Quarterly Report on European Electricity Markets

Directorate-General for Energy

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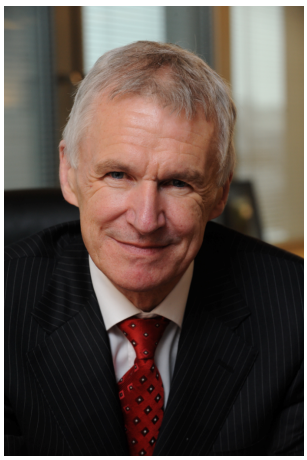
Director-General



Dear readers,

The EU economy continued to show signs of solid growth in the third quarter of 2010. Both gross inland consumption of electricity in the EU and traded volume of power on the observed European markets were higher in Q3 2010 than in the same quarter of the previous year. Besides good economic performance factors like the heat wave in early July or the seasonal decrease in the industrial power demand in August also exerted influence on electricity consumption in many EU countries. On several markets day-ahead power prices reached their highest levels since the beginning of 2009.

In the current report we introduce a new set of indicators assessing the significance of adverse power flows occurring between neighbouring wholesale markets.

The "*Focus On*" topic of our report covers hydro-based power generation which is of particular importance in the EU, regarding the objectives of increasing the share of renewable energy sources in power generation and those related to the mitigation of the impacts of climate change.

The Market Observatory for Energy continues to expand the geographical coverage of the Quarterly reports. I am pleased to inform you that, starting from the current quarter, the wholesale electricity market of Hungary is also covered by our market reports.

Philip Lowe

HIGHLIGHTS

- At the beginning of the third quarter of 2010 a heat wave in many European countries exerted an influence on residential power demand for cooling. In some countries during the early days of July high river temperatures also reduced nuclear plant availability. These developments pushed up power prices on many European markets.

- Although in August power prices went down in most countries after the end of the heat-wave and due to abundant power production amid weaker seasonal industrial demand, in September prices rose again to higher levels. Electricity prices were especially low on the French market in August which also boosted power export to neighbouring countries. On many of the observed markets the monthly prices reached the highest levels since early 2009 by the end of Q3 2010.

- Electricity consumption in the EU is seasonally low in the third quarter of the year. However, the volume of traded power on the observed European markets in the third quarter of 2010 was more than 8% higher than in the same quarter of 2009. Besides higher temperatures this was mainly due to the strong performance of most of the European economies.

- Both spot and forward monthly prices of fuels reached their peak in the June-July 2010 period and in the remaining part of the third quarter they were slightly diminished. 2011 forward base-load power prices also decreased in the first two weeks of July, while in the remaining part of Q3 2010 they remained stable.

- The focus on topic deals with hydropower. Hydro-based electricity generation is especially important for Europe regarding its climate change policies and its objective for reaching the share of renewable energy consumption in 2020.

NEW FEATURES IN THIS REPORT

- As trading with day-ahead power contracts started on the Hungarian Power Exchange (HUPX) on 20th July 2010, the new Hungarian price area is introduced in the current quarterly report.

- Introduction of Cooling Degree Days (CDDs), as an indicative measure for residential power demand for cooling during the summer period.

- Charts tracking events named "*Flows Against Price Differentials*" (FAPDs) that analyse the occurrence and the magnitude of adverse power flows on selected cross border points. Adverse flows are observed when the direction of power flow contradicts the price differential between two markets (power flows from a higher price area to a lower one).

Market Observatory for Energy

EUROPEAN COMMISSION Directorate-General for Energy

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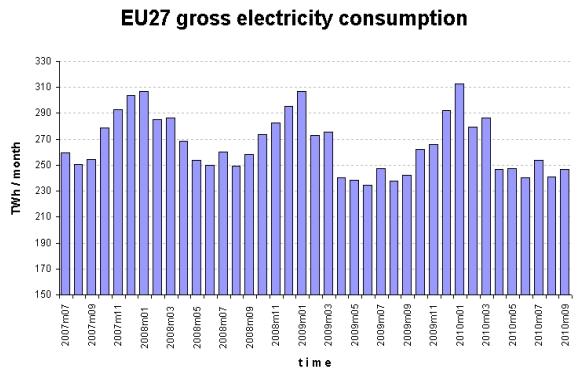
A. Recent developments in the electricity markets across Europe

In the third quarter of 2010 the gross inland electricity consumption of the EU-27 was 739.1 TWh, being slightly higher than that of Q2 2010 (+0.6%). Although Q3 2010 quarterly consumption was 1.5% higher than in the third quarter of 2009, it still lagged behind the 'usual third quarter' levels measured in the preceding couple of years before the economic crisis broke out in 2008.



Source : Eurostat
Monthly consumption for Italy and Greece (September 2010) is estimated based on GDP data for the third quarter of 2010 from Eurostat's Principal European Economic Indicators.

The annual growth rate of electricity consumption in Q3 2010 masked important regional differences. While in the Central Eastern European Region and in the South East European Region considerable growth could be observed (4.4% and 6.8%, respectively), the British Isles Region

showed a 4% contraction in power consumption compared to the third quarter of 2009. Power consumption in the Nordic Region also increased remarkably (3.8%) in the same period.

The reasons behind the varying consumption evolution trends in different regions might be found in either weather conditions or in the overall economic situation. In the Nordic Region and in Central Eastern Europe the economic growth fostered the industrial demand for more power. In contrast, higher-than-usual temperatures in South Eastern Europe might have increased residential power demand for cooling during the summer, although the overall economic situation did not trigger additional power demand.

The July-September period of the year differs from other quarters in an important respect: during that time there is virtually no power demand from households arising out of heating needs. Therefore, in this quarter the usual data on heating degree days (HDD)[1] cannot be used for analysing the power demand of households, rather, as a new feature of the current report, cooling degree days (CDD) are introduced.

[1] 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. Cooling degree days (CDDs) are defined in a similar manner; 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.

CDD values for selected countries are shown in the next table[2]. In most of the presented countries CDD values were the highest in July within the third quarter of 2010 (with the exception of Greece and Romania, where cooling demand must have peaked in August 2010). As a rule, CDD values were higher than the long term average in July and August 2010, implying that these two summer months were warmer than usual.

Cooling Degree Days (CDD) for the EU-27 and selected EU countries* in Q3 2010 - LT. average refers to the average of values measured between 1984 and 2004

		July	August	September
Spain	2009	77,91	86,36	16,91
	2010	105,41	90,83	15,89
	LT. average	59,42	59,69	9,57
Greece	2009	126,63	108,91	16,74
	2010	119,54	178,46	10,71
	LT. average	95,46	91,95	13,38
France	2009	10,38	19,80	0,34
	2010	22,56	7,89	0,00
	LT. average	8,91	14,62	0,41
Hungary	2009	40,27	26,81	0,84
	2010	61,81	16,42	0,00
	LT. average	23,54	24,57	0,31
Italy	2009	84,09	122,34	17,46
	2010	110,07	64,72	2,14
	LT. average	52,09	69,52	5,12
Portugal	2009	13,94	71,27	20,40
	2010	90,59	96,46	19,85
	LT. average	54,39	46,97	18,29
Romania	2009	40,10	21,44	1,94
	2010	48,94	67,03	0,00
	LT. average	27,72	24,92	1,02
EU-27	2009	26,13	29,56	4,69
	2010	43,08	32,48	3,11
	LT. average	20,53	22,27	2,67

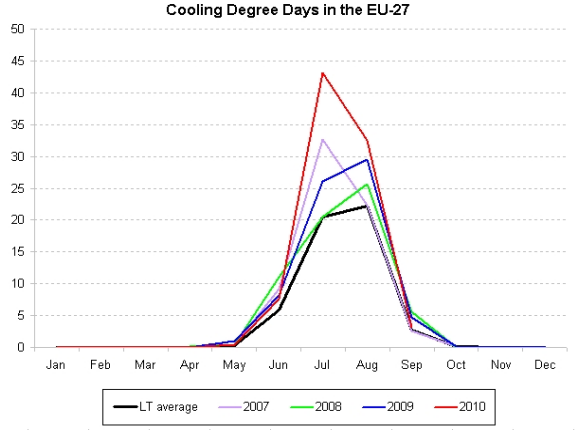
**Countries, where the sum of the three months' long term average CDDs exceeds 20.*

Source : JRC.

The chart of the monthly evolution of CDDs shows an inverse relationship compared to that of the distribution of HDDs within the twelve months of the year[3]. CDD data are of particular interest between June and September in the EU-27, although June and September are only significant regarding the cooling needs in some Mediterranean countries.

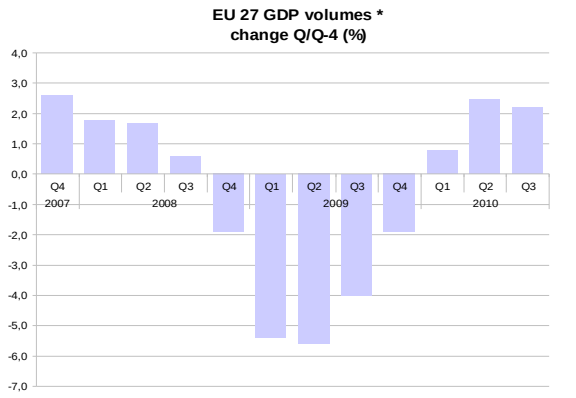
[2] The table covers Member States with functioning wholesale power markets where temperatures during the summer season may exert an influence on residential power demand.

[3] See the HDD monthly chart in Quarterly Report on European Gas Markets, January-March 2010, page 2.



Source : JRC.

Besides the evolution of temperatures, the economic performance of EU Member States was also a key factor that affected both electricity consumption and prices. In the third quarter of 2010 the EU GDP was up by 2.2% compared to the same quarter of 2009. The economic growth showed again a strong correlation with the evolution of gross inland electricity consumption (+1.9%).



Source : Eurostat.
Selected Principal European Economic Indicators
** Gross domestic product (GDP) at market prices is the final result of the production activity of resident producer units. It is defined as the value of all goods and services produced less the value of any goods or services used in their creation. Data are calculated as chain-linked volumes (i.e. data at previous year's prices, linked over the years via appropriate growth rates). Growth rates with respect to the same quarter of the previous year (Q/Q-4) are calculated from raw data.*

This was the third consecutive quarter when EU-27 level GDP growth was positive compared to the level of the same quarter of the previous year. There were only two Member States, notably Greece and Romania, which were still in recession.

Taking a look at different sectors of the economy, the highest growth in gross value added[4] could be observed in industry[5] (5.5%), which is by its nature an energy intensive sector. Trade, transport and communication activities (+2.3% in gross value added) also contributed to the overall GDP growth, while among the energy intensive sectors construction was still in a recession phase (-1.1%).

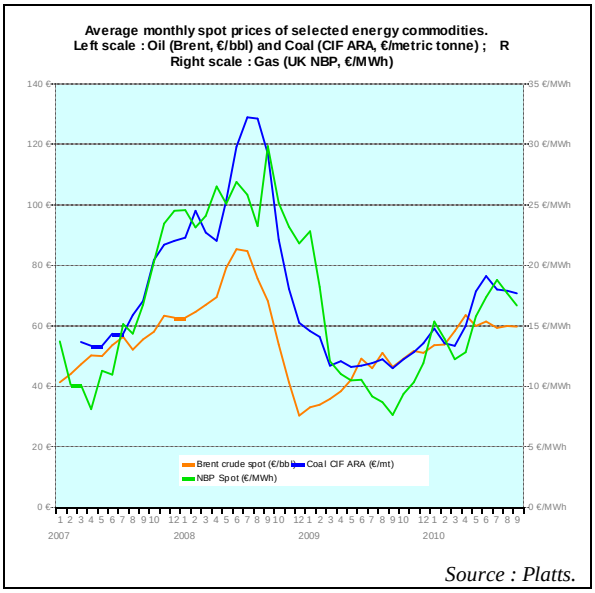
[4] Source: Eurostat
[5] Industry also includes power generation

A.1 Wholesale markets

In the third quarter of 2010 both coal and gas prices began to decline after having reached a peak at the turn of the third quarter, and oil prices showed a high degree of stability.

Brent crude oil spot prices fluctuated in a narrow range of € 57-64/bbl during the whole third quarter of 2010. Brent crude oil price quotations in US dollars and the USD/EUR exchange rates it seems that the price increase measured in USD was absorbed by the appreciation of the euro with respect to the dollar. On 1st July the Brent crude daily price stood at $ 72/bbl and it increased to $ 81/bbl by the 30th of September; in the same period the USD/EUR exchange rate moved from 1.23 to 1.37.

In the third quarter of 2010 Brent crude spot prices were 25% higher (measured in euros) on average than in the same period of 2009.



Source : Platts.

On most of the European gas hubs monthly average prices in July 2010 reached their highest levels since the first two months of 2009. UK's National Balancing Point (NBP) daily prices were above € 20/MWh in the first two weeks of July for the first time since 11th February 2009. These relatively high gas hub prices might have been related to lower inventory levels in many gas storages, implying higher demand arising from further replenishing needs. Increasing industrial demand might also have helped in pushing up gas prices on many European hubs.

After having reached a peak in July 2010 (€ 18.8/MWh), the NBP monthly average hub price began to decrease. In August it fell to € 17.6/MWh, and in September the downward trend continued (€ 16.6/MWh). As NBP gas hub prices reached their trough in the third quarter of 2009, Q3 2010 prices were more than double those of a year earlier.

Coal CIF ARA prices[6] were stable during the third quarter of 2010; daily quotations remaining within a narrow range of € 69-75/MWh during the period. Monthly average prices peaked in June 2010 (€ 76.3/MWh); then gradually diminished to € 70.8/MWh in September.

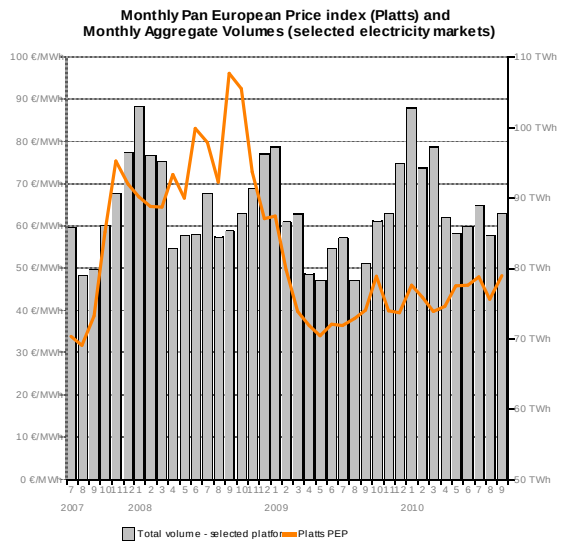
Although monthly coal prices slightly decreased during the third quarter, in Q3 2010 CIF ARA prices were 50% higher than in the third quarter of 2009. This was probably due to increased coal demand in the world as a consequence of strong economic performance.

[6] Price for a metric tonne of coal (calorific value of 6 000 kcal / kg) delivered at the Amsterdam-Rotterdam-Antwerp area with cost, insurance and freight covered.

A.1.1 Day-ahead

EU wholesale markets

In the third quarter of 2010 the slow upward trend in the Platts Pan-European Price (PEP) index that started in Q2 2009 continued to prevail. In July 2010 the monthly average price index increased to € 47.6/MWh, in August it fell back to € 42.5/MWh, while in September the monthly PEP index rose to a level (€ 48/MWh) that has not been seen since February 2009.



Source: Platts (price index) and selected European electricity wholesale markets (volumes). The selected markets are :
Nordpool Spot A.S ;
European Energy Exchange (EEX) ;
Amsterdam Power Exchange (APX Power NL) ;
Powernext Day-ahead S. A. ;
Belpex Spot ;
Energy Exchange Austria (EXAA) ;
Gestore del Mercato Elettrico (IPEX) ;
Mercado de Electricidad (OMEL) ;
Operator trhu s elektrnou (OTE) ;
Towarowa Gielda Energii S.A. (PolPX) ;
Hungarian Power Exchange (HUPX);
APX Power UK ;
Operatul Pietei de Energie Electrica din Romania (OPCOM) ;

(••••••), Hellenic Transmission System Operator

The traded-volume weighted monthly average power price was 21% higher than in the third quarter of 2009, primarily owing to the good performance of most of the EU-27 economies and to the warmer-than-usual weather conditions[7]. Monthly average power prices were higher on most of the observed markets compared to the same period of 2009 (with the exception of Romania, see page 23).

The monthly average traded volume in selected countries[8] in the third quarter of 2010 was 87.2 TWh, which was slightly more than in Q2 2010 (86 TWh), but represented an important increase (+7.6%) compared to the same period of 2009. The amount of traded power on these markets corresponded to 35% of the gross inland energy consumption of the observed countries in the third quarter of 2010.

Monthly volumes and average prices, which stood at high levels in July 2010, fell back in August and climbed back again to higher levels in September. High July traded volumes and prices could have been primarily due to the heat wave in the early period of the month. Lower August traded volume and price values were probably due to lower seasonal industrial power demand and abundant power generation in many countries, while in September industrial production returned to its usual level after the summer break.

[7] See CDD table on page 2

[8] The *Quarterly Report* intends to cover all Member States, Candidate countries and countries from the European Economic Area that have developed a functioning wholesale market for electricity. For the time being, the selected countries are: Austria (AT), Belgium (BE), the Czech Republic (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (GR), Hungary (HU) Italy (IT), the Netherlands (NL), Poland (PL), Portugal (PT), Romania (RO), Spain (ES), Sweden (SE), Slovakia (SK), the United Kingdom (UK) and Norway (NO).

Regional markets

Central Western Europe

Germany

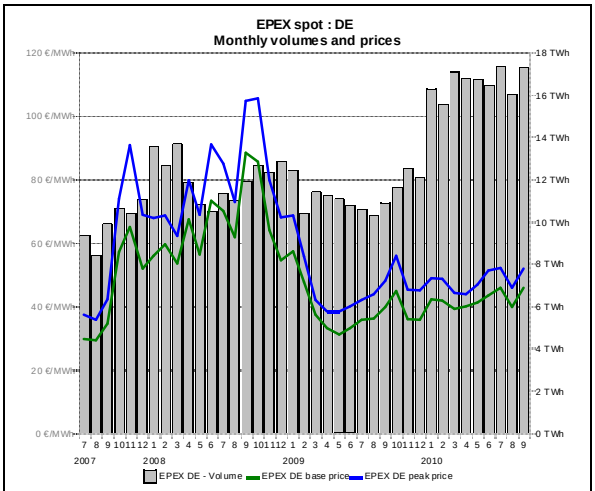
In July 2010 monthly average German base-load power prices amounted to € 45.8/ MWh, reaching a seventeen-month record high level. Peak-load average price stood at € 52/MWh, which was the highest price since October 2009.

This increase in power prices must have been strongly related to high temperatures in early July in the country. CDD value for Germany in July 2010 was 32.1 compared to a long term average of 4.1. This warm weather contributed to higher residential power demand. On the other hand, the high temperature of rivers reduced their cooling potential and thus the availability of some nuclear power plants.

Lower-than-expected wind power generation also contributed to less electricity supply and helped keep prices high in July.

Later in the third quarter of 2010 temperatures returned to levels corresponding to seasonal norms, wind power generation picked up again, and power prices began to decrease. Industrial power demand also decreased, following the usual summer seasonal pattern, which also pushed down prices.

The August monthly average base-load power price was € 39.8/MWh while peak-load decreased to € 45.6/MWh, both more than € 6/MWh lower than the corresponding values of July 2010.



Source : Platts.

In September 2010 both base-load and peak-load monthly average power prices increased again; amounting to € 45.9/MWh and € 51.8/MWh, respectively. This price increase might have been in relation to the state of the power grid (as Gundremmingen nuclear power plant was taken offline twice), lower wind power generation and increased residential demand for heating as the autumn began.

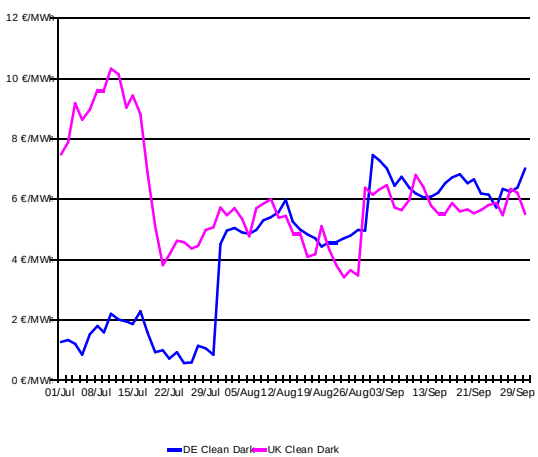
Comparing monthly average base-load electricity prices to those of the same month of 2009, price increases of 29%, 10.3% and 15.9% could be observed in July, August and September 2010, respectively.

The monthly average traded volume on the German area of the EPEX spot power exchange in Q3 2010 was similar to that of the second quarter (16.5 TWh) which equalled 38% of Germany's gross inland electricity consumption.

The next chart shows the evolution of clean dark spreads[9] in the third quarter of

[9] Dark spreads are reported as indicative prices giving the average difference between the cost of coal delivered ex-ship and the power price. As

2010. German clean dark spreads increased from a level close to zero in early August, and since then kept rising until the end of September. This might be the consequence of decreasing coal prices in the first half of the quarter and in the later period increasing power prices and stable coal prices contributed to a further increase of the spread.



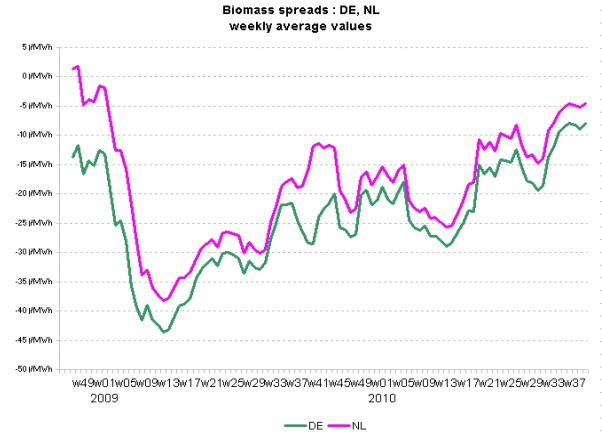
UK values are quoted in € using the €/£ daily exchange rate as reported by Platts

Source : Platts.

German and UK clean dark spreads re-coupled again after decoupling in the previous quarter, primarily owing to the stronger correlation between German and UK power prices.

In the third quarter of 2010 **biomass spreads**[10] on the German market remained negative, implying that without any supportive measures it was still unprofitable to sell power generated from biomass and wood pellets. However, biomass spreads moved to their closest position to zero (since the beginning of the available time series) by the end of the quarter.

The input costs of power generation (pellet prices plus freight rates) decreased from € 75.5/MWh to € 72.5/MWh between the first week of July 2010 and the last week of September. This input cost reduction combined with base-load power prices amounting to almost €50/MWh by the end of September resulted in the highest (closest to zero) biomass spreads measured in the short history of this data collection.



Source : APX – Endex (wood pellets, industrial grade) ; Platts (electricity and emission prices; freight rates)

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 for UK and Germany, with the coal and power reference price as reported by *Platts*.
Clean dark spreads are defined as the average difference between the price of coal and carbon emission, and the equivalent price of electricity.

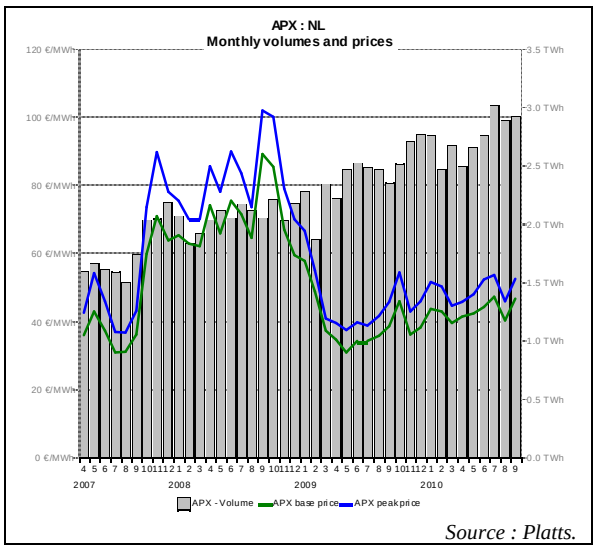
[10] Biomass spreads are indicative values giving the average difference between (1) the combined price of electricity and carbon emission on the corresponding day-ahead market and (2) the price of industrial wood pellets (delivered month-ahead ex-ship at Rotterdam).
Biomass spreads do not include operation and maintenance costs. However, the German spreads include transport costs of shipping the pellets along the Rhine (Rotterdam – Cologne area).
Specific calculation assumptions: conversion factor of 1 ton of standard wood pellet contains 4.86 MWh of energy; generation efficiency of coal and biomass fired power plants equals 35%; the price of carbon emission is defined as the difference of the German dark and clean dark spreads, calculated according to the methodology of *Platts*.

The Netherlands

Monthly average base-load power prices on the Dutch market rose to € 47/MWh in July 2010 (the highest level since February 2009). The monthly average of Dutch peak-load power prices was € 53.6/MWh, a price level which could last be observed in October 2009.

Electricity prices were strongly affected by exceptionally high temperatures in the first two weeks of July. High temperatures increased domestic power demand for cooling purposes. In consequence of the higher river water temperatures, some coal-fired plants had to be taken off the grid as abundant amount of cooling water could not be assured.

In August both monthly base-load and peak-load average prices, declined compared to July 2010, similarly to other markets in Western Europe (base-load went down by € 7/MWh while peak-load diminished by € 8/MWh).

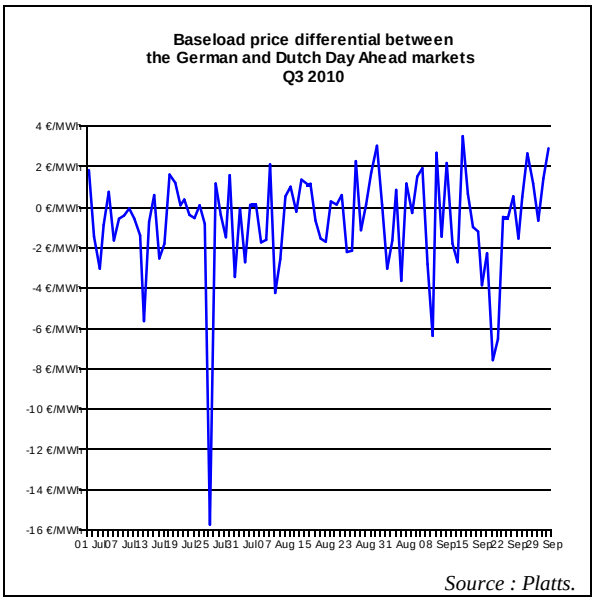


Source : Platts.

In September 2010 prices began to rise again returning close to those levels reached in July (base-load: € 46.7/MWh, peak-load: € 52.4/MWh). The price increase in September was mainly influenced by strike threats in France, increasing industrial demand after the summer break period and rising heating needs at the end of the month.

Baseload wholesale power prices on the Dutch market rose significantly year on year, by nearly 38% in July, while in August and September the increase was 13% and 21%, respectively.

Traded power volumes continued to rise in the third quarter of 2010. Fitting the trend of the last three years, they were up by 11.7% compared to Q2 2010 and by 21% compared to the same quarter of 2009. The monthly traded volume on the day-ahead in Q3 2010 was 2.61 TWh, amounting to 32% of the Dutch gross inland electricity consumption in the third quarter of 2010.

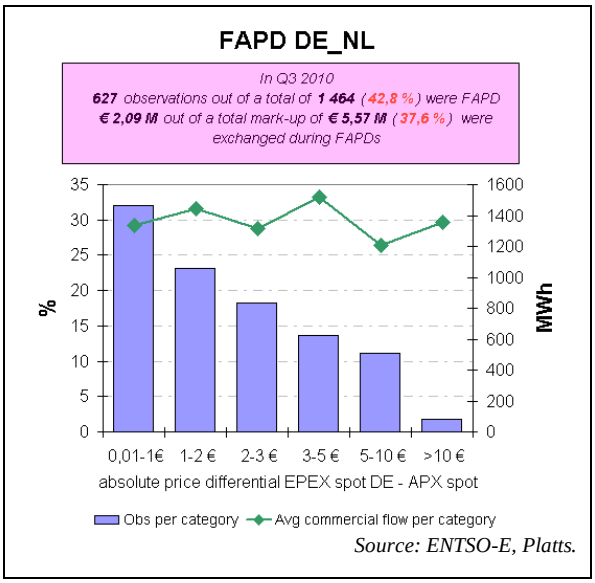


Source : Platts.

The next chart takes a closer look into the operation of the day-ahead market and how participants reacted to price signals and opportunities to trade power across the border in Q3 2010.

For the case of the German and Dutch day-ahead markets, 627 events of "*Flow Against the Price Differentials*" (FAPDs) were observed in Q3 2010, which was slightly less than 43% of all trading hours (1,464 hours)[11]. Adverse flows occur when the direction of power flow contradicts the price differential between two markets (implying that power is set to flow from a higher price area to a lower one).

An estimated € 2.1 million welfare loss can be calculated from the net volume of adverse flows and the price differentials between the two markets. This is comparable with the mark-up value of € 5.6 million associated with the cross border trade. The mark-up is calculated as the sum of hourly values of absolute price differences multiplied by the net cross border flows between the two TSOs.



Source: ENTSO-E, Platts.

As witnessed by the blue columns in the chart, the probability of a FAPD event diminishes in line with an increase in price differentials. While more than 32% of all trading hour observations when adverse flows occurred can be found in the price difference range of € 0.01-1/MWh, less than 2% of such kind of observations occurred with a price differential of more than € 10/MWh. The average amount of adverse power flows did not show significant differences among price differential ranges, averaging in a range of 1200-1500 MWh.

Dutch base-load power prices retained their premium in the third quarter of 2010 based on a quarterly average (€ 0.8/MWh) compared to German prices. Taking a look at the monthly average premiums, the highest price differential could be observed in July (€ 1.2/MWh), mainly because of a

[11] 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 provides detailed information on adverse flows. It has two panels.
The first panel estimates the ratio of the number of hours with adverse flows to the number of total trading hours in a quarter. It also estimates the monetary value of energy exchanged in adverse flow regime compared to the total value of energy exchanged across the border. The monetary value of energy exchanged in adverse flow regime is also referred to as "welfare loss". A colour code informs about the relative size of FAPD hours in the observed sample, going from green if less than 10% of traded hours in a given quarter are FAPDs to red if more than 50% of the hours are FAPDs.
The second panel gives the split of FAPDs by subcategory of pre-established intervals of price differentials. It represents the average exchanged energy and relative importance of each subcategory on two vertical axes.

low German daily price observed on 25th July (Sunday). In August, German and Dutch prices moved closer to each other, while in September, in parallel with higher electricity prices on both markets the volatility of price differentials increased significantly.

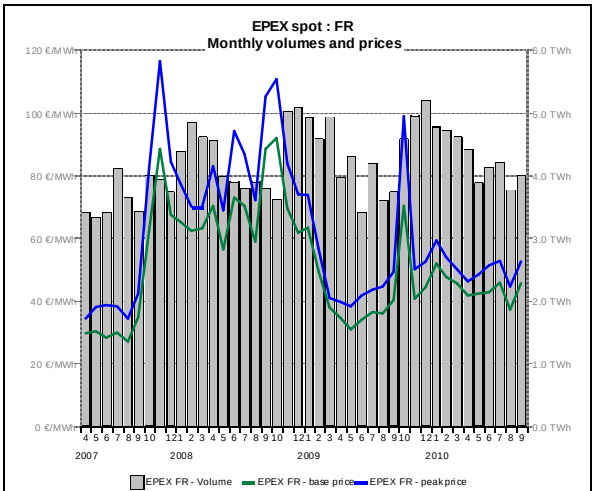
France

In France, the beginning of July 2010 was the hottest period of the year, which was also reflected in the outstanding CDD value for this month (22.6 in July 2010 vs. 8.9 as the long term value). This heat wave must have exerted an influence on power prices in the country. Monthly average electricity prices reached their highest values since February 2010 (base-load: € 45.8/MWh, peak-load: € 52.6/MWh).

Power prices retreated in August (base-load: € 37.1/MWh; peak-load: € 44.7/MWh, on monthly average), which might be explained by cooler than usual weather (reduced residential power demand for heating).

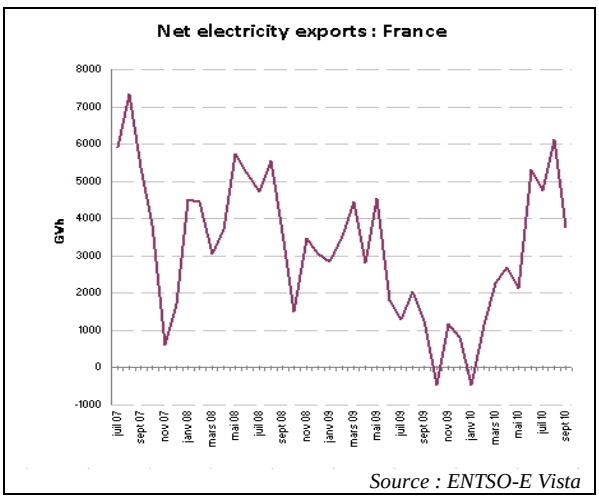
Another possible reason could be the reduced seasonal demand of industry. The first three weeks of August is traditionally the peak of the holiday season in France and therefore this month signals the lowest industrial production volume of the year.

This seasonally low industrial demand is also reflected in monthly average power prices, (both base-load and peak-load) having fallen to their lowest levels since August 2009.



Source : Platts.

In the first two weeks of August daily average base-load prices were permanently low (below € 40/MWh) which, besides the two reasons mentioned before, was also the consequence of abundant power generation. As power plants were not taken off the grid, about one third of the power generation in August was exported to the neighbouring countries. The country's net monthly electricity export position in August 2010 reached a three year record (6.13 TWh).



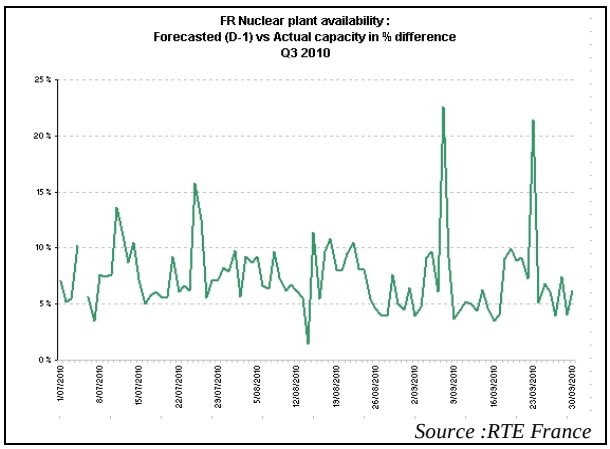
Source : ENTSO-E Vista

In September 2010, a number of factors contributed to the rise of power prices to levels observed in July. Among those

factors were the seasonal rise of industrial demand following the summer period, the increase of heating demand and strikes affecting the power sector.

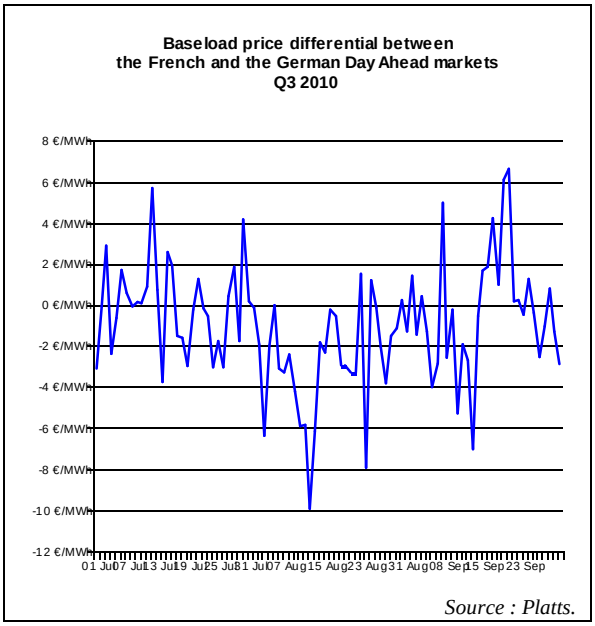
July 2010 monthly average base-load power prices were up by 26.7% compared to July 2009, while in September 2010 prices were only 13% higher than a year before. In August 2010 only minor difference could be observed, due to the exceptionally low power prices.

The average monthly traded volume in Q3 2010 was 4 TWh on the EPEX-FR spot market, which was slightly lower than in the second quarter of 2010 (4.15 TWh), but higher than that of Q3 2009 (3.85 TWh). This traded volume represents less than 11% of the country's gross inland consumption of electricity in the third quarter of 2010.



Source :RTE France

The graph above shows the link between the day-ahead baseload price and the differential of forecasted vs. actual availability of nuclear capacities. In mid-August 2010, when power prices were the lowest in the third quarter, forecasts tended to overshoot the next day's capacities, whereas in July 2010 and especially in September, lower-than-forecasted capacities contributed to higher power prices.



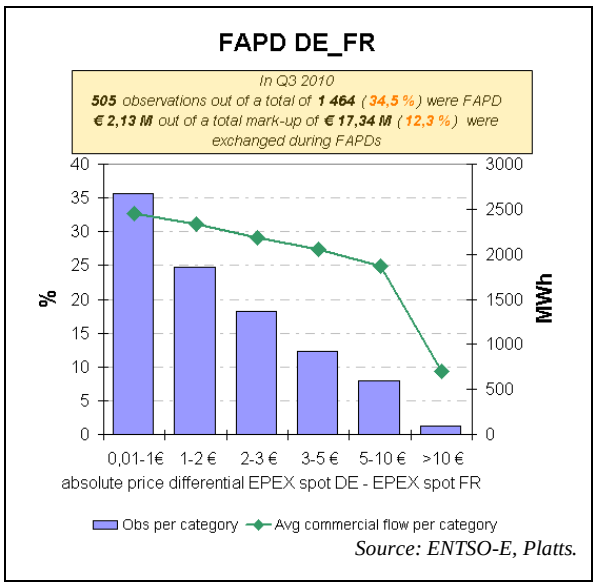
Source : Platts.

The next chart shows the distribution of FAPDs[12] for the case of German and French day-ahead markets.

505 events of FAPD were observed in Q3 2010, representing 34.5% of the total number of traded hours. The ratio of the volume of adverse flows compared to all cross border flows was 29.2%.

The welfare loss, which can be calculated from the net adverse flow volumes and the price differentials between the two markets, was € 2.13 million in Q3 2010. The total value of cross border flow price mark-ups was € 17.3 million. The relatively lower value of the welfare loss compared to the cross border flow mark-up value also signals a lesser significance of adverse flows between these two TSOs, compared to the German-Dutch market relation.

[12] For the definition of a *FAPD* event, please refer to footnote 11.



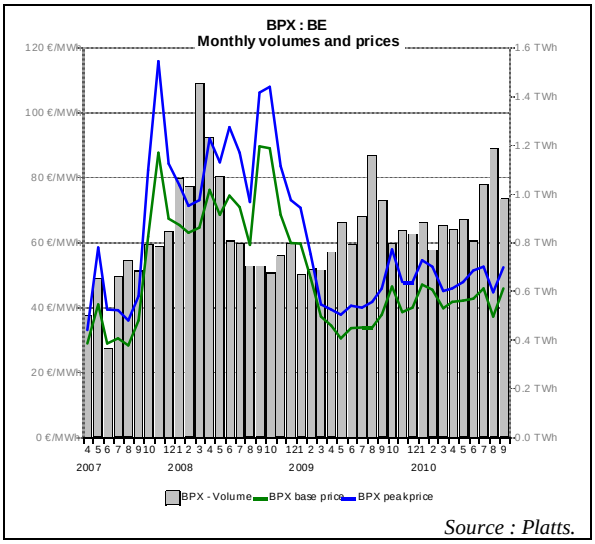
More than 35% of the FAPD events occurred in the price differential range of € 0.01-1/MWh, while only 1% of total adverse flows could be observed with a price difference greater than €10/MWh between the two markets. In the case of a FAPD event, the exchanged volume tended to decrease significantly whenever the price spread was getting bigger. Whereas the average exchange volume was around 2 500 MWh for price differential below € 1 / MWh, the exchanged volume was just 700 MWh whenever French and Germen hourly prices differed by more than € 10 / MWh.

French day-ahead base-load prices were traded on an average € 1/MWh discount in the third quarter with respect to the German benchmark, but in mid-August this discount was bigger, on some trading days it approached € 10/MWh.

French power prices showed even a greater discount to Dutch prices (€1.8/MWh on a quarterly average in Q3 2010). The quarterly average French price discount compared to the German and to the Dutch market did not show a huge difference. Whereas the premium changed frequently on the Franco – German border, the French prices remained in discount to the Dutch ones in most of the trading days of Q3 2010.

Belgium

Belgian day-ahead power prices closely followed those of France during the third quarter of 2010. The July 2010 monthly average base-load power price was € 45.6/MWh while monthly peak-load average reached € 52.1/MWh, both values were the highest since January 2010.

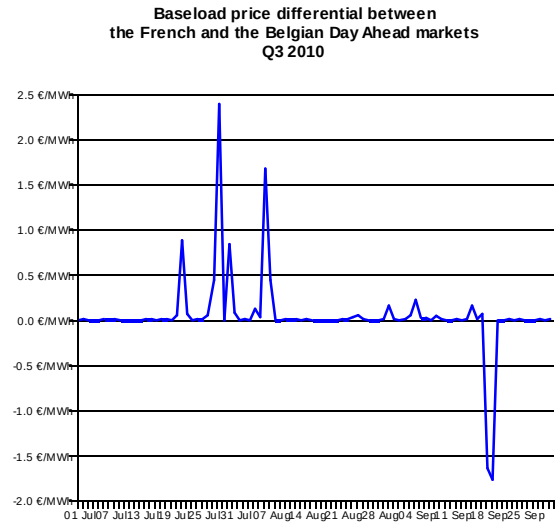


Source : Platts.

In August both base-load and peak-load monthly average prices decreased by € 8/MWh compared to July. At the end of July and in the beginning of August there were some hours (on 28th July 2010 between 07-08 and on 7th August 2010 between 07-08 and 22-23) when hourly base-load prices dropped to a very low, € 0.01-0.02/MWh value.

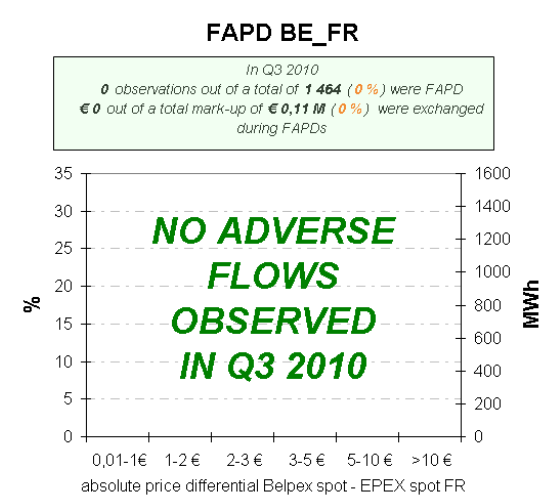
In September prices began to recover and monthly average base-load power price bounced back to € 45.7/MWh and that of peak-load to € 52.2/MWh.

The monthly average traded volume in the third quarter of 2010 was 1.07 TWh, amounting to 15% of Belgium's gross inland electricity consumption. This more or less corresponds to the ratio of France but lags behind that of the Netherlands.



Source : Platts.

The next chart shows that there were no FAPD events[13] in the third quarter of 2010 between the Belgian and the French power markets. This reflects the good functioning of the Trilateral market coupling mechanism between France, Belgium and Germany and reveals that market participants responded rationally to different price signals.

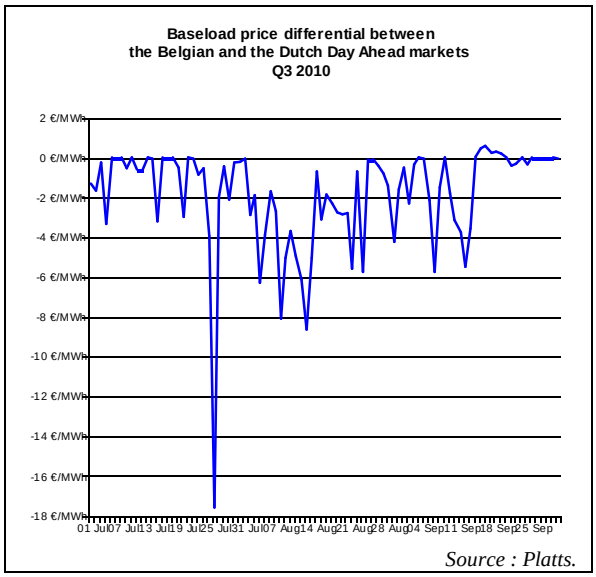


Source: ENTSO-E, Platts.

[13] For the definition of a *FAPD* event, please refer to footnote 11.

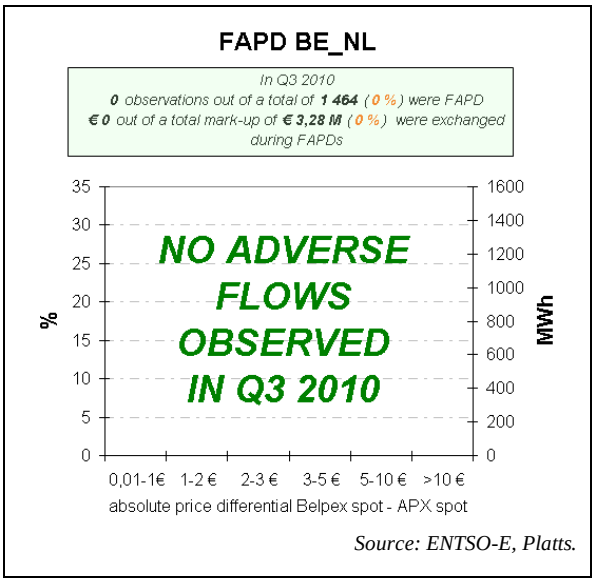
On most of the calendar days of the third quarter of 2010 price differentials between the Belgian and French power market were close to zero. There were only six days of the ninety-two calendar days of Q3 when the price differential exceeded €cents 50/MWh. A potential reason for this strong price co-movement on these two markets might be the reversal of power flow between France and Belgium. Since Q3 2008 this is the first quarter when Belgium's net power import from France was positive (0.72 TWh). The increasing importance of French import might have helped in aligning Belgian prices to those in France.

As Belgian prices were strongly correlated with French power prices, the curve showing the price differential between Belgian and Dutch markets looked quite similar to the French-Dutch curve. The extremely low French prices in August 2010 (see page 9) impacted the Belgian market and a discount can also be seen compared to the Dutch market.



Source : Platts.

Similarly to the Belgian-French cross border relation, no adverse flows occurred in the cross border trade between Belgium and the Netherlands in the third quarter of 2010. This is a positive achievement, reflecting the normal functioning of cross border trade.



Source: ENTSO-E, Platts.

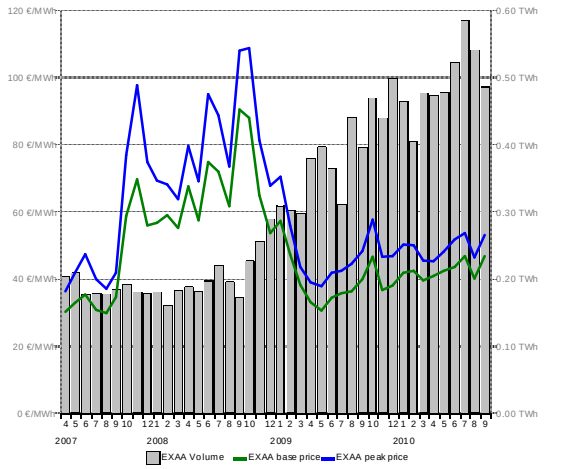
Austria

In July 2010 the Austrian monthly average base-load power price, as reported by EXAA, the Vienna-based power exchange, was at its highest level since February 2009 (€ 46.6/MWh). The monthly average peak-load price reached a nine-month high (€ 53.5/MWh). The July average base-load power price was up by 31% compared to the same month of 2009, while peak-load prices rose by 26%.

In August both base-load and peak-load monthly averages decreased (to € 39.9/MWh and to € 46.1/MWh), while in September they increased again (to € 46.5/MWh and to € 52.8/MWh)

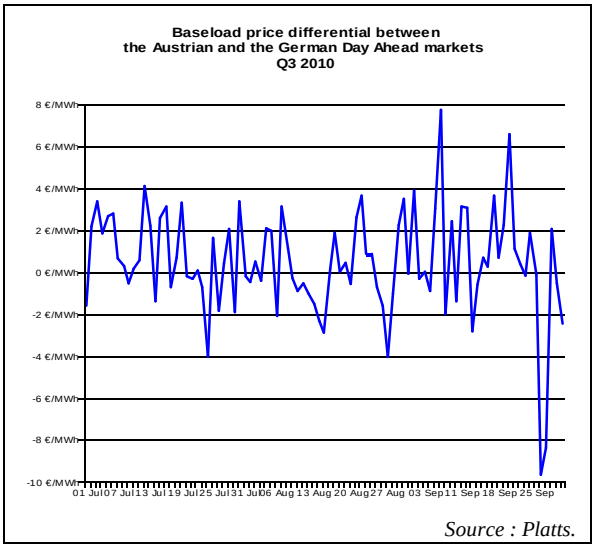
In the third quarter of 2010 the total traded day-ahead volume on the EXAA power exchange was 1.71 TWh, which was 9%

higher than the traded volume of Q2 2010, and more than 40% higher than that of the third quarter of 2009. The total day-ahead traded volume represented[14] 10% of Austria's gross electricity consumption in the third quarter of 2010.



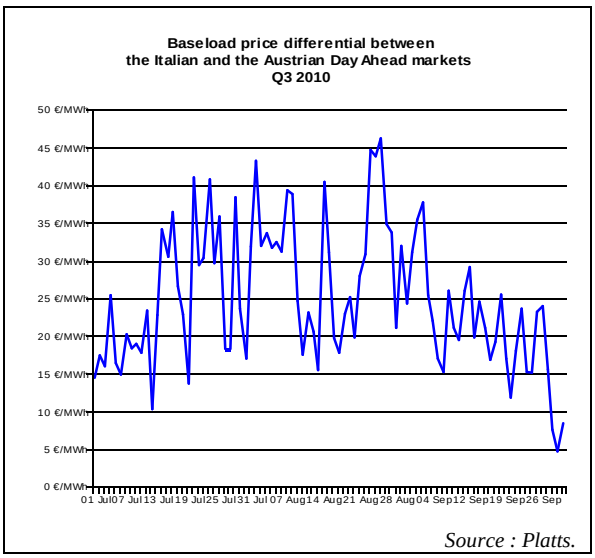
Source : Platts.

The German power market traditionally has a strong influence on Austrian power prices. In this quarter the differential between the two markets' day-ahead daily prices was in a narrow range of +- € 2/MWh on more than 60% of the quarter's calendar days.



Source : Platts.

The high level of hydro reserves in August might have been responsible for the discount that could be observed several days in that month between the Austrian and German market prices.



Source : Platts.

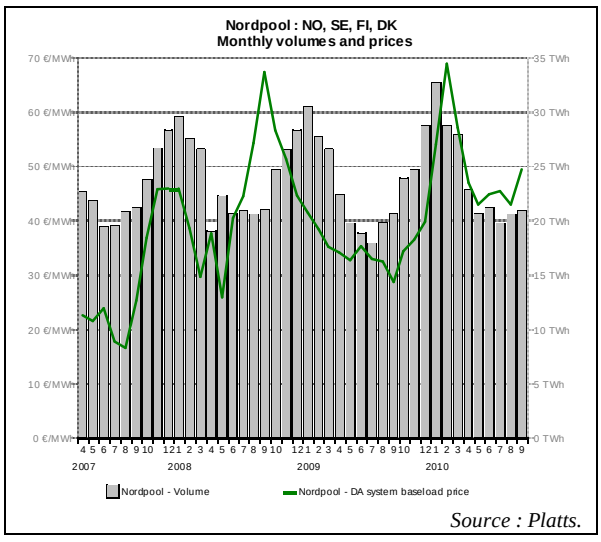
The quarterly average Italian price premium compared to the Austrian day-ahead prices was € 24.9/MWh. Between 20th July and 28th August there were seven days when this price premium exceeded € 40/MWh. In August the price differential widened as Italian prices remained high and Austrian prices went down. As

[14] This number excludes the Austrian power trades in the EPEX spot DE-AT price area

Austrian prices started to rise in September the Italian price premium narrowed.

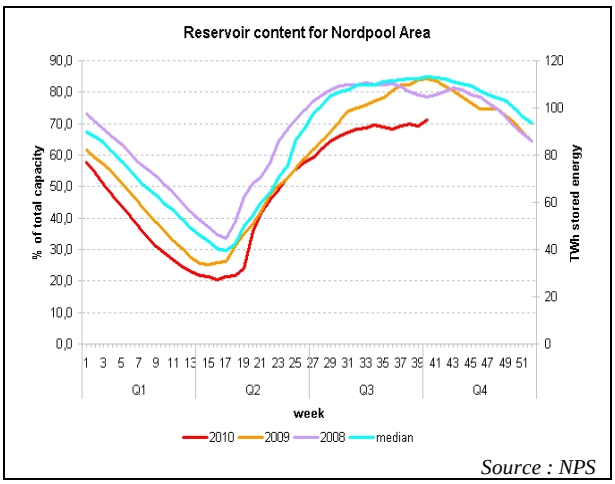
Northern Europe and the Baltic Region

As was the case in previous years, the traded volume on the day-ahead segment of the Nord Pool Spot (NPS) market reached its lowest yearly value in Q3 2010. However, the total traded volume in the third quarter of 2010 (61.5 TWh) was 5% higher than in the same quarter of 2009. Similarly to the previous two quarters, this volume represents around three quarters of the combined gross inland electricity consumption of Denmark, Norway, Sweden, Finland and Estonia, highlighting the liquid nature of the NPS market.



Source : Platts.

In July 2010 the monthly average day-ahead system price of the NPS market was € 45.3/MWh, which was 38% higher than that of the average price of July 2009. In August, the monthly average price slightly decreased (to € 42.9/MWh), then rose again in September (€ 49.4/MWh).

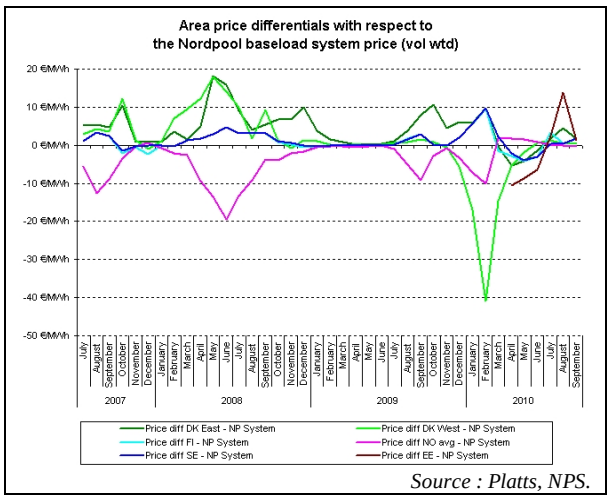


Source : NPS

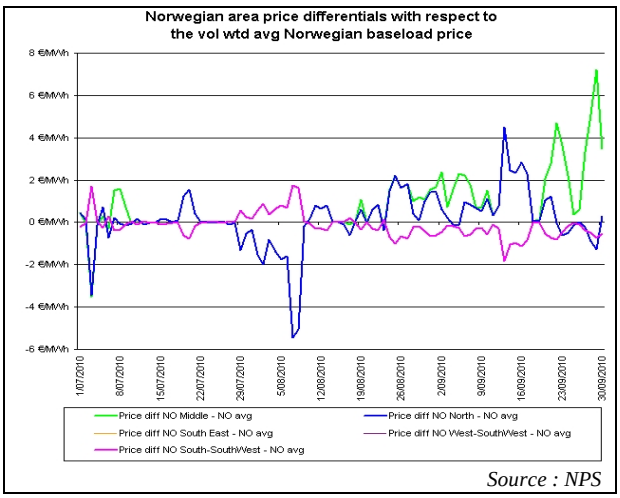
The main reason for the relatively firm prices in the third quarter and the jump in monthly average system prices in September might be explained by low hydro-reserve levels in the NPS area. In the third quarter of 2010 the average hydro reserve level was almost 15% lower than the median of the preceding ten years.

The tense situation on the Nordic electricity market during the winter 2009/2010 with limited access to the nuclear power plants in Sweden resulted in a high level of usage of the Nordic water reservoirs during that period. At the same time the volume of melting water flowing to water reservoirs was not enough to compensate the demand and thus the water reservoirs were not able to reach their usual level during the spring period.

The unusual low hydro reserve level in the Nordic area in Q3 2010, together with a limited access to the Swedish nuclear power plants and an increased demand of electricity was a strong factor for the relatively high Swedish spot prices.



Source : Platts, NPS.

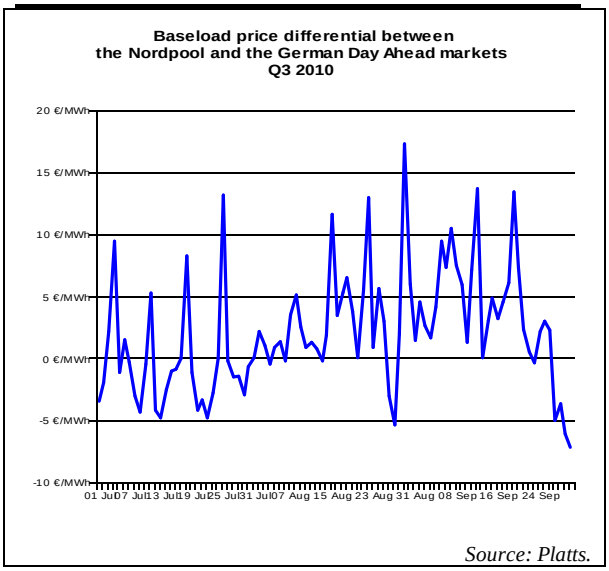


Source : NPS

Taking a closer look at the monthly price differentials between the area prices and the NPS system price, it seems that most of the monthly area prices were close to that of the system price in the July-September 2010 period. In Estonia[15] however there was a € 14/MWh monthly price difference in August, which was mainly due to extremely high hourly prices on one particular day. On 24th August there were five consecutive hours when the Estonian power area price was € 2000/MWh.

Denmark-East price area also showed higher deviation from the monthly system price (€ 4.4/MWh) in August 2010 compared to other price areas, primarily owing to those four trading days when power prices exceeded € 100/MWh for several consecutive hours.

Norwegian price differentials compared to the national base-load prices were stable during the third quarter of 2010, with the exception of the NO-Middle area and the North area where substantial differences occurred on some trading days.



Source: Platts.

Although in July 2010 monthly Nordpool base-load power prices traded at a minor discount compared to German market prices (€ -0.4/Mwh), in August and September this relation changed and a price premium larger than € 3/MWh could be observed in both months. German power prices fell substantially in August

[15] Due to a computation mistake, an erroneous statement has been put in the Quarterly Report on European Electricity Markets April-June 2010 issue on the ratio of traded volume of power in Estonia and the country's electricity consumption in the second quarter of 2010. In reality, the volume of traded power on the Estonian market (0.67 TWh) represented more than 32% of the country's electricity consumption in Q2 2010, instead of the alleged 1% in the previous issue.

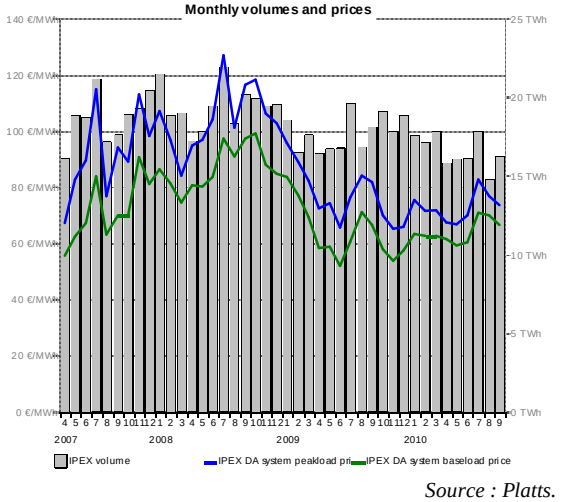
compared to July 2010, while NPS system prices remained more stable.

It is interesting to observe that the daily NPS price premium over the German market hit the highest levels on Sundays in Q3 2010 when German prices usually fell and NPS prices remained stable. This might have been the consequence of the bigger impact of industrial demand on German power prices.

Apennine Peninsula

Italy

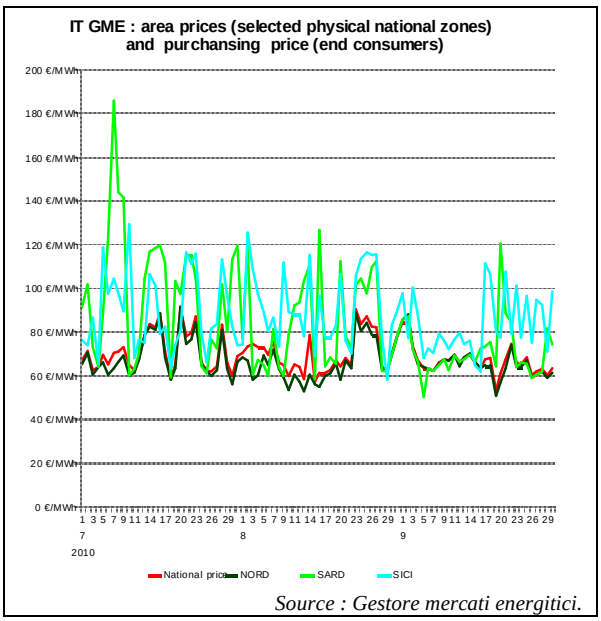
Similarly to most of the European markets, monthly average power prices rose to several months' record highs in July 2010 in Italy. In July monthly average base-load electricity prices rose to € 70.9/MWh, a price level that has not been seen since August 2009. Peak-load prices were € 82.6/MWh on average in the month of July. In August, base-load prices slightly decreased (€ 69.9/MWh on average) and in September this downward movement endured (the monthly average price was € 66.6/MWh in this month).



Source : Platts.

** Trade on Italian (IPEX) and Iberian (OMEL) electricity markets is incentivised by regulatory means.*

Peak-load prices fell more sharply, and in September 2010 the spread between base-load and peak-load prices decreased to € 7.1/MWh from more than € 12/MWh observed in July. The potential reason behind this narrowing difference might be the record high power demand in July that affected the peak-load prices to a larger extent than the base-load prices, and after the end of the heat-wave this excess demand was eliminated. In July 2010 the monthly CDD value (110.1) was significantly higher than the long term average (52.1). In contrast, August and September CDD values were lower than the long term averages for these two months, pointing towards a lower residential power demand for cooling. This might have been an important factor for decreasing prices.

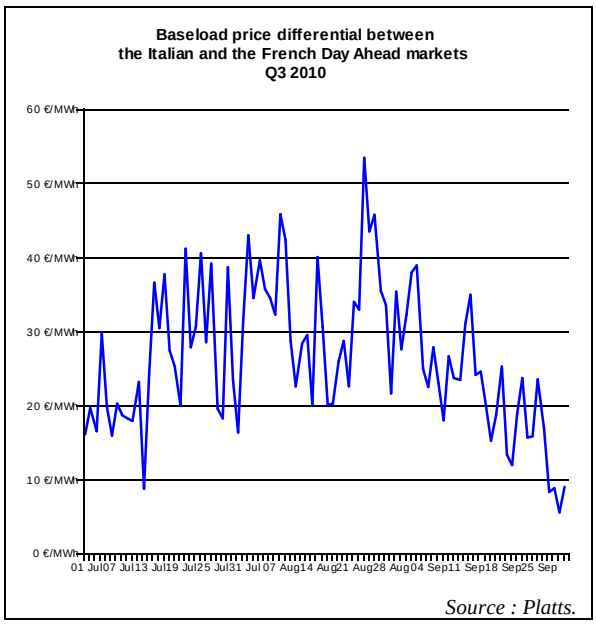


Source : Gestore mercati energitici.

Power prices in Sardinia were extremely high in early July 2010. On 7th July the daily average price was € 185.6/MWh, and on that day there were fourteen hours when prices were above € 200/MWh. Sicily area prices were not so volatile, although there

were two days (10th July and 2nd August) when daily average prices were above € 120/MWh.

Both Sardinia and Sicily area prices were higher than the national average on more than two thirds of the calendar days of Q3 2010. In contrast, Northern area prices were generally lower than the national average.



Source : Platts.

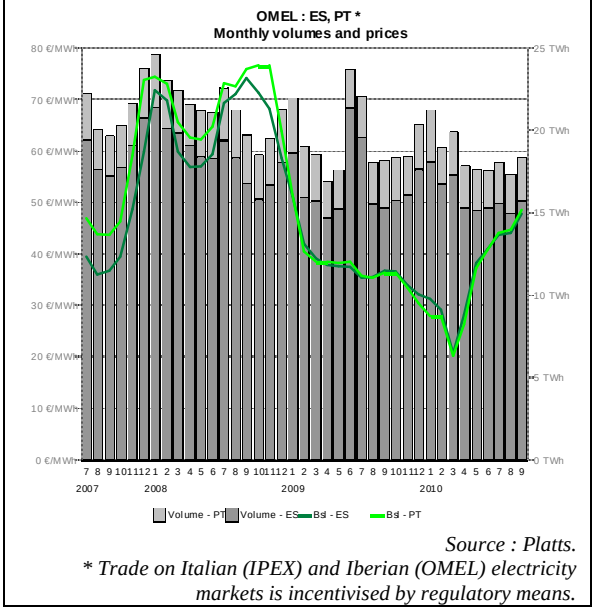
The average Italian base-load power price premium compared to France was € 26.4/MWh. On 23rd August the daily price premium was above € 53/MWh, a level which has not been seen since September 2009. The reason for this high premium may be the very low French market prices in August 2010. By the end of September the Italian price premium fell below € 10/MWh as French power prices rose significantly.

Iberian Peninsula

Spain and Portugal

The weather on the Iberian-peninsula was especially hot during the third quarter of 2010. Both in Spain and Portugal the CDDs exceeded the long term average value in each month of Q3 2010 (see page 2).

The impact of the heat was strong during July. Two consecutive records of daily power demand were set in Spain during that period. The higher-than-usual temperature combined with lower wind power generation also pushed prices higher.



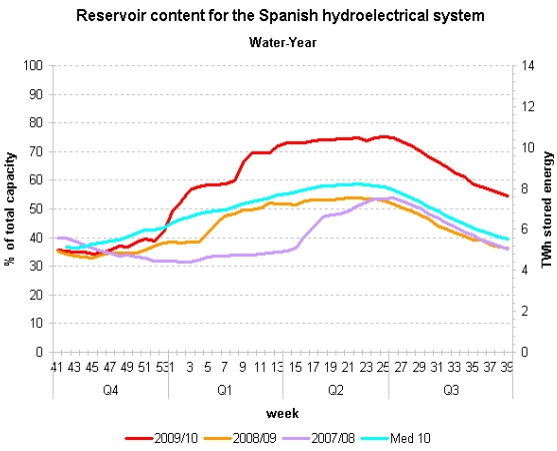
Source : Platts.
** Trade on Italian (IPEX) and Iberian (OMEL) electricity markets is incentivised by regulatory means.*

The monthly average base-load power price was €43.6/MWh in July 2010, while the Portuguese base-load rose to € 44/MWh in the same month. In August and September the monthly average base-load power price kept rising; in Spain September 2010 price was € 47.6/MWh while in Portugal it reached €48.1/MWh on

average, reaching the highest values since January 2009.

Base-load power prices were on an upward trajectory since their lowest point measured in March 2010, and compared to the same month of 2009 Spanish monthly base-load prices were up by 23%, 24% and 29% in July, August and September 2010, respectively.

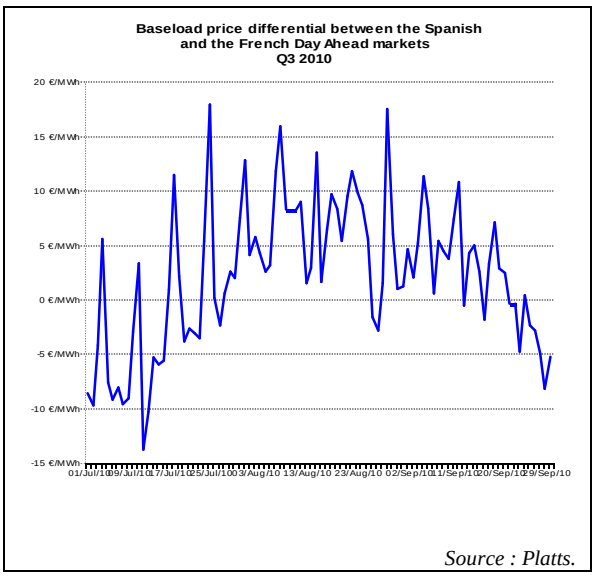
Although in August the rise of monthly average prices remained moderate compared to July, in September price increases gathered a new momentum. Power generation from wind decreased again and the unplanned outage of the Alamaraz-II nuclear reactor also reduced power supply in the first two weeks of September.



Source : Ministerio de Medio Ambiente, y Medio Rural y Marino, Gobierno de España

The high level of hydro-reserves was among the few factors that could have contributed to the mitigation of price increase during the whole Q3 2010. The abundant reserves assured that hydro-based power generation remained competitive. By the end of Q3 2010 the actual reserve level significantly exceeded that of the ten-year average.

The evolution of price differentials between the Spanish and French market followed an interesting trajectory. In the first week of July and in the last week of September electricity on the Spanish market traded at a discount to the French market. However, in August and September Spanish base-load power was more expensive than that in France. In July the price discount of Spanish power was € 2.2/MWh on average, and this turned to a price premium in August and September (€ 6.8/MWh and €2/MWh, respectively).



Source : Platts.

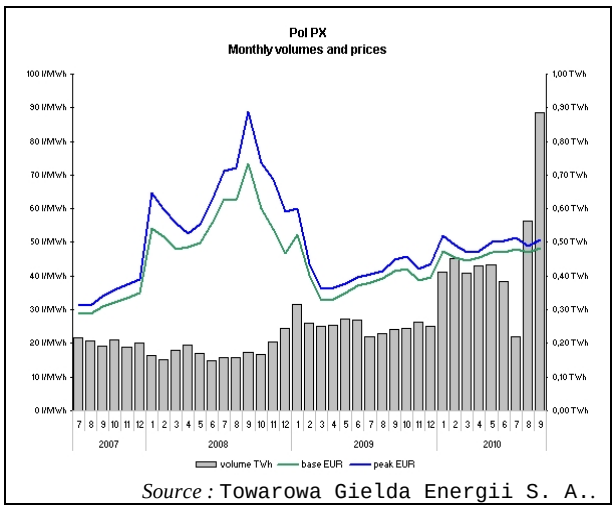
French power prices were very low during the first half of August 2010 (see page 9), which was not the case for Spanish prices. There were three days in the quarter when Spanish daily price premium exceeded € 15/MWh. As French prices caught up again in September after their lows, the Spanish price premium began to diminish and turned to a discount again by the end of the month.

Central Eastern Europe

Poland

Polish daily day-ahead base-load prices were fluctuating in a narrow range between € 46 / MWh and € 51/MWh during the whole third quarter of 2010. Monthly average base-load prices remained stable in the range of € 48 / MWh. These average prices were up by 16 to 26 % compared to the same months of 2009.

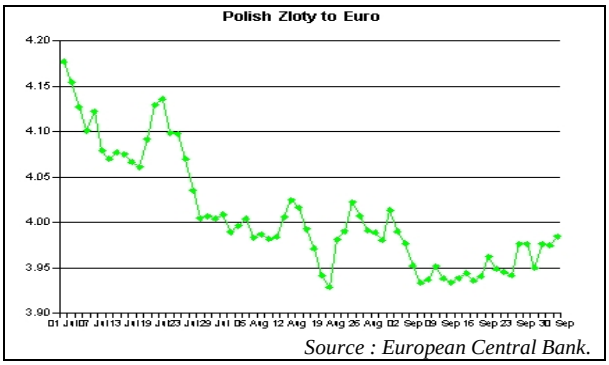
Peak-load power prices were about € 2-3 / MWh higher; in July, August and September the following monthly peak-load averages were measured: € 51.3/MWh, € 49/MWh and € 50.8/MWh, respectively.



Source : Towarowa Gielda Energii S. A..

The stability of power prices was in strong contrast with the huge growth in the monthly traded volumes. In July 2010 the monthly traded volume was only 0.22 TWh which was the lowest value since July 2009. In August and September 2010 a dramatic increase in volume could be witnessed; in the eighth month of 2010 the traded volume was 0.56 TWh and in September this rapid rise in volumes continued (0.93 TWh). These were the two highest prices since the beginning of 2005.

The reason for the significant increase of monthly trading volume on the PolPX platform was an amendment in the country's energy act[16] that required all power generators to sell at least 15% of their annual production on the regulated market. Before this amendment entered into force about 90% of all power trade was carried out on a bilateral basis. The quarterly traded volume (1.67 TWh) represented less than 5% of the country's gross inland electricity consumption in Q3 2010.



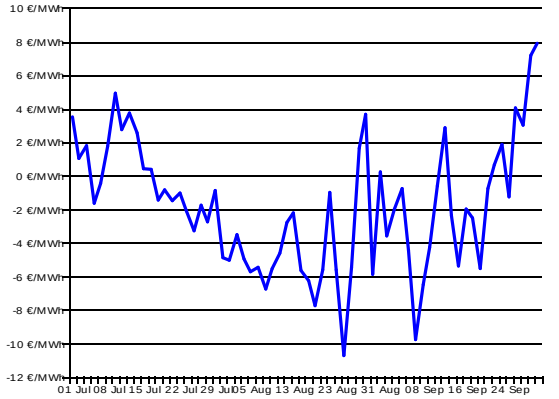
Source : European Central Bank.

From the beginning of July until the last week of August the Polish zloty appreciated by more than 5% with respect to the euro, which counterbalanced the power price decrease measured in zloty. That is an important factor in understanding the stability of prices measured in euros during the July-August period. The national currency retained its position compared to the euro in the rest of the quarter.

Looking at the next chart showing the price differentials between the German and Polish base-load prices, it seems that with

[16] See more in Platts EU Energy, Issue 249, 14th January 2011

the exception of the first two weeks of July and the last week of September Polish power traded at a premium to German prices. On 24th August this premium exceeded € 10/MWh, which was the consequence of stable Polish prices (measured in euros) and decreasing German prices. The month of September was also volatile, but by the end of the quarter the Polish price discount returned as German power prices soared.



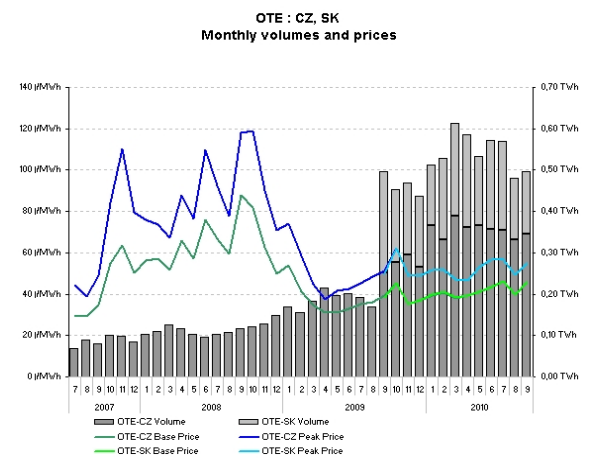
Source : Platts

Czech Republic and Slovakia

Monthly average base-load and peak-load power prices in the Czech and Slovak price areas were equal in the third quarter of 2010. Base-load prices rose to € 46.1/MWh in July 2010, the highest level since January 2009. Peak-load monthly average price also rose to a nine-month record, to € 56.8/MWh. In the beginning of July higher-than-normal temperatures might have increased the households' demand for power for the use of air conditioning units.

In August, similarly to the German market which acts as a price reference for Czech trading, monthly average prices decreased. The monthly average base-load price was € 39.9/MWh, while peak-load fell to € 49.3/MWh.
In September, both base-load and peak load monthly average prices rose again (to € 45.9/MWh and € 54.9/MWh, respectively).

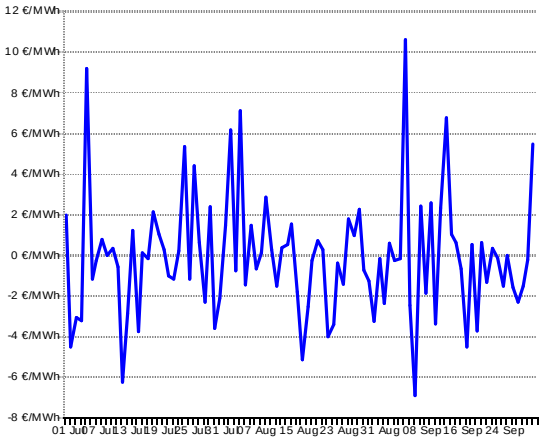
Lower wind power generation in Germany, some plant outages in Slovakia and in the last week of the month colder weather all contributed to the rise of power prices. Compared to the same month of 2009 base-load prices were up by 31% in July 2010, while in August and September the extent of the price rise was less important (11% and 16%, respectively).



Source : Operátor trhu s elektrinou, a.s.

The combined traded volume on the Czech and Slovak market was 1.55 TWh in Q3 2010, which amounted to 7% of the two countries' gross inland electricity consumption in Q3 2010. This was slightly lower than the corresponding volume in the second quarter of 2010 (1.69 TWh). The combined volume of the two markets in September 2010 (0.50 TWh) was almost the same as in September 2009.

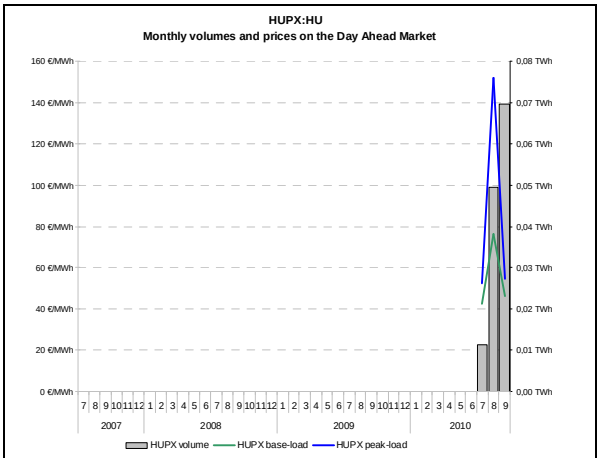
In the third quarter of 2010 Czech and German base-load prices were very close to each other on a quarterly average basis, though on many days significant price differentials appeared. The highest Czech price premium occurred on 5th September (€ 10/MWh), while the highest discount followed only two days after (€ -7/MWh).



Source : Platts, Operátor trhu s elektrinou, a.s.

Hungary

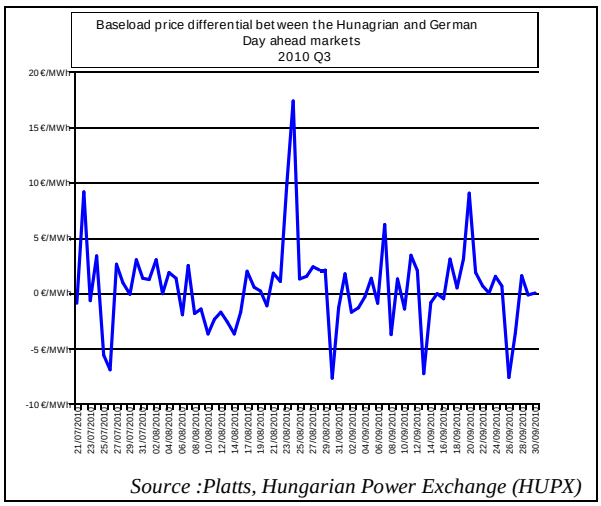
Trading of day-ahead power prices on the Hungarian Power Exchange (HUPX) platform started on 20th July 2010. In the first (not full) month the traded volume did not exceed 0.01 TWh, but in August and September the monthly traded volume showed dynamic growth (0.05 TWh and 0.07 TWh, respectively)



Source : Hungarian Power Exchange (HUPX)

In July 2010 the monthly average base-load electricity price was € 42.6 /MWh, while peak-load power was traded at € 52.4/MWh on average. In August 2010 the monthly average base-load price went up to €76.1/MWh and the peak-load rose to € 152.1/MWh. This significant hike in prices was the consequence of extremely high (nearly € 3.000/MWh) hourly prices during nine hours measured on one particular trading day (16th August, 2010). Taking out this one exceptional day from the average results in monthly average prices similar to those of July (base-load: € 40.4/MWh, peak-load: € 51.6/MWh).

In September power prices rose on HUPX, similarly to the majority of the European markets. The monthly average base-load price was € 46.1/MWh and the peak-load was 54.6/MWh. In the last couple of days of September daily average base-load prices were well above € 50/MWh.



Source :Platts, Hungarian Power Exchange (HUPX)

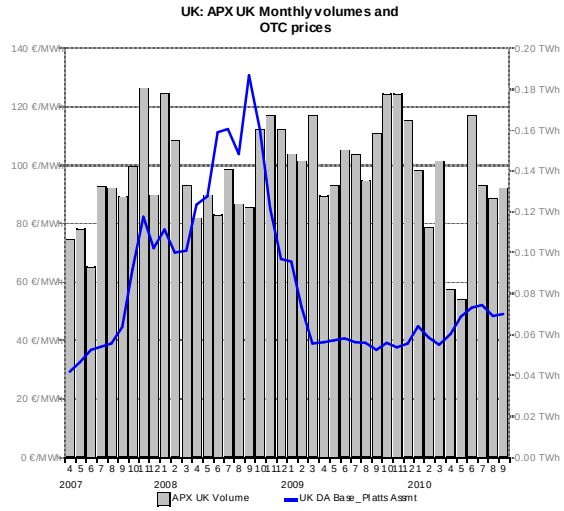
This chart above shows the evolution of the base-load price differential between the Hungarian and German power market. In the observed period Hungarian base-load power traded at an average price premium of € 0.45/MWh compared to German electricity prices.

British Isles

UK

The beginning of the third quarter of 2010 was characterized by high power prices in the UK. On some days of the first week of July base-load daily average prices were higher than € 80/MWh, the first time this level was reached since January 2010.

Power prices were supported by the weather conditions (a heat wave hit the western part of the European continent) and by gas prices that soared to their highest levels on the UK market (NBP) since February 2009. Tight grid conditions (some planned outages) also exerted an upward pressure on power prices.



UK values are quoted in € using the €/£ daily exchange rate as reported by Platts.

Source : Platts.

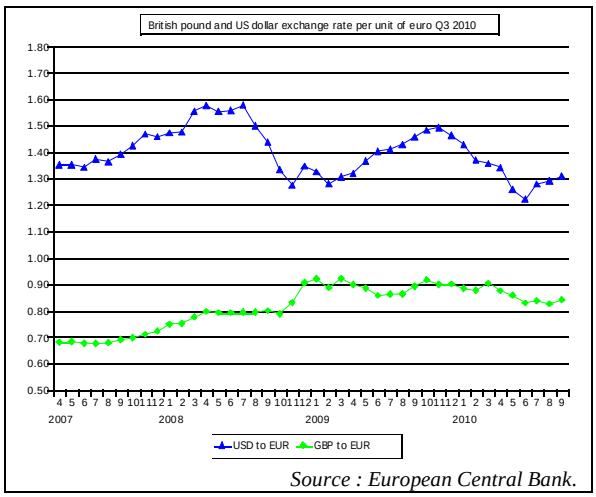
In the later periods of the third quarter of 2010 daily average day-ahead base-load prices decreased from these peaks and during most of the third quarter fluctuated in a range of € 40-60/MWh.

The monthly average base-load price was € 58.7/MWh in July 2010, while in August and September, monthly averages were slightly lower (€ 52.1/MWh and € 53.4/MWh, respectively).

Compared to July 2009, when the monthly average price of electricity was on its two-year-low as a consequence of the economic crisis, base-load prices were up by 35% in July 2010. The year-on-year price increase in August and September was 9% and 15%, respectively. Monthly traded volumes on the APX UK trading platform were quite stable during these three months, showing a monthly average of 0.13 TWh.

Currency exchange rates did not exert much influence on power prices measured in euros, such that the British pound

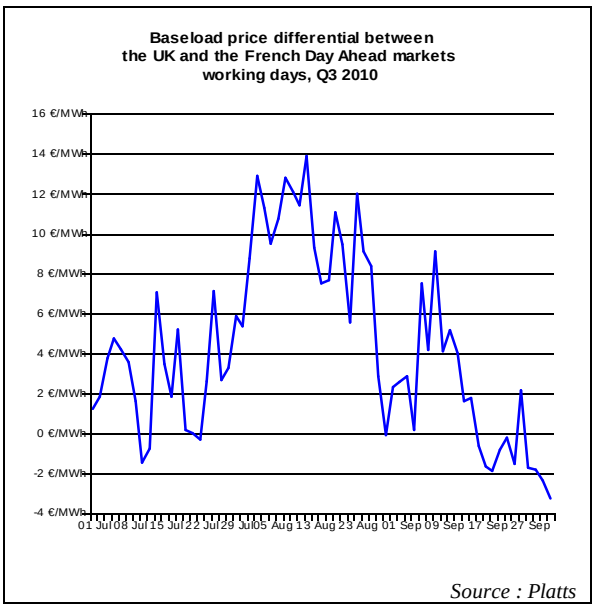
showed a high degree of stability against the euro in the third quarter of 2010.



Source : European Central Bank.

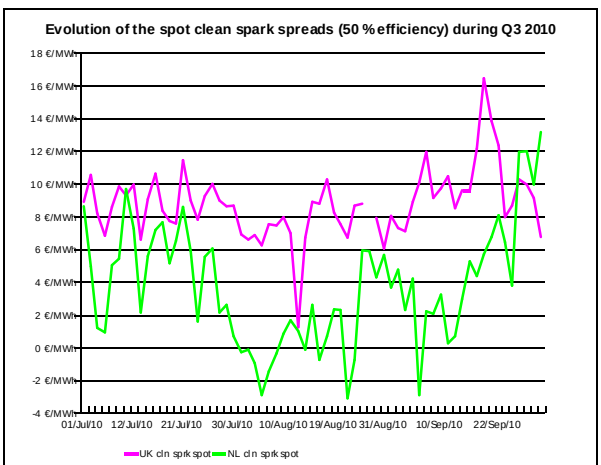
The base-load price differential curve between the UK and French day-ahead markets had a reversed V shaped form during the third quarter of 2010. While in the first two weeks of July power prices were similar on both markets, in mid-August the UK price premium widened to nearly € 14/MWh as a consequence of cheap French power prices. The increased UK price premium was also reflected in growing net electricity imports from France. While in the second quarter of 2010 the net UK power import was 1.66 TWh, it amounted to 2.96 TWh in the third quarter.

As French electricity prices returned to higher levels in the second half of Q3 2010, the relationship between the UK and French prices went from a premium to a discount.



Source : Platts

UK clean spark spreads seemed to be volatile during the third quarter of 2010. On 12th August the clean spark spreads were just above € 1/MWh which was the lowest value since December 2008. On the other hand, clean spark spreads climbed above € 16/MWh on 22nd September which was the highest value since October 2009. Changes in daily power prices might have played a bigger role in the volatility of the spreads while both gas prices and emission prices were stable during the whole quarter.



UK values are quoted in € using the €/£ daily exchange rate as reported by Platts

Source : Platts

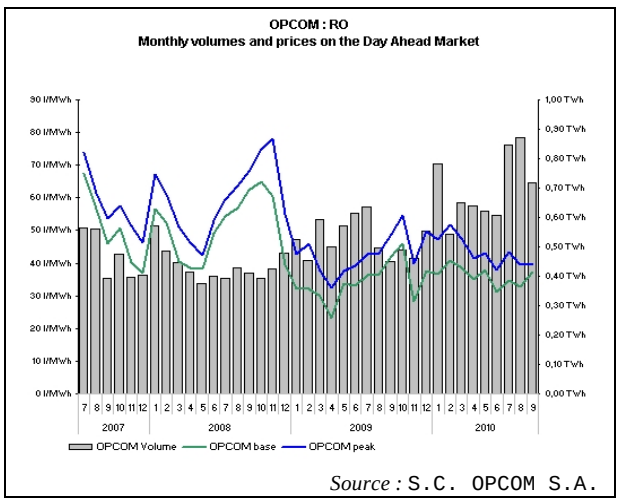
As in the third quarter of 2010 Dutch base-load power prices were generally lower than those in the UK. Dutch spark spreads were lower than their UK counterparts during most of the quarter.

South Eastern Europe

Romania

The Romanian market was the only one among observed trading platforms where both quarterly base-load and peak-load day-ahead power prices decreased in Q3 2010 compared to the third quarter of 2009.

Both base-load and peak-load quarterly average prices were down by almost 9% compared to Q3 2009. This must have been related to the performance of the national economy, while the GDP of the country was still in a contraction phase (-2.5% compared to the third quarter of 2009).

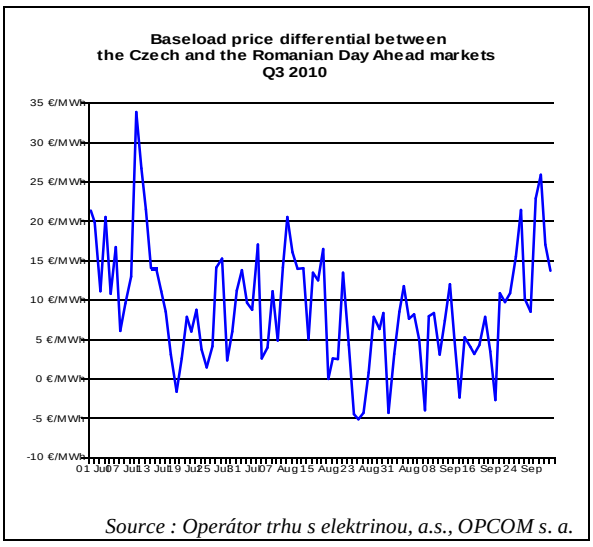


Source : S.C. OPCOM S.A.

Although actual monthly CDD values were higher than the long term average in both July (48.9 vs. 27.7) and August (67 vs. 24.9), this exerted only a negligible influence on power prices; revealing the relatively low importance of summer domestic cooling excess demand in Romania.

Both base-load and peak load monthly average power prices were fluctuating in a narrow range in the third quarter of 2010. In July the monthly average base-load price was € 34.7/MWh, decreasing to € 32.7/MWh in August and then increasing to € 37.3/MWh in September. Monthly average peak-load prices decreased from € 43.3/MWh in July to € 39.7/MWh in September 2010. The spread between monthly base-load and peak-load prices substantially narrowed in September (€ 2.5/MWh), which was the lowest value since July 2005.

Although power prices decreased in the third quarter of 2010 compared to Q3 2009, the quarterly traded volume increased to a record high (2.4 TWh), which was 54% higher than that of the third quarter of 2009. This quarterly traded volume amounted to 18% of the country's gross inland electricity consumption in the third quarter of 2010.



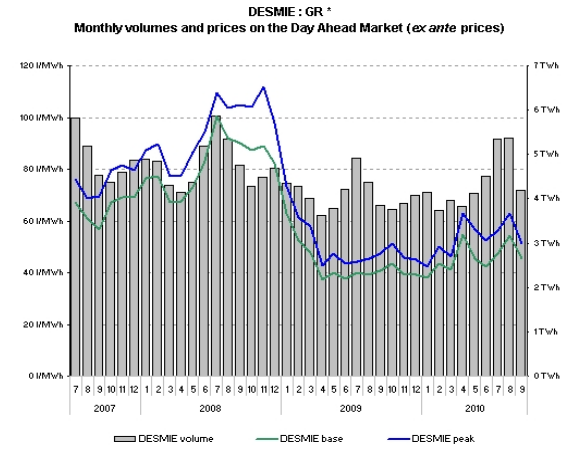
Source : Operátor trhu s elektrinou, a.s., OPCOM s. a.

The quarterly average Romanian power price discount compared to the Czech market widened to € 9.1/MWh in the third quarter of 2010, which was higher than that of Q1 (€ 0.90/MWh) and Q2 (€ 6.7/MWh). This also reflects the diverging economic performance of the two countries while the Czech economy already emerged from the recession, Romania still suffered from the economic downturn. On some days the Czech price premium soared to a range of € 25-30/MWh, mainly because of falling Romanian power prices.

Greece

In the third quarter of 2010 Greek monthly average power prices edged higher in July and August, as the weather was warmer than the long term average. Monthly average base-load prices rose to € 47.4/MWh in July (after reaching their lowest value in 2010 in June, of € 42.2/MWh) and kept on rising in August (€ 54.2/MWh). Monthly peak-load average prices also increased in July and August (to € 56.5/MWh and to € 62.9/MWh, respectively). In September, as temperatures went down, base and peak monthly average power price fell by € 9/MWh.

Both in July and August 2010 the actual monthly CDD values were higher than the long term averages. The peak of the heat-wave could be observed in August when monthly CDD was nearly twice as much as usual (178.5 vs. 91.9).

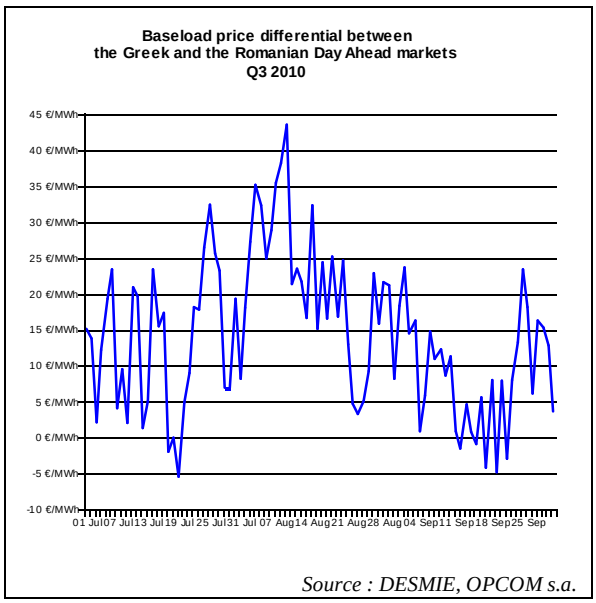


Source : Platts.

** Trade on the Greek mandatory pool (DESMIE) is incentivised by regulatory means.*

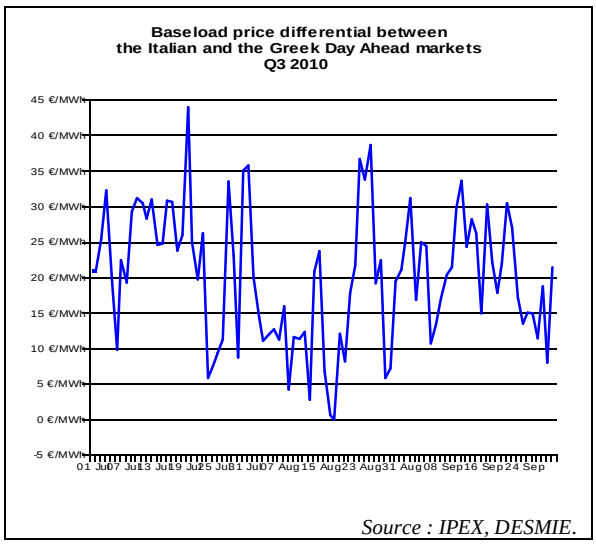
Although higher-than-usual temperatures exerted an upward pressure on power prices in Greece in the first two months of Q3 2010, the steep fall in September might be explained by the overall state of the national economy. In the third quarter of 2010 Greek GDP was 4.7% lower than in Q3 2009. Industrial production was also down by 7.6% in September 2010 compared to the same month of the previous year. The evolution of the macro-economic situation might have exerted a downward impact on power prices.

Monthly traded power volume was well above 5 TWh in both July and August (the highest values since the summer of 2008). In September the monthly volume fell back to 4.2 MWh, which corresponds to the average of the first half of 2010.



Source : DESMIE, OPCOM s.a.

While monthly Romanian base-load prices remained stable during July and August 2010 and at the same time Greek electricity prices rose, the Greek premium over the Romanian price rose significantly. The monthly Greek price premium was € 21.4/MWh in August 2010, with an extremely high daily premium of € 43.5/MWh on 9th August. In September, as Romanian daily average prices began to rise and those of Greece diminished, the price premium narrowed (to € 8.3/MWh on a monthly average).



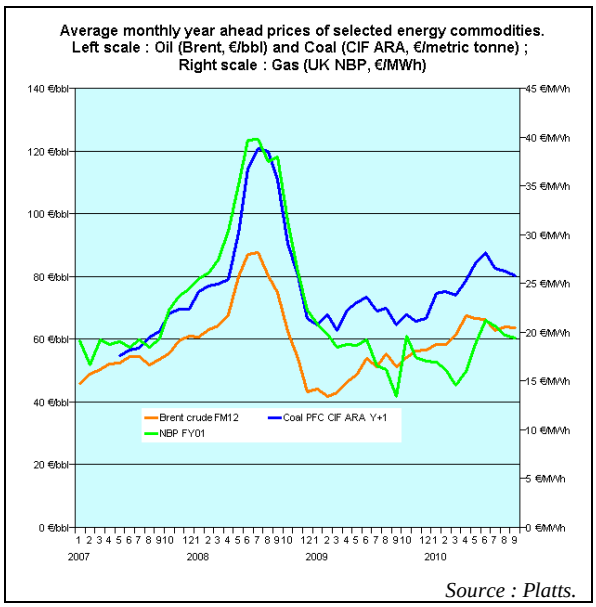
Source : IPEX, DESMIE.

Italian monthly base-load electricity prices reached their peak in July 2010, while Greek power prices continued to rise in August. In consequence, the monthly Italian price premium was the highest in July 2010 (€ 23.5/MWh), and it shrank to € 15.7/MWh in August. In September however, as Greek prices fell more sharply than those in Italy, the monthly average price gap widened again (to € 21/MWh).

A.1.2 Forward markets

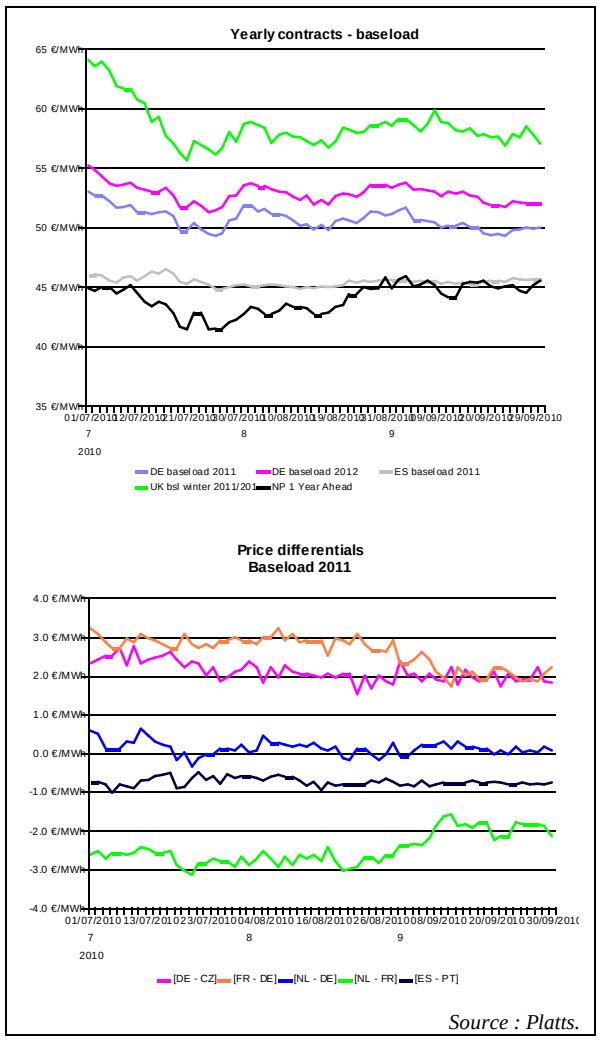
A decrease in year-ahead prices of the main fuel commodities could be observed during the third quarter of 2010 compared to second quarter prices. In September 2010 the year-ahead price for Brent crude oil was 4.3 % lower than in June. Gas and coal year-ahead prices fell by 8.5 % during this period.

While demand from India and China was assumed to have contributed to the increasing prices in the previous quarter, the decrease in China's oil imports in July put a downward pressure on oil prices in the third quarter. Forecasts of a slower-than-expected global economic recovery and concerns of a double-dip recession might also have contributed to the drop in forward fuel prices in the third quarter of 2010.



Source : Platts.

The prices of forward yearly base-load power contracts showed a similar development. After a rise in prices in June 2010 prices fell at the beginning of the third quarter. Later in August and September, prices were moving within a narrower range. Forward gas prices were observed as the main driver for these contracts. Nevertheless, the impact of summer holidays and a period of lower CO_2 prices might also have exerted influence on the evolution of forward electricity prices.

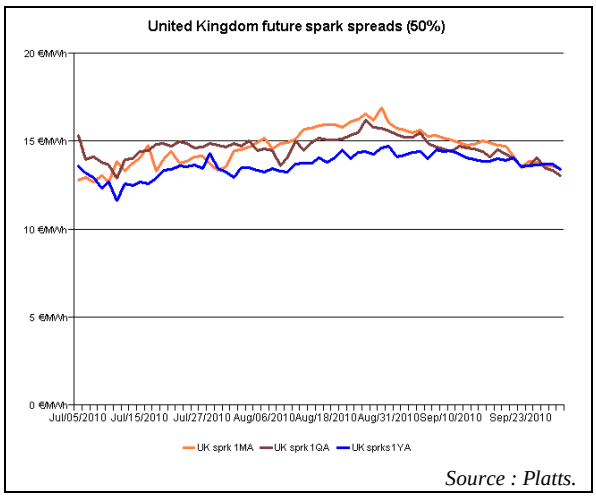


Source : Platts.

The price differentials between base-load 2011 contracts did not show significant variations. A further drop in forward prices in September (due to lower coal, gas and CO_2 prices) caused the price differentials between the French and the German contracts and between the Dutch and the French contracts to drop in both cases to € 2/MWh or even lower. This level was

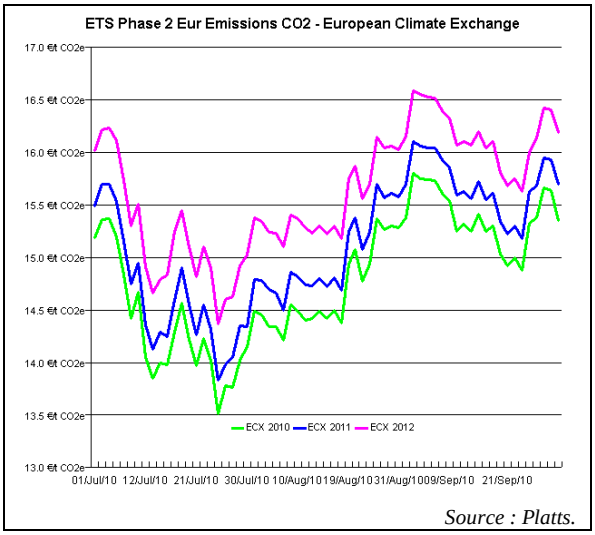
maintained during the remainder of the month.

Future spark spreads also decreased at the beginning of July and, excepting in August, stayed close to € 15/MWh for the remainder of the quarter.



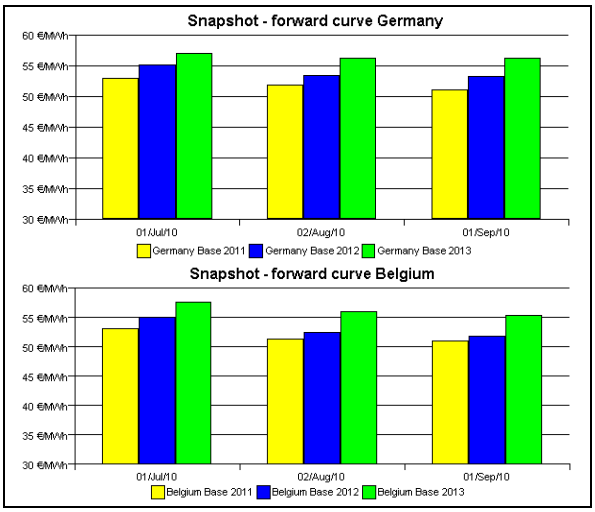
Source : Platts.

It appears that forecasts of a fragile economic recovery in July pushed the prices for CO2 emissions below € 14.5/tCO2. In August and September the prices increased considerably and to some extent this can be related to the increase in prices of carbon emmission reduction certificates (CERs) issued by the UN that have an influence on the EU ETS market[17].



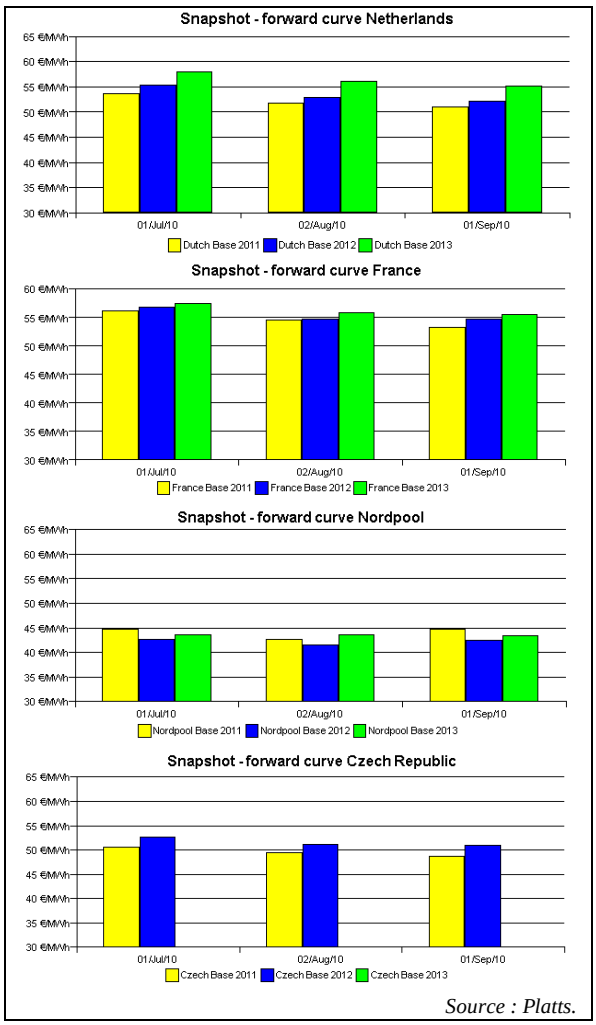
Source : Platts.

Similarly to the previous quarter, contango[18] was present on most forward curves. However, the prices in September 2010 on all forward contracts were generally lower than those of July and August, following the quarterly evolution of the forward baseload prices (see the beginning of this chapter).



[17] For some fluoroform (HFC-23) projects in Asia the supply of CERs in the framework of Clean Development Mechanism was delayed due to additional investigation of the correct usage of the schema. The price of CERs influences the price of EUAs (EU emission allowances).

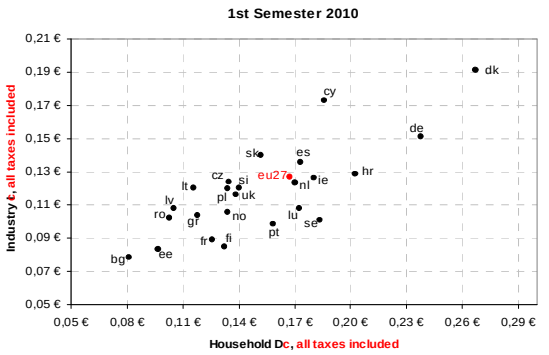
[18] A situation of contango arises in the when the closer to maturity contract has a lower price than the contract which is longer to maturity on the forward curve.



Source : Platts.

A.2 Retail markets

The next two charts show the electricity prices paid by household and industrial consumers that have median-level annual electricity consumption (consumption bands *Dc* and *Ic* according to Eurostat's consumption categories). The first chart shows the household and industrial customer prices including all taxes (gross prices), while the second one shows prices without taxes (net prices).[19]



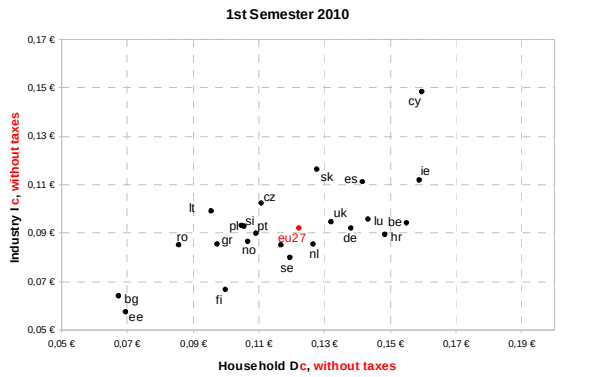
Source : Eurostat

Range for annual consumption of :
Household band Dc : [2.500 kWh – 5.000 kWh] ;
Industry band Ic : [500 MWh – 2000 MWh]

Note. Data for Belgium, Hungary and Malta are not available

After having declined in the previous semester, the range between the cheapest and the most expensive gross household price (B and Dc) of different Member States rose again. On the other hand, the range for industrial consumers decreased again, similarly to the previous semester. In the first half of 2010 the ratio between the highest and the lowest price stood at 3.3 for household consumers and 2.4 for industrial consumers. This corresponds to a range of €cents 13/KWh and €cents 7/KWh respectively.

[19] It should be noted that the indicative Eurostat categories of household and industry consumers are not necessarily representative of the average customer for a given Member State due to different consumption patterns across the EU.



Source : Eurostat

Range for annual consumption of :
Household band Dc : [2.500 kWh – 5.000 kWh] ;
Industry band Ic : [500 MWh – 2000 MWh]

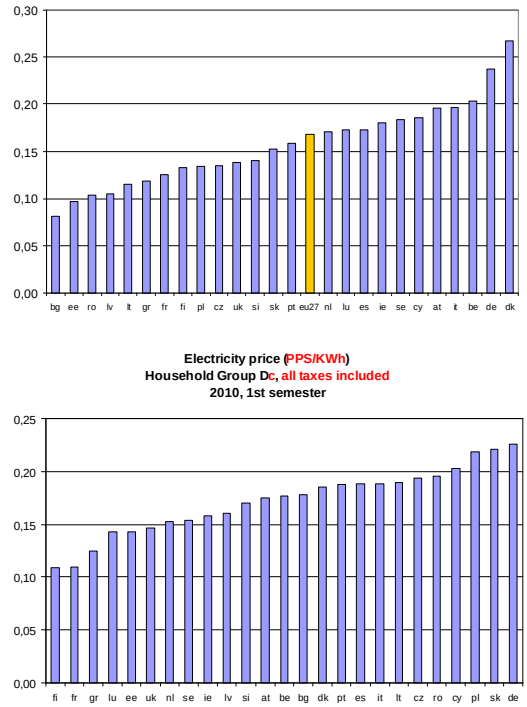
Note. Data for Austria, Hungary and Malta are not available

A.2.1 Price level

With gross prices as high as €cents 23/KWh and €cents 27/KWh respectively, households in Denmark and Germany 'paid the highest electricity prices in Europe. After purchasing power standards (PPS) correction, Danish consumers paid a price which was only the eleventh most expensive in comparison to other Member States, whereas Germany remained in the group of countries with the highest electricity prices.

Generally speaking, household consumers in most of the new Member States[20] still paid less for electricity in terms of absolute prices. However, after PPS correction the majority of them could be found in the upper half of the ranking of price levels. This was especially true for consumers in Slovakia and Poland who paid the 2nd and 3rd highest prices in terms of PPS.

[20] Member States than joined the EU in 2004 or 2007.

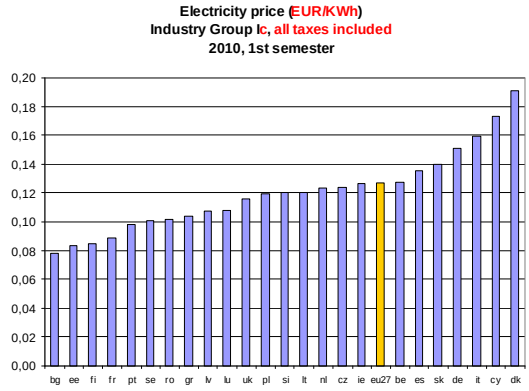


Source : Eurostat

Range for annual consumption of :
Household band Dc : [2.500 kWh – 5.000 kWh] ;

Note. Hungary and Malta are not available

Taking a look at household prices, Denmark topped again the list of EU member states in terms of gross prices for industrial consumers, charging them €cents 19/kWh. The second most expensive country was Cyprus, where the price was €cents 17/kWh.



Source : Eurostat

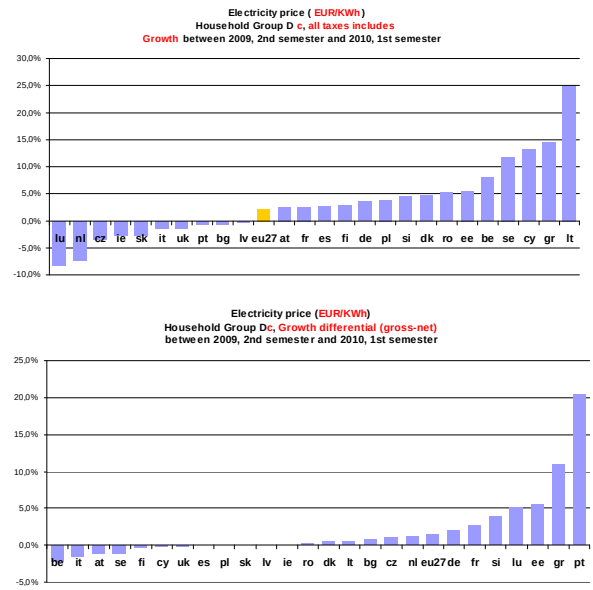
Range for annual consumption of :
Household band Ic : [500 MWh – 2.000 MWh] ;

Note. Data for Austria, Hungary and Malta are not available

A.2.2 Price dynamics

Gross prices measured in euros for household consumers in the European Union rose on average by 2.2% in the first half of 2010, compared to the previous semester[21]. Nevertheless, huge differences could be observed between the individual Member States, as can be seen in the next graph: For example, in Lithuania (24.8%), Greece (14.4%), Cyprus (13.2%) and Sweden (11.7%) the growth rate was much higher than the average, whereas significant price falls occurred in Luxembourg (-8.3%) and the Netherlands (-7.9%).

[21] In the remaining part of this chapter, unless otherwise stated, price changes are always compared to the previous semester (2nd semester of 2009)



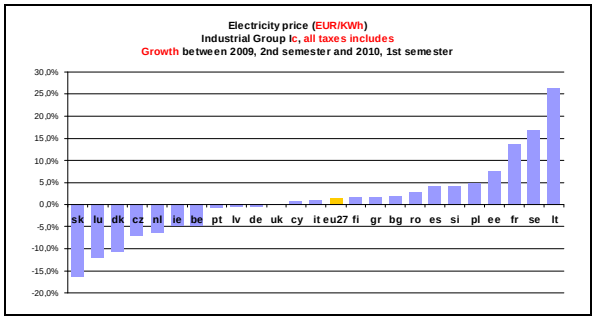
Source : Eurostat

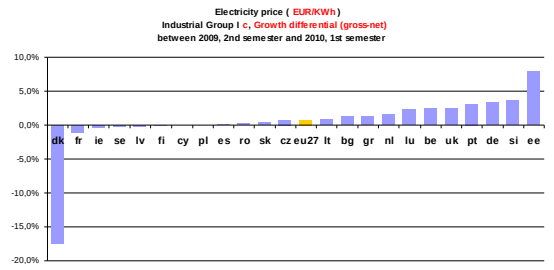
Range for annual consumption of :
Household band Dc : [2.500 kWh – 5.000 kWh] ;

Note. Data for Belgium, Hungary and Malta are not available

A large differential between the growth rates of gross and net prices indicates that the level of taxation has changed during the period in question.

In this respect, two Member States stood out: in Greece prices increased by 3.5% and 14.4% before and after taxes for consumers. In Portugal, net prices declined by 21%, but households only experienced a 0.6% decline in gross prices. These two examples of growth differentials of 10.9% and 20.3% were possibly caused by a change in taxation during the period in question.





Source : Eurostat

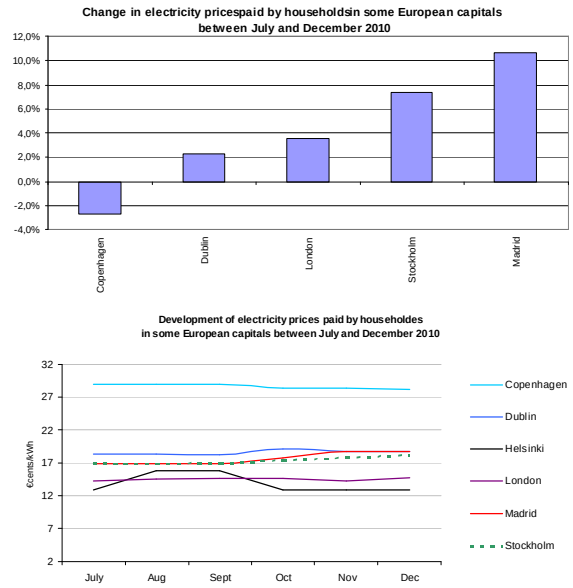
Range for annual consumption of :
Industrial band Ic : [500 MWh – 2.000 MWh] ;

Note. Data for Austria, Hungary and Malta are not available

A similar picture could be observed when looking at the changes in gross prices for industrial consumers: while at the EU-27 level, prices only increased by 1.3%, this contrasts with significant price movements in a number of Member States. Again Lithuania (26.3%) and to a lesser extent Sweden (16.7%) are among the countries that experienced the largest increases in prices, whereas significant decreases occurred in Slovakia (-16.3%), Luxembourg (-12.2%) and Denmark (-10.6%).

Taking a look at the differential between the change in net and gross prices, the largest positive difference could be observed in the case of Danish household consumers. Net prices grew by 6.9%, while at the same time gross prices fell by 10.6%, resulting in a growth differential of -17.5%. This was likely to have been caused by a change in taxation (via either a decrease in taxes or introduction of tax rebates). On the other hand, the largest negative differential between the change in net and gross prices could be observed in the case of Estonian industrial consumers: a minor drop in net prices of 0.3% could be compared to 8.0% increase in gross prices.

For the 2nd half of 2010 the HEPI price index already provides some information about the most recent price changes in a number of European capitals. Prices were stable in Amsterdam, Athens, Berlin, Brussels, Helsinki, Lisbon, Luxembourg, Paris and Vienna. However, notable price changes could be observed in Copenhagen, Dublin, London, Madrid and Stockholm, as can be seen from the following two graphs.



Source: HEPI

The HEPI electricity price index was developed by the Austrian energy market regulator E-control and VaasaEtt Global Energy Think Tank, providing monthly information about the evolution of the final gas consumer prices in some selected capital cities of EU countries.

The highest price increase could be observed in Madrid (10.6%) and Stockholm (7.4%). Copenhagen was the only capital with a noteworthy decrease in prices (-2.7%), but remained by far the most expensive among the observed capitals.

At the beginning of the 2nd semester of 2010 the electricity price in Madrid was closest to that of Stockholm. In November however it experienced a minor price jump and aligned with the price level of Dublin. A month later the Stockholm price

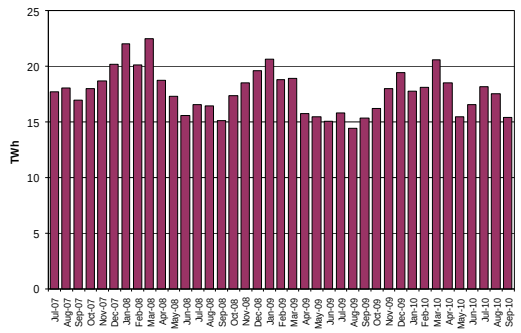
followed suit and rose to a comparable level. At the end of the year the prices in all three capitals were therefore on a very similar level. Prices in Helsinki rose temporarily by €cent 3/KWh in August, but fell back again to their low basis level in October.

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

The sum of monthly physical flows in Q3 2010 reached 51.1 TWh, slightly less than 7% of the gross inland electricity consumption of the EU-27 block. The amount of physical flows in the third quarter of 2010 was almost the same as in Q2 2010 (50.5 TWh) and 9.5 % less than in Q1 2010. The monthly flows were highest in July (18.2 TWh) and lowest in September (15.4 TWh).

The decrease in September flows was largest in Central Western Europe, where it fell from 11.8 TWh in July and August to 10 TWh in September. This decrease can be largely attributed to France, where the aggregate flows out of the country fell to 4.2 TWh in September (down from 5.1 TWh in July and 6.2 TWh in August). Nevertheless, the French September figure was still high when compared to September 2009 (2.4 TWh).

EU cross border monthly physical flows by exporting country

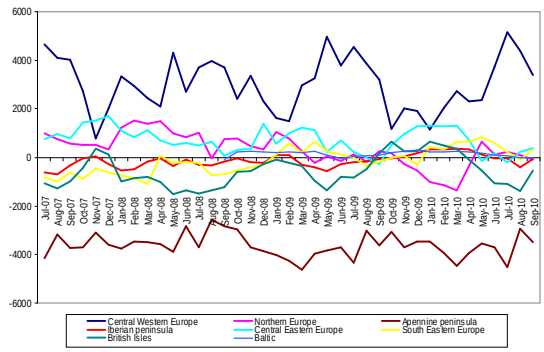


Source : ETSO

Note. Data for MT and CY are missing. Data for EE, LT and LV are available since September 2008, and for IE since July 2010. Data on physical flows from and to LU is incorporated in LU's neighbouring countries : DE, BE, FR. Data for a number of Member States is still partial, particularly for Member States in the South East European Region.

The September decrease in French cross-border flows is possibly a consequence of the decrease in power production due to strikes, and also possibly a result of maintenance works on the French-British interconnector. The chart below shows that while the French net outgoing flows decreased in September, the UK net incoming flows decreased as well.

The map of commercial flows shows some changes relative to Q2 2010. In the north, Norway changed from a net importer to a net exporter, whereas Finland turned into a net importer. In Central and Western Europe Germany became a net importer and Austria a net exporter.

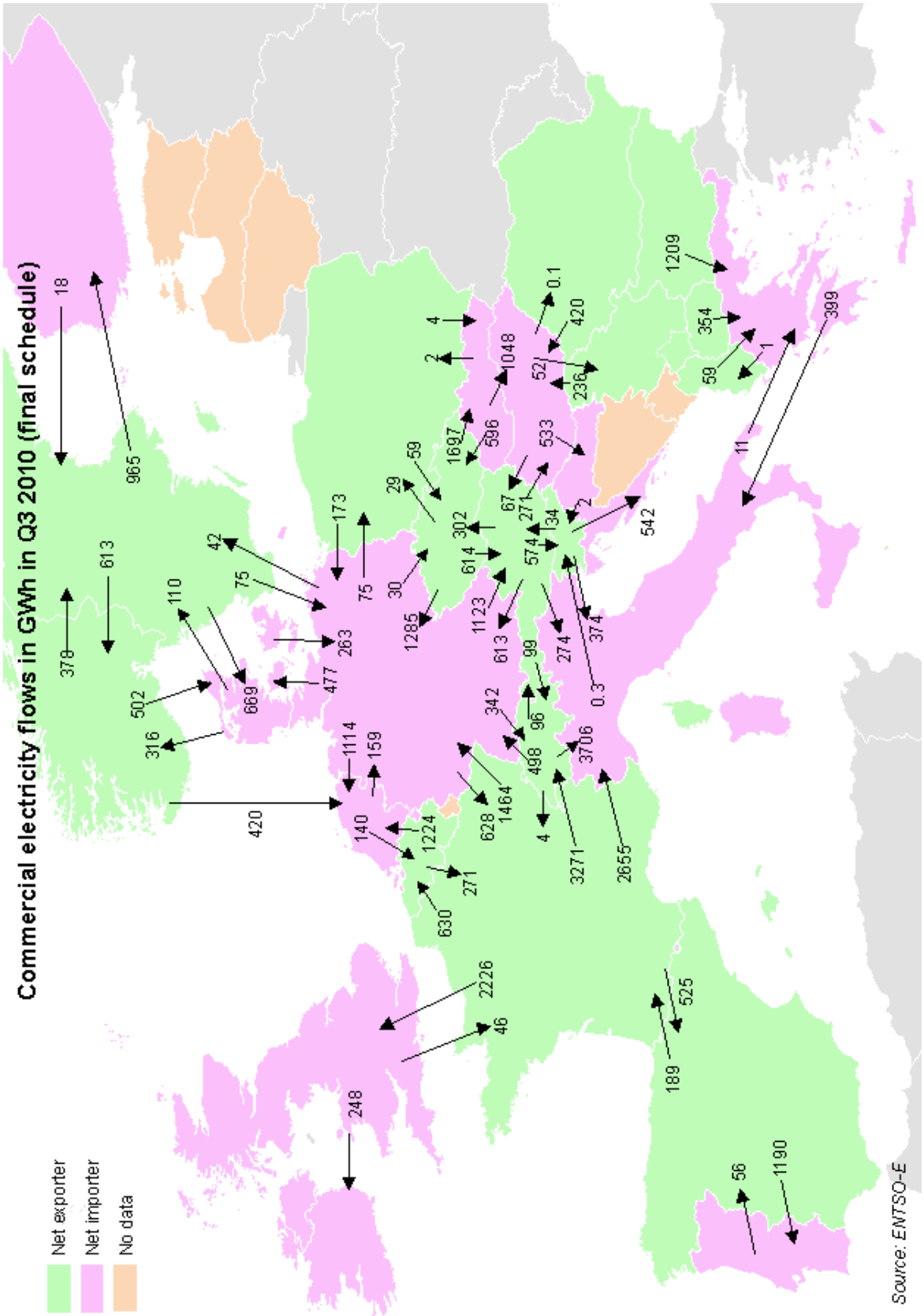


Source : ETSO.

European countries are grouped in the following regions :

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

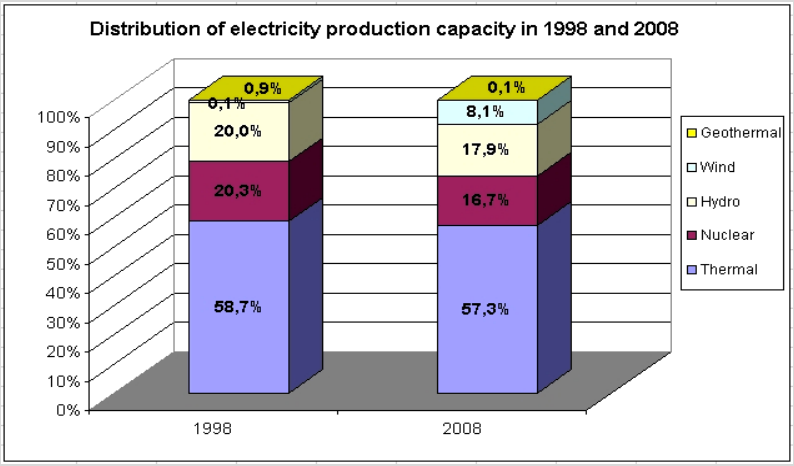
Note to the map:
Data for some countries are not available (see the legend). Due to presentation constraints the Northern European countries and Cyprus cannot be included on the map completely. Data on the commercial flows concerning Romania, Bulgaria and Serbia are not complete. There is no data available 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. For the case of the Czech-Slovak border, gross commercial values are given.


Commercial electricity flows in GWh in Q3 2010 (final schedule)
Net exporter
Net importer
No data
Source: ENTSO-E

C. *"Focus on Hydropower"*

Hydropower exploits the potential energy of the motion of water by converting it into electricity through a water turbine and generator. Hydropower's advantages over fossil-fuel-based electricity are the lack of any climate-damaging emissions and that of fuel purchase costs. There are several forms of water power generation currently in use. Conventional hydroelectric power plants generate electric power by converting the potential energy of large reservoirs of dammed water. Run-of-the-river plants use the natural flow or elevation drop of a river. In addition, there is tidal energy when the force of the tides is converted into energy. Although this method is not yet widely used, it has a potential for future electricity generation.

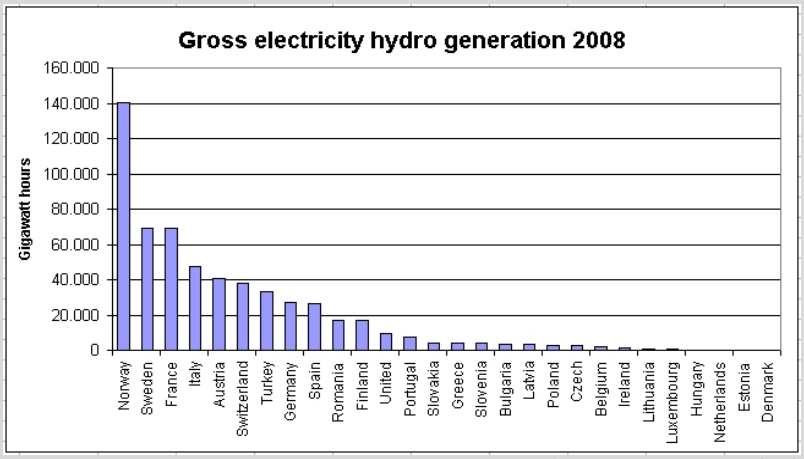
Another type of hydroelectric power generation is pumped-storage hydropower, which is used by some power plants for load balancing. Pumped storage hydro-electricity produces electricity to supply high peak demands by moving water between reservoirs at different elevations. During low-cost off peak periods electricity is used to pump water to a higher elevation. During periods of high electricity demand the water flow is reversed to generate electricity. Pumped-storage hydropower can play an important role to fulfil the increased need for energy storage, which results from the growing share of variable energy sources like wind and solar. At the moment this method is the most cost-effective form of grid energy storage available.



Source: Eurostat

Hydropower, together with nuclear and thermal generation has long been an important source of Europe's power production. The share of hydro power plants amounted to 20 % of the total installed capacity in 1998 in the EU and has been the dominant renewable source of energy for over a century. Though the installed capacity for hydro in Europe increased between 1998 and 2008, this share fell to 18% in 2008 as the EU invested significantly more in the installed capacity of other electricity generating technologies, especially wind and natural gas. 28% of the installed hydro capacity is pumped storage capacity.

Hydropower generated about 360 TWh of power in the EU-27 in 2008 which corresponds to a share of 9.7% (if Norway, Turkey and Switzerland are also taken into account European generation in 2008 amounted to 570 TWh). Norway has by far the highest hydro power production in Europe followed by Sweden and France.



Source: Eurostat

The EU's Renewables (RES) Directive includes hydropower (excluding pumped-storage hydropower) as a form of renewable energy to reach the target of at least 20% share of energy from renewable sources by 2020. Given that the requirement to preserve the state of the natural environment also plays a pivotal role in decisions about exploitation of hydropower capacities, the objectives set in the EU Water Framework Directive (WFD) also need to be taken into account. The WFD establishes a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater. As hydropower has several impacts on aquatic ecosystems, it has been identified as an important pressure on the morphology and on the physical alteration of the river system.

At the end of 2010 the Commission acknowledged in several documents the role of hydropower in reaching the 2020 targets. The commission's 2020 Energy Plan points out that hydropower, together with nuclear, could lose one third of their generation capacity by 2020 because of the limited life-time of these installations. Therefore, a replacement and expansion of the existing installations is needed. In addition the 2020 strategy highlights the importance of re-establishing Europe's leadership in energy storage, which includes the development of large hydro projects. Moreover, the European Infrastructure Package prioritises the connection of production capacities with pumped-storage facilities in the Alpine and Nordic region[22].

[22] See more about the infrastructure connections in 4th February 2011 Energy Council conclusions: http://europa.eu/rapid/pressReleasesAction.do?reference=DOC/11/1&format=HTML&aged=0&language=EN&guiLanguage=en