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Quarterly Report on European Electricity Markets

Market Observatory for Energy

DG Energy

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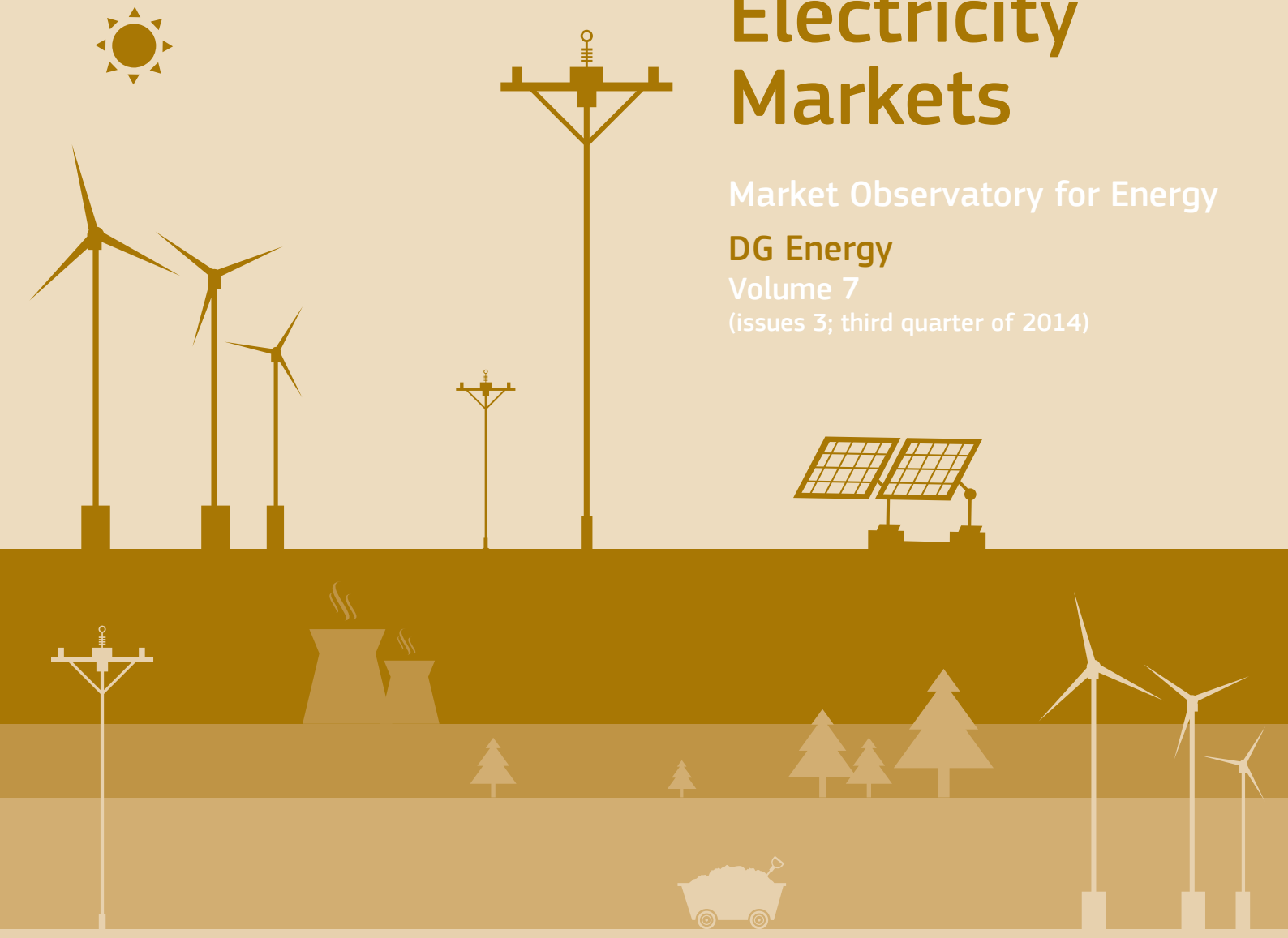

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Content

Highlights of the report

- After further decreases at the beginning of the third quarter of 2014, electricity prices on European wholesale markets slightly turned up in September.
- Market couplings between European electricity markets assured effective cross border power trading, however, this has not always led to convergence in wholesale electricity prices across the borders.
- At the beginning of the third quarter of 2014 cheap natural gas resulted in increasing gas-fired power generation in the UK, reflecting the flexibility of the country's generation fleet to the price competition between coal and gas.
- During the last few years wholesale electricity prices in the EU remained high compared to the US, resulting in a competitiveness challenge to the EU economy, especially in industries consuming significant amount of electricity during the manufacturing process.
- Retail electricity prices for industrial consumers showed signs of convergence across the EU during the last couple of years; at the same time differences between household retail electricity prices did not decrease.

Executive summary

- **Electricity consumption in the EU increased by 1.5% in the June-August of 2014 compared to the same period of 2013,** showing the sign of a measurable growth for the first time since the beginning of 2012. Parallel to this, the EU Gross Domestic Product (GDP) grew by 1.2% in the second quarter of 2014, on year-on-year comparison. However, in the first eight months of 2014 the electricity consumption in the EU was still below that in the same period of 2013.

- Cross border flow of electricity in the EU grew by 10% in May-July of 2014 compared to the same period of 2013. In the third quarter of 2014 the combined traded volume of day-ahead wholesale power contracts on the European trading platforms went up by 3.3%, compared to the same period of the previous year. As in previous periods, both increase in cross-border flow of electricity and traded volume of power on the EU markets outnumbered the increase in electricity consumption, which illustrates the **further integration and the improving liquidity of the European wholesale electricity markets.**

- **In spite of the existing market coupling among the seventeen markets of the North West European (NWE) coupled area, there were significant differences among the average wholesale electricity prices in the region in the third quarter of 2014.** The lowest prices could be observed in the French market in this quarter (29 €/MWh), while in Latvia and Lithuania the quarterly average price reached 57 €/MWh. Local factors, such as changes in power generation mixes or outages in generation or interconnection capacities can lead to significant price differentials compared to the neighbouring markets, even within a coupled region.

- The PEP indicator, expressing the average evolution of the wholesale power prices in the European markets, has continued to follow the downward trend that could be observed since the beginning of 2012, and in August 2014 it fell to as low as 35 €/MWh, before turning up in September again. Due to significant nuclear generation in France during the summer, gas prices reaching their lows in July, generally good hydro availability, and the lack of ongoing hot summer weather in the majority of the EU countries, **wholesale power prices fell further in many markets.** However, in September prices rose in most of the markets, as demand for power picked up after the end of the summer period, lighting needs increased and gas prices started to rise at the beginning of autumn.

- At the beginning of July 2014 natural gas prices on the NBP hub in the UK fell to 15 €/MWh, reaching a four-year low. Although later in the third quarter of 2014 gas prices started to rebound, **gas-fired power generation in the United Kingdom still remained profitable and the share of natural gas increased in the UK power mix in July and August.** In September, due to increasing power prices, the share of coal rebounded again in the UK power mix, providing a good example on how flexibly the generation fleet can react to the price competition between coal and gas. As most of other markets in the EU are less sensitive to changes in gas prices, such big shifts between coal and gas could not be observed, especially because of lower wholesale electricity prices gas-fired generation remained uncompetitive in most of the continental markets during the third quarter of 2014.

- High amount of solar and wind generation, good hydro availability and significant nuclear power generation in France coupled with lower demand, has led to negative hourly prices on the 17th of August on several markets in Central Western and Central Eastern Europe, and in Germany even the daily average price fell below zero. **Negative prices signal the need for more flexible electricity supply and demand.** Increasing share of renewables, assuring more than 15% of the power generation in the EU during the summer of 2014, signal the need of better integration of renewable energy sources to the power grid.

- As in international comparison **the competitiveness of the European economy depends on electricity prices,** the current report provides for the first time an **analysis on the wholesale electricity price differential between the EU and the US.** As in the past few years the competitiveness of power generation in the US has been boosted by cheap and abundant natural gas resources, electricity prices remained low compared to the EU markets. In the last two years however, as EU wholesale electricity prices decreased significantly and gas prices increased in the US, this price differential narrowed between the two regions.

- **During the last couple of years a gradual convergence could be observed between Member States in retail prices for electricity, paid by industrial consumers, while for household consumers price differentials did not decrease.** In the case of household consumers the impact of regulated end-user prices and less developed consumer awareness on choices between price offers of different utilities might explain the still prevailing larger differences across the EU Member States.

1. Electricity supply, imports and exports

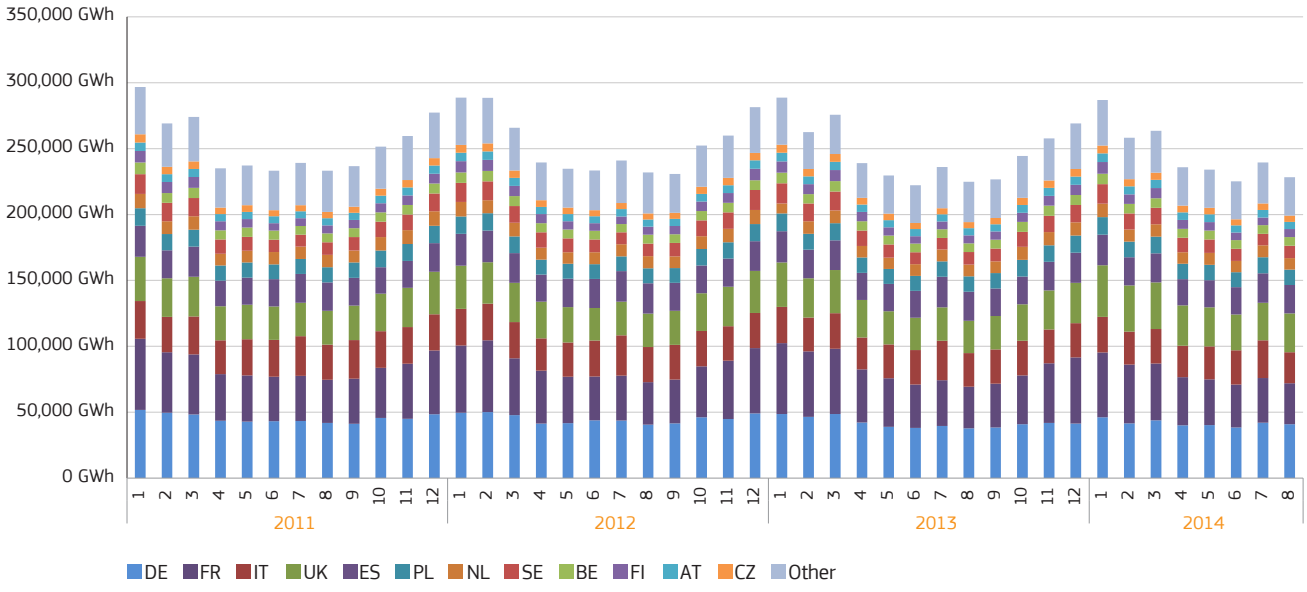
1.1 Evolution of electricity production and consumption

- Figure 1 shows the monthly electricity consumption in the EU and in the greatest electricity consumer member states in the past few years. Unsurprisingly, there is a strong correlation between the absolute electricity consumption of a given country and the size of its economy, the five largest electricity consumers in the EU are Germany, France, Italy, the UK and Spain.

- There is a strong seasonality in electricity consumption at EU level, as during the winter period lighting and heating needs result in higher demand for power. The trend of the electricity consumption is slightly decreasing during the last four years; in January-August 2014 the consumption was 0.3% less in the EU than in the same period of the previous year.

- On one hand this points to improving energy efficiency, as electricity demand correlates less strongly with the economic performance than it used to earlier. On the other hand, it is worth recalling the increasing importance of decentralised power generation sources (rooftop photvoltaics panels, smaller local power plants, etc.) in the case of which the electricity production does not appear in the transmission systems consumption statistics, which serves as a basis for the data used for the chart below.

FIGURE 1 – MONTHLY ELECTRICITY CONSUMPTION IN EU MEMBER STATES



Source: ENTSO-E, excludes Malta.

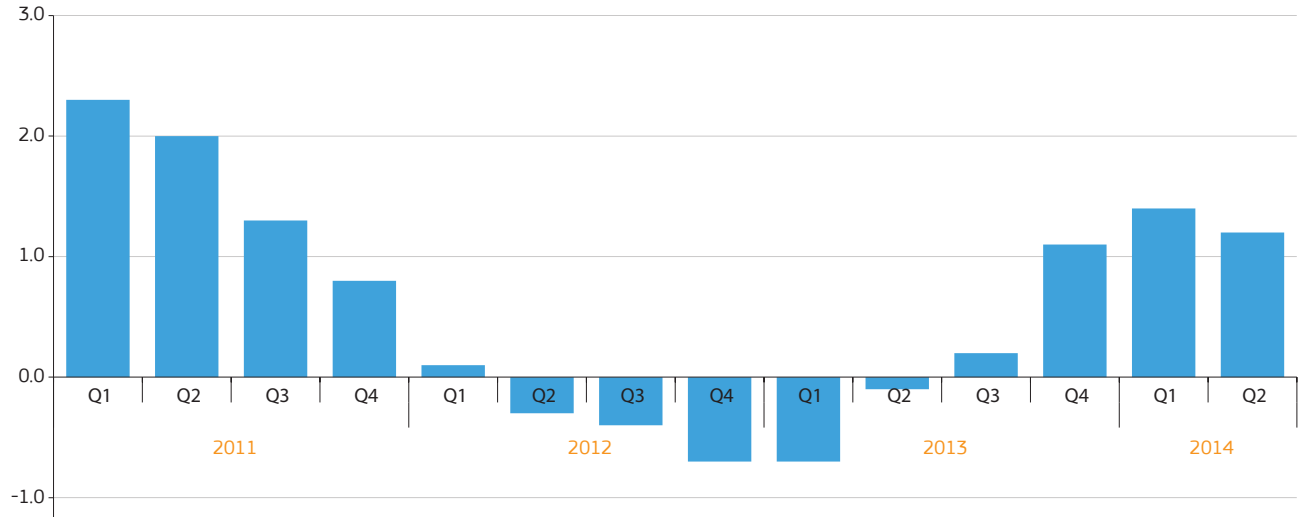
1.2 Drivers of EU electricity demand

- As Figure 2 shows, the economic recovery continued in the second quarter of 2014 in the EU. Gross value-added in economic sectors, such as manufacturing industry or construction, using significant amount of energy in their production, also grew (by 1.4% and 0.3%, respectively, compared to the same period of 2013).

- Figure 3 shows the monthly deviation of actual Cooling Degree Days (CDDs) from the long term average in the June-August 2014 period. Unlike in other periods of the year, when Heating Degree Days (HDDs) measure temperature conditions having relevant impact on power demand, in the summer period it is reasonable to use CDDs instead, as cooling needs in the residential sector have increasing impact on electricity consumption.

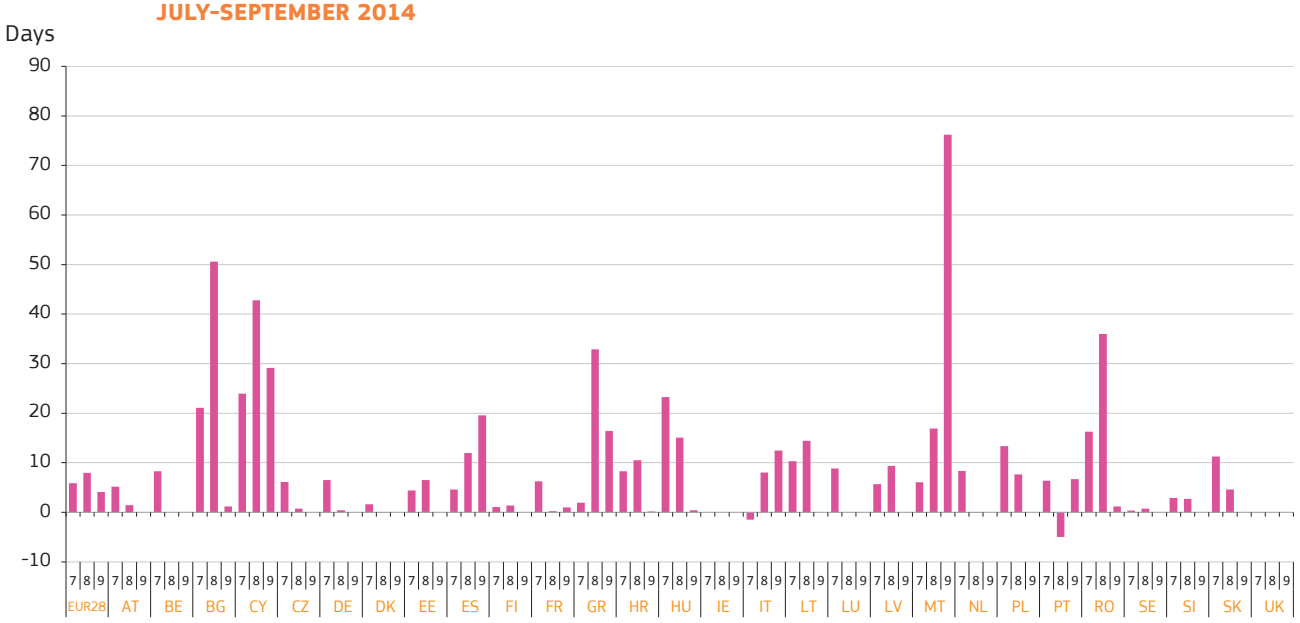
- Positive deviations from long term CDD values imply increased heating needs in the actual period, which might have impact on wholesale power prices in countries having functioning power markets (e.g.: Spain, Greece, Hungary, Italy, Romania, etc.). However, it is worth noting that higher than usual actual CDD values do not necessarily result in higher wholesale prices on the markets, as several other factors may exert their influence (See in Chapter 4).

FIGURE 2 – EU 28 GDP Q/Q-4 CHANGE (%)



Source: Eurostat

FIGURE 3 – DEVIATION OF ACTUAL COOLING DEGREE DAYS (CDDS) FROM THE LONG TERM AVERAGE, JULY-SEPTEMBER 2014



Source: Eurostat/JRC.
The warmer is the weather, the higher is the number of CDDs.

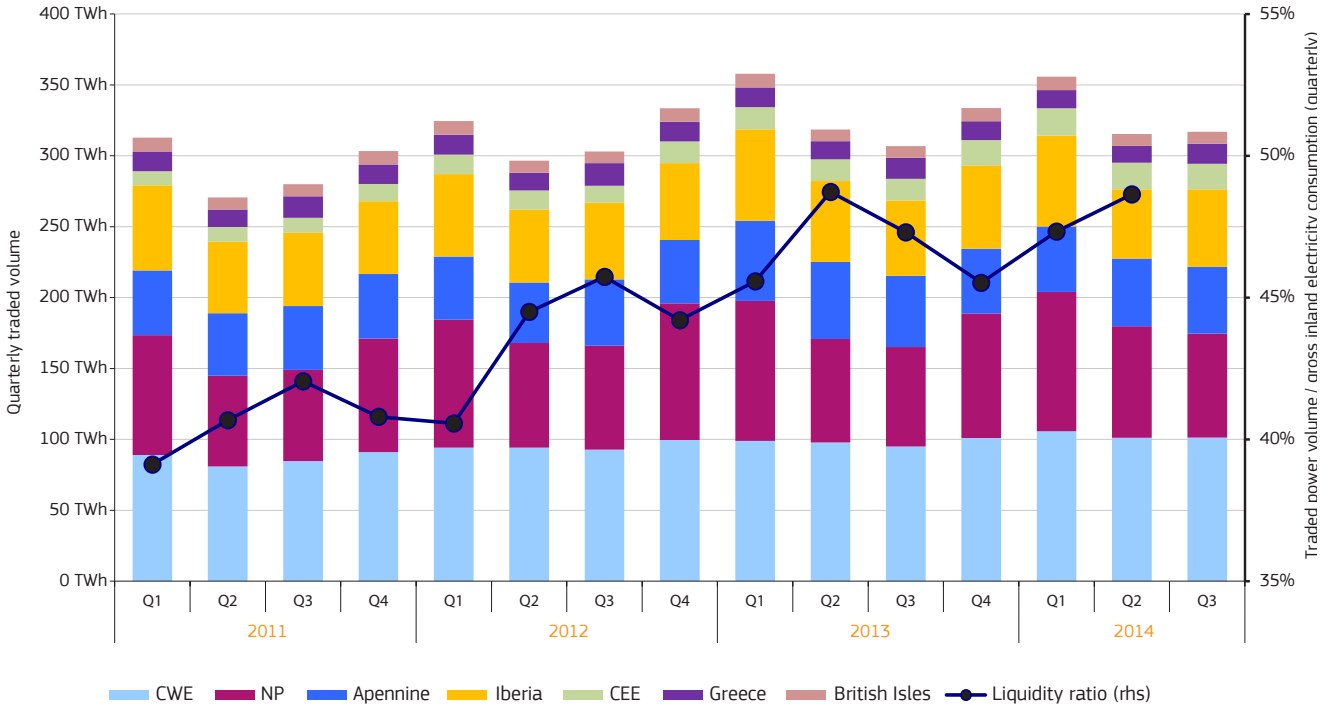
2. Traded volumes and liquidity on European wholesale electricity markets

- As Figure 4 shows, in the third quarter of 2014 the combined traded volume of day-ahead power contracts on European wholesale power trading platforms amounted to 317 TWh, which was slightly higher than in Q2 2014 (315 TWh), and grew by 3.3% compared to the same period of 2013 (when it was 307 TWh).

- Market liquidity, measured as the ratio of quarterly traded volume of day-ahead contracts and the quarterly electricity consumption of a given region, has increased to the highest during the past few years (48.8%) at European level in the second quarter of 2014, as the increase in traded volume of power outnumbered that in electricity consumption compared to the same period of 2013.

- In the second 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 85.9%. Both Central Western European (CWE) and Central Eastern European (CEE) market liquidity ratios reached an all-time high (33.4% and 23.4%, respectively).

FIGURE 4 – 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 5 shows the most important price drivers, affecting electricity generation costs in the EU. Coal became a competitive power generation source in many European countries, as since the beginning of 2011 the price of North-West European import contracts (CIF ARA), used as a benchmark in the Western part of the continent, fell by more than 30%.

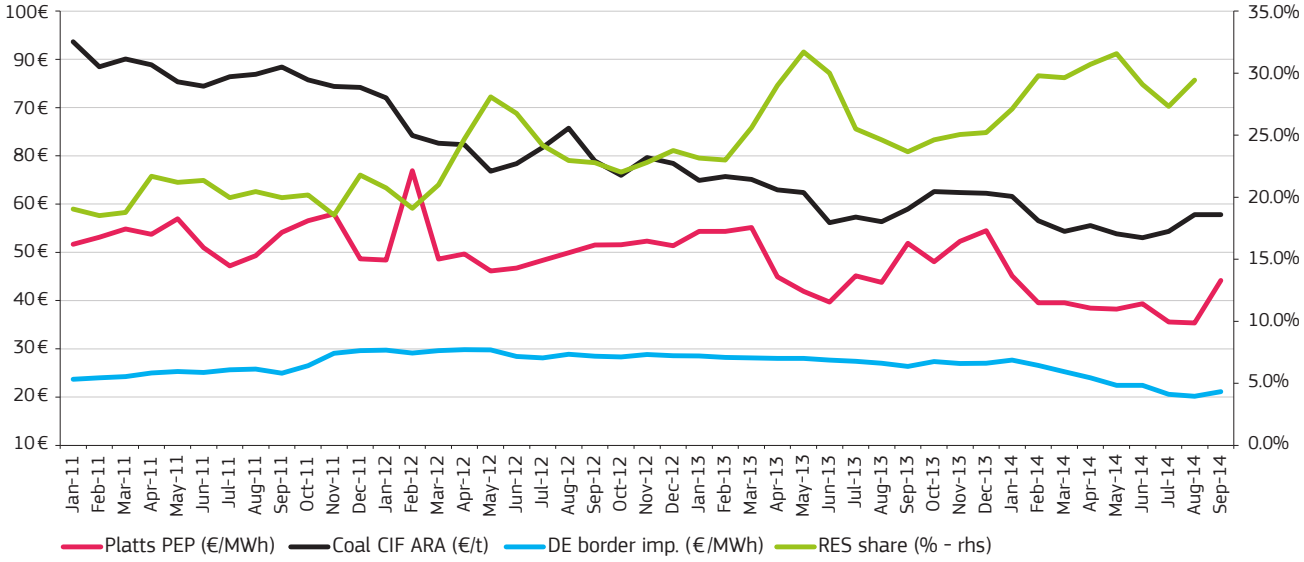
- Natural gas prices (measured as import prices on the German border) were fairly stable in 2012 and 2013, while from the beginning of 2014 they started to decrease, mainly due to high reservoir levels and mild winter conditions. Cheaper coal prices and decreasing wholesale electricity prices resulted in the reducing share of natural gas in the European power mix during the last couple of years; however, gas was mainly substituted by renewable sources rather than by coal.

- The share of renewable generation sources (wind, solar, biomass, together with hydro) followed an increasing trend during the past few years; since the beginning of 2011 this share was up by more than 10 percentage points. The fluctuations of the renewables share on the chart below is mainly due to changes in availability of hydro resources.

- Increasing share of renewables often result in negative hourly or on some trading days even in negative daily average baseload electricity prices, as it happened on the German EPEX market on the 17th of August 2014, when the daily average price fell below zero (-2.4 €/MWh). Occurrence of negative prices on the wholesale markets also reinforce the need of better integration of renewable generation sources to the power grid.

- Figure 5 also shows that since the beginning of 2012 the PEP index, representing the price evolution of the major European power markets, has been following a decreasing trend. Besides the supply side drivers described in the previous points, power demand remained subdued in the past few years, as consumption of electricity also decreased, or at best stagnated in most of the EU countries.

FIGURE 5 – EVOLUTION OF EUROPEAN AVERAGE WHOLESALE POWER PRICES COMPARED WITH COAL AND GAS PRICES AND THE SHARE OF RENEWABLES IN POWER GENERATION

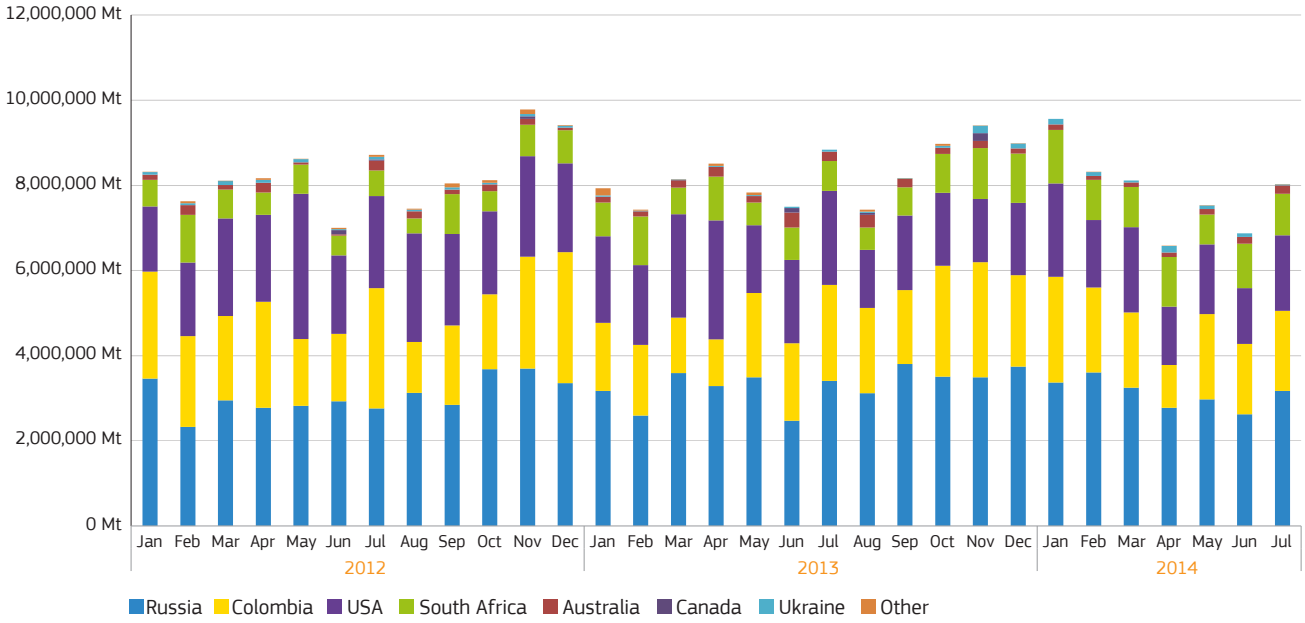


Source: Platts, BAFA, ENSTO-E
Platts PEP: Pan European Power Index (in €/MWh)
Coal CIF ARA: Principal coal import price benchmark in North Western Europe (in €/Mt)
DE border imp. stands for long term contract based import natural gas price on the German border (in €/MWh)
RES (renewables) includes hydro, wind, solar and biomass; RES share in the total power generation estimation for the EU-28 as a whole (right hand scale)

- The EU imported the bulk if its steam coal needs, which is mainly used in power and heat generation, as Figure 6 shows, from Russia, the United States, Colombia and South Africa in the past few years. While in earlier years coal imports in the EU showed a significant annual growth, from 2013 this dynamics first turned to stagnation and in 2014 to a decrease.

- In January-July 2013 the amount of imported steam coal decreased by 0.7%, compared to the same period of 2012, while in the first seven months of 2014 the decrease accelerated (-2.1%). As power demand in the EU did not show signs of recovery, and domestic coal stocks were abundant on the continent, it seems that there have been no more room for increase in steam coal imports in the EU.

FIGURE 6 – EXTRA-EU STEAM COAL IMPORT SOURCES AND MONTHLY IMPORTED QUANTITY IN THE EU-28



Source: Platts international coal trader

- European emission allowance prices have been fairly stable in the third quarter of 2014; they practically remained in a narrow range of 5.5-6.5 €/tCO_2e during the whole quarter. Although this price level is more than the double of what could be observed in April 2013, the market seemed to be still in ovesupply and at this level carbon prices continued to favour coal fired generation, being not able to provide signs for decarbonisation investments in the power sector.

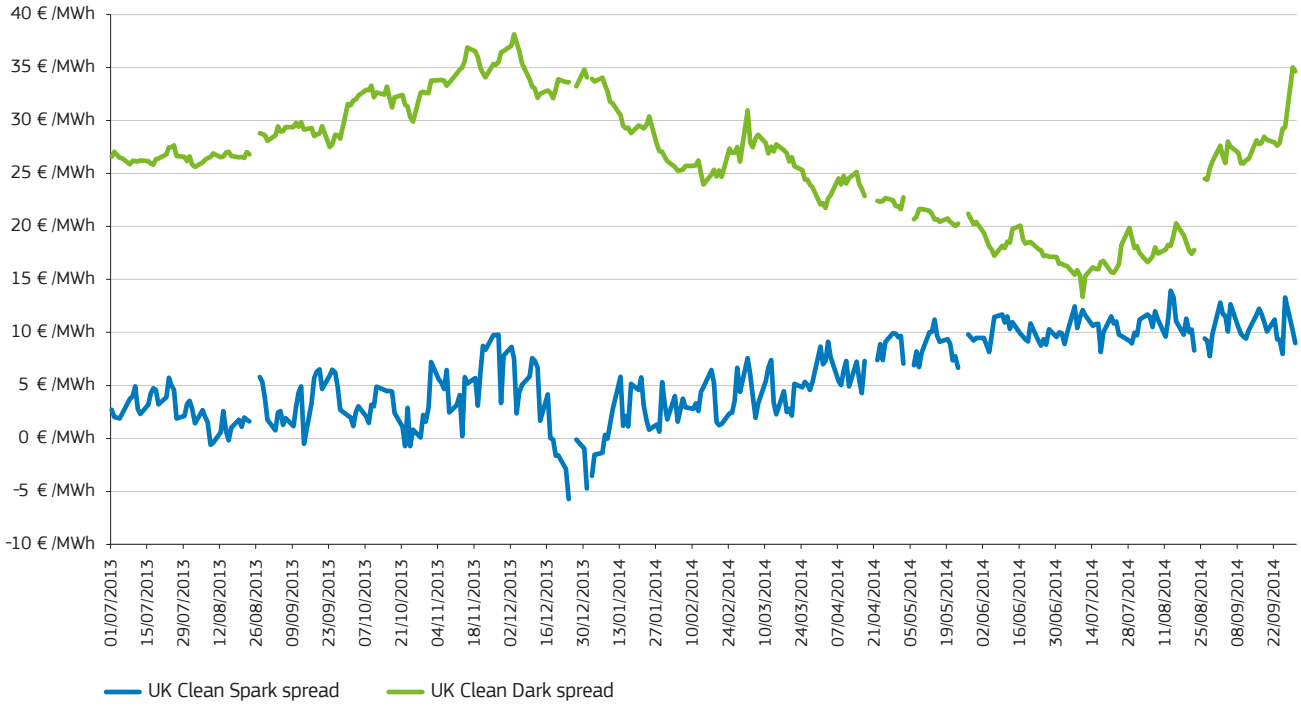
FIGURE 7 – EVOLUTION OF ETS EMISSION ALLOWANCE PRICES FROM JULY 2013 TO JUNE 2014

Source: Platts

- As Figure 8 and Figure 9 show, clean spark spreads in the United Kingdom, measuring the profitablity of gas-fired power generation, were close to 10 €/MWh during most of the third quarter of 2014. This stability in the clean spark spreads was the result of increasing natural gas prices on the NBP hub, increasing UK wholesale power prices, and stable emission allowances prices in this period. In Germany, given that wholesale power prices were much lower during the whole Q3 2014, clean spark spreads were still in negative ranges, pointing to further squeezing out of natural gas from the German power mix.

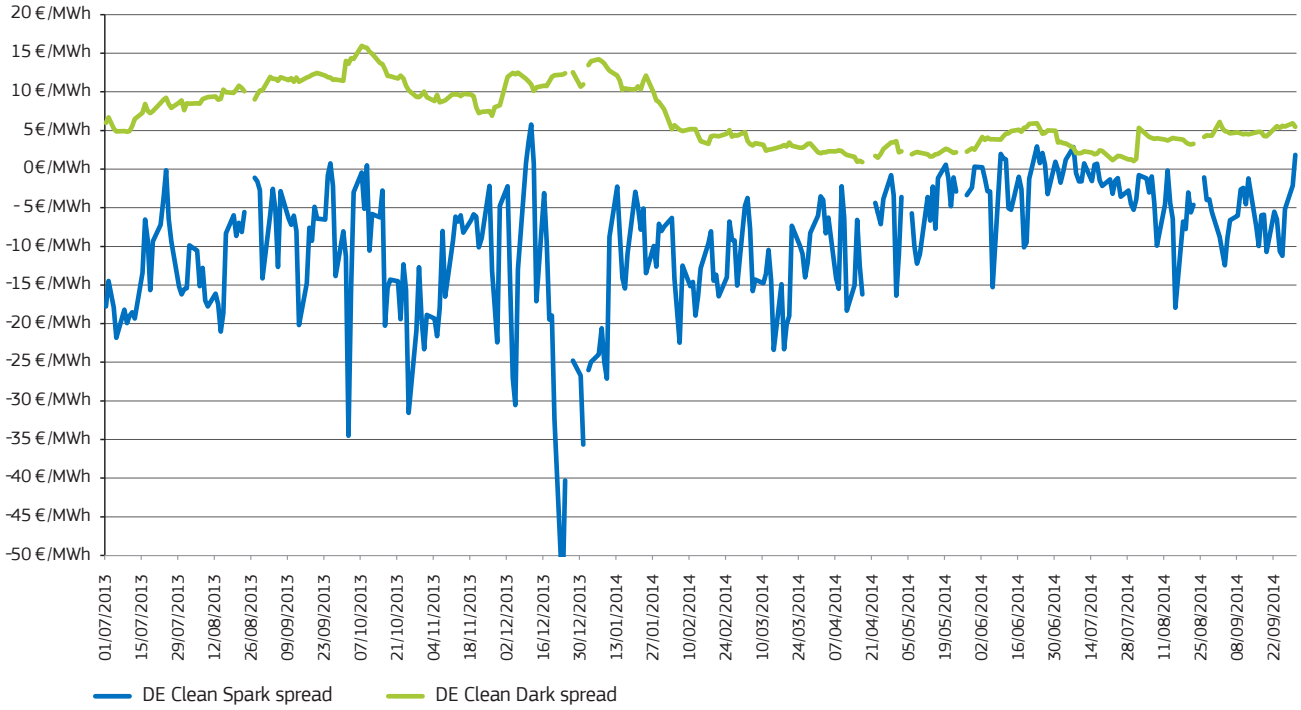
- In the case of clean dark spreads, measuring the profitability of coal-fired generation, a huge increase could be observed in the UK and a high degree of stability in Germany. Increasing power prices in the UK, coupled with stable coal and carbon prices have led to the highest clean dark spread since December 2013 by the end of Q3 2014. In Germany, as wholesale power prices, coal and carbont contracts all remained stable, clean dark spreads did not show significant changes throughout the quarter.

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 below (Figure 10) shows, there were significant price differences in the wholesale prices across the EU in the third quarter of 2014, ranging from 28.7 €/MWh in France to 59.9 €/MWh in Greece. In most of the Central Western and Central Eastern European countries wholesale prices were fairly aligned with each other, though local generation mixes, temporary outages in generation facilities or interconnectors (e.g.: Poland, Belgium) resulted in larger price differentials to the neighbouring countries in these regions.

- Local generation or interconnection availability factors can significantly change the position of a country in the ranking of wholesale prices at EU level. For example, Spain and Portugal, which used to be among the cheapest countries in the first half of 2014, belonged to the most expensive ones in Q3 2014, due to significant changes in their power mixes (a large amount of renewable generation has been replaced by costlier conventional generation sources).

- Countries having lower than optimal interconnection capacities to their neighbours (e.g.: some of the Baltic states, Greece or Ireland) tended to have significantly higher prices during Q3 2014 than most of other European peers.

- Although most of the wholesale electricity markets are coupled with one or more neighbouring countries, and market coupling reduces welfare losses in cross border electricity trading, in itself it cannot eliminate price differentials across Europe, as local factors described above are still important in price formation.

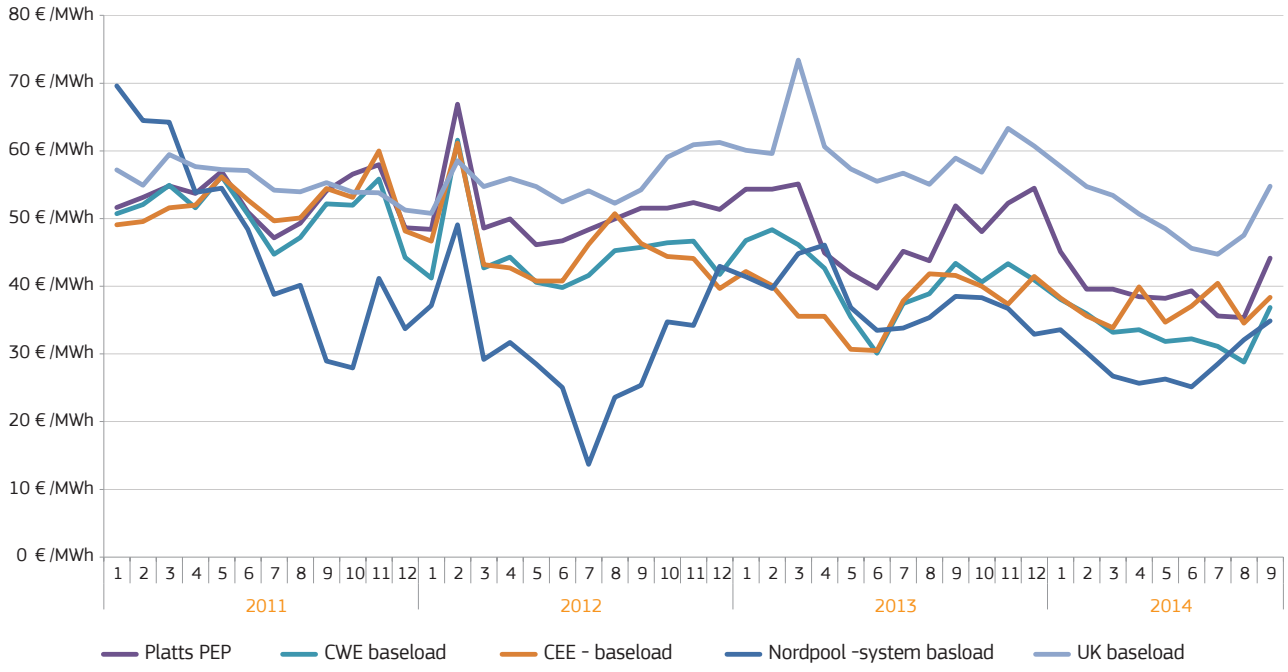
FIGURE 10 – COMPARISON OF AVERAGE WHOLESALE BASELOAD ELECTRICITY PRICES, FIRST SEMESTER OF 2014

Source: European wholesale power exchanges

- Figure 11 and Figure 12 show the evolution of monthly average baseload wholesale electricity prices in the main power regions in the EU; in parallel with the Platts European Power Index (PEP). All market indices on Figure 11 followed a downward path since the fourth quarter of 2013, while in Q3 2014 most of them turned up, mainly due either to increasing natural gas prices (as it was the case in the UK) or to decreasing hydro and renewable generation (Nordpool and the CWE region). The CWE average baseload price fell slightly below 30 €/MWh in August 2014, mainly in the consequence of significant nuclear generation in France and high hydro levels in the Alpes.

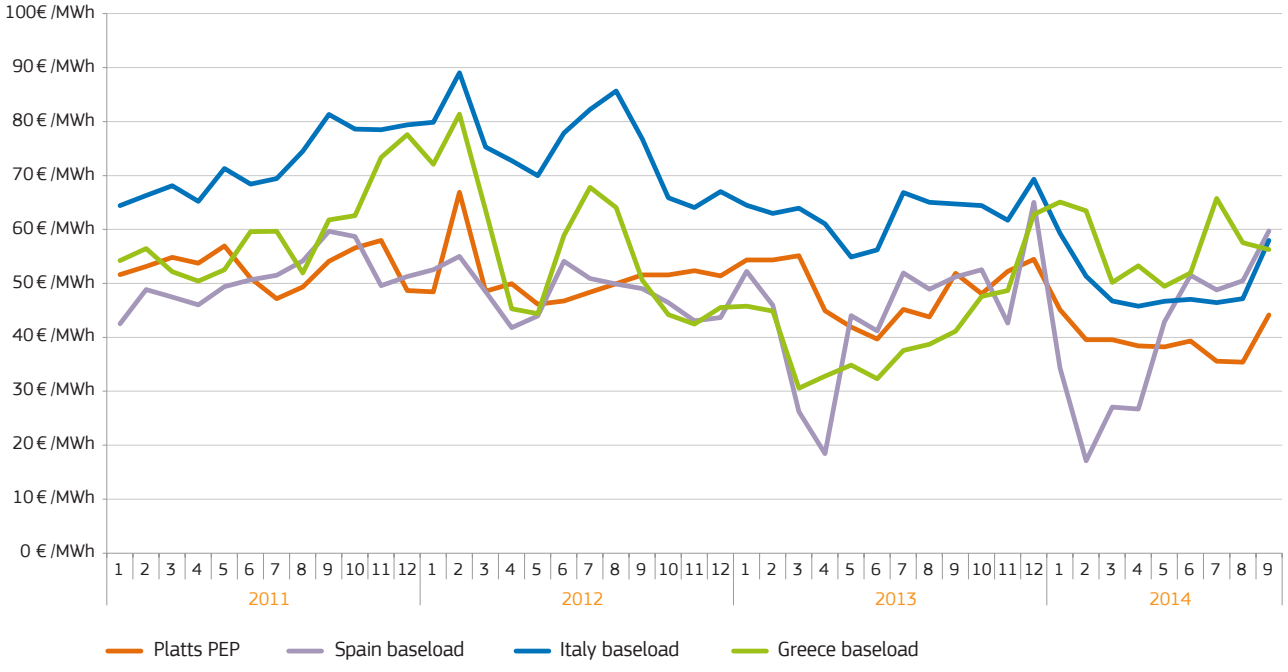
- Similarly to the Nordpool region, the Spanish market was also significantly impacted by the changes in hydro generation. Between February and September the Spanish monthly baseload price has more than trebled, primarily owing to decreasing hydro availability. The Italian power price was, similarly to the UK, impacted by natural gas prices, though the increasing importance of renewables in Italy makes the picture more sophisticated.

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

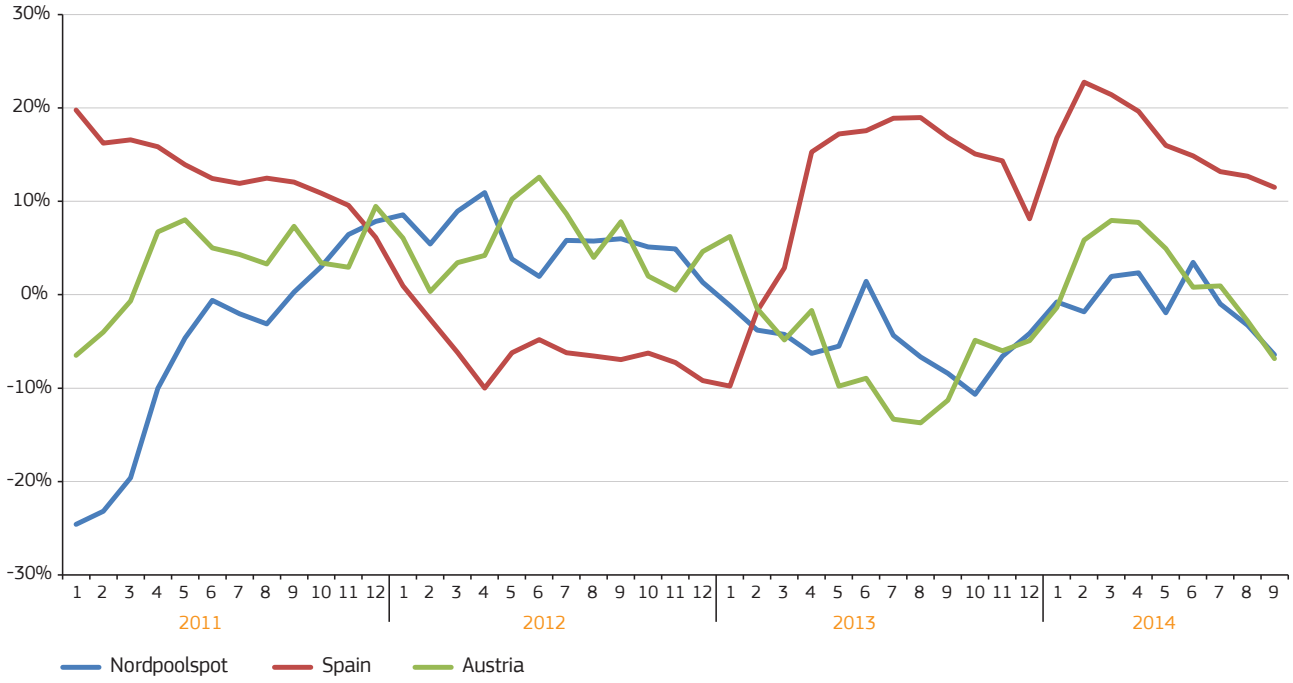
FIGURE 12 – COMPARISONS OF THE PLATTS PEP AND MONTHLY ELECTRICITY BASELOAD PRICES IN REGIONAL ELECTRICITY MARKETS (SPAIN, ITALY AND GREECE)



Source: Platts, European power exchanges

- Figure 13 shows the deviation of actual hydro reservoir levels compared to the local long term seasonal averages. In all of the three observed regions (Nordpool, Spain and Austria) actual hydro levels decreased in the third quarter of 2014. In the case of Spain and Austria they were even below the long term averages at the end of September 2014, implying a lower than usual potential for hydro generation. Hydro levels are also important in other countries in the CEE region, for example Romania, or Hungary, which latter can benefit from cheap power imports from the Balkan countries, generated from hydro.

FIGURE 13 – 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, France, Germany, the Netherlands, Switzerland)

- As Figure 14 shows, in July and August 2014 day-ahead wholesale power prices continued their downward trend that could be observed since the end of 2013. In August both the baseload and peakload monthly regional averages fell to several year lows (both around 30 €/MWh).

- Decreasing prices were due to the coincidence of several factors on both the demand and the supply side of the electricity market. During the summer period industrial demand for power normally recedes in the holiday season, and in the lack of ongoing warm weather power demand for residential cooling needs in the CWE region was not siginificant in this period.

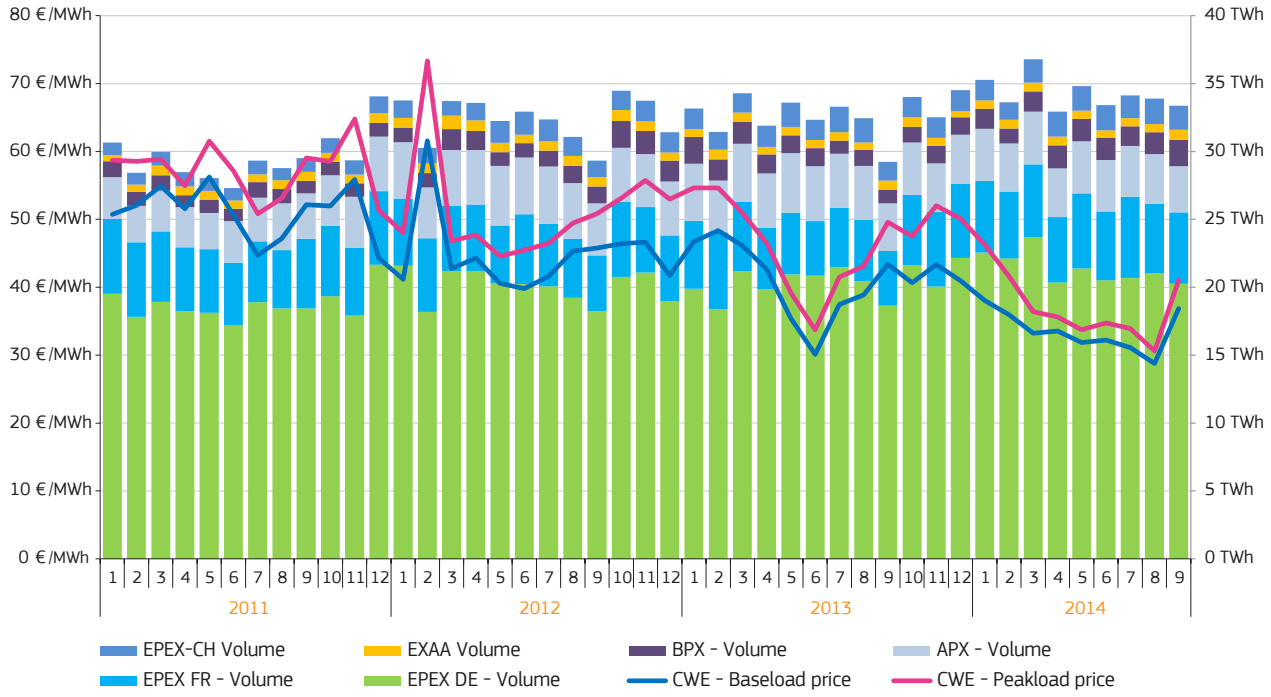
- In France the monthly day-ahead average baseload power price fell to very low levels (23 €/MWh) in August 2014, due to the combination of abundant nuclear power supply, increasing hydro power generation, relatively mild weather and limited industrial demand for power. In Germany windy weather assured high level of renewable generation, however, solar power generation receded due to cloudy and rainy weather. In the Netherlands the price of the day-ahead contracts increased gradually throughout the whole Q3 2014 period, in paralel with rising natural gas hub prices. In July a new coal-biomass power plant came online in Rotterdam, which may increase the competitiveness of Dutch power generation in the period of high gas prices, reducing import needs.

- In September 2014, as demand started to increase due to the end of the holiday season and increasing lighting needs at the beginning of autumn, wholesale power prices turned up in the CWE market. This price increase was helped by decreasing renewables generation in the region and further increasing gas prices.

- In Belgium three nuclear reactors, representing 3 GW generation capacity that amounts to one quarter of the total genertion fleet of the country, has been permanently taken offline. On the short term this results in increasing import needs and during the winter period power shortages may occur, for which the special plan for temporary disconnecting pre-defined regions in the country, in order to keep the power system in operation, has been prepared and presented to the public. In paralel with this, a strategic reserve measure, putting online an additional capacity of 850 MW in the case of quick need, has been implemented as of November 2014.

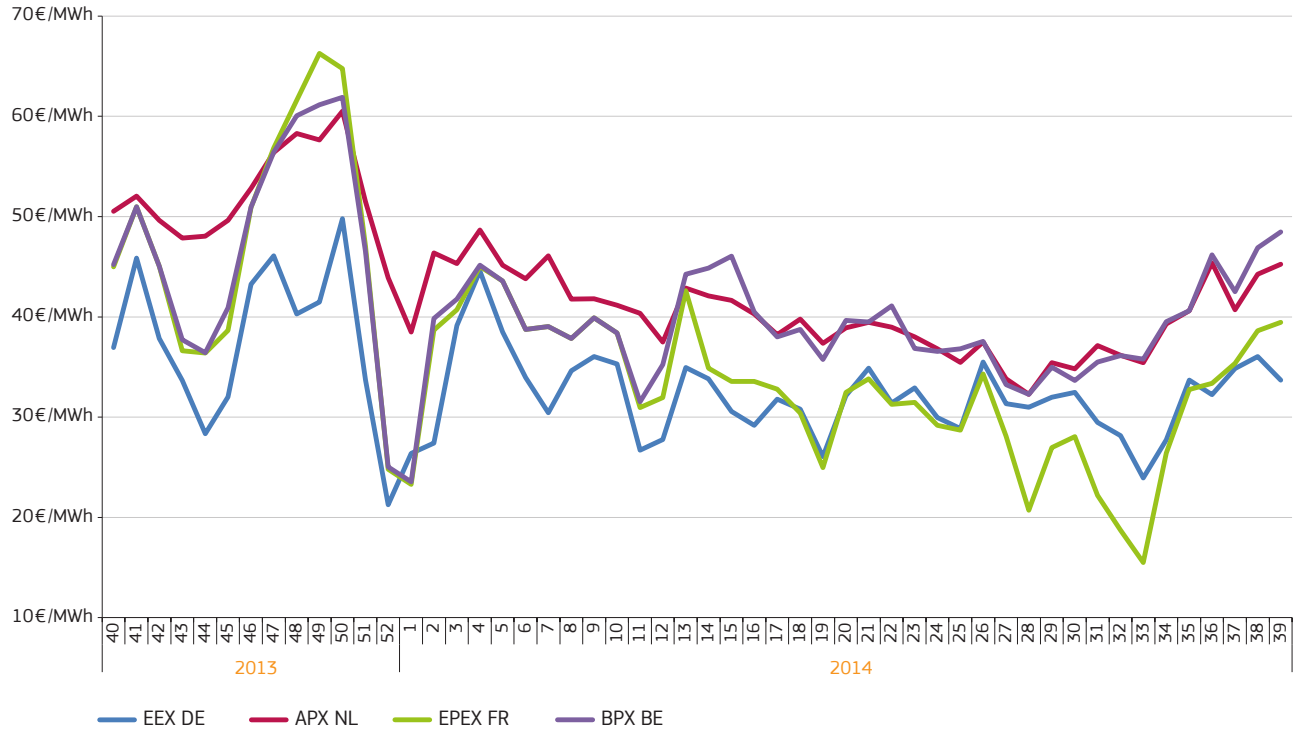
- As a result of these ahievements in the CWE region Belgian and Dutch baseload power contracts showed an 8-10 €/MWh premium to their German and French peers by the end of the third quarter of 2014, as Figure 15 shows. Belgium continued to be a significant power importer from France, while the Netherlands imported its additional power need from Germany, also importing power from Norway and exporting to the United Kingdom.

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, and the evolution of natural gas prices on the British NBP gas hub. In the first half of July 2014 the UK day ahead baseload electricity price fell to 45 €/MWh, which was the lowest since June 2010. This was mainly due to decreasing natural gas prices, diminishing to a four-year low of 15 €/MWh at the beginning of the third quarter of 2014,

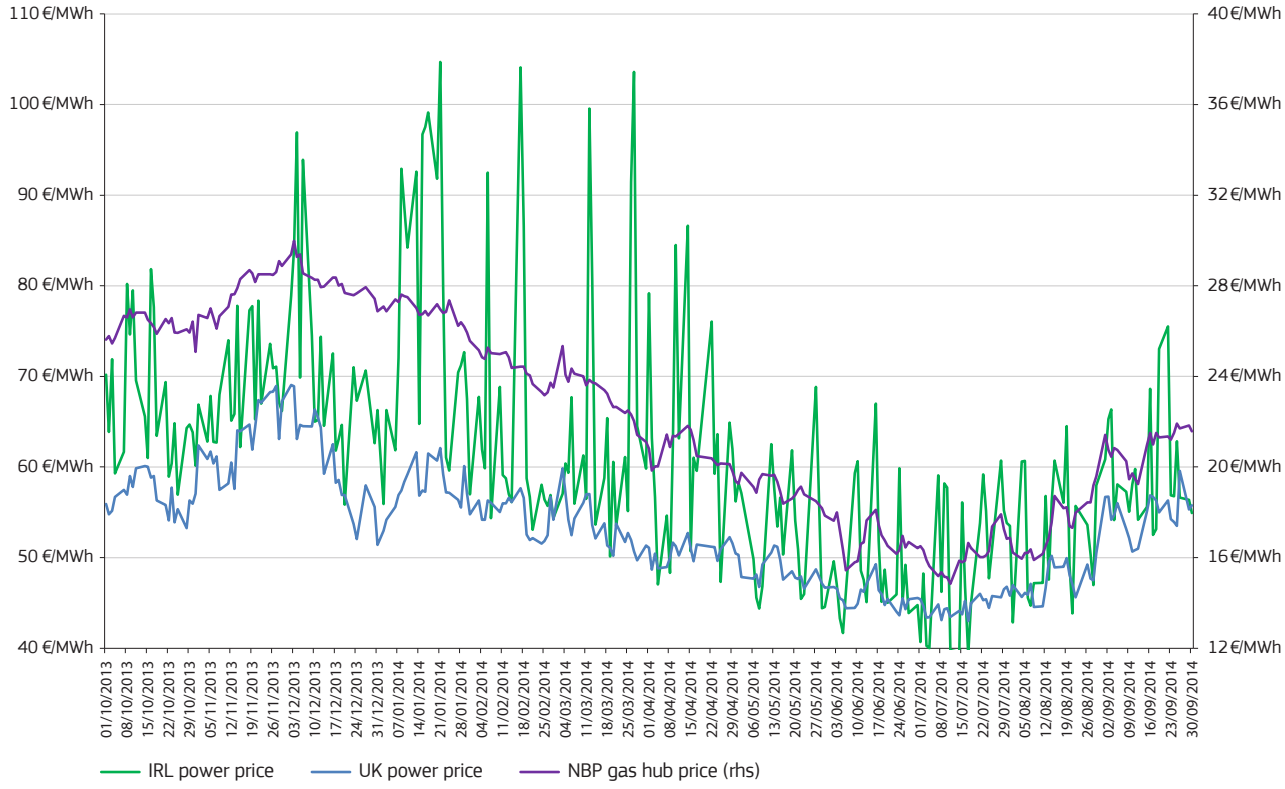
- The stable profitability of gas-fired generation and decreasing profitability of coal-fired generation have shifted the UK power mix towards natural gas from coal. While in April 2014 the share of coal in the UK power generation mix was 34%, it fell to 18% in the July-August period. Meanwhile, the share of natural gas rose from 19% measured in April to 37% in July, and then in August 2014, in parallel with rebounding gas prices, it fell slightly back to 33%. In August 2014 the share of renewables (mainly wind) was above 10% in the UK power mix again, helping to mitigate the impact of rising natural gas prices. In September, as gas prices continued to climb higher, the share of coal in the power mix began to rebound. This perfectly shows how flexibly the UK power generation fleet can react to the developments in the coal-gas price competition.

- Despite low prices, the average UK wholesale contract showed a 10-15 €/MWh premium to the major West European peers, and the country remained in a strong net electricity importer position, as prices on the continent were even lower.

- Irish price premium to the UK wholesale electricity market has shrunk to the lowest level (3 €/MWh) in the third quarter of 2014 since the beginning of available data sets (2010). The fluctuation of the Irish prices was definitely lower than in the previous two quarters, resulting in lower average electricity prices in the country. Gas prices also strongly impacted the Irish power generation mix. In parallel with decreasing gas prices the share of gas went up from 43% to 62% between April and July 2014.In August, this share fell back, but in September, in spite of rising gas prices, it rose back to 60%, as dwindling wind power generation could not satisfy all electricity needs.

- Contrary to the gas-coal competition observed in the UK, wind power has recently become the competitor generation source to natural gas in the Irish mix. However, given the intermittent nature of wind, gas cannot be so flexibly substituted by wind as it can be by coal in the UK, which fact might contribute to the higher electricity price volatility in Ireland.

FIGURE 16 – 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)

- After reaching 25 €/MWh in June 2014, the lowest level since September 2012, the monthly average wholesale system price in the Nordpoolspot market started to increase and reached 35 €/MWh in September, as Figure 17 shows. This was mainly due to the decreasing level of hydro reserves, being slightly less compared to the long term average in July, while in September it lagged behind the normal seasonal value by more than 6 percentage points.

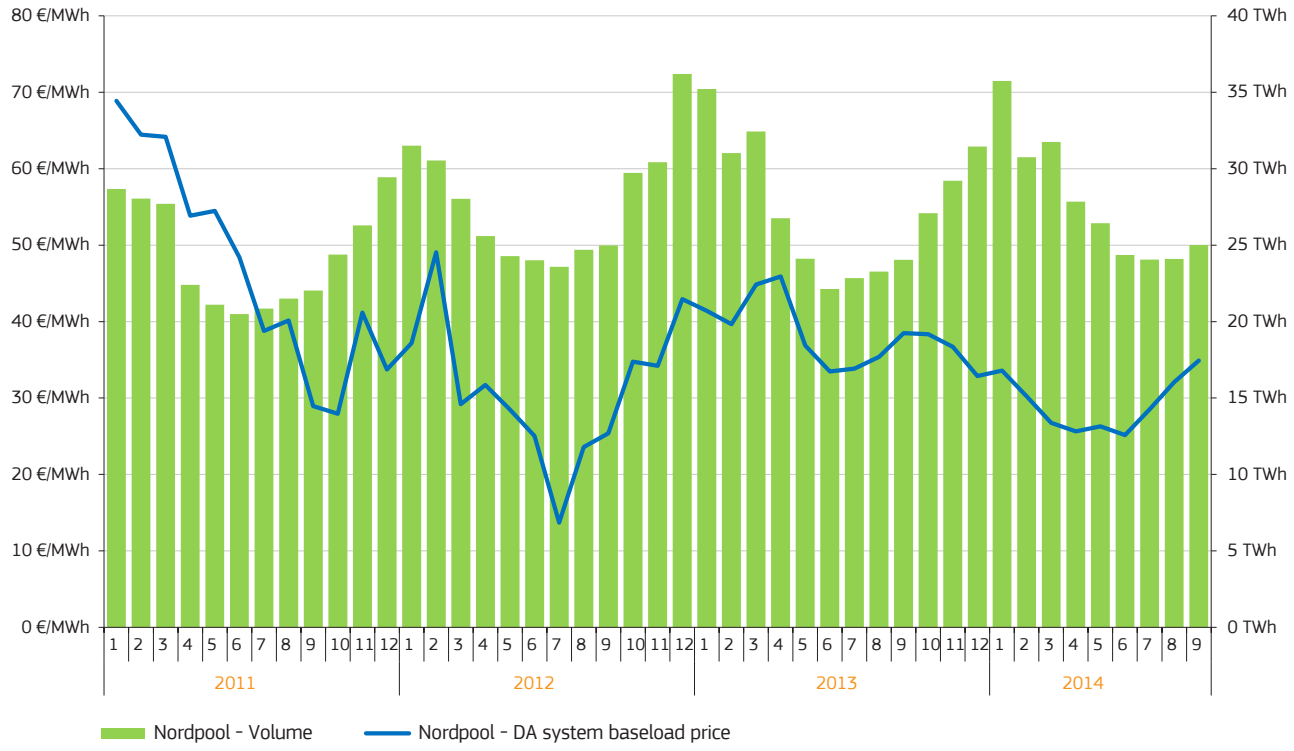
- Decreasing hydro power generation was partly compensated by higher share of nuclear in the regional energy mix. In the July-August period share nuclear reached 50% in Sweden and 40% in Finland. On the top of this biomass assured around one sixth of Finnish power generation in the same period.

- Norway proved to be the cheapest market again in the Nordic region in the third quarter of 2014 (31 €/MWh on quarterly average), while the average wholesale price was almost 57 €/MWh in Latvia and Lithuania, reflecting the insufficient interconnection capacities with the rest of the Nordic region of these two Baltic countries and high exposure for power imports at the same time.

- Although prices on most of the continental peers were quite close the Nordic prices (the French and German quarterly price average were even lower than the Norwegian price), the Nordic region managed to preserve its net power exporter position, mainly exporting to the Netherlands and Poland, where significant price premiums could be observed to the Nordpoolspot market.

- Following the seasonal pattern, the average traded volume in the third quarter of the year fell to a yearly low, however, in Q3 2014 the combined Nordpoolspot traded volume was up by 4% compared to the same period of the previous year, pointing to an increasing liquidity of the regional wholesale electricity market.

FIGURE 17 – MONTHLY TRADED VOLUMES AND PRICES IN NORTHERN EUROPE



Source: Nordpool spot market

4.4 Apennine Peninsula (Italy)

- Between March and August 2014 the Italian monthly average baseload electricity price fluctuated in a narrow range of 45-47 €/MWh, which was low compared to the prices in this market observed in the last decade. In September however, due to increasing gas prices on the Italian and other major European hubs, the monthly baseload average price rose to 58 €/MWh, being the highest since the beginning of the year.

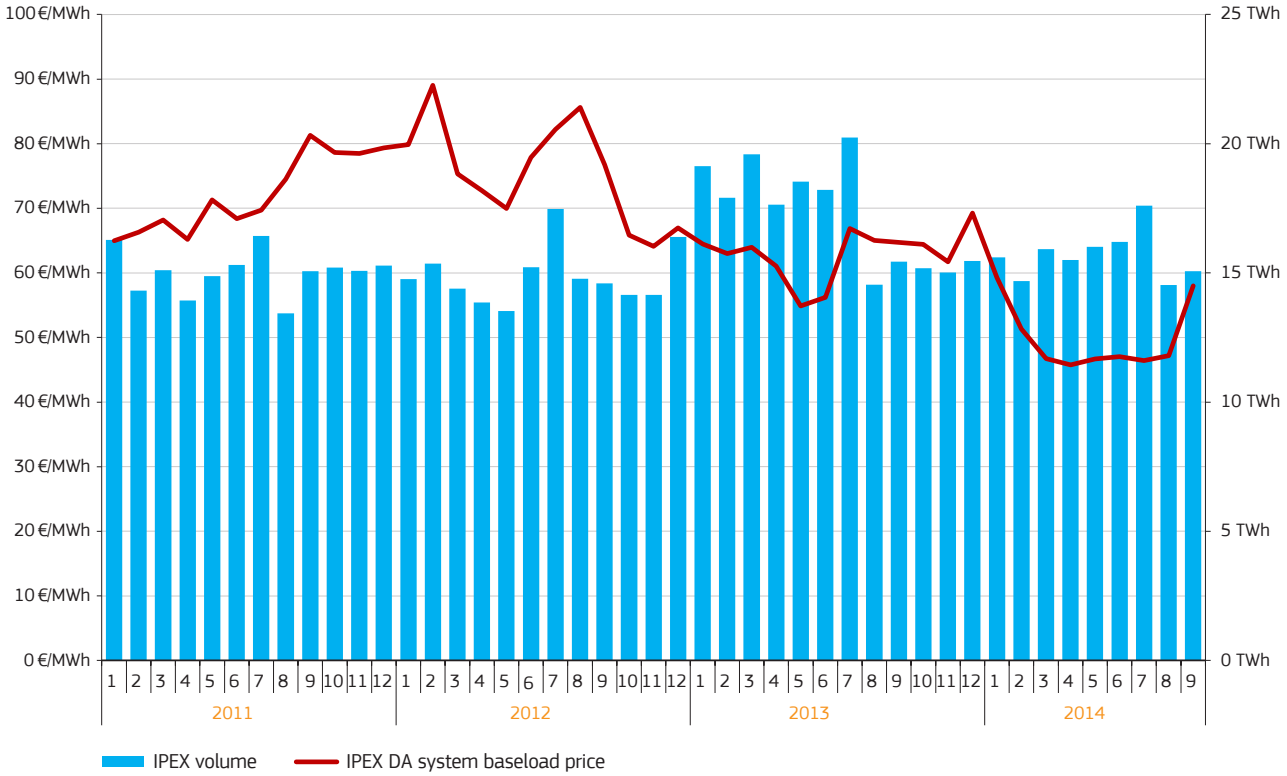
- The share of conventional thermal power plants (gas, coal and oil) in power generation has been following a decreasing trend in Italy, dropping from 80% at the beginning of 2012 to 54 % in July-August 2014. This is accompanied by increasing share of renewable sources, mainly solar energy, which latter assured 13% (all-time high) of the generated power in August 2014. Meanwhile, due to the rainy weather in the Alpes during the summer, the share of hydro was more than 25% in July-August.

- Increasing share of renewable energy sources and lower gas prices helped to bring down wholesale power prices in Italy, however, the market was still in a price premium of 15-20 €/MWh to Central and Western Europe, providing for opportunities for these countries to export electricity to Italy.

- As the summer in 2014 was not substantially warmer than usual, and as industrial demand for power remained limited in the consequence of the sluggish economic recovery in the country, the lack of substantial extra-demand for power could not exert an upward pressure on the electricity market, also contributing to low prices.

FIGURE 18 – MONTHLY TRADED VOLUMES AND PRICES IN ITALY

Source: GME (IPEX)



4.5 Iberian Peninsula (Spain and Portugal)

- Spanish and the Portuguese wholesale electricity markets were among the most expensive ones in the third quarter of 2014 in the EU. The quarterly average baseload price in these markets were above 52 €/MWh in Q3 2014.

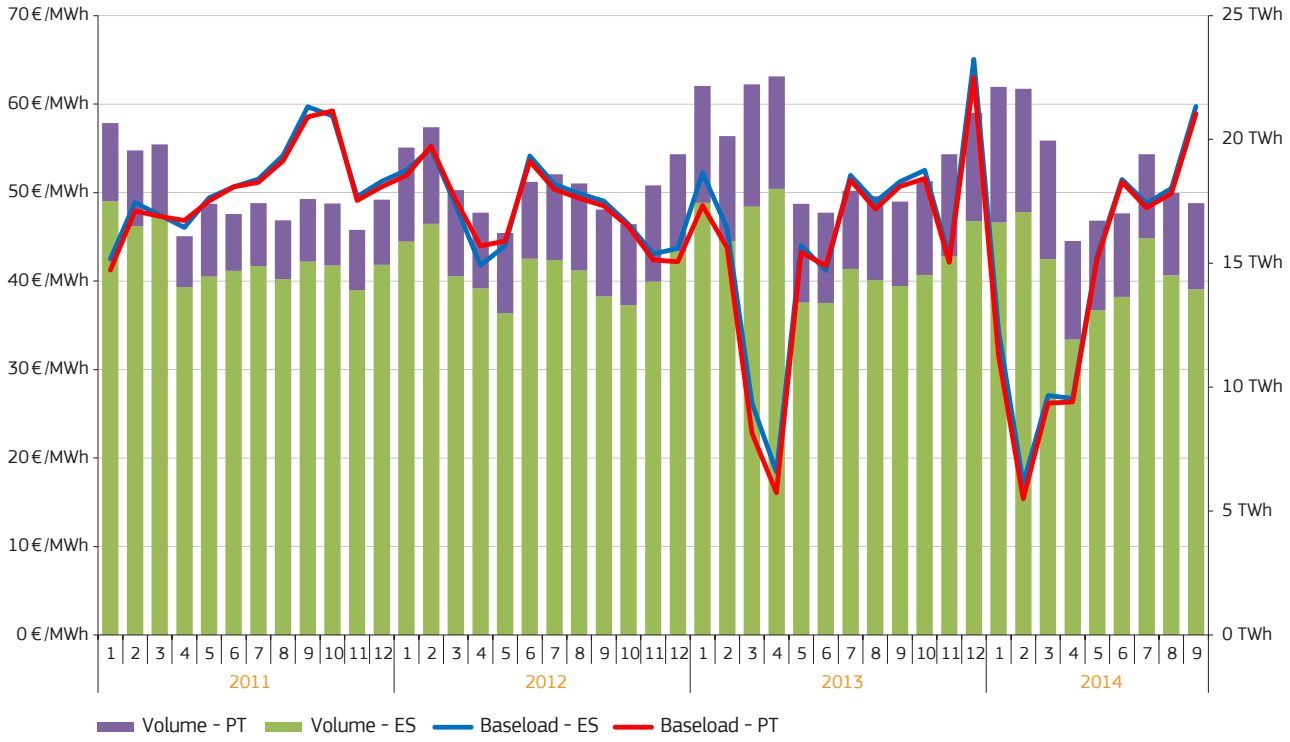
- On the supply side increasing generation costs were filtering through wholesale electricity prices, as actual hydro reserve levels were lower than the long term average (at the end of Q3 2014 this difference amounted to 7 percentage points), the share of wind power generation fell to several year lows in September 2014, and an unplanned nuclear outage also reduced the supply of technologies with low marginal generation costs, pushing the electricity mix towards costlier forms of power generation.

- Fossil fuels assured more than 52% of the Spanish power generation in September, being the highest share since January 2012.

- On the demand side, improving economic activity and an ongoing hot weather in August-September 2014 also resulted in increasing industrial and residential demand for power, providing for a support for the upward price trend of the wholesale markets in Spain and Portugal

- As on average there was a 25 €/MWh price premium to the French market in Q3 2014, it is not surprising that power imports from France reached a several year high (817GWh) in August 2014 in Spain. However, in spite of the existing market coupling between the Spanish and the French markets, cheaper imports from France could not exert a real downward pressure on the Spanish market, in the lack of sufficient cross border electricity interconnection capacities.

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



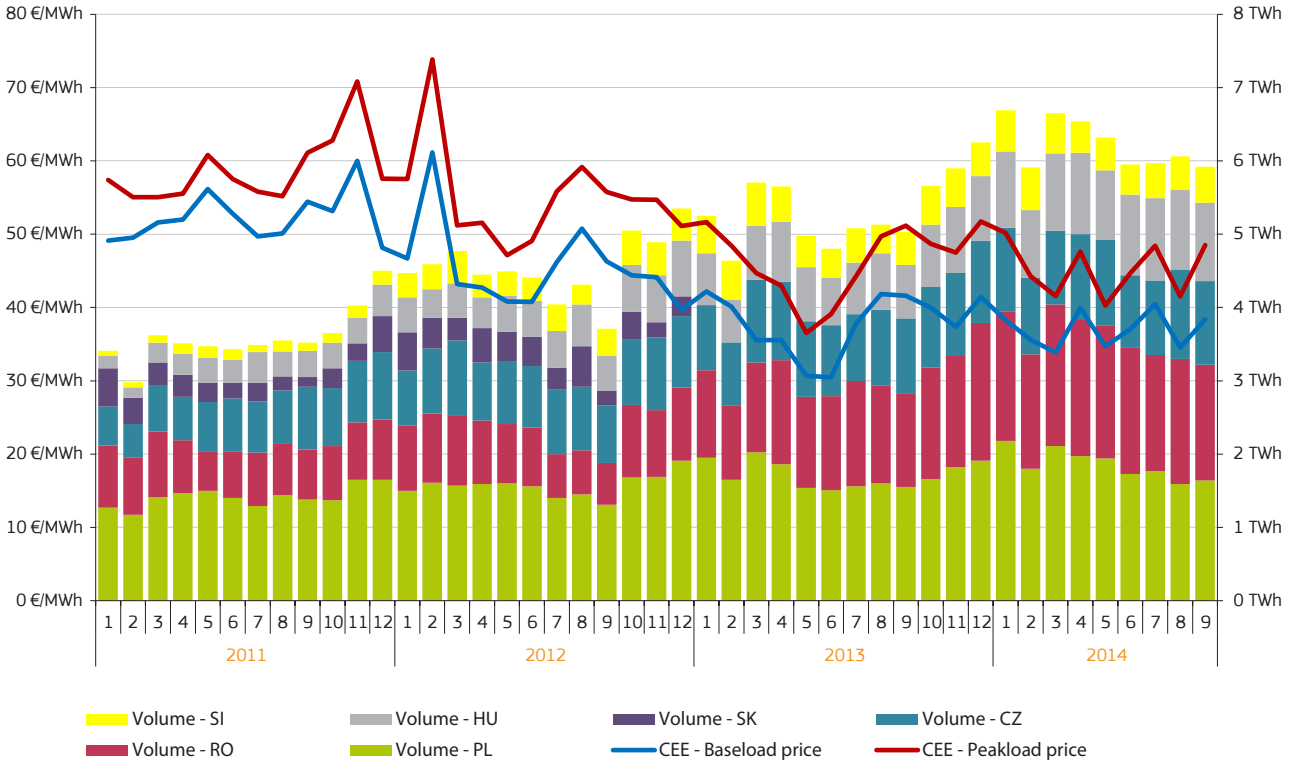
Source: Platts, OMEL

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

- As Figure 20 shows, the combined traded volume of day-ahead baseload power contracts continued to grow in the third quarter of 2014, compared to the same quarter of the previous year (+18%), though due to the seasonal pattern it slightly decreased compared to April-June 2014. In the second quarter of 2014 the liquidity of the CEE market kept on improving and reached 23% (as measured as the ratio of traded volume of power and the consumption of electricity in the participating countries), which was higher than in Q2 2013 (19%).

- The monthly average regional baseload wholesale price was 38 €/MWh in September 2014, while the respective figure for the peakload contracts stood at 49 €/MWh, fitting in the slightly decreasing trend of the wholesale prices on the CEE market that could be observed in the twelve months preceding the third quarter of 2014.

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



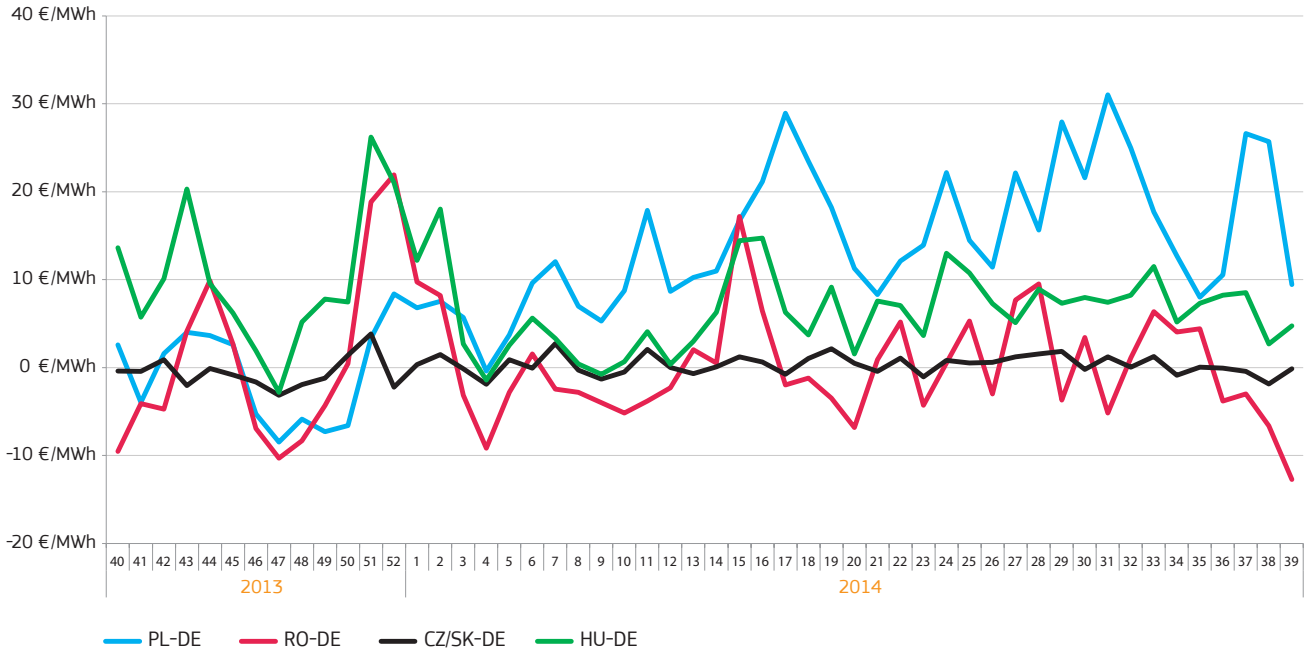
Source: Regional power exchanges, Central and Eastern Europe (CEE)

- As Figure 21 shows Polish wholesale electricity prices were the most expensive in the CEE region throughout the whole third quarter of 2014, similarly to the previous quarter. The Polish market remained one of the most expensive in the EU, primary due to a series of plant outages, cross-border capacity constraints and ongoing hot weather in some periods of the quarter, resulting in tightening supply margins.

- Czech and Slovak market prices were the most closely aligned with their German peers; mild weather conditions, resulting in the lack of upward pressure on prices, managed to keep power prices low. Hungarian prices were mostly influenced by declining hydro reserve levels in the Balkans, cross-border capacity curtailments on the Slovak border and some unplanned outages in August and September 2014.

- Romanian power prices turned out to be the lowest in the CEE region by the end of the third quarter of 2014, as high level of hydro generation, providing for 35% of the power mix in the country on quarterly average, assured a cheap source of power generation.

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

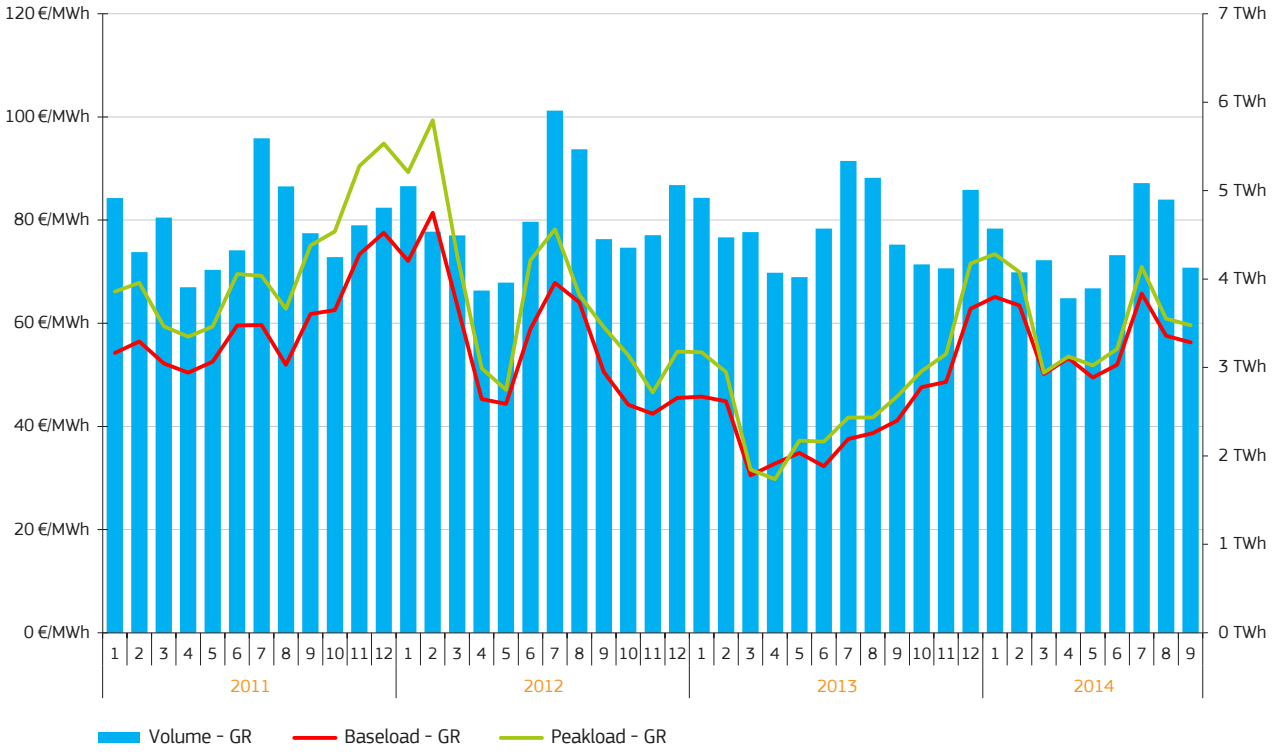


Source: Platts (EPEX), Regional power exchanges

4.7 South Eastern Europe (Greece)

- In July 2014, due to hot weather conditions, resulting in increasing residential cooling needs, the Greek monthly average wholesale baseload power price rose to 66 €/MWh, while to peakload contract was 71 €/MWh, being the highest prices since the beginning of the year.
- Although in August and September both baseload and peakload prices decreased following milder temperatures, Greece remained the most expensive power market in the third quarter of 2014 (with an average baseload price of 59.9 €/MWh).
- From the second quarter of 2014 onwards Greece had to rely more and more on electricity imports to satisfy its domestic consumption needs; in August 2014 almost 23% of its electricity consumption had to be imported, mainly from Bulgaria and the Former Yugoslav Republic of Macedonia (FYROM), while a year earlier this ratio was only 3%. This increasing import need is mainly the consequence of decreasing gas fired power generation in the country.
- At the same time share of solar power generation is increasing, reaching 11% in the third quarter of 2014. Due to the rainier weather the share of hydro power generation was also higher during the summer of 2014 as a year earlier. Increasing renewable power generation might help in keeping wholesale prices lower and mitigating power import needs.

FIGURE 22 – MONTHLY TRADED VOLUMES AND PRICES IN GREECE



Source: DESMIE

5. International outlook
comparing EU power prices with US peers

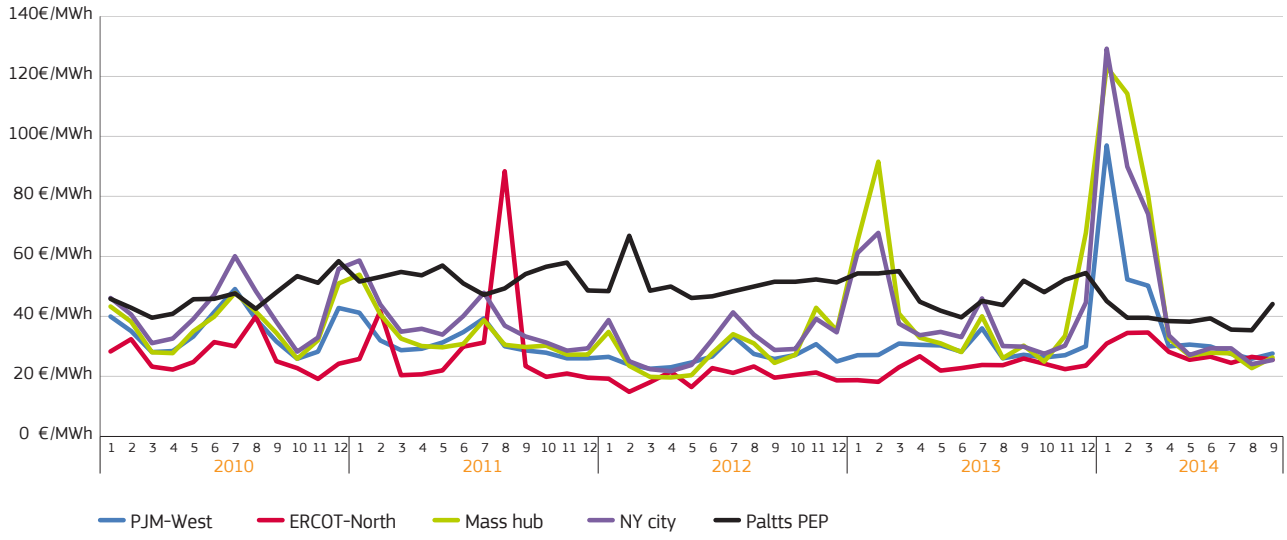
- As the next two charts (Figure 23 and Figure 24) show, wholesale electricity prices on the major US hubs were lower than the PEP index during most of the time in the last four years. The average of the four US hub prices, as Figure 24 shows, were only below the European PEP index at the beginning of 2014, when power prices spiked in the US, due to harsh winter conditions.

- Due to available cheap domestic gas resources (mainly shale gas), electricity generation in the US tended to more and more rely on natural gas during the last few years. US electricity price differential to Europe widened between 2010 and 2012, as US gas hub prices gradually decreased, however, since mid-2012 it started to decrease again as gas prices in the US rebounded from the lows measured in April-May 2012.

- Natural gas prices are extremely sensitive to weather conditions; during winter period higher gas prices often resulted in wholesale electricity price spikes, especially in northern US power regions (Massachusetts, New York), while in the South (ERCOT) gas prices were more stable and winter electricity spikes were rare.

- Permanent wholesale electricity price differentials between the US and the EU result in a competitiveness advantage for energy intensive industries manufacturing in the US, as they consume a significant amount of electricity compared to their value-added during the production process. This competitiveness advantage might lead to relocating of the manufacturing activities from the EU to the US, especially in the case of industries, where trade intensity (the importance of exports and imports between the EU and the US compared to the EU domestic production) is significant.

FIGURE 23 – COMPARISON OF THE MAJOR US WHOLESALE ELECTRICITY HUB PRICES WITH THE EUROPEAN



AVERAGE (PEP)

Source: Source: Platts

PJM West: Pennsylvania-Jersey-Massachusetts hub (Western part); ERCOT: Texas hub; Mass: Massachusetts hub; NY city: New York city hub-;

Platts PEP: Pan-European Power index

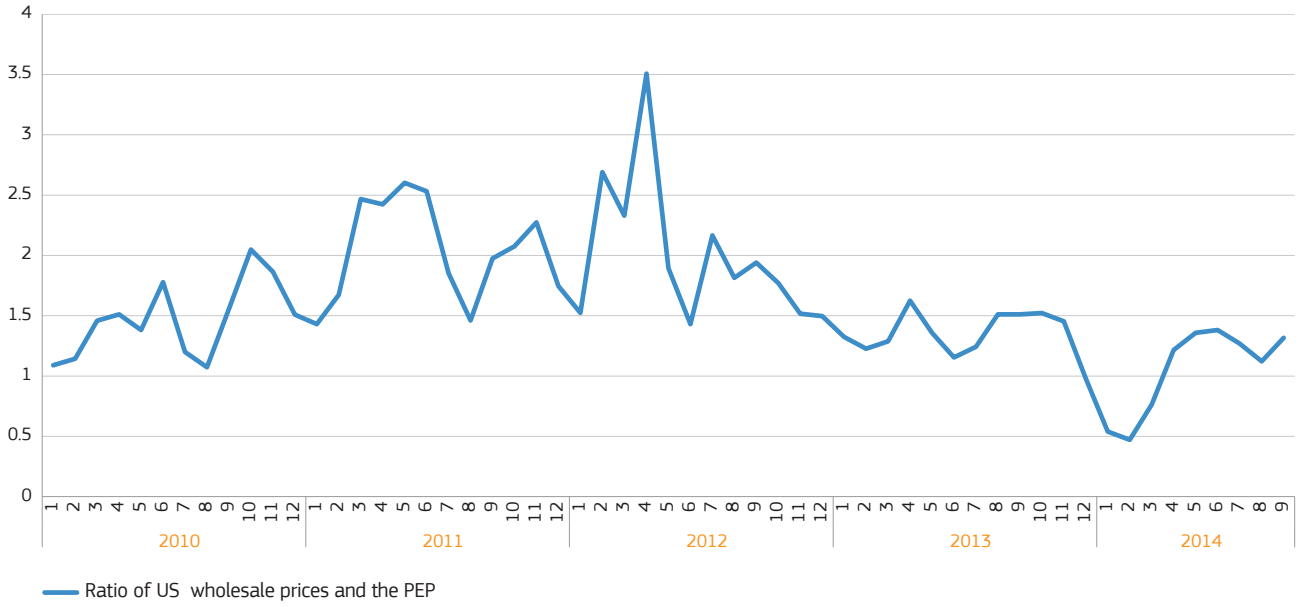


FIGURE 24 – THE RATIO OF THE AVERAGE US WHOLESALE ELECTRICITY PRICE AND THE EUROPEAN AVERAGE (PEP)

Source: Platts

US wholesale electricity price average calculated from the four indices presented on Figure 23.

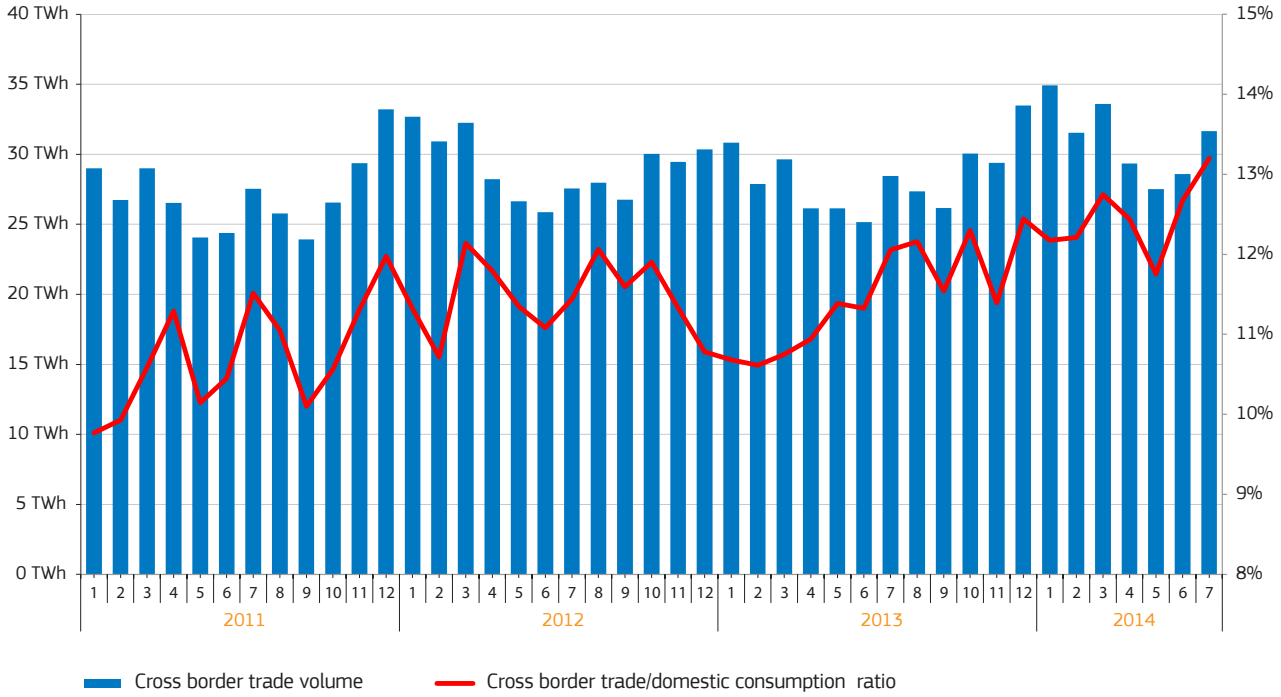
6. Building the internal market for electricity

- As Figure 25 shows, in May-July 2014 monthly cross-border physical power flows in the EU reached 29.3 TWh on average, being 10% higher than in the same period of 2013. Electricity consumption only slightly increased[1] (by 1.6%) in May-July 2014 compared to same months of 2013, while the combined traded volume of power increased by 3.3% on the major electricity trading platforms in the EU.

- The ratio of cross border physical flows and the electricity consumption in the EU reached 13.2% in July 2014, which was the highest in the last four years.

- The increase in cross border physical flows outnumbered both the increase in electricity consumption and traded volume of power, pointing to improving liquidity, growing interdependency and further integration of electricity markets in the EU.

FIGURE 25 – 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

1. In the first eight months of 2014 it decreased compared to the same period of 2013, see Chapter 1

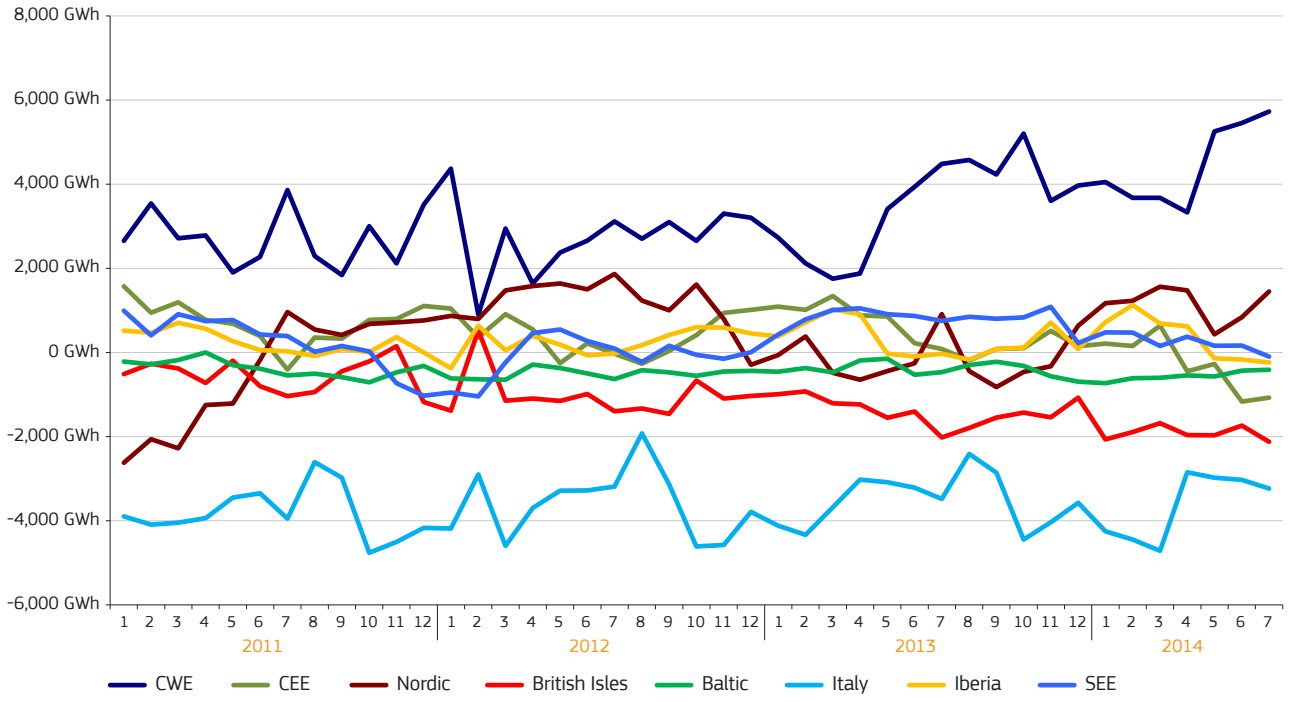
- As Figure 26 shows, the Central Western Europe (CWE) power region reached its strongest net electricity exporter position in July 2014 in the last four years, due to low wholesale electricity prices across the region, providing for good export opportunities to many neighbouring countries and regions having higher domestic wholesale electricity price level.

- Domestic wholesale power prices in Poland were among the highest in the EU, providing export opportunities for Germany and Sweden to this country. This can also be tracked on the increasingly net importer position of the CEE region and increasingly net exporter position of the CWE and Nordic regions.

- The British Isles and Italy were still in a strong net importer position, though due to cheap gas domestic wholesale electricity prices also decreased, this could not compete with cheaper electricity import opportunities, mainly from the CWE region. The Baltic and SEE regions were close to equilibrium in their net electricity flow position. In spite of high prices in the Iberian-peninsula, the region could not import enough cheaper power from France, due to insufficient cross border capacities.

- Figure 27 shows the map of commercial power flows between neighbouring markets in most of the countries of the European continent, providing information on cross-border power flows and the net electricity exporter or importer position of each country in May-July of 2014.

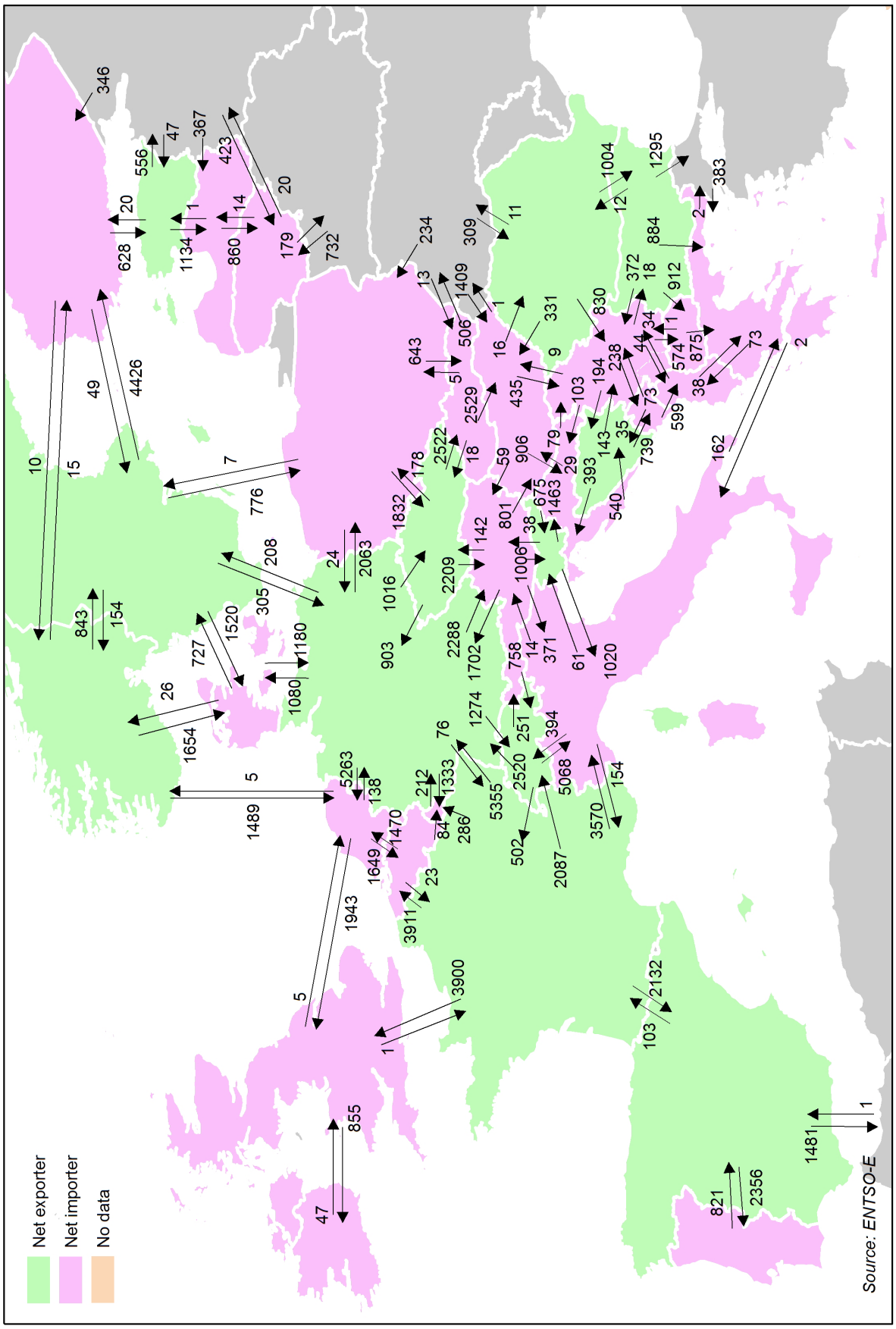
FIGURE 26 – EU CROSS BORDER MONTHLY PHYSICAL FLOWS BY REGION



European countries are grouped in the following regions:

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

FIGURE 27 – COMMERCIAL ELECTRICITY FLOWS IN GWH IN MAY-JULY 2014 (FINAL SCHEDULE)

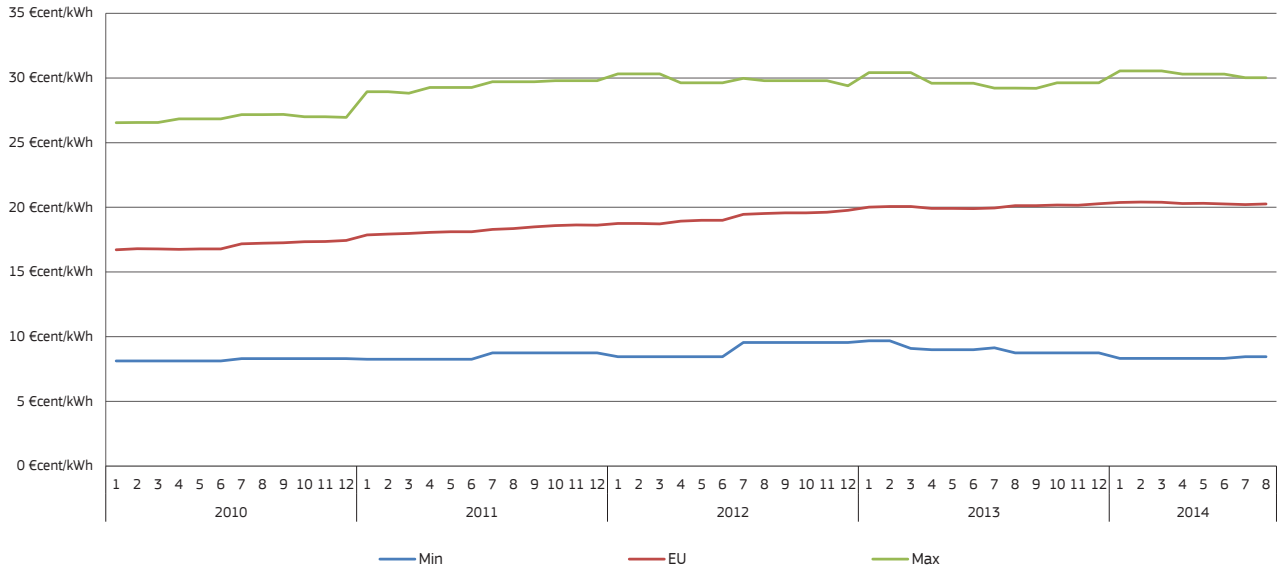


Data for some countries are not available (see the legend). Due to presentation constraints the Northern European countries and Cyprus cannot be included on the map completely. There is no data available on Kosovo under UNSCR 12/4499. Data on flows between Germany and Austria are estimates. For the majority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

7. Retail electricity prices in the EU

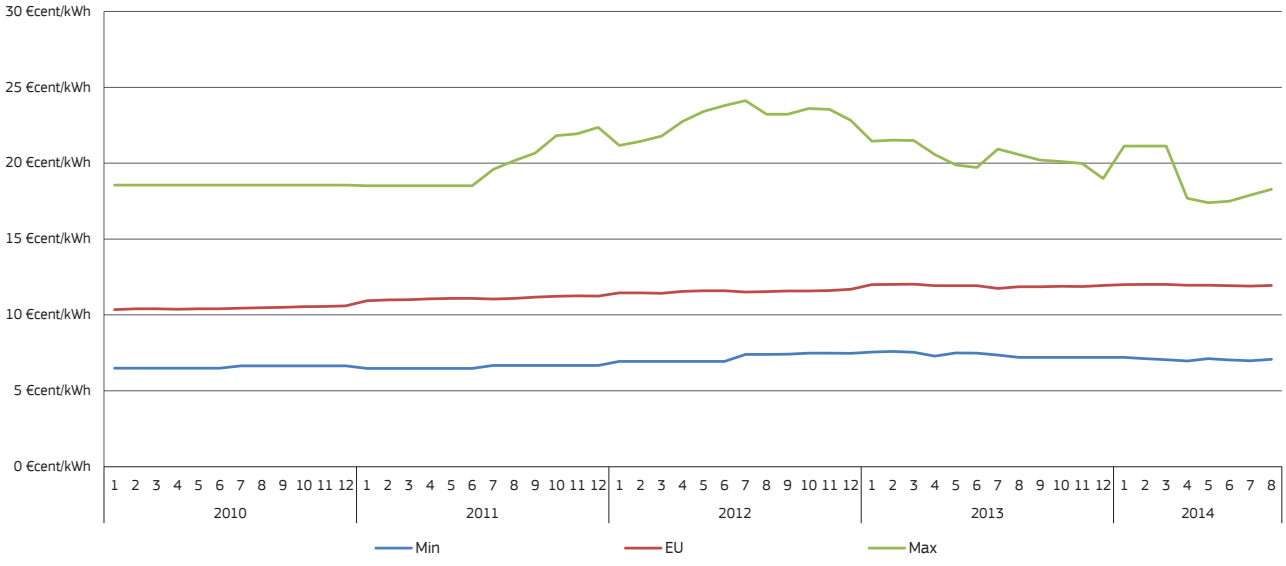
- Figure 28, Figure 29 and Figure 30 below show the retail electricity price ranges in the EU for household and industrial consumers in the last four years for different consumption bands.
- In the case of household consumers prices for a medium level of annual consumption (between 2,500 kWh and 5,000 kWh) are presented, while for industrial consumer both prices for medium level consumption (between 500 MWh and 2 000 MWh) and for large consumption (between 70 000 MWh and 150 000 MWh) are shown.
- Retail prices paid by households include all taxes, while retail prices paid by industrial customers are prices without VAT and recoverable taxes and levies. Monthly retail electricity prices are estimated by using half-yearly prices from Eurostat and Harmonised Consumer Price Indices (HICP) for the household prices and Producer Price Indices (PPI) for the industrial consumers.
- In August 2014 the estimated monthly retail electricity prices for household consumers were the lowest in Bulgaria (8.5 Eurocent/kWh), and the highest in Denmark (30 Eurocent/kWh), implying a 3.5 fold difference in prices across the EU Member States. During the last four years the ratio of the highest and the lowest household retail price in the EU was between 3.3 and 3.6, showing not too much convergence over time. The lack of convergence might be linked to the increasing importance of non-market elements (network costs, taxes and policy levies) within the final retail prices, in parallel with existing regulated prices and insufficient competition among power utilities, manifesting in low consumer switching rates in many countries. Applying Purchasing Power Standards (PPS), the difference between the cheapest and the most expensive country diminishes. In August 2014 the highest-lowest price ratio was 2.3, down from 2.6 observed in mid-2012.
- In the case of industrial consumers having medium level of annual consumption, the lowest prices could be observed in Sweden (7.1 Eurocent/kWh) and the highest prices in Cyprus (18.3 Eurocent/kWh) in August 2014. The price ratio of the cheapest and the most expensive country was 2.6, down from 3.4 observed in mid-2012. Similarly to consumers having medium level electricity consumption, the lowest retail electricity price could be observed in Sweden (4.9 Eurocent/kWh), while the highest in Cyprus (15.9 Eurocent/kWh) for large industrial consumers. The highest/lowest price ratio was 3.3, down from 4.4 in July 2012.
- It seems that, contrarily to the household prices, in the case of industrial consumers retail electricity price convergence across the EU is gradually taking place, which might be related to less retail price regulation compared to the household sector and better negotiating position of industrial consumers, leading to better competition among power utilities.
- The maps (Figure 31 and Figure 32) 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 and levies) in the first half of 2014, which are the most recently available data from Eurostat.

FIGURE 28 – RANGES OF ELECTRICITY PRICES PAID BY HOUSEHOLD (ALL TAXES INCLUDED) CONSUMERS IN ANNUAL CONSUMPTION BAND DC (2 500 KWH < CONSUMPTION < 5 000 KWH) IN EU MEMBER STATES



Source: Eurostat.

FIGURE 29 – RANGES OF ELECTRICITY PRICES PAID BY INDUSTRIAL (WITHOUT VAT) CONSUMERS IN CONSUMPTION BAND IC : 500 MWH < CONSUMPTION < 2 000 MWH IN EU MEMBER STATES



Source: Eurostat.

FIGURE 30 – RANGES OF ELECTRICITY PRICES PAID BY INDUSTRIAL (WITHOUT VAT) CONSUMERS IN CONSUMPTION BAND IF : 70 000 MWH < CONSUMPTION < 150 000 MWH IN EU MEMBER STATES

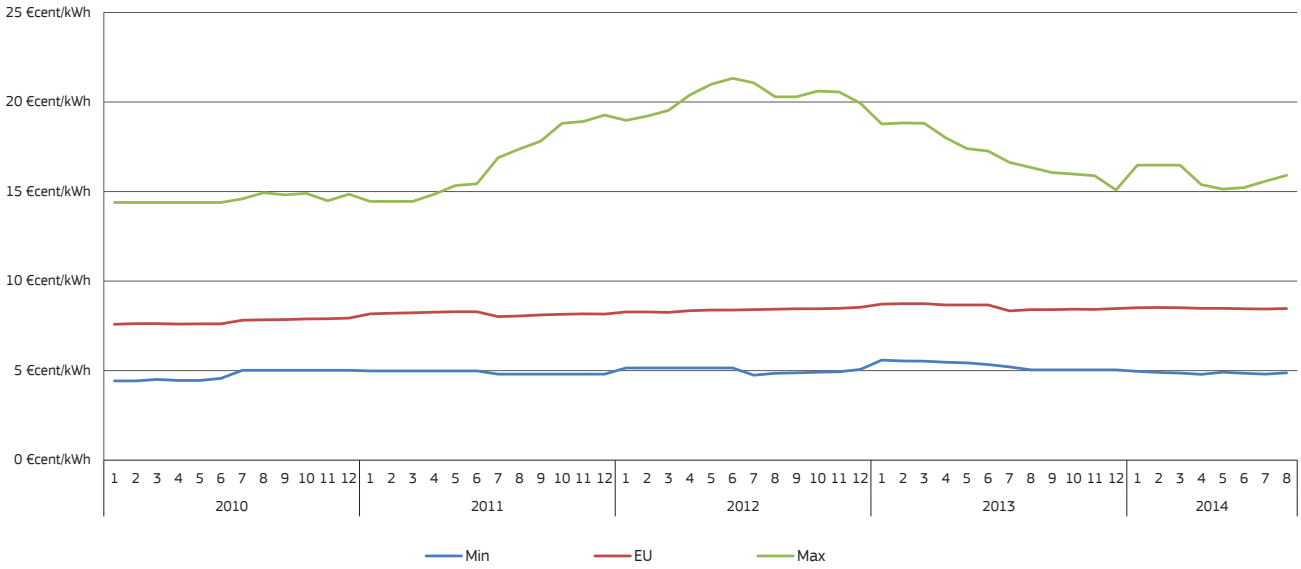
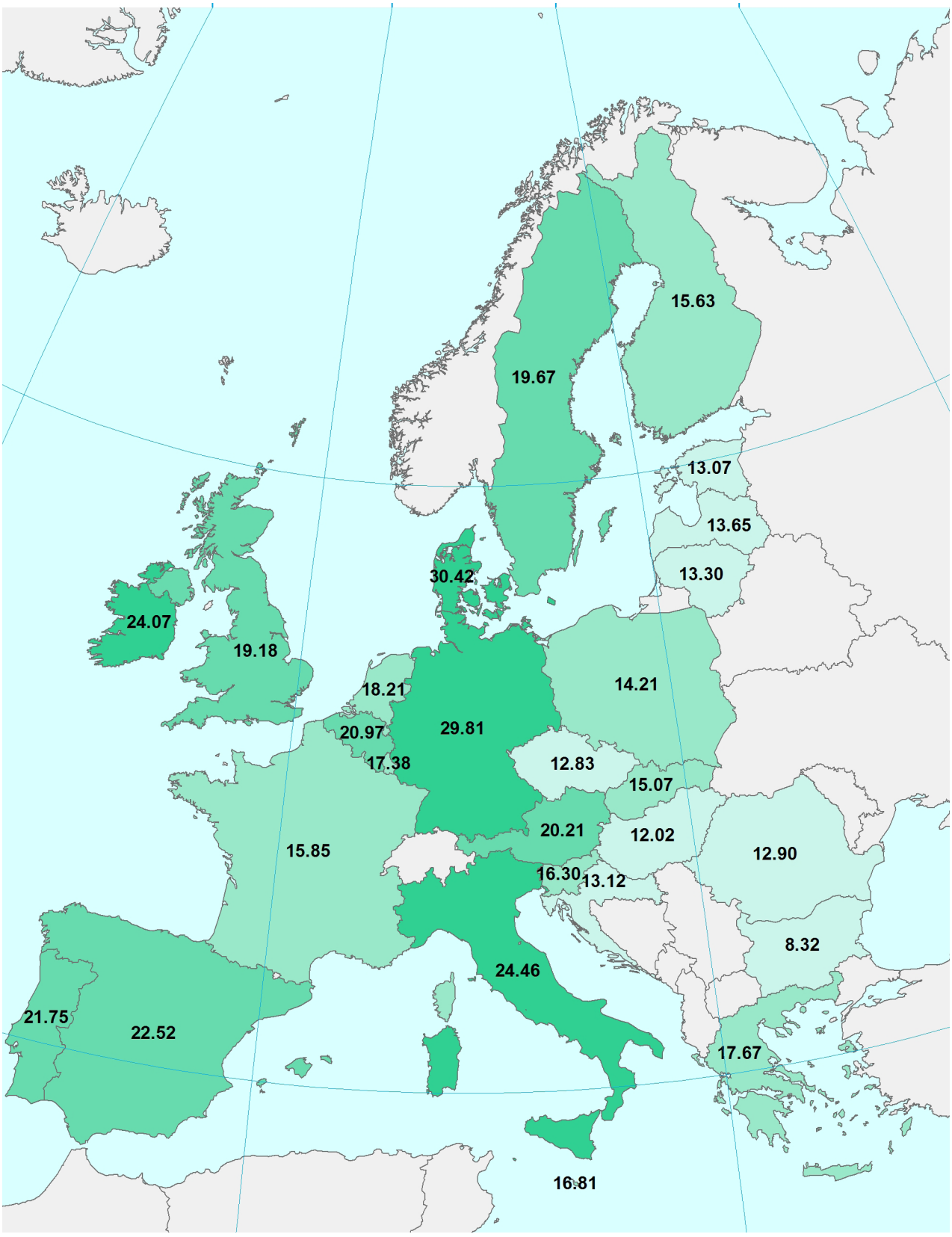


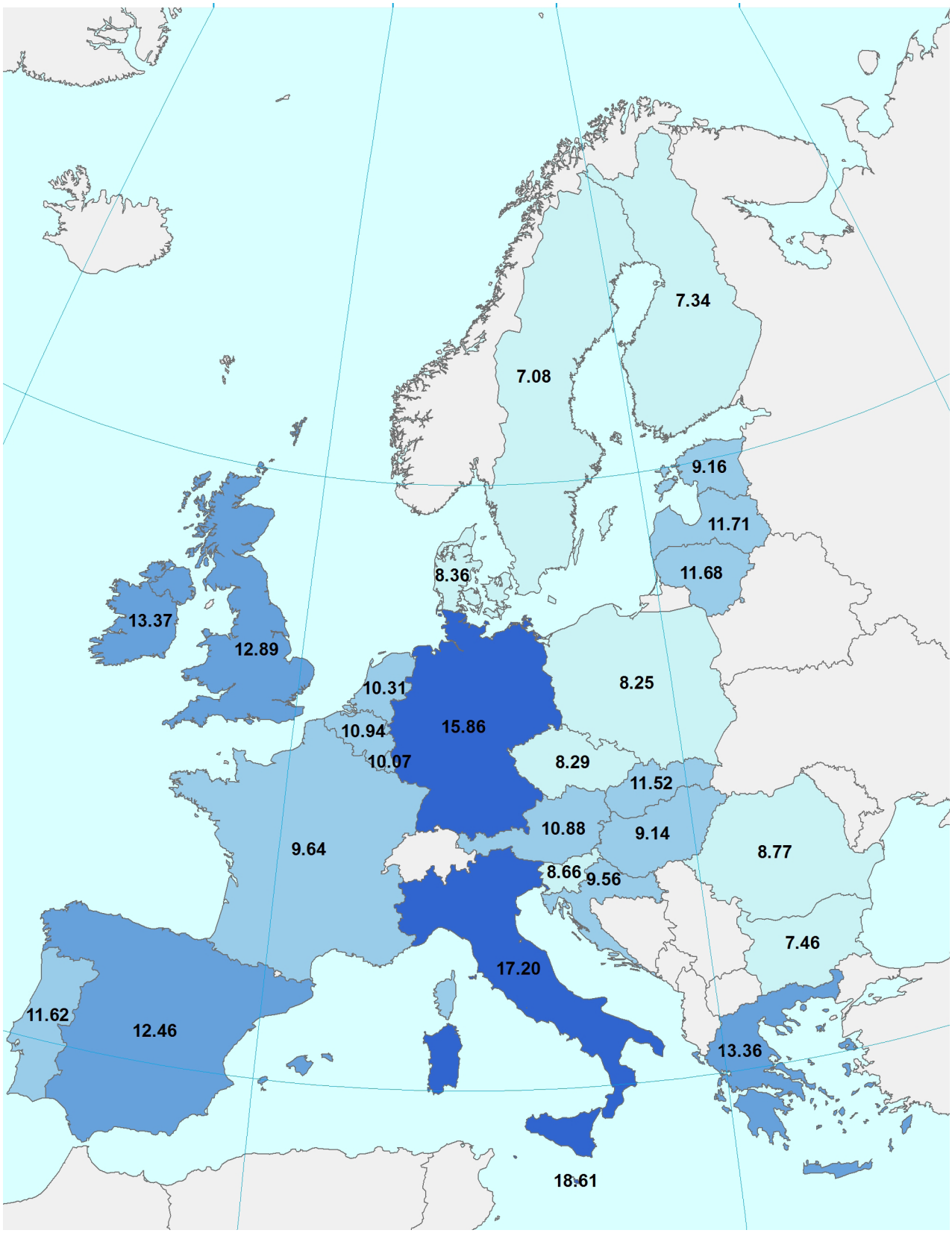
FIGURE 31 – ELECTRICITY PRICES (INCLUSIVE OF TAXES) – HOUSEHOLDS – PRICES: 1ST SEMESTER 2014



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

- < 14.00
- 14.01-19.00
- 19.01-23.00
- >23.01

FIGURE 32 – ELECTRICITY PRICES (WITHOUT VAT AND NON-RECOVERABLE TAXES) – INDUSTRIAL CONSUMERS – PRICES: 1ST SEMESTER 2014



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

- <9.00
- 9.01-12.00
- 12.01-15.00
- >15.01

8. 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..