Quarterly Report on European Electricity Markets

Directorate-General for Energy

EUROPEAN COMMISSION

- MARKET OBSERVATORY FOR ENERGY

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EUROPEAN COMMISSION

Günther H. Oettinger

Dear readers,

After five consecutive quarters of recession, the EU economy started to grow again in the beginning of 2010. This, together with competitive prices of input fuels and colder than normal weather conditions, prompted a robust rise of electricity consumption.

Wholesale markets also reacted vigorously in Q1 2010 by significantly increasing the traded volumes, both on the day-ahead and financial parts of the market. As a whole, European wholesale prices remained on competitive levels throughout the first quarter, further enhancing the prospects for economic growth. Market participants were reacting to emerging price differentials across regions by setting the direction and the volumes of cross border flows.

Northern Europe was the only region that did not experience moderate prices during the first quarter of 2010. The joint effect of colder than normal weather, low hydro reserves, off grid nuclear reactors and capacity decrease on major transmission lines drove the market price to record levels. Generators form other European regions took the signal and provided essential cross border flows which helped system operators to keep the normal functioning of the grid.

As of this quarter, we will start reporting on a new price area in Central Europe. I am very glad to say welcome to Slovakia. We are also keen to monitor how renewable energy sources are integrating into the internal market. That is why we introduce biomass spreads on the German and Dutch wholesale market as a new feature of our reports.

Finally, we put a focus in this issue on the front end processes in the EU nuclear industry as uranium is one of the main primary energy sources of the European Union.

HIGHLIGHTS

- Robust increase of gross inland consumption and day-ahead turnover on the EU electricity platforms related to uplift of industrial demand and colder-than-normal meteorological conditions in Q1 2010. New legislation in Germany influenced positively traded volumes on the day-ahead.

- EU electricity regions were facing diverse conditions at the start of 2010.

- The Nordic region experienced unusually high prices related to the combination of low hydro reserves, 2 out of 4 nuclear reactors in maintenance, colder-than-normal weather conditions and capacity reduction of major transmission lines. Export from European regions was essential to keep the normal operation of the Nordic region. The region benefited from strong increase of inflows helping to alleviate the tight grid margins and to balance generation and load.

- Elsewhere, wholesale prices were lower than those observed in the same quarter of 2009. Electricity systems were well supplied and prices of energy commodities serving as input to power generation were competitive.

- Retail prices for households and industrial customers showed moderate movements in most of the Member States compared to the first semester of 2009.

- Front-end part of the nuclear industry featured in the focus on topic

NEW FEATURES IN THIS REPORT

- Introduction of the Slovak price area in OTE / Power exchange Central Europe.

- Introduction of biomass spreads for the Dutch and the German wholesale markets. Data indicating that electricity generated from biomass units needs support (feed-in tariff) to face current market conditions.

- Introduction of nuclear plant availability for the French wholesale market.

Market Observatory for Energy

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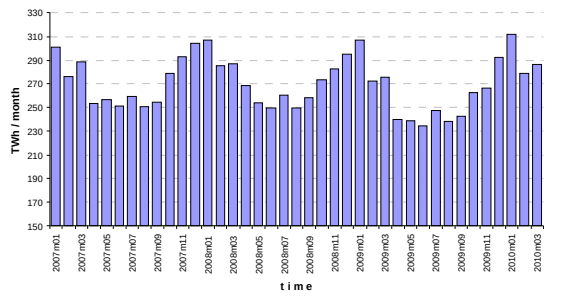
A. Recent developments in the electricity markets across Europe

The beginning of 2010 was marked by high levels of electricity consumption across the EU. In Q1 2010 all major regions registered a rise in electricity demand. On a yearly basis, the increase varied from 0.6% in the British Isles to 6.8% in the Nordic region.

As a result, Q1 2010 gross electricity consumption in the EU was 2.5% higher than in the same period of 2009. Almost 312 TWh of electricity was consumed in January 2010. One has to go back to 2006 to see levels of consumption above 310 TWh.



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

According to data from *Eurostat*, the year-on-year growth of consumption levels was accelerating for each month of Q1 2010:

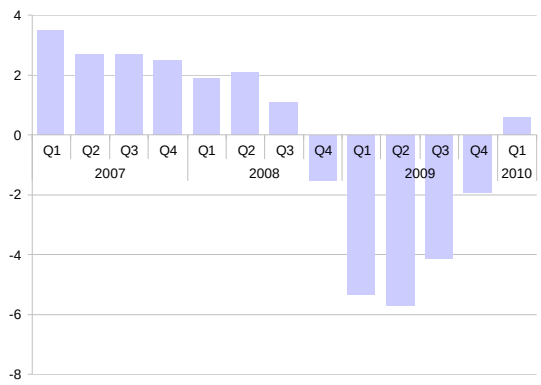
the corresponding values for January, February and March were respectively 1.6%, 2.1% and 3.9%.

This accelerating growth pattern was common for most of the different regions of the EU with the exception of the British Isles, the Baltic and the Nordic regions.

Among the factors that influenced the evolution of EU electricity consumption in the first quarter of 2010 were the state of the economy, the meteorological conditions and the modest levels of wholesale prices for electricity.

After five consecutive quarters of decrease, the EU started to register positive growth rates as more and more Member States came out of recession. Compared to the same quarter of the previous year, EU GDP rose by 0.7% in Q1 2010.

EU 27 GDP volumes *
% change Q/Q-4



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.*

More than half of that growth could be attributed to the industrial and energy sectors for which gross value added increased by 3.5% in Q1 2010 on a yearly basis[1].

Electricity consumption recovered along with the rise of industrial production and economic activity. In addition, residential electricity demand for heating was also very strong in Q1 2010 as the European continent experienced an unusually cold winter period[2].

According to the *Eurostat/JRC* data, there were on average about 36 heating degree days (HDD)[3] more in each month of Q1 2010 than in the same period of 2009.

In January 2010 alone, there were about 70 HDDs more than a year ago.

[1] By comparison, the growth of the gross value added in construction was -5.6%, in agriculture it was -0.6%, in financial services and business activities it was 0.1% and in trade, transport and communication services it was 0.3%. *Source : Eurostat news release euroindicators 101/2010, table 5.*

[2] The few notable exceptions were Cyprus, Malta and Greece where the January – March weather was milder than a year ago and Estonia, Poland, Austria and Slovenia, where average temperatures in Q1 2010 were similar to the ones observed in Q1 2009.

[3] 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.

EU 27 Heating Degree Days in Q1
Values for 2008, 2009, 2010 and 1980 – 2004 average

	January	February	March
2008	466,43	403,96	401,61
2009	555,66	476,36	406,00
2010	624,23	499,45	421,50
LT avg.	545,97	471,03	412,40

Source : Eurostat / JRC

Q1 2010 was not only colder than the same quarters of 2008 and 2009, the EU temperatures in that period were well below the 25 year average calculated by *Eurostat / JRC*.

A.1 Wholesale markets

As global oil demand continued to recover throughout Q1 2010, the prices of the main crude benchmarks kept on moving up in line with a trend that started at the end of 2008.

That movement was amplified by the depreciation of the Euro against the major currencies. For example, the US Dollar/Euro exchange rate went from 1.43 in January 2010 to 1.36 in March 2010.

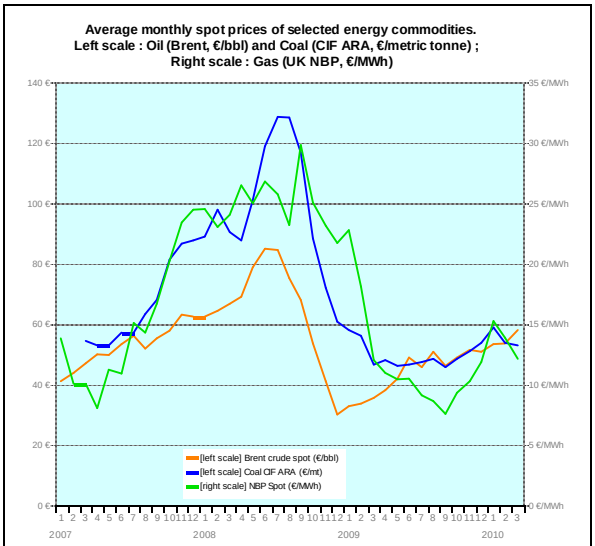
As a result, while Brent (measured in Dollars) registered a 3.5% increase in the first three months of 2010, European refiners were experiencing an increase of 9% of their crude oil bills.

As in previous quarters, coal and natural gas prices moved in different directions to Brent crude prices.

Whereas the monthly coal price CIF ARA[4] registered a 15 % increase from March 2009 to March 2010, in Q1 2010 alone it fell by 10%. Measured in US Dollars, this amounted to a 14% fall, from $ 84.4 / Mt in January 2010 to $ 72.4 / Mt in March 2010.

The fall in the spot price of natural gas on the National Balancing Point in UK was even more significant. From January to March 2010 prices lost about a fifth of their value, in line with the well known seasonal pattern of gas consumption.

Monthly prices in Q1 2010 were on average 21% cheaper than the corresponding periods of 2009.



Source : Platts.

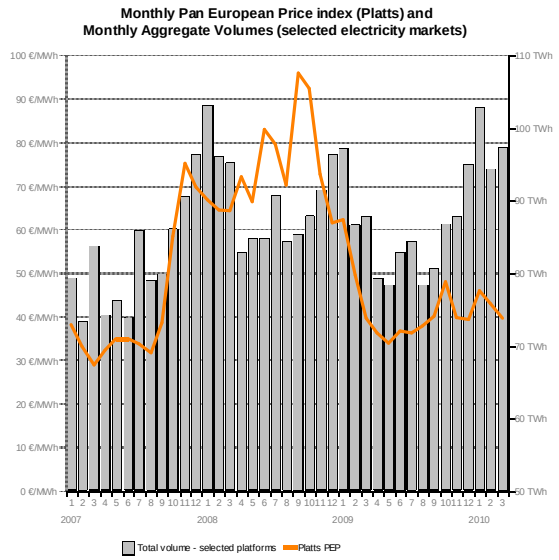
Well supplied coal and gas markets remained a stabilizing factor in the development of wholesale electricity prices throughout Q1 2010. In turn, this strengthened further the industrial demand for energy in the EU.

[4] 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

Monthly turnover of the spot segment of wholesale markets in selected countries[5] remained very robust throughout Q1 2010.



Source : Platts (price index) and selected European electricity wholesale markets (volumes). The selected markets are :

Nordpool Spot A.S ;
European Power Exchange (EPEX spot) ;
Amsterdam Power Exchange (APX Power NL) ;
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) ;
APX Power UK ;
Operatul Pietei de Energie Electrica din Romania (OPCOM) ;

Hellenic Transmission System Operator

For the first time since 2008, the turnover crossed the 100 TWh / month mark in January 2010. Day-ahead traded volumes in January-March 2010 were surpassing those for the same periods a year ago.

In Q1 2010 the growth rate of recorded volumes was accelerating. For example, year-on-year, the growth in the spot turnover for the months of January, February and March was 5.8%, 8.9% and 11% respectively. This development was similar to that observed in EU gross electricity consumption. However, the scale of increase of wholesale volumes was much bigger, implying that industrial demand for electricity has started to recover.

Day-ahead electricity prices remained in the range observed in Q4 2009, with the monthly average *Platts Pan-European price index* fluctuating between € 39 / MWh and € 46 / MWh. Compared to the same quarter of the previous year, prices were about 15% cheaper, benefiting most likely from competitive prices of energy commodities serving as inputs to power generation.

It should be noted however that the global EU price levels masked very contrasting price developments across, and even within, the various electricity regions of the EU.

As will be highlighted later in this report, most of these divergences were prompted by specific grid conditions and the availability of renewable energy sources.

As a general rule, wholesale markets reacted as expected, with growing price differentials indicating the increasing value of securing a cross border flow in the right direction.

[5] 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), Finland (FI), France (FR), Germany (DE), Greece (GR), Italy (IT), the Netherlands (NL), Poland (PL), Portugal (PT), Romania (RO), Slovakia (SK), Spain (ES), Sweden (SE), the United Kingdom (UK) and Norway (NO).

Regional markets

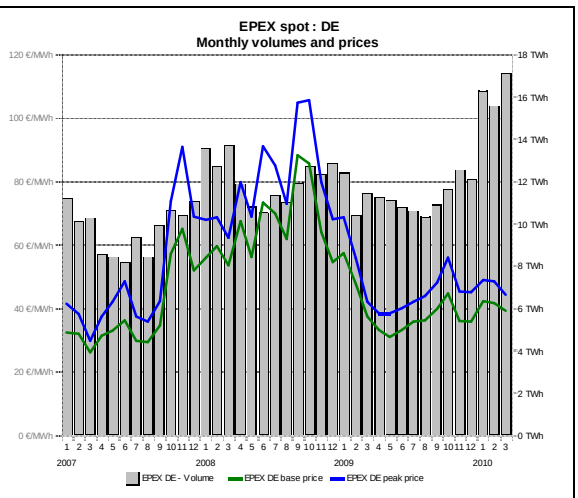
Central Western Europe

Germany

The first quarter of 2010 was marked by a significant growth of traded volumes on the German spot market.

In January 2010, a total of 16.3 TWh of energy was exchanged on the day-ahead segment of EPEX spot in the German/Austrian price area, about 29% of the combined German and Austrian gross electricity consumption. Compared to the turnover of the month before, this represents an increase of 4 TWh.

Market participants continued to exchange actively in the remaining months of Q1. As a result, the traded volume reached almost 50 TWh, a 43% rise from the same quarter of 2009.



Source : Platts.

One of the reasons of the increased market activity in Germany may be the introduction of a new law[6] obliging transmission system operators to market renewable energy on the spot market from 2010 on.

The average monthly prices remained in the € 39 – 42 / MWh range for the base and € 44 – 49 / MWh for the peak, representing a 14% decrease from the levels recorded in Q1 2009.

This development seems to suggest that the growing amount of intermittent renewable power did not necessarily bring increased levels of volatility in Q1 2010 except for a couple of hours in early January and March when prices turned negative.

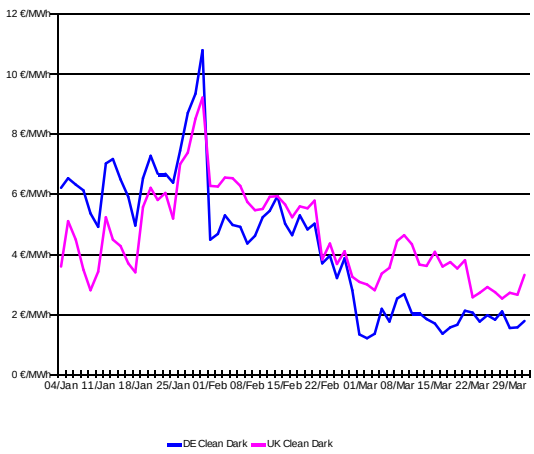
Weather conditions were another factor influencing the day-ahead price. Judging by *Eurostat / JRC* data, temperature levels in Q1 2010 were comparable to those of Q1 2009, both years being colder than the 25 year average, especially for the month of January. As the grid was well supplied for most of the first quarter of 2010, generators were able to meet increased demand from the residential sector without big difficulties.

Barring few exceptions in the last days of January, when output from wind generators was low, the German **clean dark spreads**[7] continued the downward

[6] *Erneuerbare Energien Gesetz* (EEG)

[7] Dark spreads are reported as indicative prices giving the average difference between the cost of coal delivered ex-ship and the power price. As such, they do not include operation, maintenance or transport costs. Spreads are defined for a coal-fired plant with 35 % efficiency.
Dark spreads are given 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.

movement started in Q4 2009. From January to March 2010 the spreads lost more than € 4 / MWh, reaching levels below € 2 / MWh.

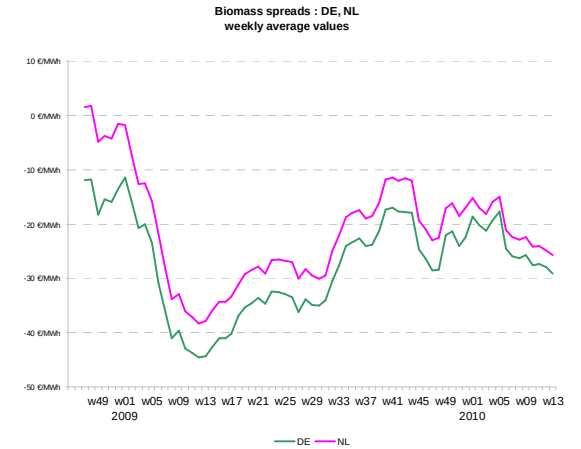


UK values are quoted in € using the €/£ daily exchange rate as reported by Platts

Source : Platts.

It seems that market conditions in Q1 2010 were not appropriate for selling power generated from pellets and wood waste. As shown in the next graph, **biomass spreads**[8] remained firmly negative.

From January to March 2010, the average weekly variable costs were in the range of € 75 – € 77 / MWh whereas the combined price of power and emission allowance went from € 56.7 / MWh to € 48.4 / MWh. As a result, the spread slid deeper into negative territory reaching almost – € 26 / MWh by the end of March 2010.



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

The level of spreads could be considered as an indication of the minimum[9] level of support measures which could prompt biomass producers to enter the wholesale market.

For example, based on a parliamentary decision[10] from the German *Bundestag*, a 10 MW biomass plant, running for the baseload in 80 % of the hours of the year, should benefit from a feed-in tariff of € 81.82 / MWh in 2010.

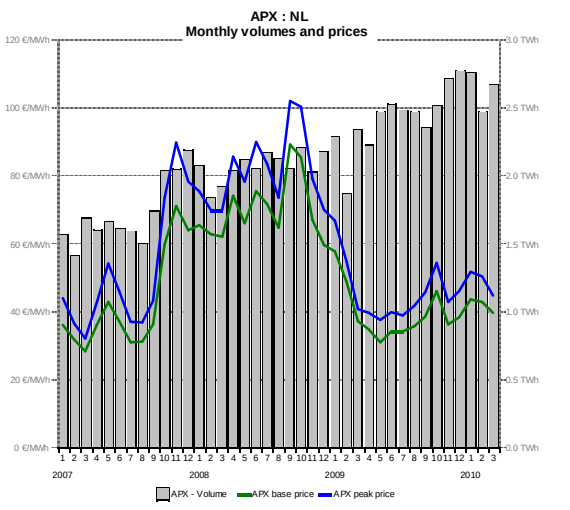
[8] Biomass spreads are indicative values giving the average difference between (1) the combined price of electricity and carbon emission on the corresponding day-ahead market and (2) the price of industrial wood pellets (delivered month-ahead ex-ship at Rotterdam).
Biomass spreads do not include operation 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*.

[9] The reason is that the above-mentioned variable costs exclude costs related to operation and maintenance.

[10] http://www.erneuerbare-energien.de/files/pdfs/allgemein/application/pdf/eeg_verguetungsregelungen_en.pdf

The Netherlands

Turnover on the Dutch day-ahead market remained robust throughout Q1 2010. Traded volume increased by more than a fifth from the levels registered in the same quarter of 2009. January volume was 2.76 TWh, about 26% of the Dutch gross electricity consumption in that month.

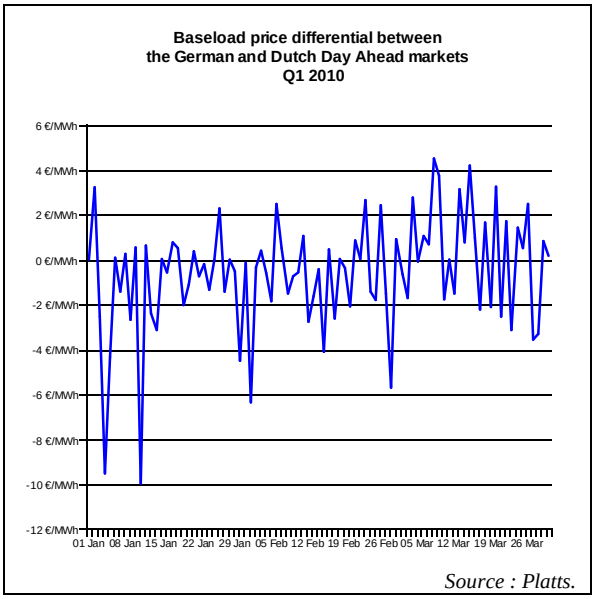


Source : Platts.

As in Germany, the average monthly prices for base and peakload in the Netherlands were around € 40 and € 47 / MWh respectively.

The German and Dutch contracts were following similar direction in Q1 2010. Barring few exceptions at the beginning of January, prices usually remained in the € 2 /MWh range.

During the observed period grid margins in the Netherlands were on normal levels most of the time. In the beginning of February cross-border capacity in the Netherlands was affected by an ongoing outage on the NorNed interconnector.



Source : Platts.

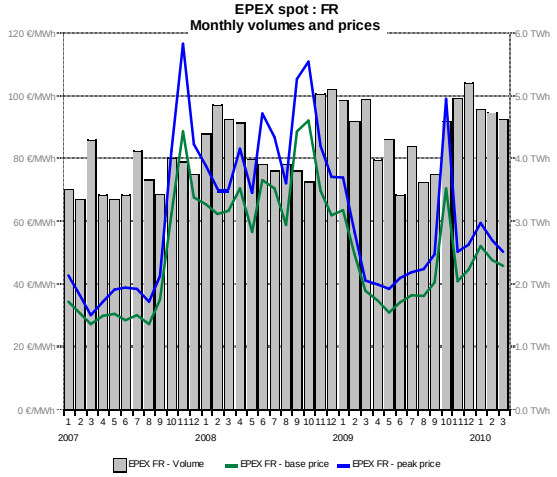
Wind levels and residential demand for heating were among the factors affecting the transactions on the day-ahead. When both were moving in the same direction, wholesale prices were experiencing big upward or downward shifts.

For example, the MWh was traded at € 0.01 for a couple of hours in January and March when wind output from the North Sea was high and the load was reduced.

This development was similar to the one observed in Germany.

France

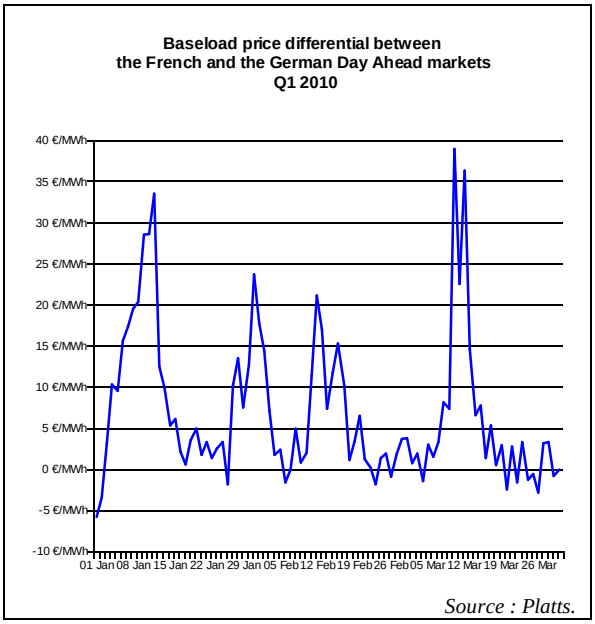
Following the turbulent events experienced in the fourth quarter of 2009, the wholesale prices in the French area of EPEX spot stabilized in the € 45 – 52 / MWh range for the baseload and € 50 – 59 / MWh for the peakload in Q1 2010. Compared to the levels of the same quarter of 2009, this represents a 10% decrease.



Source : Platts.

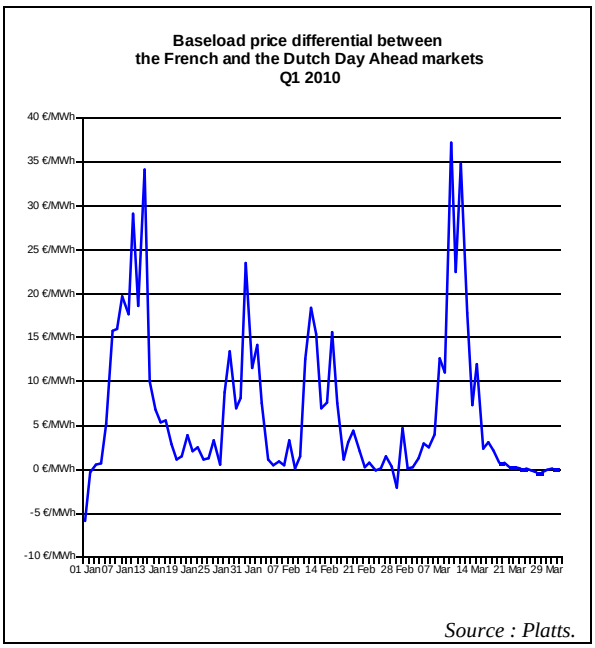
Total traded volume on the French day-ahead was 14.1 TWh in Q1 2010, a 2.2% decrease from the same quarter of 2009. The turnover covered only 8 % of the French gross electricity consumption.

Monthly average prices in January 2010 were still € 10 / MWh higher than those observed elsewhere in the Central West region of EU. While French prices were slowly getting in line with prices of neighbouring areas, the average difference stood at € 5 / MWh by the end of March 2010.



Source : Platts.

Tight grid conditions were among the factors keeping the French day-ahead prices at a premium with respect to the corresponding prices in the UK, Belgium, Germany and Spain.

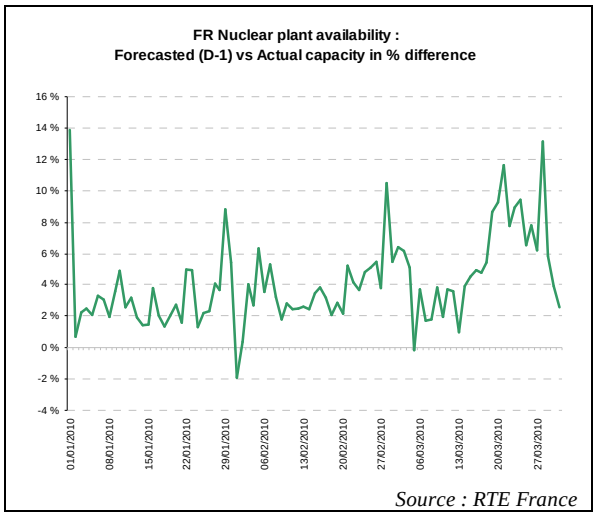


Source : Platts.

Household demand was strong, especially in January 2010 when temperature was

colder than normal[11]. Later in the quarter, temperatures returned to levels closer to the corresponding 25 year average.

The average available nuclear capacity was about 52 GW in Q1 2010, less than 60 % of the total capacity as some of the nuclear plants were in maintenance.

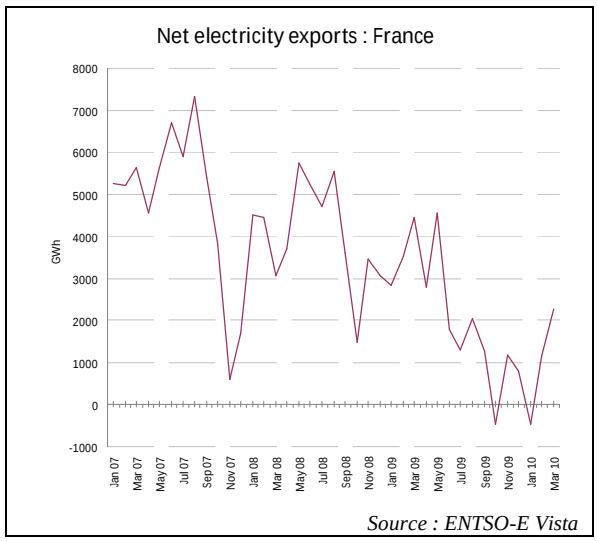


Source : RTE France

Data from the French TSO shows that by the end of the observed period, forecasted nuclear capacity was larger than the available capacity. This result, together with the falling prices, implies that the load may have been overestimated.

The data on load and nuclear availability seem to explain well the net export position of France during Q1 2010.

In January, when almost 60 TWh were consumed, France had to import electricity. In the following months, as consumption was reduced by more than 8 TWh, France became a net exporter.



Source : ENTSO-E Vista

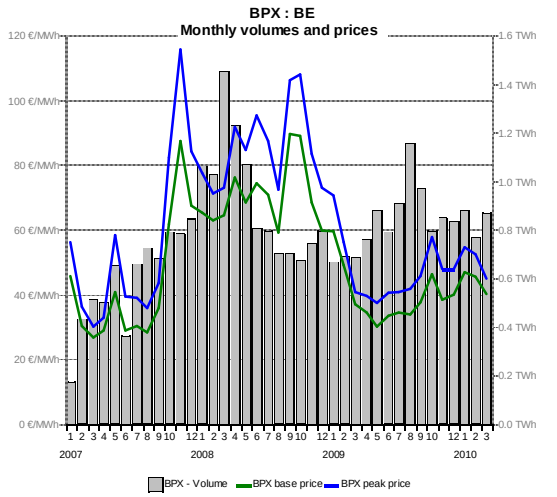
On the other hand, the rate of decrease of nuclear availability was smaller that that of gross consumption[12]. As a result, more power could be allocated to exports.

[11] In January 2010, there were 77 HDD more, than the corresponding 25 year average, implying that the average French temperature was about 15% lower than usual.

[12] The average capacity of nuclear power available in France in January and March 2010 was respectively 54.1, and 48.2 GW (a decrease of 7%). The corresponding figures for electricity consumption were 59.5, and 51.1 TWh (a decrease of 13%).

Belgium

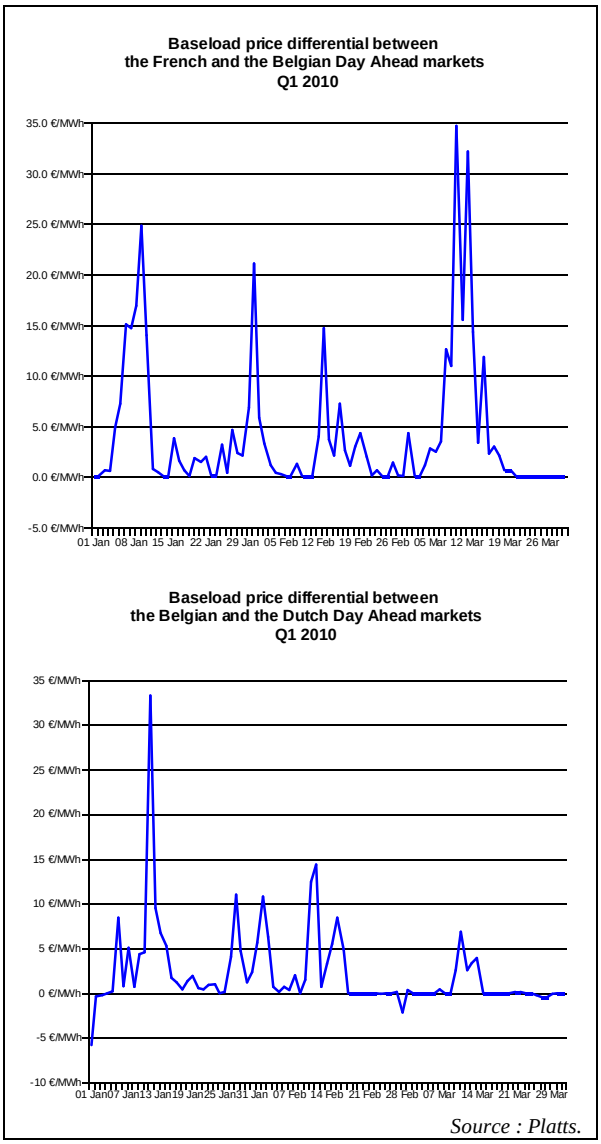
Market participants negotiated 2.52 TWh of energy on the day-ahead segment of Belpex, the Belgian power exchange, during the first quarter of 2010. The amount represented approximately 10 % of the Belgian consumption of electricity during that period. Compared to the same quarter of 2009, the Q1 2010 turnover was 23% bigger. The exchanged volumes were however way below those negotiated at the beginning of 2008 and in August 2009.



Source : Platts.

Belgian wholesale prices lost about 15% of their value during the first quarter of 2010. Compared to the respective periods of the previous year however, January and February average baseload and peakload prices were cheaper[13], whereas the respective March prices were more expensive.

In a development which was similar to that observed in France, several hourly prices crossed the € 100 / MWh barrier in January and February. For example, the day-ahead price of the hourly interval 09:00 – 09:59 for 12.01.2010 was negotiated € 195.56 / MWh and more than 2 GWh were exchanged in that interval. In that day prices remained above € 100 / MWh between 07:00 and 12:59. There was a similar episode on 12.02.2010.



Source : Platts.

Belgian spot contracts were traded at a discount to the French, the discount reaching on some occasions € 35 / MWh. As a conseuence the major flows were in the direction from Belgium to France. According to data from ENTSO – Vista, the flows from France to Belgium

[13] The prices were lower by 21% and 7.5% for the baseload and by 23% and 7% for the peakload.

amounted to 119.4 GWh in Q1 2010. For the same period, a total of 1 774.3 GWh was transported in the opposite direction.

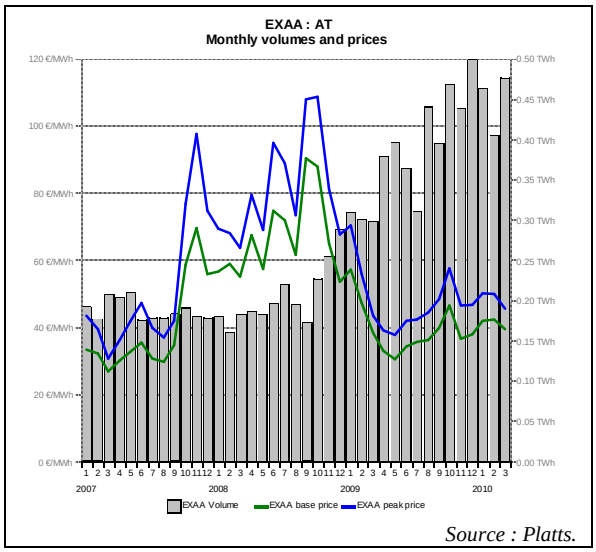
During the observed period the Belgian prices were traded on average at a € 2.2 / MWh premium to the corresponding Dutch prices. However, there were periods with high wind input when the discount widened to € 33.25 / MWh.

Austria

The day-ahead turnover of EXAA, the Austrian power exchange based in Vienna, rose from 2.45 TWh in 2008 to 4.61 TWh in 2009.

This development continued in the first quarter of 2010. Recorded trade volumes reached 1.35 TWh, almost doubling the levels of Q1 2009.

The new German law on renewable energy (see footnote 6 on p. 5 of the current report), may have affected the liquidity on the day-ahead segment of EXAA.



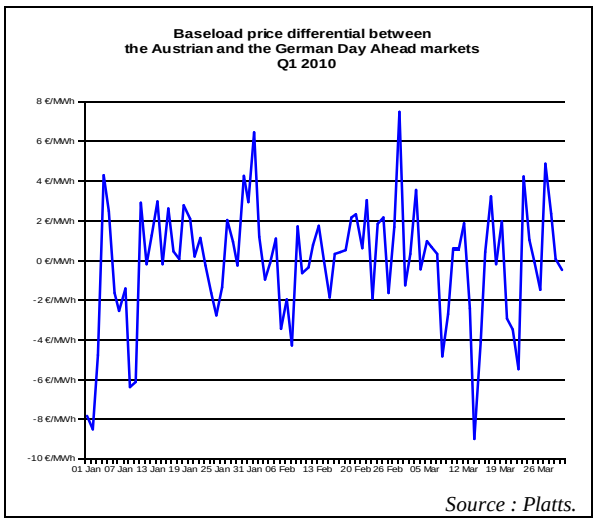
Source : Platts.

The EEG was introduced at the start of 2009, fixing the feed-in tariffs and obliging German TSOs to buy all power coming from renewable sources. By 2010 it also obliged these TSOs to market all renewable energy via the power exchange.

It seems that, starting from 2009, a number of market players chose to increase their trading activity on EXAA. By negotiating transactions on the Vienna platform, rather than the German / Austrian price area of the Paris based EPEX spot, these participants were expecting to hedge positions against price volatility due to an increase of power coming from intermittent sources such as wind.

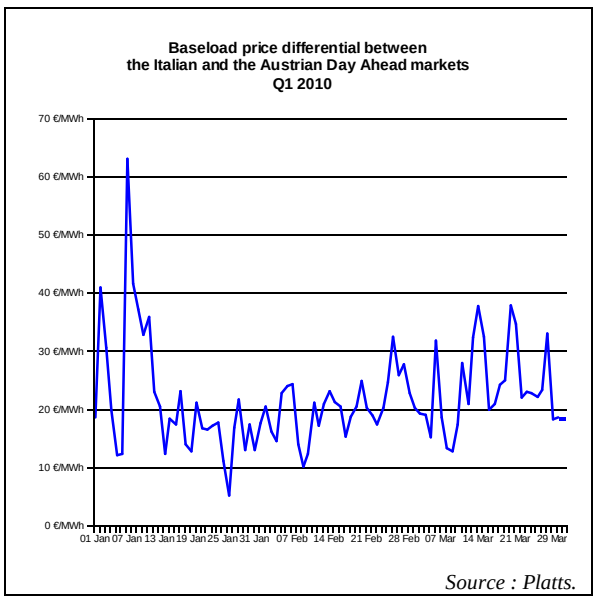
Another reason for the increase of trading activity may be that the prices of the Vienna exchange are considered closer to OTC prices for the German and Austrian areas and the fact that EXAA closes earlier at 10:15 CET whereas EPEX spot closes at 12:00 CET.

In Q1 2010 wholesale prices of EXAA and the German / Austrian area of EPEX spot were moving in the same direction. The Austrian contract was traded on average at a small discount, but the price differential was regularly switching from positive to negative and vice versa.



Source : Platts.

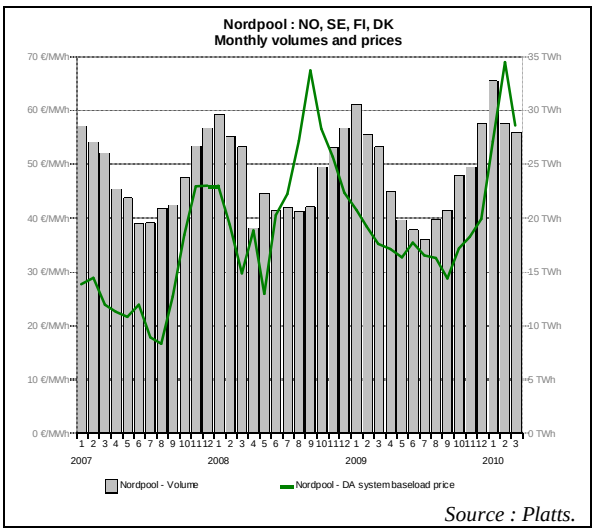
As usual, the Austrian day-ahead baseload contract was traded at a significant discount to the Italian benchmark, the discount being mostly in the € 10 – 30 / MWh range but there were days when the difference crossed the € 60 / MWh mark.



Source : Platts.

Northern Europe

From January to March 2010, the Nordic region experienced one of the most difficult trading periods in its recent history. A number of factors combined to place the region among of the highest price areas across Europe whereas in normal periods the region enjoys one of the lowest prices.



Source : Platts.

Traded volume on the day-ahead segment of Nordpool reached 32.8 TWh in January 2010, an all-time high, 7% bigger than the previous record turnover registered in January 2009. Total turnover on the spot was about 75 % of the gross electricity consumption in the Nordic area in Q1 2010, reconfirming the position of Nordpool as the most liquid marketplace in Europe.

From December 2009 to January 2010, the average monthly system price appreciated by € 14 / MWh. On Jan. 7th and Jan 8th the system price crossed the € 100 / MWh mark during peakload hours. On Jan 7th prices went as high as € 235 / MWh. On

the next day the hourly prices reached € 730 / MWh for the period 08:00 – 10:59 and stayed above € 200 / MWh until 19:59. During the peakload period of the selected days, a total of 1.2 TWh of energy was exchanged between trading parties. By that time, Statnett, the Norwegian TSO, announced it would hold an urgent investigation into the price spikes.

In February 2010, new € 14 / MWh were added to the average monthly system price, which almost reached € 70 / MWh. As a result, the year-on-year change for February 2010 was an impressive 80%. February became the month with the highest system price in Nordpool ever.

These high levels were prompted by events occurring in the 6-day interval starting from Feb 21st until Feb 26th when the system price remained well above the € 100 / MWh mark for extensive hours. The all-time high price for the Nordic region was marked on Feb 22nd between 11:00 and 11:59 when the benchmark reached € 1 027.4 / MWh. 49.4 GWh of energy was exchanged at that time. The price remained above € 1 000 / MWh for three hours.

While the system price remained on high levels for the rest of Q1 2010, no such periods were recorded in March 2010.

The high prices on the Nordic day-ahead result from the combination of at least four different factors.

During the first quarter of 2010 the Nordic region experienced colder than normal meteorological conditions. The next table gives a measure of the severity of the weather by using the 25 year average as the reference point. Results are similar if some combination of temperature conditions during the first quarters of the last three years is used instead.

Prompted by such conditions, residential demand for heating increased significantly. The Nordic region consumed a total of 44.1 TWh of electricity during the month of January 2010, improving by more than 1 TWh the previous highest result in January 2006.

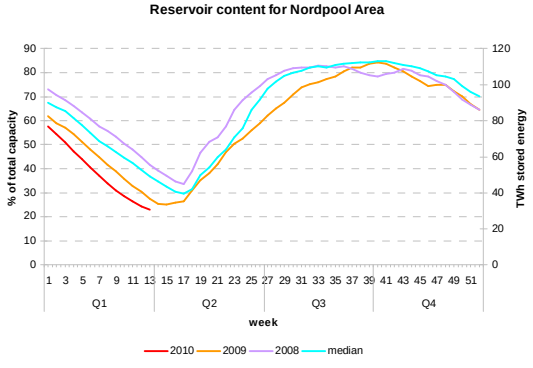
Heating Degree Days above the LT average
Actual number and (*%*)
Nordic region, 2010 Q1

	DK	FI	SE	NO
January	127 (*19*)	137 (*13*)	114 (*13*)	95 (*11*)
February	87 (*15*)	69 (*8*)	117 (*14*)	104 (*13*)
March	2 (*0*)	31 (*4*)	26 (*4*)	19 (*3*)

Source : Eurostat / JRC

Consumption levels remained very robust throughout Q1 2010.

The weather in the Nordic region was not only cold – it was dry as well. Hydro reserves were roughly 15% below their normal levels, implying that throughout Q1 2010 generators disposed on average with 15 – 20 TWh/week less of stored energy.



Source : Nordpool

On top of that, two of the four nuclear reactors in Sweden were off grid during extensive periods of Q1 2010, including those with very high wholesale prices.

Finally, by the end of 2009 Statnett had to introduce capacity reduction on a 420 kV tie line in a main transmission corridor until new investments across the Oslo-fjord takes place[14]. The earlier capacity of the transmission corridor (Flesaker-corridor) was 3100 MW. Due to the thermal capacity reduction of the line, the Flesaker-corridor has now a capacity of about 2000 MW.

This reduction had repercussions not only on the internal dispatching in Norway but also on the cross border flows with Sweden under specific gird conditions.

The joint effect of cold, dry weather, very tight grid margins and reduced transmission capacity, was the emergence of bottlenecks in the Nordic network. Some of the most difficult operational situations arose in Norway on Jan 7th and Jan 8th, within the Southern price area (East – West direction) as well as between the Southern and Middle Norway (South – North direction).

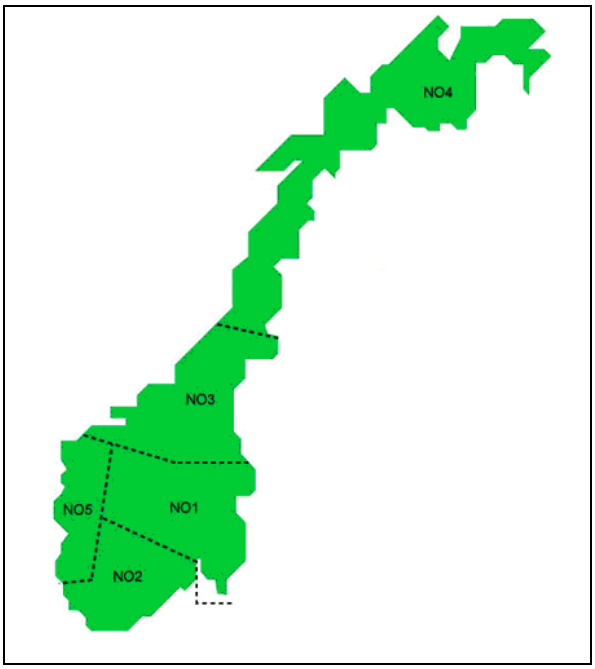
The Norwegian TSO reacted first by splitting the Norway South area into two new areas; Norway South East and Norway South West. The setting up of two new areas on Jan 12th was done to reduce bottlenecks and to optimize the exploitation of the grid.

[14] Nordpool exchange information note No 104/2009, http://www.nordpoolspot.com/en/Market_Information/Exchange-information/No-1042009-New-bidding-area-for-ElspotElbas-valid-from-Monday-11-January-2010-/

On Feb 23rd, as prices soared to all-time highs, the Norwegian TSO reacted by creating a fifth power zone in South Western Norway in an effort to avoid power outages and grid congestion.

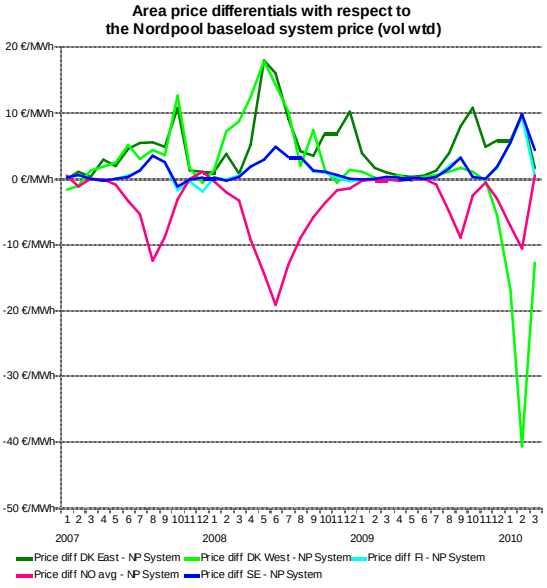
Two new zones came into operation on March 15th, Norway West – South West (WSW) and Norway South – South West (SSW), replacing the former Norway South West zone that lasted two months. According to Statnett, the power system in the WSW area was more vulnerable to long term failure and lack of rainfall than usual. The creation of a new zone, with higher prices based on increased consumption, would "push power" into the area.

The zonal split of Norway into different price areas as of the end of Q1 2010 is shown on the next graph.



The emergence of bottlenecks resulted in significant shifts of the relative positions of Nordpool areas.

For example, the Denmark West area, which is usually more expensive than the weighted system average, became the cheapest area in Q1 2010. In mid-February, the region benefited from increased imports from Germany due to high wind power output. Prices in the Denmark East area were co-moving with the other regions of Nordpool. The eastern area of Denmark is more interconnected with the Swedish system than the West. As such, it was more exposed to the tight conditions on the Swedish grid prevailing in Q1 2010.

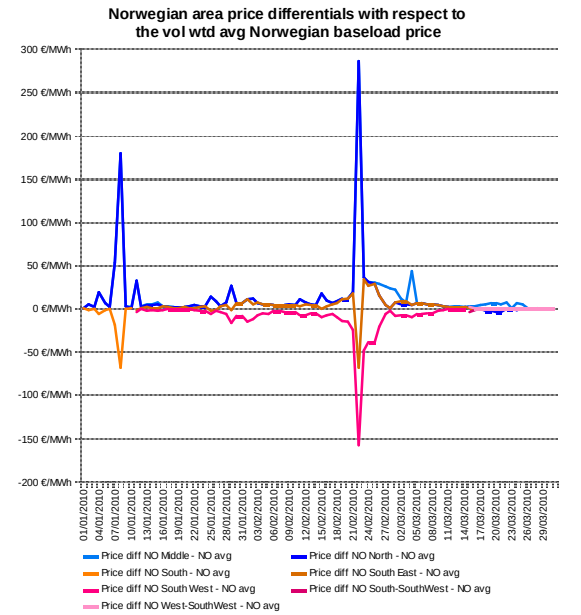


Source : Platts.

The bottlenecks in the South Western part of Norway created a spill over effect in a number of other Nordpool regions. The two episodes of peak prices were reproduced in the following areas: Norway Middle, Norway North, Sweden, Finland and Denmark East, where prices were above € 1000 / MWh during several hours on Jan 8th and Feb 22nd.

The South Eastern area of Norway remained well supplied. When prices in other regions went above € 1000 / MWh the hourly prices in that area were affected. They increased to above € 100 / MWh levels but not more.

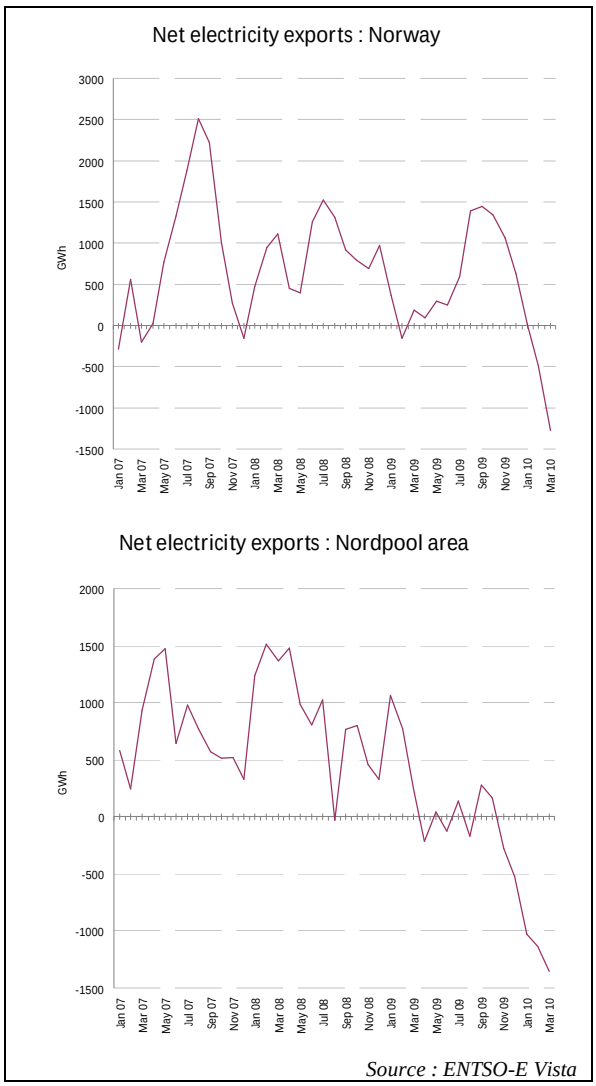
As mentioned earlier, tight supply conditions were not affecting Denmark West. On March 1st Western Danish prices were even negative for 3 hours.



Source : Platts.

Export from other European regions was essential to keep the normal operation of the Nordic system. In Q1 2010 there was an important change in the net balancing position of the region. As shown by data from ENTSO – Vista, the inflows into the Norwegian grid increased significantly during the first months of 2010.

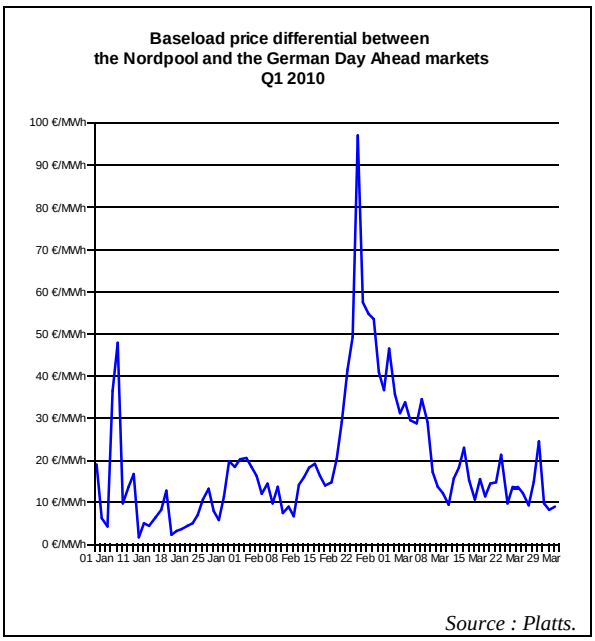
As a result, the Nordic region became a net importer of electricity.



Source : ENTSO-E Vista

Eurostat data also confirms that in Q1 Norway was importing more electricity than the corresponding Q1 amounts in 2008 and 2009.

As a result of all events that happened in the region, the average baseload premium of Nordpool with respect to Central Western Europe soared to € 18.8 / MWh in Q1 2010.

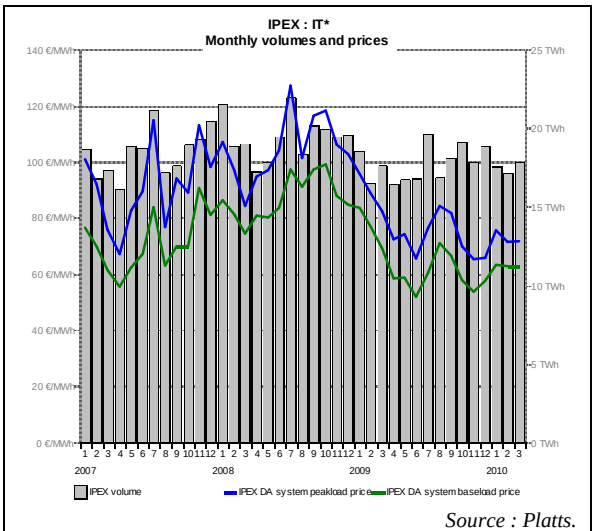


Source : Platts.

Apennine Peninsula

Italy

During the observed period, the average monthly Italian wholesale prices stabilized around € 62 / MWh for the baseload and € 73 / MWh for the peakload.



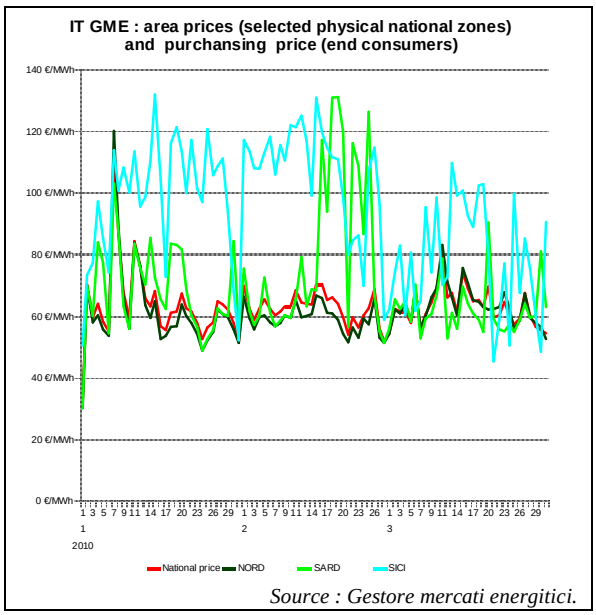
Source : Platts.

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

In the beginning of January grid conditions were tight, especially around noon and early evening hours when prices were regularly above € 100 / MWh. On Jan 7th during the entire peak period prices were above € 120 / MWh, reaching a local high for the 17:00 – 17:59 period.

Traded volumes were also stable, around 17.5 TWh / month, on levels which were roughly comparable to those observed in Q1 2009.

Turning into Italian areas, the most notable developments occurred once again in Sicily and Sardinia where daily prices were often beyond € 100 / MWh. The price differentials were indicative of persistent bottlenecks.

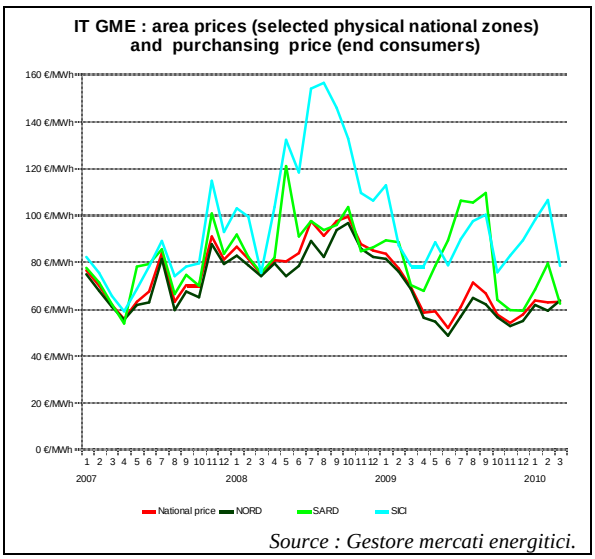


Source : Gestore mercati energitici.

For example, it seems that the existing interconnector between Corsica and Sardinia is yet to produce a major effect on prices in Sardinia. In March 2010 there were instances when the outflows from Corsica were priced at € 3000 / MWh with Sardinia prices being above € 100 / MWh.

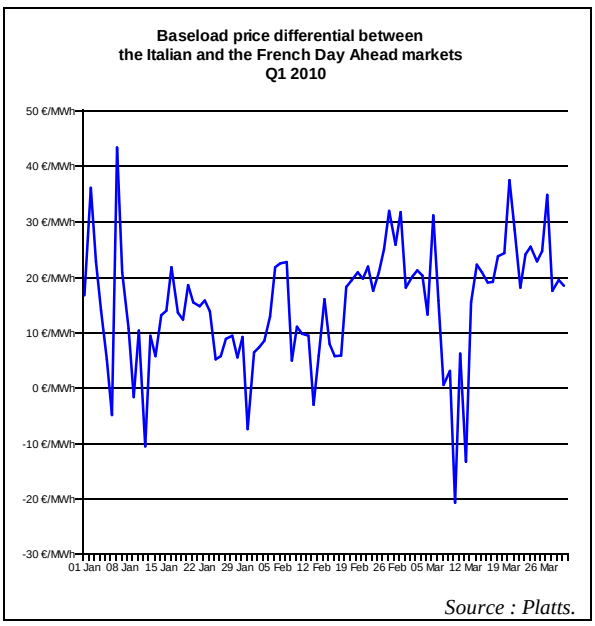
Several days later, the interconnector price was set at € 0 / MWh while the area price in Sardinia was still above € 100 / MWh.

Average monthly prices in Sicily seem to move away from the national system price since spring 2008.



Source : Gestore mercati energitici.

With respect to the neighbouring countries, the Italian benchmark was again traded at a premium of around € 10 / MWh.

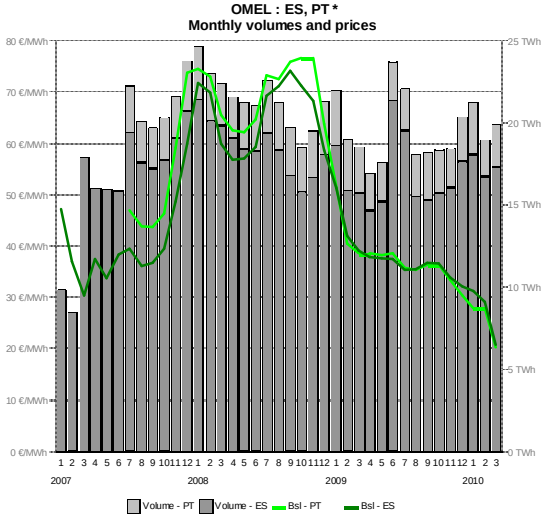


Source : Platts.

Iberian Peninsula

Spain and Portugal

The Iberian Peninsula was the region that experienced one of the lowest electricity wholesale prices in Q1 2010. The Spanish average monthly baseload price went from € 31 / MWh in January to € 20.5 / MWh in March, registering respectively 40% and 47% decrease from the same period of the year before. The situation in Portugal was similar.



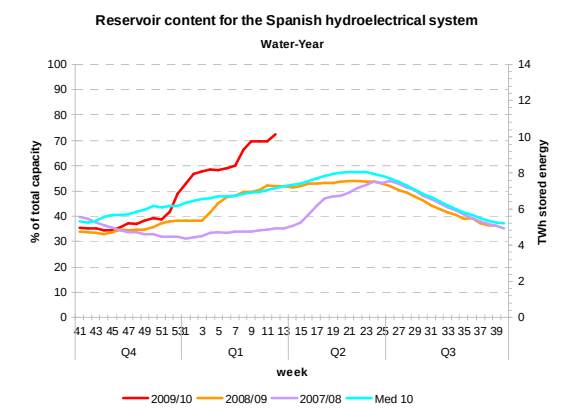
Source : Platts.
** Trade on Italian (IPEX) and Iberian (OMEL) electricity markets is incentivised by regulatory means.*

Despite the competitive prices, the traded volume on the day-ahead platform of OMEL, the Iberian electricity exchange, levelled around 20 TWh / month. One of the reasons explaining this may be the fact that in Q1 2010 Spain and Portugal were still in recession[15] and the industrial demand for electricity was still to recover fully.

Abundant renewable energy was among the factors driving down Iberian wholesale prices.

Contrary to other regions, the hydro reserves were way above the normal seasonal averages and wind output was performing at normal, even favourable conditions.

As a result, the system price was fixed at less than € 10 / MWh during long periods of the day. From the end of February until mid March the prices went down to € 0 / MWh for as much as 18 hours (Feb 28th).



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

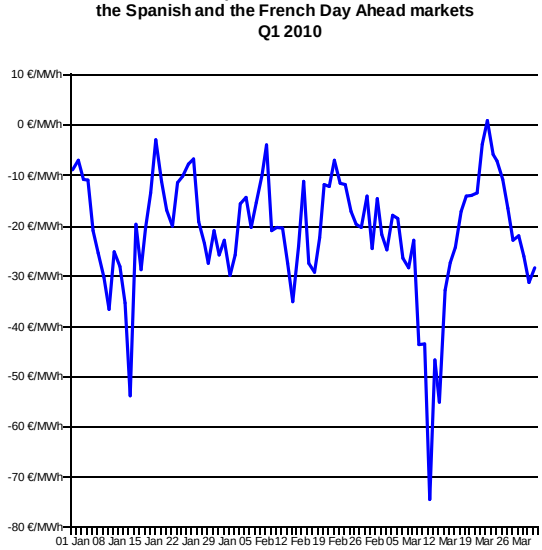
Not surprisingly, the Spanish contract was traded at a big discount to the French benchmark. On average, the discount was around € 22 / MWh but on some occasions (mid March) it crossed the € 70 / MWh barrier.

According to data from ENTSO –Vista, the Spain – France net balance of cross border flows in Q1 turned from negative to positive[16] in just 3 years, indicating that

[15] According to the Principal Economic Indicators of Eurostat, the year-on-year change of GDP for Q1 2010 in Spain and Portugal was respectively -1.2% and -0.9%.

[16] The Spanish – French net balance in the first quarter of 2008, 2009 and 2010 was -1.15, -0.08 and +1.02 TWh respectively.

market participants reacted in line with the emerging price differences.

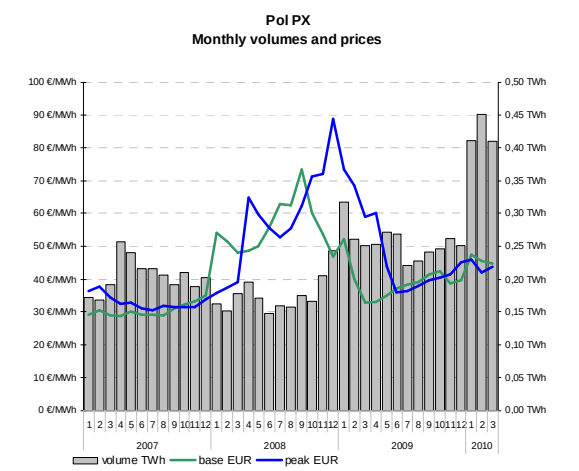


Source : Platts.

Central Eastern Europe

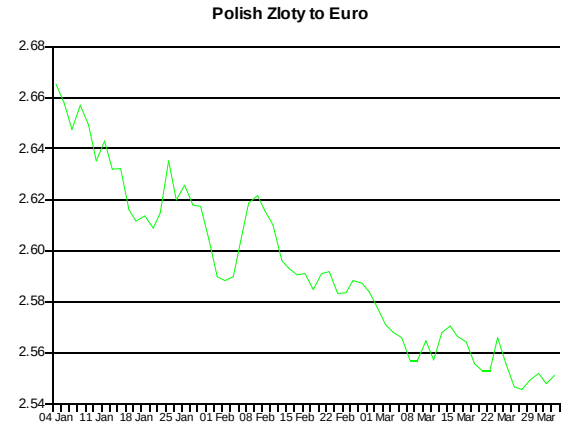
Poland

The monthly turnover on *TGE*, the Polish electricity exchange, almost doubled in Q1 2010 from the volumes registered a quarter ago. However, the record monthly volume of 0.45 TWh represented less than 3.5% of the gross consumption of electricity.



Source : Towarowa Gielda Energii S. A..

During the observed period, the Polish monthly average wholesale prices continued their upward movement and increased by 12% compared to the levels of Q4 2009.



Source : European Central Bank.

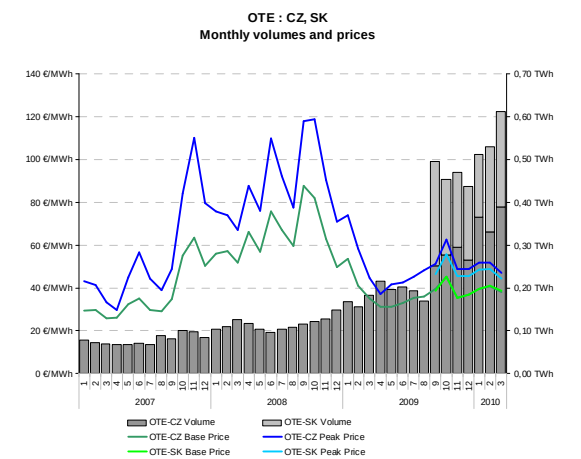
One of the reasons of this increase may be the appreciation of the Polish currency. From October 2009 to March 2010 the Zloty/Euro exchange rate went from 2.74 to 2.5, an appreciation of almost 9% in six months.

Source : Platts

The German – Polish baseload price differential swung in both directions during Q1 2010. On average, the Polish contract was traded at a small premium as wind output was making the German one more competitive.

Czech Republic and Slovakia

The traded volume on OTE, the Slovak and Czech day-ahead platform, continued to grow in Q1 2010. From January to March 2010, almost 1.1 TWh of Czech spot contracts were exchanged, more than doubling the corresponding volume from a year ago. In March 2010, the combined Slovak and Czech turnover reached 0.51 TWh, representing about 7 % of the gross electricity consumption of both countries.



Source : Operátor trhu s elektrinou, a.s.

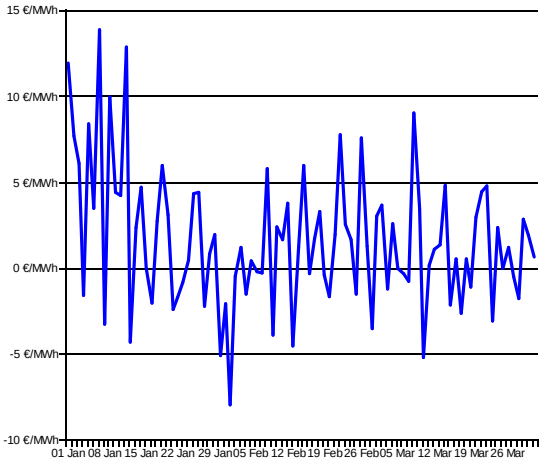
The Czech and Slovak baseload prices moved in line throughout the first quarter of 2010, with the monthly price for the Slovak benchmark trading at a € 0.20 / MWh premium on average. On the other hand, the Slovak peakload was about € 3 / MWh cheaper than its Czech counterpart.

As elsewhere in the Central Western European (CWE) region, the Czech day-ahead prices registerd a 10% decrease from Q1 2009 to Q1 2010.

At the start of 2010, the Czech and Slovak grids were operating in normal conditions as the system was well supplied and residental and industrial demand were on

levels comparable to those observed at the beginning of 2009

In Q1 2010, the Czech baseload contract was traded at an average discount of € 1.55 / MWh to the German benchmark. The spread was smaller in the last week of January and the beginning of February when output from wind generators in the Northern Sea was high.

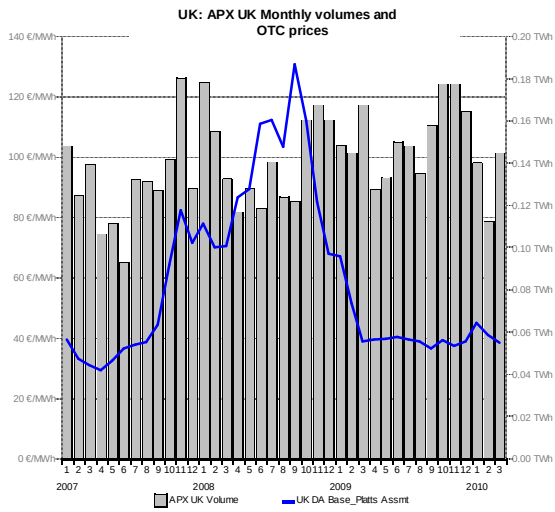


Source : Platts, Operátor trhu s elektrinou, a.s.

British Isles

UK

Despite colder than normal meteorological conditions[17] in the first quarter of 2010, the UK electricity grid was well supplied. Most of the power-generating units were on line and few outages were reported. As a result, the UK wholesale market for electricity remained stable. The day-ahead reference price continued to move in a range of € 37 – 40 / MWh that was set back in March 2009.



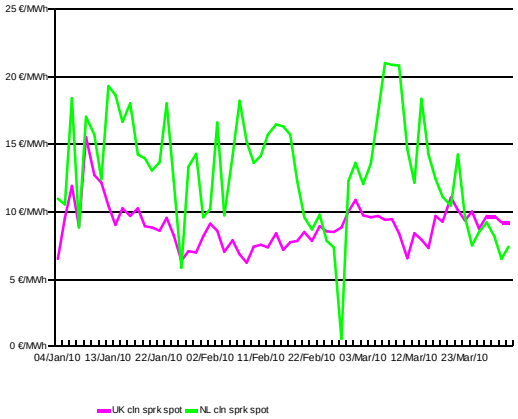
UK values are quoted in € using the €/£ daily exchange rate as reported by Platts.

Source : Platts.

The monthly average price for January 2010 was an exception, due to two gas balancing alerts from the National Grid as production problems in Norway provoked a brief reduction of gas flows.

[17] According to Eurostat – JRC data, there were 12 % more HDDs in January and February 2010 than a year ago. These two months had respectively 75 and 44 HDD more than the corresponding long term average values.

For a short period in the beginning of January the clean **spark spreads**[18] moved above € 15 / MWh.

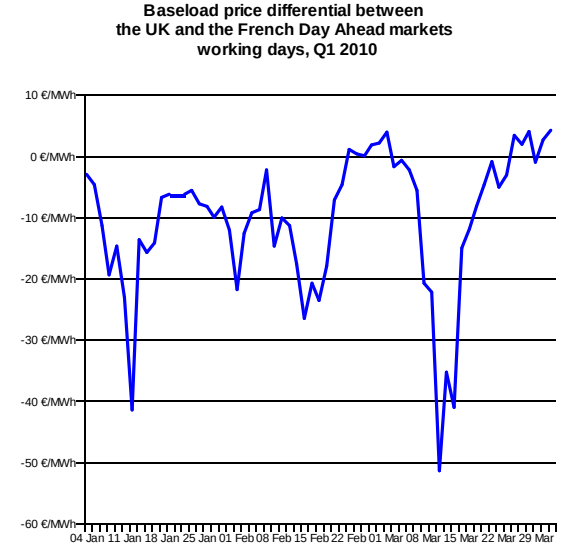


UK values are quoted in € using the €/£ daily exchange rate as reported by Platts

Source : Platts

The UK day-ahead contract continued to trade at a big discount to the French benchmark. In the first quarter of 2010 the discount averaged € 10.46 / MWh. On March 10th, a difference of € 51.37 / MWh was recorded between the French and UK baseload prices.

According to ENTSO – Vista data, the UK generators exported 2.27 TWh of energy in the first quarter of 2010.



Source : Platts

South Eastern Europe

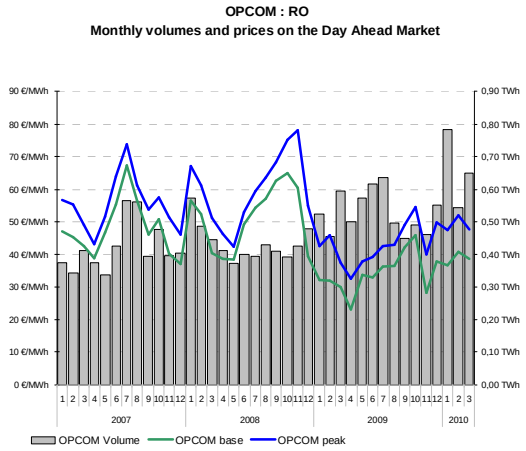
Romania

Liquidity on OPCOM, the Romanian wholesale market, continued to improve throughout the first quarter of 2010. The traded volumes registered 0.78 TWh of exchanged energy in January alone, almost a 25% increase from the previous record level.

The Q1 2010 day-ahead turnover represented 13 % of the gross electricity consumption in Romania where winter conditions were milder than those of a year ago and milder yet than the long-term average.

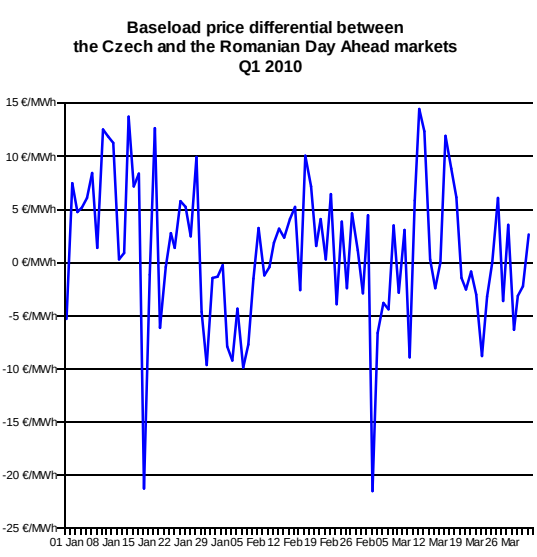
Compared to the same periods of 2009, the average monthly prices for electricity started to increase. The March 2010 base and peakload were about 28 % higher than a year ago.

[18] Spark spreads are indicative prices showing the average difference between the cost of gas delivered on the gas transmission system and the power price. As such, they do not include operation, maintenance or transport costs. The spark spreads are calculated for gas-fired plants with standard efficiencies of 50% and 60%. This report uses the 50% efficiency.
Spreads are quoted for the UK, German and Benelux markets.
Clean spark spreads are defined as the average difference between the cost of gas and emissions, and the equivalent price of electricity.



Source : S.C. OPCOM S.A.

As a result, the Romanian benchmark moved more in line with Central European prices. The next graph illustrates the Czech – Romanian price differential in Q1 2010.

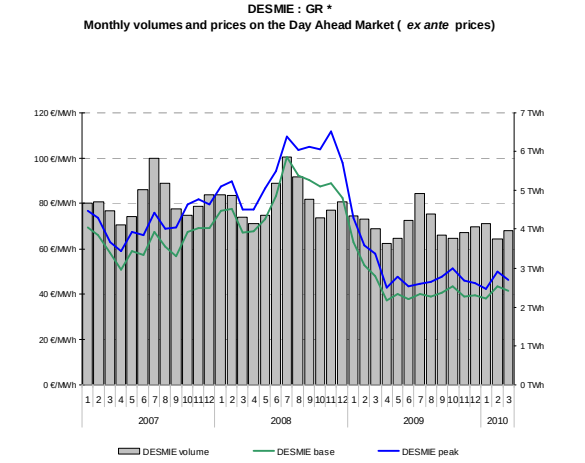


Source : Operátor trhu s elektrinou, a.s., OPCOM s. a.

On average, the Romanian baseload was traded on a € 0.9 / MWh discount but there were periods when the Czech day-ahead was much cheaper.

Greece

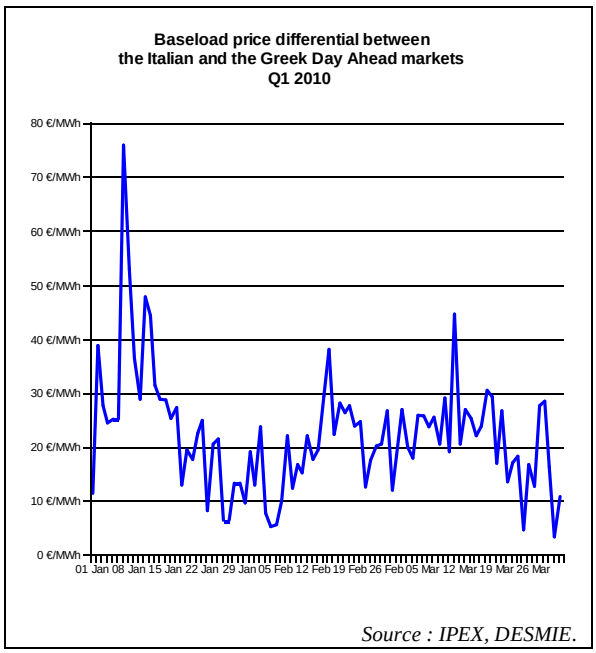
Milder-than-normal weather conditions in the first quarter of 2010 kept the Greek residential demand for heating on low levels. As the country remained in recession in Q1 2010, industrial demand for electricity was also down.



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

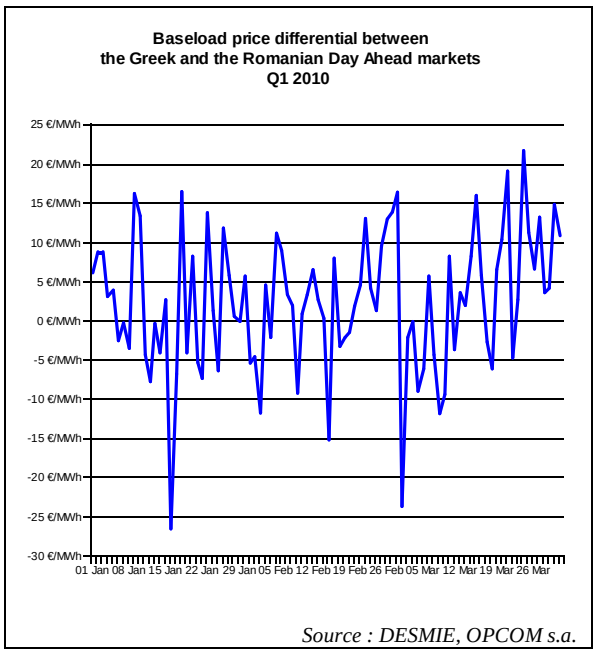
This development resulted in comfortable grid margins, keeping the day-ahead base and peak prices below their respective levels in Q1 2009.

For the observed period, approximately 760 GWh of energy was exported to Italy, the average price difference between the two markets was € 22.15 / MWh.



Source : IPEX, DESMIE.

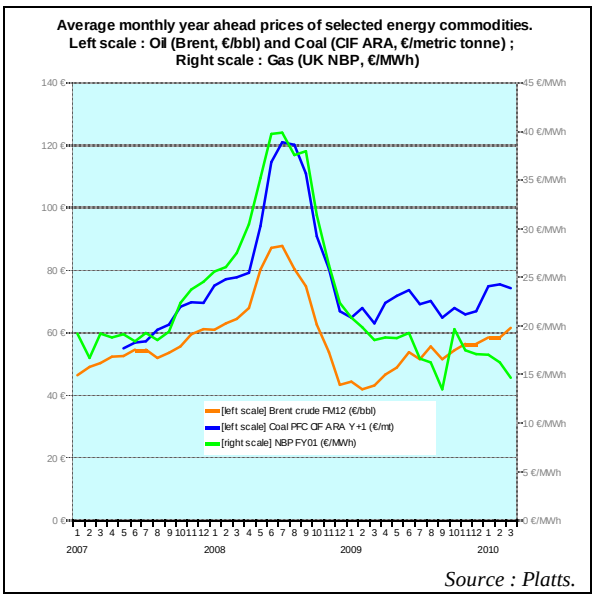
The Q1 2010 average baseload price differential between Greece and Romania was € 2.14 / MWh but it experienced large daily swings, the Romanian discount varying from € 21 to -26 / MWh



Source : DESMIE, OPCOM s.a.

A.1.2 Forward markets

Forward prices of European benchmark energy commodities followed different paths from January to March 2010. The tendency of decoupling energy prices that started back in 2009 points to different supply and demand conditions underlying the global market of crude oil and the more regional markets for coal[19] CIF ARA and gas[20].



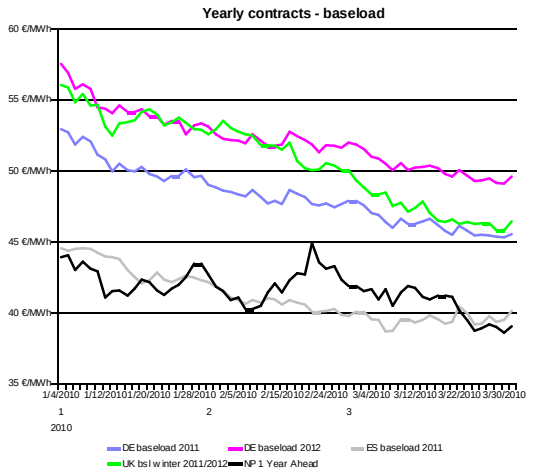
Source : Platts.

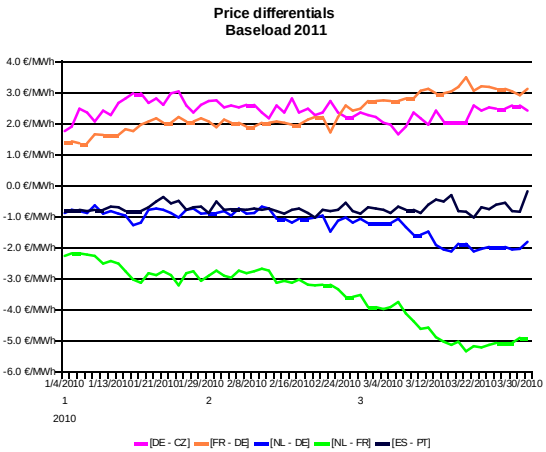
In Q1 2010 the year-ahead price of crude oil increased by 5%, that of coal remained stable while the price of gas lost 14%. Compared to the same period of 2009, oil and coal forward prices in Q1 2010 appreciated by 38% and 15% while the gas year-ahead lost 12%.

Forward electricity prices across the different European regions moved in line with the prices of gas. In Q1 2010 the major European contracts for the 2011 baseload lost between 10 and 17%.

[19] Delivery in the area of Amsterdam-Rotterdam-Antwerp.
[20] Delivery on the National grid of UK.

This development may indicate that market participants see increasingly the gas fired power plants as a good back-up choice to intermittent renewable energy.





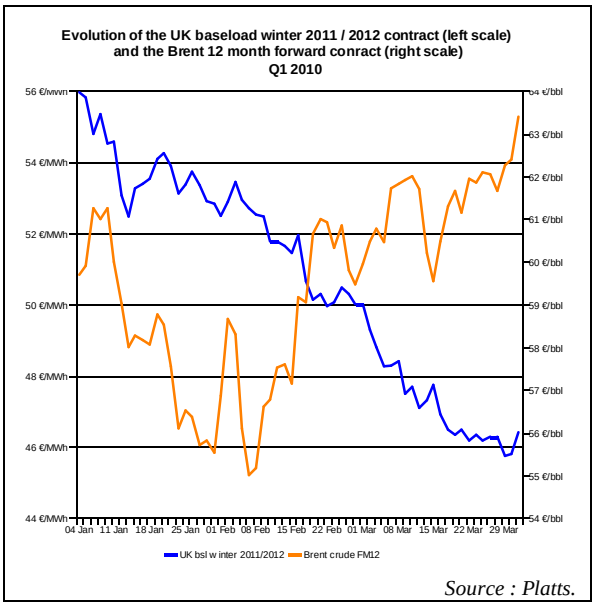
Source : Platts.

The usual pattern of regional price dynamics continued throughout the first quarter of 2010. Foreword prices for the Nordic and Iberian baseload contracts were relatively low; most of the Central and Western European evolved close to the German benchmark and the UK remained a relatively high price area.

There were a few new developments that occurred in Q1 2010. For example, the Nordic and Iberian contracts changed places for a couple of weeks during the period of extremely high day-ahead prices in the Nordpool area. However, the Nordic region continued to be considered a low price area. Its foreword contract was traded at a discount to those of the Central Western European region, implying that market participants were not worried for the long term prospects of the Nordic region by the events occurring on the Nordpool day-ahead in Q1 2010.

Another interesting development was the gradual decoupling of French and Dutch prices. By the end of March 2010, the 2011 French baseload was sold at a € 5 / MWh premium to the corresponding Dutch benchmark. At the beginning of January the price difference was much smaller.

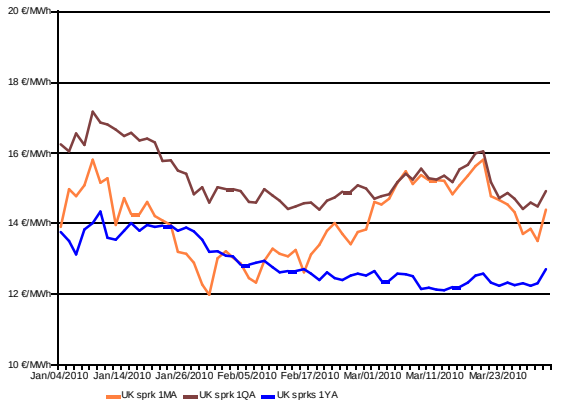
Finally, the UK year-ahead contract became more competitive. While it was traded at a € 5 / MWh premium with respect to the German contract at the beginning of January, by the end of Q1 the difference was reduced to around € 0.5 / MWh.



Source : Platts.

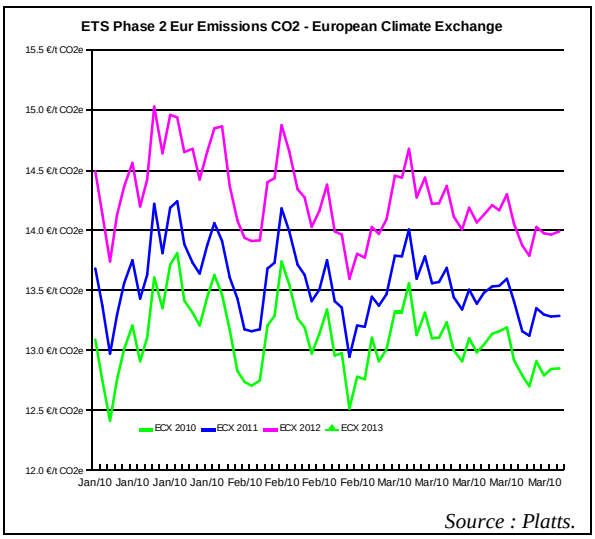
As illustrated by the previous graph, the UK baseload contract for 2011 fell by € 10 / MWh in the first quarter of 2010. It has clearly decoupled from the crude oil price.

At the beginning of the observed period, month and year-ahead quotations of the UK spark spreads curve were traded on similar levels. By the end of February, the curve was already in backwardation[21], putting additional downward pressure on the UK 2011 baseload.



Source : Platts.

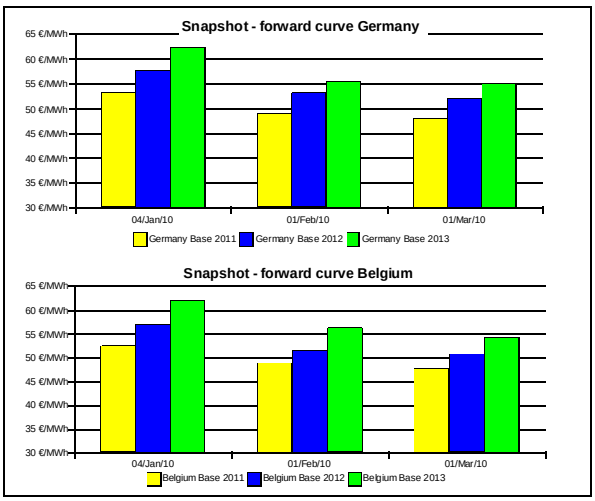
European Union carbon permit prices for 2010, 2011 and 2012 edged up and down on light volumes throughout the observed period. The curve, which remained in contango[22], was supported by German power and UK gas prices.



Source : Platts.

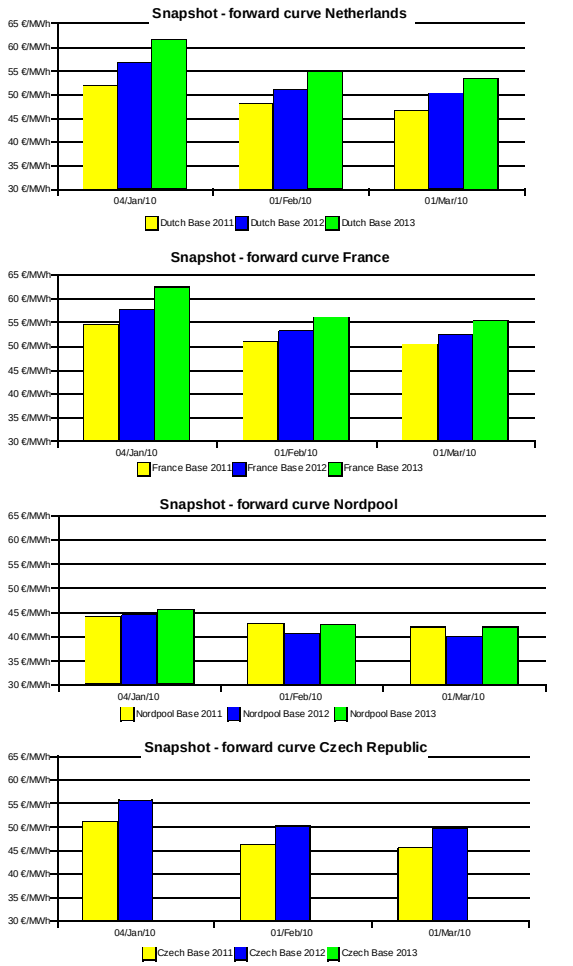
Likewise, the electricity curve for most of the European regions remained in contango. Market participants were expecting higher prices in the future when economic recovery was expected to gain speed.

The Nordic region was the only exception to that development. As shown earlier in this report, foreword price dynamics were much affected by the events that took place in January and February 2010.



[21] Backwardation occurs when the closer-to-maturity contract is priced higher than the contract which is longer to maturity.

[22] 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.

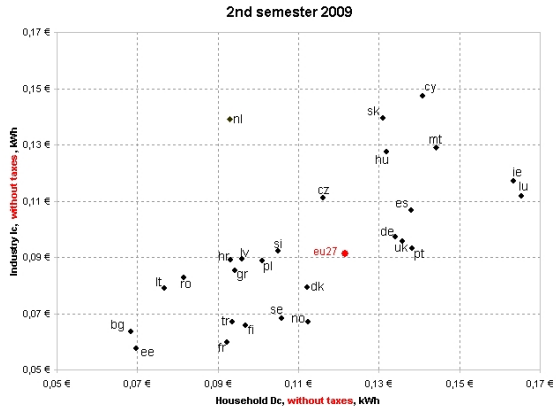


Source : Platts.

A.2 Retail markets

A.2.1 Prices by Member state

The two charts below show the electricity prices paid by the 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 prices without taxes (net prices), while the second one shows the prices including all taxes (gross prices) in the second semester of 2009.



Source : Eurostat

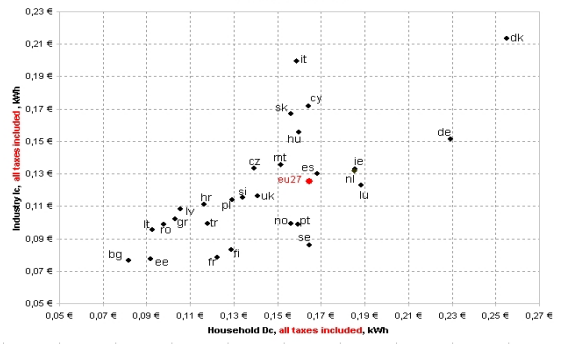
Range for annual consumption of :
Household band Dc : [2.500 kWh – 5.000 kWh] ;
Industry band Ic : [500 MWh – 2000 MWh]

Note. Data for Austria, Italy and Belgium are not available

Compared to the first semester of 2009, the variations of net prices of individual countries, both for household and industrial consumers showed a narrower range than what could be observed in the previous semester.

In the case of household consumers, net prices rose by the fastest pace in Poland (14.4%), Estonia (6.7%) and Cyprus (5.5%). The steepest price declines occurred in Malta (11.4%); Greece (10.7%) and Denmark (9.4%).

The highest increases in net prices paid by industrial customers were observed in Cyprus (26.5%) and Denmark (7.5%), while significant price decreases occurred in Latvia (14.5%); Slovenia (13.4%) and in Greece (10.1%).



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 and Belgium are not available

The evolution of gross prices paid by either household or industrial customers more or less followed the same pattern as that of the net prices but in some cases the changes in taxation exerted a significant influence on gross prices.

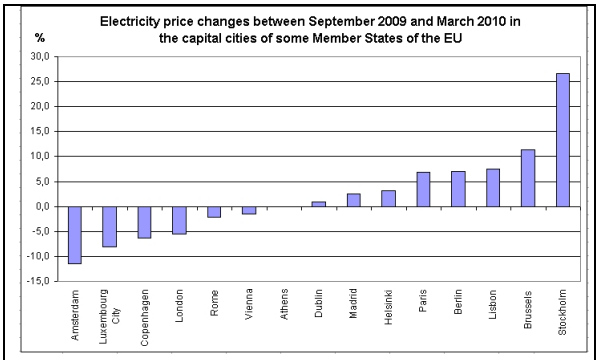
The highest gross price increases perceived by households were observed in Poland (14.5%), Hungary (7.6%) and Portugal (5.7%). In contrast, Maltese, Greek and Irish households faced significant price decreases (11.4%, 10.6% and 8.6%, respectively).

Industrial customers were exposed to higher gross prices in Cyprus (26.1%), while price falls occurred in the following countries: Malta (14.2%); Slovenia (13.9%); Lithuania (13.2%) and Italy (10.5%).

Changes in indirect taxes appeared in the difference of the evolution of gross and net prices. In Germany and Denmark household consumers faced 4% and 3% less decrease in final (gross) prices than that would have been a consequence of the pure (net) price fall; suggesting an upward effect of changes in taxation. In contrast, households in Luxembourg and Portugal experienced lower increase in final prices than the net price rise (2.1% and 3.7%, respectively).

Gross prices for ndustrial customers in Greece rose 8.4% faster than the net prices. In Estonia this difference was 4%. In contrast, Danish industrial customers benefited from the alleviating effect of tax changes with gross prices rising by 4.1% less than the net prices.

The next chart provides partial information about the evolution of household electricity prices in selected European capitals. During the observed six months' period household prices declined in Amsterdam (11.4%); Luxembourg (8.1%) and Copenhagen (6.3%), while they went up in Stockholm (26.6%); Brussels (11.3%) and Lisbon (7.6%).



Source: HEPI

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 final electricity consumer prices in some selected EU capitals

In March 2010, households in Copenhagen paid the highest electricity price from the selected European capitals (28.6 EUR cents/kWh), while the cheapest one was observed in Helsinki (11.8 EUR cents/kWh). This coincides well with Eurostat's data about household consumption band Dc prices for the second half of 2009; showing Finland as one of the cheapest and Denmark as the most expensive country of those ones whose capitals are covered by the HEPI index (see the chart on the previous page).

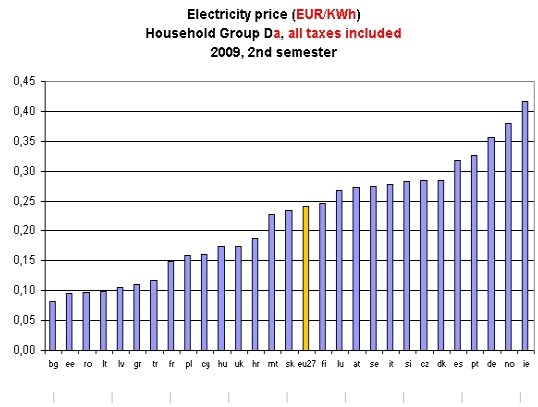
A.2.2 Cross–panel data on household electricity prices

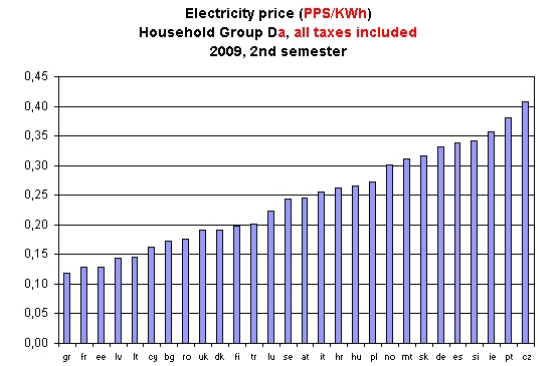
The next two charts show the electricity prices paid by households (for the lowest annual consumption band Da specified by the Eurostat), including all taxes in the second half of 2009. The first chart shows the absolute unit values in euros, while the second one provides information of the impact of the purchasing power standards (PPS) correction on the price level in each country.

Similarly to the previous semester the highest absolute prices could be observed in Ireland, Norway and Germany. The prices in Member States that joined the EU in the recent years can be found below the EU-27 average, with the exception of the Czech Republic and Slovenia.

The PPS correction exerted only a slight influence on the list of the ten cheapest countries, while five new Member States can be found among the ten most expensive ones, notably Poland, Malta, Slovakia, Slovenia and the Czech Republic, which latter proves to be the most expensive country.

The ratio of the unit price in the most expensive and in the cheapest country is more than 5 measured in euros, while the PPS correction reduces this ratio to 3.4.

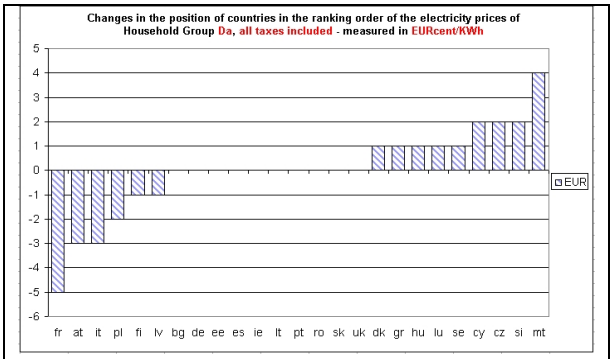




Notes
1) Purchasing power price data for Belgium and Italy are missing
2)Range for annual consumption of :
Household band Da : [0 kWh – 1 000 kWh] ;
Industry band Ia : [0 MWh – 20 MWh]
2) The purchasing power standards (PPS) data for all Member States are provisional.

Source : Eurostat

The next chart illustrates the relative position of each country in the price ranking order compared to the first semester of 2009. France, Austria and Italy moved downward, suggesting that the price evolutions in these countries were lagging behind that of the average of the EU-27. In fact, prices in these three countries were less than in the previous semester in both euro and PPS terms.



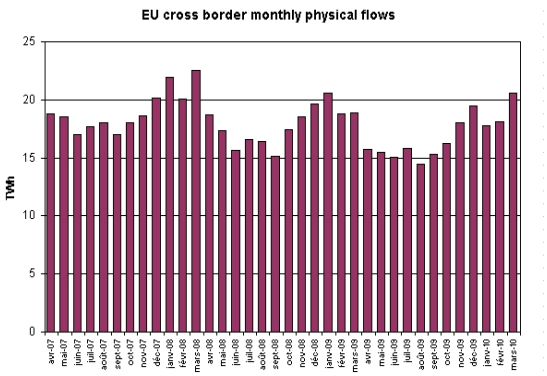
Notes
1) Data for Belgium and the Netherlands are missing
2) Only EU Member States are taken into account
3) Positive values designate higher position in the price ranking order, meaning that the given country's prices rose faster (or decreased less) than the average of the EU-27, otherwise said the given country became more expensive compared to the other ones, as measured against the previous semester (first half of 2009)

Source : Eurostat

Meanwhile, in Cyprus, the Czech Republic and Malta price increases outpaced the average growth rate of the EU-27, especially in Malta where both prices measured in euros and in PPS rose by more than 60%. This was reflected in the upward movement of these countries in the ranking order.

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

The next chart shows the monthly volume of electricity cross-border flows. It seems that the volume of exchanged energy have recovered from the low levels experienced in August 2009. March 2010 was the first month when the flow volume on year-on-year basis turned to positive again since September 2009. However, if the volume of cross-border flows of the first quarter of 2010 is compared to that of the same period of 2009, the shrinkage still persists, with an observable 3.2% decrease.



Source : ENTSO – Vista
Note. Data for IE, MT and CY are missing. Data for EE, LT and LV are available since September 2008. 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.

Looking at the chart that shows the monthly net physical flows by region it seems that the Central Western European region's traditionally positive outflow volume began to rise again. The relatively low prices on most of these wholesale markets apparently helped boosting the outflow of electricity from this region.

The Apennine peninsula's strong net inflow volume reached in March 2010 its second highest value in the last three years, as a result of significant difference between the inflow and outflow volumes (4,415 vs 15.5 GWhs).

The Nordic region turned into a net importer of energy in Q4 2009 and Q1 2010. This development is related to the recent price increases experienced on the spot market of Nordpool which used to be one of cheapest wholesale market in Europe (see more on pages 12-16 of the current report).

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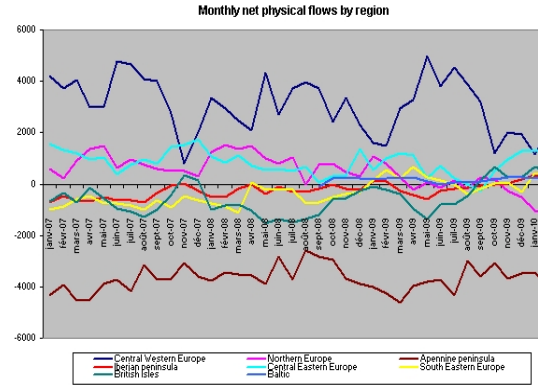

Source : ENTSO – Vista

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*
Baltic	*EE, LT, LV*

The cross border balance of the Central and Eastern European Region was definitely on the positive side recovering from a net importing position in Q3 2009. The quarterly net outflow balance was the highest since the last quarter of 2007.

The remaining four regions (Iberian Peninsula, South Eastern Europe, British Isles and the Baltic) also posted net outflow balances during the first three months of 2010, although the net position was closer to the equilibrium.

C. *"Focus on the front end of nuclear industry"*

Nuclear energy is one of the main primary energy sources in the European Union (EU). In 2009, nuclear energy was produced in 15 EU Member States by 144 nuclear reactors, in all generating approximately one third of the electricity produced in the EU.

The costs of electricity generated by nuclear power include initial capital costs, nuclear fuel costs, maintenance and operational costs, the decommissioning of nuclear power plant, the storage of used fuel, reprocessing, and the final disposal of used fuel.

From the natural uranium mined in the chemical form of U308 (or yellowcake) to electricity output there are a series of industrial (or front-end) processes such as mining, conversion, enrichment, fuel fabrication, and energy generation. The cost of nuclear fuel could be split as follows: 40 % of the total is for uranium, 4 % for conversion, 47 % for enrichment, and 9 % for fuel fabrication. To ensure security of supply, it is important to follow and monitor all the markets for front-end activities.

Natural uranium is mined at different geographically stable locations around the world. This is an important advantage of nuclear energy in terms of security of supply. In 2009, global natural uranium production amounted to 50 519 tonnes of uranium, the main mining regions being Kazakhstan, Canada, Australia and Africa. Although the European nuclear market represents around 1/3 of the world market, less than 3 % of EU nuclear reactor needs are covered by indigenous production. The main countries supplying natural uranium to the EU are Australia, Russia and Canada. Approximately 70 % of natural uranium demand is covered by primary production (i.e. mining), but in the coming years secondary sources (inventory material, low-enriched uranium derived from highly enriched uranium and also from re-enrichment of tails, and re-enriched reprocessed uranium) are expected to diminish and primary production will become even more important.

Uranium price levels are closely followed by the nuclear industry to ensure that the price is sufficient to meet the investment needs of future mining. Since 2007, natural uranium markets have been in a 'contango' situation (when spot prices are lower than forward-looking long-term price indicators) due to security of supply reasons and the possibility to minimise market-related risks and avoid uranium storage costs. A decisive difference between long-term and spot uranium markets is that the long-term market is determined by actual production costs and long-term supply and demand for natural uranium, while the spot market is strongly influenced by available inventory. European nuclear utilities are well covered with long-term supplies (more than 95 % of all supplies are delivered under long-term contracts) and hold adequate levels of stocks, so are not exposed to temporary spot price fluctuations.

Unlike with the natural uranium mining industry, there are only a few major conversion and enrichment service providers world-wide. In 2009, there was considerable overcapacity in conversion and enrichment services in the European Union. However, enrichment service provision in the EU will be temporarily reduced due to the restructuring of the AREVA enrichment services (France).

The largest nuclear fuel manufacturing capacities are in France, Germany, the Russian Federation and the USA, but fuel is also produced in other countries. Fuel producers are also the main suppliers of nuclear power reactors. In the EU, nuclear fuel fabrication needs are covered by EU producers. However, on the market for the Pressured Water Reactors' (VVER) fuel mainly used in the EU-12 Member States, the Russian supplier TVEL has a dominant position, holding a market share of 95 %.

The role of Euratom, the European Atomic Energy Community, is to develop, in the interest of all Member States, a legal framework for nuclear energy meeting the highest standards for safety and security. Further, the task of the Euratom Supply Agency is to implement a common fissile material supply policy for nuclear material based on the principle of equal access to sources of supply. The 2009 Annual Report[23] analyses the nuclear developments in the EU, the world market for nuclear fuels as well as the supply and demand for nuclear fuels in the EU.

[23] http://ec.europa.eu/euratom/ar/last.pdf