



# European Daily Electricity Markets Methodology

August 2013



## Introduction

ICIS publishes European Daily Electricity Markets (EDEM) on every working day (in England and Wales) of the year. EDEM assesses and records prices and market activity on the liquid markets in Europe, including but not limited to:

- UK
- Germany
- France
- Czech Republic
- Hungary
- Poland
- Romania
- Serbia
- Spain
- The Netherlands
- Italy
- Turkey
- Bulgaria
- Greece

The financial value of electricity is established by two methods:

1. Price Assessments. ICIS assesses the market closing prices for a range of European power hubs on the day of publication, and publishes a price range for each delivery period on a number of liquid markets. This is known as the BID-OFFER RANGE, representing the highest buyer's bid and the lowest seller's offer at the relevant close of each market.

2. Indexation (Heren Index). Indices are published for a variety of delivery periods and delivery points. Each Heren Index is a transaction-based price, calculated using the volume-weighted average of eligible transactions (trades) for the relevant delivery period reliably reported to ICIS.

More precise details of ICIS price assessments and Heren Indices, together with further information about our service, will be found below.

## EDEM Price Assessments

### General Definitions

Certain key criteria apply to all of EDEM's daily price assessments. The European wholesale electricity markets (variously defined as over-the-counter markets) are assessed each working day during the period 13:00 to 18:00 London time (varying by country and market), when ICIS contacts a wide range of active market participants by telephone.

ICIS price assessments published and start dates	
Country	Start date
UK	7 Apr 1997
German	9 Aug 1999
Spanish (weekly from 7 Feb 2003)	2 Jan 2001
Dutch(weekly from 7 Feb 2003)	9 Jan 2001
French	11 Jul 2001
Czech	22 Aug 2006
Italian	7 Jun 2007
Polish	19 Apr 2010
Hungarian	19 Apr 2010
Romanian	19 Apr 2010
Serbian	19 Apr 2010
Turkish	3 Mar 2011
Bulgaria (weekly from 5 Apr 2012)	5 Apr 2012
Greek (weekly from 5 Apr 2012)	5 Apr 2012
Slovak (weekly from 20 May 2008, ended 13 April 2010)	20 May 2008

Price assessments published in EDEM are formulated by ICIS at the conclusion of this process and represent ICIS close-of-day bid-offer ranges for electricity delivered at a number of hubs in the time ranges specified in the table. They are not based on deals done during the day (listed separately in EDEM).

"Bid" is deemed to be the highest price bid by buyers at the close of business on the trading day in question.

"Offer" is deemed to be the lowest price offered by sellers at the close of business on the trading day in question.

Baseload prices quoted are for power delivered at a flat rate throughout the specified delivery period. Peak prices quoted are for power delivered during the peak period of working days (generally approximately 07:00-19:00 but varying

according to individual market) and do not include Weekend delivery. Prices quoted as extended peaks are differentiated from the peak loadshape in use elsewhere in a region, for example, Poland.

An asterisk (\*) on the price assessment indicates an indicative bid and offer, either because there was no firm quote at the close of the market, or the bid/offer spread was wider than £1/MWh or €1/MWh, or there was no consensus on the bid/offer spread among market sources.

## Periods

**Day-ahead:** Day-ahead prices are for power to be delivered for the next working day (in England and Wales) following the date of the report. Thus, in a report published on Friday, the Day-ahead quote would apply to the following Monday, unless this was a public holiday in England and Wales.

Any UK public holiday will be treated as a single trading day on all markets and will be assessed as a separate period in the price assessment table. A separate index will also be calculated for that UK public holiday. This is for the purpose of continuity in our price series and is based on close analysis of trading patterns over UK public holidays.

**Weekend:** Weekend prices are for the first Saturday and Sunday following the date of the report.

**Week-ahead:** Week-ahead prices are for power to be delivered each day Monday to Sunday the following week for Baseload and each day Monday to Friday for Peakload.

**Months:** Each month quoted represents power to be delivered on each day of the calendar month. The exception to this rule is the UK market, which follows EFA month patterns rather than calendar months (the calendar can be viewed at [https://www.theice.com/publicdocs/EFA\\_Calendar.pdf](https://www.theice.com/publicdocs/EFA_Calendar.pdf)).

**Quarters:** The quarters are three-month periods beginning on 1 January (Q1), 1 April (Q2), 1 July (Q3) and 1 October (Q4). Each represents power to be delivered on each day of the quarter. The UK market quarters follow the EFA quarter patterns as above.

**Seasons:** The seasons are six-month periods beginning on 1 April (Summer) and 1 October (Winter). The exceptions to this rule are the UK market, which follows EFA month patterns rather than calendar months as above.

**Years:** EDEM price assessment yearly quotes are for calendar years unless otherwise stated. Each assessment listed represents electricity to be delivered on each day of the 12-month period. April Annual refers to electricity supplied for a year from the beginning of April (not necessarily 1 April in the UK, see above) of a particular year while October Annual refers to electricity supplied for a year from the beginning of October (not necessarily 1 October in the UK).

Extended Peaks Load Shapes			
Country	Hours	Days	Notes
Czech, Slovak and Hungarian	06-22	Mon-Fri	Includes public holidays
Polish	07-22	Mon-Fri	Excludes public holidays
Romanian	07-23	Mon-Fri	Includes public holidays
Serbian	06-22	Mon-Fri	Includes public holidays

## UK OTC power price assessments

The UK physical power market (variously defined as the spot or over-the-counter market) is assessed each working day during the period 16:00 to 18:00 London time, when ICIS contacts by telephone a wide range of active market participants.

Price assessments published in the UK OTC POWER PRICE ASSESSMENTS table are formulated by ICIS at the conclusion of this process and represent ICIS close-of-day bid-offer ranges for power delivered under Grid Trade Master Agreement (GTMA) terms. They are not based on deals done during the day (listed separately in EDEM).

**Load Shapes:** Daily power traded on the UK market is by custom split into six four-hour Week Day (WD) or Weekend (WE) periods. The periods are laid out as indicated in table above.

Baseload prices quoted are for power delivered at a flat Rate throughout the specified delivery period 23:00 to 23:00, ie WD 1-6 and WE 1-6 (if the period traded includes a weekend).

In the context of the UK market, Peak prices quoted are for power delivered during the peak period of working days (07:00-19:00), ie WD 3, 4 & 5, and do not include Weekend delivery, ie Winter Peaks includes WD 3-5 but NOT WD 1, 2 & 6 and NOT WE 1-6. Off-peaks refers to WD 1, 2 & 6 and WE 1-6 (if the period traded includes a weekend).

Various other non-standard load shapes are traded on the UK power market. Where these are reported in EDEM, EDEM will provide a definition based on the WD/WE periods they comprise.

Trading periods on the UK power market do not follow the standard calendar format but instead are based on the EFA (Electricity Forwards Agreement) calendar (the calendar can be viewed at [https://www.theice.com/publicdocs/EFA\\_Calendar.pdf](https://www.theice.com/publicdocs/EFA_Calendar.pdf)).

### **German price assessments**

The German electricity market is assessed each working day during the period 14:00 to 17:00 London time. Baseload prices quoted are for power delivered at a flat rate throughout the specified delivery period 00:00-24:00. Peak prices quoted are for power delivered during the peak period of working days (08:00-20:00) and do not include Weekend delivery.

### **French price assessments**

The French electricity market is assessed each working day during the period 14:00 to 17:00 London time. Baseload prices quoted are for power delivered at a flat rate throughout the specified delivery period 00:00-24:00. Peak prices quoted are for power delivered during the peak period of working days (08:00-20:00) and do not include Weekend delivery.

### **Dutch price assessments**

The Dutch electricity market is assessed every Friday during the period 14:00 to 17:00 London time. Baseload prices

quoted are for power delivered at a flat rate throughout the specified delivery period 00:00-24:00. Peak prices quoted are for power delivered during the peak period of working days (07:00-23:00) and do not include Weekend delivery.

### **Spanish price assessments**

The Spanish electricity market is assessed every Wednesday during the period 14:00 to 17:00 London time. Baseload prices quoted are for power delivered at a flat rate throughout the specified delivery period 00:00-24:00.

### **Czech price assessments**

The Czech electricity market is assessed each working day during the period 14:00 to 17:00 London time. Baseload prices quoted are for power delivered at a flat rate throughout the specified delivery period 00:00-24:00. Peak prices quoted are for power delivered during the peak period of working days (08:00-20:00) and do not include Weekend delivery. Extended peaks prices are for power delivered during 06:00-22:00.

### **Hungarian price assessments**

The Hungarian electricity market is assessed each working day during the period 14:00 to 17:00 London time. Baseload prices quoted are for power delivered at a flat rate throughout the specified delivery period 00:00-24:00. Peak prices quoted are for power delivered during the peak period of working days (08:00-20:00) and do not include Weekend delivery. Extended peaks prices are for power delivered during 06:00-22:00.

### **Polish price assessments**

The Polish electricity market is assessed each working day during the period 13:00 to 17:00 London time. Baseload prices quoted are for power delivered at a flat rate throughout the specified delivery period 00:00-24:00. Extended peaks prices quoted are for power delivered during the peak period of working days (07:00-22:00) and do not include Weekend delivery or Polish public holidays.

## Romanian price assessments

The Romanian electricity market is assessed each working day during the period 13:00 to 17:00 London time. Baseload prices quoted are for power delivered at a flat rate throughout the specified delivery period 00:00-24:00. Extended peaks prices quoted are for power delivered during the peak period of working days (07:00-22:00) and do not include Weekend delivery.

## Serbian price assessments

The Serbian electricity market is assessed each working day during the period 13:00 to 17:00 London time. Baseload prices quoted are for power delivered at a flat rate throughout the specified delivery period 00:00-24:00. Peak prices quoted are for power delivered during the peak period of working days (08:00-20:00) and do not include Weekend delivery. Extended peaks prices are for power delivered during 06:00-22:00.

## CEE/SEE regional baseload spreads

The Regional baseload spreads show price differentials between the named markets for key contracts. These differentials are based on price assessments, and reflect the premium of the first-named market to the second-named market. If the first-named market is assessed below the second-named, the spread will be negative.

Where price assessments are made in a currency other than euros, the assessment is converted to euros using the daily currency exchange rates for the delivery period – ie, a forward exchange rate rather than a spot rate.

## Italian price assessments

The Italian electricity market is assessed each working day during the period 14:00 to 17:00 London time. Baseload prices quoted are for power delivered at a flat rate throughout the specified delivery period 00:00-24:00. Peak prices quoted are for power delivered during the peak period of working days (08:00-20:00) and do not include Weekend delivery.

## Turkish price assessments

The Turkish electricity market is assessed each working day during the period 13:00 to 17:00 London time. If Thursday falls on a UK public holiday, the market will be assessed the UK working day before.

Baseload prices quoted are for power delivered at a flat rate throughout the specified delivery period 00:00-24:00.

The Rolling front year contract has a delivery period for the next year, beginning on the first calendar day of the month ahead of the publication date.

## Bulgarian price assessments

The Bulgarian electricity market is assessed every week over the Thursday working day. If Thursday falls on a UK public holiday, the market will be assessed the UK working day before.

Baseload prices quoted are for power export only, at a flat rate throughout the specified delivery period 00:00-24:00, and include export fees.

The spread to Turkey is calculated by subtracting the midpoint of the Turkish front-month Baseload price assessment in €/MWh from the midpoint of the Bulgarian front-month Baseload price assessment.

## Greek price assessments

The Greek electricity market is assessed every week over the Thursday working day. If Thursday falls on a UK public holiday, the market will be assessed the UK working day before.

Baseload prices quoted are for power delivered at a flat rate throughout the specified delivery period 00:00-24:00.

The spread to Turkey is calculated by subtracting the midpoint of the Turkish front-month Baseload price assessment in €/MWh from the midpoint of the Greek front-month Baseload price assessment.

## Heren Indices - General Definitions

ICIS' various market indices share a number of common characteristics, regardless of market or time period. They are all volume-weighted averages of trades reported to ICIS during the course of its market reporting activities. All of the trades on which the indices are based are published in EDEM on a daily basis in the tables of trades reported. This information is subject to EDEM's usual tests of reliability:

1. Confirmation is sought from both parties to the deal.
2. If, as is often the case, both counter-parties are unwilling to confirm, confirmation is accepted from one side only. However, corroboration is also sought from other market participants.
3. If no confirmation is available, the deal may still be included if it is accepted by the wider market, and if EDEM itself regards it as reliable.
4. In addition to price and volume, which are essential for inclusion in the Index, EDEM ensures that deals included in the Index are stand-alone deals.
5. In the event that reported trades fall noticeably above or below the traded range for that contract on a given day, and in the absence of any reasonable explanation, EDEM would discard the deal or deals. Deals would be liable for rejection if they were 1% above or below the highest or lowest deals reported to EDEM on that day. Evidence of the traded range given by market participants during the market reporting process would also be taken into account when assessing whether to include or discard a deal. Any discarded deals would not be entered into the ICIS database and would not appear in the reported deals tables in EDEM. They would therefore also be excluded from any Heren Index.
6. Each daily Index requires a minimum of three transactions. On days when there are fewer than three eligible transactions for an Index, that Index is published as the midpoint of the bid/offer spread published in EDEM's OTC power price assessment table.

Heren Indices published and start dates	
<b>Day-ahead indices</b>	
UK Day-ahead	18 Aug 2000
German Day-ahead	1 Feb 2002
French Day-ahead	30 Apr 2007
Czech Day-ahead	11 Apr 2007
Hungarian Day-ahead	19 Apr 2010
<b>Day-ahead Peak Indices</b>	
UK	17 Jan 2011
German	17 Jan 2011
French	17 Jan 2011
Czech	17 Jan 2011
Hungarian	17 Jan 2011
<b>Weekend Indices</b>	
UK	5 Jan 2001
German	3 May 2002
French	4 May 2007
Czech	13 Apr 2007
Hungarian	19 Apr 2010
<b>Monthly Indices</b>	
UK	1 Feb 1999
German	1 Jul 2001
French	1 Aug 2001
Czech	1 Jun 2007
Hungarian	1 Apr 2010
Polish	1 Apr 2010
Italian	1 Jan 2011

### The UK electricity Heren daily index

The UK Electricity Heren Day-ahead Index values Baseload electricity traded for the next working day and is published by ICIS each working day in EDEM.

The Index day is the first working day following the date of publication. Thus, the Index published on 27 March values Baseload power traded on 27 March for delivery on 28 March. The Day-ahead Index published on a Friday values power to be delivered on Monday, or on Tuesday when the Monday is a public holiday in England and Wales. Separate holiday indices will be calculated for English and Welsh public holidays.

Expressed in pounds per megawatt hour (£/MWh), the index is derived from actual transactions for Baseload electricity for the Day-ahead period. The Index is the volume-weighted average of transaction prices.

### **The UK electricity Heren daily peaks index**

The UK Electricity Heren Day-ahead Peaks Index values Peakload electricity traded for the next working day and is published by ICIS each working day in EDEM.

The Index day is the first working day following the date of publication. Thus, the Index published on 27 March values Peakload power traded on 27 March for delivery on 28 March. The Day-ahead Peaks Index published on a Friday values power to be delivered on Monday, or on Tuesday when the Monday is a public holiday in England and Wales. Separate holiday indices will be calculated for English and Welsh public holidays.

Expressed in pounds per megawatt hour (£/MWh), the index is derived from actual transactions for Peakload electricity (WD 3, 4 & 5) for the Day-ahead period. The Index is the volume-weighted average of transaction prices.

### **The UK electricity Heren weekend index**

The UK Electricity Heren Weekend Index is published by ICIS every Friday (or the final working day of the week when Friday is a public holiday) in EDEM.

The Weekend Index is a volume-weighted average of deal prices for electricity to be delivered for the forthcoming weekend. It values power traded for the forthcoming weekend period over the immediately preceding working days. Thus, the Index published on, for example, Friday 6 April values power traded on 2-6 April for delivery on 7-8 April. It is published on the working day immediately prior to the Weekend period.

Because the 'Weekend' period is generally interpreted within the UK power market as referring purely to Saturday and Sunday and not including any contiguous public holidays, Heren's Weekend Index is based purely on Saturday and Sunday deals. EDEM will include separate Indices for any public holidays that are contiguous with the weekend.

Expressed in £/MWh, the index is derived from actual transactions for baseload electricity for the Weekend period.

The Index is the volume-weighted average of transaction prices.

### **The UK electricity Heren monthly index**

The UK Electricity Heren Monthly Index is a monthly index of value for electricity traded under GTMA terms and is published by ICIS each working day in EDEM.

Expressed in £/MWh, the index is derived from actual transactions for Baseload electricity for the month in question (Index Month). The Index is the volume-weighted average of transaction prices.

The transactions on which the Index is based are those which took place in the EFA month preceding the Index Month. Thus, for the July Index, only entire July deals which took place in the June EFA period were eligible.

### **The German electricity Heren daily index**

The German Electricity Heren Day-ahead Index values Baseload electricity traded for the next working day in England and Wales, where the market is assessed, and is published by ICIS each working day in EDEM. Separate holiday indices will be calculated for English and Welsh public holidays.

The Index day is the first working day following the date of publication. Thus, the Index published on 27 January values Baseload power traded on 27 January for delivery on 28 January. The Day-ahead Index published on a Friday values power to be delivered on Monday, or on Tuesday when the Monday is a public holiday in England and Wales.

The Day-ahead Index is a volume-weighted average of transaction prices for electricity to be delivered in Germany. Expressed in €/MWh, the index is derived from actual transactions for Baseload electricity for the Day-ahead period. The Index is the volume-weighted average of transaction prices.

### **The German electricity Heren daily peaks index**

The German Electricity Heren Day-ahead Peaks Index values Peakload electricity traded for the next working day in England and Wales, where the market is assessed, and is published by ICIS each working day in EDEM. Separate holiday indices will be calculated for English and Welsh public holidays.

The Index day is the first working day following the date of publication. Thus, the Index published on 27 January values Peakload power traded on 27 January for delivery on 28 January. The Day-ahead Index published on a Friday values power to be delivered on Monday, or on Tuesday when the Monday is a public holiday in England and Wales.

The Day-ahead Index is a volume-weighted average of transaction prices for Peakload (hours 8-20) electricity to be delivered in Germany. Expressed in €/MWh, the index is derived from actual transactions for Peakload electricity for the Day-ahead period. The Index is the volume-weighted average of transaction prices.

### **The German electricity Heren weekend index**

The German Electricity Heren Weekend Index is published by ICIS every Friday (or the final working day of the week when Friday is a public holiday) in EDEM.

The Weekend Index is a volume-weighted average of deal prices for electricity to be delivered for the forthcoming weekend. It values power traded for the forthcoming weekend period over the immediately preceding working days. Thus, the Index published on, for example, Friday 6 April values power traded on 2-6 April for delivery on 7-8 April. It is published on the working day immediately prior to the Weekend period.

Because the 'Weekend' period is generally interpreted within the German power market as referring purely to Saturday and Sunday and not including any contiguous public holidays, Heren's Weekend Index is based purely on Saturday and Sunday deals. EDEM will include separate Indices for any public holidays that are contiguous with the weekend.

Expressed in €/MWh, the index is derived from actual transactions for baseload electricity for the Weekend period. The Index is the volume-weighted average of transaction prices.

### **The German electricity Heren monthly index**

The German Electricity Heren Monthly Index is a monthly index of value for electricity traded on a month-ahead basis and is published by ICIS each working day in EDEM.

Expressed in €/MWh, the index is derived from actual transactions for baseload electricity for the month in question (Index Month). The Index is the volume-weighted average of transaction prices.

The transactions on which the Index is based are those which took place in the month preceding the Index Month. Thus, for the July Index, only entire July Baseload deals which took place in the June period are eligible.

### **The French electricity Heren daily index**

The French Electricity Heren Day-ahead Index values Baseload electricity traded for the next working day in England and Wales, where the market is assessed, and is published by ICIS each working day in EDEM. Separate holiday indices will be calculated for English and Welsh public holidays.

The Index day is the first working day following the date of publication. Thus, the Index published on 27 January values Baseload power traded on 27 January for delivery on 28 January. The Day-ahead Index published on a Friday values power to be delivered on Monday, or on Tuesday when the Monday is a public holiday in England and Wales.

The Day-ahead Index is a volume-weighted average of transaction prices for electricity to be delivered in France. Expressed in €/MWh, the index is derived from actual transactions for Baseload electricity for the Day-ahead period. The Index is the volume-weighted average of transaction prices.

### **The French electricity Heren daily peaks index**

The French Electricity Heren Day-ahead Peaks Index values Peakload electricity traded for the next working day in England and Wales, where the market is assessed, and is published by ICIS each working day in EDEM. Separate holiday indices will be calculated for English and Welsh public holidays.

The Index day is the first working day following the date of publication. Thus, the Index published on 27 January values Peakload power traded on 27 January for delivery on 28 January. The Day-ahead Index published on a Friday values power to be delivered on Monday, or on Tuesday when the Monday is a public holiday in England and Wales.

The Day-ahead Index is a volume-weighted average of transaction prices for Peakload (hours 8-20) electricity to be delivered in France. Expressed in €/MWh, the index is derived from actual transactions for Peakload electricity for the Day-ahead period. The Index is the volume-weighted average of transaction prices.

### **The French electricity Heren weekend index**

The French Electricity Heren Weekend Index is published by ICIS every Friday (or final working day of the week when Friday is a public holiday) in EDEM.

The Weekend Index is a volume-weighted average of deal prices for electricity to be delivered for the forthcoming weekend. It values power traded for the forthcoming weekend period over the immediately preceding working days. Thus, the Index published on, for example, Friday 6 April values power traded on 2-6 April for delivery on 7-8 April. It is published on the working day immediately prior to the Weekend period.

Because the 'Weekend' period is generally interpreted within the French power market as referring purely to Saturday and Sunday and not including any contiguous public holidays, Heren's Weekend Index is based purely on Saturday and Sunday deals. EDEM will include separate Indices for any public holidays that are contiguous with the weekend.

Expressed in €/MWh, the index is derived from actual transactions for baseload electricity for the Weekend period. The Index is the volume-weighted average of transaction prices.

### **The French electricity Heren monthly index**

The French Electricity Heren Monthly Index is a monthly index of value for electricity traded on a month-ahead basis and is published by ICIS each working day in EDEM.

Expressed in €/MWh, the index is derived from actual transactions for baseload electricity for the month in question (Index Month). The Index is the volume-weighted average of transaction prices.

The transactions on which the Index is based are those that took place in the month preceding the Index Month. Thus, for the July Index, only entire July Baseload deals that took place in the June period are eligible.

### **The Czech electricity Heren daily index**

The Czech Electricity Heren Day-ahead Index values Baseload electricity traded for the next working day in England and Wales, where the market is assessed, and is published by ICIS each working day in EDEM. Separate holiday indices will be calculated for English and Welsh public holidays.

The Index day is the first working day following the date of publication. Thus, the Index published on 27 January values Baseload power traded on 27 January for delivery on 28 January. The Day-ahead Index published on a Friday values power to be delivered on Monday, or on Tuesday when the Monday is a public holiday in England and Wales.

The Day-ahead Index is a volume-weighted average of transaction prices for electricity to be delivered in the Czech Republic. Expressed in €/MWh, the index is derived from actual transactions for Baseload electricity for the Day-ahead period. The Index is the volume-weighted average of transaction prices.

### **The Czech electricity Heren daily peaks index**

The Czech Electricity Heren Day-ahead Peaks Index values Peakload electricity traded for the next working day in England and Wales, where the market is assessed, and is published by ICIS each working day in EDEM. Separate holiday indices will be calculated for English and Welsh public holidays.

The Index day is the first working day following the date of publication. Thus, the Index published on 27 January values Peakload power traded on 27 January for delivery on 28 January. The Day-ahead Index published on a Friday values

power to be delivered on Monday, or on Tuesday when the Monday is a public holiday in England and Wales.

The Day-ahead Index is a volume-weighted average of transaction prices for Peakload (hours 8-20) electricity to be delivered in the Czech Republic. Expressed in €/MWh, the index is derived from actual transactions for Peakload electricity for the Day-ahead period. The Index is the volume-weighted average of transaction prices.

Trades series published and start dates	
UK	10 Dec 1997
German	27 Sep 2000
Spanish	26 Mar 2001
Dutch	8 Mar 2001
French	11 Jul 2001
Czech	12 Sep 2006
Italian	14 Jun 2007
Hungarian	29 Jun 2009
Polish	29 Jun 2009
Slovak	29 Jun 2009
Romanian	19 Apr 2010
Serbian	19 Apr 2010
Belgian	18 Jan 2011
Swiss	18 Jan 2011
Turkish	3 Mar 2011

### The Czech electricity Heren weekend index

The Czech Electricity Heren Weekend Index is published by ICIS every Friday (or final working day of the week when Friday is a public holiday) in EDEM.

The Weekend Index is a volume-weighted average of deal prices for electricity to be delivered for the forthcoming weekend. It values power traded for the forthcoming weekend period over the immediately preceding working days. Thus, the Index published on, for example, Friday 6 April values power traded on 2-6 April for delivery on 7-8 April. It is published on the working day immediately prior to the Weekend period.

Because the 'Weekend' period is generally interpreted within the Czech power market as referring purely to Saturday and Sunday and not including any contiguous public holidays, Heren's Weekend Index is based purely on Saturday and

Sunday deals. EDEM will include separate Indices for any public holidays that are contiguous with the weekend.

Expressed in €/MWh, the index is derived from actual transactions for baseload electricity for the Weekend period. The Index is the volume-weighted average of transaction prices.

### The Czech electricity Heren monthly index

The Czech Electricity Heren Monthly Index is a monthly index of value for electricity traded on a month-ahead basis and is published by ICIS each working day in EDEM.

Expressed in €/MWh, the index is derived from actual transactions for baseload electricity for the month in question (Index Month). The Index is the volume-weighted average of transaction prices.

The transactions on which the Index is based are those that took place in the month preceding the Index Month. Thus, for the July Index, only entire July Baseload deals that took place in the June period are eligible.

### The Hungarian electricity Heren daily index

The Hungarian Electricity Heren Day-ahead Index values Baseload electricity traded for the next working day in England and Wales, where the market is assessed, and is published by ICIS each working day in EDEM. Separate holiday indices will be calculated for English and Welsh public holidays.

The Index day is the first working day following the date of publication. Thus, the Index published on 27 January values Baseload power traded on 27 January for delivery on 28 January. The Day-ahead Index published on a Friday values power to be delivered on Monday, or on Tuesday when the Monday is a public holiday in England and Wales.

The Day-ahead Index is a volume-weighted average of transaction prices for electricity to be delivered in Hungary. Expressed in €/MWh, the index is derived from actual transactions for Baseload electricity for the Day-ahead period. The Index is the volume-weighted average of transaction prices.

## The Hungarian electricity Heren daily peaks index

The Hungarian Electricity Heren Day-ahead Peaks Index values Peakload electricity traded for the next working day in England and Wales, where the market is assessed, and is published by ICIS each working day in EDEM. Separate holiday indices will be calculated for English and Welsh public holidays.

The Index day is the first working day following the date of publication. Thus, the Index published on 27 January values Peakload power traded on 27 January for delivery on 28 January. The Day-ahead Index published on a Friday values power to be delivered on Monday, or on Tuesday when the Monday is a public holiday in England and Wales.

The Day-ahead Index is a volume-weighted average of transaction prices for Peakload (hours 8-20) electricity to be delivered in Hungary. Expressed in €/MWh, the index is derived from actual transactions for Peakload electricity for the Day-ahead period. The Index is the volume-weighted average of transaction prices.

## The Hungarian electricity Heren weekend index

The Hungarian Electricity Heren Weekend Index is published by ICIS every Friday (or final working day of the week when Friday is a public holiday) in EDEM.

The Weekend Index is a volume-weighted average of deal prices for electricity to be delivered for the forthcoming weekend. It values power traded for the forthcoming weekend period over the immediately preceding working days. Thus, the Index published on, for example, Friday 6 April values power traded on 2-6 April for delivery on 7-8 April. It is published on the working day immediately prior to the Weekend period.

Because the 'Weekend' period is generally interpreted within the Hungarian power market as referring purely to Saturday and Sunday and not including any contiguous public holidays, Heren's Weekend Index is based purely on Saturday and Sunday deals. EDEM will include separate Indices for any public holidays that are contiguous with the weekend.

Expressed in €/MWh, the index is derived from actual transactions for baseload electricity for the Weekend period. The Index is the volume-weighted average of transaction prices.

## The Hungarian electricity Heren monthly index

The Hungarian Electricity Heren Monthly Index is a monthly index of value for electricity traded on a month-ahead basis and is published by ICIS each working day in EDEM.

Expressed in €/MWh, the index is derived from actual transactions for baseload electricity for the month in question (Index Month). The Index is the volume-weighted average of transaction prices.

The transactions on which the Index is based are those that took place in the month preceding the Index Month. Thus, for the July Index, only entire July Baseload deals that took place in the June period are eligible.

## The Polish electricity Heren monthly index

The Polish Electricity Heren Monthly Index is a monthly index of value for electricity traded on a month-ahead basis and is published by ICIS each working day in EDEM.

Expressed in €/MWh, the index is derived from actual transactions for baseload electricity for the month in question (Index Month). The Index is the volume-weighted average of transaction prices.

The transactions on which the Index is based are those that took place in the month preceding the Index Month. Thus, for the July Index, only entire July Baseload deals that took place in the June period are eligible.

## The Italian electricity Heren monthly index

The Italian Electricity Heren Monthly Index is a monthly index of value for electricity traded on a month-ahead basis and is published by ICIS each working day in EDEM.

Expressed in €/MWh, the index is derived from actual transactions for baseload electricity for the month in question (Index Month). The Index is the volume-weighted average of transaction prices.

The transactions on which the Index is based are those which took place in the month preceding the Index Month. Thus, for the July Index, only entire July Baseload deals which took place in the June period are eligible.

## Trades

ICIS publishes trades it collects from market sources on a daily basis. Although we aim to publish as many trades as possible, we can not guarantee to have all trades done during the day.

Trades for markets covered weekly will be published on a weekly basis and display all deals done since the previous publication date.

## Spark and dark spreads

ICIS calculates its spark and dark spreads as the cost of power per MWh minus the cost of the fuel needed to generate that power. The cost of fuel is calculated using industry standard plant efficiencies to take account of energy not converted into electrical energy and therefore lost.

A positive spread means that it is theoretically profitable to generate electricity for the period in question, while a negative spread means that generation would be a loss-making activity. However, it is important to note that the spreads do not take into account additional generating charges beyond fuel and carbon, such as operational costs.

**Spark spreads** are calculated as the cost of power per MWh minus the cost of gas. ICIS uses the Day-ahead index for Day-ahead electricity and gas values in the UK and Germany, and the midpoint of baseload power price assessments for all other calculations, except for peak spark and clean peak spark spreads, which use the midpoint of peak power price assessments. Gas indices and price assessment values use data from sister publication ESGM, using the NBP for UK

calculations; the TTF for German calculations as the TTF hub is currently the most liquid gas market in the region, and is widely used as a reference for German gas prices; and the Italian PSV for Italian calculations (please see ESGM methodology for an explanation of how those values are reached). The UK gas price in pence/therm (British thermal unit) is converted to £/MWh by dividing by a standard factor of 2.93071.

ICIS uses the standard gas-fired plant efficiency factor of 49.13% for its spark spreads – an industry standard to allow for efficient spark spread trading – on the basis that 100,000 therms of gas could generate 60MW of power. The spark spread value is therefore the power price minus the gas price divided by 0.4913.

Spark spread = power price - (gas price/0.4913).

ICIS also calculates additional gas-fired plant efficiency of 52.11% to reflect the increased efficiency of newer gas-fired power plants, on the basis that 55,000 therms of gas could generate 35MW of power.

**Dark spreads** are calculated as the cost of power per MWh minus the cost of coal.

ICIS uses Baseload power price assessments for all dark spread contracts, and CIF ARA coal swaps price assessments from sister publication CSD (please see CSD methodology for an explanation of how those values are reached).

The cost of coal in US dollars per tonne is converted to the local currency using forward rates constructed by ICIS using currency data from Bloomberg. The cost per tonne figure is converted to MWh by dividing by 6.978 – based on the energy content of coal CIF ARA coal swaps represent, which is 6,000kCal/kg NAR (net as received) – and converted to MWh using conversion factors from the International Energy Agency.

ICIS calculates its dark spreads using the industry standard of 35% plant efficiency.

Dark spread = power price – (((coal price converted to local currency)/6.978)/0.35)

ICIS calculates additional coal-fired plant efficiencies of 38% and 40% in some markets, to reflect increased efficiency of newer coal-fired power plants.

The cost of emissions for **clean spark spreads** is calculated by multiplying the cost of carbon emissions allowances from sister publication EDCM (please see EDCM methodology for an explanation of how those values are reached), converted to local currency where necessary, and multiplied by the emissions intensity factor.

ICIS uses the UK government natural gas conversion factor (dating from June 2013) of 0.18404 tonnes of carbon dioxide equivalent emitted per MWh on the basis of gross calorific value, in line with how gas is traded (<http://www.transco.co.uk/services/cvalue/cvinfo.htm>).

The UK government figure has been chosen on the basis that the UK has the most liquid traded spark spread market. UK government carbon dioxide emissions conversion factors are issued by the Department for Environment, Food and Rural Affairs (DEFRA): <http://www.ukconversionfactorscarbonsmart.co.uk/>

The emissions intensity factor is calculated by dividing the carbon dioxide equivalent emitted per MWh by the standard plant efficiency. For a clean spark spread for a 49.13% efficient gas plant, the emissions intensity factor used is therefore (0.18404 divided by a plant efficiency of 0.4913).

Clean spark spread = spark spread - (emissions price x (0.18404/0.4913)).

For a clean spark spread for a 52.11% efficient gas plant, the emissions intensity factor used is (0.18404 divided by a plant efficiency of 0.5211).

To calculate **clean dark spreads**, ICIS uses the Intergovernmental Panel on Climate Change (IPCC) emissions conversion factor (dating from 2006) of 0.34056 tonnes of carbon dioxide equivalent emitted per MWh of power generated from coal on the basis of net calorific value, in line with how coal is traded. The IPCC emissions conversion factor has been chosen as an international figure to reflect the coal market, and the resulting emissions factor is in widespread use within the power industry. The IPCC taskforce on national greenhouse gas inventories on energy emissions dating from 2006 can be found here: <http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html>

The emissions intensity factor is calculated by dividing the carbon dioxide equivalent emitted per MWh by the standard plant efficiency. For a clean dark spread for a 35% efficient coal-fired plant, the emissions intensity factor used is therefore (0.34056 divided by a plant efficiency of 0.35).

Clean dark spread = dark spread - (emissions price x (0.34056/0.35)).

A clean dark spread for a 38% efficient coal-fired plant uses an emissions intensity factor of (0.34056 divided by a plant efficiency of 0.38), and a clean dark spread for a 40% efficient coal-fired plant uses an emissions intensity factor of (0.34056 divided by a plant efficiency of 0.40).

For the UK market, ICIS calculates additional clean spark and dark spread values to take the carbon price support (CPS) tax on fuels for electricity generators into account, to reflect more realistic generation costs. The support level is announced two years in advance. Details can be found here: <http://www.hmrc.gov.uk/climate-change-levy/carbon-pf.htm>

ICIS calculates the CPS impact by converting the emissions price to sterling and adding the UK government-designated carbon price support, then factoring in the relevant emissions intensity factor.

CPS clean spark spread = UK spark spread - ((emissions price converted to £) + (UK CPS level)) x (emissions intensity factor of 0.18404/0.4913)).

The clean spark to clean dark spread subtracts the clean dark spread at 35% efficiency from the clean spark spread at 49.13% efficiency to show which type of generation is theoretically more profitable for a given contract period. A positive spread implies gas-fired generation would be more profitable, while a negative spread implies coal-fired plant would be more profitable. However, this number is indicative and does not take into account additional generating charges beyond fuel and emissions, such as operational costs.

## Baseload spreads

ICIS publishes the geographical spreads between markets for key contracts in map form, for western European markets covered daily and also for Central and Eastern European markets covered daily. These spreads are based on ICIS daily price assessments, and reflect the premium of the first-named market to the second-named market. If the first-named market is assessed below the second-named, the spread will be negative.

The month-ahead, front quarter and front season spreads between the UK and France and the UK and Germany are indicative only, as the UK power market follows EFA month patterns rather than calendar months, so delivery periods may differ.

### POWER PLANT OUTAGES

ICIS publishes a list of power plant outages across a number of key markets with, where known, the date of the outage, the reason for the outage and the estimated plant/unit restart date.

### OTHER DATA

The following information is published in EDEM but is based on secondary data not generated by ICIS.

**Across The Market:** The Across The Market table compares the Day-ahead prices of Europe's leading electricity markets (either OTC, exchange or index-based, varying by country), published elsewhere in the report. Prices are quoted in €/MWh and are compared with the previous day's prices.

**German Day Ahead Settlement Prices:** The German platform of the EPEX Spot exchange offers Day-ahead hourly spot trading contracts. The prices published are the hourly price of power traded at the exchanges for Day-ahead power in €/MWh. See the exchange's website – [www.epexspot.com](http://www.epexspot.com) – for further details.

**Powernext French Day Ahead Market:** The French platform of the EPEX Spot exchange offers Day-ahead hourly spot trading contracts. The prices published are the hourly price of power traded at the exchanges for Day-ahead power in €/MWh. See the exchange's website – [www.epexspot.com](http://www.epexspot.com) – for further details.

**Italian IPEX Results:** GME, the Italian electricity market operator, publishes the Baseload and Peak results of its Day-ahead electricity exchange, the PUN index, on its website. See the market operator's website – [www.mercatoelettrico.org](http://www.mercatoelettrico.org) – for further details.

**Nordic Prices:** Prices for the Nordic electricity market (covering Norway, Sweden, Denmark and Finland) are reproduced from the Nord Pool exchange's closing Best Buyer/Best Seller prices for key Baseload contracts.

The System Price is an average Day-ahead price based on bids for purchase and sale of hourly contracts and block contracts that cover all 24 hours of the next day. Prices are determined through auction trade for each delivery hour.

Nord Pool volume is the total volume of electricity traded on the Nord Pool futures exchange for the day in question.

**APX NL Hub Results:** The Amsterdam Power Exchange (APX) offers Day-ahead hourly spot trading contracts. The prices published are the average of these hourly prices expressed in Day (Baseload), Peak Hours (8-20) and Off-Peaks (20-8) terms in €/MWh. See the exchange's website – [www.apx.nl](http://www.apx.nl) – for further details.

**Belpex Belgian Hub Results:** The Belgian Belpex offers Day-ahead hourly spot trading contracts. The prices published are the average of these hourly prices expressed in Day (Baseload), Peak Hours (9-20) and Off-Peaks (1-8, 21-24) terms in €/MWh. See the exchange's website – [www.belpex.be](http://www.belpex.be) – for further details.

**Austrian EXAA:** The Austrian EXAA (Energy Exchange Austria) operates a Day-ahead market offering 24 hourly power contracts for delivery the following day. The EXAA prices published in EDEM represent the weighted average of the 24 prices, represented as the Baseload price, as well as the Peaks price and a maximum and minimum price. The volume is the total volume traded for the following day. See the market operator's website – [www.exaa.at](http://www.exaa.at) – for further details.

**Spanish Pool Price:** OMEL, the Spanish electricity market operator, publishes the hourly results of its Day-ahead electricity pool on its website. The Spanish Pool Price published in EDEM represents the Baseload and Peak price averages of the hourly prices. See the market operator's website – [www.omel.es](http://www.omel.es) – for further details.

**PPX:** The Polish Power Exchange (PPX) operates a Day-ahead market offering 24 hourly power contracts for delivery the following day. The PPX price published in EDEM represents the weighted average of the 24 prices. The volume is the total volume traded for the following day. See the market operator's website – [www.polpx.pl](http://www.polpx.pl) – for further details.

**Romanian OPCOM:** Romania's OPCOM operates a Day-ahead market offering 24 hourly power contracts for delivery the following day. The OPCOM price published in EDEM represents the weighted average of the 24 prices. See the market operator's website – [www.opcom.ro](http://www.opcom.ro) – for further details.

**Czech OTE Day-ahead:** The Czech Republic's OTE operates a Day-ahead market offering 24 hourly power contracts for delivery the following day. The OTE price published in EDEM represents the weighted average of the 24 prices. See the market operator's website – [www.ote-cr.cz](http://www.ote-cr.cz) – for further details.

**UK Electricity Balancing Market System Sell And Buy Prices:** The UK electricity Balancing Mechanism is used by the National Grid as a means of balancing power flows on to and off the electricity transmission system. For further information on the function of the balancing market and a definition of the terms used in the table, please refer to the website [www.bmreports.com](http://www.bmreports.com).

**APX Power UK Spot Contracts:** These charts, provided by APX UK, give a breakdown of the prices and volumes for spot electricity traded on the exchange on a daily, two-hourly, four-hourly and half-hourly basis. For more information on the data please visit the Exchange's website at [www.apx.nl](http://www.apx.nl).

**ICE Baseload UK Electricity Futures:** This table represents the closing prices for the InterContinental Exchange's (ICE) key UK electricity Baseload futures contracts. For more information on the data please visit the exchange's website at [www.theice.com](http://www.theice.com).

**Endex Dutch Electricity Futures Exchange:** This table represents the closing prices for the Endex exchange's key Dutch electricity Baseload and Peaks futures contracts. For more information on the data please visit Endex's website at [www.endex.nl](http://www.endex.nl).

**N2EX UK Spot Market:** This table represents the settlement prices for the N2EX exchange's Day-Ahead Prompt index and Day Ahead Market (DAM) Index (auction). For more information on the data please visit the exchange's website at [www.n2ex.com](http://www.n2ex.com).

**Turkish PMUM data:** This table represents the time-weighted average for Baseload and Peakload hours using the hourly settlements from the Turkish balancing market PMUM, operated by Turkish electricity transmission system operator TEIAS. For more information on the data, please visit [www.teias.gov.tr](http://www.teias.gov.tr)

**Weather:** Pan-European weather forecasts on a 1-5 day and 6-10 day basis are provided to EDEM by Weather Services International. For more information, please e-mail [energy@wsieurope.com](mailto:energy@wsieurope.com) or visit the company's website – [www.wsieurope.com](http://www.wsieurope.com).

Renewable weather forecast data for up to six days ahead are provided to EDEM by [SpotRenewables.com](http://SpotRenewables.com), a product from EuroWind GmbH. For more information, please visit [www.spotrenewables.com](http://www.spotrenewables.com)

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