



Quarterly Report

on European Electricity Markets

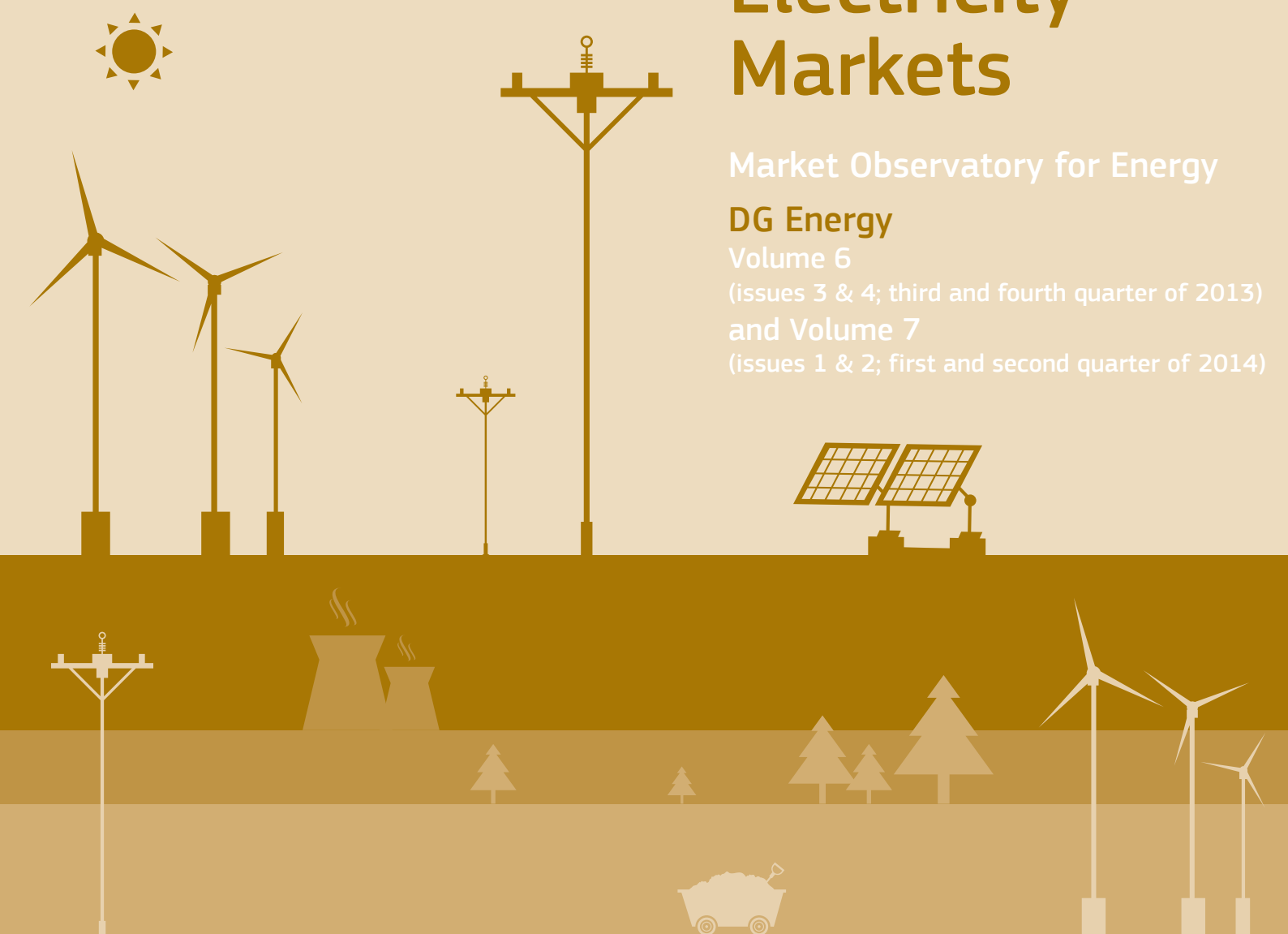
Market Observatory for Energy

DG Energy

Volume 6

(issues 3 & 4; third and fourth quarter of 2013)
and Volume 7

(issues 1 & 2; first and second quarter of 2014)



Energy

DISCLAIMER: This report prepared by the Market Observatory for Energy of the European Commission aims at enhancing public access to information about prices of electricity in the Members States of the European Union. Our goal is to keep this information timely and accurate. If errors are brought to our attention, we will try to correct them. However the Commission accepts no responsibility or liability whatsoever with regard to the information contained in this publication.

Copyright notice: Reproduction is authorised provided the source is acknowledged. © European Commission, Directorate-General for Energy, Market Observatory for Energy, 2014

Commission européenne, B-1049 Bruxelles / Europese Commissie, B-1049 Brussel – Belgium
E-mail: ENER-MARKET-OBSERVATORY-QUARTERLY-REPORTS@ec.europa.eu

Content

Highlights of the report.....	1
1. Electricity supply, imports and exports.....	2
1.1. Evolution of electricity production and consumption	2
1.2. Drivers of EU electricity demand	3
2. Traded volumes and liquidity on European wholesale electricity markets	6
3. Evolution of commodity and power prices	8
3.1. Evolution of power prices, and the main factors affecting power generation costs	8
3.2. Comparisons of monthly electricity baseload prices on electricity markets.....	11
4. Regional wholesale electricity markets.....	14
4.1. Central Western Europe (Austria, Belgium, France, Germany, the Netherlands, Switzerland).....	14
4.2. British Isles (UK, Ireland)	16
4.3. Northern Europe (Denmark, Estonia, Finland, Latvia, Lithuania, Norway, Sweden)	17
4.4. Apennine Peninsula (Italy).....	18
4.5. Iberian Peninsula (Spain and Portugal)	19
4.6. Central Eastern Europe (Czech Republic, Hungary, Poland, Romania, Slovakia, Slovenia).....	20
4.7. South Eastern Europe (Greece).....	22
5. Building the internal market for electricity.....	24
6. Retail electricity prices in the EU	28
7. Glossary	32

Highlights

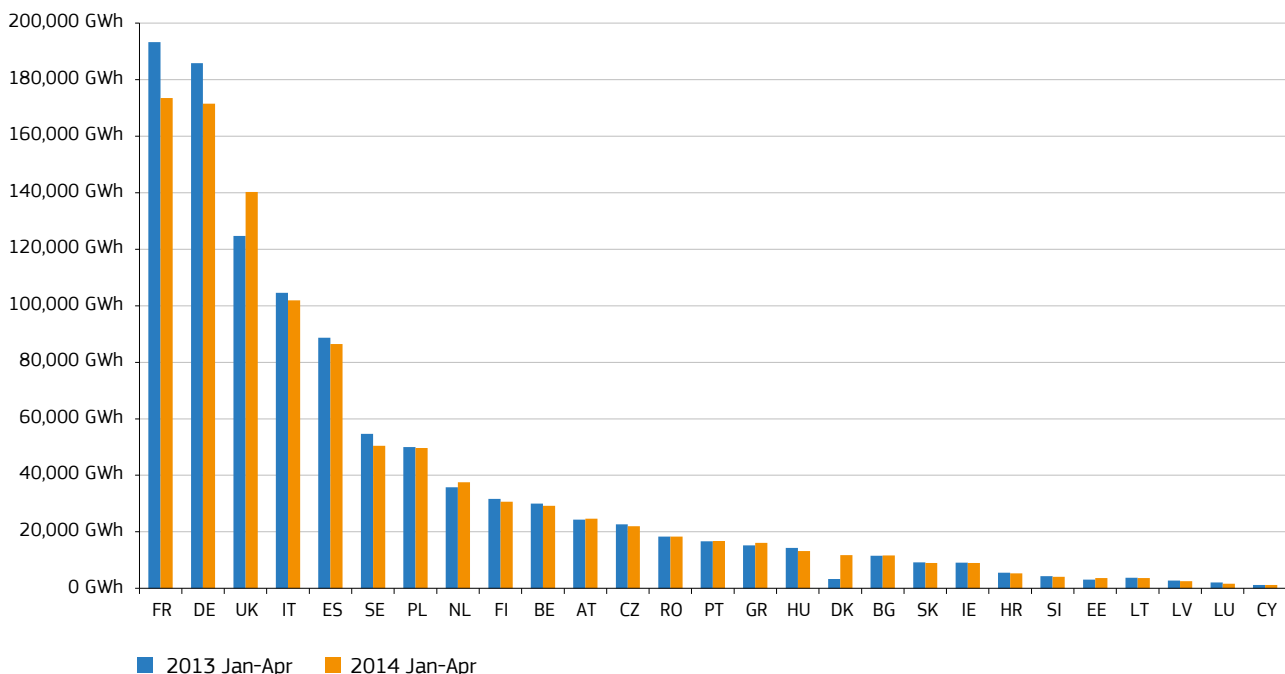
- **Electricity consumption in the EU decreased by 2.7% in the first four months of 2014 compared to the same period of 2013.** Parallel to this, the EU Gross Domestic Product (GDP) grew by 1.4% in the first quarter of 2014, on year-on-year comparison, which was the biggest economic growth since the third quarter of 2011.
- **During the last four years the trend of electricity consumption in the EU clearly decoupled from economic growth.** While in the first quarter of 2014 GDP in the EU-28 was 3.6% higher than in the same period of 2010, electricity consumption decreased by 4.8% during the same period, pointing to decreasing electricity intensity of the European economy.
- In spite of decreasing electricity consumption, cross border trade of electricity in the EU grew by 13% in the first four months of 2014 compared to the same period of 2013. As in previous periods, decreasing power consumption combined with increase in cross-border power trading illustrates the **further integration of the European wholesale electricity markets.**
- **In February 2014 markets of the United Kingdom, Central Western Europe and Nordpool have been coupled and in May the coupled area has been extended to South Western Europe, creating a European coupled area with seventeen participating countries.** Market coupling enables more effective power trading through implicit cross-border auctions, though this does not necessarily lead to full convergence of wholesale electricity prices across the borders. In the first half of 2014 the average wholesale power price was around 30 €/MWh in Denmark and Sweden, while in the UK it was above 50 €/MWh.
- In the first half of 2014, due to high gas reserves and subdued heating demand relating to mild weather conditions, natural gas prices fell significantly on the major European hubs. This resulted in decrease of wholesale power prices and **improving profitability of gas-fired power generation in the United Kingdom and decreasing losses in the continental markets.** As coal prices only slightly decreased in this period the relative competitiveness of gas fired generation against coal improved, though the share of natural gas did not increase significantly in the European power mix.
- The PEP indicator, expressing the average evolution of the wholesale power prices in the European markets, has been following a downward trend since the beginning of 2012 and in the second quarter of 2014 it fell to 38-39 €/MWh, being the lowest since the summer of 2009. Due to increasing share of wind and solar in the power mix, decreasing gas prices, good hydro availability in some countries and decreasing electricity consumption, **wholesale power prices fell to several year lows in many markets in the EU.** In the second quarter of 2014 plant maintenance works reduced the available generation capacities in many countries, however, this could not change the generally downward trend of wholesale electricity prices.
- **Wind and solar power played an increasingly important role in the power mixes of many European countries during the first half of 2014.** As the penetration of renewables has been increasing, the need for operating costlier conventional thermal power plants during peak hours of the day diminished, reducing the price differential between baseload and peakload periods.
- For the first time in the history of the German power market, high amount of solar and wind generation, as well as must-run units and inflexible base load such, as nuclear power, coupled with lower demand, has led to negative daily average wholesale electricity prices on two Sundays in the first half of 2014. **Negative prices signal the need for more flexible electricity supply and demand.**
- **Significant differences could be observed in retail prices for electricity between Member States for both household and industrial consumers.** Besides domestic energy supply costs, reflecting the impact of the power generation mix and the availability of electricity import sources, non-market elements, such as regulated network tariffs and energy taxes fundamentally influenced end-user electricity prices in the EU Member States.

1. Electricity supply, imports and exports

1.1 Evolution of electricity production and consumption

- *Figure 1* compares the evolution of electricity consumption in EU Member States in the January-April period in 2013 and 2014. Consumption of electricity decreased by 2.7% in the first four months of 2014 compared to the same period of the previous year. Similarly to 2013, France, Germany and the UK remained the three largest electricity consumers in the first four months of 2014, while smaller countries like Lithuania, Latvia, Luxembourg and Cyprus were among the EU countries, which had the lowest electricity consumption in this period.

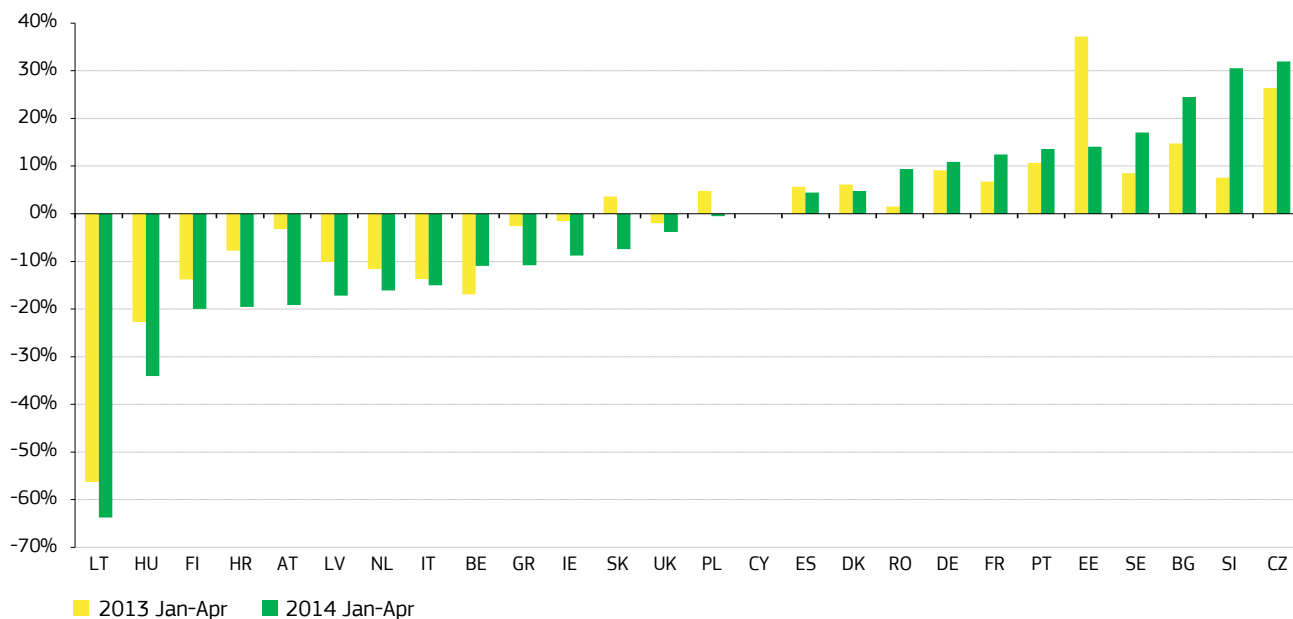
FIGURE 1 - ELECTRICITY CONSUMPTION IN EU MEMBER STATES, JANUARY-APRIL 2013 AND JANUARY-APRIL 2014



Source: ENTSO-E, excludes Malta.

- *Figure 2* shows the differences between gross electricity generation and gross inland consumption (generation surpluses or deficits as a proportion of gross inland consumption) in most of the EU Member States. Countries, such as Lithuania (producing 60% less than its domestic electricity consumption), Hungary, Finland and Croatia were strongly net power importers in the January-April period of 2013 and 2014. On the other hand, Czech Republic, Slovenia, Bulgaria and Sweden were producing more than their domestic need, implying that they were net exporters. Among the three largest electricity consumers the UK was net importer, while France and Germany were net exporters in the first four months in both 2013 and 2014.
- Only Slovakia and Poland switched position from net electricity exporter to net importer in the January-April period of 2014 compared to the same period of 2013; this might have been related to the temporarily limited domestic generation capacity availability and competitive power import source alternatives in the aforementioned period of 2014 in both countries.

FIGURE 2 – POWER GENERATION SURPLUSES AND DEFICITS COMPARED TO THE GROSS INLAND CONSUMPTION IN JANUARY-APRIL PERIOD OF 2013 AND 2014 IN EU MEMBER STATES (IN PER CENT)

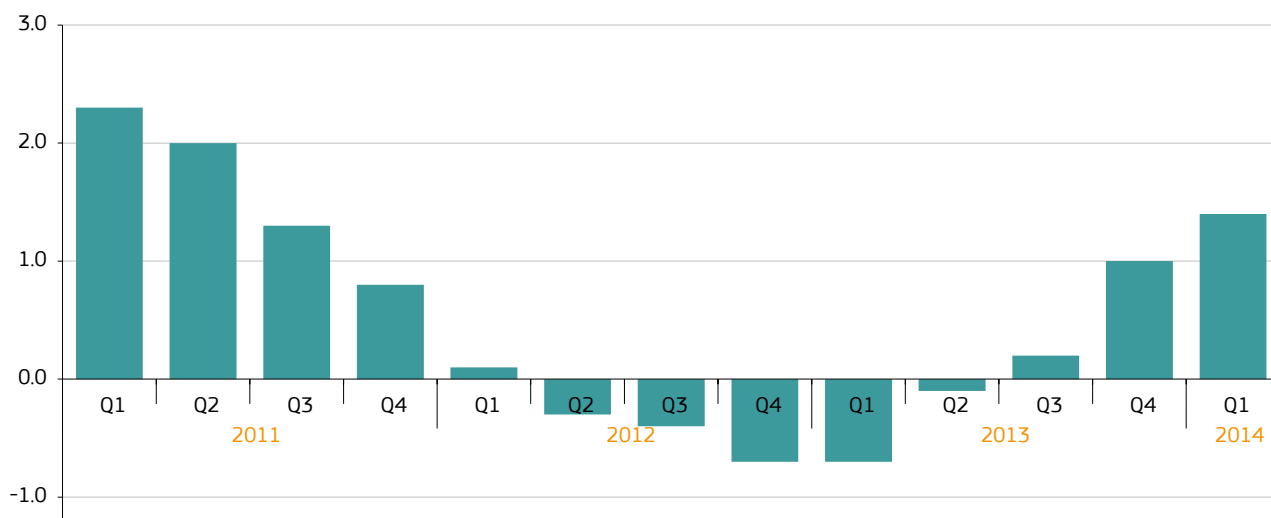


Source: ENTSO-E, excludes Malta and Luxembourg

1.2 Drivers of EU electricity demand

- As Figure 3 shows, since the third quarter of 2013 economic growth in the EU-28 has picked up again, and in the first quarter of 2014 it reached the highest level (1.4% on year-on-year comparison) since the third quarter of 2011. In economic sectors being significant electricity consumers, such as the manufacturing industry and construction, gross value added increased by 2.6% and 1.3% respectively in Q1 2014, implying an increasing industrial demand for power compared to the same period of 2013.

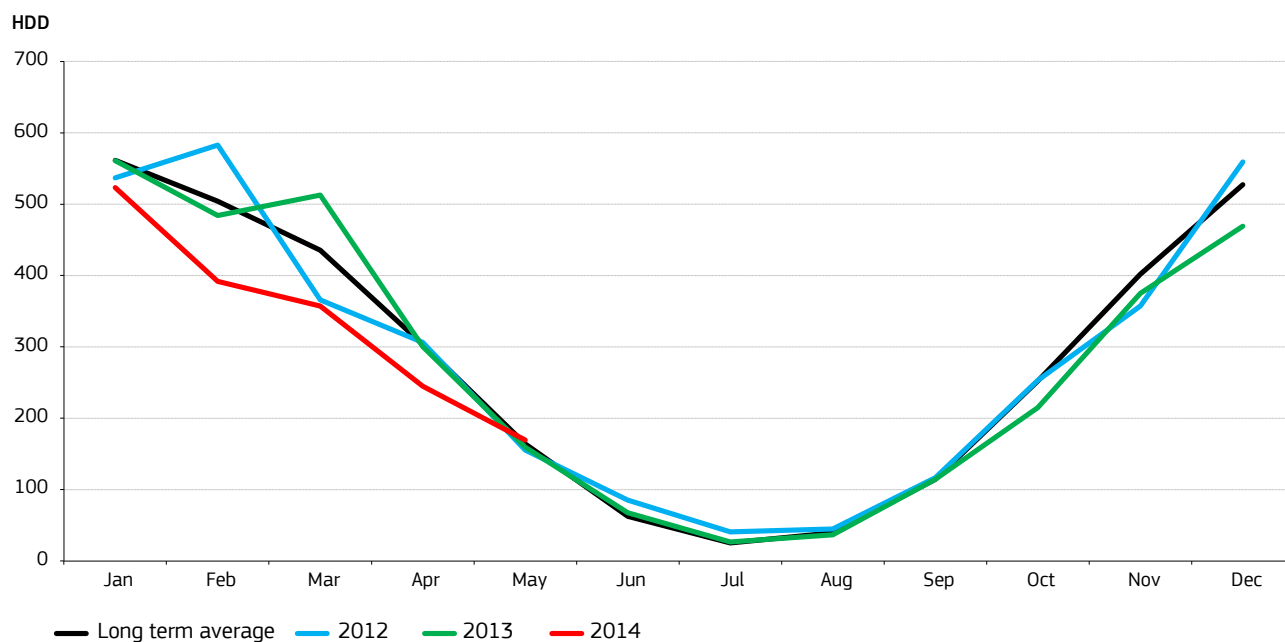
FIGURE 3 - EU 28 GDP Q/Q-4 CHANGE (%)



Source: Eurostat

- Figure 4 shows the evolution of Heating Degree Days (HDDs) in the last three years compared to the monthly long term average. In the first four months of 2014 HDDs were lower than either the long term average or in the respective period of 2012 and 2013. The weather in January-April 2014 was significantly milder than normal in most of the EU countries, implying much lower heating needs, which affected both fuel feedstock prices used for power generation and wholesale electricity prices.

FIGURE 4 - EU 28 HEATING DEGREE DAYS (HDDs)



Source: Eurostat/JRC.

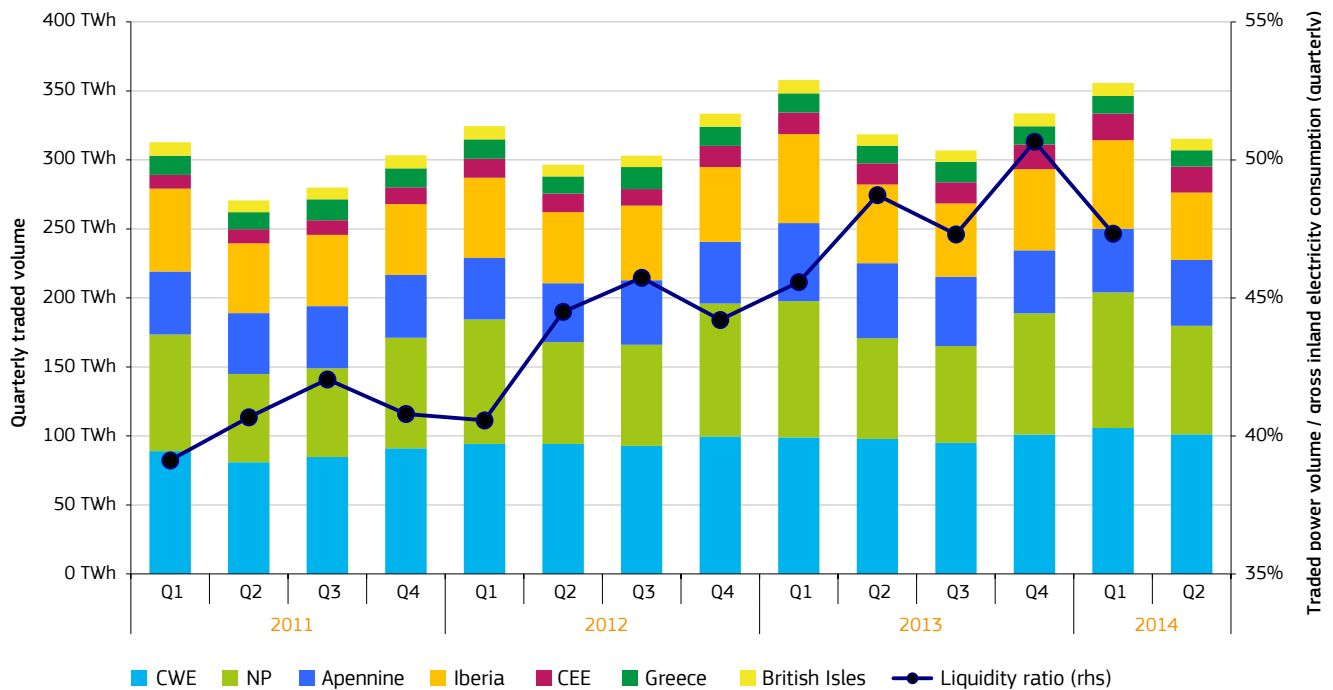
The colder is the weather, the higher is the number of HDDs.

2. Traded volumes and liquidity on European wholesale electricity markets

6

- In the second quarter of 2014 the combined traded volume of day-ahead power contracts on European wholesale power trading platforms amounted to 315.4 TWh, showing a 1% decrease to the same quarter of 2013, and a more significant, 11% decrease compared to Q1 2014, as a result of seasonal decrease in electricity consumption. Seasonal decrease in electricity consumption is associated with the end of heating season and decreasing lighting needs in the second quarter of the year.
- As *Figure 5* shows, quarterly traded volume of power in European day-ahead markets showed an increasing trend during the last three of years. Traded volumes were the highest in the Central West European (CWE) and the Nordpool regions. Iberian, Italian and Greek markets - where bilateral trading transactions are carried out in the organised market by law (mandatory pools) - could be characterised by relatively high trading volumes compared to the electricity consumption of these countries.
- Market liquidity, measured as the ratio of quarterly traded volume of day-ahead contracts and the quarterly electricity consumption of a given region, also increased significantly and reached 47% in Q1 2014 on average in Europe. This liquidity ratio was only 39% in the first quarter of 2011 and 45% in Q1 2013.
- In the first quarter of 2014, similarly to the previous quarters, Nordpoolspot proved to be the most liquid non-mandatory pool in Europe, with a liquidity ratio of 84%, followed by the CWE region (30%) and Central and Eastern Europe (22%).

FIGURE 5 - QUARTERLY TRADED VOLUMES AND LIQUIDITY ON THE MAJOR EUROPEAN WHOLESALE ELECTRICITY MARKETS



Source: Platts, European power exchanges, ENTSO-E Electricity consumption data are only available until the end of Q1 2014, therefore liquidity numbers are not provided for the last quarter (Q2)

Central Western Europe (CWE): Germany, France, Belgium, Luxembourg, Netherlands, Austria, Switzerland

Nordpool (NP): Norway, Sweden, Finland, Denmark, Estonia and Lithuania, Latvia

OMEL: Spain and Portugal

IPEX: Italy

Central Eastern Europe (CEE): Poland, Czech Republic, Slovakia, Hungary, Romania and Slovenia

DESMIE: Greece

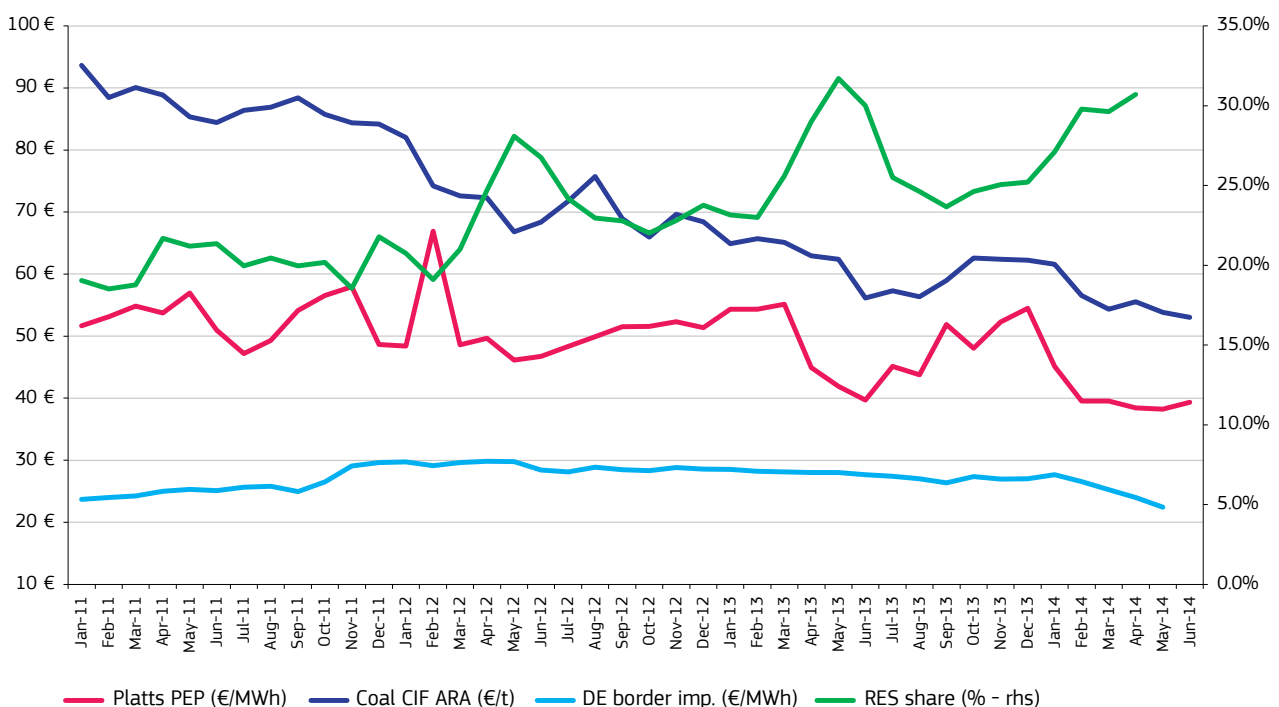
British Isles: United Kingdom and Ireland

3. Evolution of commodity and power prices

3.1 Evolution of power prices, and the main factors affecting power generation costs

- Figure 6 shows the evolution of the Platts European Power Index (PEP), in comparison with the price trends of German import gas and North-West European import coal contracts, and on the right hand scale the share of renewables in the EU power generation mix.
- Since the beginning of 2011, coal prices have been falling, thereby contributing to reducing coal-fired power generation costs, while natural gas prices have remained at relatively high levels until the beginning of 2014. The evolution of the coal-gas price ratio have been providing a competitive advantage for coal fired generation until most recent times, however, as gas prices decreased significantly during the first half of 2014 on most of the West European hubs, costs of gas fired generation also became lower.
- Figure 6 below also shows that decreasing power prices in the last two and a half years occurred alongside an increasing share of renewables in the European power mix. Although the rising share of renewables is primarily due to increasing wind and solar capacity installations in the EU (and biomass also contributes to broader deployment of renewables in many countries), hydro-based power generation still remains an important source in many European countries and it can substantially contribute to lowering the power generation costs, especially in rainy periods.

FIGURE 6 – EVOLUTION OF EUROPEAN AVERAGE WHOLESALE POWER PRICES COMPARED WITH COAL AND GAS PRICES AND THE SHARE OF RENEWABLES IN POWER GENERATION



Source: Platts, BAFA, ENSTO-E

Platts PEP: Pan European Power Index (in €/MWh)

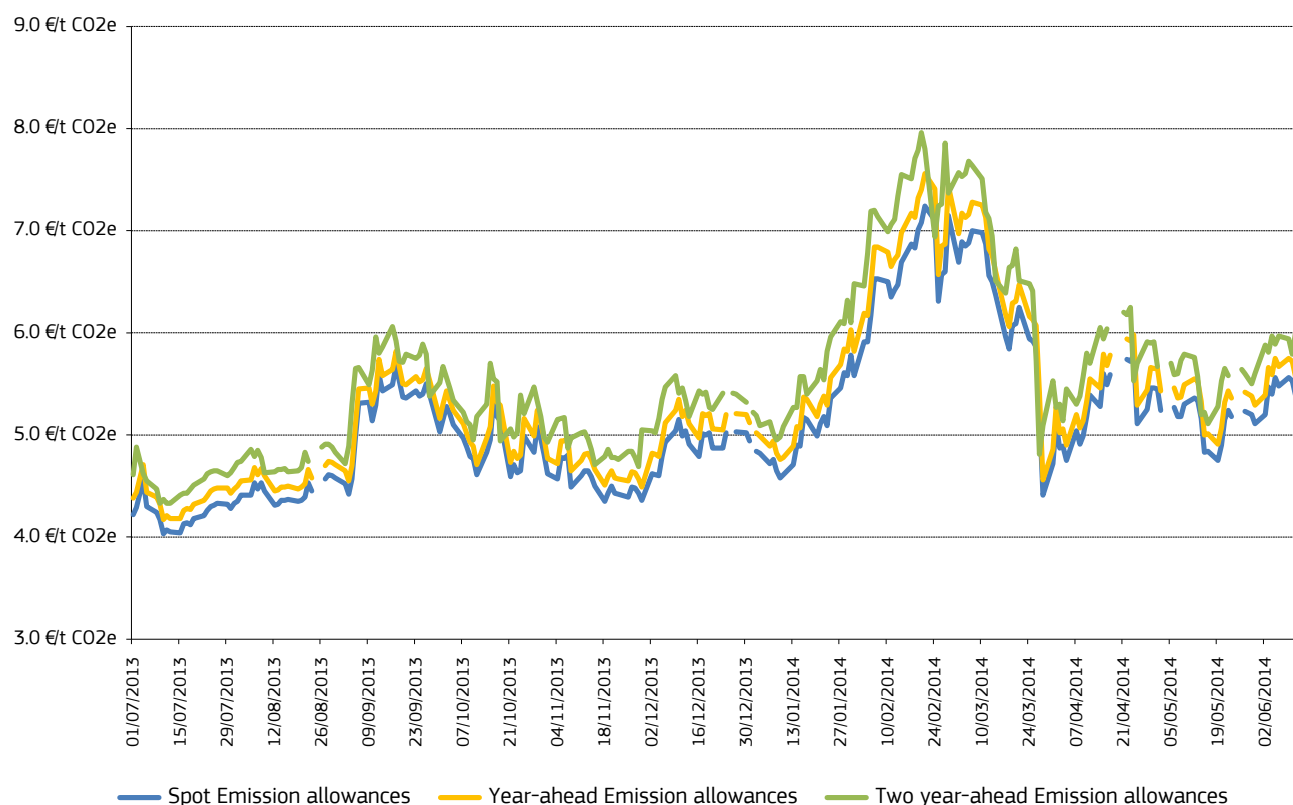
Coal CIF ARA: Principal coal import price benchmark in North Western Europe (in €/Mt)

DE border imp. stands for long term contract based import natural gas price on the German border (in €/MWh)

RES (renewables) includes hydro, wind, solar and biomass; RES share in the total power generation estimation for the EU-28 as a whole (right hand scale)

- European emission allowance prices have slightly rebounded from the lows experienced in the first half of 2013, however, the carbon market is still oversupplied and, with the exception of a short period in January-February 2014, prices remained in a narrow range of 5-6 €/tCO₂e in the first half of 2014. Regarding the fossil fuel based power generation, low carbon prices still contributed to the competitiveness of coal compared to natural gas during this period.

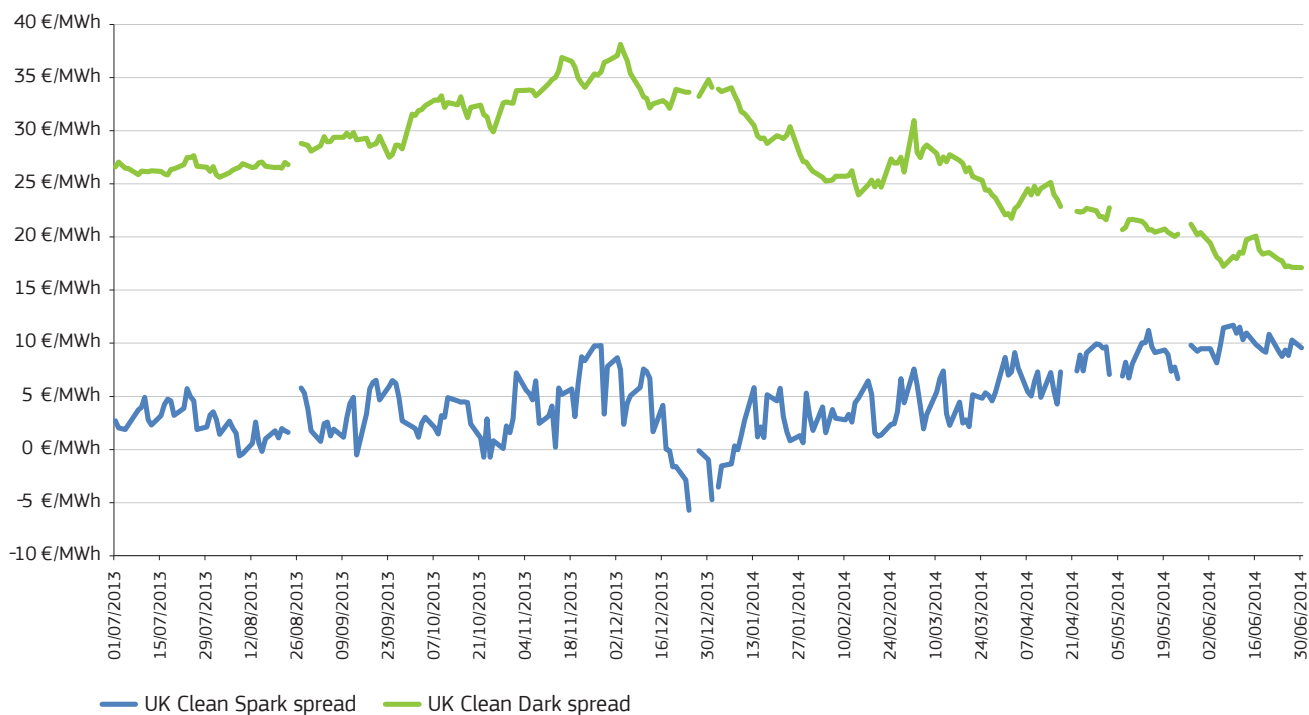
FIGURE 7 – EVOLUTION OF ETS EMISSION ALLOWANCE PRICES FROM JULY 2013 TO JUNE 2014



Source: Platts

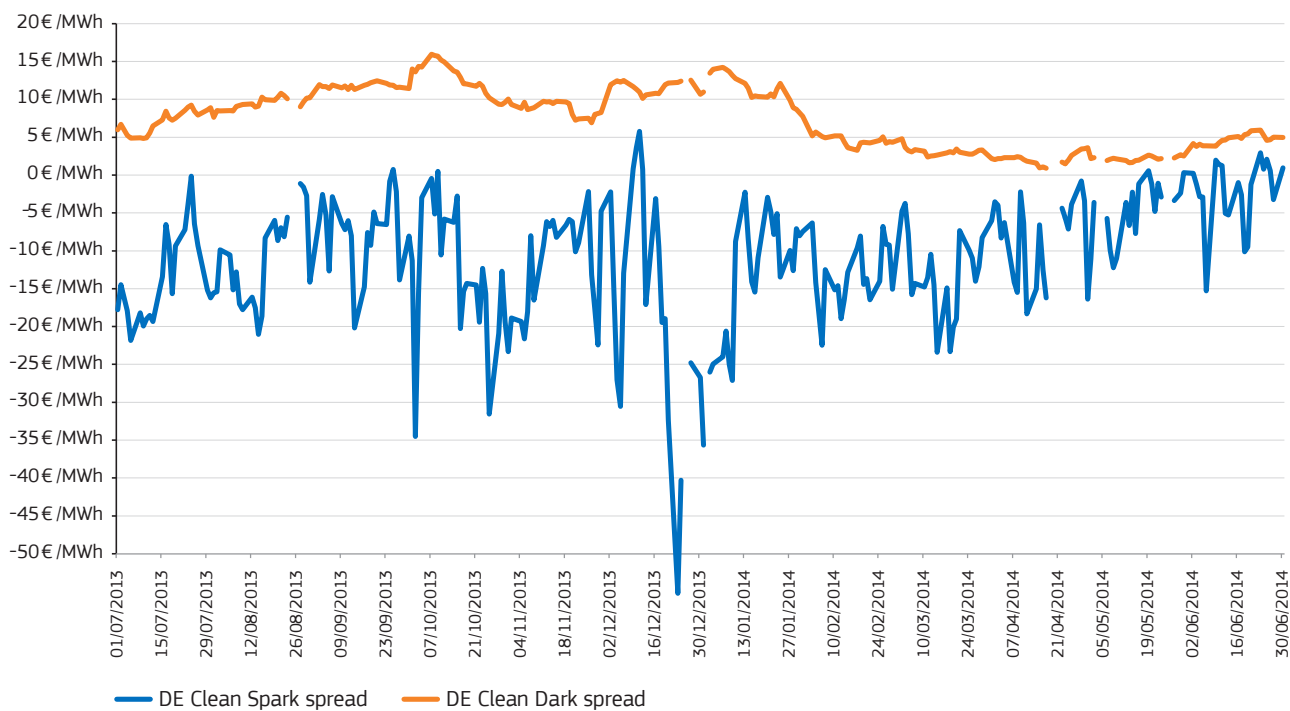
- As Figure 8 and Figure 9 show, coal-fired power generation was highly profitable in the UK, with double-digit clean dark spreads, while it was less profitable in Germany in the second half of 2013. In the same period gas-fired generation was only slightly profitable in the UK, but was generally unprofitable in Germany, with high volatility occurring in the clean spark spreads.
- However, as gas prices started to fall at the beginning of 2014 and went down by 30% on the most important West European gas hubs by the end of the first half of the year, the profitability of gas-fired generation started to increase in the UK and got closer to the break-even point (but still remained in the negative range) in Germany. As in the UK gas prices have a major impact on the marginal costs of power generation, decreasing gas prices substantially reduced wholesale power prices and consequently the profitability of coal-fired generation, given that coal prices were stable. In Germany the impact of gas on power prices is less important, however, the profitability of the two generation technologies significantly converged in both countries by the end of the first half of 2014.
- Nevertheless, the decreasing difference between the profitability of coal and gas fired generation has not yet managed to reverse the downward trend of the share of gas in the power mix, either in the UK or in Germany.

FIGURE 8 - EVOLUTION OF CLEAN DARK AND CLEAN SPARK SPREADS IN THE UK



Source: Platts

FIGURE 9 - EVOLUTION OF CLEAN DARK AND CLEAN SPARK SPREADS IN GERMANY



Source: Platts

3.2 Comparisons of monthly electricity baseload prices on electricity markets

- As the map on the next page (Figure 10) shows, there were significant price differences in the wholesale prices across the EU in the first half of 2014. Prices were the highest in countries having limited or not sufficient level interconnections to other countries of the internal electricity market (e.g.: Ireland, Latvia, Lithuania and Italy). Prices were low in countries where solar and wind generation could reduce the costs of power (e.g.: Germany) and where hydro levels were high (e.g.: Spain, Portugal and Romania).
- Local factors, such as temporarily unavailability of generation capacities coupled with increasing import needs can also substantially influence prices on the national markets, as this happened for example in Poland in the first half of 2014. Markets instruments aiming at optimising cross border electricity auctions (e.g.: market coupling) and enhancing cross border interconnections can contribute to reducing differences in wholesale electricity prices across the EU.

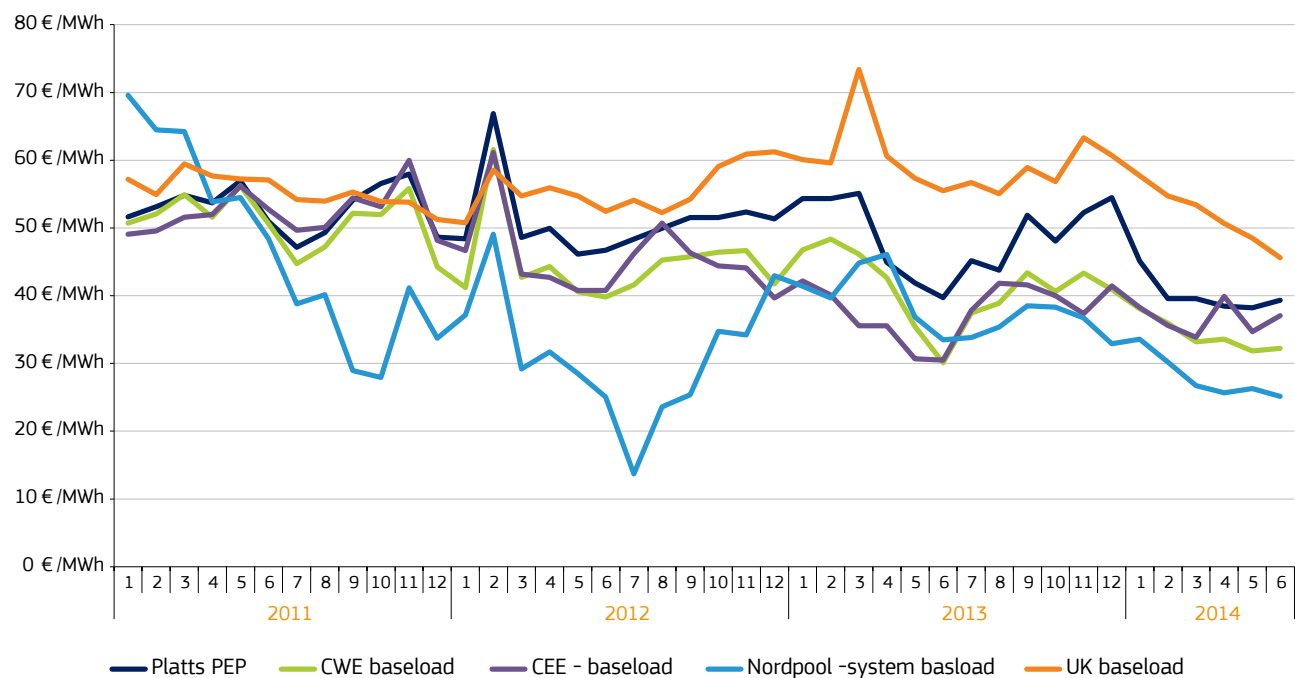
FIGURE 10 - COMPARISON OF AVERAGE WHOLESALE BASELOAD ELECTRICITY PRICES, FIRST SEMESTER OF 2014



Figure 11 and Figure 12 show the evolution of the monthly Platts' Pan-European Power Index (PEP), and average power prices in seven different regions of Europe. The PEP has been following a downward trend since the beginning of 2012 and in the second quarter of 2014 it fell to 38-39 €/MWh, being the lowest since the summer of 2009. Decreasing industrial demand for electricity on the demand side, and increasing share of renewables, decreasing or stagnating fossil fuel feedstock costs and permanently low carbon prices on the supply side have all contributed to this downward wholesale electricity price trend.

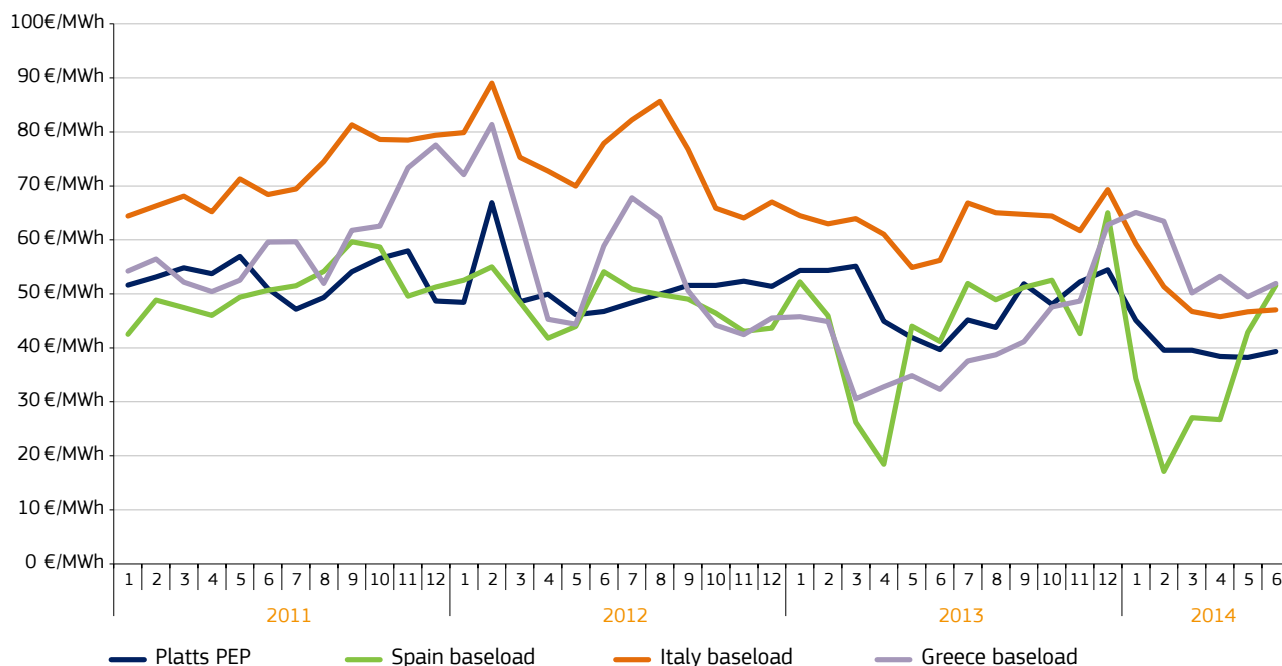
- Power prices in the UK and Italy have normally been higher than other EU peers and the PEP, mainly resulting from a high dependence on natural gas. The two Member States have also had to supplement power generation with imports in order to satisfy domestic electricity demand, further driving up domestic wholesale power prices. However, as gas prices started to fall in 2014, and the role of renewable generation is increasing, especially in the Italian power mix, this price premium began to shrink.
- In the Central Western Europe (CWE) region renewable power generation has an increasing role (especially in Germany) in determining wholesale electricity prices, significantly impacting the price level in Central and Eastern Europe as well. Nuclear availability in France is also an important factor in setting wholesale electricity prices in the CWE region and power exports from France also impacts the price level in other markets (e.g.: Italy).

FIGURE 11 - COMPARISONS OF THE PLATTS PEP AND MONTHLY ELECTRICITY BASELOAD PRICES IN REGIONAL ELECTRICITY MARKETS (CWE, CEE, NORDPOOL AND THE UK)



Source: Platts, European power exchanges

FIGURE 12 - COMPARISONS OF THE PLATTS PEP AND MONTHLY ELECTRICITY BASELOAD PRICES IN REGIONAL ELECTRICITY MARKETS (SPAIN, ITALY AND GREECE)

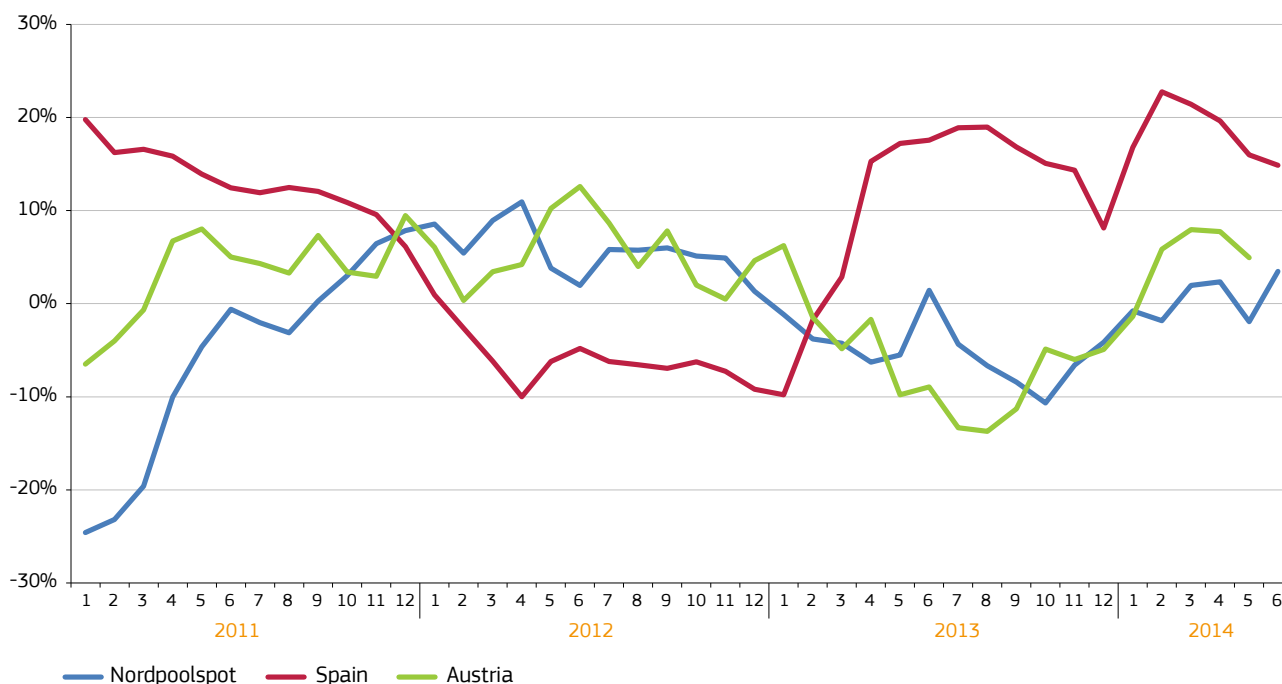


Source: Platts, European power exchanges

- Prices in the Nordpoolspot market and in Spain are often significantly impacted by changes in hydro availability, as Figure 12 and Figure 13 show. Spanish wholesale electricity prices fell significantly below the level of the major European peers in the first couple of months of 2014 in the consequence of rapidly increasing hydro availability. Nordpoolspot prices showed only minor discounts to West European peers as Nordic hydro levels were close to long term seasonal levels in the first half of 2014. Hydro availability also plays a role, though less important, in the CWE region. Hydro availability in the Balkans can impact prices in Greece and in some countries of Central Eastern Europe (CEE), having significant electricity import exposure to Balkan countries.

13

FIGURE 13 - DEVIATION OF HYDRO RESERVOIR LEVELS FROM THE LONG TERM LOCAL TREND IN THE NORDPOOL AREA, SPAIN AND AUSTRIA (IN PERCENTAGE POINTS)



Source: Platts, European power exchanges

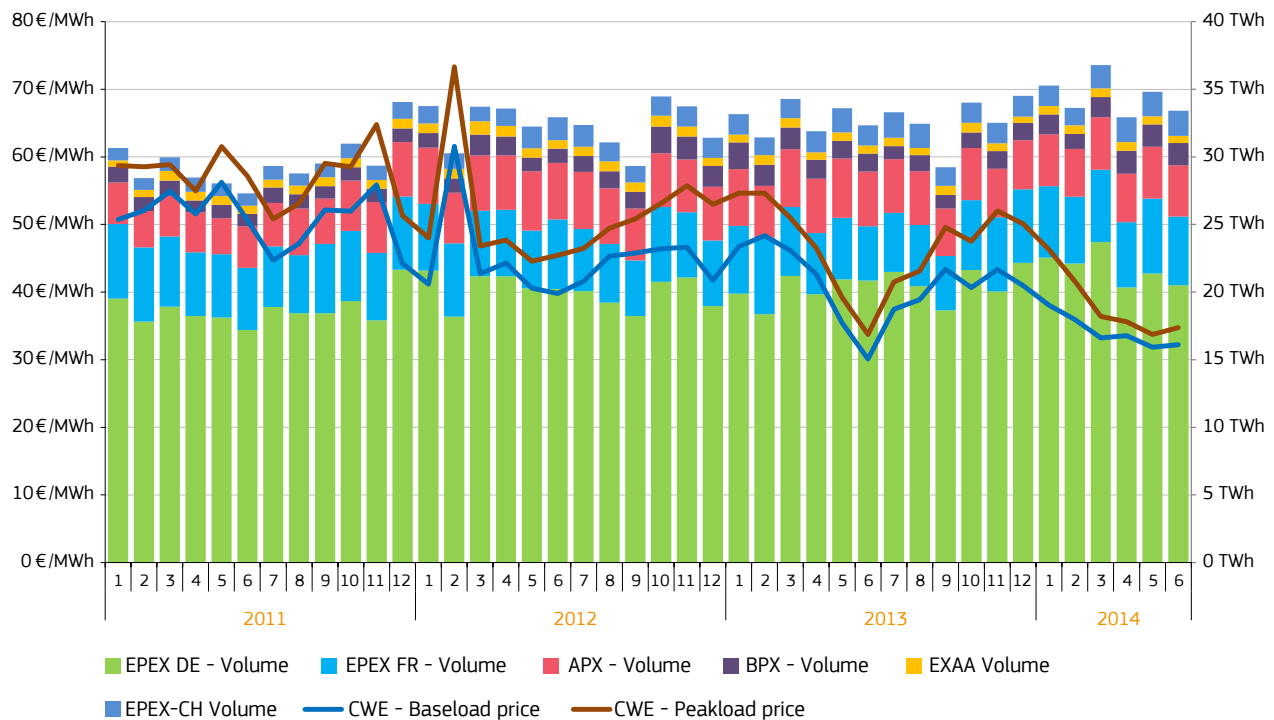
4. Regional wholesale electricity markets

4.1 Central Western Europe (Austria, Belgium, France, Germany, the Netherlands, Switzerland)

- As *Figure 14* shows, in the second half of 2013 average monthly wholesale power prices in the CWE region started to recover from lows registered in June 2013. In July and August of 2013 hot summer weather added pressure to the power demand, coupled with some nuclear outages in France and Germany. From September demand for power started to increase following the seasonal patterns (increasing needs for lighting in the autumn and industrial demand recovery after the end of the summer holiday season). In October the weather was mild and prices were kept under control by the significant amount of wind-based power generation, helped by a storm in North-Western Europe at the end of the month. From November, as the winter season began, cold snaps arrived and wind and solar generation receded, wholesale power prices turned up. However in December, due to the mild and sunny weather and the holiday season around Christmas, prices fell back again.
- In the first three months of 2014 the weather was milder than normal, and solar power generation was abundant in the CWE region, especially in Germany. The price of natural gas started to decrease, putting a further downward pressure on regional power prices. From April, as the winter season ended, heating and lighting needs decreased, implying less demand for power, electricity utilities started plant maintenance works. In France fairly good level of hydro availability in April 2014 and good nuclear availability in the rest of the second quarter assured healthy power supply.
- On the 16th of March 2014, due to record high solar generation and subdued industrial demand on Sunday, the daily average German baseload price fell below zero (-4.1 €/MWh) for the first time ever. Solar generation assured 8.4% of the German power generation in March 2014, which was unusually high in this period of the year. As increasing proportion of generated power came from solar, hourly power prices rose only moderately during the peak periods of the day, as costlier gas-fired units did not have to be put into the operation.
- *Figure 15* shows the evolution of the German, French, Dutch and Belgian wholesale electricity prices between July 2013 and June 2014, on a weekly average. Due to abundant renewable generation and cheap coal prices, German day-ahead contracts were the lowest during most of the time. French power prices were closely aligned with the German market during this period, only some cold spells in wintertime and nuclear plant outages in April could result in temporary price decouplings from the German peers. Dutch prices were mostly influenced by decreasing gas prices in the first half of 2014 and power exports to the UK.
- In Belgium the availability of domestic nuclear capacities played a key role in setting wholesale electricity prices. Two nuclear reactors (Tihange 2 and Doel 3) were taken off the grid in the last week of March 2014, and remained offline until the end of the first half of the year. Belgian wholesale electricity prices were the most expensive in the second quarter of 2014 in the CWE region.
- On the 4th of February 2014 the coupling of North Western European (NWE) day-ahead markets was launched, and fifteen countries¹, representing three quarters of the European electricity consumption have been coupled, using the Price Coupling of Regions mechanism. On the 13th of May the South Western Europe region (Spain and Portugal) was coupled with NWE, increasing the number of participating countries to seventeen in the market coupling.
- Introduction of market couplings has made implicit cross-border auctions easier and might contribute to increase in traded volumes of power and market liquidity, however, prices do not necessarily converge after the coupling takes place; different national power mixes and lack of sufficient level physical interconnections may raise obstacles to convergence of power prices within the coupled area.

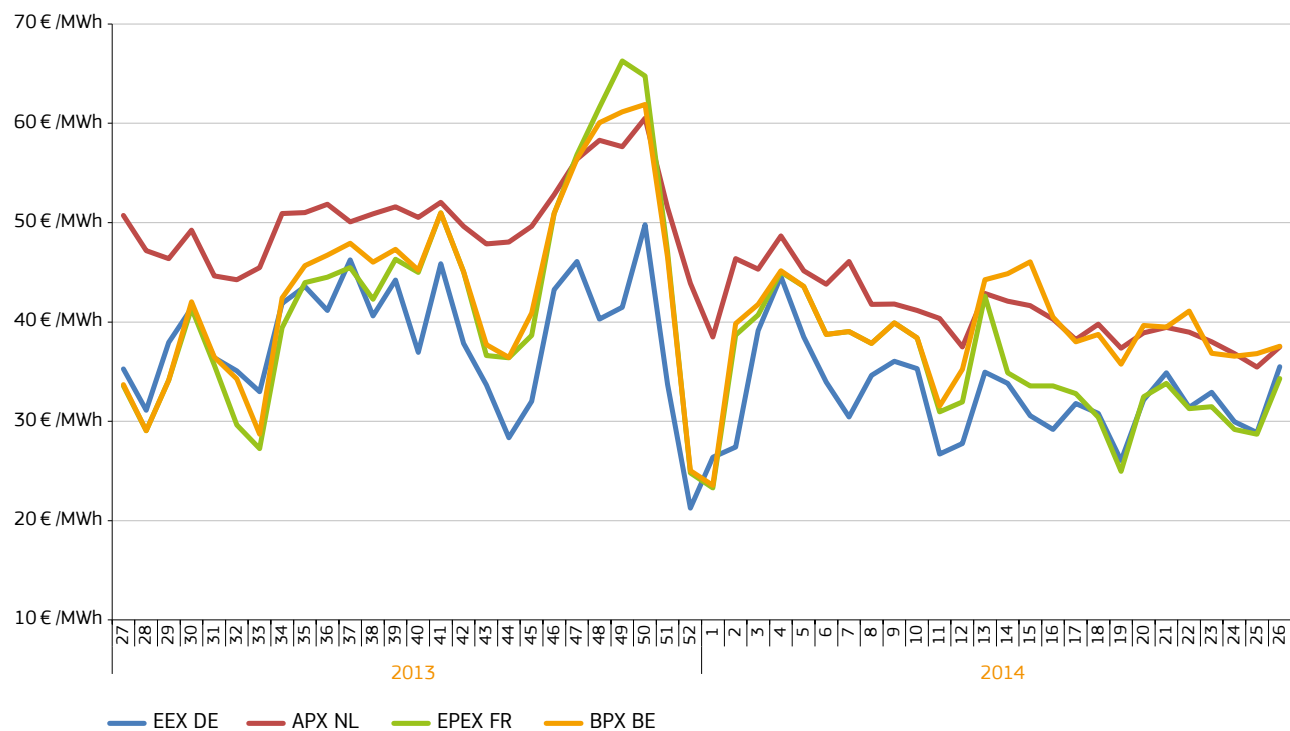
¹ United Kingdom, Germany, France, Belgium, Netherlands, Luxembourg, Austria, Norway, Sweden, Finland, Denmark, Estonia, Latvia, Lithuania. Poland is partially coupled through the SwePol link

FIGURE 14 – MONTHLY TRADED VOLUMES AND PRICES IN CENTRAL WESTERN EUROPE



Source: Platts, EPEX

FIGURE 15 – WEEKLY AVERAGE WHOLESALE POWER PRICES IN THE CWE REGION

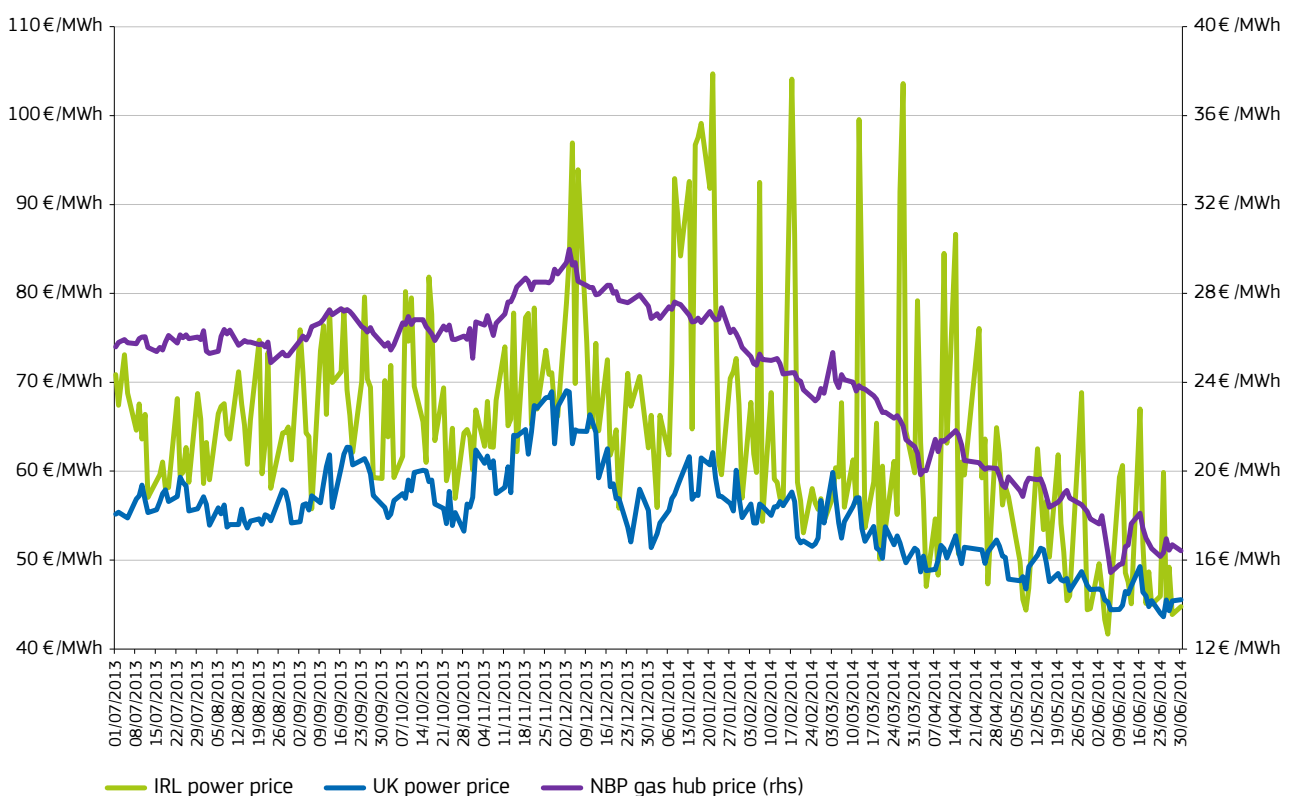


Source: Platts

4.2 British Isles (UK, Ireland)

- Figure 16 shows the daily average baseload power prices in the UK and Ireland between July 2013 and June 2014.
- Power prices in the UK were stable between July and October 2013, due to milder summer temperatures than in the continental Europe, good nuclear availability and strong wind generation in the end of this period, despite outages in September and bullish gas prices at the beginning of autumn. In November and December 2013, as the winter season arrived, temperatures became lower and gas prices went up, resulting in higher wholesale electricity prices. However, at the end of December wind generation reached high levels, which combined with the subdued power demand during the holiday season led to plunge in UK wholesale power prices.
- From the beginning of 2014 gas prices on the NBP hub started to fall, due to milder than normal winter temperatures, permanently high storage levels and subdued demand for natural gas. This resulted in a continuous decrease in UK wholesale power prices, reaching 46 €/MWh in June 2014 on average, which was the lowest since May 2010. The impact of the Carbon Price Support, increased as of 1st of April 2014 from 4.94 GBP /mt CO₂ to 9.55 GBP/mt CO₂, could not really be tracked in the wholesale prices amid the generally bearish mood.
- In spite of the improving profitability of gas-fired power generation, (See Figure 8) the share of gas decreased further in the UK power mix, reaching 18% in the January-April period of 2014, being lower than in the same period of the previous year (25%). At the same time the importance of wind is increasing, this source assured 7% of all power generation in the first four months of 2014, after reaching almost 10% in December 2013.
- Although the British wholesale electricity market was coupled with the CWE region in February 2014, UK prices in Q2 2014 still had a significant premium to the Dutch and the French markets (9.6 €/MWh and 16.6 €/MWh, respectively), signalling that market coupling does not necessarily lead to price convergence between neighbouring markets.
- Irish day-ahead power was closely following the UK peers during the second half of 2013, however, between December 2013 and April 2014 there were several price spikes in Ireland, which might be linked to reduced power inflows from the UK and domestic generation outages. Wind has become an important source and assured 24% of domestic power generation in January-April 2014, which was higher than a year before (19%). Given its variable nature, high volatility of wholesale prices in Ireland can partly be explained by increasing share of wind.

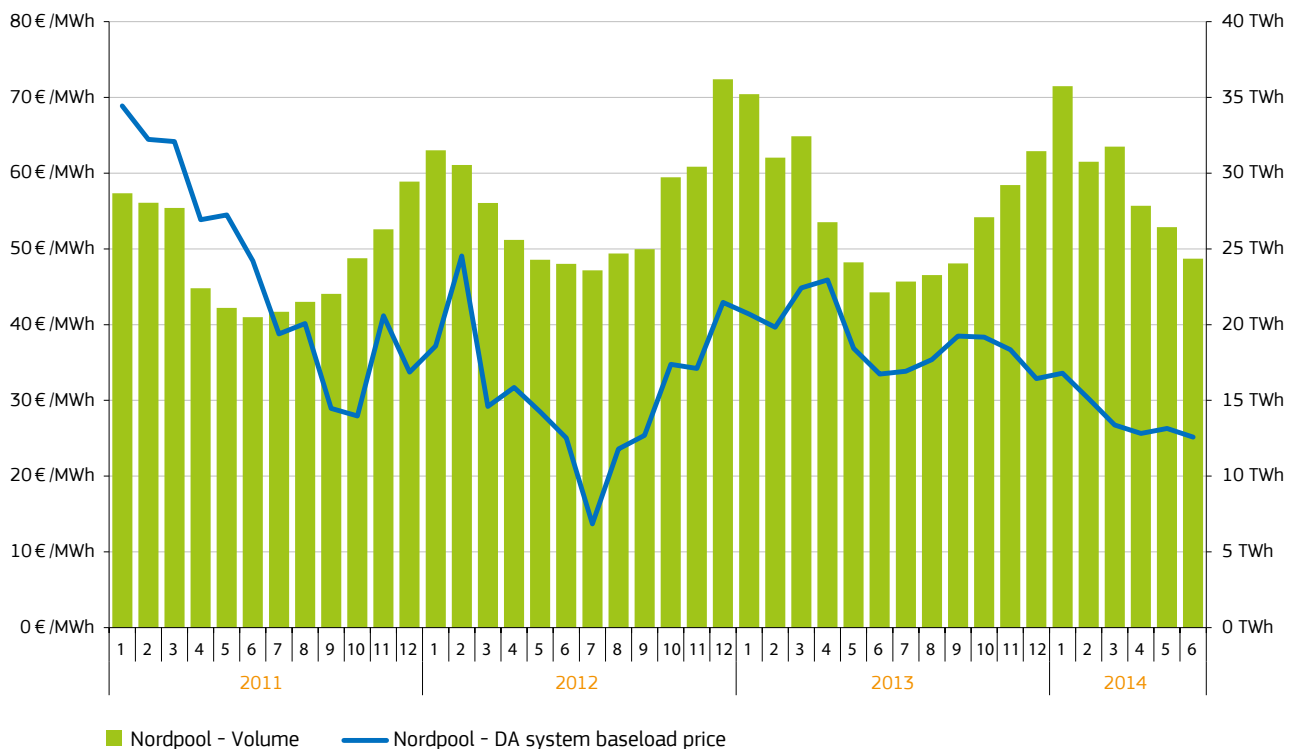
FIGURE 16 – DAILY AVERAGE POWER PRICES IN THE UK AND IRELAND, IMPACTED BY GAS PRICES



4.3 Northern Europe (Denmark, Estonia, Finland, Latvia, Lithuania, Norway, Sweden)

- Figure 17 shows the evolution of monthly day-ahead baseload power contracts in the Nordic markets. The strong seasonality in monthly traded volumes, corresponding to the change in electricity consumption in the countries of the region, also characterised the twelve month period between July 2013 and June 2014. The combined Nordic region traded power amounted to 22 TWh in July 2013, reached more than 35 TWh in January 2014 and fell back below 25 TWh in June 2014.
- In the second half of 2013, as Nordic hydro reserve levels were lower than the long-term seasonal average, the monthly average baseload power system remained stable in the range of 30-40 €/MWh. As of 2014, as hydro generation picked up again, and as wholesale power prices followed a decreasing path in North Western Europe, Nordic prices also began to fall, and in June 2014 they reached 25 €/MWh on average, being the lowest since September 2012.
- In the consequence of falling prices in the Nordpool market a perceivable price discount appeared to the markets of Central and Western Europe, providing good opportunity to export cheap power to this region. By the end of the first half of 2014 the net power export balance of Nordic region reached its highest value since the second half of 2012.
- However, not all power areas in the Nordpool market could benefit from increasing hydro-based power generation. In spite of the decreasing price level, area prices in Latvia or Lithuania, two countries not having sufficient level interconnections with other areas of Nordpool, did not follow the decreasing path of the area prices elsewhere in the region, and by June 2014 they showed a premium of almost 30 €/MWh to the Nordpool system price.

FIGURE 17 – MONTHLY TRADED VOLUMES AND PRICES IN NORTHERN EUROPE

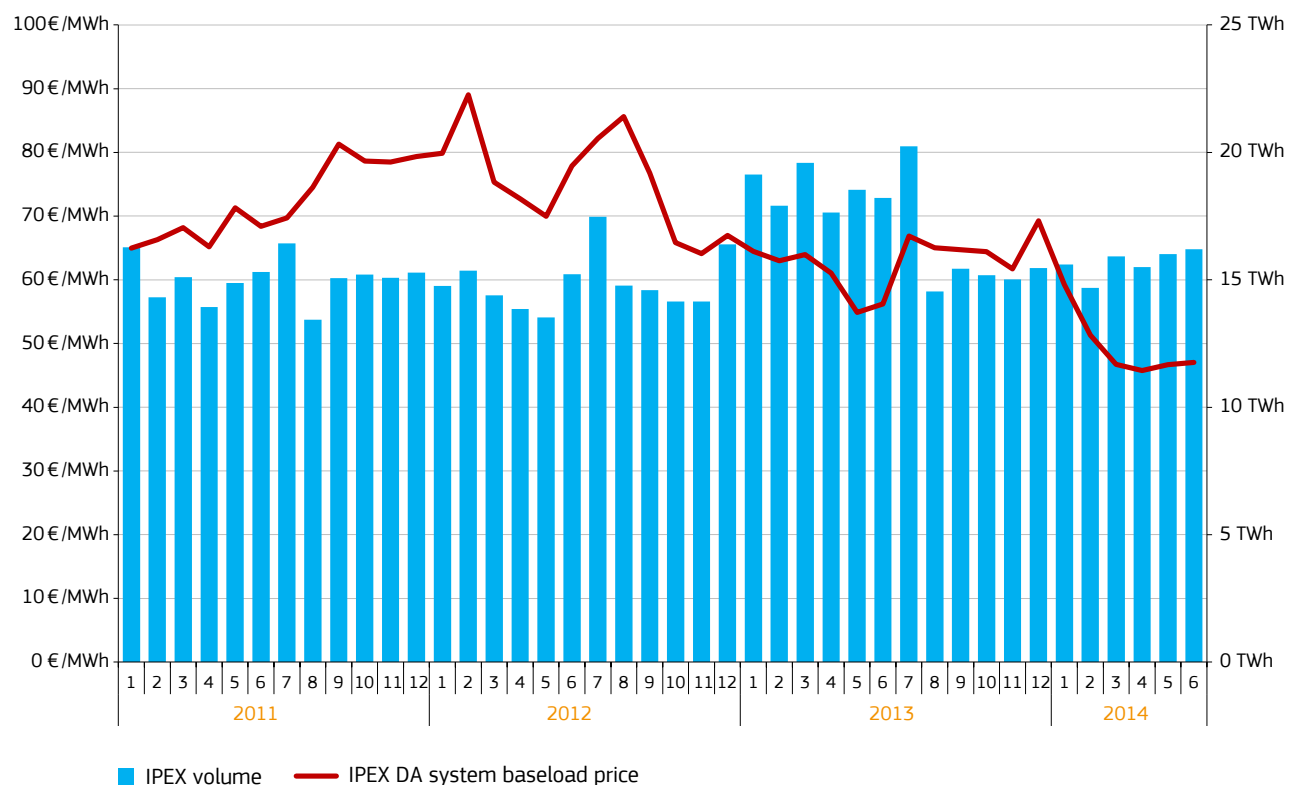


Source: Nordpool spot market

4.4 Apennine Peninsula (Italy)

- In the second half of 2013 the national Italian monthly average day-ahead baseload power price fluctuated in a range of 60-70 €/MWh. During the summer months wholesale electricity prices remained on high levels, due to increasing power demand for air conditioning. In October Italian national and regional prices were affected by power transmission line curtailments between different power regions (e.g.: between Sardinia, Sicily and mainland Italy).
- Due to a short-lived cold spell in the first half of December 2013, natural gas prices on the Italian PSV hub turned up sharply, resulting in spikes in wholesale electricity prices, which on average exceeded 80 €/MWh on some trading days. During the Christmas holiday season wholesale electricity prices returned to normal levels.
- From the beginning of 2014 Italian national wholesale electricity prices began to fall, mainly in the consequence of low demand for power (both industrial and residential demand), permanently decreasing natural gas prices and increasing share of renewables in domestic power generation.
- In April 2014 the share of hydro in Italian power mix was 25%, while the share of other renewables (solar, wind and biomass) amounted to 21%, which latter was the highest ever. At the same time the share of natural gas fell to 31%, being the lowest since the beginning of available time series (2006). Increasing share of renewables, replacing costlier gas-fired generation resulted in reducing power generation costs and prices in the wholesale market.
- Due to the aforementioned reasons, the monthly average Italian national baseload power price varied in a narrow range of 46-47 €/MWh between March and June 2014, being the lowest since November 2004.

FIGURE 18 – MONTHLY TRADED VOLUMES AND PRICES IN ITALY

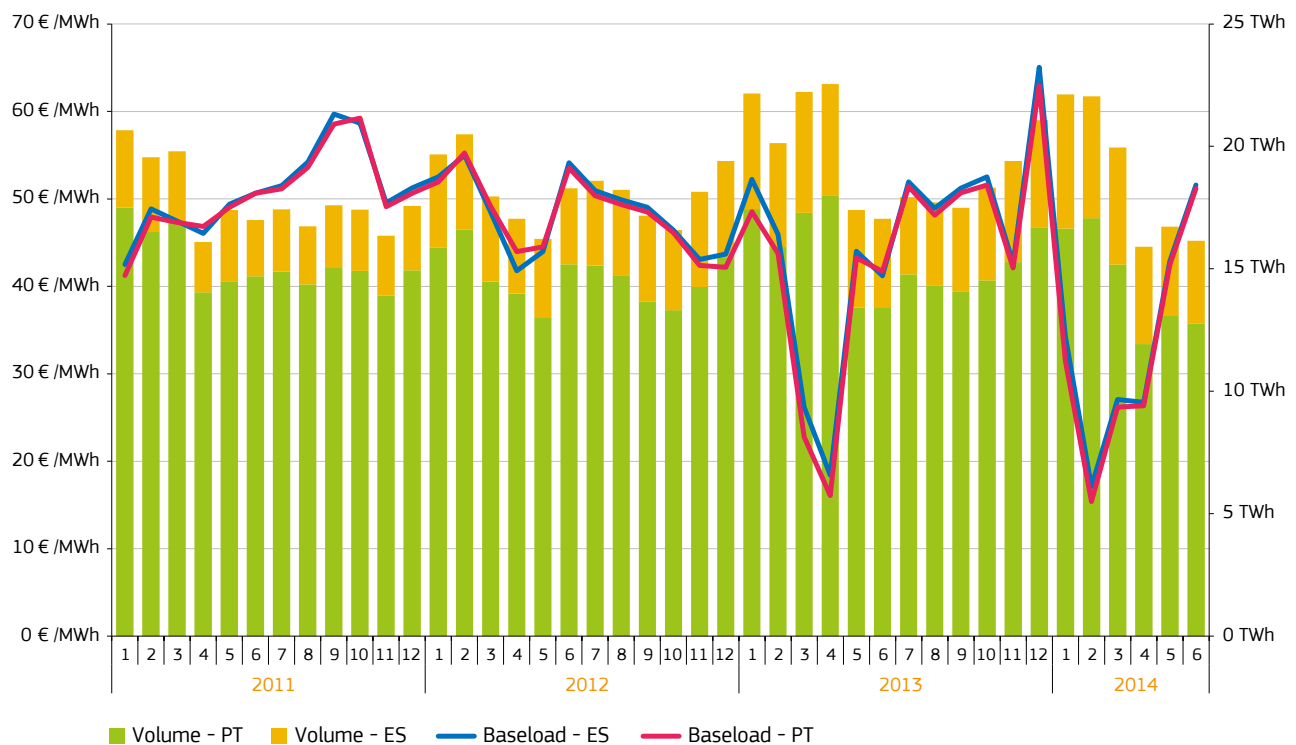


Source: GME (IPEX)

4.5 Iberian Peninsula (Spain and Portugal)

- Between July and October 2013 monthly average day-ahead baseload prices in Spain and Portugal were fairly stable, fluctuating around 50 €/MWh. Although the Spanish government announced further measures to tackle the problem of the so-called tariff deficit, having likely upward impact on wholesale prices, this was hardly visible during this period. In November, despite the beginning of the winter season, wholesale power prices fell due to high level of wind generation.
- In December 2013, as wind generation receded and hydro reserve levels fell ten percentage points below the long term seasonal average (see Figure 13), a sudden shift in the power mix towards costlier conventional sources resulted in wholesale price spikes, exceeding 90 €/MWh on daily average several times during the month. These were the highest daily averages since January 2008. On the other hand, during Christmas holidays prices fell in the range of 5-10 €/MWh, providing for an extremely high volatility of the market in December 2013.
- From January 2014 onwards wind and hydro based generation picked up again, squeezing out costlier conventional generation forms from the power mix, which resulted in decreasing wholesale power prices. In February 2014, as hydro assured 27% of domestic power generation in Spain and other renewables reached more than 30% (in Portugal the respective numbers were 50% and 34%) the Spanish monthly average price fell to 17.1 €/MWh (in Portugal it was 15.4 €/MWh), which were the lowest since the beginning of available time series (January 2007).
- In the second quarter of 2014 power supply margins tightened in the consequence of increasing demand for power and a series of planned outages of nuclear power plants (due to maintenance works). In May and June, as summer temperatures arrived, demand for power increased further (mainly due to domestic cooling needs), lifting the average wholesale price level above 50 €/MWh in both Spain and Portugal.

FIGURE 19 – MONTHLY TRADED VOLUMES AND PRICES IN THE IBERIAN PENINSULA

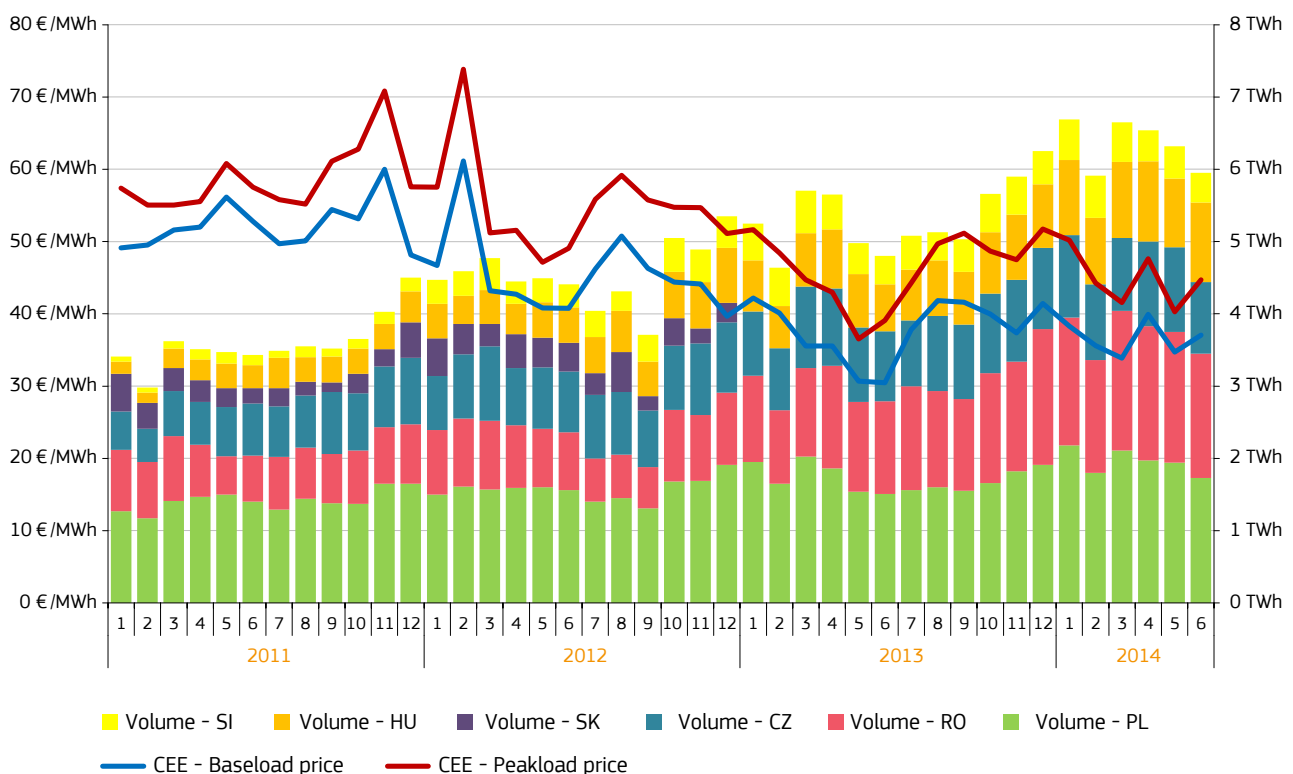


Source: Platts, OMEL

4.6 Central Eastern Europe (Czech Republic, Hungary, Poland, Romania, Slovakia, Slovenia)

- Between July 2013 and June 2014 Central Eastern Europe (CEE) remained the most dynamic power trading region in Europe. In the second quarter of 2014 traded volume of day-ahead power grew by more than 22 % on a yearly basis, outnumbering the growth in traded volume in the CWE region (3.4%) and in the Nordpool spot market (7%).
- As Figure 20 shows, monthly average baseload power prices started to recover in the July-September period of 2013, mainly due to increasing demand for power relating to hot summer weather, cross border capacity curtailments on the Polish-Slovak border, maintenance of Czech transmission lines and lower hydro supplies from the Balkan countries. In the remaining three months of 2013 milder than usual weather put a lid on power demand, which resulted in decreasing wholesale prices, however, temporary price spikes occurred due to plant outages in Poland and cross border capacity curtailments in Hungary (on the interconnector from Austria).
- In the first three months of 2014, as the weather was generally milder than usual in the CEE region (though at the end of January there was a short-lived cold spell, resulting in price spikes), and as power supply was healthy, wholesale power prices continued their downward trend.
- In April 2014, as the plant maintenance season started and significant generation capacities were taken offline in Poland (and in Hungary two nuclear reactors too), price spikes became more frequent. In spite of the increasing role of wind generation in Poland, the country normally having the lowest wholesale price in the CEE region, prices were the highest there in Q2 2014 on average, due to the ongoing non-availability of significant generation capacities. Flooding in the Balkans in May 2014 triggered shutdowns of several plants there, reducing power exports to Hungary, which resulted in increasing Hungarian wholesale power prices.
- Whereas countries like Czech Republic and Romania were strongly net exporters of electricity in the first half of 2014, mainly due to mothballing of gas-fired generation capacities Hungary became an increasingly net power importer. While in 2012 gas-fired generation assured 28% of generated power in Hungary, in the January-May 2014 period this proportion fell to 12% (and in June 2014 even below 7%). In the first five months of 2014 the country assured more than 35% of its domestic power consumption from import sources, showing the second highest electricity import dependency ratio after Lithuania in the EU.

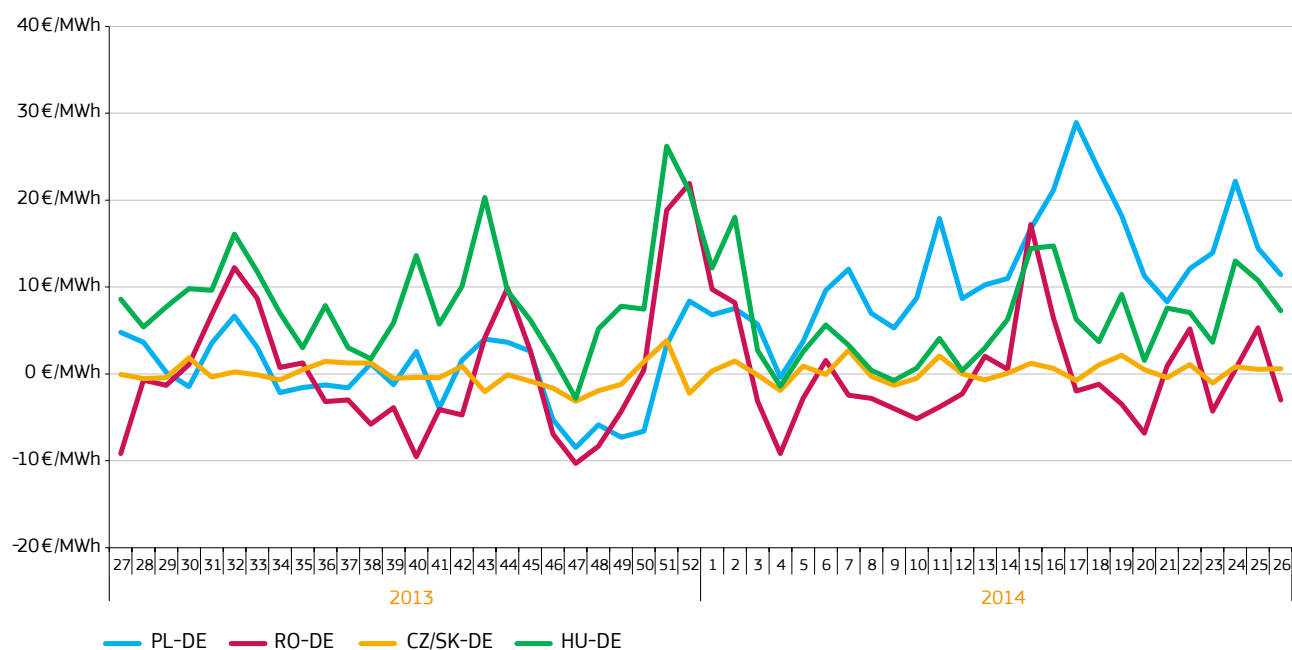
FIGURE 20 – MONTHLY TRADED VOLUMES AND PRICES IN CENTRAL EASTERN EUROPE



Source: Regional power exchanges, Central and Eastern Europe (CEE)

- Figure 21 shows the regional price premiums or discounts to the German market between July 2013 and June 2014 on weekly average.
- Czech and Slovakian baseload prices were the most closely aligned to German prices throughout the whole observation period. Polish prices were closely aligned to the German peers in the second half of 2013, however, due to the aforementioned capacity outages, they started to decouple from the German peers at the beginning of 2014, and at the end of April 2014 the Polish price premium over the German market was close to 30 €/MWh. Hungarian price premium to Germany strongly fluctuated in the function of the availability of power imports from neighbouring markets.

FIGURE 21 – REGIONAL WEEKLY BASELOAD PRICE PREMIUMS OR DISCOUNTS TO THE GERMAN MARKET

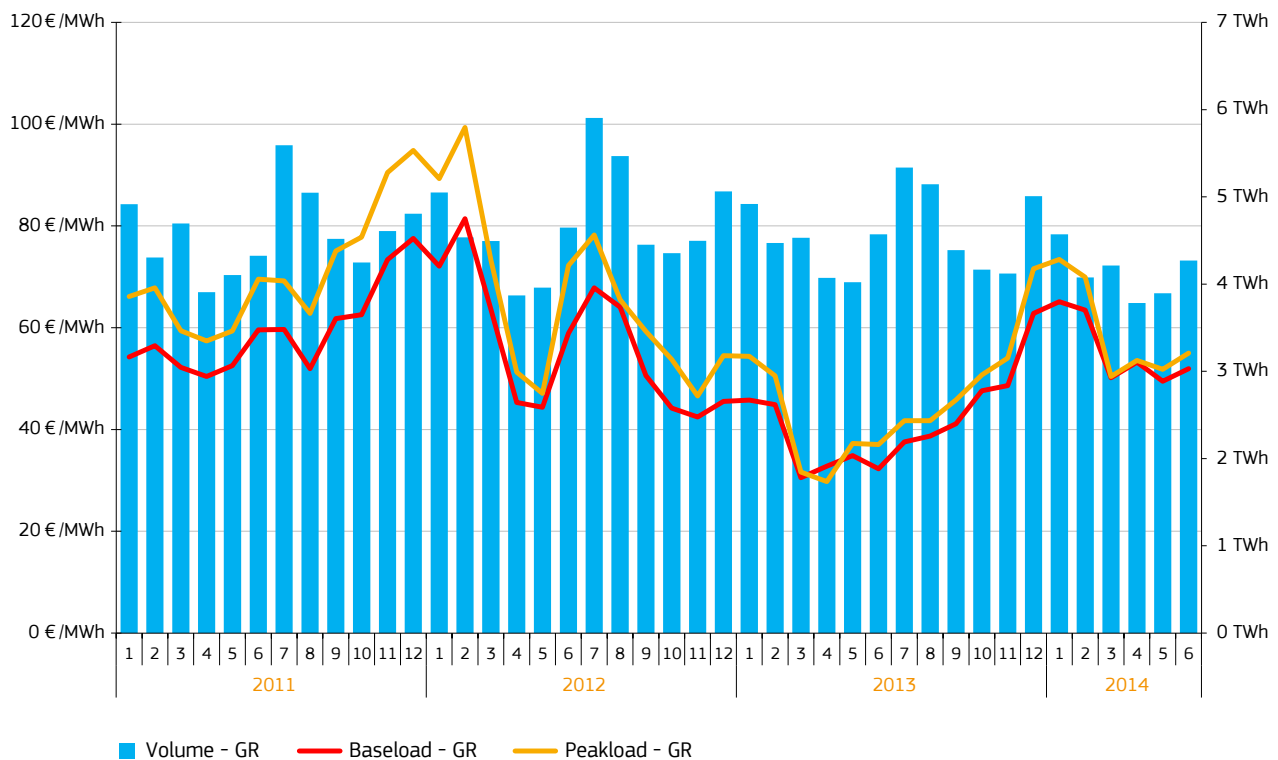


Source: Platts (EPEX), Regional power exchanges

4.7 South Eastern Europe (Greece)

- In Greece the monthly average baseload price started to recover after reaching several year lows in the second quarter of 2013. From 32.5 €/MWh measured in June 2013, monthly average baseload power prices practically doubled and reached 65 €/MWh in January 2014. Meanwhile, monthly average peakload contracts rose from 37 €/MWh to 73 €/MWh on average. Since then both monthly baseload and peakload averages receded, reaching respectively 52 €/MWh and 55 €/MWh in June 2014.
- The main reason for the significant rise in Greek power prices was the decrease in the domestic hydro-based and fossil fuel based power generation, which could not be fully substituted by increasing wind and solar generation. Consequently, the country's electricity consumption had to be satisfied increasingly from import sources, mainly from Bulgaria and the Former Yugoslav Republic of Macedonia.
- In the January-April period of 2014 domestic consumption of electricity showed a measurable increase (5%) in Greece compared to the same period of the previous year, for the first time since several years. This increasing demand for power was mainly satisfied from import sources that might also helped in keeping prices on higher levels in the first half of 2014 than a year before.

FIGURE 22 – MONTHLY TRADED VOLUMES AND PRICES IN GREECE

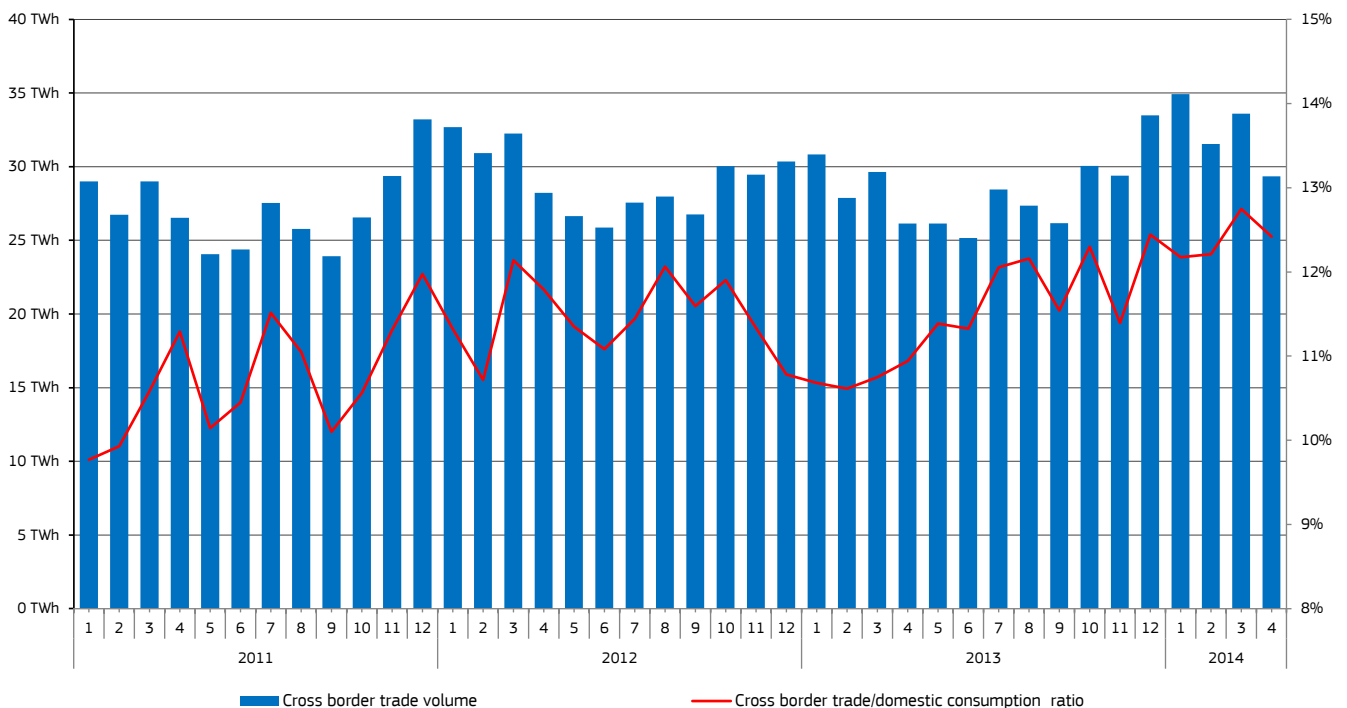


Source: DESMIE

5. Building the internal market for electricity

- In the January-April period of 2014 monthly cross-border physical power flows in the EU reached 32.4 TWh on average, being 13% higher than in the first four months of the previous year. During the last couple of years the increase in cross-border electricity flows was more significant than either the evolution of consumption of electricity in the EU or the increase in the traded volume of power on the European power trading platforms.
- As Figure 23 shows, in April 2014 the ratio of cross-border traded electricity compared to the monthly electricity consumption in the EU was 12.4%, being higher than in April 2013 (11%), or in January 2011, when it was only 9.8%.
- Given that consumption of electricity in the EU slightly decreased in the first four months of 2014, compared with the same period of 2013, increasing cross-border trade contributed to increasing market liquidity, growing interdependency and integration of European electricity markets.

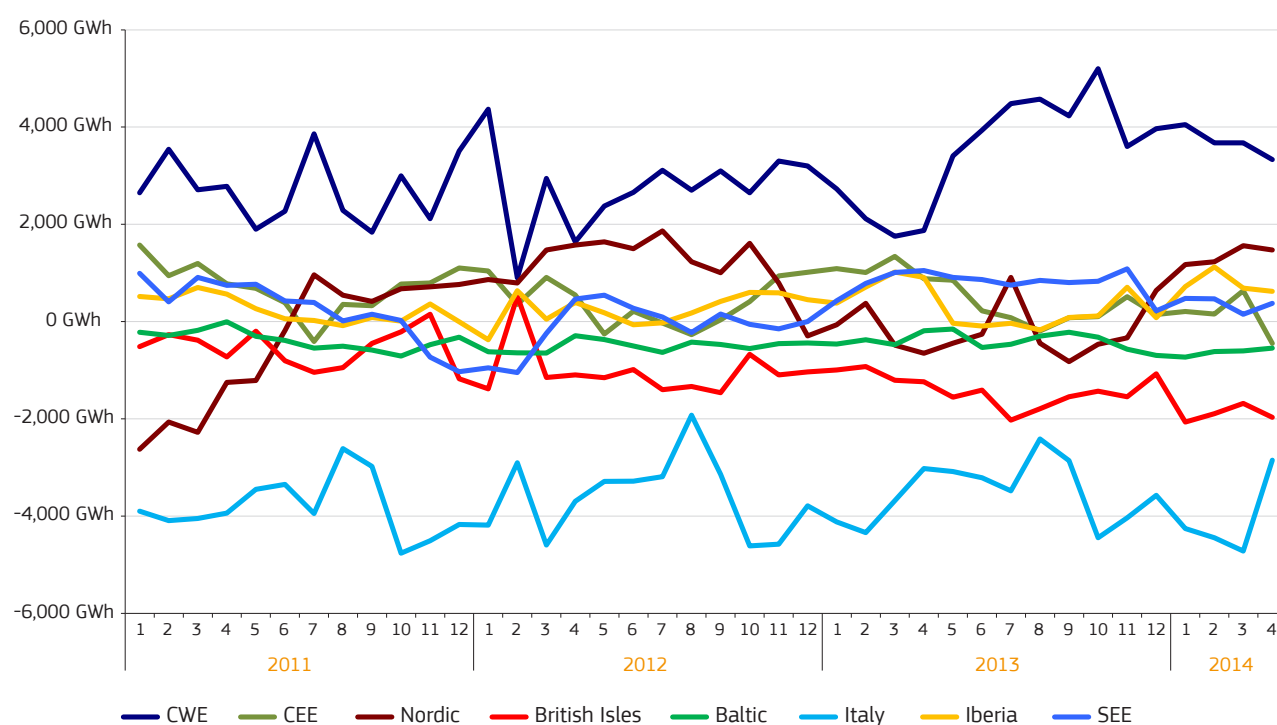
FIGURE 23 – MONTHLY VOLUME OF CROSS-BORDER TRADED ELECTRICITY AND ITS RATIO COMPARED TO THE CONSUMPTION IN THE EU



Source: ENTSO-E. Malta and Cyprus are missing

- Between July 2013 and June 2014, the net power outflow (exporter) position of the CWE region stabilised around historically high levels - 4,000 GWh on monthly average. Competitive wholesale prices in the region assured cheap export sources to other regions of Europe. Similarly to the CWE, the Nordic region also intensified its power export activities from the beginning of 2014, mainly due to its price discount to the major continental European regions.
- In contrast, the British Isles tended to rely more and more on power imports, as cheaper continental sources offered a competitive alternative to domestic fossil fuel based power generation. Italy, which is traditionally a net power importer, retained this position during the first half of 2014, however, due to falling domestic wholesale power prices its import surplus dwindled in March-April 2014.
- The net position of the remaining four regions was close to the equilibrium; Central and Eastern Europe, South Eastern Europe and the Iberian-peninsula were net power exporters, while the Baltic region was net power imported between July 2013 and June 2014.
- Figure 25 shows the map of commercial power flows between neighbouring markets in most countries of the European continent, providing information on cross-border power flows and the net electricity exporter or importer position of each country in the January-April 2014 period.

FIGURE 24 – EU CROSS BORDER MONTHLY PHYSICAL FLOWS BY REGION

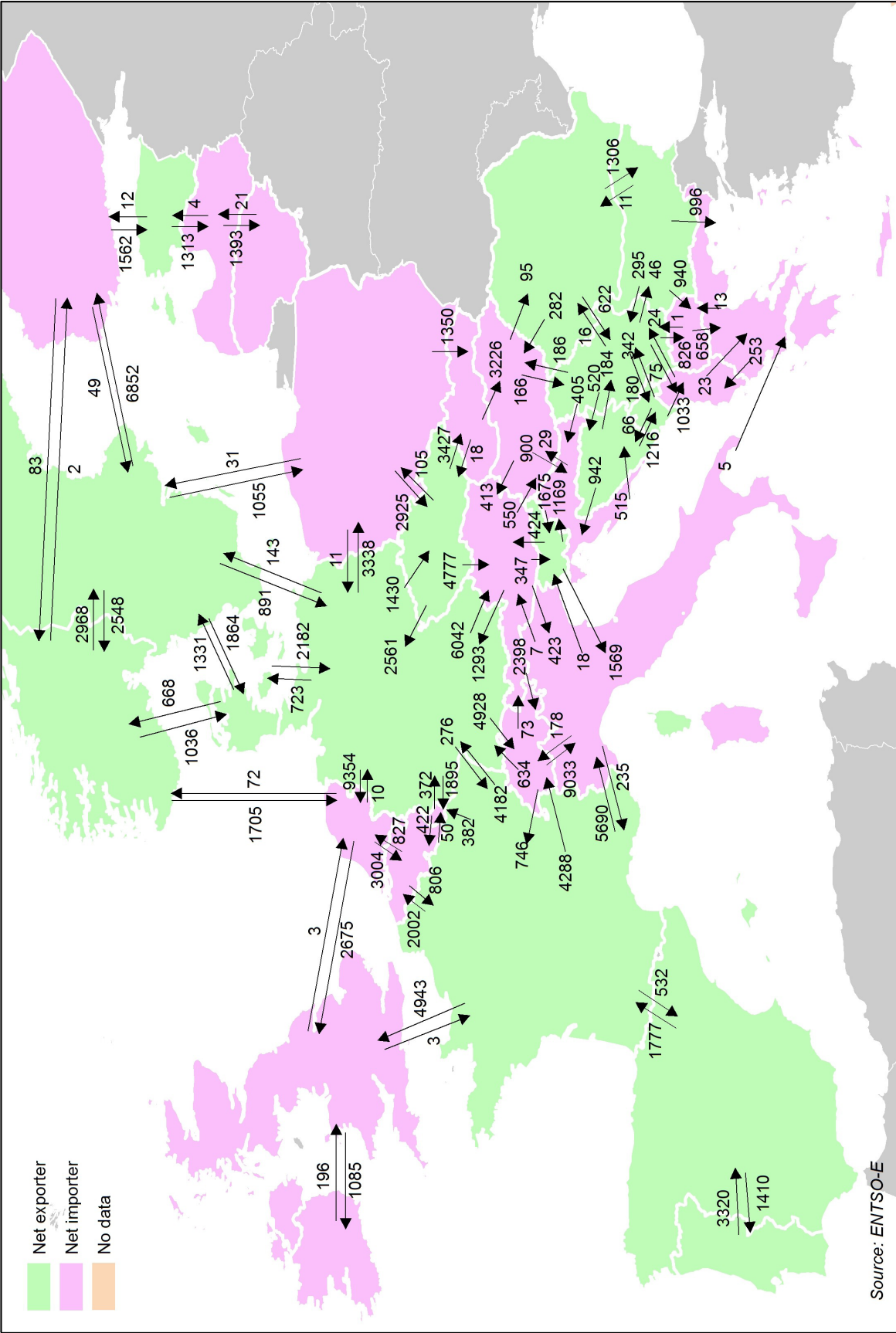


European countries are grouped in the following regions:

Central Western Europe	DE, NL, FR, LU, BE, AT, CH
Central Eastern Europe	PL, CZ, HU, SK, HR, SI
Iberian Peninsula	ES, PT
South Eastern Europe	RO, BG, GR, RS, BA, ME, FYROM, AL

Nordic	SE, FI, DK, NO
British Isles	UK, IE
Apennine Peninsula	IT
Baltic	EE, LT, LV

FIGURE 25 – COMMERCIAL ELECTRICITY FLOWS IN GWH IN JANUARY-APRIL 2014 (FINAL SCHEDULE)



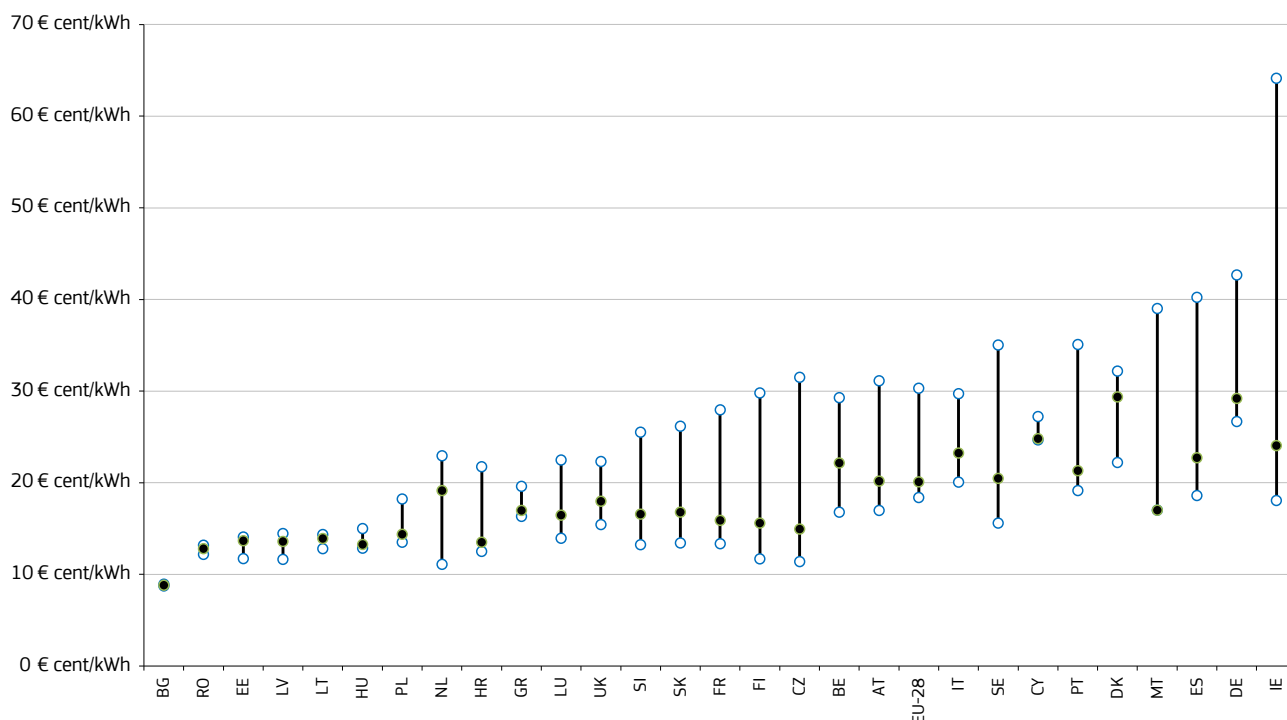
Data for some countries are not available (see the legend). Due to presentation constraints the Northern European countries and Cyprus cannot be included on the map completely. There is no data available on Kosovo under UNSCR 12/4499. Data on flows between Germany and Austria are estimates. For the majority of the reported borders, commercial flow data is netted on hourly frequency. In the case of the Czech-Slovak border, gross commercial values are given.

6. Retail electricity prices in the EU

- *Figure 26 and Figure 27* show the retail electricity price ranges for household and industrial consumers in the second half of 2013, for different consumption bands.
- Retail prices paid by households include all taxes, while retail prices paid by industrial customers are prices without VAT and recoverable taxes.
- The blank bubbles at the top and bottom of the ranges show the highest and the lowest prices in different consumption bands, while the black filled bubble shows Dc and Ic band prices², which are prices paid by consumers with average consumption. In most Member States, it can be observed that the higher the consumption, the lower the retail electricity price (per kWh) paid in the case of both household and industrial consumers.
- The largest difference between prices of different household consumption bands could be observed in Ireland (64.1 €cents in Band Da and 18.1 €cents/kWh in Band De), while for the industrial consumers the largest difference occurred in Spain (6.6 €cents/kWh in Band Ig and 25 €cents/kWh in Band Ia). Fixed elements in the consumer invoices, being independent from the amount of consumed electricity in a given period of time, may result in higher unit prices for consumers having lower consumption.
- In household consumption band Dc (annual consumption between 2,500 kWh and 5,000 kWh) households in Bulgaria paid the lowest price (8.8 €cents/kWh), while households in Denmark paid the highest price (29.4 €cents/kWh) in the EU in the second semester of 2013. Compared to the second semester of 2012 the highest price increases could be observed in Estonia (22%), Greece (20%) and Romania (19%), while household prices in the Dc consumption band decreased mostly in Hungary (-18%) and Cyprus (-15%).
- In industrial consumption band Ic (annual consumption between 500 MWh and 2,000 MWh) consumers in Bulgaria paid the lowest price (7.3 €cents/kWh), while industrial consumers in Cyprus paid the highest price (20.1 €cents/kWh) in the EU in the second semester of 2013. Compared to the second semester of 2012 the highest price increases could be observed in Estonia (19%) and Germany (11%), whereas the steepest decreases occurred in Cyprus (-14%) and Poland (-8%).
- The maps (Figure 28 and Figure 29) on the next two pages show retail electricity prices paid by households (with an annual consumption between 2,500 kWh and 5,000 kWh, including all taxes) and by industrial customers (with an annual consumption between 500 MWh and 2,000 MWh, without VAT and non-recoverable taxes) in the second half of 2013, which are the most recently available data from Eurostat.

² Price categories defined by Eurostat, according to annual electricity consumption. See the legend below the charts on the next page.

FIGURE 26 – RANGES OF ELECTRICITY PRICES PAID BY HOUSEHOLD (ALL TAXES INCLUDED) CONSUMERS IN DIFFERENT ANNUAL CONSUMPTION BANDS IN EU MEMBER STATES, 2ND SEMESTER OF 2013



Source: Eurostat

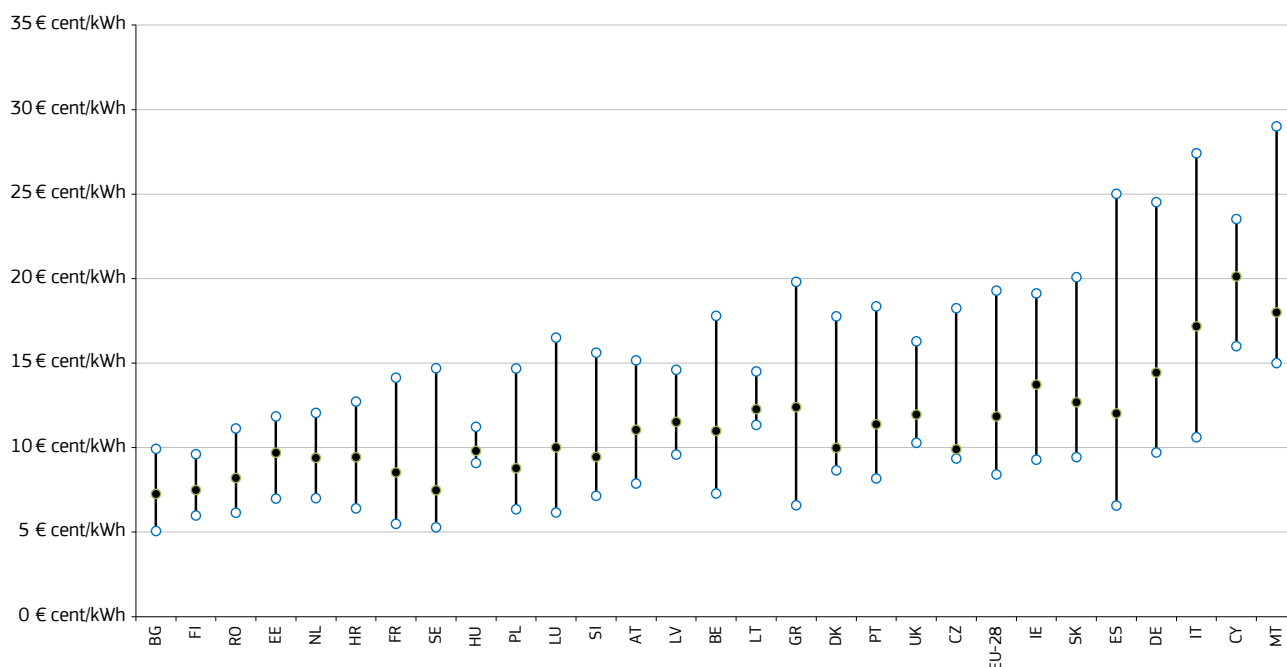
Prices include all taxes. Price categories refer to annual consumption bands defined by Eurostat.

Band DA : Consumption < 1 000 kWh • Band DB : 1 000 kWh < Consumption < 2 500 kWh

Band DC : 2 500 kWh < Consumption < 5 000 kWh • Band DD : 5 000 kWh < Consumption < 15 000 kWh

Band DE : Consumption > 15 000 kWh • The black bubble shows Band Dc price.

FIGURE 27 – RANGES OF ELECTRICITY PRICES PAID BY INDUSTRIAL (WITHOUT VAT) CONSUMERS IN DIFFERENT ANNUAL CONSUMPTION BANDS IN EU MEMBER STATES, 2ND SEMESTER OF 2013



Source: Eurostat

Prices excluding VAT and non-recoverable taxes. Price categories refer to annual consumption bands defined by Eurostat.

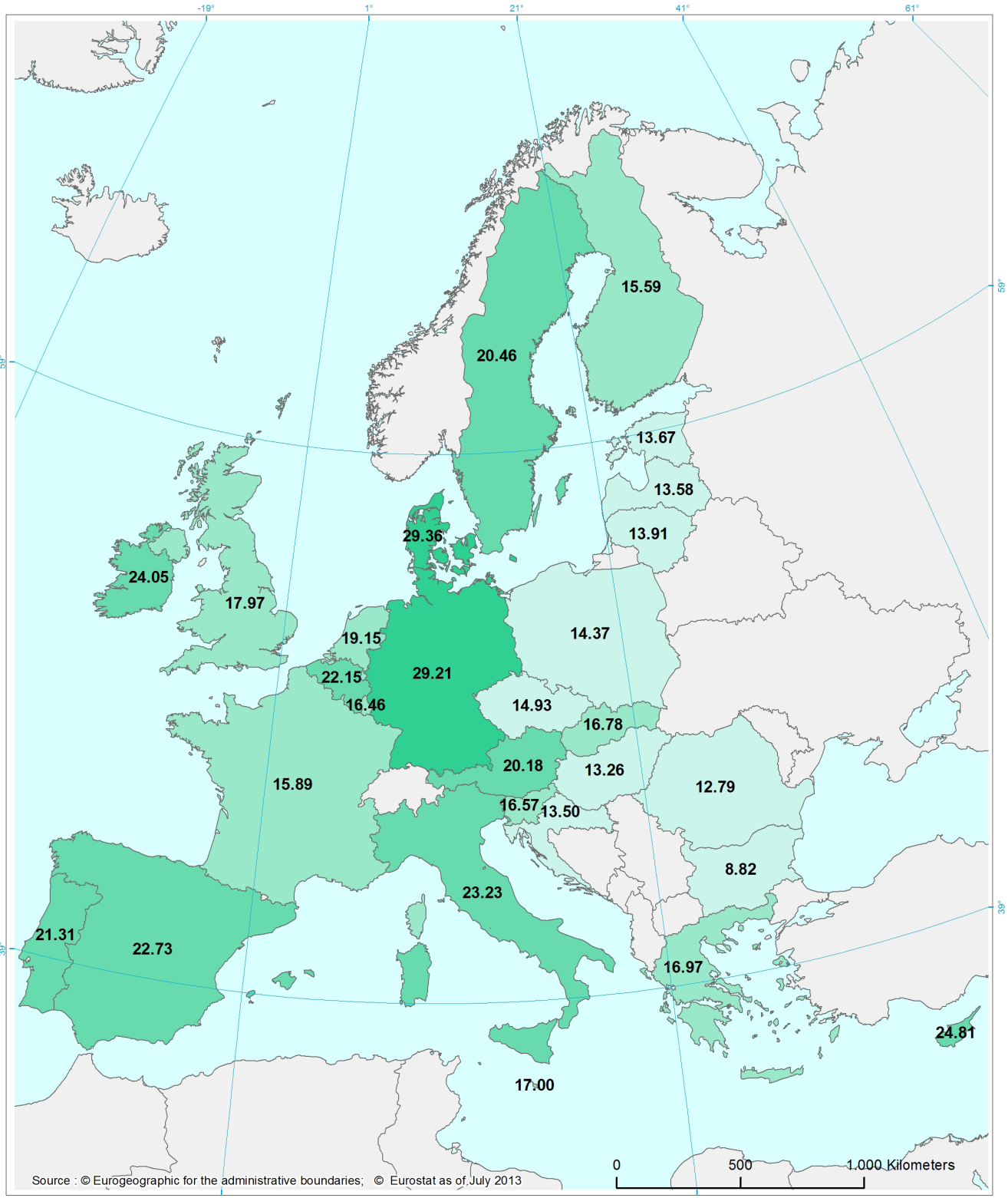
Band IA : Consumption < 20 MWh • Band IB : 20 MWh < Consumption < 500 MWh

Band IC : 500 MWh < Consumption < 2 000 MWh • Band ID : 2 000 MWh < Consumption < 20 000 MWh

Band IE : 20 000 MWh < Consumption < 70 000 MWh • Band IF : 70 000 MWh < Consumption < 150 000 MWh

Band IG : Consumption > 150 000 MWh • The black bubble shows Band Ic price.

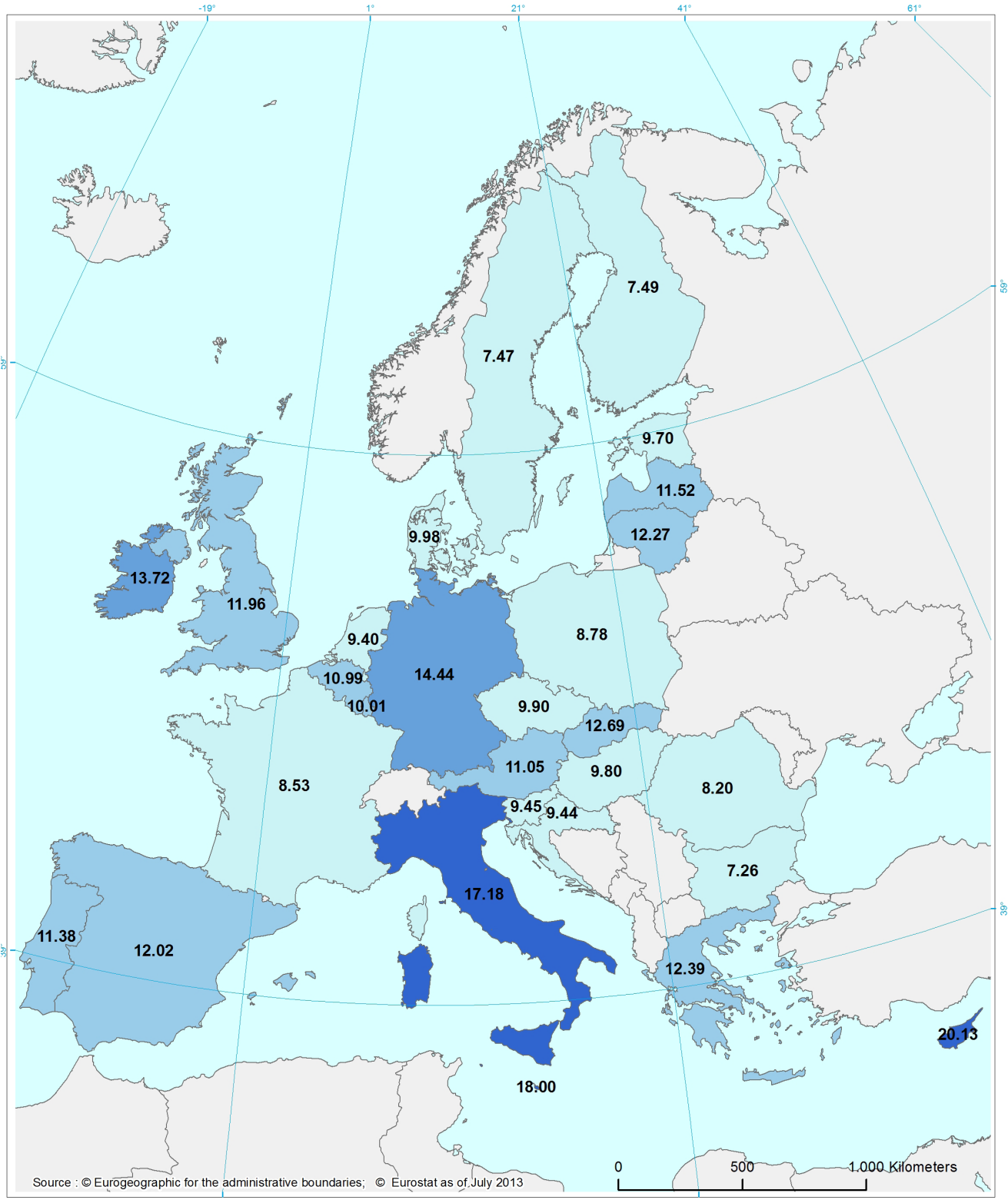
FIGURE 28 – ELECTRICITY PRICES (INCLUSIVE OF TAXES) – HOUSEHOLDS – PRICES: 2ND SEMESTER 2013



**BAND DC : 2 500 KWH < CONSUMPTION < 5 000 KWH
PRICES PER KWH (C€)**

- < 15.01
- 15.01 - 20.00
- 20.01 - 25.00
- > 25.00

**FIGURE 29 – ELECTRICITY PRICES (WITHOUT VAT AND NON-RECOVERABLE TAXES) – INDUSTRIAL CONSUMERS –
PRICES: 2ND SEMESTER 2013**



**BAND IC : 500 MWH < CONSUMPTION < 2 000 MWH
PRICES PER KWH (C€)**

- < 10.01
- 10.01 - 13.00
- 13.01 - 16.00
- > 16.00

7. Glossary

Backwardation occurs when the closer-to-maturity contract is priced higher than the contract which matures at a later stage.

Clean dark spreads are defined as the average difference between the price of coal and carbon emission, and the equivalent price of electricity. If the level of dark spreads is above 0, coal power plant operators are competitive in the observed period. *See dark spreads.*

Clean spark spreads are defined as the average difference between the cost of gas and emissions, and the equivalent price of electricity. If the level of spark spreads is above 0, gas power plant operators are competitive in the observed period. *See spark spreads.*

Contango: A situation of contango arises in the when the closer to maturity contract has a lower price than the contract which is longer to maturity on the forward curve.

Cooling degree days (CDDs) are defined in a similar manner as Heating Degree Days (HDDs); the higher the outdoor temperature is, the higher is the number of CDDs. On those days, when the daily average outdoor temperature is higher than 21°C, CDD values are in the range of positive numbers, otherwise CDD equals zero.

Dark spreads are reported as indicative prices giving the average difference between the cost of coal delivered ex-ship and the power price. As such, they do not include operation, maintenance or transport costs. Spreads are defined for a coal-fired plant with 35 % efficiency. Dark spreads are given in this publication for UK and Germany, with the coal and power reference price as reported by *Platts*.

Flow against price differentials (FAPDs): By combining hourly price and flow data, FAPDs are designed to give a measure of the consistency of economic decisions of market participants in the context of close to real time operation of electrical systems.

With the closure of the day-ahead markets (D-1), the prices for each hourly slot of day D are known by market participants. Based on the information from the power exchanges of two neighbouring areas, market participants can establish hourly price differentials. Later in D-1, market participants also nominate commercial schedules for day D. An event named 'flow against price differentials' (FAPD) occurs when commercial nominations for cross border capacities are such that power is set to flow from a higher price area to a lower price area. The FAPD chart in this quarterly report provides detailed information on adverse flows, presenting the ratio of the number of hours with adverse flows to the number of total trading hours in a quarter.

Heating degree days (HDDs) express the severity of a meteorological condition for a given area and in a specific time period. HDDs are defined relative to the outdoor temperature and to what is considered as comfortable room temperature. The colder is the weather, the higher is the number of HDDs. These quantitative indices are designed to reflect the demand for energy needed to heat a building.

Spark spreads are reported as indicative prices giving the average difference between the cost of natural gas delivered ex-ship and the power price. As such, they do not include operation, maintenance or transport costs. Spreads are defined for a gas-fired plant with 50 % efficiency. Spark spreads are given for UK and Germany in this publication, with the gas and power reference price as reported by *Platts*.

Tariff deficit expresses the difference between the price (called a tariff) that a *regulated utility*, such as an electricity producer is allowed to charge and its generation cost per unit..

