest mainline at the Greensburg, Kansas, compressor station. The segment of pipe between Custer and Sherman is also included, as well as other sections of ANR south of Greensburg.

Enable East (daily and bid week)

The Enable Gas Transmission system includes deliveries into six distinct Pooling Areas, four of which have distinctly different pricing characteristics. The majority of liquidity on the EGT system is centered in the Neutral and North Pooling Areas, which are included in the Argus Enable East index. This index was renamed from CenterPoint in December 2013. The six Pooling Areas are the Flex or Neutral Pooling area, the North Pooling Area, the South Pooling Area, the Line CP Pooling Area, and the West 1 and West 2 Pooling Areas. The southern pool trades at a premium, and is not included in this index. All pools are described below for clarity.

Flex or Neutral Pooling Area (included)

The Flex or Neutral Pooling Area is the area containing all receipt points on EGT's transmission mainlines, and lines connected at Pittsburg, Latimer, Haskell, and Pushmataha counties in Oklahoma.

North Pooling Area (included)

The North Pooling Area includes all receipt points on EGT's transmission mainlines, and lines connected there, located at points east of the eastern terminus of the Neutral Pooling Area and north of Line AC.

South Pooling Area (not included)

The South Pooling Area includes all receipt points on EGT's transmission mainlines, and lines located east of the eastern terminus of the Neutral Pooling Area and south of, and including, Line AC, with the exception of the area defined as the Line CP Pooling Area.

West Pooling Area #1 (not included)

The West Pooling Area #1 includes all receipt points on EGT's transmission mainlines, and lines connected at points west of the Amber Junction compressor station.

The West Pooling Area #2 (not included)

The West Pooling Area #2 represents an area containing all receipt points on EGT's transmission mainlines, and lines connected at points east of the Amber Junction compressor station and west of the western terminus of the Neutral Pooling area. Line CP represents deliveries into EGT's 42-inch diameter pipeline extending from Duke Energy's Carthage hub area in east Texas to EGT's Perryville Hub in northeast Louisiana.

NGPL, Amarillo (daily only)

The Amarillo Pool on Natural Gas Pipe Line commences in Gage County, Neb., on the Amarillo mainline at compressor station 106 and terminates at station 109 in Keokuk County, Iowa.

NGPL, Midcontinent (daily and bid week)

Includes receipts into the Natural Gas Pipe Line from compressor station 155 in Wise County, Texas, northwest to connections with NGPL's Amarillo System at station 112 in Moore County, Texas. The Midcontinent zone also includes the pipeline segment from Moore County to compressor station 106 in Gage, Neb. Also included are deliveries into the NGPL "Triangle" which is formed as the pipeline runs southeast from station 103 in southwestern Kansas, to connections with NGPL at station 156 in Kiowa County, Oklahoma.

Oneok, Oklahoma (daily and bid week)

Includes deliveries into Oneok's single pricing pool for gas coming from several large gathering systems. This gas is gathered primarily in the east-central part of Oklahoma in Pittsburg and Haskell counties and also from the west-central part of the state in Blaine, Canadian and Grady counties.

Panhandle Oklahoma Mainline (daily and bid week)

Includes transactions done into Panhandle Eastern Pipe Line's Field zone in Texas, Oklahoma, and Kansas, from two laterals located south of the Haven, Kansas compressor station. The first lateral runs in a northeast direction from the Texas and Oklahoma panhandles and southwest Kansas, including Sunray, Hansford, Liberal and Greensburg compressor stations, while the second lateral connects with Haven from points in central and western Oklahoma, including the Cashion, Seiling and Alva compressor stations. Deliveries to Haven, the beginning of Panhandle Eastern's Market zone, are not included.

Southern Star (daily and bid week)

The Southern Star index includes receipts into the system in Texas, Oklahoma and Kansas.

Upper Midwest

Alliance, into interstates (daily only)

Deliveries from the Alliance Pipeline into ANR Pipeline, Natural Gas Pipe Line, Midwestern Gas Transmission and Vector Pipelines at the Aux Sable station in Illinois.

ANR ML7 (daily and bid week)

Deliveries into ANR Pipeline's northern zone, called ML7, which commences at the Sandwich compressor station in Illinois and proceeds to Wisconsin, Michigan and Ohio. The northernmost point is the Crystal Falls station in Wisconsin. The ML7 zone comprises an area east to the Defiance station in Ohio and to the Orient storage field in Michigan.

Chicago Citygates (daily and bid week)

Citygate deliveries to the Chicago, Illinois, metropolitan area of the following LDC systems: Peoples Gas Light and Coke, Nicor Gas, North Shore Gas and NIPSCO.

Chicago Nicor (daily and bid week)

Deliveries into Nicor Gas.

Chicago Nipsco (daily and bid week)

Deliveries into Northern Indiana Public Service Company.

Chicago Peoples (daily and bid week)

Deliveries into Peoples Gas Light & Coke.

Consumers Citygates (daily and bid week)

Deliveries to all citygate stations on the local distribution company network of Consumers Energy in Michigan.

Emerson, Viking GL (daily and bid week)

Transactions from TransCanada's mainline at Emerson, Manitoba into Great Lakes Gas Transmission and into Viking Gas Transmission.

Lebanon (daily and bid week)

Deliveries into or receipts from any of the following pipelines in the Lebanon, Ohio, area: Texas Gas Transmission, ANR Pipeline, Texas Eastern Transmission, Panhandle Eastern, Columbia Gas Transmission, Eastern Gas Transmission and Rockies Express Pipeline.

Mich Con Citygates (daily and bid week)

Deliveries to any of the 180 citygates of Michigan Consolidated Gas Co. in Michigan, including stations in Michigan's Upper Peninsula, Alpena area, Traverse City area, Petoskey, Grand Rapids area, the Muskegan area, Ludington and in the South East, including the Wayne and Washtenaw areas. MichCon is an operating subsidiary of DTE Energy.

NGPL Iowa-Illinois (daily only)

Receipts in the Iowa-Illinois receipt zone of Natural Gas Pipe Line, from compressor station 108 in Keokuk County, Iowa, into all area served by the pipeline in Illinois. The index does not include transactions at the citygates of local distribution companies that comprise Chicago Citygates indexes.

Northern Border Ventura Transfer (daily only)

This index comprises gas traded on Northern Border Pipeline at Ventura, Iowa, that is not traded for delivery into Northern Natural Gas.

NNG Demarc (daily and bid week)

Demarcation on Northern Natural Gas is the pooling point for shippers on Northern Natural looking to aggregate natural gas receipts from the field area before further flow downstream to the market area. The point is at Clifton Station in Clay County, Kansas.

NNG Ventura (daily and bid week)

Deliveries at the Ventura pooling point on Northern Natural Gas in Hancock County, Iowa. Supply may be received either from the field zones of Northern Natural or at the interconnect from Northern Border Pipeline.

REX Moultrie-NGPL (daily and bid week)

Deliveries into Natural Gas Pipe Line from Rockies Express in Moultrie County, Illinois.

REX Shelby-ANR (daily and bid week)

Deliveries into ANR Pipeline from Rockies Express in Shelby County, Indiana.

REX zone 3 (daily and bid week)

Deliveries off of Rockies Express pipeline into other pipelines in zone 3, from Audrain County, Missouri up to but not including its terminus in Monroe County, Ohio, at the Clarington hub.

Rover, delivered (daily)

Deliveries from Rover pipeline into ANR pipeline and Panhandle Eastern pipeline in Defiance County, Ohio.

Rockies/Northwest**Cheyenne (daily and bid week)**

Production in eastern Wyoming can be delivered into either Trailblazer Pipeline, Rockies Express Pipeline, Public Service Company of Colorado or Colorado Interstate Gas at the Cheyenne Hub in Colorado. The hub is operated by CIG.

CIG Rocky Mountains (daily and bid week)

Receipts into Colorado Interstate Gas' 20-inch, 22-inch and 24-inch mainlines in Wyoming and Colorado. Also included are a segment in Utah and a 16-inch lateral in Wyoming. Not included are deliveries or receipts into CIG's system at points south of Cheyenne, Wyoming, along the front range of Colorado and into Kansas, Oklahoma and Texas.

GTN, Kingsgate (daily only)

This interconnection is at the US-Canada border near Kingsgate, B.C., in Boundary County, Idaho. Deliveries are from Foothills Pipeline into Gas Transmission Northwest.

Kern River receipts (daily and bid week)

This point includes transactions done along the Kern River Gas Transmission pipeline in Wyoming but not including deliveries at the Opal tailgate, which trades at a premium to other receipt points. Kern River receipts includes: Anschultz Ranch, Carter Creek, CIG at Muddy Creek,

Clear Creek, Goshen, Northwest Pipeline at Muddy Creek, Overland Trail, Mountain West, Painter, MountainWest Roberson Creek and Whitney Canyon.

Northwest Wyoming (daily only)

This point includes transactions on Northwest Pipeline in Wyoming only, from the Green River compressor station to the Kemmerer compressor station, including deals done at Opal.

Northwest, S. of Green River (daily only)

Receipts into Northwest Pipeline in a segment from the Green River, Wyoming, compressor station to the La Plata interconnection with El Paso Natural Gas in the San Juan Basin in La Plata County, Colorado. Included are deliveries from Clay Basin storage, the Piceance Basin and the Ignacio processing plant.

NWPL, Rocky Mountains (bid week only)

Includes receipts into Northwest Pipeline mainline in the states of Wyoming, Utah and Colorado. The region includes transactions on the pipeline between the Kemmerer compressor station in Wyoming and the Moab compressor station in southern Utah. This index includes both the Rocky Mountains and the Wyoming pools as defined by Northwest Pipeline, and all deals done at Opal and Muddy Creek.

Northwest Sumas (daily and bid week)

The Canadian border region on Northwest Pipeline includes receipts into the pipeline from Westcoast Energy at the Huntingdon, B.C.-Sumas, Washington, connection at the US-Canadian border.

Opal (daily and bid week)

Any transactions done from the Opal tailgate to the Muddy Creek compressor station in Wyoming on Kern River Gas Transmission. Operator Williams allows gas traded at this point to be delivered into any connecting pipeline: Northwest Pipeline, Colorado Interstate Gas, MountainWest Overthrust, Rockies Express or MountainWest Pipeline. Trades done at Opal that are not for delivery into a specific pipeline are included in the Opal index. There is no transportation premium between Opal and Muddy Creek.

PG&E Citygates (daily and bid week)

Purchases or sales at the Pacific Gas & Electric citygates. Deliveries come from the Redwood, Silverado or Baja paths or with Mission Path onstream transportation.

PG&E Malin, Oregon (daily and bid week)

Deliveries into the Pacific Gas & Electric system at the Malin interconnection from either Gas Transmission Northwest or Tuscarora Pipeline. The index was expanded in August 2011 to include receipts at Onyx Hills from Ruby Pipeline into the PG&E Redwood Path.

Stanfield (daily only)

Deliveries from Gas Transmission Northwest into Northwest Pipeline at the Stanfield, Oregon, compressor station.

White River Hub (daily and bid week)

The White River Hub is a joint venture between MountainWest and Enterprise Products Partners. It runs from Enterprise's Meeker

processing facility, which gathers gas from the Piceance Basin in northwest Colorado, south to interconnect with Rockies Express and TransColorado Gas Transmission and east to connect with MountainWest Pipeline at Greasewood, along with Northwest Pipeline, Colorado Interstate Gas and Wyoming Interstate Co.

Canada

Alliance Trading Pool (daily)

The pool is a virtual marketplace for buyers and sellers on Alliance pipeline to transact in British Columbia, Alberta and Saskatchewan. Receipts and deliveries can occur for pool transactions at Alliance points in Canada.

Dawn, Ontario (daily and bid week)

Deliveries from the Union Gas Dawn Facility, a hub around several depleted reservoir storage pools in Ontario, into major interconnects including TransCanada, Vector, Enbridge, Great Lakes Gas Transmission, Consumers Energy, Panhandle Eastern and into Dawn storage. Deliveries at Parkway are not included.

NIT/AECO (daily and bid week)

The AECO gas storage business in Alberta, Canada, is comprised of facilities at Suffield and Countess (owned by Niska Gas Storage). Although the AECO facilities are geographically dispersed across Alberta, the toll design of Nova Gas Transmission means that they function commercially as the same point. The index price is reported in Canadian dollars per gigajoule and \$/mmBtu using the Royal Bank of Canada Noon day rate with a conversion factor of 1mmBtu = 1.054615 gigajoules.

NIT/AECO basis (bid week only)

This index includes deals done at AECO during bid week on a basis to the Nymex month-ahead value on the third day of bid week.

Empress (daily and bid week)

The Empress index is constituted by tailgate gas from a variety of processing facilities in southeastern Alberta near the Saskatchewan border, on the eastern terminus of the Nova system, also known as TransCanada's Alberta system. Gas processed at Empress is shipped either on TransCanada's mainline or Foothills Pipeline. The index price is reported in Canadian dollars per gigajoule.

Westcoast station 2 (daily and bid week)

Deliveries into Westcoast Energy at compressor station 2 in British Columbia. The price is reported in Canadian dollars per gigajoule and \$/mmBtu.

Southwest

El Paso Bondad (daily only)

Transactions at the Bondad compressor station in Colorado.

El Paso, Permian Basin (daily and bid week)

Comprised of receipt points in the Waha pool in Pecos, Reeves and Terrell counties in Texas and receipts in the Keystone pool, which are in Andrews, Coke, Crane, Culberson, Ector, Glasscock, Loving, Midland, Pecos, Reagan, Reeves, Sterling, Upton, Ward and Winkler counties in Texas and Eddy and Lea counties in New Mexico.

El Paso, San Juan Basin (daily and bid week)

Deliveries into El Paso Natural Gas in the San Juan Basin, including supply from the Blanco and Rio Vista processing plants in New Mexico, which are south of the Bondad compressor station.

El Paso, South Mainline (daily only)

Deliveries on the south mainline of El Paso Natural Gas at points between the Cornudas station in west Texas to, but not including, Ehrenberg, Arizona.

Kern River, delivered (daily and bid week)

Deliveries from Kern River Gas Transmission upstream of the Southern California Gas system in the Las Vegas, Nevada, area. Deliveries at Wheeler Ridge, Kramer Junction and Daggett are not included.

Permian Basin (daily and bid week)

The Permian Basin average is a volume-weighted average comprised of these three existing indexes: El Paso Permian Basin, Transwestern Permian Basin and Waha.

PG&E South (daily and bid week)

Deliveries into the PG&E system from El Paso Natural Gas and Transwestern Pipeline at Topock, California; from Kern River Gas Transmission at Daggett, California, and from the High Desert Lateral; from Southern California Gas at Kern River Station and from Questar Southern Trails Pipeline at Essex, California.

SoCal Citygates (daily and bid week)

Deliveries from and to holders of Southern California Gas Company's citygate pool contracts, including in and out of storage.

SoCal Gas Co (daily and bid week)

Deliveries into the Southern California Gas Company pipeline system at any of the following interconnects: Topock, California, Blythe, California, Ehrenberg, Arizona, Kramer Junction, California, Kern River Station, Needles, Arizona, and Wheeler Ridge. Also includes deliveries from PG&E from points including Kern River Station and Pisgah/Daggett.

Transwestern Permian Basin (daily and bid week)

The Transwestern Permian Basin index comprises receipts into Transwestern Pipeline in the West Texas and Central zones. The West Texas zone is located southeast and southwest of the WT-1 compressor station in Lea County, New Mexico, and in many west Texas counties. The Central zone is bordered by station 8 in Lincoln County, New Mexico, to the northwest, station P-1 in Roosevelt County, New Mexico, to the east and station WT-1 in Eddy County, New Mexico, to the south.

Transwestern San Juan Basin (daily and bid week)

The Transwestern San Juan Basin index comprises the pipeline's San Juan lateral, and includes receipts into Transwestern Pipeline into the Ignacio to Blanco zone in Colorado and the Blanco Hub zone in New Mexico, to Thoreau, New Mexico.

Waha (daily and bid week)

The Waha area has four market centers with a total of 38 direct interconnections to a number of interstate and intrastate pipelines, which provide transportation to southwestern states, east Texas and the

midcontinent area. The pipelines include El Paso Natural Gas Pipeline, Transwestern Pipeline, Natural Gas Pipe Line, Northern Natural Gas, Delhi Pipeline, Oasis Pipeline, EPGT Texas and Lonestar Pipeline. Hubs include the DCP Midstream Partners Midland Hub, the Atmos Energy pipeline system hub, Enstor's Waha hub, the Encina hub of Southern Union Gas and the EPGT hub of El Paso Texas Pipeline.

Waha-Enterprise (daily only)

Deliveries into the Texas intrastate system of Enterprise Products Partners at the Waha hub in Pecos County, Texas. The Enterprise system in the Permian basin is extensive and includes gathering lines and processing plants at other locations in Texas and New Mexico, but deliveries at these locations are not included.