European Commission

Quarterly Report on European Electricity Markets

Market Observatory for Energy

DG Energy

Volume 6, issue 2
Second quarter 2013

Energy

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Content

Highlights

- **Electricity consumption in the EU decreased by 0.7% in the first four months of 2013 compared to the same period of 2012.** Parallel to this, the EU Gross Domestic Product (GDP) shrunk by 0.7% in the first quarter of 2013, on a year-on-year comparison.

- In spite of decreasing electricity consumption, traded volume of day-ahead power contracts on European trading platforms grew by 9% in the second quarter of 2013 (after having grown by 10% in the previous quarter). Cross-border physical power flows increased by 6% in the EU as a whole in the second quarter of 2013 on a year-on-year comparison, after a growth of 4% registered in the previous quarter. As in previous quarters, decreasing power consumption combined with increase in power trading illustrates a **continued increase in market liquidity and further integration of the European wholesale electricity markets.**

- **In the Central West European (market-coupled) area, prices started to recouple in the second quarter of 2013, after significant price divergences observed in earlier periods.** After the end of wintry weather at the beginning of April in France, prices fell and were realigned with German prices, which were kept low due to high levels of renewable power generation, cheap coal and low carbon prices. In early June, after ten months of nuclear safety inspections, the reconnection of two nuclear power plants to the grid in Belgium reduced the power import needs of the country and enabled prices to realign with the German market. Netherlands was the only market in the Central West European region which continued to experience a significant price premium to Germany.

- **Gas-fired power generation continued to fall in most of the EU countries in the second quarter of 2013,** as gas prices stabilised at high levels, and coal prices continued decreasing, in parallel with carbon prices falling to record lows in April. Although falling continental power prices reduced the profitability of coal-fired generation, the share of coal rose above 50% in the German power mix in the first half of 2013. In the UK, coal-fired generation remained profitable as power prices were higher than their continental peers, partly owing to the impact of the newly introduced carbon price floor in April 2013.

- **Intermittent power generation sources, such as wind and solar, played an increasingly important role in the power mixes of many European countries during the second quarter of 2013.** In Central Western and Central Eastern Europe, high levels of renewables generation contributed to the lowest wholesale power prices observed in the last few years.

- **Frequent occurrences of negative prices in many European markets signal the need for better integration of renewables into the power grid.** On a Sunday afternoon in mid-June wind and solar assured more than 60% of power generation in Germany, resulting in negative hourly prices in the whole CWE region. In Spain, besides wind and solar, abundant hydro-based generation resulted in the lowest monthly wholesale power price in April 2013 during the last three years.

- **The largest difference in retail prices for electricity between Member States could be observed in the case of household and industrial consumers with the lowest electricity consumption** according to data covering the second semester of 2012. In the case of higher consumption, the price difference was less significant between Member States.

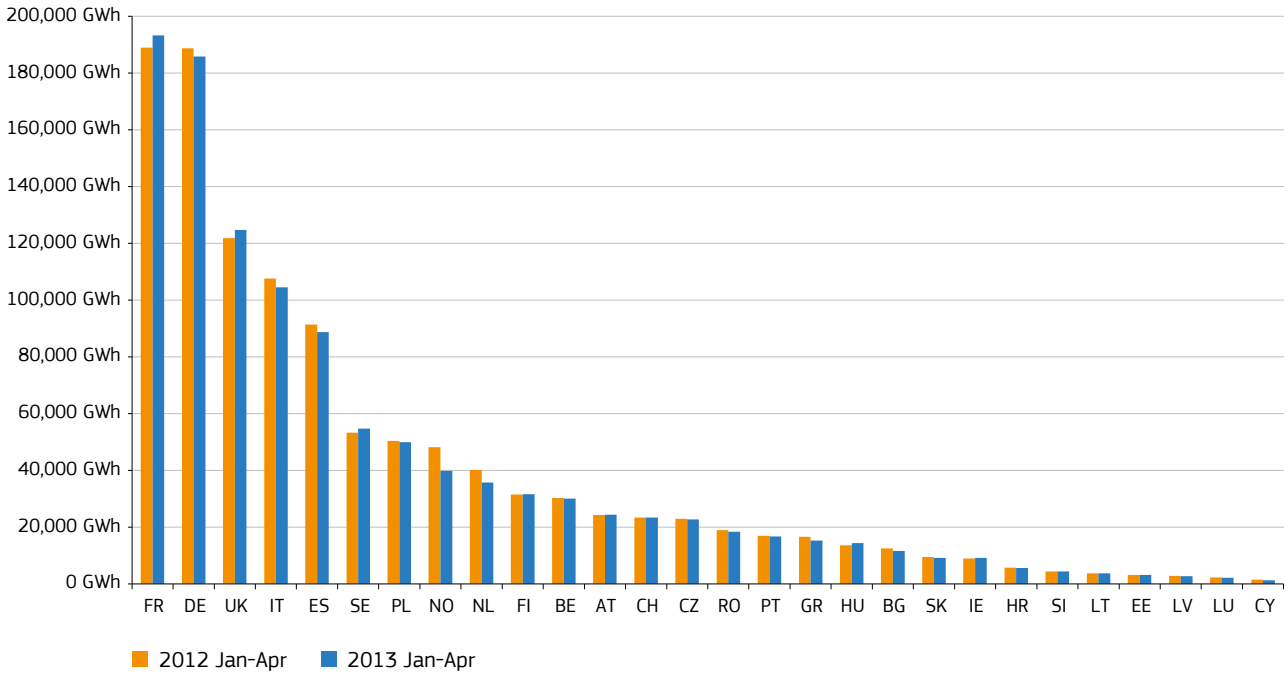
- **Generally across Member States, the higher the average electricity price in a given country, the larger the difference in prices between different consumption bands.** This is true in most Member States for both household and industrial consumers. Retail prices for the lowest annual consumption band are normally the highest among all consumption categories.

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 (plus Norway and Switzerland) in the first four months of 2012 and 2013. Consumption of electricity decreased by 0.7% in the EU in January-April 2013 compared to the same period of the previous year.

FIGURE 1 – ELECTRICITY CONSUMPTION IN EU MEMBER STATES, JANUARY-APRIL 2012 AND JANUARY-APRIL 2013

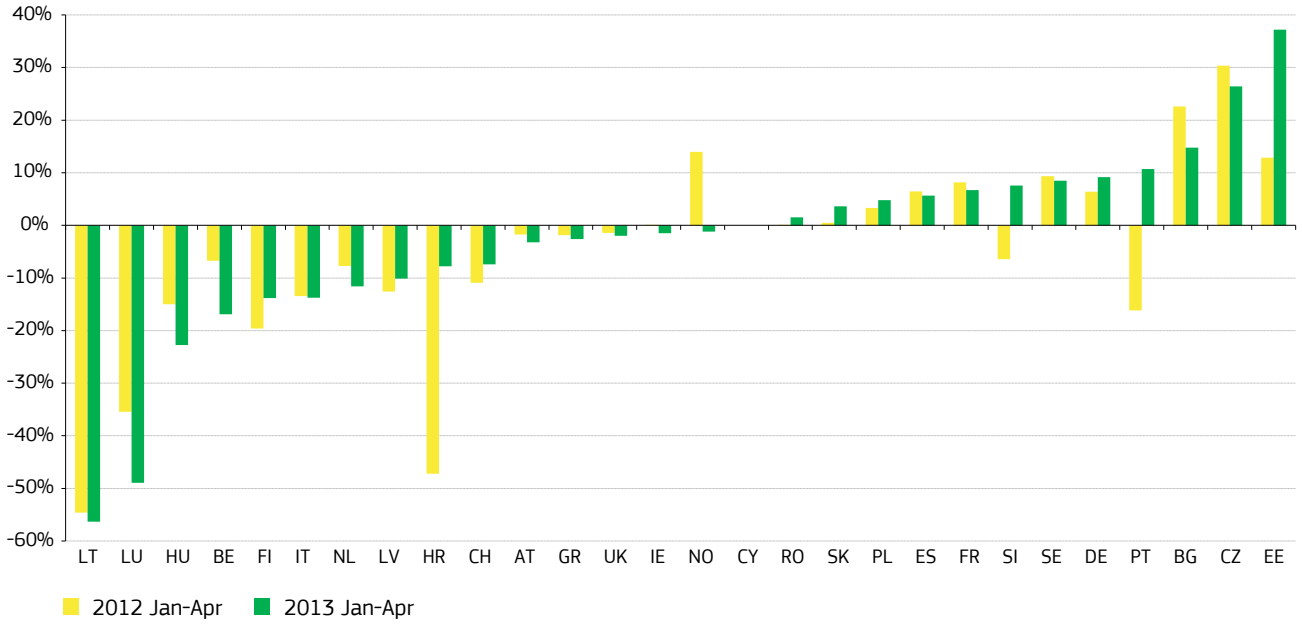


Source: ENTSO-E, excludes Denmark and Malta. Includes Croatia, Norway and Switzerland.

- *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 a number of EU Member States. Countries such as Lithuania, Luxembourg, Hungary, the Netherlands and the UK produced less electricity than their gross inland consumption in the January-April period of 2012 and 2013, implying that they were net power importers. On the other hand, Estonia, Czech Republic, Bulgaria and certain big consumers like France and Germany were net power exporters, as their national electricity production exceeded their consumption in the observed periods.

- Due to specific local circumstances, some Member States switched from net importer to net exporter position between 2012 and 2013 or vice versa.. For example, due to increasing hydro availability domestic power generation Portugal could satisfy its local needs in January-April 2013, which was not the case a year before.

FIGURE 2 – POWER GENERATION SURPLUSES AND DEFICITS COMPARED TO THE GROSS INLAND CONSUMPTION IN JANUARY-APRIL PERIOD OF 2012 AND 2013 IN EU MEMBER STATES (IN PER CENT)

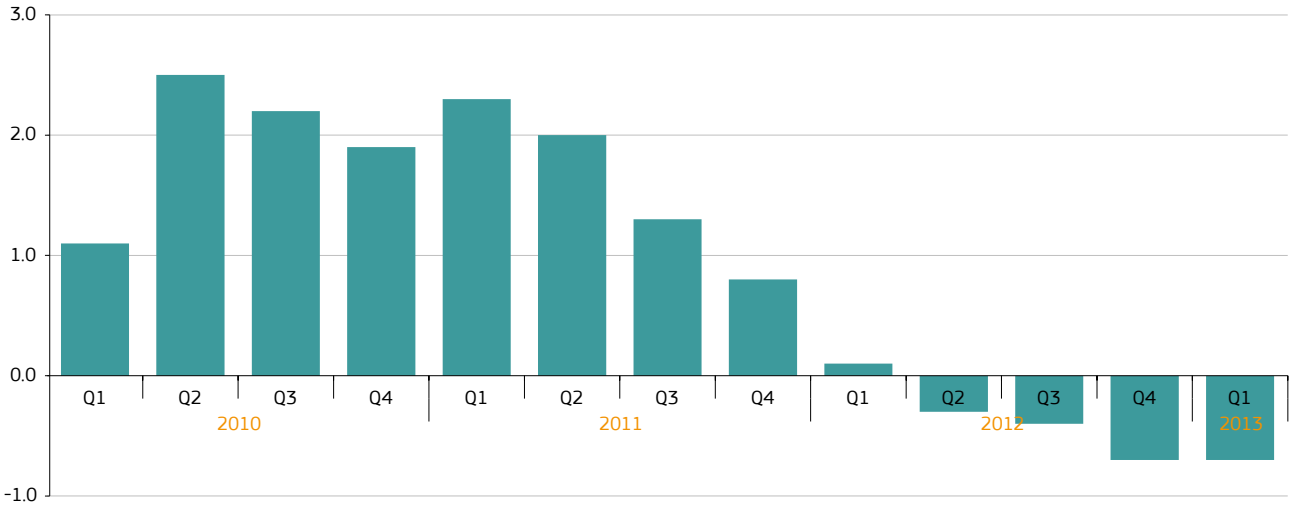


Source: ENTSO-E, excludes Denmark and Malta. Includes Croatia, Norway and Switzerland.

1.2 Drivers of EU electricity demand

- In the first quarter of 2013, similarly to the previous quarter, gross domestic product (GDP) in the EU-27[1] shrunk by 0.7% compared to the same quarter of the previous year. While year-on-year EU GDP growth figures revealed a fourth successive contraction of the EU economy, demand for electricity remained subdued in Q1 2013. Gross value added in important energy consumer sectors, such as industry and construction, decreased significantly in Q1 2013 (-1.9% and -4.8%, respectively, on a year-on-year comparison).

FIGURE 3 – EU 27 GDP Q/Q-4 CHANGE (%)

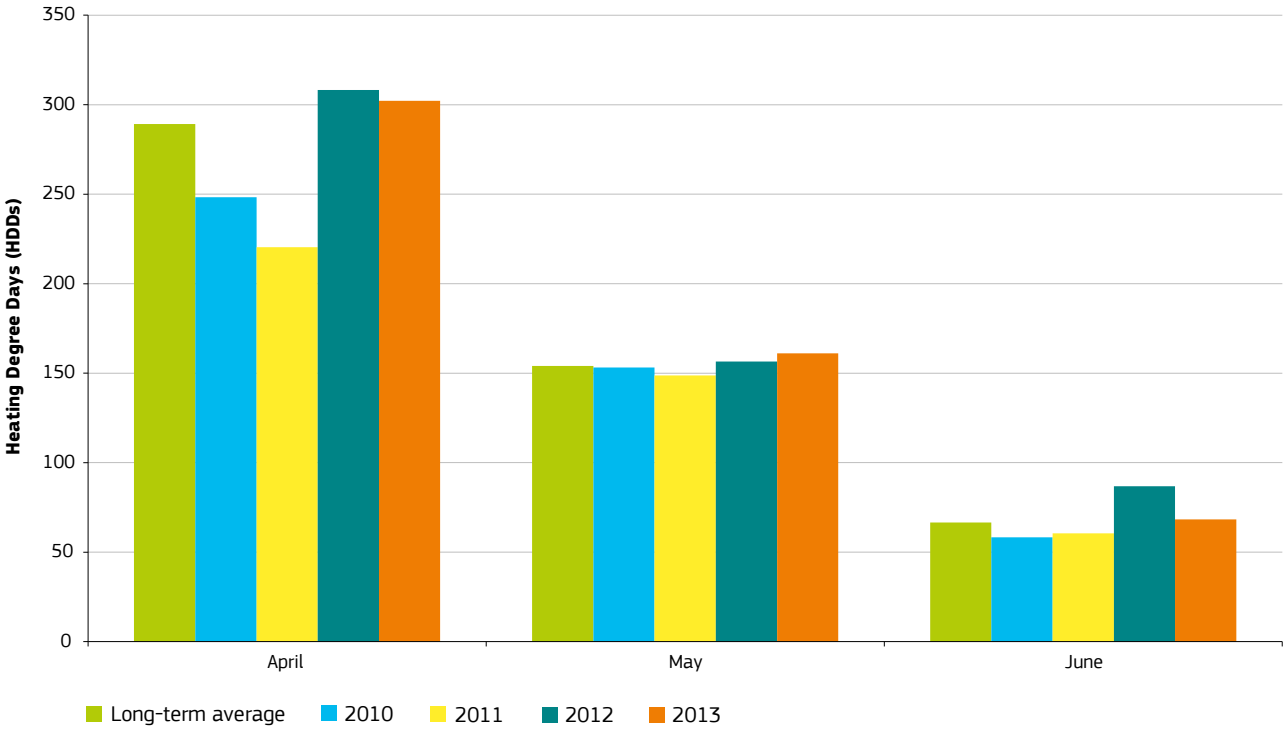


Source: Eurostat

1 As Croatia joined the EU on the 1st of July 2013, Eurostat did not provide GDP numbers for EU-28 so far.

- *Figure 4* shows the evolution of Heating Degree Days (HDDs) in the second quarter of 2013. April 2013 was slightly colder than the long term average in the EU-27, (implying higher HDD values), while HDDs in May and June 2013 were broadly in line with the long term trend.

FIGURE 4 – EU 27 HEATING DEGREE DAYS (HDDS)



Source: Eurostat/JRC. The colder is the weather, the higher is the number of HDDs.

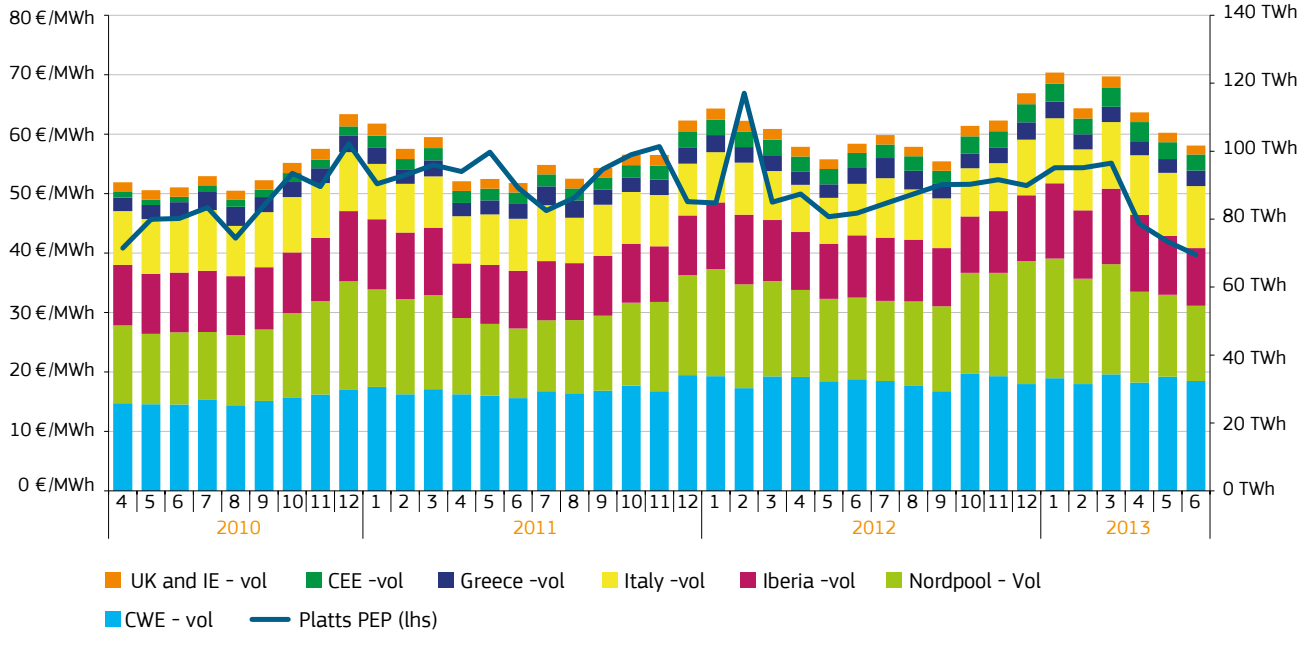
2. Traded volumes on European wholesale electricity markets

- In the second quarter of 2013, the combined traded volume of day-ahead power contracts on European wholesale power trading platforms amounted to 318.5 TWh, representing an increase of nearly 6% compared to the same quarter of 2012. However, compared to Q1 2013 the quarterly traded volume of power decreased by 11%, resulting from the seasonal decrease in electricity demand.

- Monthly 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.

- As *Figure 5* shows, the Platts' Pan-European Power Index (PEP), showing the monthly evolution of wholesale power prices, decreased significantly in the second quarter of 2013. This price decrease was the consequence of a number of factors, including limited industrial demand for power, seasonal factors due to decreasing heating and lighting needs, low generation costs due to low fossil fuel and carbon prices and an increasing share of hydro and renewables in the electricity mixes in some European countries.

FIGURE 5 - THE PLATT'S PAN EUROPEAN POWER INDEX AND THE WHOLESALE MONTHLY TRADED VOLUME OF POWER IN DIFFERENT EUROPEAN POWER REGIONS

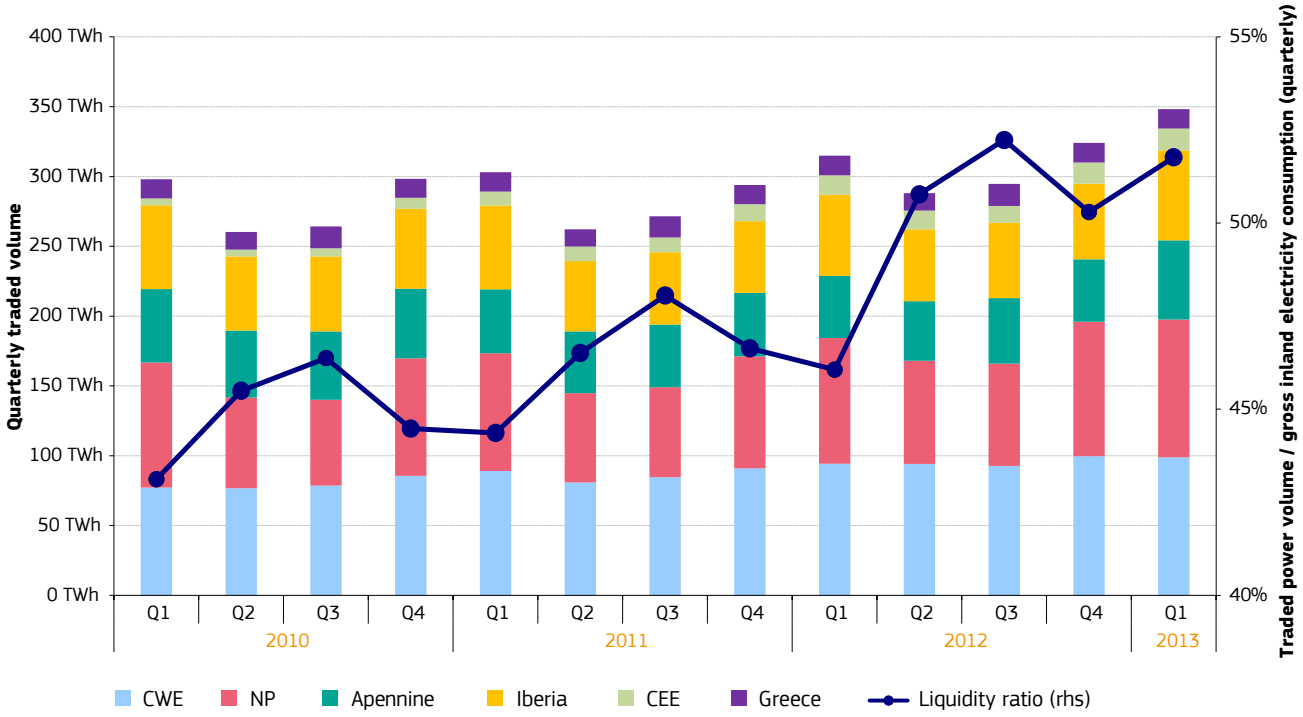


Source: Platts, European power exchanges

- As *Figure 6* shows, quarterly traded volume of power in European day-ahead markets showed an increasing trend during the last couple of years. 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 52% in Q1 2013 on average in Europe.

- In the first quarter of 2013, similarly to the previous quarters, Nordpoolspot proved to be the most liquid non-mandatory pool in Europe, with a liquidity ratio of 85%, followed by the CWE region (26%) and Central and Eastern Europe (17%).

FIGURE 6: QUARTERLY TRADED VOLUMES AND LIQUIDITY ON THE MAJOR EUROPEAN WHOLESALE ELECTRICITY MARKETS



Source: Platts, European power exchanges, ENTSO-E

3. Evolution of commodity and power prices

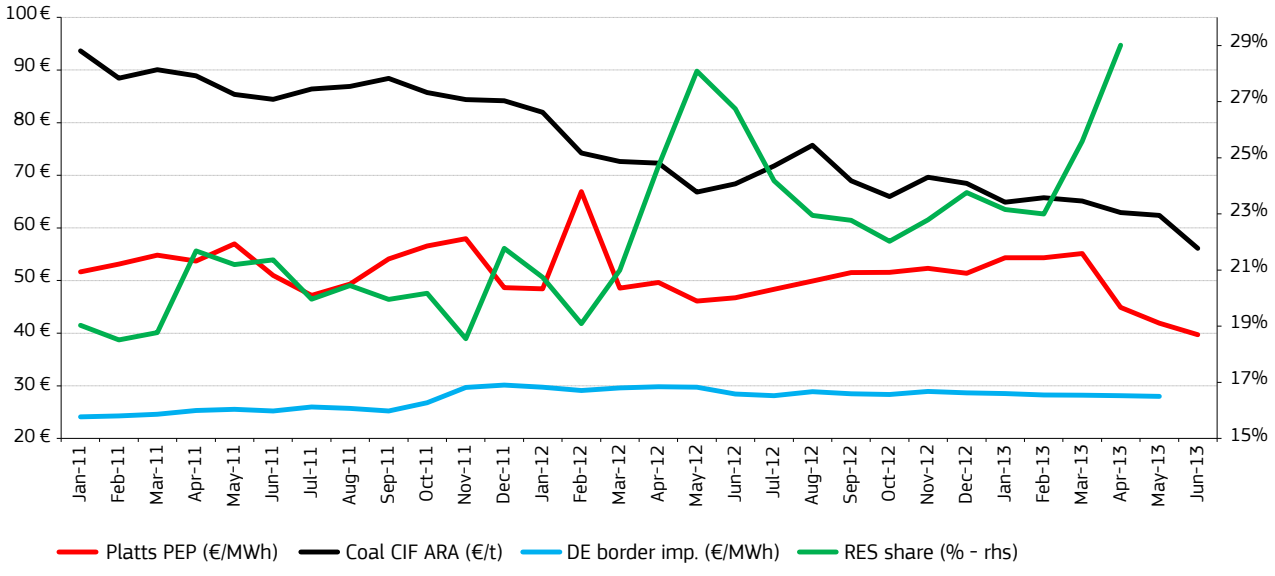
3.1 Evolution of power prices, and the main factors affecting power generation costs

- *Figure 7* 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 high levels. The combination of low carbon prices and falling coal prices has favoured coal-fired generation in Europe.

- *Figure 7* below also shows that falling power prices in the last few months have occurred alongside an increasing share of renewables in the European power mix. Besides an increasing share of wind and solar generation, hydro-based power generation in rainy periods can substantially contribute to lowering the generation costs in some European countries, as happened in the second quarter of 2013.

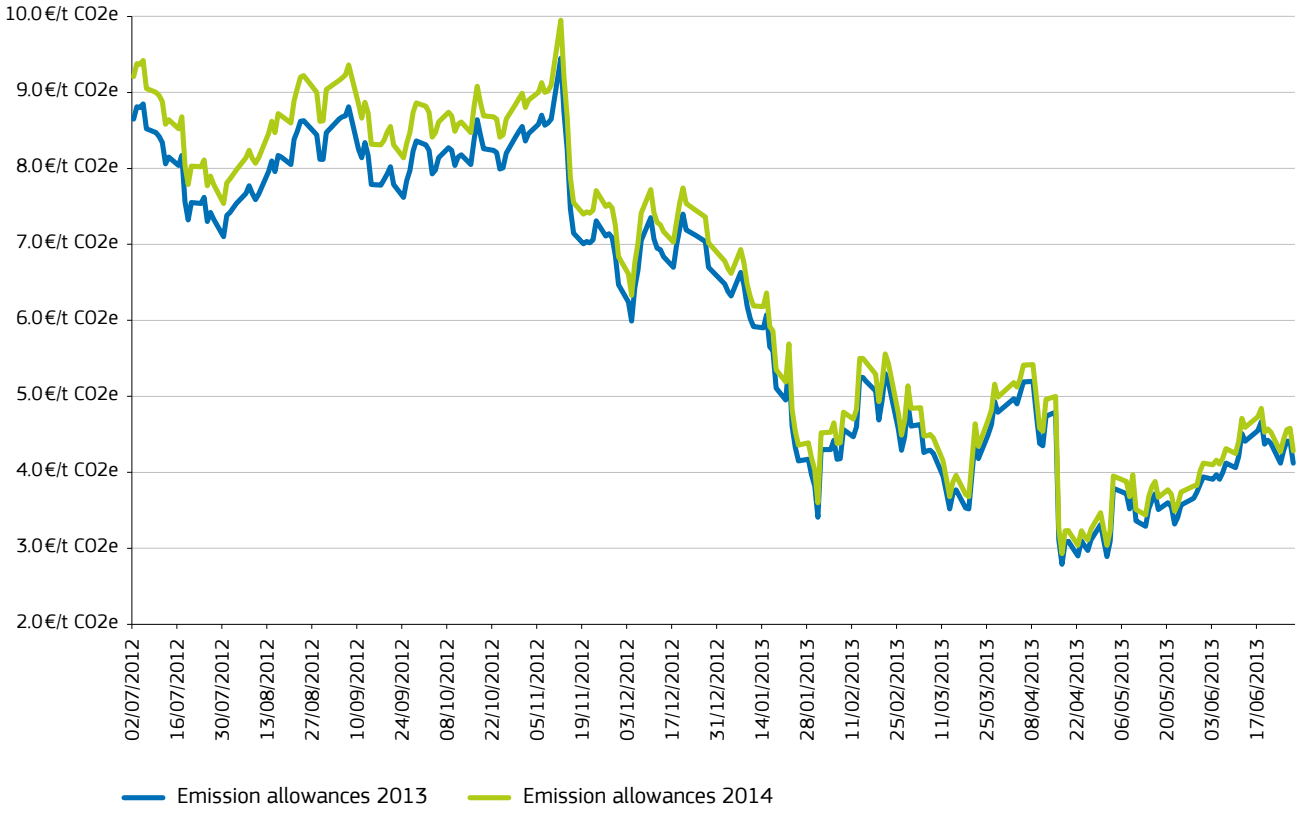
FIGURE 7 – EVOLUTION OF EUROPEAN AVERAGE WHOLESALE POWER PRICES COMPARED WITH COAL AND GAS PRICES AND THE SHARE OF RENEWABLES IN POWER GENERATION



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 fell below 3 €/tCO_2e in mid-April 2013, which was an all-time low in the history of the Emission Trading System. Since then a small rebound could be observed, however, the average daily emission allowance price remained in a narrow range of 3-5 €/tCO_2e during the second quarter of 2013.

FIGURE 8 – EVOLUTION OF ETS FROM JULY 2012 TO JUNE 2013



Source: Platts

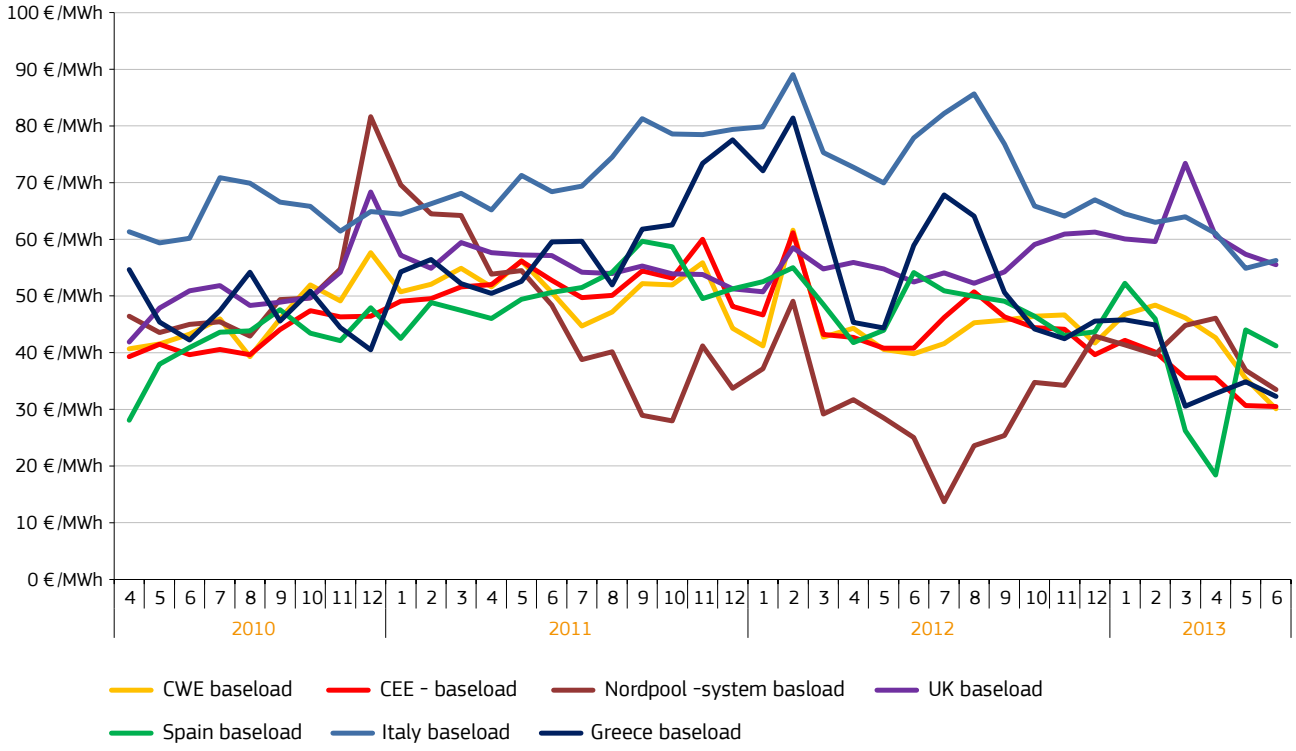
3.2 Comparisons of monthly electricity baseload prices on electricity markets

- *Figure 9* shows the evolution of monthly average power prices in seven different regions of Europe. Prices have generally showed a decreasing trend in most of the European regions since the beginning of 2013. Regional prices showed a higher degree of convergence than in the last couple of years with the exception of the UK and Italy, two markets in which power usually trades at a premium in price to most of the continental peers.

- High power prices in the UK and Italy result 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 domestic wholesale power prices.

- In the Central Western Europe (CWE) region, renewable power generation in Germany and nuclear availability in France were important determinants of wholesale electricity prices. Good levels of renewable generation helped to drive regional prices down in both the CWE and CEE regions to four-year lows by the end of Q2 2013.

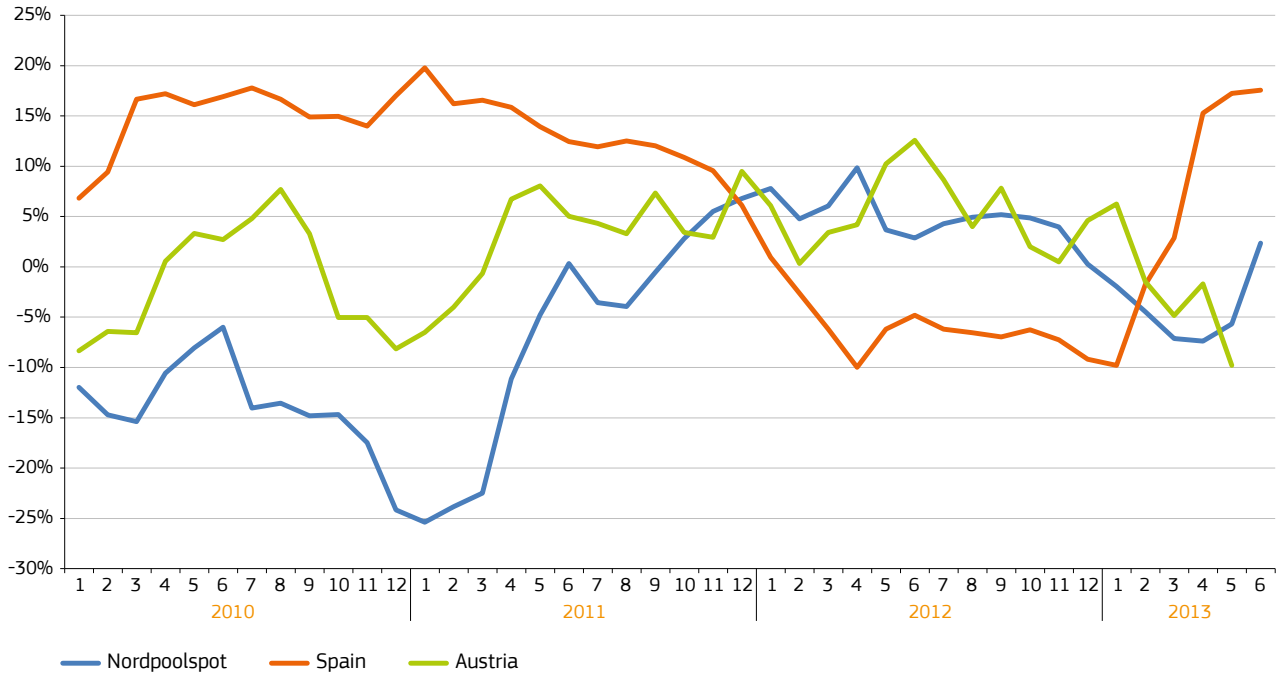
FIGURE 9 – COMPARISONS OF MONTHLY ELECTRICITY BASELOAD PRICES IN REGIONAL ELECTRICITY MARKETS



Source: Platts, European power exchanges

- Prices in the Nordpoolspot market and in Spain are often significantly impacted by changes in hydro availability, as *Figure 10* shows. For example, in mid-2012, when hydro levels were higher than long term averages in the Nordic countries, power prices were low. The same could be observed in Spain at the beginning of the second quarter of 2013. Hydro availability also plays a role, though less important, in the CWE region and hydro availability in the Balkans can impact prices in Greece and in some countries of Central Eastern Europe (CEE).

FIGURE 10 – DEVIATION OF HYDRO RESERVOIR LEVELS FROM THE LONG TERM LOCAL TREND IN THE NORDPOOL AREA, SPAIN AND AUSTRIA (IN PRECENTAGE POINTS)



Source: Nordpool, OMEL, E-Control

4. Regional wholesale electricity markets

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

- As *Figure 11* shows, average monthly wholesale power prices in the CWE region fell significanlty during the second quarter of 2013. The volume-weighted regional average baseload price, which stood at 46 €/MWh in March 2013, fell to the lowest level since May 2009 in June 2013, reaching 30 €/MWh. The monthly average baseload prices in Germany, France, Austria and Switzerland fell below 30 €/MWh at the end of Q2 2013, for the first time since March 2007.

- On the demand side, falling prices could be explained by decreasing economic activity and a series of public holidays, which reduced industrial demand for power during Q2 2013. Residential power demand declined as a result of decreasing heating and lighting needs at the end of the wintry season.

- On the supply side, coal prices continued to fall in Q2 2013 and carbon emission prices were depressed during the whole quarter. In France, while the second quarter of the year is typically the period for nuclear plant maintenance works, nuclear availability remained high. Hydro levels, especially in May and June, were higher than usual in most of the region, due to the rainy weather and melting of large amounts of snow in the Alps. Low generation costs and limited demand for power resulted in low power prices in the CWE region.

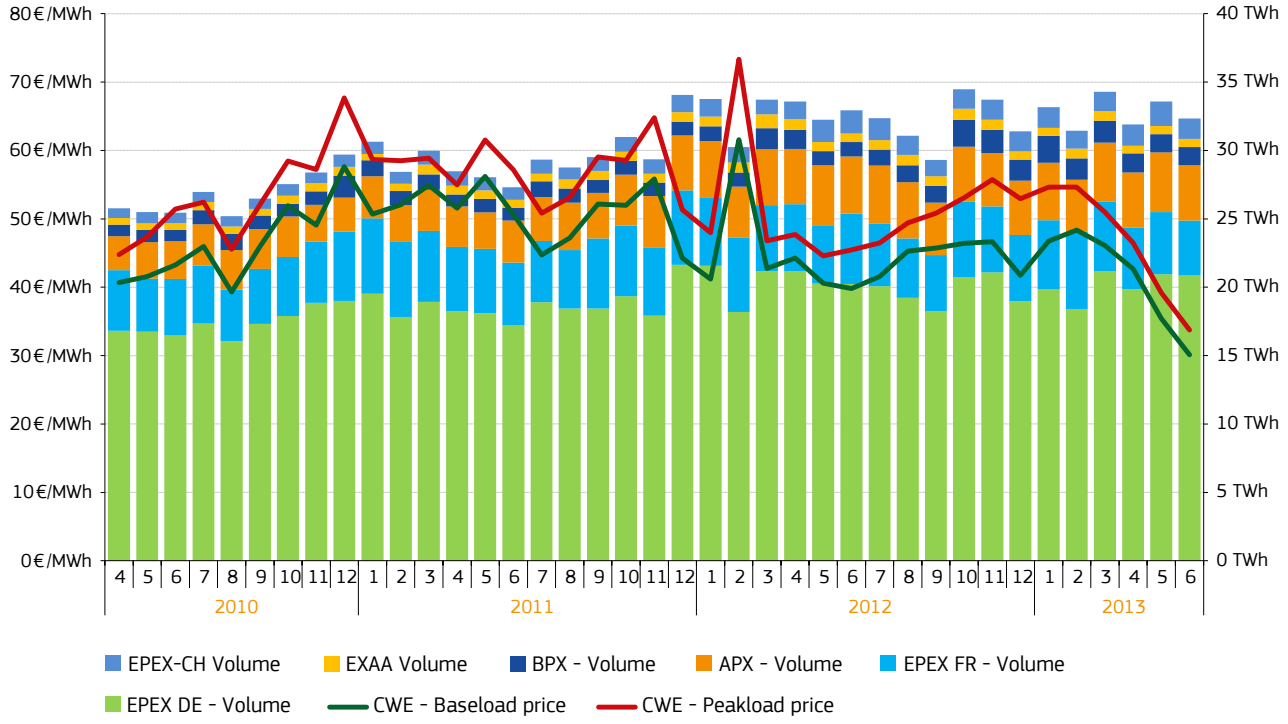
- Renewable generation in Germany was high during most of the quarter. On the 16th of June, on a Sunday afternoon, the combined share of wind and solar assured more than 60% of power generation, reaching an all-rime high in the country. This resulted in several hours of negative power prices (falling below -100 €/MWh in Germany and Belgium), while in neighbouring France prices fell below-200 €/MWh, due to oversupply in the regional power system.

- In the first half of 2013, the share of solid fuels in the German power generation mix rose above 50%, which was higher than in 2012 (45%) and in 2011 (43%). The German clean dark spread, measuring the profitability of coal-fired power generation, fell to 4 €/MWh in Q2 2013 from double-digit levels in the previous two quarters. Sharply decreasing wholesale electricity prices and slightly decreasing coal and carbon prices have resulted in decreasing profitablity of coal-fired generation.

- Gas-fired generation remained unprofitable in Germany in Q2 2013, with the average of the clean spark spread falling as low as -19.5 €/MWh.

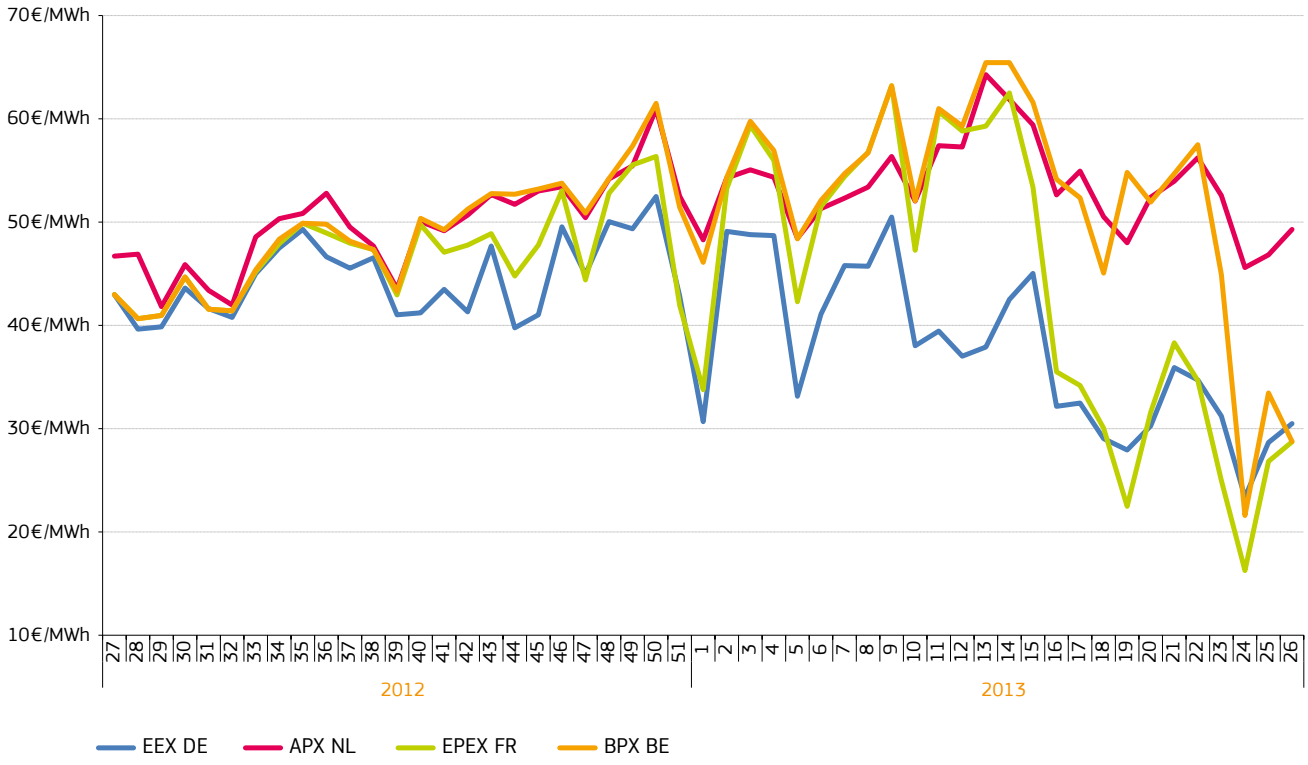
- *Figure 12* shows the evolution of the French, Dutch and Belgian price premiums to the German market on a weekly average. After the end of the heating season in April 2013, French power prices quickly realigned with their German peers, also due to increasing nuclear and hydro generation. Belgian prices became significantly lower in early June, as two nuclear reactors were restarted following a ten-month long security inspection. Dutch prices remained decoupled from Germany during the whole quarter due to the dominance of costly gas-fired generation and increasing power exports to the UK, which also contributed to keeping domestic wholesale prices high.

FIGURE 11 – MONTHLY TRADED VOLUMES AND PRICES IN CENTRAL WESTERN EUROPE



Source: Platts

FIGURE 12 – WEEKLY AVERAGE WHOLESALE POWER PRICES IN THE CWE REGION



Source: Platts

4.2 British Isles (UK, Ireland)

- As *Figure 13* shows, daily average baseload power prices in the UK and Ireland followed a downward trend during most of the second quarter of 2013. At the beginning of the quarter, power prices in both countries were impacted by high natural gas prices, as the cold wintry weather resulted in high residential gas demand for heating needs. Later on, as the weather turned milder, gas prices started to fall, which in turn drove down power generation costs.

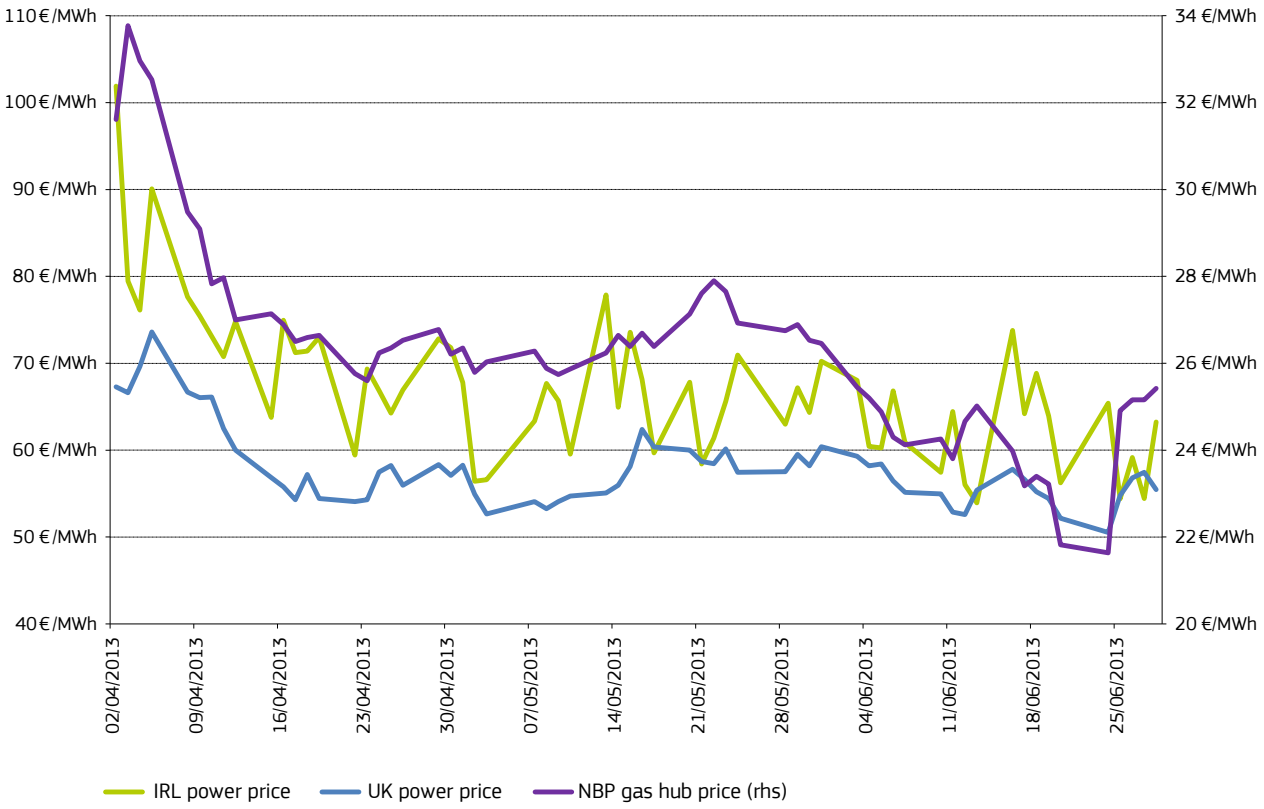
- Power prices in the UK were significantly higher than in most other West European markets; in Q2 2013, the average UK premium to France reached 19 €/MWh. This is mainly due to a comparably lower share of renewables and nuclear in the UK power mix, and a high share of costly gas-fired generation. Furthermore, the new carbon price floor, introduced as of 1st of April 2013 in the UK, has increased the costs of fossil fuel based power generation.

- During the last three years, a significant shift from gas to coal could be observed in the UK power generation mix. While in January-May 2010 gas-fired generation assured 46% of the total electricity production and coal's share was 30%, in the first five months of 2013 the share of gas went down to 26% and that of coal rose to 43%. Decreasing coal and carbon prices led to an average clean dark spread in the UK of 28 €/MWh in Q2 2013, assuring good profitability for coal-fired plants. In contrast, increasing gas prices has contributed to a clean spark spread of only slightly more than 3 €/MWh.

- The share of wind power generation in the UK power mix has grown, from almost zero to nearly 6% between the first five months of 2010 and 2013. This is however not high enough to significantly impact marginal power generation costs and thus wholesale power prices in the UK.

- Irish day-ahead power was traded at an average 9 €/MWh price premium to the UK during the second quarter of 2013. The country's power mix is still dominated by natural gas, which is almost exclusively imported from the UK. However, the share of wind power is continuously growing; in the first five months of 2013 it reached almost 20%.

FIGURE 13 – DAILY AVERAGE POWER PRICES IN THE UK AND IRELAND, IMPACTED BY GAS PRICES



Source: Platts, SEMO

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

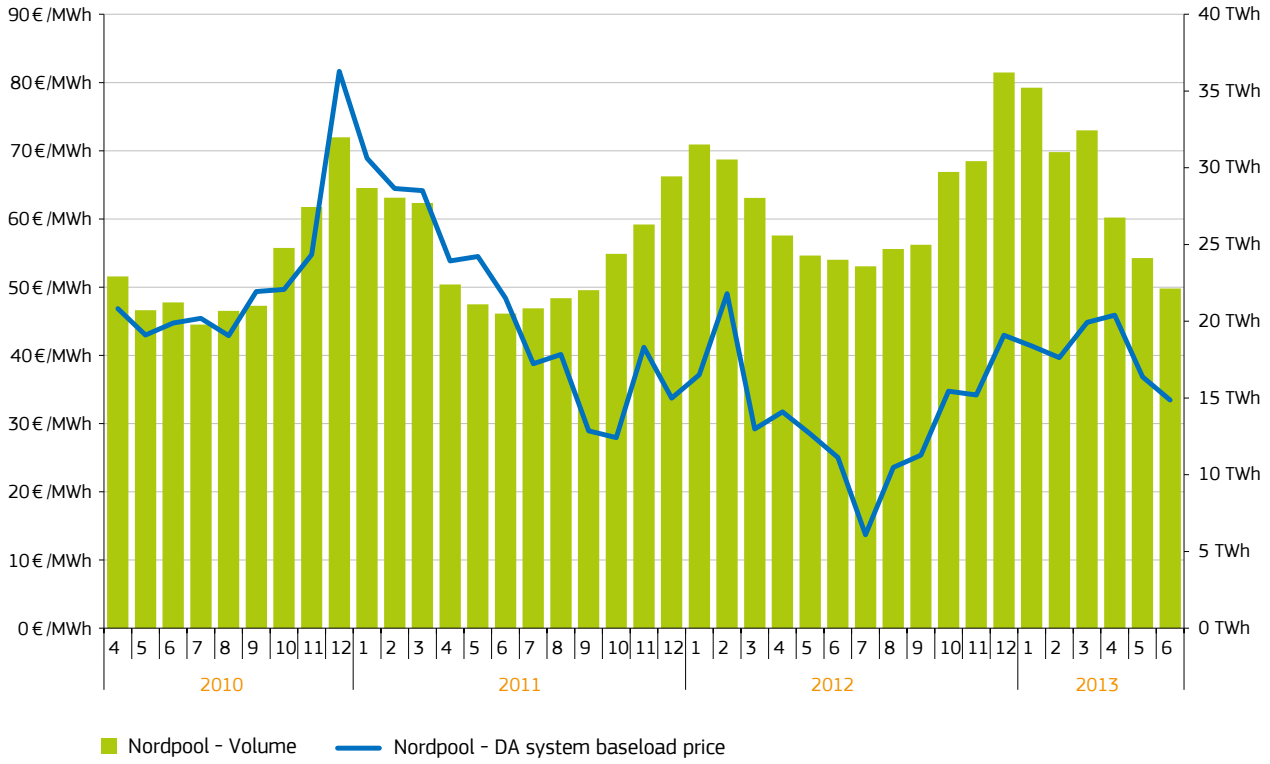
- As *Figure 14* shows, the monthly traded volume of day-ahead baseload power contracts in the Nordic markets decreased rapidly from the beginning of 2013. In January it was slightly above 35 TWh, while in June it decreased to 22 TWh, following the usual seasonality of the market (after the end of winter, as electricity demand falls, traded volume also tends to go down).

- In Q2 2013, the daily average baseload power price fell continuously. In the first week of April 2013, it was slightly above 50 €/MWh, while at the end of June it fell below 30 €/MWh. Due to enduring wintry weather during much of the spring, the annual power price peak occurred later than in previous years (normally the highest monthly power price within the year can be observed in the first quarter).

- During most of 2011 and 2012, the Nordpool region was a strong net power exporter, mainly to the CWE region, as abundant hydro generation assured good opportunities to export cheap power. However, in the second quarter of 2013, as power prices in the CWE region decreased significantly and hydro sources in the Nordic countries were not able to assure a price level low enough to compete with Western European prices, Nordpool's net power flow position was close to equilibrium, and in some months the region even became a net power importer.

- On the 3rd of June 2013, Latvia joined the Nordpool region and wholesale power trading has been operational since then in the country. Latvian baseload power prices were closely aligned with neighbouring Lithuania's prices in June 2013 and were significantly higher than the Nordpool system price, as due to a lack of sufficient interconnections with other parts of the Nordpool market, Baltic-states could not fully profit from falling prices elsewhere in the region.

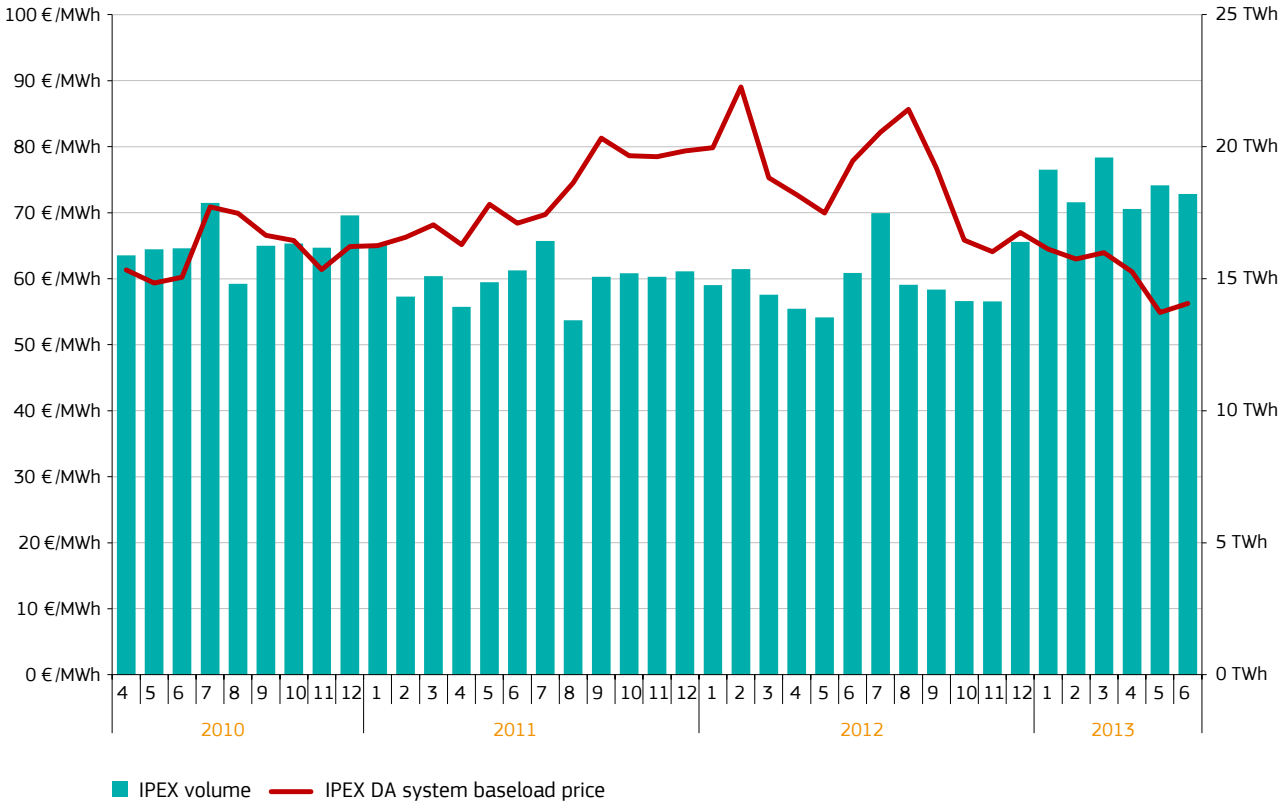
FIGURE 14 – MONTHLY TRADED VOLUMES AND PRICES IN NORTHERN EUROPE



4.4 Apennine Peninsula (Italy)

- From the beginning of the second quarter of 2013 until mid-June, the national Italian baseload power price followed a downward trend: from a monthly average of 64 €/MWh observed in March 2013 it fell to below 55 €/MWh in May, a level last recorded in November 2009.
- This decreasing trend during most of the second quarter of 2013 was due to lower natural gas prices on the PSV hub. It can also be explained by more hydro and renewable based power generation in the Italian power mix.
- While two or three years ago natural gas represented between 45% and 50% of the Italian power generation mix, in Q2 2013, the share of gas fell below 30% in June 2013. In the same month, the share of hydro was more than 26%, with solar contributing 16% of total generation and the share of wind was close to 5%. These renewable energy sources contributed to reducing generation costs and wholesale power prices.
- Although there were several cross-border electricity capacity curtailments in May and June 2013 between Italy and its neighbours (due to maintenance works on interconnectors), these temporary reductions in import capacities did not significantly impact the domestic wholesale power price level.

FIGURE 15 – MONTHLY TRADED VOLUMES AND PRICES IN ITALY



Source: GME (IPEX)

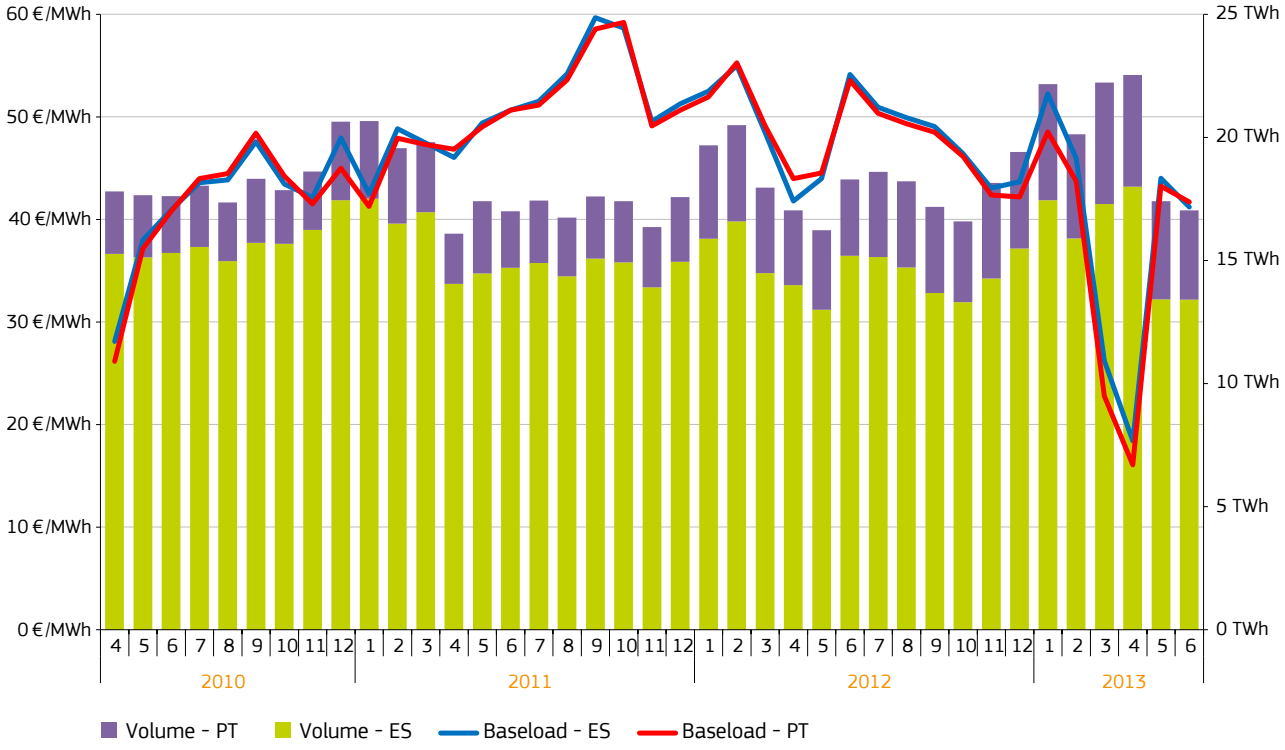
4.5 Iberian Peninsula (Spain and Portugal)

- In April 2013 the monthly average day-ahead baseload prices in Spain and Portugal fell to three-year lows (18 €/MWh in Spain, 16 €/MWh in Portugal), primarily owing to a high level of hydro-based power generation in both countries. Fossil fuel generation (costlier than renewables or nuclear) represented only 27% of the power generation in Spain, and 19% in Portugal; these were unprecedented low values during the last decade. In the first three weeks of April daily average prices fluctuated between zero and 10 €/MWh over several days.

- Abundant and extremely cheap power in Spain provided good export opportunities to France. This was however constrained by limited interconnection capacities, preventing the French market from importing all of the power excess supply from the Iberian region.

- From early May 2013, wind and solar generation receded, and - despite high reservoir levels - hydro generation also decreased. As a consequence, daily baseload power prices in Spain climbed back to 40-50 €/MWh and stayed mostly in this range until the end of Q2 2013. The share of nuclear also decreased due to plant maintenance works, while the share of fossil fuels rose again, contributing to the increase in overall power generation costs.

FIGURE 16 – MONTHLY TRADED VOLUMES AND PRICES IN THE IBERIAN PENINSULA



Source: Platts

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

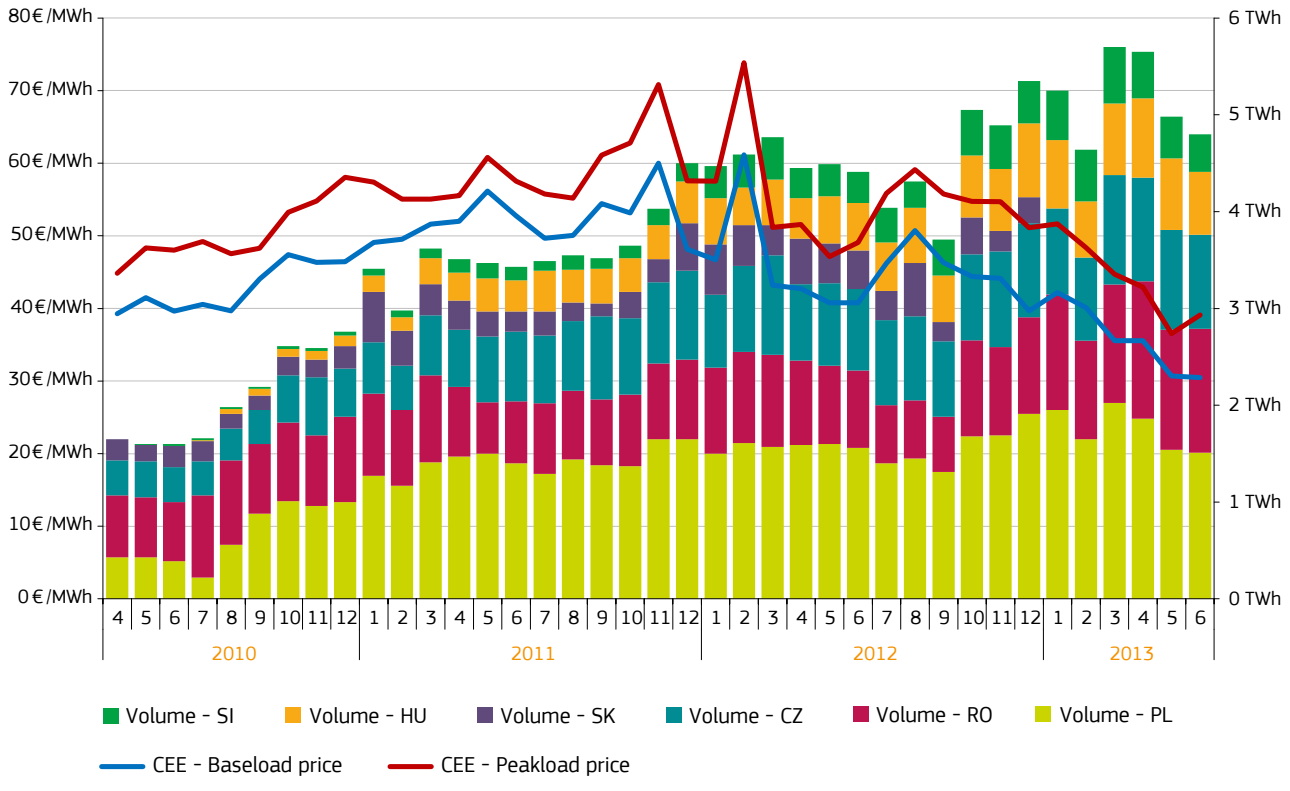
- In the second quarter of 2013, Central Eastern Europe (CEE) remained the most dynamic power trading region in Europe, as traded volume of day-ahead power grew by more than 15% on a yearly basis.

- As *Figure 17* shows, monthly average baseload power prices continued their downward trend in the second quarter of 2013 and fell to 31 €/MWh by the end of the quarter, which was the lowest monthly price since April 2009. Peakload monthly averages reached a four-year low in May 2013 (37 €/MWh), then slightly rebounded to finish the quarter at 39 €/MWh.

- General factors on both the power demand and supply sides played a role in pushing down prices in the region. Limited industrial demand for power, impacted by the sluggish economic recovery (or in the case of some countries, recession), decreasing generation costs (mainly in the case of coal-fired generation, due to cheap coal imports and extremely low carbon prices), and abundant renewable supply in Germany and the CEE region all contributed to low regional wholesale power prices.

- In certain countries of the CEE region good hydro availability, following abundant rainfalls across Central Europe, kept domestic wholesale prices low. In Romania, hydro generation assured more than 40% of the domestic power needs in May and June, while in Hungary and Slovenia healthy hydro reservoir levels in the Balkans provided cheap power import opportunities.

FIGURE 17 – MONTHLY TRADED VOLUMES AND PRICES IN CENTRAL EASTERN EUROPE

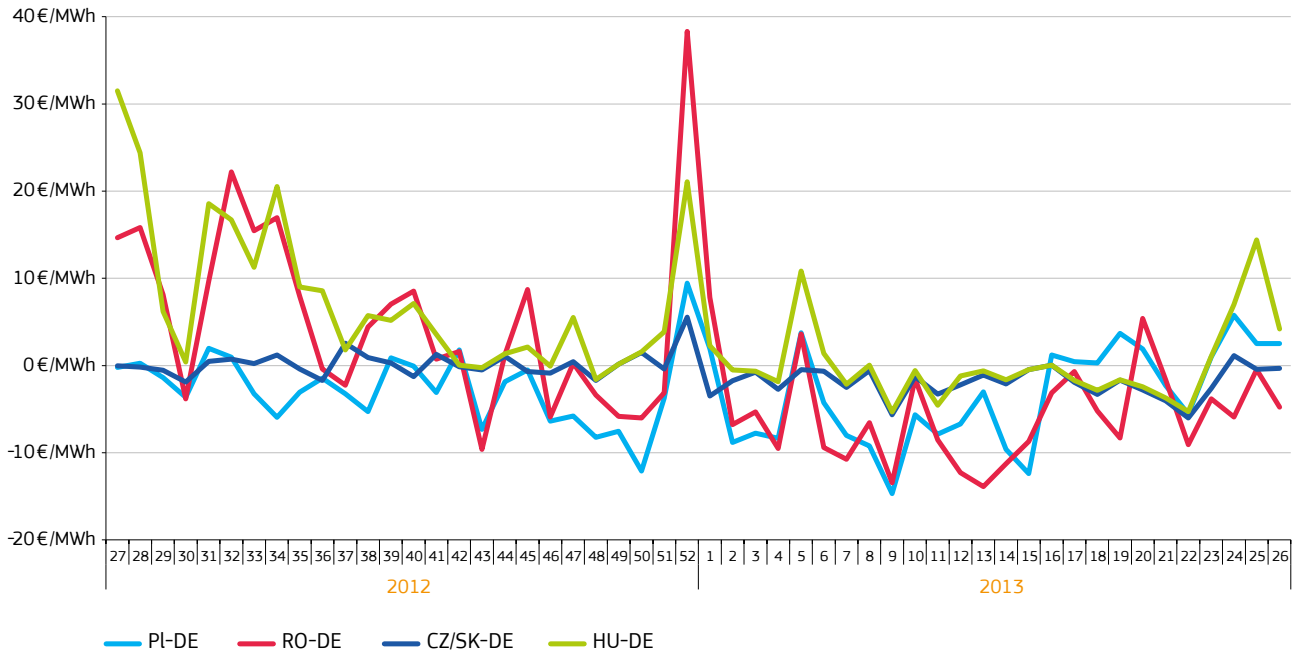


Source: Regional power exchanges

- *Figure 18* shows the regional price premiums or discounts to the German market between July 2012 and June 2013. The Hungarian baseload price premiums to Germany significantly decreased after the country's accession to the Czech-Slovakian market coupling area in September 2012. However, in some periods, when cross-border capacity curtailments or weather factors such as heat-waves (for example, in the second half of June 2013) impacted the market, measureable premiums could be observed.

- Czech and Slovakian baseload prices were the most closely aligned to German price levels, while Polish prices were mainly below. Prices in Romania were heavily impacted by local hydro generation availability.

FIGURE 18 – REGIONAL WEEKLY BASELOAD PRICE PREMIUMS OR DISCOUNTS TO THE GERMAN MARKET

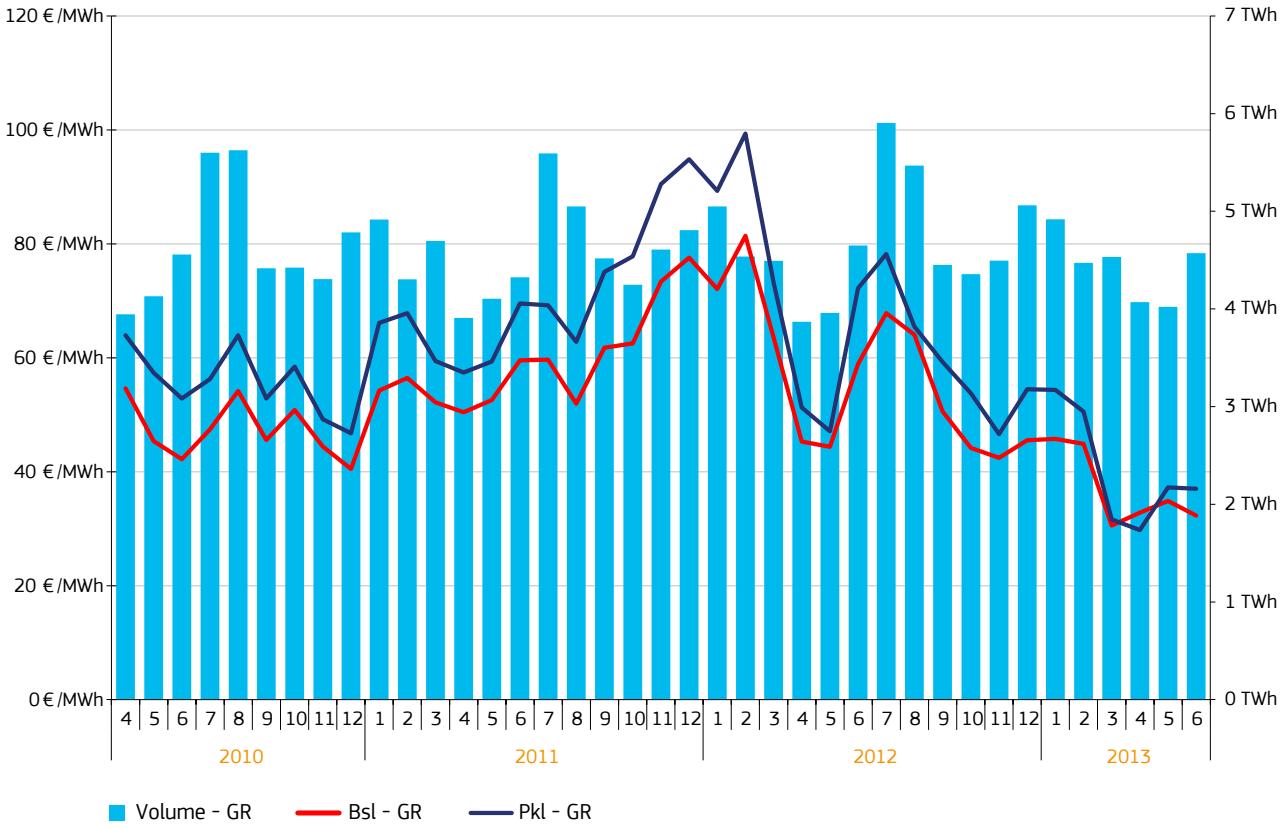


Source: Platts (EPEX), Regional power exchanges

4.7 South Eastern Europe (Greece)

- In Greece, the monthly average baseload price moved in a narrow range of 32-34 €/MWh during the whole quarter, while the monthly peakload average increased from 30 €/MWh to 37 €/MWh between April and June 2013.
- In April 2013, both Greek electricity production and consumption remained close to the lowest levels of the last decade, registered in April 2012. Industrial demand for power was limited by the economic situation and weather conditions during the second quarter of 2013 did not increase residential demand for power.
- Sharply decreasing lignite and natural gas based power generation contributed to a low level of electricity production, though the amount of power generated from wind and solar kept on increasing during the second quarter of 2013 and their share in the power mix reached 15-20% over this three-month period. Decreasing fossil fuel based generation and increasing share of renewables might also have contributed to consistently low prices in Q2 2013.

FIGURE 19 – MONTHLY TRADED VOLUMES AND PRICES IN GREECE

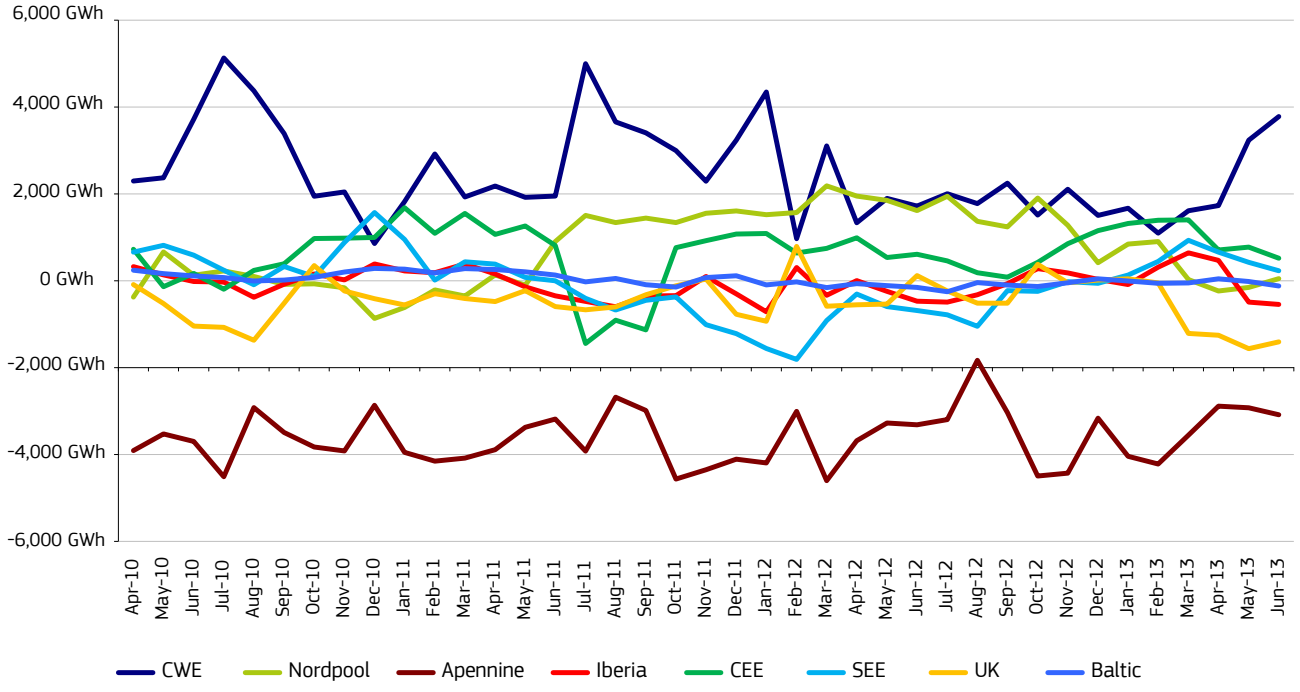


Source: DESMIE

5. Building the internal market for electricity: cross border flows and trade

- In the second quarter of 2013, monthly cross-border physical power flows in the EU reached 22 TWh on average, which was 9.4% higher than in the second quarter of 2012.
- Similarly to the previous quarters, the increase in cross-border flows was greater than that in traded volume of power on the European power trading platforms (6%). Given that consumption of electricity slightly decreased during the same period, increasing cross-border trade contributed to increasing market liquidity, growing interdependency and integration of European electricity markets.
- In the second quarter of 2013, the net power outflow (exporter) position of the CWE region strengthened compared to the previous quarter and reached the highest level in June 2013 since the beginning of 2012. At the same time net power imports in the British Isles region reached the highest in five years, primarily owing to the persisting British price premium to the CWE region during the whole of the second quarter of 2013. The Apennine-peninsula region retained its traditional net importer position during the second quarter of 2013, while other European regions were close to the equilibrium regarding their net power flow positions.

FIGURE 20 – EU CROSS BORDER MONTHLY PHYSICAL FLOWS BY REGION



European countries are grouped in the following regions:

Central Western Europe	*DE, NL, FR, BE, AT, CH*	*Nordic*	*SE, FI, DK, NO*
Central Eastern Europe	*PL, CZ, HU, SK*	*British Isles*	*UK, IE (from July 2010 on)*
Iberian Peninsula	*ES, PT*	*Apennine Peninsula*	*IT*
South Eastern Europe	*SI, GR, BG, RO, HR, AL, FYROM, RS*	*Baltic*	*EE, LT, LV*

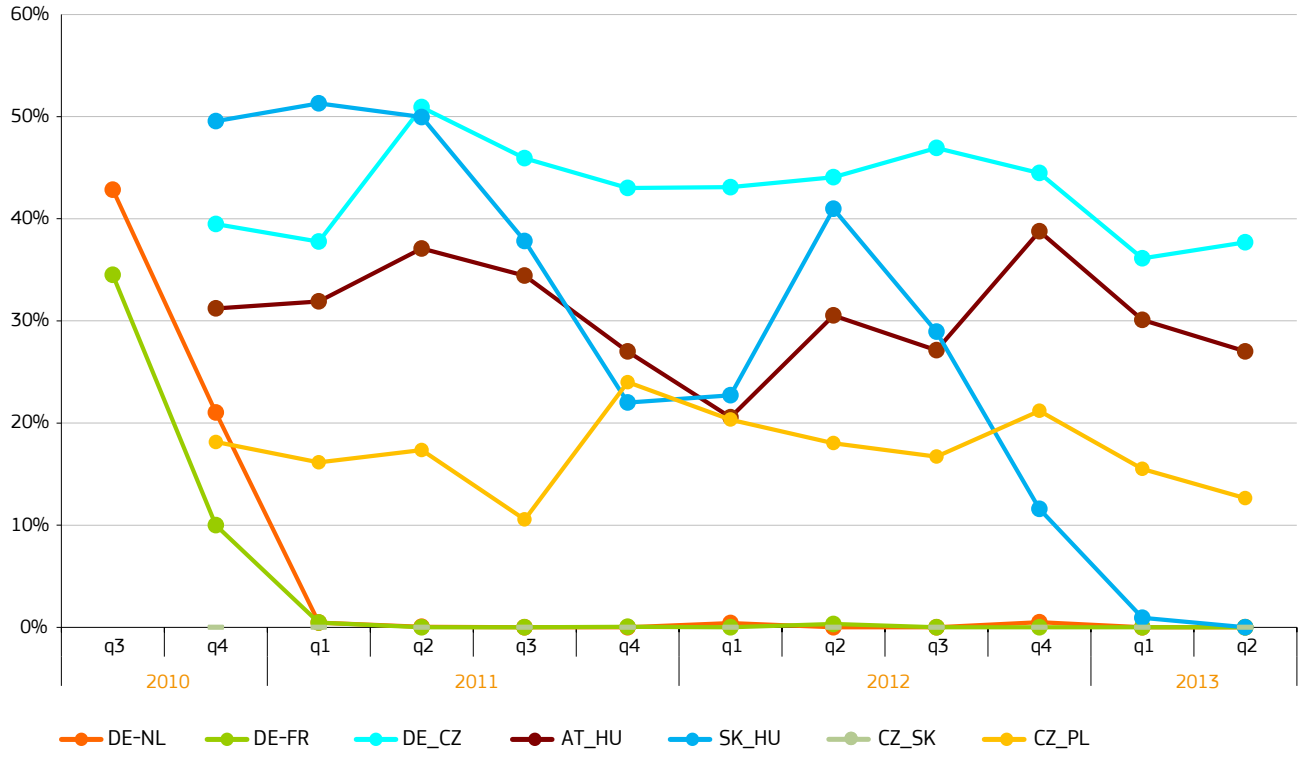
- The ratio of adverse power flows (or flows against price differentials - FAPDs*) is a useful measure of the effectiveness of existing market couplings or integration of neighbouring power markets. *Figure 21* provides examples of adverse flows between neighbouring markets in the CWE and CEE regions.

- In the CWE region, the ratio of power flows against price differentials between Germany and France and between Germany and the Netherlands remained insignificant in the second quarter of 2013. After the reconnection of two nuclear power plants in Belgium, erratic behaviour of domestic hourly power prices resulted in a temporary increase in adverse power flows with the country's two neighbours, the Netherlands and France.

- Adverse power flows completely disappeared in Q2 2013 in the Czech-Slovakian-Hungarian market coupling area, in spite of the existence of significant price divergence of the Hungarian market from the Slovakian prices during some periods. In contrast, the lack of market couplings between other markets in the CEE region resulted in perceivable adverse flows and in some cases high FAPD ratios.

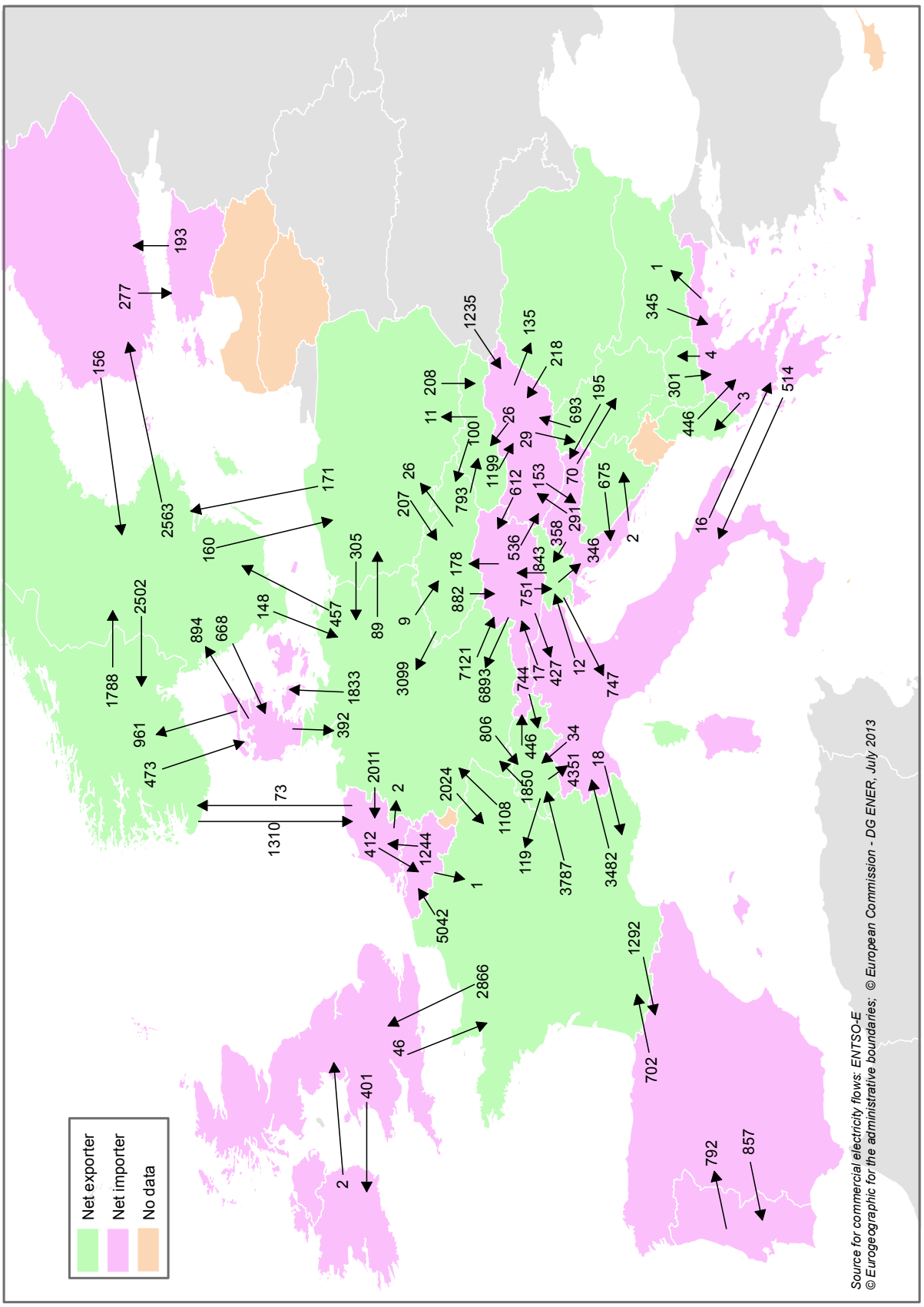
- *Figure 22* shows the map of commercial power flows between neighbouring countries in most countries of the European continent, providing information on quarterly cross-border power flows and the net electricity exporter or importer position of each country in the second quarter of 2013.

FIGURE 21 – EVOLUTION OF ADVERSE POWER FLOW RATIOS IN THE CENTRAL WESTERN AND CENTRAL EASTERN EUROPEAN REGIONS



Source: Platts, Regional power exchanges

FIGURE 22 – COMMERCIAL ELECTRICITY FLOWS IN GWH IN Q2 2013 (FINAL SCHEDULE)



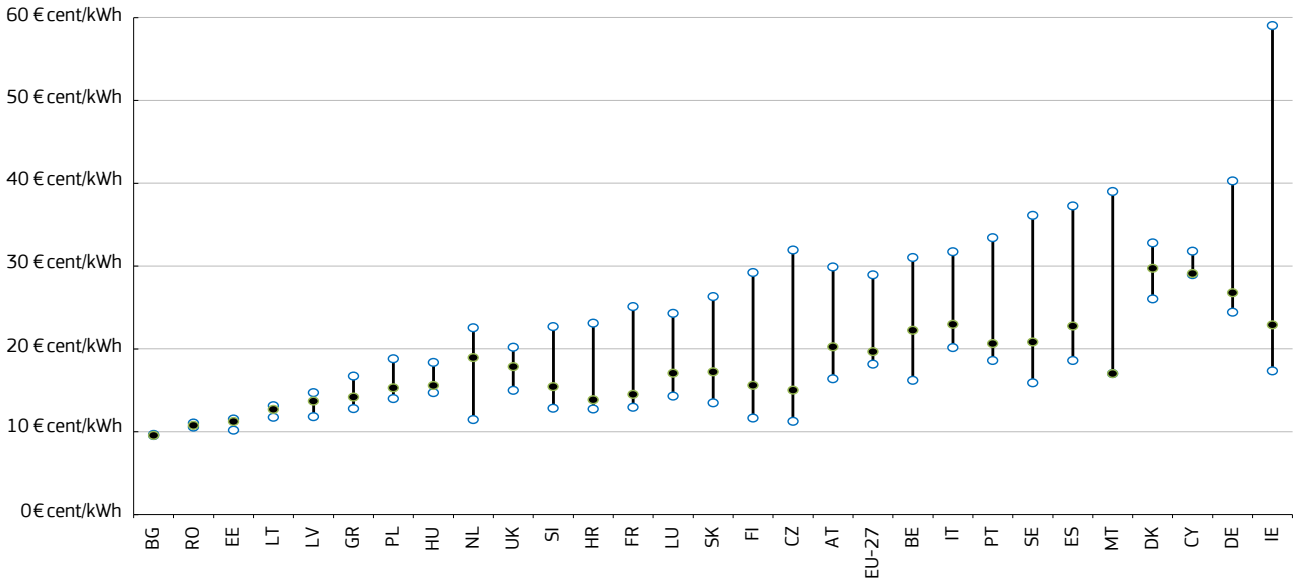
Data for some countries are not available (see the legend). Due to presentation constraints the Northern European countries and Cyprus cannot be included on the map completely. There is no data available on Kosovo under UNSCR 12/4499. Data on flows between Germany and Austria are estimates. For the majority 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

- *Figures 23 and 24* below show the retail electricity price ranges for household and industrial consumers in the second half of 2012, 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 prices[2], 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 paid in the case of both household and industrial consumers. This is possibly due to the existence of fixed elements of retail electricity price invoices, which are independent from the amount of electricity consumed and which therefore contribute proportionally more to the final retail price in lower consumption categories.
- In household consumption band Da (annual consumption less than 1,000 kWh) households in Bulgaria paid the lowest price (9.6 €cents/kWh, including taxes), while households in Ireland paid the highest price (59 €cents/kWh, including taxes) in the second semester of 2012. The ratio of the highest and the lowest price across the EU Member States in band Da (6) was higher than in other consumption bands (between 3 and 4).
- In industrial consumption band Ia (annual consumption less than 20 MWh) consumers in Bulgaria paid the lowest price (9.5 €cents/kWh, excluding VAT), while consumers in Cyprus paid the highest price (27.9 €cents/kWh).
- The maps on the next two pages show retail electricity prices paid by households (with an annual consumption less than 1,000 kWh, including all taxes) and by industrial customers (with an annual consumption less than 20 MWh, without VAT and non-recoverable taxes) in the second half of 2012, which are the most recently available data from Eurostat.

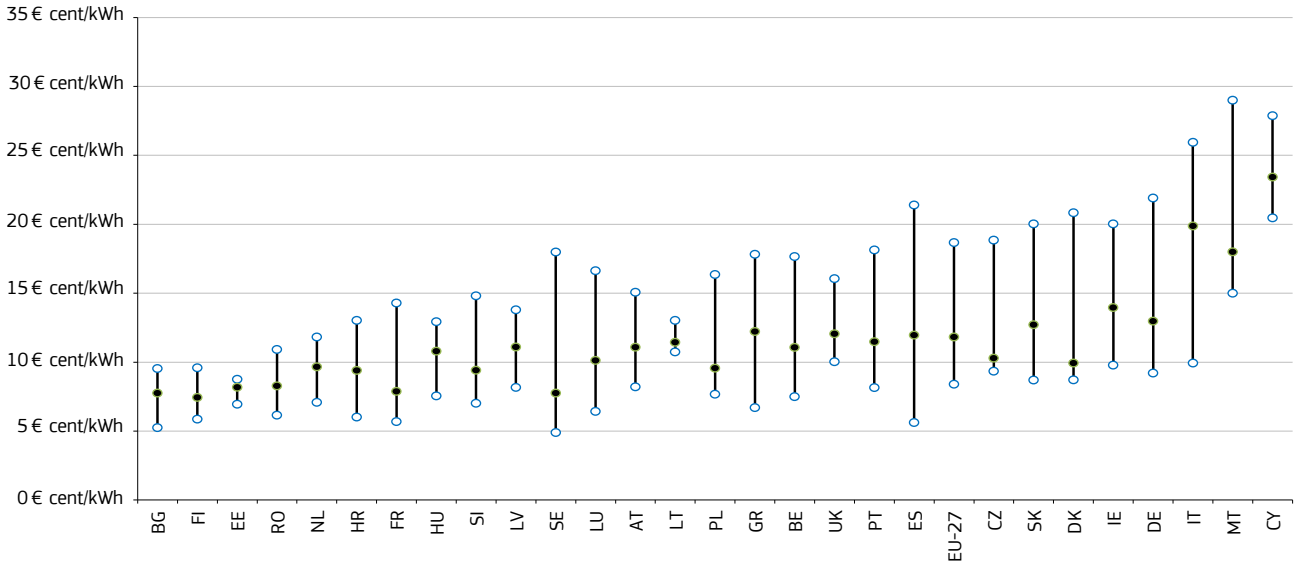
2 Price categories defined by Eurostat, according to annual electricity consumption. See the legend below the charts on the next page.

FIGURE 23 – RANGES OF ELECTRICITY PRICES PAID BY HOUSEHOLD (ALL TAXES INCLUDED) CONSUMERS IN DIFFERENT ANNUAL CONSUMPTION BANDS IN EU MEMBER STATES, 2ND SEMESTER OF 2012



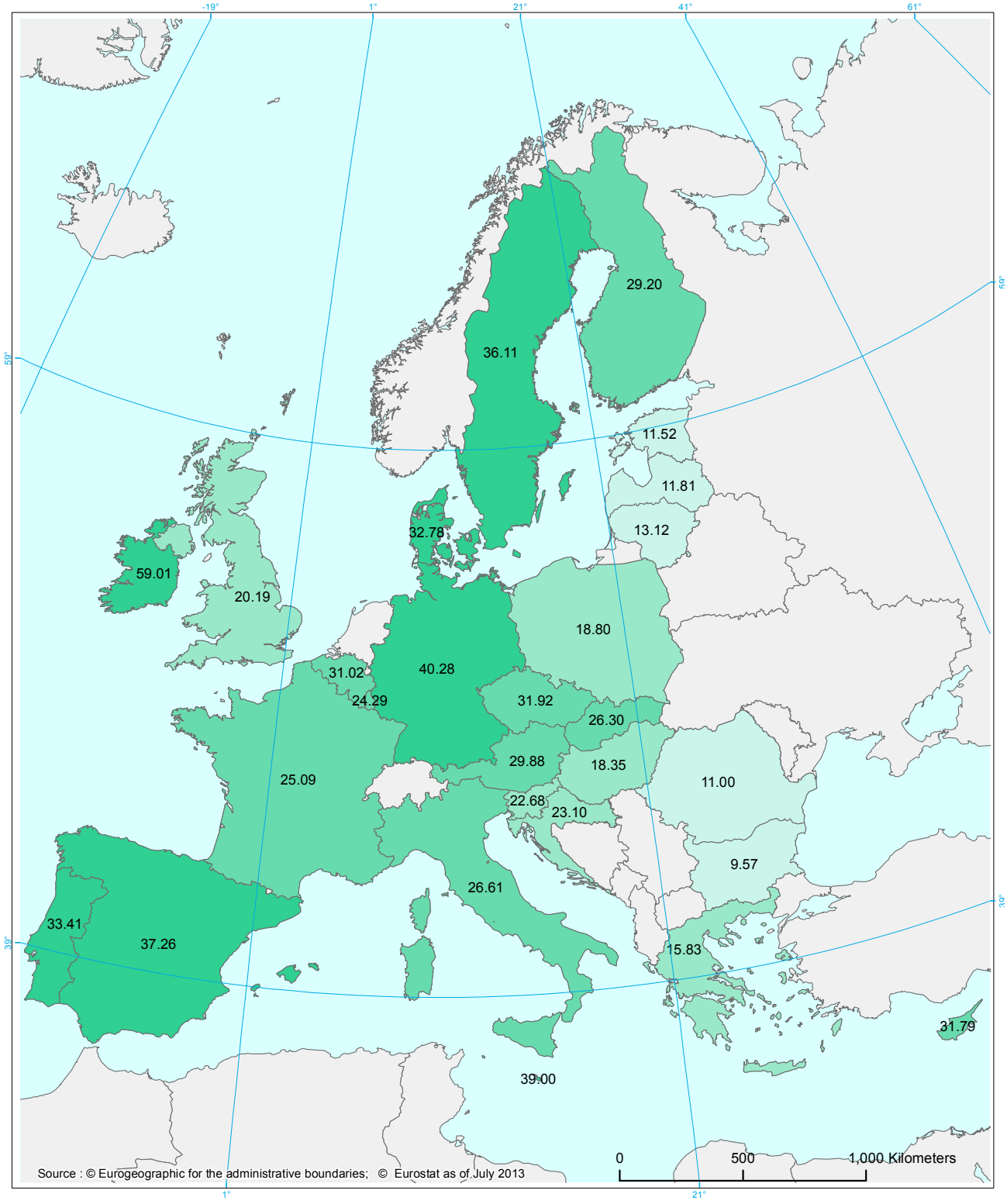
Source: Eurostat
Prices include all taxes. Price categories refer to annual consumption bands defined by Eurostat.
Band DA : Consumption < 1 000 kWh
Band DB : 1 000 kWh < Consumption < 2 500 kWh
Band DC : 2 500 kWh < Consumption < 5 000 kWh
Band DD : 5 000 kWh < Consumption < 15 000 kWh
Band DE : Consumption > 15 000 kWh
The black bubble shows Band Dc price.

FIGURE 24 – RANGES OF ELECTRICITY PRICES PAID BY INDUSTRIAL (WITHOUT VAT) CONSUMERS IN DIFFERENT ANNUAL CONSUMPTION BANDS IN EU MEMBER STATES, 2ND SEMESTER OF 2012



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 25 – ELECTRICITY PRICES (INCLUSIVE OF TAXES) – HOUSEHOLDS – PRICES: 2ND SEMESTER 2012

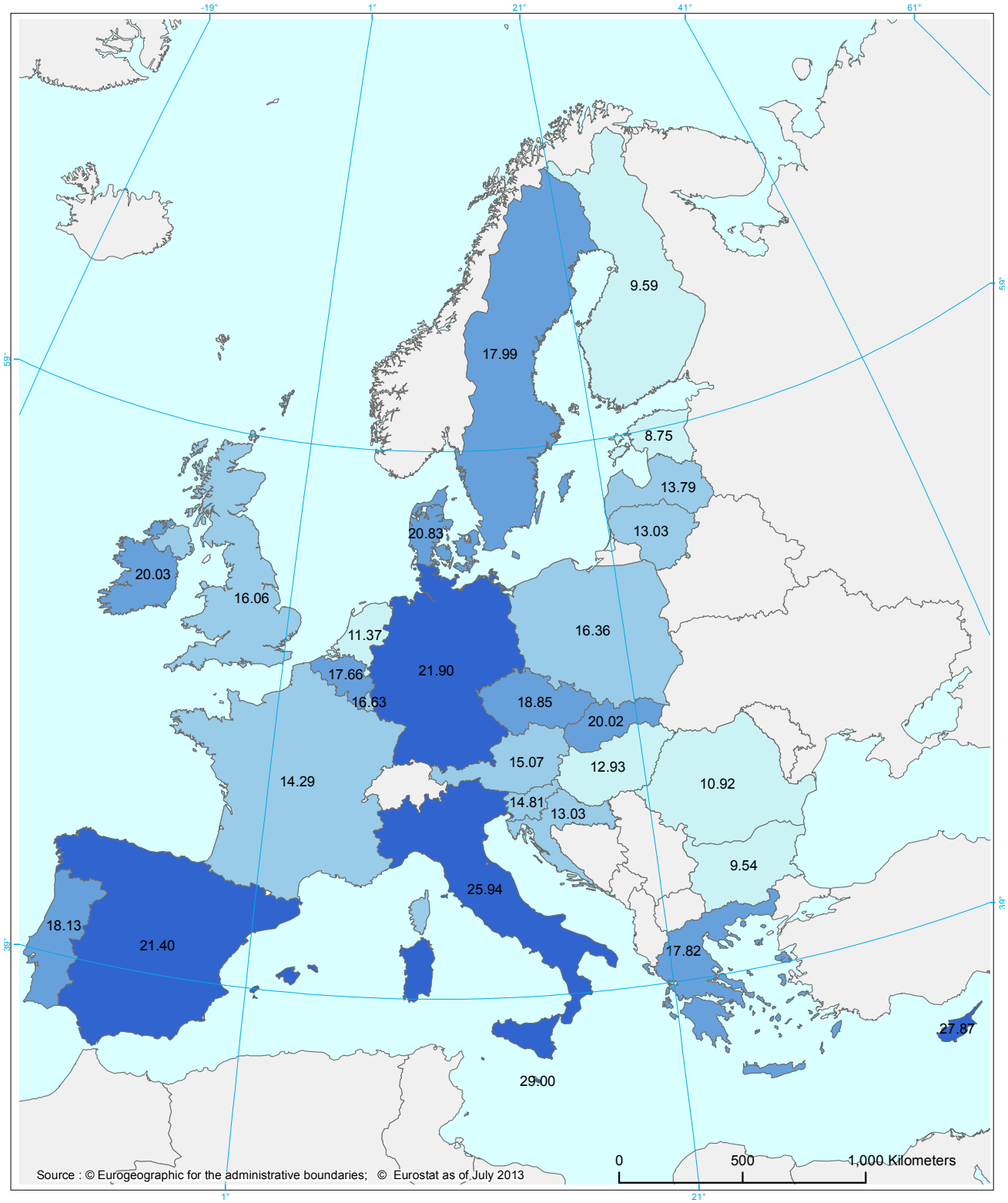


Prices per kWh (c€)

- no data
- < 15,01
- 15,01 - 24,00
- 24,01 - 32,00
- > 32,00

Band DA : Consumption < 1 000 kWh

FIGURE 26 – ELECTRICITY PRICES (WITHOUT VAT AND NON-RECOVERABLE TAXES) – INDUSTRIAL CONSUMERS – PRICES: 2ND SEMESTER 2012



Prices per kWh (c€)

- no data
- < 13,01
- 13,01 - 17,00
- 17,01 - 21,00
- > 21,00

Band IA : Consumption < 20 MWh

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 21oC, 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.