Quarterly Report on European Electricity Markets

Directorate-General for Energy and Transport

EUROPEAN COMMISSION

- MARKET OBSERVATORY FOR ENERGY

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The Director

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Dear readers,

We are pleased to present the *Quarterly Report on European Electricity Markets*, covering the final quarter of 2008.

The period from October to December was packed with events which have touched not only the European electricity industry but also our economies as a whole. I am sure you remember the October subprime mortgage crisis triggering some of the biggest drops in history of the leading stock exchange indices and governments stepping in to guarantee the deposits of their citizens. Then, in December, as the economic slowdown was starting to hit our economies, close to our Eastern borders a new gas conflict was unfurling. Little did we know at that time that the conflict was about to touch so many European households and industries for such an unprecedented long period of time.

The wholesale markets across the continent have experienced the tumbling down of prices and liquidity. However, even in these difficult times, the bases keep looking strong.

The "*focus on*" section of our report is looking into a topic contributing to a sustainable energy future: the promotion of mass installation of smart meters (over the European grid).

Thank you for your continued and growing interest in this publication.

Heinz Hilbrecht

Commission européenne, B-1049 Bruxelles / Europese Commissie, B-1049 Brussel - Belgium. Telephone: (32-2) 299 11 11.
Office: DM24 - 06/83. Telephone: direct line (32-2) 2968174. Fax: (32-2) 2964574.

E-mail: heinz.hilbrecht@ec.europa.eu

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A. Recent developments in the electricity markets across Europe

A.1 Wholesale markets

During the fourth quarter of 2008 the electricity markets across Europe started to experience the first consequences of the economic slowdown.

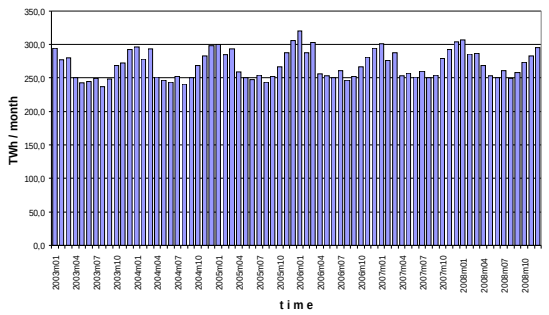
As the financial crisis plunges more and more EU economies into recession, energy market operators were wondering about the duration of the squeeze and the resilience of the fledging European electricity and gas markets.

Market liquidity was among the first victims of the credit crunch, affecting the majority of electricity wholesale markets. Although the day-ahead volumes on the European power exchanges stayed strong (see the A.1.1 section), the trading activity on the forward curve was reduced in the aftermath of bankruptcy filings by major financial institutions such as Lehman Brothers. A similar tendency of reduced liquidity was observed on the OTC segment of the market.

The investment plans of utilities could also face revision as the recession starts to affect the industrial consumption of electricity and the borrowing costs continue to rise. According to Fitch rating

agency, the spreads on 5 year bonds issued by the highest rated European energy companies have increased significantly from 60 to 200 basis points[1] between 2007 and the end of 2008.

EU27 monthly electricity consumption*



Source : Eurostat

*Note. * The values of the monthly consumption of Greece (October – December 2008) have been extrapolated.*

The electricity consumption in the European Union in 2008 stayed on a similar level to that of 2007. However, all Q4 months registered lower volumes in 2008. The change for October, November and December was respectively –1,73%, –3,45% and –2,85%.

While the October and November drop could be attributed to a relatively harsher weather in 2007 than in 2008, it seems that the December reduction has more to do with the falling industrial demand.

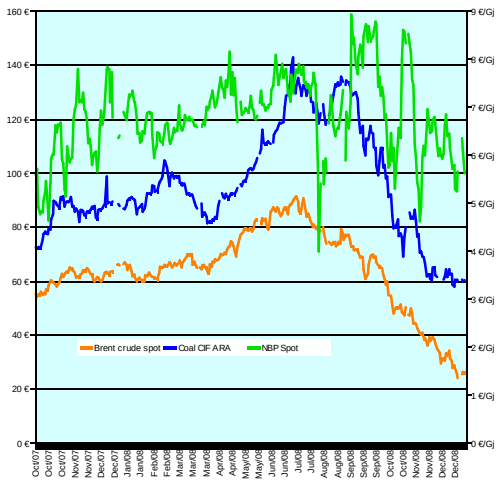
EU 27 Heating Degree Days
during Q4 of 2006, 2007 and 2008

	October	November	December
2006	177	328	428
2007	234	405	484
2008	222	372	484

Source : Eurostat / JRC

[1] With respect to a government secured paper having similar maturity.

Daily spot prices of selected energy commodities.
Left scale : Oil (Brent) and Coal (CIF ARA) ; Right scale : Gas (UK NBP)



Source : Platts.

From July to December 2008, oil and coal prices have plummeted by 71 % and 58 % on fears of recession following the financial turmoil. The reduction of the freight costs has put an additional downward pressure on the price of coal.

The price of emission allowances was also substantially reduced during Q4 as fears of contracting industrial demand prompted some utilities to sell certificates in order to improve their liquidity positions (go to page 16 of this report).

September was the month that saw the highest quotes for gas in 2008. By the end of the year, the price was reduced by more than 37%.

Compared to the price correction of other energy commodities, the reduction of wholesale electricity prices was modest. This was partly due to the winter months when system margins are traditionally tight in Europe.

However, the trading during the fourth quarter of 2008 was dominated by bears as the majority of the market participants seemed to share the view that wholesale electricity prices are overvalued with respect to the prices of fuel inputs.

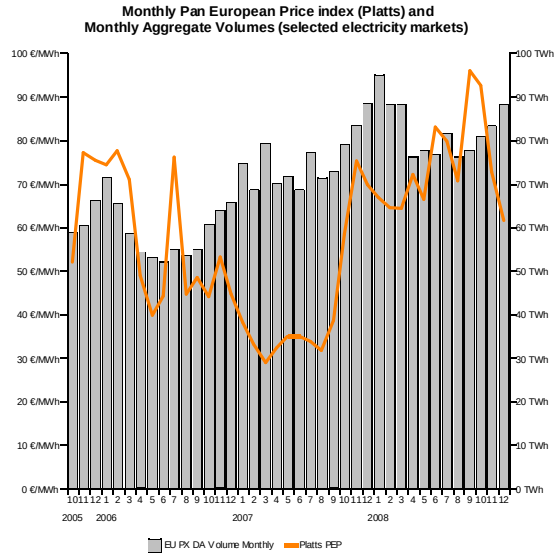
On a more positive note, the Market Observatory for Energy welcomes the creation of the *European Network of Transmission System Operators for* Electricity (ENTSO-E). The new association, founded by 42 TSOs coming from 34 European countries, aims to strengthen the cooperation in a number of key areas such as the development of network codes, the operation and development the European high voltage grid as well as research activities.

A.1.1 Day ahead

EU wholesale markets

The *Platts Pan European Power* **index**[2] lost approximately € 30 / MWh during the fourth quarter of 2008, more than a third of its value to reach levels last seen in October 2008.

The factors that most frequently shaped the evolution of day-ahead prices during the observed period were the expected levels of wind power production and hydro reserves, the availability of spare capacity on the grid, the weather conditions as well as the spot fuel prices.



Source : Platts.

The selected European electricity 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) ;
APX Power UK ;
Operatul Pietei de Energie Electrica din Romania (OPCOM)

The cumulative day-ahead **volume** for the selected countries[3] stayed above 80 TWh per month between October and December 2008, suggesting that the markets are

[2] Platts Pan European Power index (PEP) is a demand-based weighted average of the mid-points of Platts' day-ahead assessments on the day. The PEP covers the power markets of the following European countries: UK, Spain, Germany, France, Belgium, the Netherlands, Switzerland and Austria. In the case of Spain, when there is no day-ahead assessment the last week-ahead assessment of the previous week is used instead.

[3] 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), Italy (IT), the Netherlands (NL), Poland (PL), Romania (RO), Spain (ES), Sweden (SE), the United Kingdom (UK) and Norway (NO).

showing encouraging signs of resilience in a period of a global credit crunch.

Regional markets

Central Western Europe

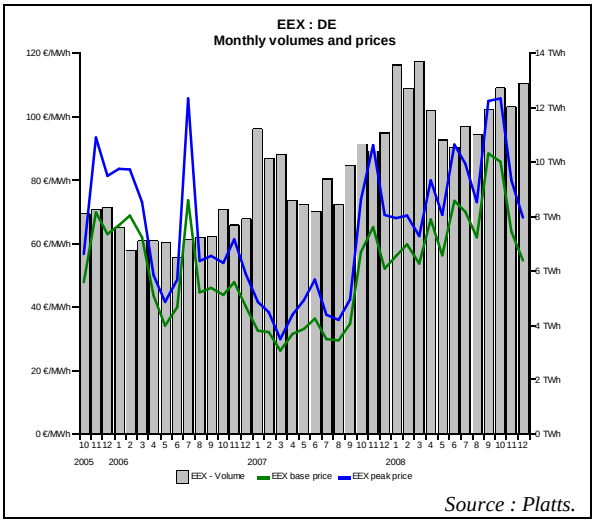
The *Capacity Allocation Service Company for the Central West European Electricity market* (*CASC – CWE*) was established in November 2008. This follows the signing of a Memorandum of Understanding back in 2007 between the Ministries, TSOs, regulators, power exchanges and representatives of the market participants of the five Member States composing the CWE region.

The single coordination office will operate auctions and trading for the monthly and yearly transmission capacity for the 7 regional TSOs. The stakeholders hope that the implementation of the regional market coupling could improve significantly the liquidity and the transparency of the trading platforms.

Germany

The baseload and peakload prices in December 2008 were on average 36 % lower than their respective levels in October 2008.

Cleared day-ahead volumes on the *EEX* continued to increase despite the credit crunch[4]. The liquidity on the forward curve (go to page 15 of this report) was more affected[5] but it also found a stable level by the end of the period.



Source : Platts.

At the beginning of October a number of problems emerged with the price determination on the coupled Danish-German market. As a result, the market coupling was temporarily suspended. The volume of energy coming from the *Nordpool* area was also reduced.

Low wind output and an increased demand from French participants[6] were also among the factors that kept up the October prices at relatively high levels.

The wind conditions changed completely in the following month. The downward pressure on the prices was further increased by a combination of good system margins and falling coal prices.

By the end of November, the day-ahead segment experienced a small bull run as

[4] Lehman Brothers were clearing member of the *EEX*.

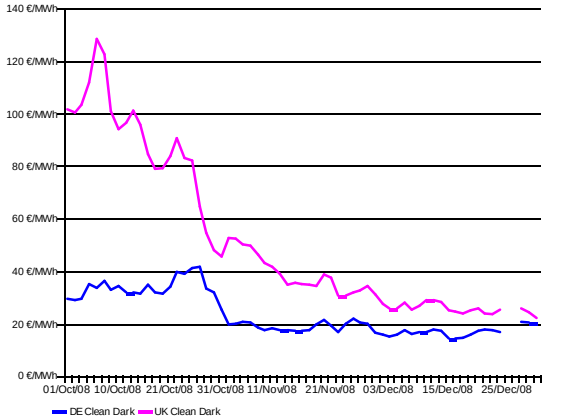
[5] *Platts* reports that in October the liquidity on the forward curve has halved.

[6] This was mainly due to the fact that a number of nuclear power plants were off the grid at that period.

banks rushed in to close their book orders. The overall effect of this short lived episode was to slow down a bit the fall of the prices.

At the end of the observed period the market operators were more and more concerned with the levels of industrial demand.

According to the German Statistical office, the industrial revenue dropped in September by 3.9%, November and December figures were expected to be worse. As recession hit the biggest EU economy the industrial consumers started to anticipate a significant reduction of orders. There were fears that if the economic activity contracts sharply, the big industrial consumers could turn into net producers of electricity, putting further downward pressure on the forward prices.



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

Source : Platts.

As coal prices experienced steeper falls than the power prices, the green dark spreads[7] remained at high levels. However, by the end of the period the spreads were decreasing.

The Netherlands

October volumes on the Dutch exchange have been at record levels, both on the day-ahead and the financial segments. The aggregated volume for the day-ahead during this month was above 2,20 TWh. Fears that the number of transactions will contract with the coming recession and the diminishing industrial demand were somehow alleviated in December when the day-ahead volume was once again close to 2,20 TWh.

Peakload and baseload prices have fallen by more than 30% during the fourth quarter of 2008. By the end of December the prices were already below their respective December 2007 levels. Among the chief factors that influenced these developments were the wind levels (slightly above the average in October, very strong in November and normal in December), the system availability showing no sign of strain and the bearish

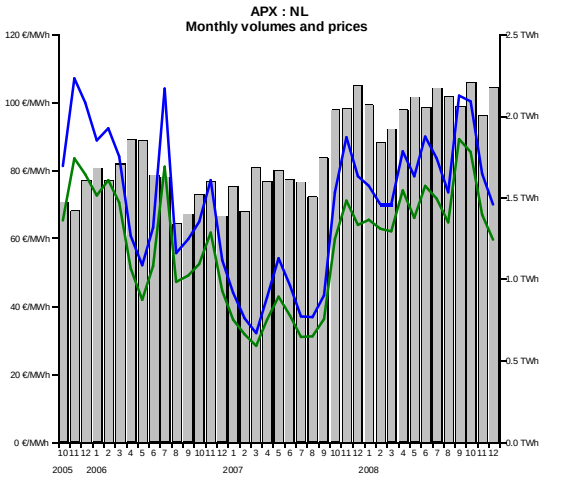
[7] Dark spreads are reported as indicative prices giving the average difference between the cost of coal delivered ex-ship and the power price. As such, they do not include operation, maintenance or transport costs. Spreads are defined for a coal-fired plant with 35 % efficiency.
Dark spreads are given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

sentiment about the economic outlook in Europe.

At the beginning of the period the prices of Dutch contracts moved in line with the German market. French contracts were traded at premium as there were problems with the available capacity. Later, the prices have followed the general bearish pattern of the other market places.

In December the Dutch ministry of Finance has approved the merger of *APX Group*, the Anglo-Dutch energy exchange and the European Energy Derivatives Exchange (ENDEX N.V.) creating a leading integrated energy exchange and becoming the largest European gas exchange.

Prior to that *APX* has announced plans to redefine peak hours and to bring them in line with the other European markets[8].



Source : Platts.

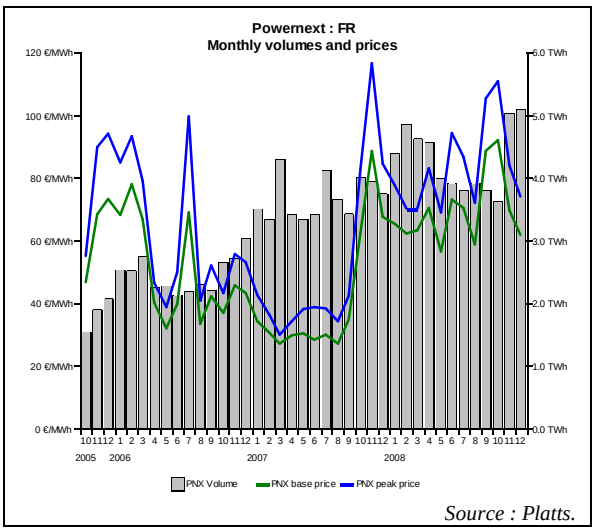
[8] *APX* considered a gradual phase out of the 16-hour peak (start 08:00 – 23:59) which would be replaced with the standard 12-hour peak (start 08:00 – end 19:59).

During the observed period, Dutch and Norwegian TSOs *TenneT* and *Statnett* have announced that the market coupling will become operational at the start of 2009. Currently the TSOs are running explicit auctions for the capacity of the NordNed undersea cable connecting the Netherlands and Norway.

France

Market participants were very active on the day-ahead segment of the French power exchange. For the months of November and December, *Powernext* has registered record monthly volumes passing for the first time the 5 TWh mark.

As market sentiment turned into negative in the aftermath of the global financial crisis, liquidity on the forward curve started to decrease rapidly with *Platts* reporting a 12,8 % year-on-year drop in December. However, the Virtual Power Plant auctions, where *EDF* is selling long term offtake rights from its nuclear plants, have helped to keep up liquidity.

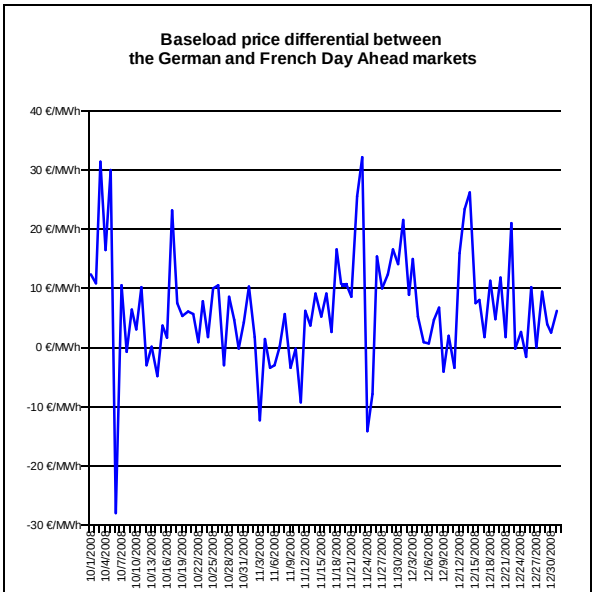


Source : Platts.

By the end of the observed period, peak and base prices were more than 30% lower than their October values. From the start of the year, the peak and base prices have dropped respectively 5,3 % and 4,2 %.

The market seemed to react to news related to the state of available capacity on the grid. During the fourth quarter, the number of nuclear plants off the grid went from 12 to 6 from a total of 58. Throughout the period the margins were improving as more and more plants came into the grid to meet the increasing demand from end consumers. The meteorological conditions were also an important driver as the seasonal residential demand related to heating is relatively more important in France than its neighbouring countries.

An interesting research done by *RTE*, the French TSO, seems to indicate that the French dependence on electrical heating is increasing. In 2008, 1° C drop in temperature during the winter resulted in a 2100 MW increase of electricity consumption. The respective figures for 2007 and 2006 were 1800 MW and 1500 MW.



Source : Platts.

At the start of the observed period the premium with the German market was increasing. It seems that market participants were pricing in the fact that during the winter season the French grid is under strain as the heating system is more intensive on electricity than the German one. Then, as plant availability and meteorological conditions improved in France the premium went down. In November it picked up slightly because of the strong output of wind-generated power in Germany.

Another interesting study done by *CapGemini* seemed to suggest that compared to other countries, the French nuclear availability remains at relatively low levels. In 2006 and 2007 it was estimated at 83.6 % and 80.2% while the availability rate of Belgian and US nuclear power plants was at 90% during the same period. Load following[9] and partial fuel

[9] As the part of nuclear plants in the French system is higher than in the US and Belgium, some plants need to adapt more flexible operational schedules.

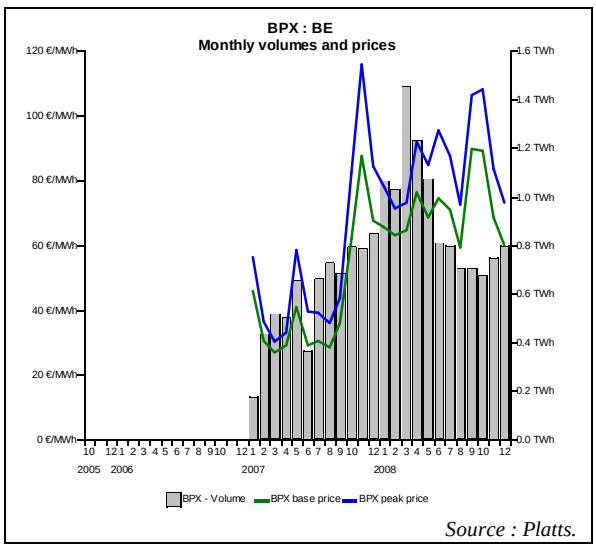
reloading[10] were among the factors that were singled out in this study to explain the difference.

Belgium

Day-ahead base and peak prices in Belgium have stayed close to the French ones during the last quarter of 2008 as there were few episodes of congested interconnectors.

Electricity consumption was lower in December than October. This situation which is uncharacteristic for the winter period has fuelled fears of falling industrial demand.

Even a cold spell of weather by the end of November could not stop the downward movement of prices.



Source : Platts.

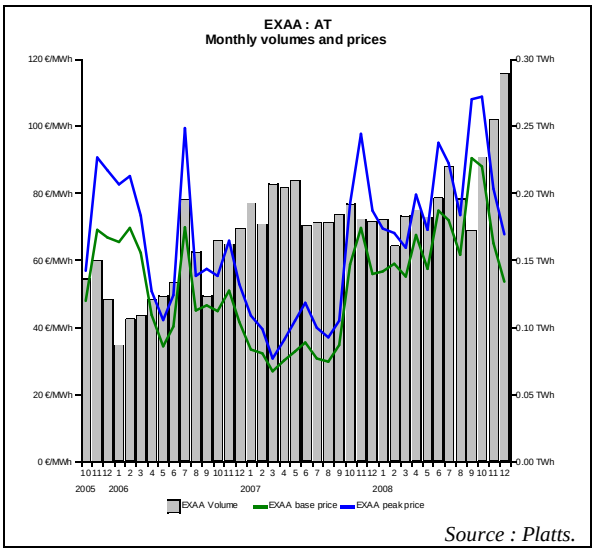
[10] Refuelling of the French reactors seems to be done more frequently (12 month cycles vs 18 months in US and Belgium) to make it coincide with the summer months of low consumption because nuclear plants are indispensable during the winter.

The liquidity of the day-ahead market was low with cleared monthly volumes below 0,8 TWh. As the trilateral market coupling mechanism is functioning normally, it appears that large volumes for delivery on the Belgian grid have been cleared by neighbouring exchanges. For example, some 0,7 TWh were cleared by *APX* in October 2008.

The liquidity on the forward curve was even lower, following in general Dutch and German tendencies.

Austria

Baseload and peakload prices in Austria moved in line with those of the German market. Along with the predominant bear factors (economic slowdown, falling industrial demand, falling prices of energy commodities), the healthy level of water reserves in the Alpine region has contributed to put a downward pressure on the prices which lost almost 40 % in three months.



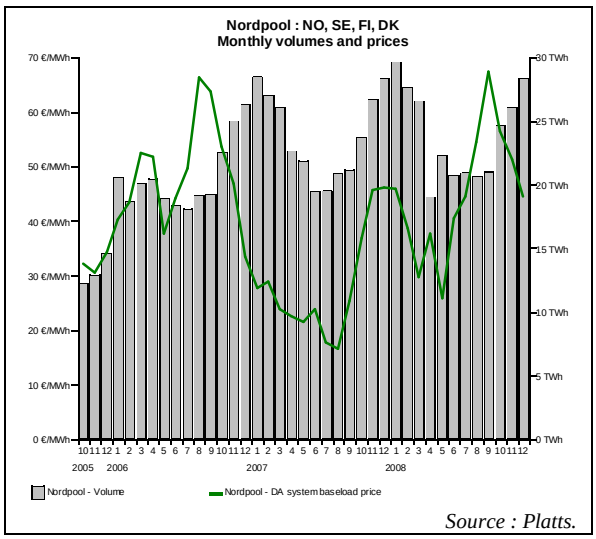
Source : Platts.

October, November and December 2008 registered consecutively the highest monthly volumes on the exchange. However, the cleared volumes remain very modest, still below the 0,3 TWh mark.

Northern Europe

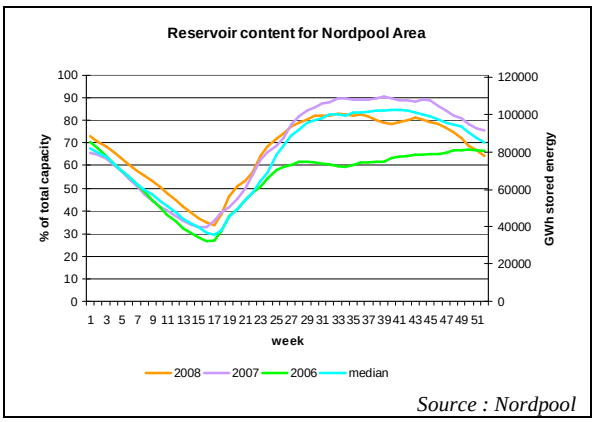
In the fourth quarter of 2008 the *Nordpool* area continued to enjoy a set of wholesale electricity prices which were on average cheaper than the majority of EU countries.

The average monthly system baseload price has slid from € 56,41 / MWh in October to € 51,31 / MWh in November to € 44,32 / MWh in December. Compared to September 2008, the price has lost a third of its value.



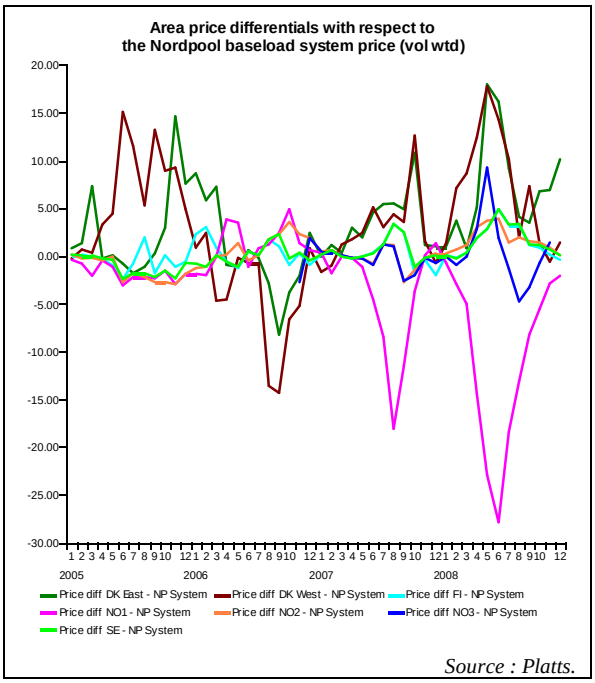
Source : Platts.

Water levels stayed below average levels but it seems that market operators were more concerned with the overall effects of the financial crisis and looming recession on the electricity market in Scandinavia.



Source : Nordpool

Exports from the Nordpool area to continental Europe continued to increase as price margins between the two areas remained high.



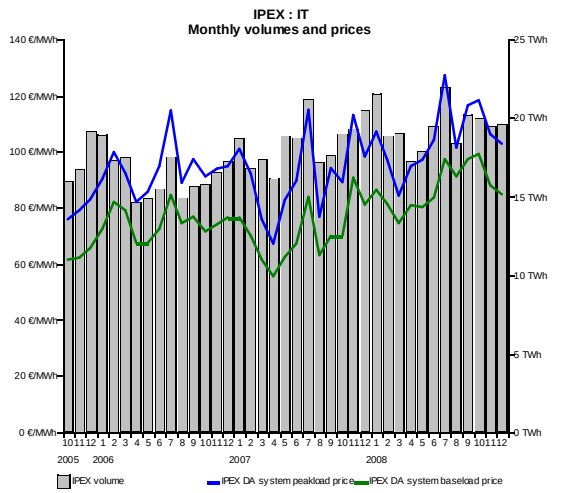
Source : Platts.

While system prices have stayed at a relatively low level, area prices have continued to follow different trajectories. During the last quarter of 2008 Denmark East was the highest price area and the Norway NO1 area (covering the South of Norway) the lowest one. The other areas have recorded more or less converging

prices as the interconnector capacity was on acceptable level.

Apennine peninsula

Italy *



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

Italian day-ahead prices have experienced a smaller reduction in comparison to other European markets. From October to December, the average peak and base prices have dropped about 13% from their starting values. However, the peakload stayed above € 100 / MWh during the observed period.

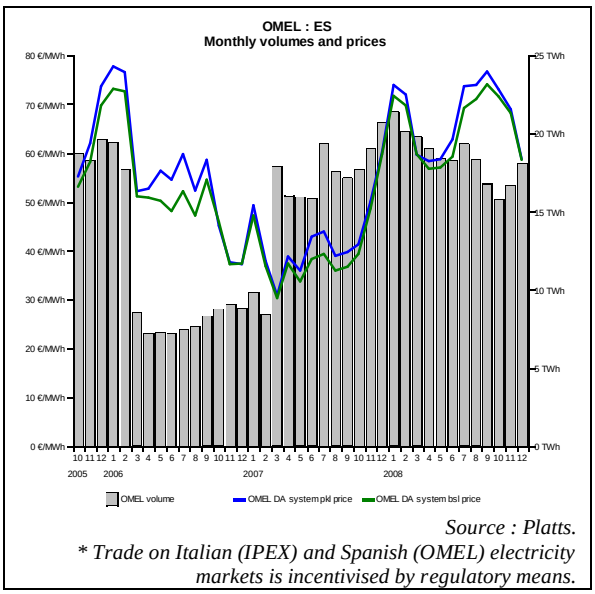
The differential between the peak and base prices evolved in the range of € 20 / MWh, indicating that the system was relatively tight during the business hours.

By the beginning of the period market operators were concerned by a 560 MW power plant in Sicily going off the grid until the end of the year. In the following days bearish sentiment spilled over from other energy markets reacting to incoming information about the scale of the financial crisis and the pessimistic prospects of economic growth and industrial activity. According to Eurostat data, Italian electricity consumption in December 2008 was more than 7% lower than the consumption for the same period in 2007.

Iberian peninsula

Spain *

Between October and December 2008 the wholesale electricity prices in Spain have stayed on average on a lower level than those of France. During this period the peak and base prices have lost about 18% from their initial values.

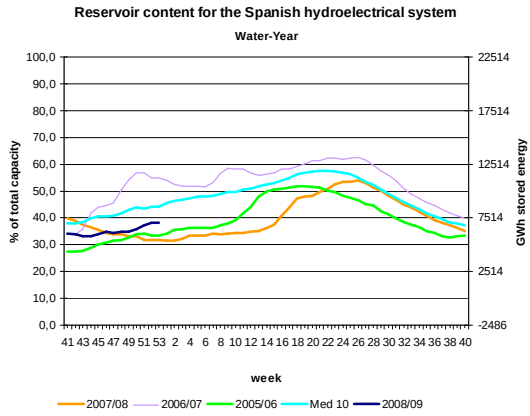


Source : Platts.
** Trade on Italian (IPEX) and Spanish (OMEL) electricity markets is incentivised by regulatory means.*

The cleared volumes on the market were about 2 TWh / month lower than those of the last quarter of 2007.

Factors that have influenced the market were the level of industrial demand for electricity (which started to fall from October) and news coming from the global oil market.

The wind outlook and other meteorological parameters were also very important to the market participants. On the 26th of November, the energy generated from wind has met a record 43 % of total demand, indicating that wind is becoming a very important factor for the Spanish market.



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

During the fourth quarter of 2008 the reserves of the Spanish hydroelectrical system have been very low. The stored energy that could be retrieved from the hydro system during a given week from the fourth quarter has been approximately 1,4 TWh lower than the corresponding 10 year average figure.

The market prices seem to indicate that the fears of recession and the corresponding drop of demand have played a more important role than the preoccupations with system margins triggered by a tight situation with plant availability (hydro plants, but also episodes of other plants going off the grid).

Central Eastern Europe

In the last quarter of 2008 electricity trading in Central Eastern Europe (CEE) was developing in the context of growing fears that the recession could hit harder the countries from the CEE region than elsewhere in Europe. As a result, the liquidity was thinning among worrying news that industrial demand was rapidly contracting.

For example, Hungarian TSO *MAVIR* has announced that industrial electricity demand was 6.8 % down in November. The electricity consumption in the CEE region was 6% lower in December 2008 compared to the same month of in 2007.

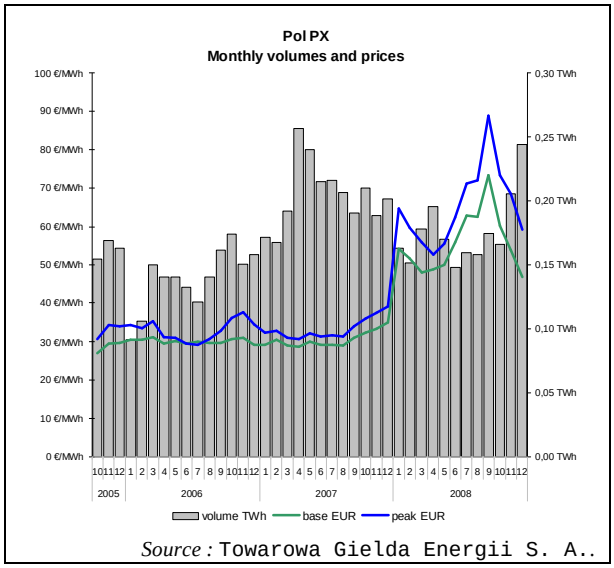
Poland

Wholesale prices on the Polish market have lost about 20 % of their value in the final quarter of 2008. Half of this drop could be attributed to the depreciation of the Polish zloty to the Euro (approximately 11%).

The average baseload / peakload price in December 2008 was still 34% / 51% higher than in December 2007, suggesting that Polish wholesale prices tend to converge to those of the CWE region, and especially the German ones.

The cleared volume has picked up but remained below 0,25 TWh / month, a

modest value compared to the monthly internal consumption in Poland.

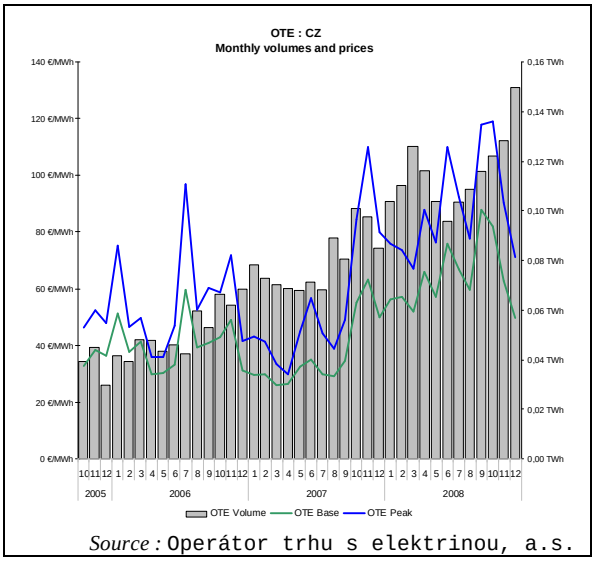


Source : Towarowa Gielda Energii S. A..

Czech republic

From October to December, the Czech wholesale prices plunged on average by 40%. The day-ahead market continued to follow the corresponding German prices. The average German - Czech spread for November was below € 1 / MWh, down from about € 3 / MWh in October. For December, the spread climbed above € 4 / MWh as the general bearish sentiment from the energy commodity markets was reinforced by fears that the Czech industrial demand is receding and that it could drop as much as 5 % in 2009.

The cleared volume on the OTE day-ahead market continued to increase reaching almost 0,15 TWh / month in December. Liquidity is expected to go higher as the *Prague Energy Exchange (PXE)* and the *Czech Market Operator (OTE)* have agreed to create a unified spot market for electricity, to be operational from the 1st of April 2009.



Source : Operátor trhu s elektrinou, a.s.

During the observed period the *PXE* has also announced that it intends to launch forward contracts for electric power delivered on the Slovakian grid[11]. This initiative comes as part of a more global market coupling project between Slovakia and the Czech Republic.

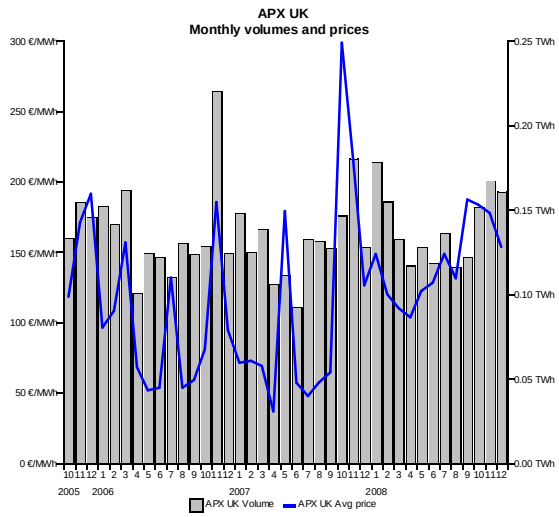
Market operators were wondering how the existing export fee in Slovakia would affect the liquidity of the new contract.

[11] *PXE* intends to launch as well forward contracts with delivery on the Hungarian grid.

British Isles

UK

The monthly average *APX UK* price has slid down from € 183 / MWh in October to € 153 / MWh in December.

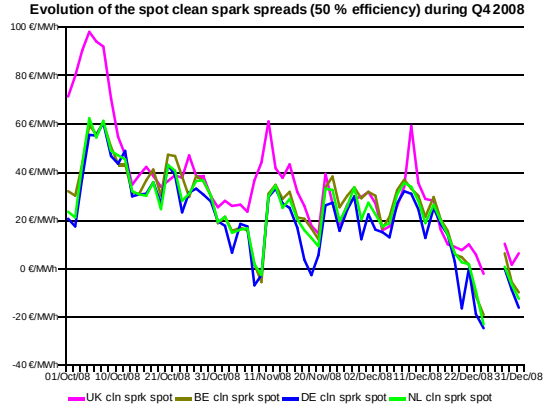


UK values are quoted in € using the €/£ daily exchange rate as reported by Platts.
APX UK power data reported by Platts consists of the minimum and maximum trade values and total volume for the 48 half hourly contracts of the day-ahead.

Source : Platts.

Electricity supply margins and meteorological conditions were among the important factors that drove the market. The Met Office announced that UK was facing "coldest start of winter in 30 years". However, tight plant availability eased over the period.

Market participants were also interested in the price of gas on the on-the-day market which reflected the downward trends in global energy markets.



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

Source : Platts

Spark spreads[12] stayed at very high levels at the beginning of the period as the drop in gas price was more pronounced than the one on power prices. Later, in the period, spreads eased.

Industrial electricity demand was a growing concern for market operators by the end of the quarter putting downward pressure on the spot and on the curve.

The recorded volumes on the *APX UK* trading platform were in the range of 0,15 TWh / month.

At the beginning of December, *APX UK* launched a day-ahead auction trading

[12] 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.

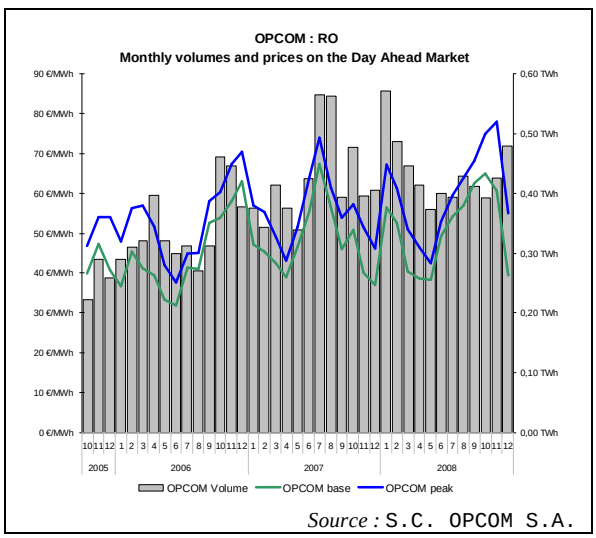
segment complementing the existing prompt market.

During the same period the Futures and Options association (FOA) chose the NP/NASDAQ project to establish a spot and cash – settled derivative market for electricity in Great Britain.

These initiatives aim to substantially increase the liquidity of the market as GB cleared volumes remain modest in comparison to some European markets.

South Eastern Europe

Romania



Source : S.C. OPCOM S.A.

Wholesale electricity prices in Romania registered substantial falls in the fourth quarter of 2008 with the base writing off 40% of its value from the beginning of the period and the peak dropping 26 %.

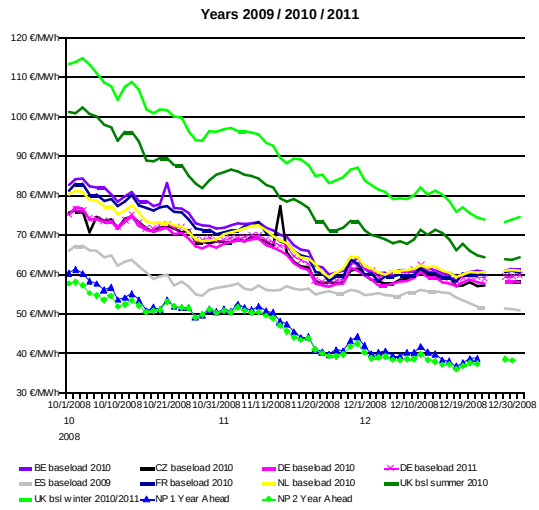
Market operators followed the general trends in energy commodity markets and concerns about the effects of the recession over the Romanian economy.

In June 2008 the Romanian and Hungarian TSOs *Transelectrica* and *MAVIR* have signed a letter of intent on launching a market coupling mechanism based on the principle of "two power exchanges, two bidding zones, one platform, one rulebook". *OPCOM* was confirmed as the tender winner to support *HUPX* in establishing a trading platform in Hungary. After finalizing the details of the contractual agreement, the two parties were expecting the decision of Hungarian regulator to grant a license to *HUPX*.

A.1.2 Forward markets

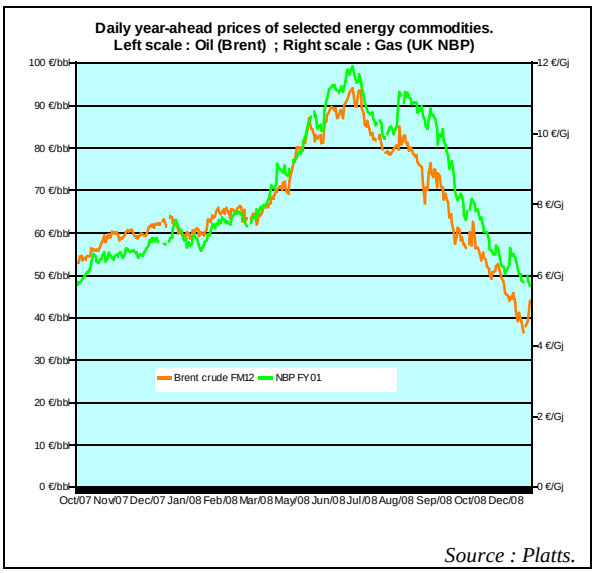
The prices of contracts for baseload delivery in 2009, 2010 and 2011 have been steadily oriented downwards across the European trading platforms.

A common pattern is emerging where UK seasonal contracts are on the top of the pricing list, then come Belgian, Czech, Dutch and French contracts evolving in a tight corridor around the German forward, then the Spanish contract for next year delivery and Nordpool contracts being the cheapest.



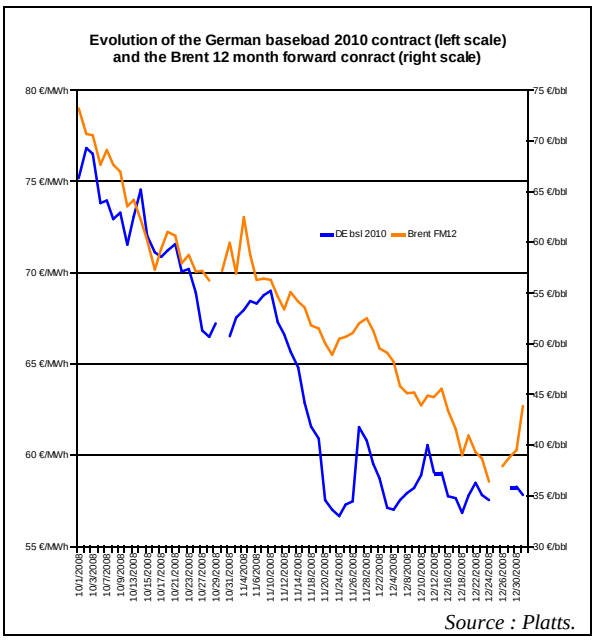
Source : Platts.

Market operators were attentive to news related to the worsening economic prospects. Bearish sentiment from the plunging energy commodity markets was feeding in the electricity forward curve.



Source : Platts.

By the end of 2008 the prices of future contracts for oil, gas and coal have lost more than 50 % of their value back in July 2008. Contracts were trading cheaper than a year ago as the markets reeled from the financial turmoil and the quick slowing down of all major economic regions in the world.

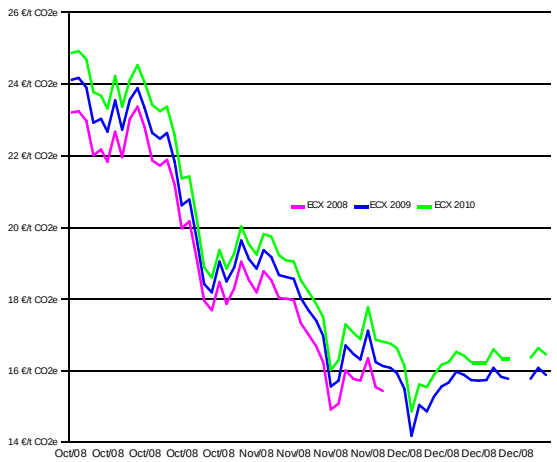


Source : Platts.

The German baseload price for 2010 and 2011 deliveries was following more closely the coal than the oil future price. Market operators seemed to agree that the future CIF ARA, an important driver for the German market, had a significant downward potential during Q4 of 2008.

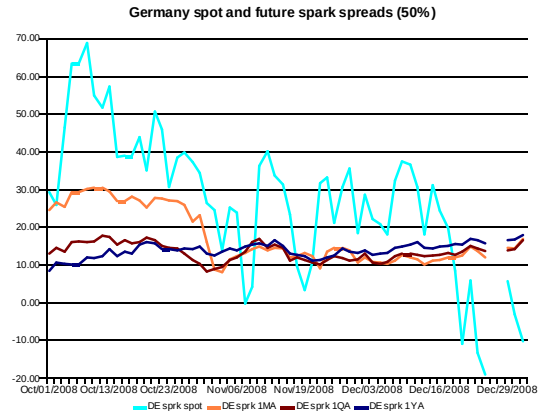
As freight tariffs kept on decreasing in the fourth quarter of 2008, coal was becoming an attractive option for power producers.

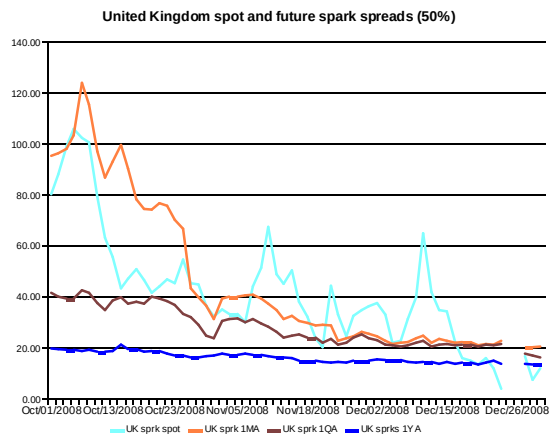
The prices of emission allowances have also experienced steep falls, losing approximately € 8 / tCO_2 in three months as operators were concerned that the falling industrial activity would impact the future demand for allowances. Some big energy players were also reported to sell allowances to ease up their liquidity positions.



Source : Platts.

The EU phase 2 trading scheme (ETS) accounts for more than 70 % of the global carbon market.





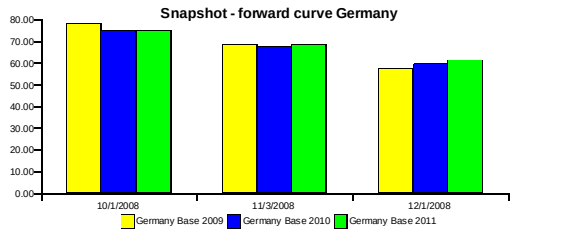
UK values are quoted in € using the €/£ daily exchange rate as reported by Platts

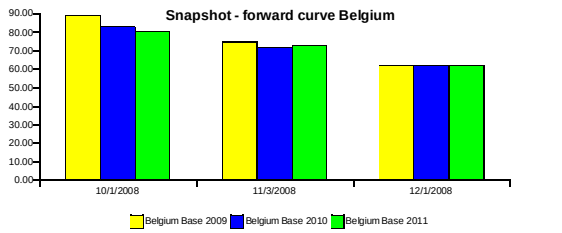
Source : Platts.

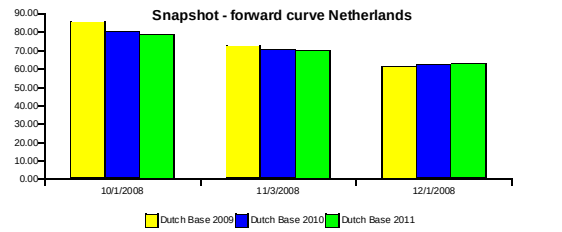
The future spark spreads on the far end of the curve were trading in the range of € 15 – € 20 / MWh for UK and € 10 – € 15 / MWh for Germany. The closer to maturity spreads was wider, especially in UK and in the beginning of the observed period.

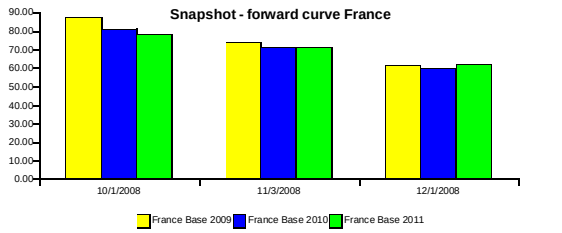
The forward curve on the selected European markets was looking much more stable (see next page). While the set of forward prices was steadily declining between October and December, the prices for different maturities stayed at close range, indicating that market operators were having difficulties to form an opinion

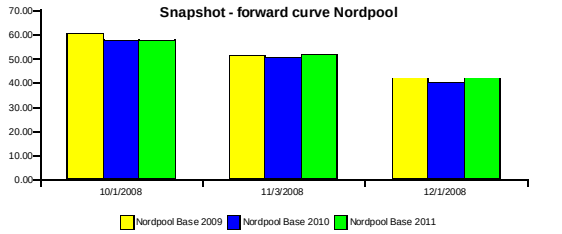
about the duration of the economic slowdown.

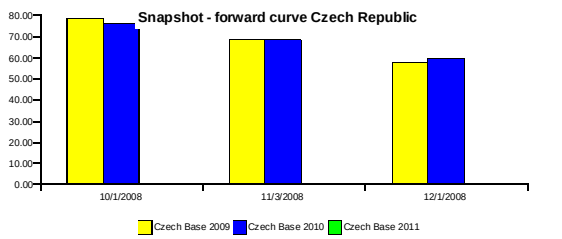










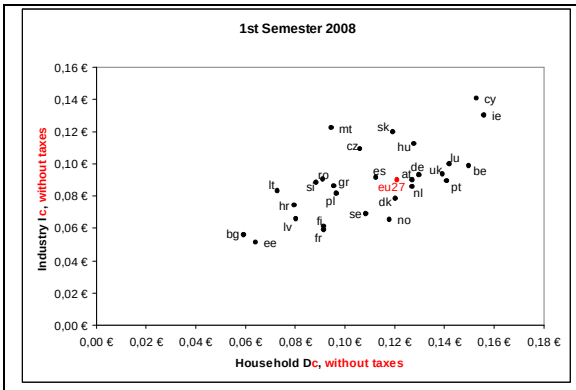


Source : Platts.

A.2 Retail markets

A.2.1 Prices by Member state

The following scatter plot represents the estimation of production cost, transmission and distribution charges for the median industrial and domestic consumer[13] in EU Member States based on the latest available data from Eurostat.



Source : Eurostat

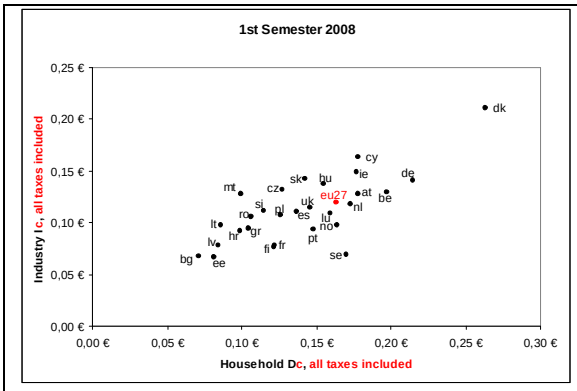
Range for annual consumption of :
Household band Dc : [2 500 kWh – 5 000 kWh] ;
Industry band Ic : [500 MWh – 2000 MWh]

Note. Data for Italy is not available

Adding the VAT and other non deductible taxes produces some notable modifications in the plot (see next page).

For example, the positions of Denmark and Germany change as both countries are applying strict environmental policies serving as incentives to end users to be more efficient in their use of electricity.

[13] Categories Ic and Dc.



Source : Eurostat

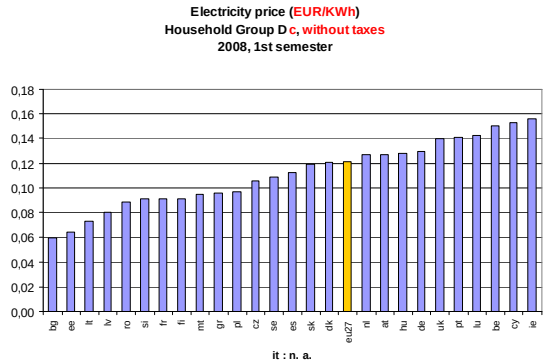
Range for annual consumption of :
Household band Dc : [2 500 kWh – 5 000 kWh] ;
Industry band Ic : [500 MWh – 2000 MWh]

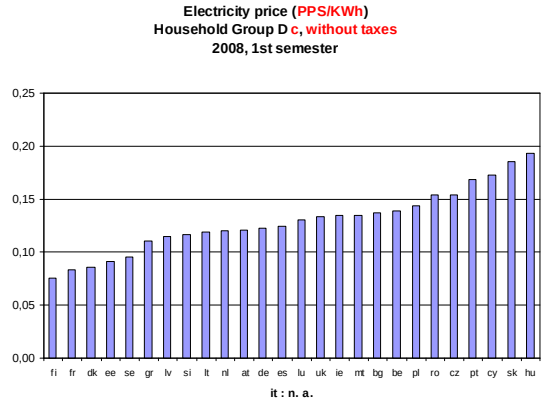
Note. Data for Italy is not available

A.2.2 Cross–panel data on household electricity consumption

The positions of Member States with respect to the price paid by households from category Dc differs substantially with respect to the counting unit. As a rule, New Member States are present both on the low end of the ranking by Euro and on the high end of the ranking by purchasing power standards.

Compared to the second semester of 2007, Member States with notable price decreases[14] for consumers from category Dc were: Romania (both in € and in PPS terms), Estonia, Bulgaria and Poland (expressed in PPS). The price[15] went up for Denmark and Sweden (expressed in PPS) and Latvia, the Czech Republic and Hungary (expressed in Euro).





Notes
1) Data for Italy is not available
2) Range for annual consumption of :
Household band Dc : [2 500 kWh – 5 000 kWh] ;
Industry band Ic : [500 MWh – 2000 MWh]
3) The purchasing power standards (PPS) data for all Member States is provisional.

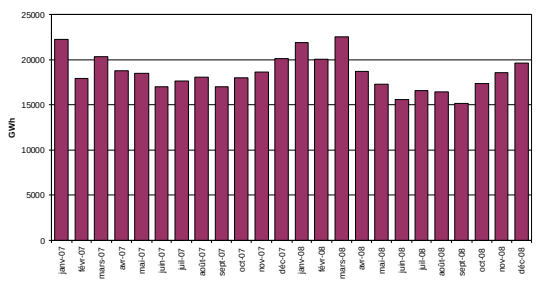
Source : Eurostat

[14] Not taking in account taxes.
[15] See the previous footnote.

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

Starting from December 2008, a new transmission line connecting the Romanian and the Hungarian grids was put in operation.

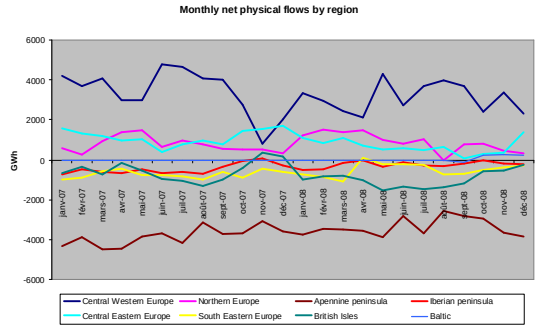
Construction works on the new 400 kV line connecting Croatia with Hungary have started in October 2008. *HEP-OPS* and *MAVIR*, the two neighbouring TSOs were expecting the work to be completed in 2009.



Source : ETSO.

Note. Data on IE, MT and CY is missing. Data on EE, LT and LV is available for 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.

In the months from October to December the cross border flows of electric energy have increased from 17 TWh / month to almost 20 TWh / month. However, the volumes were slightly lower than the ones recorded during the same months of 2007.



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*
Baltic	*EE, LT, LV*

Looking at the regional level, it seems that the growing inflows to the Italian system were compensated by a steady outflow from Central Western Europe, together with increasing exports from Central East Europe and a lesser import volumes to the British Isles.

Compared to the similar months of 2007, the Ukrainian exports were up by 10 % in October, by 30 % in November and by 35% in December. This evolution seems to indicate the dire effects of the recession on the Ukrainian economy.

C. *"Focus on … Smart meters"*

Smart meters are devices based on modern information and communication technologies, which enable more complex and real-time management of energy consumption. Smart meters allow not only remote meter reading (the AMR – Automatic Meter Reading concept) but also two-way communication (AMM – Automated Meter Management), thereby offering a wide range of information to distribution network operators, suppliers, metering companies and consumers for electricity demand management:

- smart meters can more accurately inform distribution network operators about losses and loads, hence the possibilities to efficiently manage the network are significantly improved;
- new pricing models make it possible to better manage the suppliers' portfolios, allowing also introduction of demand response products;
- meter reading is more accurate and labour costs for metering companies can be significantly lower than in the case of manual reading;
- consumers receive bills for the actual consumption which provides incentives for behavioural changes, and there are greater possibilities to develop smart(er) homes etc.

Although smart meters offer considerable benefits, their penetration has so far been moderate on the low voltage level. On the high voltage level they are used more widely. The energy sector needs more time to adapt, therefore smart meters are often viewed only as an additional feature which should fit in the grids as easily and as cheaply as possible without distorting the existing structures. However, the increasing share of intermittent electricity generation will necessitate development of modern grids with smart meters constituting an essential part of them. Moreover, once smart meters are incorporated into the grids they have the potential to inicentivise the consumption shift from peak hours and consequently reduce the need to invest into additional generation capacities to meet the peak demand. The preliminary estimations in Italy show a 4% shift of load out of the peak hours and the same result was achieved in the field trial of Puget Sound Energy, the utility of the State of Washington. Furthermore, results from trials in a number of Member States show that using smart meters, especially when combined with informative billing and customer feedback, can reduce final energy consumption by around 10 %.

The European Union has already taken legislative measures in order to promote smart meters. The Measuring Instruments Directive 2004/22/EC will facilitate the trade in measuring instruments in the internal market, which should make it easier for the meter producers

to sell their products. In the Directive 2006/32/EC on energy end-use efficiency and energy services, intelligent metering systems are considered as a measure to improve energy saving. Given their benefits, the European Commission is looking further into additional legislative promotion of smart meters, e.g. in the proposal for amending Directive 2003/54/EC concerning common rules for the internal market in electricity (COM(2007) 528 final). The proposal is a part of the Third legislative package on the EU energy markets and in Annex A paragraph (i) it calls for the right of the consumers to be "*properly informed every month of actual electricity consumption and costs*".

While many Member States are currently finalising roll out plans, three countries have so far made significant progress in the installation of smart electricity meters. In Italy the roll-out has already surpassed 85% of low-voltage consumers and should reach 100% by 2011. In Sweden all households will have smart meters as of 1 July 2009. In Finland 80 % of all consumption sites shall be equipped with smart metering by the end of 2013 (compared to the current level of 25%). The approach in these countries has been different. In Italy it is a direct consequence of the decision to install smart meters and thereby accommodate to the liberalised market. In Sweden on the other hand, it is a result of the legislation which requires monthly reading and invoicing based on real consumption for all residential customers from 1 July this year.

The assessment of the long-term impact of smart meters on actual end-use consumption remains one of the challenges for the future. There is also a need to develop a framework for sharing of good practices arising from different approaches and trials on smart metering.