METHODOLOGY AND SPECIFICATIONS GUIDE
EUROPEAN NATURAL GAS ASSESSMENTS AND INDICES

Latest update: December 2015

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INTRODUCTION

Platts methodology for assessing European gas markets has developed over a number of years. It draws on our experience in the global energy markets. Platts sets great importance on producing independent reports and assessments. The assessments we publish are not compiled in alliance with any other participant in the market.

Platts assessments are based on our own surveys of market participants completed by Platts price reporters each day. Assessments aim to reflect the fair, repeatable market value of the commodity at the close of normal business.

At the same time, Platts assessments seek to give priority to data that meets its editorial standards and aim to reflect realistic spreads between markets and products.

Platts seeks to survey as broad a cross-section of the market as possible. This can include canvassing brokers, traders, producers, distributors and end-users. Market players are contacted by phone, instant message or email. In addition, some companies email us trade and market information, which we would consider in conjunction with other information gathered. Platts may also observe activity on trading platforms such as broker screens. Platts welcomes information from all recognized market participants to contribute to its price assessments and would encourage those active in the market to contribute information on trading activity. Where possible we would encourage parties to submit trade or closing price information including time and volume size of deals and counterparty information.

Platts publishes its price assessment schedule on an annual basis on its website. The date and time of publication may be subject to change in the event of outside circumstances that affect Platts’ ability to adhere to its normal publication schedule. In the event that any such circumstance occurs, Platts will endeavor, whenever feasible, to communicate publicly any changes to its publication schedule and assessment periods, with as much advance notice as possible.

Platts MOC assessments

Platts market-on-close assessments reflect market value at the end of the normal trading cycle. For European gas we define this as:

UK day-ahead intra-day – From January 28 2014 at 11:00 London time, published within the trading day

UK day-ahead contracts – 16:30 London time.

Continental European day-ahead contracts – 16:30 London time.
(Time stamp change from 12:00 noon London time to 16:30 London time as of November 1, 2009.)

Continental European forward contracts – 16:30 London time.

UK forward contracts – 16:30 London time. (Time stamp change from 17:00 London time to 16:30 London time as of November 1, 2009).

The market-on-close assessment reflects the tradable value of the commodity at the given point in time, based on data that meets Platts editorial standards including repeatable trades, bids and offers, and other relevant information. It is based on information available at the time and editorial judgement may be applied. If there are no qualified trades in a product and no firm bids and offers in the market, we may look at spreads against other products or markets (e.g. Q2 versus Q3, Dutch gas versus German gas, Zeebrugge gas versus UK NBP gas, etc).

Platts monitors the market structure throughout the day to ensure that market-on-close business converges with prevailing market values at the stated assessment times.

Platts assessments of European gas prices reflect a gross calorific value, or higher heating value, basis.

Platts indices, midpoints AND ASSESSMENT RANGES

Effective July 1, 2015, Platts publishes a single midpoint value for each of its European natural gas assessments in European Gas Daily, on European Power Alert and in Natural Gas Alert. Platts continues to publish a low-high range around its midpoint assessments for European gas symbols introduced before July 2015 in Market Data categories EG and GF. The low and high reflect a fixed value either side of the midpoint. Effective July 1, 2015, low-high ranges are standardized as follows:

Primary assessments in Eur/MWh: plus/minus 5 euro cent for the most liquid continental European hubs. Applicable markets: Dutch TTF

Primary assessments in Eur/MWh: plus/minus 10 euro cent. Applicable markets: Austrian VTP, French PEG Nord, French PEG Sud/TRS, German GASPOOL, German NetConnect, Italian PSV.

Primary assessments in p/th: plus/minus 0.10 p/th. Applicable markets: Belgian Zeebrugge, UK NBP

Platts day-ahead NBP index and month-ahead NBP index correspond to the daily assessment midpoint. Prior to the addition of midpoint assessments on July 1, 2015, these data points were published in European Gas Daily. Effective July 1, 2015, midpoint assessments for UK NBP day-ahead and month-ahead are published in the day-ahead and month-ahead rows of the UK NBP assessments table in European Gas Daily. The day-ahead NBP index and month-ahead NBP index remain available on European Power Alert, Natural Gas Alert and in Platts Market Data.

Platts publishes a single assessment value for its Spanish natural gas assessments with no low-high range. The assessments were introduced on October 1, 2015.

The European Gas Midpoints table in European Gas Daily provides a snapshot of Platts European natural gas midpoint assessments of day-ahead and month-ahead contracts for the UK, Dutch, Belgian, French, German, Austrian and Italian markets. The table also includes Platts month-ahead assessment of the Spanish AOC, effective October 2015.
Bank holiday closing times

Ahead of certain UK Bank Holidays, such as Christmas Eve and New Year’s Eve, Platts assesses the MOC price earlier than normal, at 12:00 noon London time. This is to take account of typically much lower liquidity and the earlier end of trade.

Standard contract definitions

Platts assessments are based on standard contract definitions and volumes, as outlined in the following sections of this document. These vary according to market.

For UK and Zeebrugge gas markets, the standard prompt trade is 25,000-50,000 thd in 25,000 thd increments. The standard forward trade is 25,000 or 50,000 thd. For the Dutch Title Transfer Facility, the Italian Punto di Scambio Virtuale, the French Point d’Exchange de Gaz Nord and Sud/Trading Region South, the German NetConnect Germany and GASPOOL trading points, the Austrian VTP hub and the Spanish Almacenamiento Operativo Comercial (AOC), the standard lot size is 30 MW, with larger lot sizes in 30 MW increments common on the prompt.

Trades involving smaller or larger volumes may be considered for the purpose of determining Platts European gas assessments.

Confirmation of trades

Platts welcomes information from recognized market counterparties to inform its assessment process. We would encourage market parties to supply details of trades including the contract type, location, price, volume, timing of the trade, whether the trade was a buy or a sell, counterparty, broker and platform with each trade.

Platts does not currently compile any volume-weighted averages of trades for European gas.

Round trip/wash trades, spread trades

All trades discovered to be “round trip” or “wash” trades are excluded from all Platts assessments and indices.

Where a trade is concluded as one leg of a transaction linked to a similar trade in another product or market – spread or basis trades – it is the difference between the two products or markets, not the outright values, that is important. That basis spread (or differential) may be used in the assessment of the outright price level. Platts produces calculations of the day-ahead and month-ahead “basis” spread between the UK NBP and Zeebrugge gas markets.

Other non-standard transactions

Transactions known to be between affiliates, subsidiaries or otherwise related companies are also generally excluded from Platts assessments.

Transactions involving counterparties for whom trade with the majority of market participants is restricted would also be discounted. This is because the price tag on the deal may be inflated or depressed as a result of the special relationship between the companies involved.

When Platts assessments are published

Platts publishes a day-ahead assessment for the UK’s NBP Monday-Friday each week. This includes coverage of UK bank holidays. On Fridays the day-ahead price is for delivery on the Monday.

Platts publishes spot assessments for Zeebrugge, the Dutch Title Transfer Facility, the Punto di Scambio Virtuale, Point d’Exchange de Gaz Nord and Sud, GASPOOL and NetConnect Germany (formerly BEB and E.ON) facilities and for the Austrian Virtual Trading Point (including the Baumgarten hub), and forward assessments for the NBP, Zeebrugge, Dutch Title Transfer Facility, the Punto di Scambio Virtuale, the Point d’Exchange de Gaz Nord and Sud, the GASPOOL and NetConnect Germany facilities and for the Austrian VTP and Spanish AOC on all UK working days.

Platts publishes weekend assessments for NBP, Zeebrugge and the Dutch Title Transfer Facility on all UK working days. Platts publishes weekend assessments for the Punto di Scambio Virtuale, the Point d’Exchange de Gaz Nord and Sud, GASPOOL, NetConnect Germany and the Austrian VTP on Friday or on the last working day of the week in the event of a Friday UK public holiday.

Currency Conversions

Platts UK and Zeebrugge markets are originally assessed in pence per therm. Other markets are originally assessed in Euro per MWh. The original assessments are then converted into other currencies using the spot exchange rates published in that day’s issue of European Gas Daily. Effective June 2, 2014, the source of the foreign exchange data is Tullett Prebon and the timestamp is 16:00 London time.

Please note that until June 2014 exchange rates were published with a time lag, with the previous day’s exchange rate close used in calculations.

European Gas Daily: Monthly Averages

The monthly average prices shown in European Gas Daily: Monthly Averages are based on the monthly averages of day-ahead and month-ahead assessments made during the month in question.

Effective August 1, 2015, the day-ahead average is the flow-date average of spot prices assessed for the month and includes weekend and bank holiday delivery. To illustrate, a January 31 day-ahead assessment would not be included in the January average because the gas would flow February 1. Before August 2015, the day-ahead average published in European Gas Daily: Monthly Averages was the trade-date average.
The month-ahead average is the trade-date average of all month-ahead assessments during the month in question.

**Platts European Gas Daily:** Monthly Averages includes currency conversions to $ per 1,000 cubic meters. This is calculated by multiplying $ per MMBTu prices by 36.2. Please note that this is an indicative value. The exact conversion rate from a per unit energy price to a per unit volume price depends on the energy content of the gas in question.

Monthly averages, including day-ahead trade-date monthly averages, are also available on European Power Alert and in Platts Market Data category EG.

**PLATTS UK GAS MARKET COVERAGE**

The UK is home to Europe’s oldest spot gas market. Trading emerged at UK beach terminals—the place where gas shipped in from offshore fields comes ashore—in the early 1990s. In 1996 with the signing of the Network Code, trade concentrated on a notional “National Balancing Point.” The NBP contract has become the standard for UK gas trade and allows counterparties to trade gas on the same terms for delivery anywhere within the National Transmission System operated by UK gas pipeline company National Grid.

Trade at the UK’s two biggest beach terminals, St Fergus in Scotland and Bacton in East Anglia, at one end of the Belgium-UK Interconnector, is now very limited, while liquidity is firmly focused on the NBP. Platts therefore halted its assessments of gas delivered at St Fergus and Bacton as of November 10, 2008.

**Specifications**

**Delivery:** Platts quotes prices for firm, physical delivery in the UK at the notional “National Balancing Point” (NBP).

**Units:** All Platts UK gas assessment prices are in UK pence/therm, with equivalent prices provided in euro per megawatt hour, euro per gigajoule and US dollars per million British thermal units for easy comparison with continental European and global gas markets.

**Lot size:** Standard qualifying trades are 25,000-500,000 th/d in 25,000 th/d increments for prompt trade (within-day, day-ahead and weekend) and 25,000 or 50,000 th/d for forward trades. Trades involving smaller and larger volumes may be taken into account depending on other features of the trade.

**Timing**

Within-day = delivered within day of assessment/trade

Day-ahead = delivered next working day after assessment, (Friday’s assessment reflects Monday delivery, including bank holidays when the price will often be close to the weekend price, extra day-ahead prices are assessed ahead of bank holidays).

EFA Day-Ahead = The EFA day-ahead accounts for the difference between the start of the gas day and the start of the electricity day. The electricity day starts at 11pm. Up until September 30, 2015, the gas day start was 6am. Until September 29, 2015, the EFA day-ahead was calculated by adding 7/24ths of within-day to 17/24ths of day-ahead.

The gas day start changed to 5am on October 1, 2015. Due to the change, the gas day was only 23 hours long (6am-5am) on September 30, 2015. On this day, the EFA day-ahead was calculated by adding 7/23rds of within-day to 16/23rds of day-ahead.

From October 1 onwards the EFA day-ahead is calculated by adding 6/24ths of within-day to 18/24ths of day-ahead.

Weekend = delivered Saturday, Sunday

Week + 1 = delivered Monday-Friday of the front week

Balance of Month = delivery starting the next working day until the end of month. On the last day of the month balance of month = within day.

**PLATTS CONTINENTAL EUROPEAN GAS COVERAGE**

Platts launched coverage of the continental gas markets in August 1999, with assessments for the then-fledgling Belgian hub of Zeebrugge. As one end of the UK-Belgium Interconnector, the growth and features of the Zeebrugge market have—unsurprisingly—been dictated to a large extent by UK shippers. Zeebrugge gas typically trades in pence per therm, using the UK model, and will most often follow the NBP market at a premium or discount, depending on market conditions.

Platts Zeebrugge gas assessments currently reflect prices at the so-called “Zeebrugge beach” interconnection point, rather than the virtual Zeebrugge Trading Point launched by the Belgian network operator in late 2012. Dutch transporter Gasunie created a version of the national balancing point called the Title Transfer Facility. From January 5, 2004, Platts also assessed prices at this trading point.

Trading points elsewhere in continental Europe are developing as market and infrastructure conditions improve. Since June 18, 2007, Platts has been assessing prices at the Punto di Scambio Virtuale, the Point d’Exchange de Gaz (PEG Nord), the BEB and E.ON Ruhrgas facilities. From October 2009 BEB is renamed GASPOOL and E.ON Ruhrgas is renamed NetConnect Germany.

Platts added the Central European Gas Hub in Baumgarten, Austria, on December 1, 2009, after liquidity there became sufficient to support daily assessments. On April 6, 2010, separate assessments
were added for PEG Sud, France, for the same reason. PEG Sud assessments were renamed PEG Sud/TRS in March 2015.

Baumgarten is included within the Austrian Virtual Trading Point from January 2013. Platts month-ahead Austrian gas prices reflect VTP delivery from December 2012 while both day-ahead and month-ahead prices reflect VTP delivery from January 2013.

Platts added daily month-ahead assessments for the Spanish Almacenamiento Operativo Comercial (AOC) virtual hub on October 1, 2015.

Platts also added daily Spanish AOC/LNG differentials for the month-ahead on October 1, 2015.

Specifications

Zeebrugge

**Delivery:** Prices are for firm, physical delivery at the Zeebrugge beach hub operated by Huberator. This is not the same as the virtual Zeebrugge Trading Point launched in late 2012.

**Unit:** All prices are quoted in UK pence/therm, with equivalent prices provided in euro per megawatt hour, euro per gigajoule and US dollars per million British thermal units for easy comparison with continental European and global gas markets.

**Quality:** As defined by Belgian network operator Fluxys.

**Lot size:** Standard qualifying trades are 25,000-500,000 therms in 25,000 therms increments for prompt trade (within-day, day-ahead and weekend) and 25,000 or 50,000 therms for forward trades. Trades involving smaller and larger volumes may be taken into account depending on other features of the trade.

**Timing:** Day-ahead = delivered next working day after assessment, (Friday's assessment reflects Monday delivery)

Weekend = delivered Saturday, Sunday

Week + 1 = delivered Monday-Friday of the front week

Balance of Month = delivery starting the next working day until the end of month. On the last day of the month balance of month = within day.

**Months:** All months are calendar months

**Quarters:** Q1 = January to March, Q2 = April to June, Q3 = July to September, Q4 = October to December

**Seasons:** Winter = October to March, Summer = April to September

Gas year = October 1-September 30

_Dutch Title Transfer Facility (TTF)_

**Delivery:** Prices are for firm, physical delivery at the notional trading point, the Dutch Title Transfer Facility.

**Unit:** All prices are quoted in euro per megawatt hour with equivalent values given in pence/therm, euro per gigajoule and US dollars per million British thermal units for easy comparison with continental European and global gas markets.

**Quality:** Prices are typically for high cal gas. Other specs are as defined by the Dutch network operator, Gasunie.

**Lot size:** Standard qualifying trades are 30 MW for prompt (day-ahead and weekend) and forward trade. Trades involving smaller and larger volumes may be taken into account indirectly, depending on other features of the trade.

**Timing:** Day-ahead = delivered next working day after assessment, (Friday's assessment reflects Monday delivery)

Weekend = delivered Saturday, Sunday

Week + 1 = delivered Monday-Friday of the front week

**Months:** All months are calendar months

**Quarters:** Q1 = January to March, Q2 = April to June, Q3 = July to September, Q4 = October to December

**Seasons:** Winter = October to March, Summer = April to September

Gas year = October 1-September 30

Cal year = Calendar year

_Italian Punto di Scambio Virtuale (PSV)_

**Delivery:** Prices are for firm, physical delivery at the notional trading point, the Punto di Scambio Virtuale.

**Unit:** All prices are quoted in euro per megawatt hour with equivalent values given in pence/therm, euro per gigajoule and US dollars per million British thermal units for easy comparison with continental European and global gas markets.

**Quality:** Prices are typically for high cal gas. Other specs are as defined by the Italian network operator.

**Lot size:** Standard qualifying trades are 30 MW for prompt (day-ahead) and forward (month-ahead) trade. Trades involving smaller and larger volumes may be taken into account indirectly, depending on other features of the trade.

**Timing:** Day-ahead = delivered next working day after assessment, (Friday's assessment reflects Monday delivery)

Weekend = delivered Saturday, Sunday

Month = calendar month

Quarters: Q1 = January to March, Q2 = April to June, Q3 = July to
September, Q4 = October to December

**Seasons:** Winter = October to March, Summer = April to September

**French Point d’Exchange de Gaz Nord (PEG Nord)**

**Delivery:** Prices are for firm, physical delivery at the notional trading point, the Point d’Exchange de Gaz Nord.

**Unit:** All prices are quoted in euro per megawatt hour with equivalent values given in pence/therm, euro per gigajoule and US dollars per million British thermal units for easy comparison with continental European and global gas markets.

**Quality:** Prices are typically for high cal gas. Other specs are as defined by the French network operator.

**Lot size:** Standard qualifying trades are 30 MW for prompt (day-ahead) and forward (month-ahead) trade. Trades involving smaller and larger volumes may be taken into account indirectly, depending on other features of the trade.

**Timing:** Day-ahead = delivered next working day after assessment, (Friday’s assessment reflects Monday delivery)

Weekend = delivered Saturday, Sunday

Month = calendar month

**Quarters:** Q1 = January to March, Q2 = April to June, Q3 = July to September, Q4 = October to December

**Seasons:** Winter = October to March, Summer = April to September

**Cal year = Calendar year**

**French Point d’Exchange de Gaz Sud (PEG Sud)/Trading Region South (TRS)**

**Delivery:** Prices are for firm, physical delivery at the notional trading point, Trading Region South (TRS)*.

**Unit:** All prices are quoted in euro per megawatt hour with equivalent values given in pence/therm, euro per gigajoule and US dollars per million British thermal units for easy comparison with continental European and global gas markets.

**Quality:** Prices are typically for high cal gas. Other specs are as defined by the French network operator.

**Lot size:** Standard qualifying trades are 30 MW for prompt (day-ahead) and forward (month-ahead) trade. Trades involving smaller and larger volumes may be taken into account indirectly, depending on other features of the trade.

*Note: Platts renamed its day-ahead and weekend assessments for southern French gas as PEG Sud/TRS on March 31, 2015. Platts renamed its month-ahead assessments for southern French gas as PEG Sud/TRS on March 2, 2015. The name change reflects the implementation of the TRS common market area created by the combination of the former PEG Sud and TIGF hubs with effect from April 1, 2015.

**Timing:** Day-ahead = delivered next working day after assessment, (Friday’s assessment reflects Monday delivery)

Weekend = delivered Saturday, Sunday

Month = calendar month

**Quarters:** Q1 = January to March, Q2 = April to June, Q3 = July to September, Q4 = October to December

**Seasons:** Winter = October to March, Summer = April to September

**Cal year = Calendar year**

**German GASPOOL**

**Delivery:** Prices are for firm, physical delivery at the notional trading point, the GASPOOL hub. The GASPOOL area includes the former BEB price area, which merged with other market zones in October 2009.

**GASPOOL includes:** H-Gas Northern Germany, ONTRAS and WINGAS TRANSPORT market areas.

**Unit:** All prices are quoted in euro per megawatt hour with equivalent values given in pence/therm, euro per gigajoule and US dollars per million British thermal units for easy comparison with continental European and global gas markets.

**Quality:** Prices are typically for high cal gas. Other specs are as defined by the German network operator.

**Lot size:** Standard qualifying trades are 30 MW for prompt (day-ahead) and forward (month-ahead) trade. Trades involving smaller and larger volumes may be taken into account indirectly, depending on other features of the trade.

**Timing:** Day-ahead = delivered next working day after assessment, (Friday’s assessment reflects Monday delivery)

Weekend = delivered Saturday, Sunday

Month = calendar month

**Quarters:** Q1 = January to March, Q2 = April to June, Q3 = July to September, Q4 = October to December

**Seasons:** Winter = October to March, Summer = April to September

**Cal year = Calendar year**

**German NetConnect Germany**

**Delivery:** Prices are for firm, physical delivery at the notional trading point, the NetConnect Germany market. NetConnect Germany replaces the E.ON hub. It represents a merger of the E.ON Gastransport, bayernets, GRTgaz Deutschland, Eni Gas Transport Deutschland and GVS Netz market areas. The areas merged in October 2009.

**Unit:** All prices are quoted in euro per megawatt hour with equivalent
values given in pence/therm, euro per gigajoule and US dollars per million British thermal units for easy comparison with continental European and global gas markets.

**Quality:** Prices are typically for high cal gas. Other specs are as defined by the German network operator.

**Lot size:** Standard qualifying trades are 30 MW for prompt (day-ahead) and forward (month-ahead) trade. Trades involving smaller and larger volumes may be taken into account indirectly, depending on other features of the trade.

**Timing:** Day-ahead = delivered next working day after assessment, (Friday’s assessment reflects Monday delivery)

Weekend = delivered Saturday, Sunday

Month = calendar month

**Quarters:** Q1 = January to March, Q2 = April to June, Q3 = July to September, Q4 = October to December

**Seasons:** Winter = October to March, Summer = April to September

Cal year = Calendar year

**Austrian Virtual Trading Point (Baumgarten)**

**Delivery:** Prices are for firm, physical delivery at the notional trading point, the Central European Gas Hub (CEGH)’s Virtual Trading Point. This includes Baumgarten, Austria.

Platts Austrian month-ahead gas assessments from December 2012 reflect the Austrian VTP. Both day-ahead and month-ahead Austrian gas assessments reflect the VTP from January 2013 onwards, due to the inclusion from 2013 of the Baumgarten hub within the Austrian VTP trading point.

**Unit:** All prices are quoted in euro per megawatt hour with equivalent values given in pence/therm, euro per gigajoule and US dollars per million British thermal units for easy comparison with continental European and global gas markets.

**Quality:** Prices are typically for high cal gas. Other specs are as defined by the Austrian network operator.

**Lot size:** Standard qualifying trades are 30 MW for prompt (day-ahead) and forward (month-ahead) trade. Trades involving smaller and larger volumes may be taken into account indirectly, depending on other features of the trade.

**Timing:** Day-ahead = delivered next working day after assessment, (Friday’s assessment reflects Monday delivery)

Weekend = delivered Saturday, Sunday

Month = calendar month

**Spanish Almacenamiento Operativo Comercial (AOC)**

**Delivery:** Prices are for firm, physical delivery at the notional trading point, the Almacenamiento Operativo Comercial.

**Unit:** All prices are quoted in euro per megawatt hour with equivalent values given in pence/therm, euro per gigajoule and US dollars per million British thermal units for easy comparison with continental European and global gas markets.

**Quality:** Prices are typically for high cal gas. Other specs are as defined by the Spanish network operator.

**Lot size:** Standard qualifying trades are 30 MW for forward (month-ahead) trade. Trades involving smaller and larger volumes may be taken into account indirectly, depending on other features of the trade.

**Timing:** Month = calendar month

**AOC/LNG Differential**

The Spanish AOC/LNG price differential is calculated from the Platts East Atlantic Marker (EAM) converted to Eur/MWh minus Platts assessment of Spanish AOC gas in Eur/MWh.

The differential is converted to $/MMBtu, p/th and Eur/Gj.

The EAM is Platts daily LNG assessment of cargoes lifted Free On-Board (FOB) from production/reload ports across the East Atlantic.

Further information on the EAM is available in the Platts Liquefied Natural Gas Assessments and Netbacks methodology and specifications guide at [www.platts.com](http://www.platts.com).

**FLOW DATE PRICING**

Flow date prices store prompt gas prices against the day on which the gas is delivered to the purchaser, rather than on the day that the gas was traded. For example, the October 1 assessment of day-ahead gas trades that took place on that day would be databased against October 1 on a trade-date basis, but against October 2 on a flow-date basis.

Platts day-ahead flow date prices create a price point for every day of the year in a single continuous sequence by combining the day-ahead trade-date gas price assessment from Monday to Friday with the Friday assessment of the weekend price. Friday’s weekend price is used to provide the flow date price points for Saturday and Sunday. The flow date sequence also takes values from the additional day-ahead prices that are assessed ahead of UK bank holidays.

Flow date price history is available from May 31, 2014. Price history for the Zeebrugge day-ahead flow date is available from November 2, 2013, in the following units: p/th and Euro/MWh.
NW EUROPE OIL-INDEXED GAS PRICE INDICATOR (GCI)

The Platts NW Europe oil-indexed gas price indicator (GCI) is a gas price indicator, showing the out-turn price of a model oil-linked long-term NW Europe gas sales contract. This is calculated monthly for the current month, month ahead and month ahead +1. We publish daily in European Gas Daily and on European Power Alert (fixed pages EP870 and EP872) the differentials between this monthly number and our existing gas price assessments for the day-ahead, month ahead and month ahead +1 contracts at the UK NBP and Dutch TTF.

The monthly indicator price is calculated in Euro per MWh. Platts will also publish converted values in pence/therm and $/MMBtu using the respective GBP/Euro and US Dollar/Euro exchange rate of the day the monthly indicator is calculated.

The monthly indicator price, in Euro per MWh, is calculated according to a model long-term oil-indexed gas sales contract. Platts takes average low sulfur fuel oil and 0.1% gasoil prices for northwest Europe and converts these into a Euro per MWh price based on the average US dollar/Euro exchange rate over a six-month period and giving a 45% weighting to gasoil and a 55% weighting to fuel oil. After combining the gasoil and fuel oil prices, a fixed discount factor of 30% is applied in producing the gas price indicator to reflect the fact that sales contracts usually price gas below the straight oil-equivalent price.

Different companies may use different contract formulae and the indicator price is only a model of one potential contract arrangement that could be used in the industry. The model is based on the traditional contracts in use in past years, but does not include any additional discount factors to account for the recent contract renegotiations seen in the industry since the financial crisis of 2008. In recent years it has been reported that many importers have negotiated discounts against the traditional formula. The model is that any additional discount factors to account for the recent contract renegotiations seen in the industry since the financial crisis of 2008. In recent years it has been reported that many importers have negotiated discounts against the traditional formula.

Contracts used by industry normally have a six- to nine-month time lag. The Platts current month indicator is based on average prices for periods three to eight months ago. The forward month indicator is based on average prices for periods two to seven months ago. The forward month +1 indicator is based on average prices for periods one to six months ago.

For example, on October 1 the current month price would reflect average prices three to eight months ago, ie. gasoil and fuel oil prices during February to July. The two-months-ahead price would reflect two to seven months ago, ie. March to August. The two-months-ahead price would reflect one to six months ago, ie. April to September.

SPARK SPREADS

Platts spark spreads are indicative prices giving the average difference between the cost of gas and the equivalent price of electricity on any given day on a high heating value (HHV) basis.

A graph in European Gas Daily shows prices calculated for the UK, Benelux and German markets.

UK spark spreads are based on Platts NBP gas assessments and the equivalent UK electricity assessment. Belgian spark spreads are based on Zeebrugge gas assessments and equivalent Belgian power assessment. Dutch spark spreads are based on Dutch gas assessments and equivalent Dutch power assessment. German spark spreads are based on TTF gas assessments and equivalent German power assessments.

The graph shows 50% efficient clean spark spreads, accounting for the cost of emissions. Note: Until October 2014, UK gas and power contracts rolled at different times of the month. Prior to that, Platts took UK power conventions as the basis for its month-ahead spark spread contracts.

Platts also publishes spark spreads for the Italian and Turkish markets. The Italian spark spreads are based on Platts PSV gas assessments and equivalent Italian power assessment. The Turkish spark spreads are based on the indicative natural gas balance of month price (see sub-heading below) and Platts Turkish month-ahead baseload power assessment.

The source of all gas prices is European Power Alert and European Gas Daily with the exception of the indicative Turkish balance of month price. The source of all power prices is European Power Alert and European Power Daily.

Turkish Balance of Month indicative data

The Turkish Natural Gas Balance of Month data used to calculate Platts Turkish spark spreads reflects the price for industrial users posted on the web site of state gas importer and transit operator Botas, updated weekly. Platts applies a discount to the posted price, reflecting wholesale participants incentives to take, distribute and administer gas sales. The discount is monitored regularly and currently stands at 5%. Any change to the discount will be notified in Platts market commentary. The value is expressed in Turkish Lira per cubic meter (Lira/cu m). This value is the basis for the natural gas leg of the daily Turkish month-ahead spark spread published in Platts European Power Daily, and also features in $/MMBtu in Platts International Gas Report gas price snapshot. The data is indicative only, to enable data analysis.

COAL SWITCHING PRICE INDICATOR (CSPI)

Platts Coal Switching Price Indicator (CSPI) calculates the threshold at which gas prices are more competitive than coal prices as input fuel in power generation. When the gas price is higher than the CSPI, CCGT generation is more expensive than coal-fired generation and vice versa.

Platts CSPI data is quoted for the UK and the Netherlands and is expressed in Eur/MWh and for the UK only in p/therm.

Platts publishes CSPI data for the following delivery dates: first month ahead, first quarter ahead and the first calendar year ahead.
Platts CSI data is based on the Platts CIF ARA coal forward curve assessment that corresponds to each CSI delivery period and on Platts EU emissions Allowance assessments for December delivery.

For the UK CSI, Platts incorporates the cost of the UK government’s Carbon Price Support (CPS) levy at the confirmed rates of GBP9.55/mt from April 1, 2014 to March 31, 2015, GBP18.08/mt from April 1, 2015 to March 31, 2016 and GBP18.00/mt from April 1, 2016 to March 31, 2017. For the calendar year ahead UK CSI, a time-weighted average of the CPS will be used to reflect the presence of two confirmed UK CPS rates for any given calendar year.

For the Dutch CSI, Platts incorporates the cost of the Dutch coal tax at the confirmed rate of Eur14.40/mt for calendar year 2015. The 2015 rate was applied to Platts calculations with effect from December 16, 2014. A Eur0.00/mt rate for dates in 2016 was incorporated on September 7, 2015, reflecting government plans to introduce a tax exemption on coal-fired power plants with an efficiency of 38% or higher from 2016 and following Platts analysis of minimum operating efficiencies of the Dutch coal-fired power plant fleet.

Previous rates were Eur14.27/mt coal for calendar year 2014.

Platts calculates the CSI using the following carbon emission factors:

- **Natural Gas**: 0.18404 mtCO2/MWh
- **Coal**: 0.34056 mtCO2/MWh (thermal basis, before combustion).

Platts calculates the CSI using the following efficiencies:

- **UK CCGT**: 45% and 50% HHV
- **UK Coal**: 35% LHV
- **Dutch CCGT**: 45% and 50% HHV
- **Dutch Coal**: 40% LHV

The full CSI formula is as follows:

- **UK CSI/EUR (Eff = 50%, Eff = 45%) = Eff * [Coal_Price/35% + (EF_Coal/35% - EF_CCGT/Eff)* (EUA_Price + UK_CPS)]**

  - **Dutch CSI (Eff = 50%, Eff = 45%) = Eff * [Coal_Price/40% + (EF_Coal/40% - EF_CCGT/Eff)* (EUA_Price + Dutch_CT/40%)]**

**Formula Definitions:**

- **Coal_Price = Platts CIF ARA coal price assessment as quoted in USD/mt and converted into Eur/MWh**
- **EUA_Price = Platts EUA assessment as quoted in Eur/mt**
- **EF_CCGT = Emissions factor CCGT**
- **EF_Coal = Emissions factor coal**
- **UK_CPS = UK Carbon Price Support**
- **Dutch_CT = Dutch coal tax**
- **UK CSI/EUR = UK Coal Switching Price Indicator, quoted in Eur/MWh**
- **UK CSI_p = UK Coal Switching Price Indicator, quoted in p/therm**
- **Dutch CSI = Dutch Coal Switching Price Indicator, quoted in Eur/MWh**

**CROSS-FUEL COMPARISONS**

Platts cross-fuel comparisons are indicative prices of the costs of burning oil, gas and coal in power stations to produce a unit of electricity. In each case, the price of the fuel for spot and forward delivery is converted into an equivalent electricity price, quoted on European Power Alert page 503 in pence/therm, Eur/MWh, Eur/GJ and $/MMBtu and in European Gas Daily in pence/therm, Eur/MWh and $/MMBtu. The conversions assume the following plant efficiencies:

- **Natural Gas**: 50%, **Fuel Oil**: 32%, **Gasoil**: 32%, **Coal**: 35%.

**NOTE:** Cross-fuel comparisons were updated on December 16, 2014.

Previous plant efficiencies were: **Gas**: 55%, **Fuel Oil**: 32%, **Gasoil**: 32%, **Coal**: 34%.

**NOTE:** Platts began to publish cross-fuel comparisons in European Gas Daily in Eur/MWh from March 2, 2015.

**NOTE:** The cross-fuel comparisons table was updated on March 2, 2015 to incorporate Dutch TTF gas and German baseload electricity prices, providing cross-fuel comparisons data for the Continental European markets in addition to the UK.

**NOTE:** Cross-fuel comparisons data containing Gasoil 0.1% sulfur content and Fuel Oil 3.5% sulfur content were discontinued on March 2, 2015, in the table published in European Gas Daily and on October 15, 2015 for European Power Alert. Platts continues to publish cross-fuel comparisons data for Fuel Oil 1% in European Gas Daily and on European Power Alert.

**NOTE:** Platts began to publish cross-fuel comparisons in European Gas Daily in $/MMBtu from October 15, 2015. At the same time, Platts discontinued publishing the equivalent data in Eur/GJ in European Gas Daily. Cross-fuel comparisons data in Eur/GJ remains available on European Power Alert and in Platts Market Data.

The standard specifications and sources of each fuel type are as follows:

- **Natural Gas**
  - **Quality:** As specified by UK transporter National Grid.
  - **Volumes:** All prices are based on standard contract lot sizes defined in Platts European Natural Gas Methodology and Specifications Guide.
  - **Delivery:** All prices are for physical delivery at the UK’s National Balancing Point.
  - **Timing:** Balance month, one calendar month ahead, two calendar months ahead, and one quarter ahead.
Fuel Oil 1%

Fuel oil specifications can be found in Platts European Oil Products Methodology and Specification document:

http://www.platts.com/methodology-specifications

In the past, utility companies used to buy 3.5% sulfur cargoes for burning purposes, but limits endorsed by the EU on the sulfur content mean that utility grade trades on high sulfur are rare. Most utilities now use 1% sulfur max for burning purposes.

Source: European Gas Daily/European Power Alert/Natural Gas Alert.

Source: Platts Global Alert.

Coal

Delivery: Prices are based on cargoes delivered CIF Northwest Europe (Amsterdam-Rotterdam-Antwerp).

Coal specifications can be found in Platts Coal Methodology and Specification document:

http://www.platts.com/methodology-specifications

Source: Platts Coal Trader International/Platts Global Coal Alert

Electricity

Delivery: All prices are for physical delivery on the England, Wales and Scotland high voltage (380 kV) grids. Distribution costs are not included.

Timing: Prices are quoted for the month ahead, two months ahead and quarter ahead.

Volume: All prices are based on trades in a standard volume as defined in Platts European Electricity Methodology and Specifications Guide.

Source: Platts European Power Daily/Platts European Power Alert.
ABANDON—To allow an option to expire worthless

AMERICAN STYLE OPTION—An option which can be exercised by the buyer (holder) at any time during its life

ANTHRACITE—A hard, black coal with high energy content, often referred to as hard coal

ARBITRAGE—The simultaneous purchase of a commodity/derivative in one market and the sale of the same, or similar, commodity/derivative in another market in order to exploit price differentials

AT-THE-MONEY—An option whose exercise price is equal, or close to, the current price in the underlying market

BACKWARDATION—A market where the price for nearby delivery is higher than for forward forward months

BARREL—A volumetric unit of crude oil, equivalent to 42 US gallons

BASELOAD—The minimum amount of electric power delivered or required over a given period of time at a steady rate. The minimum continuous load or demand in a power system over a given period of time

BAUMGARTEN, Austria—the location of the Central European Gas Hub, commonly known simply as Baumgarten. Platts has covered assessments for the Baumgarten hub since December 1, 2009. From 2013 this is included in the Austrian Virtual Trading Point.

BBL—Balgzand-Bacton Line. Pipeline between the UK and the Netherlands, online in 2006.

Bcf—billion cubic feet

Bcm—billion cubic meters

BID PRICE—The price at which a buyer is prepared to buy

BITUMINOUS COAL—The most common coal, which is dense, black and has a moisture content of less than 20%. Used for generating electricity, making coke, and space heating

BRITISH THERMAL UNIT (Btu)—The amount of energy necessary to raise the temperature of one pound of water one degree Fahrenheit

BULLISH—Belief that a price is going to rise

CALL OPTION—An option that gives the buyer (holder) the right but not the obligation to buy a specified quantity of an underlying futures at a fixed price, on or before a specified date. The grantor of the option is obliged to deliver the future at the fixed price if the holder exercises the option

CAPACITY—The gas throughput rating of a pipeline or storage rating of a storage facility.

CASH MARKET—The physical market underlying a futures or options contract

CASH AND CARRY—An arbitrage transaction involving the simultaneous purchase of a cash commodity with borrowed money and the sale of the appropriate futures contract

CASH SETTLEMENT—The settlement of futures or options by paying a cash difference, rather than taking/making physical delivery

CEGH—Central European Gas Hub, commonly known simply as Baumgarten, where it is located, in Austria. Platts has covered assessments for the Baumgarten hub since December 1, 2009. From 2013 this is included in the Austrian Virtual Trading Point.

CLEARING—The process of matching trades, settling trades and provision of a guarantee for traded contracts, often a service performed by exchanges

CLEARING FEE—A fee charged by a clearing house for clearing trades

CLOSE OUT—Finalizing a transaction by making an equal and opposite trade to an open position

COGENERATION—The simultaneous production of both useable heat and steam electricity from a common fuel source

COMBINED CYCLE—The combination of one or more gas turbine and steam turbines in an electric generation plant. An electric generating technology in which electricity is produced from otherwise lost waste heat exiting from one or more gas (combustion) turbines. The heat is routed to a conventional boiler or to a heat recovery steam generator for use by a steam turbine in the production of electricity. This process increases the efficiency of the electric generating unit

CONNECTION—The physical junction between two gas systems permitting the transfer of gas

CONTANGO—Where the prompt price of a commodity/derivative is less than its price in further forward markets. Often described as the “healthy” state of commodities markets, except where seasonality is very strong

CONTI INDEX—Platts demand-weighted index of continental European power assessments

CONTRACT—A binding agreement between a buyer and a seller in a transaction

CONTRACT FOR DIFFERENCES (CFD)—A cash-settled futures contract between a supplier and buyer that is referenced to a
settlement price

CUBIC FEET/METERS PER SECOND—A measurement of gas or water flow representing one cubic foot of gas or water moving past a given point in one second

CURTAILABLE RATE—An option offered by utilities to customers who can accept specified amounts of service reduction in return for reduced gas supply

DELTA HEDGING—The process whereby the grantor of an option decides to buy or sell more or less of an underlying futures contract in order to protect against being declared upon by the options holder. If delta hedging, the grantor of a call option will buy more of the futures contract if it rises in value towards the strike price (as the probability of being declared upon rises towards 100%). The grantor of a put option will typically sell more of the underlying futures contract if it slides in value (as the probability of being declared upon rises towards 100%)

DELTA NEUTRAL—When the grantor of an option has balanced the probability of being declared upon through buying/selling the underlying futures contract

DEGREE DAY—A measure of seasonal variation and intensity of temperature. In residential customer load, the more negative degree days in a year than the norm, the higher the electricity/gas consumption.

DEMAND—The rate at which gas is delivered to or by a system at a given instant or averaged over a designated period, usually expressed in cubic meters, cubic feet or kilowatt hours

DEMAND SIDE MANAGEMENT (DSM)—All activities or programs undertaken by a gas system or consumers to influence the amount and timing of gas use

DISCOUNT—The amount by which a future or option is priced below its existing market value

DISTRIBUTION—The system of gas pipelines that connect between the transmission network and end customers. The transport of gas to ultimate use points such as homes and businesses

EFP—Exchange of futures for physical, refers to the exchange of a futures position for a physical (swap) position

E.ON RUHRGAS FACILITY (EGT)—Notional point within the German gas pipeline network. Part of the NetConnect Germany market zone since October 2009.

EXERCISE—The procedure by which an option holder takes up the rights to the contract and is delivered a long (call) or short (put) futures position by the grantor at a fixed price

EXIT FEE—A fee that is paid by a customer leaving a utility network intended to compensate the utility in whole or part for the loss of fixed cost contribution from the exiting customer

EXPIRY (OPTIONS)—The date by which an option holder must decide whether to exercise or abandon an option

FIRM ENERGY—Energy sales which, although not subject to interruption for economic purposes, may be interrupted under force majeure conditions

FIRM GAS—Gas sold on a continuous basis for a defined contract term

FORCE MAJEURE—A contractual provision which contemplates forgiveness of an obligation to perform due to uncontrollable events such as acts of God, war or forces of the elements that are out of the control of the parties

FUTURES CONTRACT—An agreement to make or take delivery of a commodity at a fixed date or strip of dates in the future, at a price agreed upon at the time of dealing

GASPOOL—A gas trading hub in Germany, which replaces the former BEB hub from October 2009. GASPOOL incorporates the BEB, WINGAS and ONTRAS trading points in Germany into a single hub.

GCI—Gas Contract Indicator. Platts calculates an oil-indexed Gas Contract Indicator price for Northwest Europe to show an indicative price that would be paid by a European consumer buying their gas under a long-term, oil-indexed gas sales contract.

GIGAWATT—One billion watts

GIGAWATT HOUR (GWh)—One billion watt-hours

GRID—The layout of an electrical transmission system or a synchronized transmission network or a gas mainline pipeline network

HEDGE—The reduction of risk by covering anticipated commitments at a fixed price in the future through a futures or options contract. Buyers and sellers can hedge

IBT—International Bacton Terminal. Point at which the UK-Belgium gas pipeline lands in the UK.

INTERCONNECTION—Facilities that connect two electricity or gas grids or control areas

INTERRUPTIBLE DEMAND—The amount of customer demand that, in accordance with contractual arrangements, can be interrupted by direct control of the system operator, remote tripping, or by action of the customer at the direct request of the system operator

INTERRUPTIBLE GAS—Gas sold to customers with a provision that permits curtailment or cessation of service at the discretion of the supplier or transporter

IN-THE-MONEY—An option which has intrinsic value. A put option is in-the-money when its strike price is above the value of the underlying futures contract. A call option is in-the-money when its strike price is below the value of the underlying futures contract
IZT—International Zeebrugge Terminal. Point at which UK-Belgium gas interconnector lands in Belgium.

INITIAL MARGIN—The returnable collateral required to establish an options position

INTRINSIC VALUE—The value to an option holder if (s)he were to exercise an option today

JOULES—A measure of energy equal to 1 watt second

KILOWATT (kW)—A unit of electricity equal to one thousand watts

KILOWATT-HOUR (kWh)—A unit of electricity equivalent to one kilowatt of power used for one hour. One kilowatt-hour is equal to 1,000 watt-hours. An average household will use between 800-1300 kWh/month

KILOWATT YEAR (kW-y)—A unit of electrical capacity equivalent to one kilowatt of power used for 8760 hours

LIGNITE—A brownish-black coal of low rank with high inherent moisture and volatile matter (used almost exclusively for electric power generation). It is also referred to as brown coal

LONG—When the holder of futures positions has contract to buy more than (s)he has contracted to sell

LONG-RUN MARGINAL COSTS—All costs associated with the lowest cost incremental unit including variable production costs and capital costs

MARGINAL COST PRICING—A system of pricing designed to ignore all costs except those associated with producing the next incremental unit of gas. Sometimes referred to as incremental cost pricing

MARK-TO-MARKET—To revalue futures/option positions using current market prices to determine profit/loss. The profit/loss can then be paid/collected daily (see variation margin)

MEGAWATT (MW)—A unit of electrical power equal to one million watts or one thousand kilowatts

MEGAWATT-HOUR (MWh)—One million watt-hours of electricity. A unit of electrical energy which equals one megawatt of power used for one hour

MMBtu—One million British thermal units

MMcf—One million cubic feet of natural gas

MUNICIPAL UTILITY—A utility owned and operated by a municipality or group of municipalities

NATURAL GAS—A naturally occurring mixture of hydrocarbon and non-hydrocarbon gases found in porous geological formations beneath the earth’s surface, often in association with crude. The principal constituent is methane

NETCONNECT GERMANY—A gas trading hub in Germany, that replaces the E.ON Ruhrgas (EGT) gas hub. From October 2009 it has incorporated the EGT, bayernets, GRTgaz Deutschland, Eni Gas Transport Deutschland and GVS Netz market areas.

NBP—National Balancing Point. A notional point within the UK gas pipeline network. Basis for most UK gas trades.

NETWORK—An interconnected system of gas transmission lines, compressors, gasification units etc connected together in such a way as to provide reliable transmission of gas

OFFER—An indication of willingness to sell a specified amount of a commodity at a specific price

OPEN INTEREST—The number of contracts left open in a market which need to be closed out or taken through to delivery

OPEN OUTCRY—A trading system in which members trade verbally on a trading floor

OUT-THE-MONEY—An option which has no intrinsic value. A put option is out-of-the-money when its strike price is below the value of the underlying futures contract. A call option is out-of-the-money when its strike price is above that of the underlying futures contract

PEAK LOAD—The maximum electrical load demand in a stated period of time. On a daily basis, peak loads occur at midmorning and/or in the early evening

PEAK LOAD PLANT—A plant usually housing low-efficiency, quick response steam units, gas turbines, diesels, or pumped-storage hydroelectric equipment normally used during the maximum load periods. Characterized by quick start times and generally high operating costs, but low capital costs

PEAKING CAPACITY—Capacity of generating equipment normally reserved for operation during the hours of highest daily, weekly, or seasonal loads.

PEG NORD, PEG SUD—Point d’Exchange de Gaz Nord and Point d’Exchange de Gaz Sud, notional points within the French gas pipeline network

PEP INDEX—Platts demand-weighted index of all European electricity assessments

PHYSICAL DELIVERY—The transfer of ownership of an underlying commodity between a buyer and seller to settle a futures contract following expiry

POSTAGE STAMP RATE—A rate for electric transmission that does not vary according to distance from the source of the power supply. So-called because postage stamps for letters are typically at a fixed price, regardless of destination, within the same country.

PREMIUM—The price paid by the option holder to the option grantor

PRICE CAP—A method of setting a utility distribution company’s rates
where a maximum allowable price level is established by regulators, flexibility in individual pricing is allowed, and where efficiency gains can be encouraged and captured by the company.

PSV—Punto di Scambio Virtuale. A notional point within the Italian gas pipeline network.

PUT OPTION—An option that gives the holder the right (but not the obligation) to sell a specified quantity of the underlying instrument at a fixed price, on or before a specified date. The grantor of the option has the obligation to take delivery of the underlying instrument if the option is exercised.

RALLY—A rapid rise in a price.

RENEWABLE SOURCE—A power source that is continuously or cyclically renewed by nature like solar, wind, hydroelectric, geothermal or biomass.

ROLL OVER—The transfer of a position from one futures period to another—involving the purchase (sale) of the nearby month and simultaneous sale (purchase) of a further-forward month.

SETTLEMENT PRICE—A price established at the close of a trading day used to calculate the settlement of futures contracts.

SHORT—When the holder of a futures position has contracted to sell more than (s)he has contracted to buy.

SPOT MARKET—A market where goods are traded through rapid negotiation. Opposite of long-term contracting.

SPREAD—The differential between two futures periods, or the difference between bids and offers for a specific period.

SPREAD (OPTIONS)—An option trade in which two or more open positions are established in order to trade the differentials and offset risk. Option spreads may use different strike prices and/or expiry dates.

STRIKE PRICE—The price at which an option holder has the right to buy or sell an underlying commodity/derivative.

SYSTEM OPERATOR—A person or entity who operates the gas system.

TARIFF—Rates a regulated entity will charge to provide service to its customers as well as the terms and conditions that it will follow in providing service.

TERAWATT HOURS (TWh)—Thousand Gigawatt hours.

THERMAL GENERATION—The production of electricity from plants that convert heat energy into electrical energy. The heat in thermal plants can be produced from a number of sources such as coal, oil, gas or nuclear fuel.

TIERED RATES—A rate design which divides customer use into different tiers, or blocks, with different prices charged for each.

TIME VALUE—The time component in a premium for an option. Typically the time value of an option declines as it moves closer to expiry.

TRANSMISSION—The network of pipelines used to move gas from generators to the distribution system. Also used to interconnect different utility systems into a synchronized network. Transmission is considered to end when the energy is transformed for distribution to the consumer.

TRANSMISSION LOSS—The gas lost in transmission between one point and another. It is measured as the difference between the net gas passing the first point and the net gas passing the second point.

TTF—Title Transfer Facility. A notional point within the Dutch gas pipeline network.

TURBINE—The part of a generating unit usually consisting of a series of curved vanes or blades on a central spindle, which is spun by the force of water, steam or hot gas to drive an electricity generator.

UNCOVERED POSITION (FUTURES)—Where a long market player has bought more of a commodity than he has agreed to sell, or where a short market player has sold more of a commodity than (s)he has to deliver.

UNCOVERED POSITION (OPTIONS)—When the grantor of an options position has no cover in the underlying futures market against a price swing in the holder’s favor (see delta hedging).

VAR—Voltage-Ampere-Reactive. A measure of reactive power.

VARIABLE COSTS—The total costs incurred to produce energy, excluding fixed costs which are incurred regardless of whether the resource is operating. Variable costs usually include fuel, increased maintenance and additional labor.

VARIATION MARGIN—Profits and losses on open positions which are calculated daily by the mark-to-market process, which are then paid or collected daily.

VOLATILITY (HISTORICAL VOLATILITY)—The degree to which a particular price has fluctuated in the past.

VOLATILITY (OPTIONS)—A value attributed to an underlying futures contract which determines the premium that is set by the grantor. Includes an element of historical volatility, and the volatility which the grantor of an option believes will still be seen in that futures contract.

WATT—A measure of real power production or usage equal to one Joule per second. The rate of energy transfer equivalent to 1 ampere flowing under a pressure of 1 volt.

WATT HOUR (Wh)—An electrical energy unit of measure equal to 1 watt of power supplied to, or taken from, an electricity circuit steadily for 1 hour.