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# ***ARGUS NORTH AMERICAN ELECTRICITY/NATURAL GAS CORRELATION CURVES***

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The most up-to-date Argus North American Electricity/Natural Gas Correlation Curves methodology is available on [www.argusmedia.com](http://www.argusmedia.com)

## Methodology overview

### Methodology rationale

Argus produces daily forward price curves that are distinct from the forward price assessments published in Argus market reports.

Argus forward curves are the modelled current value of a forward delivery or loading period at the specified timestamp on the day of publication and are not forecasts of future spot prices.

Argus forward curves are produced using models designed to produce reliable and representative indicators of commodity market values, free from distortion.

Model inputs and outputs, including the final forward curves, intermediate values that may be generated during the production process and reports, are subjected to ongoing validation to ensure that the models perform as expected in generating representative prices.

## Argus Electricity/Natural Gas Correlation Curves

### Means of calculation

Correlations are for prices published in Argus North American Natural Gas Forward Curves and Argus North American Electricity Forward Curves. Correlations are calculated according to the following formula:

$$\text{Correlation} = \rho = \frac{\text{cov}(X,Y)}{\sigma_x \sigma_y}$$

Where:

Cov = Covariance

X = Electricity Price

Y = Natural Gas Price

$\sigma$  = Standard Deviation

For each electricity price, correlations are calculated using CME Henry Hub futures and the Argus natural gas forward prices listed below. See the [Argus North American Electricity Forward Curves](#) and [Argus North American Natural Gas Forward Curves](#) methodologies.

### Correlation terms

Argus assesses 5,10,20,30 and 50 day correlation terms. For example, a 5-day correlation is based on closing prices for each of the 5 consecutive trading sessions up to and including the day of publication.

### Curve length

Heat rate are calculated for 84 months forward, the current year, five years, 27 quarters and 21 seasons forward. Note, winter is January-February, spring is March-April and summer is July-August.

### Timing

Correlations are based on electricity and natural gas prices at the close of CME's Henry Hub futures primary trading sessions, normally 14:30 EST.

### Units of assessment

Correlations are expressed as correlation coefficients, which range between -100pc and +100pc.

Electricity market	Corresponding natural gas market
ERCOT - Houston Load Zone	HSC
ERCOT - Houston Zone	HSC, NGPL - STX
ERCOT - North Load Zone	Waha
ERCOT - North Zone	HSC, Katy, Waha
ERCOT - South Load Zone	Katy
ERCOT - South Zone	HSC, Katy
ERCOT - West Load Zone	Waha
ERCOT - West Zone	EP Permian, Waha
FRCC - Florida	FGT - Z3
ISO-NE - Connecticut Zone	Algonquin, Iroquois Zone 2
ISO-NE - Maine Zone	Algonquin
ISO-NE - Mass Hub	Algonquin, Iroquois Zone 2
ISO-NE - NEMA Zone	Algonquin
ISO-NE - New Hampshire Zone	Algonquin
ISO-NE - Rhode Island Zone	Algonquin
ISO-NE - SEMA Zone	Algonquin
ISO-NE - WCMA Zone	Algonquin
MISO - Arkansas Hub	Centerpoint
MISO - Illinois Hub	Chicago CG, NGPL - Midcont.
MISO - Indiana Hub	Chicago CG, TCO
MISO - Louisiana Hub	Trunkline - LA
MISO - Michigan Hub	Chicago CG, Michcon CG
MISO - Minnesota Hub	Chicago CG, NNG Demarc, NNG Ventura
MISO - Texas Hub	HSC
NYISO - Zone A	Niagara, Waddington
NYISO - Zone B	Niagara
NYISO - Zone C	Niagara
NYISO - Zone D	Niagara
NYISO - Zone E	Niagara
NYISO - Zone F	Algonquin
NYISO - Zone G	Algonquin, TETCO - M3
NYISO - Zone H	Algonquin
NYISO - Zone I	Algonquin
NYISO - Zone J	TETCO - M3, Transco Zone 6 (NY)
NYISO - Zone K	Transco Zone 6 (NY)
PEPCO DC	Transco Zone 6 (non-NY)
PEPCO MD	Transco Zone 6 (non-NY)
PJM - AD Hub	Eastern Gas Transmission, South Point, TCO
PJM - AECO Zone	Transco Zone 6 (non-NY)
PJM - AEP Zone	TCO
PJM - APS Zone	TETCO - M3
PJM - ATSI Zone	TETCO - M3
PJM - BGE Zone	TETCO - M3, Transco Zone 6 (non-NY)
PJM - ComEd Zone	Chicago CG, NGPL - Midcont.
PJM - Dayton Zone	TCO
PJM - DEOK Hub	TCO
PJM - Duquesne Zone	TETCO - M3
PJM - East Hub	TETCO - M3, Transco Zone 6 (non-NY)
PJM - FE Ohio	TCO
PJM - JCPL Zone	TETCO - M3, Transco Zone 6 (non-NY)
PJM - Meted Zone	TETCO - M3, Transco Zone 6 (non-NY)
PJM - NI Hub	Chicago CG, NGPL - Midcont.
PJM - Peco Zone	TETCO - M3, Transco Zone 6 (non-NY)
PJM - Penelec Zone	Transco Zone 6 (non-NY)
PJM - Penn Power	TCO
PJM - PEPCO Zone	TETCO - M3, Transco Zone 6 (non-NY)
PJM - PPL Zone	TCO, TETCO - M3
PJM - PSEG Zone	TETCO - M3, Transco Zone 6 (non-NY)
PJM - RECO Zone	Transco Zone 6 (non-NY)
PJM - West Hub	TETCO - M3, Transco Zone 6 (non-NY)
SERC - Southern	TETCO - ELA
SPP - SPP North Hub	PEPL
SPP - SPP South Hub	PEPL
VACAR	TCO
WSPP - COB	Malin, PG&E CG
WSPP - Four Corners	EP San Juan
WSPP - Mead	EP Permian, Kern River
WSPP - Mid C	Malin, Sumas
WSPP - NP 15	PG&E CG, Socal
WSPP - Palo Verde	EP Permian, EP San Juan
WSPP - SP 15	Kern River, Socal

## Corrections

Argus will on occasion publish corrections to forward curve prices after the publication date. We will correct errors that arise from clerical mistakes, calculation errors, or a misapplication of our stated methodology. Argus will not retroactively change published prices based on new information learned after publication. We make our best effort to produce forward curves based on the information we gather during the trading day assessed.

## Ethics and compliance

Argus operates according to the best practices in the publishing field, and maintains thorough compliance procedures throughout the firm. We want to be seen as a preferred provider by our subscribers, who are held to equally high standards, while at the same time maintaining our editorial integrity and independence. Argus has a strict ethics policy that applies to all staff. The policy can be found on our website at [www.argusmedia.com](http://www.argusmedia.com).

Included in this policy are restrictions against staff trading in any energy commodity or energy related stocks, and guidelines for accepting gifts. Argus also has strict policies regarding central archiving of email and instant messenger communication, maintenance and archiving of notes, and archiving of spreadsheets and deal lists used in the forward curve generation process. 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).

## Review of methodology

The overriding objective of any methodology is to produce prices which are reliable and representative indicators of commodity market values and are free from distortion. As a result, Argus regularly examines our methodologies and is in regular dialogue with the industry in order to ensure that the methodologies are representative of the market being assessed.

In addition to this ongoing review of methodology, Argus conducts reviews of all of its methodologies and methodology documents on at least an annual basis.

Argus will periodically and as merited initiate reviews of market coverage based on a qualitative analysis that includes measurements of liquidity, visibility of market data, consistency of market data, quality of market data and industry usage of the resulting forward prices. Argus will review:

- Appropriateness of the methodology of existing forward curves
- Termination of existing forward curves
- Initiation of new forward curves

An informal process will be initiated to examine viability. This process includes:

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

Should changes, terminations, or initiations be merited, an internal proposal will be submitted to management for review and approval. Should changes or terminations of existing forward curves be approved, then formal procedures for external consultation are begun.

## Changes to methodology

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

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

Argus will provide sufficient opportunity for stakeholders to analyse and comment on changes, but will not allow the time needed to follow these procedures to create a situation wherein unrepresentative or false prices are published, markets are disrupted, or market participants are put at unnecessary risk.

Argus will engage with industry throughout this process in order to gain acceptance of proposed changes to methodology. Argus cannot however guarantee universal acceptance and will act for the good order of the market and ensure the continued integrity of its forward curves as an overriding objective.

Following the consultation period, Argus management will commence an internal review and decide on the methodology change. This will be followed by an announcement of the decision, which will be published to subscribers and include a date for implementation.

## Publishing schedule

Argus International Biofuels Forward Curves are published on weekdays, according to a publishing schedule that is available at [www.argusmedia.com](http://www.argusmedia.com).