Quarterly Report on European Gas Markets

Directorate-General for Energy

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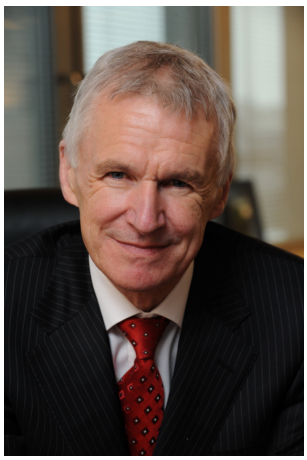
Director-General



Dear readers,

The third quarter of 2010 was a period of relative price stability for natural gas in most of the regions of the EU. While different pricing mechanisms continued to compete on the EU gas markets, hub prices remained cheaper relative to prices of gas under long-term contracts.

During the observed period an extended outage of an important pipeline delivering gas into Italy provided support for prices in Italy and in neighbouring Austria. It also influenced prices and supply in Northern European markets. The spot price differences on the Belgian, UK, Dutch, German and French hubs evolved in a relatively tight range of 18 to 20 €/MWh.

Parallel to increasing price convergence of European hubs, a clear decoupling with the US Henry Hub spot prices could be observed as more LNG was reaching European shores. This development provided additional supply to spot gas traded on the hubs and contributed to a generally well supplied European system.

The "*Focus On*" topic of the current report sheds more light on the challenges and opportunities facing owners and operators of LNG vessels. It describes the process of transporting the molecules of natural gas from the liquefaction plant in the exporting country to the regasification terminal in the importing country.

Philip Lowe

HIGHLIGHTS

- A decoupling between the US Henry Hub spot and European hub spot prices could clearly be observed in Q3 2010. Increased production of gas in the US, lessening the need for imports of LNG, has meant that more LNG has been available for the European markets instead, providing additional supply to spot gas traded on the hubs, and contributing to a generally well supplied European system.

- The price convergence among Northern hubs was at times very tight during the quarter, with less than 50 eurocents per MWh separating the day-ahead price of the Belgian, UK, Dutch, German and French hubs on certain days.

- Throughout the third quarter of 2010, European hub spot prices were affected by the outage of the Swiss Transitgas pipeline which carries gas from North Western Europe to Italy, due to a landslide. This deprived Italy of 17% of its total imports of natural gas. The availability of this gas in other parts of Northern Europe contributed to the stability of spot prices there during the quarter. On the other hand, the squeeze on supply as a consequence of the outage put further pressure on prices in Italy and, to a lesser extent, Austria.

New feature

- This issue of the Quarterly Report on European Gas Markets presents for the first time market specific comparisons between hub spot prices, spot LNG prices and border prices of piped gas, generally considered to be representative of long-term oil-indexed gas contracts. Across Northern European markets, it could be observed that hub and LNG spot prices tended to be cheaper than border prices. In the third quarter, differences of as much as 60% could be observed in prices between average quarterly hub spot prices and border prices for gas in the EU.

QUARTERLY REPORT ON EUROPEAN GAS MARKETS

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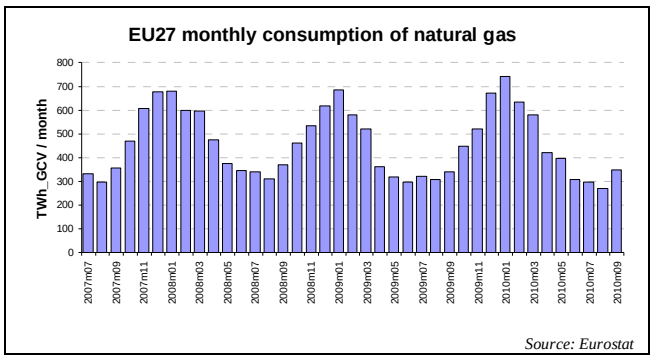
A. Recent developments in the gas markets across Europe

A.1 Gas consumption, production and imports

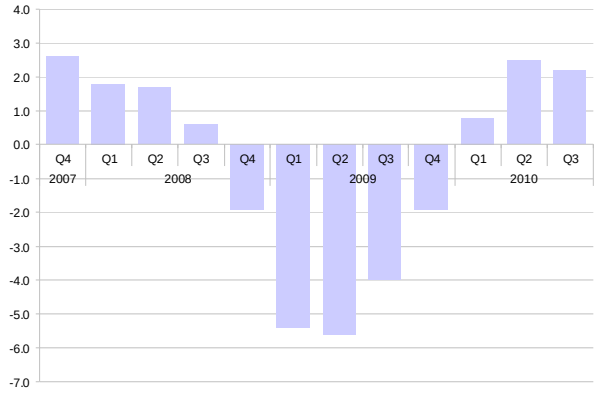
2010 third quarter EU gas consumption equalled 916 TWh, much below the third quarter consumption levels recorded in the two previous years of 968 TWh in 2009 and 1,020 TWh in 2008. This was due to particularly low levels of consumption recorded in the months of July and August, with August representing the lowest monthly consumption level since the start of the economic crisis.



Source: Eurostat

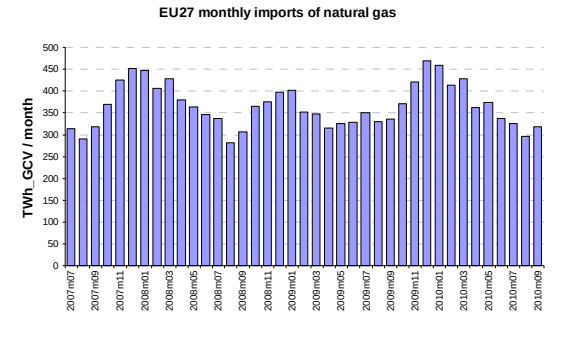
After good second quarter growth levels - of 15% year on year - which were accompanied by a second quarter of positive year on year growth in EU GDP (after five successive quarters of negative growth), this subdued level of consumption

came along with slightly lower GDP growth for the third quarter, compared to the previous quarter (see chart below).



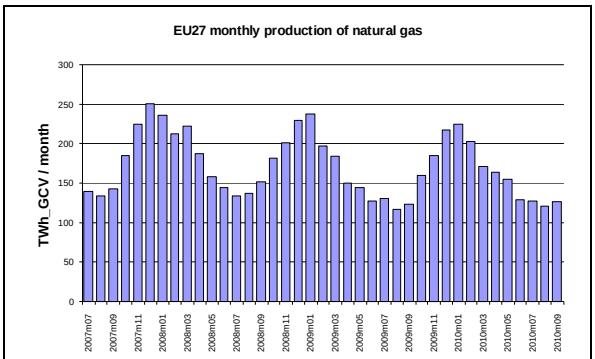
Source : Eurostat.
Selected Principal European Economic Indicators
** Gross domestic product (GDP) at market prices is the final result of the production activity of resident producer units. It is defined as the value of all goods and services produced less the value of any goods or services used in 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.*

The picture for EU imports of natural gas was only slightly different from consumption, with levels for the third quarter (of 939 Twh) being much below the equivalent quarter of the previous year (1,016 Twh) but slightly above Q3 2008 (927 Twh). Import levels exceeded consumption as gas storages were being replenished in preparation for the high demand of the winter season.



Source: Eurostat

Third quarter 2010 levels of gas production in the EU were on a par with levels recorded in Q3 2009, but quite a bit lower than production in equivalent quarters of 2008 and 2007, revealing of the continued downward trend in EU gas production.



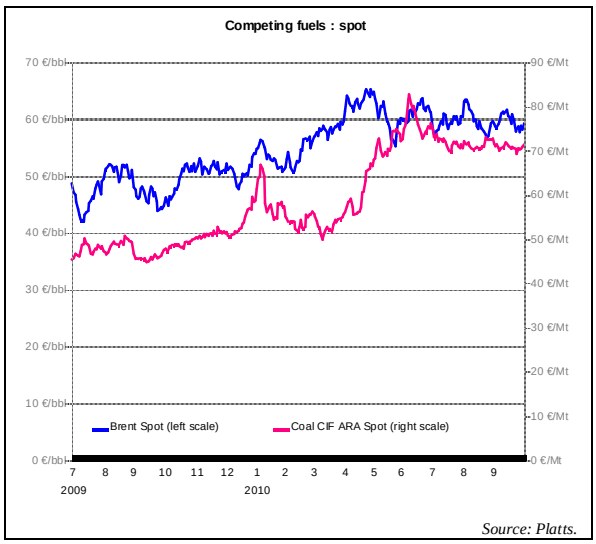
Source: Eurostat
Monthly imports for Portugal (April – June 2010) are estimated based on GDP data for the second quarter of 2010 from Eurostat's Principal European Economic Indicators.

A.2 Wholesale markets

A.2.1 EU spot gas markets

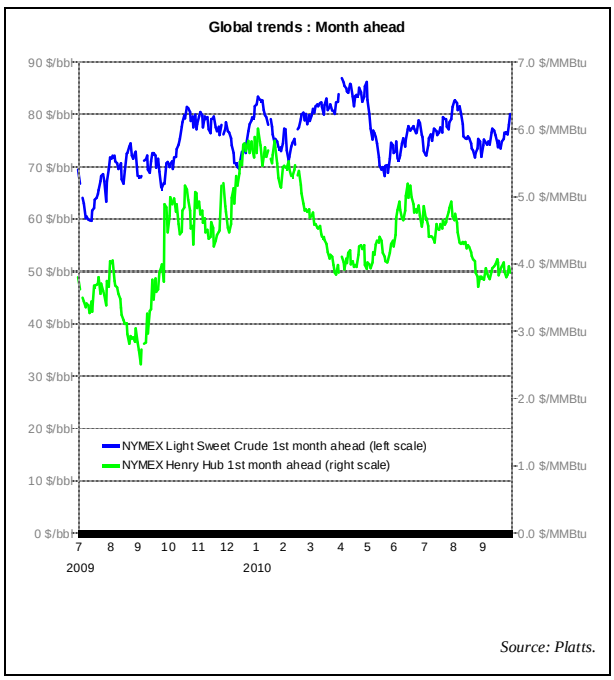
A.2.1.1 Overview

The price of Brent in the EU flattened out and remained relatively stable in the third quarter, as was indeed the case for coal. Priced in US dollars, Brent increased (from just above $70/barrel to just below $80/barrel), though this was largely absorbed by a continuously rising Euro relative to the US dollar, explaining the flat prices in Euros.



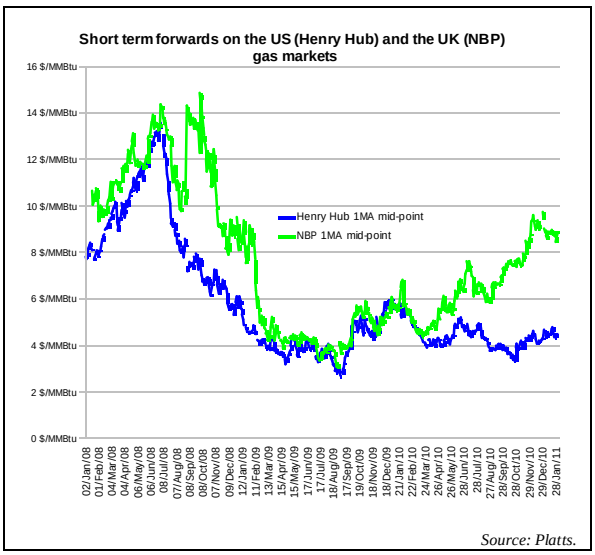
Source: Platts.

Comparing month-ahead developments in NYMEX crude and gas prices in Q3 2010, it can be seen that while the former remained relatively stable, Henry Hub gas experienced a reversal of earlier gains from the previous quarter possibly due to ample US gas supply.



Source: Platts.

The steep downward trend which the Henry Hub followed in Q3 2010 was quite different from price developments on European hubs. While in the past, the UK NBP might have more closely followed the trajectory and level of the Henry Hub in order to compete for the Atlantic LNG market, it has been taking a different direction in the past year. The decoupling of the UK NBP and US Henry Hub prices can be observed in the next graph.

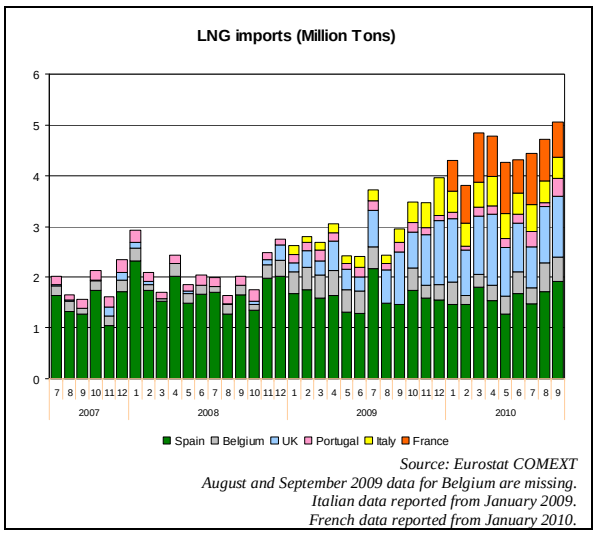


Source: Platts.

The growth of natural gas production in the US is among the reasons for this decoupling. It resulted in a reduction of demand for imported LNG. This has meant that more LNG has been available for the European markets, providing additional supply to spot gas traded on the European hubs.

Volumes of LNG imports into Europe are reported in the next graph. Though the height of the bars is not directly comparable as data for some countries has not been available for the whole period, it can be seen for countries such as Italy, Belgium, UK and Portugal that the volume

of imports of LNG has grown steadily in recent times.

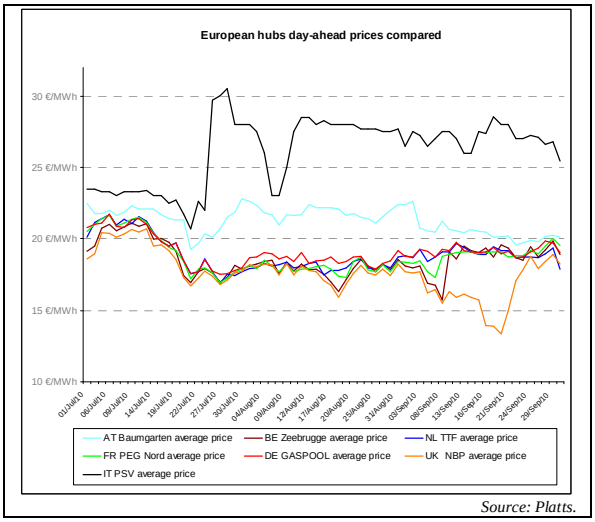


Source: Eurostat COMEXT
August and September 2009 data for Belgium are missing.
Italian data reported from January 2009.
French data reported from January 2010.

The 'Focus On' section of the current report provides a closer look at the challenges and opportunities facing the construction, ownership and operation of LNG carriers in meeting the growing expectations of producers and consumers of natural gas.

The price of UK spot gas could also increasingly be determined by demand from other EU countries, attracted by the relatively liquid NBP. The UK hub seems to be considered an attractive alternative to the oil-indexed, long-term, LTC gas contracts more typical of the European mainland. UK gas day-ahead has even proven attractive compared to other European day-ahead markets, being frequently available at a discount to these markets.

After recording impressive gains in the second quarter, price developments across European hubs in the third quarter included an initial fall in July, followed by two months of relative stability, with some individual cases of high price volatility across short periods.



Source: Platts.

There was on the one hand the usual group of Northern hubs[1] trading in a very tight price range, and on the other hand Italy's PSV, trading at a significant premium to the rest, and Austria's Baumgarten, which after seemingly evolving in a more PSV-like fashion in the second quarter, appeared to 'rejoin' the other European hubs in terms of price level and trend in the second quarter.

Looking at the Northern hubs, and not including a dip during September in the UK, these traded in a price range of between 15.9 and 21.7 €/MWh in Q3 2010. The period started in a €20 to €21 per MWh price range, and ended in a €18 to €20 per MWh price range.

The convergence of hubs was at times very tight, with less than 50 eurocents per MWh separating the day-ahead price of the

[1] Including the UK's NBP, Belgium's Zeebrugge, Netherland's TTF, Germany's Gaspool and NCG and France's PEG Nord.

Belgian, UK, TTF, German and French hubs on certain days.

European hub spot prices which were primarily driven higher in the second quarter by high amounts of refilling of gas storages after a cold winter and a tight supply situation, were therefore still high relative to the same period a year earlier.

Spot prices in the third quarter were maintained at high levels in part due to continued refilling of storage levels, as the second quarter ended with relatively modest storage levels (see section B on storage for more details).

One event occurring at the end of July had an effect on prices across Europe for the remainder of the quarter, namely the outage of the Swiss Transitgas pipeline which carries gas from NW Europe (i.e: from the Netherlands and Norway) across Switzerland to Italy, due to a landslide. It is an important source of gas into Italy, representing 17% of Italian imports of natural gas.

As a result of this outage, a substantial amount of gas that normally would have traded through the Italian PSV platform is likely to have made its way to the French market. It also meant that no volumes could pass through the pipeline's German-Swiss border point at Wallbach, with gas being stuck in Germany and thus available for consumption in German and other neighbouring markets such as the Dutch TTF, and depressing prices in these markets in the process.

Austria was also affected by the outage as it represents a vital supply route to Italy. This led to a widening of the price gap to Germany from the end of July as lack of supply to Italy via Switzerland called for larger supplies from Austria. Increased utilisation of the interconnector between Austria and Italy had the effect to support prices in Austria while excess gas in Germany, as gas originally destined for Italy boosted supplies, put downward pressure on prices there.

The effect of this outage was in fact more extensive, also influencing prices on the UK and Belgian hubs, as the Transitgas outage meant that Interconnector gas from the UK into Belgium was not needed as much by other mainland markets, thus reducing Interconnector flows.

This incident had a lasting influence on prices throughout the quarter as there was continuous speculation on the time when the problem would be resolved and flows would resume. Initially, the outage was expected to be relatively short-lived. Eventually, it became clear that it would be a much longer-term affair and indeed it persisted throughout the quarter and beyond.

Coming back to the evolution of European spot prices during the third quarter, after a period of close convergence between hubs, the UK experienced a downward trend that began at the beginning of September and reached a bottom three weeks later when the UK day-ahead traded at 13.3 €/MWh. This is commented further in the UK section.

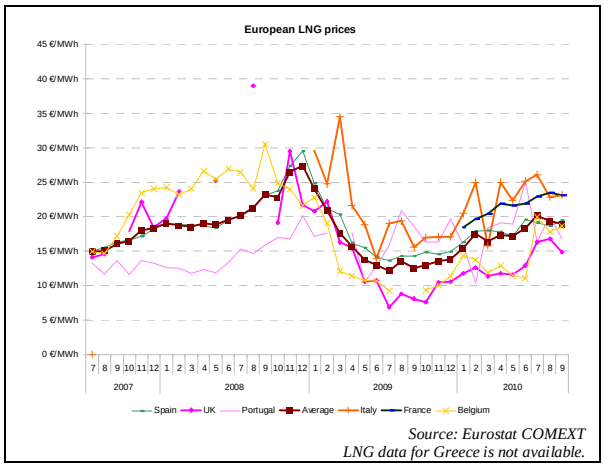
The beginning of September was also a period of weakness in prices for continental hubs, resulting from a return from three weeks of maintenance outage of Norway's Karsto plant which sends gas to

the continent not only through the Langeled pipeline (UK) but also other continent bound pipelines and the planned (three day) outage of the BBL pipeline sending gas to the UK from the Netherlands, therefore making this gas available in mainland Europe instead of the UK.

A.2.1.2 Gas contracts and pricing mechanisms

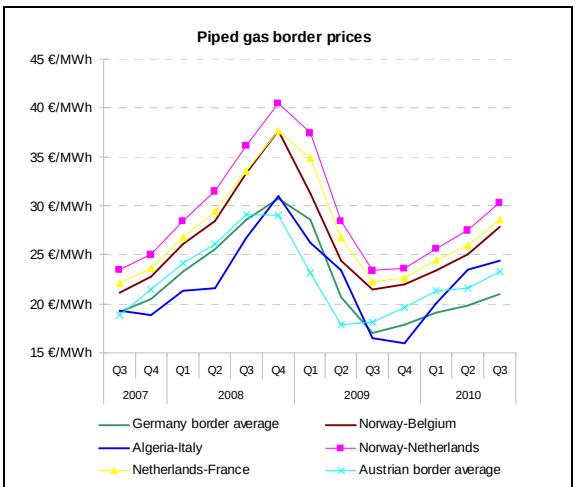
In contrast to spot hub prices, monthly average spot LNG prices in the EU for the Q3 2010 period revealed a price range of between 14.9 and 23.4 €/MWh and an average price of 19.5 €/MWh for the period.

While the average spot price paid for LNG deliveries in Europe in Q3 2010 was similar to what was paid on average on European hubs for spot piped gas, the variability in LNG price was greater.



Source: Eurostat COMEXT
LNG data for Greece is not available.

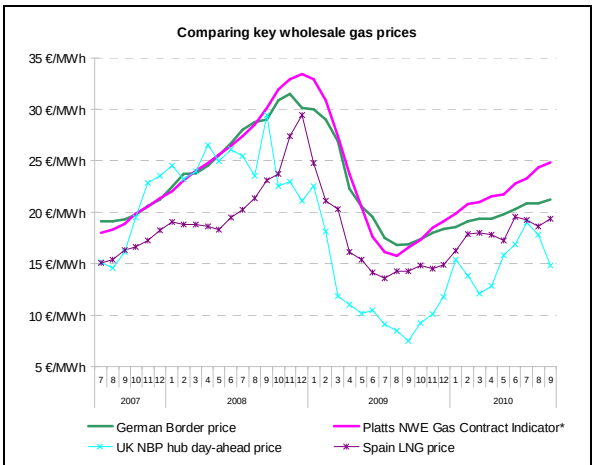
Looking at a selection of border prices for piped gas in Europe also reveals a fairly broad range of prices in comparison to spot gas prices, with no apparent outliers. Focussing on Q3 price data and on the selection shown in the graph below gives an average price of 25.9 €/MWh for the quarter, from a range of between 21 and 30.3 € per MWh.



Sources: Gas Strategies, German Federal Office of Economics and Export Control (BAFA)

Note that border prices are estimations of prices of piped gas imports paid at the border, based on information collected by customs agencies, and is deemed to be representative of long-term oil-indexed gas contracts.

The graph below plots together a selection of different wholesale price contracts for natural gas in Europe.



Sources: Eurostat COMEXT, Platts, German Federal Office of Economics and Export Control (BAFA)

Note that border prices are estimations of prices of piped gas imports paid at the border, based on information collected by customs agencies, and is deemed to be representative of long-term oil-indexed gas contracts.

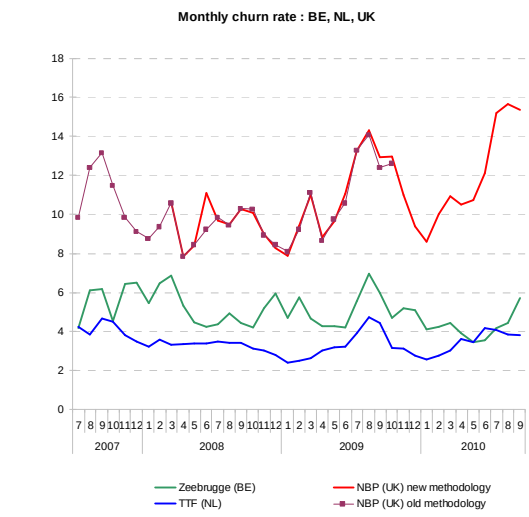
On the basis of the information conveyed in the preceding graphs, it can generally be said that prices for spot gas on European hubs in Q3 2010 were generally cheaper and less variable than either spot LNG or border prices for piped gas.

The comparison of wholesale gas prices reveals that the hub-traded NBP day-ahead gas has been on the whole continuously cheaper than other gas since the third quarter of 2008, while LTC gas as represented by the Platts NWE Gas Contract Indicator (GCI) has typically been more expensive than other types of gas.

Average German border price has been priced close to the Platts GCI until late 2009 when the latter has continuously exceeded it. In contrast, the price of LNG as represented by LNG deliveries to Spain has been dearer than hub-traded spot gas since 2008 but cheaper than both the Platts CGI and the German average border price.

The relatively low levels of spot LNG gas prices in comparison to imported piped gas prices may well have contributed in turn to the relative attractiveness of UK gas prices in comparison to other European hubs (given the high levels of imports of LNG gas in the UK), and the consequent high flows out of the UK through the Interconnector pipeline into Belgium and on to other European markets, which has been apparent recently, especially in the second quarter.

With regard to liquidity, developments in the third quarter of 2010 did no bring about significant changes in terms of the churn rates[2] of either the Belgian or the Dutch hubs. The UK NBP did however experience an increase, achieving a churn rate averaging upwards of 15 for the quarter, compared to a usual range of between 8 and 10. This represented a continuation of the rising trend of the previous quarter, and was due to the fact that the total level of UK traded volumes remained relatively constant since the previous quarter, while that of physically delivered volumes fell quite significantly (by 21%), leading to a higher churn rate. Such an increase in the churn rate can be expected for a hub which experiences quite marked seasonal variations in physically delivered volumes along with more constant levels of total energy traded.



Sources: Huberator (BE), Gas Transport Services (NL), National Grid (UK), Platts. The definition of the UK churn rate was modified as from November 2009. Following a change in the volume categories reported by National Grid, the new churn formula uses daily nominations instead of throughput. For comparison both churn rates are reported in this issue.

[2] The churn rate is an indicator of the liquidity of a market/ hub. It represents the ratio between the total volume of trades and the physical volume of gas consumed in the area served by the hub.

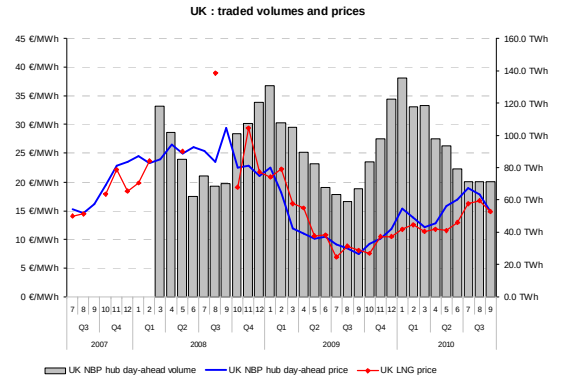
A.2.1.3 Regional markets

North-Western Europe

United Kingdom

Third quarter volumes on the UK's National Balancing Point (NBP) averaged 71 TWh per month, remaining flat across the quarter. In comparison, monthly volumes in the previous quarter averaged 90 TWh. In contrast in the previous year, the average monthly volume traded on the exchange in the third quarter averaged 64 TWh. Thus while total third quarter volumes fell in comparison to the second quarter (by 21%), they increased by 11% year on year.

While volumes remained stable throughout the quarter, NBP spot prices followed a downward trend. After having risen from average monthly levels of 12.8 €/MWh to 16.9 €/MWh in the second quarter, NBP spot prices reached an average monthly 18 month high of 18.9 €/MWh in July before receding to a monthly average of 14.8 €/MWh in September 2010.



Sources: National Grid (UK), Platts, Eurostat COMEXT.
Following a change in the volume categories reported by National Grid nominations are used to present the monthly volumes instead of physically delivered trades.

This compares to prices for UK deliveries of LNG which reached a quarterly high of 16.8 €/MWh in August 2010, and which also followed a downward trend, though lagging by one month the price of UK spot hub gas. Looking further back in time, prices paid for LNG deliveries in the UK have tended to be close to, and since the fourth quarter of 2009 have been less than, UK NBP day-ahead prices.

Strength in prices in early July was maintained due to a tighter supply situation, in spite of lower demand, with fewer than expected LNG cargoes from Qatar coming into the UK, a result of unexpected maintenance of Qatari LNG plants. Continued supply issues with regard to Norwegian gas in July also affected imports into Europe, adding to the supply pressures.

Supply constraints coupled with relatively high prices even led to storage withdrawals being made in June through to mid-July in the UK, high spot prices providing an incentive to withdraw as expectations of lower quarter-ahead prices (see forward section) meant that it was relatively cheaper and therefore more economical to resort to storage gas in the immediate to meet demand.

During the second half of July though, prices receded as demand fell back and as deliveries of LNG from Qatar increased following restarting of plants which had been halted for maintenance. This in fact had an influence across European hubs, which all experienced quite important price movements downwards over the course of a few days in July.

In August, UK gas supply was also boosted by increasing LNG flows. This contributed to keeping UK prices relatively low.

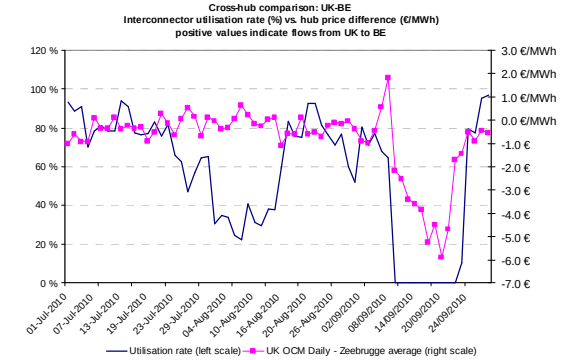
Further weakness in prices in September possibly came as a result of falling demand. The planned shut-down of the Interconnector, flowing gas from the UK to the continent, for a period of two weeks (between the 9th to the 24th) prevented exports to the continent. The closure of the UK's mid-range (Rough) storage facility during the same period, also for maintenance, meant that it was closed to injection, further reducing demand.

There were little price differences between NBP and the Belgian Zeebrugge hub for most of the third quarter with the exception of the two-week period in September when the Interconnector was shut down. During that period, UK prices were much reduced relative to Belgian hub prices, but the price differential was again on average close to zero after the outage period (see graph below).

The Dutch-UK BBL pipeline which, unlike the Belgian-UK Interconnector, is uni-directional and only flows gas from the Netherlands to the UK, was also out for three days in September for scheduled maintenance, between the 6th and 9th of September. In spite of this however, the price of gas decreased (by 7.6% the day of the shutdown) due to a sufficiently supplied system.

But UK prices recovered quickly after that period, registering daily growth of 12.8% and 15.4% over two consecutive days (21st and 22nd of September 2010), and ahead of the planned return of the Interconnector and Rough storage.

After a second quarter of increasing utilisation of the Interconnector due to lower UK prices supporting exports of gas into the continent, the third quarter was a period of very varied utilisation. The dip in utilisation in late July and August might have been the consequence of the Transitgas outage, as there was a reduced need from Northern Europe for UK gas. In September, the utilisation rate went to zero as the Interconnector went into its two-week planned maintenance shutdown.

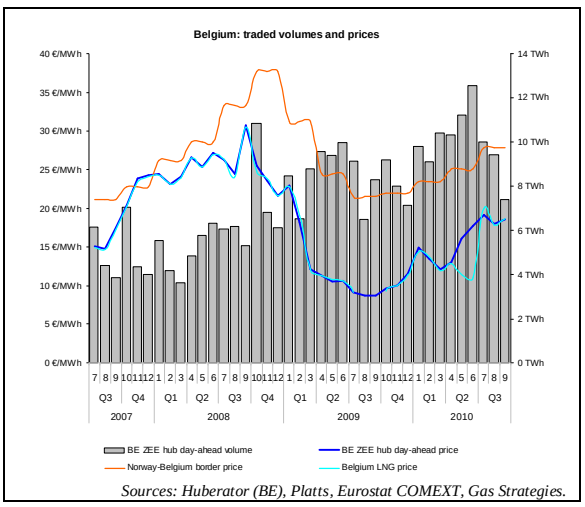


Sources: Interconnector, Platts
Note: there was a two week planned outage between the 9th and 24th of September 2010, which explains utilisation rates falling to zero during that period in the graph above.

Belgium

Third quarter traded volumes at the Belgian Zeebrugge (ZEE) gas hub were much reduced from the levels attained in the previous quarter (-21%), as temperatures increased and as the UK prices increased to match continental levels, thereby lessening Interconnector flows into Belgium from the UK.

Prices on the Belgian hub however remained relatively stable throughout the quarter, averaging 19.2 €/MWh in July and 18.6 €/MWh in September (and 18.6 €/MWh also for the quarter). This represented a period of relative stability after growth of 48% in prices between March and June 2010, as reported in the previous issue. The average price of 19.2 €/MWh recorded in July did however represent not only an increase on the previous quarter's monthly average price of 17.8 €/MWh, it also exceeded average monthly prices recorded since the beginning of 2009.

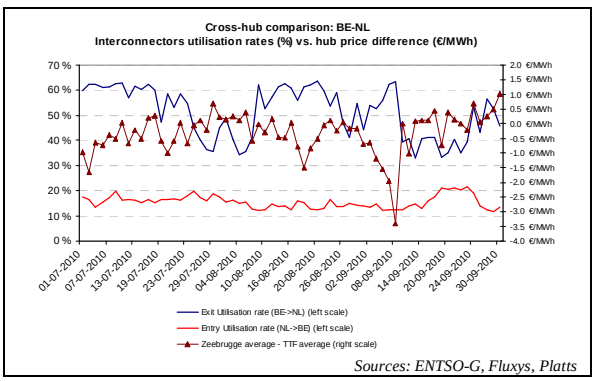


Sources: Huberator (BE), Platts, Eurostat COMEXT, Gas Strategies.

In comparison to Belgian hub spot prices, spot LNG prices which had been falling in the previous quarter and which had been inferior to hub spot prices by some margin (averaging 11.8 €/MWh over the second quarter compared to 15.6 €/MWh for spot gas), caught up very rapidly by July, even exceeding hub spot prices (reaching 20 €/MWh), to then stay on par with hub prices for the remainder of the quarter.

Both hub spot and LNG prices were however far lower than piped Norwegian gas to Belgium, which averaged 27.8 €/MWh over the third quarter. While trends in different gas prices have been similar, the border price for Norwegian gas was at times more than twice the spot price for gas in Belgium in 2009, while in 2010 so far it has exceeded spot price by 60% on average.

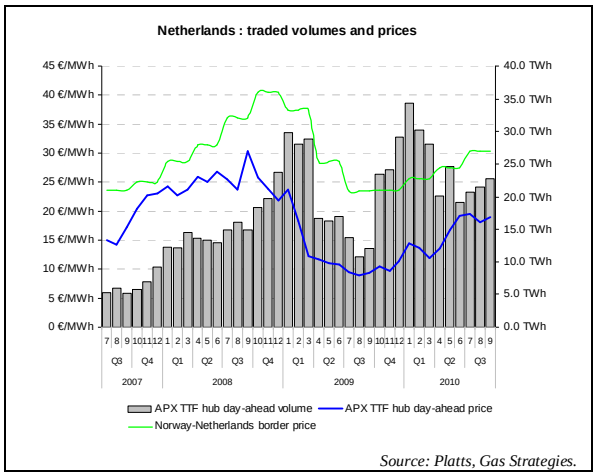
Comparing the Belgian hub to the Netherlands TTF hub, it can be observed that the price differential was very variable, with frequent reversals of the relative position of one market trading at a premium or discount to the other. On the whole however, the price difference between the hubs was rarely larger than 1 Euro. The utilisation of gas flows from Belgium to the Netherlands was also very erratic though ended the quarter at lower levels than at the beginning. Flows of gas from the Netherlands to Belgium remained low relative to capacity and constant.



Sources: ENTSO-G, Fluxys, Platts

Netherlands

On the Dutch TTF hub, monthly volumes of gas traded increased progressively throughout the third quarter in contrast to volumes on the Belgian hub. Overall, 65 TWh of gas were traded on the Dutch hub in the third quarter, an equivalent level to the previous quarter, and 78% more than was traded in the third quarter of 2009.



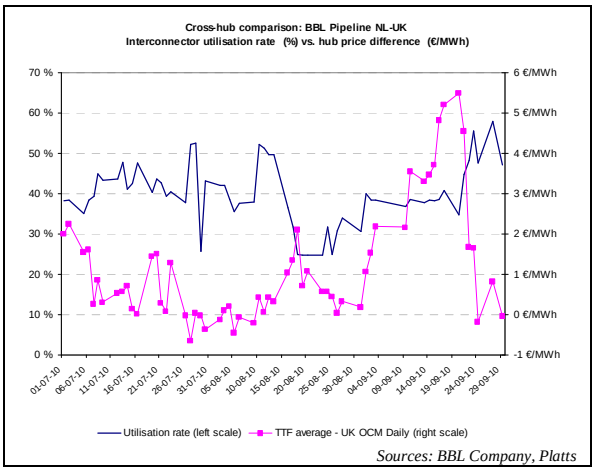
Source: Platts, Gas Strategies.

Spot prices followed the same trend to that noted for the Belgian hub, initially registering an increase from the previous quarter and then receding somewhat and on the whole remaining relatively stable. The quarterly average of the monthly prices for the hub was 18.9 €/MWh (compared to 18.6 €/MWh for Belgium and 17.2 €/MWh for the UK).

As with the Belgian hub, this compares favourably again to border prices, with the average Q3 price for Norwegian gas piped into the Netherlands exceeding the average monthly spot price over the quarter by more than 11 €/MWh. The same observation can also be made as the Belgian market, namely that throughout 2009 and 2010 to date, the Norway-Netherlands border price has greatly exceeded the day-ahead price available on the TTF hub (on average by over 100% over that period).

Comparing the TTF price to that of the NBP reveals that the Dutch hub traded on average at a premium of no more than 1 Euro for most of the quarter with the exception of the first three weeks of September which coincided with preparation for, and actual planned shut-down of the Belgium-UK Interconnector.

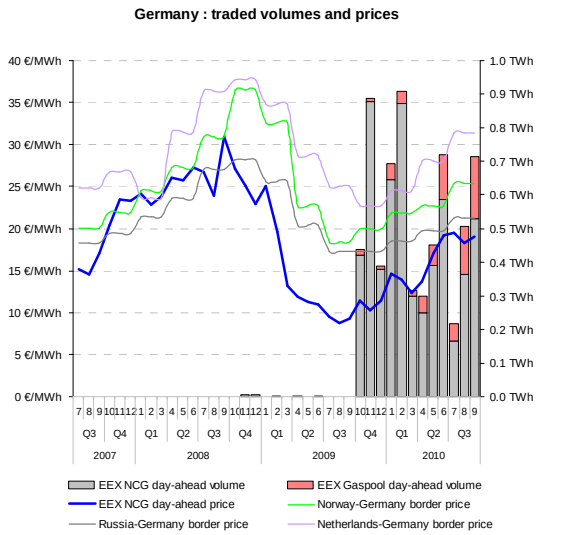
At the same time, the utilisation rate of the BBL pipeline, flowing gas from the Netherlands to the UK, remained relatively stable during the period of the outage, and then increased to upwards of 50% at the end of the quarter. Note that the BBL pipeline being only unidirectional from the Netherlands to the UK, it could not be used to relieve falls in supply to the continent from the UK due to the Interconnector outage. Note in addition that while this is not conveyed in the chart below, the BBL pipeline was out for scheduled maintenance for three days between the 6th and 9th of September.



Sources: BBL Company, Platts

Germany

Combined volumes on Germany's NetConnect (NCG)[3] and Gaspool[4] hubs for Q3 2010 amounted to 1.44 TWh, in line with the previous quarter, and below the first quarter (which recorded 1.92 TWh).

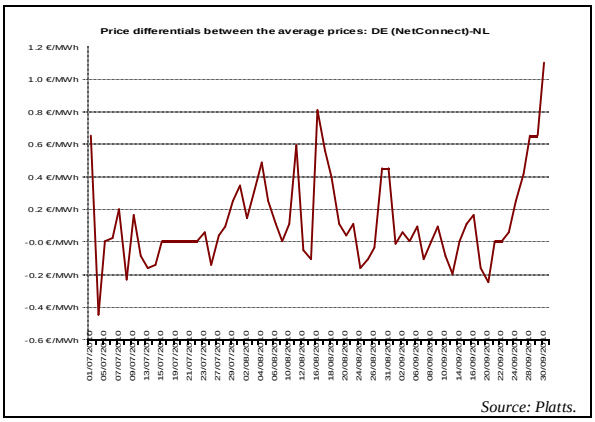


Source: Platts, Gas Strategies.

NCG hub day-ahead prices continued to experience the same trend as that reported for the other continental European hubs such as Belgium and the Netherlands, i.e: after increasing significantly in the second quarter, NCG prices continued to increase in July but then levelled off a little and remained relatively stable for the remainder of the quarter. With an average quarterly price based on monthly prices of just below 19 €/MWh, the NCG also recorded the highest price since the first quarter of 2009, and matched the average TTF price for the quarter, itself higher than the UK and Belgian hub day-ahead prices.

Comparing the German spot evolution to the Dutch hub spot price (see graph further below) for the third quarter shows that the German price was slightly above the Dutch price for most of the quarter but that the variability rarely exceeded 1 Euro and most typically was less than 50 Eurocents.

A number of German border prices are plotted in the graph above alongside the NCG spot price, and it can be observed that, similar to other hubs, these are all in excess of the spot price traded on the hub. It is interesting to note however that there is a great deal of variability between the border prices of gas delivered to Germany. Thus it can be seen that throughout 2009 and for most of 2010, German border prices for gas from the Netherlands have exceeded border prices for gas from Norway by 20% on average and border prices from Russia by 39% on average.

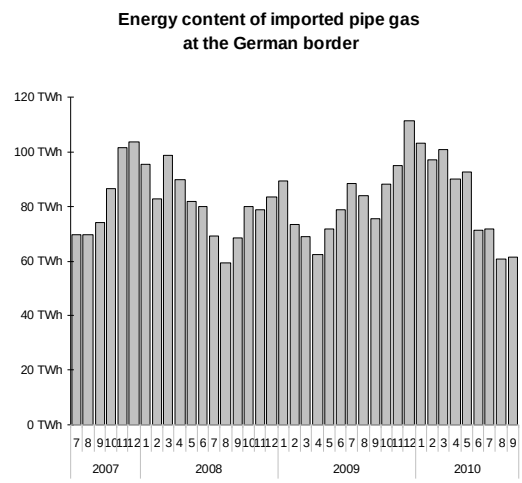


Source: Platts.

The graph below shows the evolution of imported pipe gas at the German border. Energy content for the third quarter of 2010 was lower than the one observed in the equivalent quarter of 2009 (by 16%),

[3] NCG is formerly known as *E.ON Gastransport (EGT)*.
[4] Gaspool is formerly known as BEB. The new market area started on the 1st of October 2009.

though exceeded Q3 2008 levels by 6% and nearly matched 2007 levels. This downward trend mirrors to some extent that of German gas consumption, which in Q3 2010 was significantly less than the equivalent quarter in the three previous years.



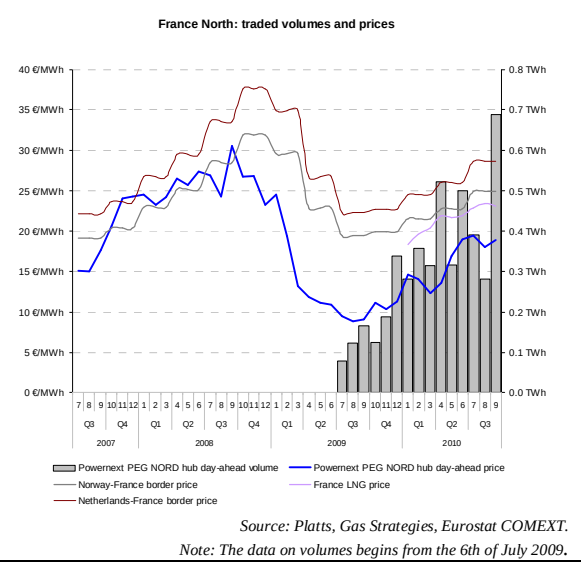
Source: Federal Office of Economics and Export Control (BAFA)

France North

France's Point d'Echange de Gaz (PEG) Nord experienced a surge in volumes traded on the last month of the third quarter, when 0.69 TWh of gas was traded, exceeding the largest monthly average previously recorded (of 0.52 TWh) by some margin, though remaining very modest if compared to other hubs such as the UK, the Netherlands or even Belgium.

Day-ahead prices on the Northern French exchange also followed the same pattern of other continental hubs, reaching a 2009/2010 to date monthly average high (of 19.5 €/MWh), and registering a quarterly average (of 18.9 €/MWh) also in line with day-ahead prices on the other continental European hubs. Indeed, the average is close to that on the Belgian hub for the quarter (18.6 €/MWh), though some notable yet relatively short-lived differences of usually not more than 1 Euro could be observed at times during the quarter between the two hubs (see second graph below).

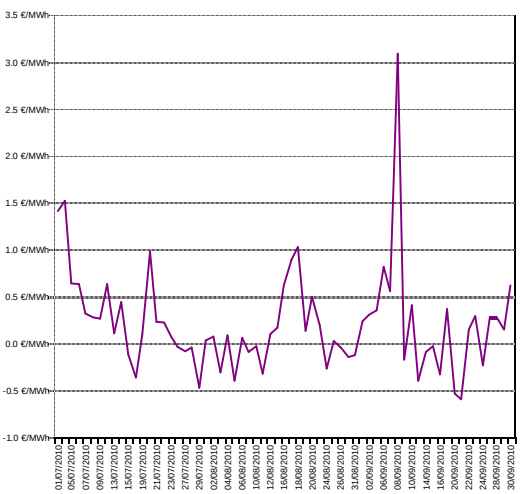
The PEG Nord usually trades at a premium to the Belgian ZEE, but there were times when it traded at lower prices, which could have been due to gas originally intended for Italy through the Transitgas pipeline, which remained out of action during the third quarter, being available for consumption in France instead. This even cancelled out the effects of ongoing maintenance on the French system during July and August which should normally have lifted PEG Nord prices



Source: Platts, Gas Strategies, Eurostat COMEXT.
Note: The data on volumes begins from the 6th of July 2009.

The story is again similar to other hubs on the PEG Nord hub with regard to the relative levels of various contract gas prices and the price of hub spot gas; thus PEG Nord day-ahead traded at a much

reduced level to either Norwegian or Dutch-French border prices, while the price of LNG, though cheaper than border prices, still exceeded spot prices by some margin. French LNG spot prices in the third quarter of 2010 traded well above the hub spot price, averaging upwards of 23 €/MWh compared to the quarterly average reported above for PEG Nord spot of just below 19 €/MWh. In comparison to Belgian LNG prices, which averaged 18.8 €/MWh over the quarter, French LNG prices were quite considerably dearer.



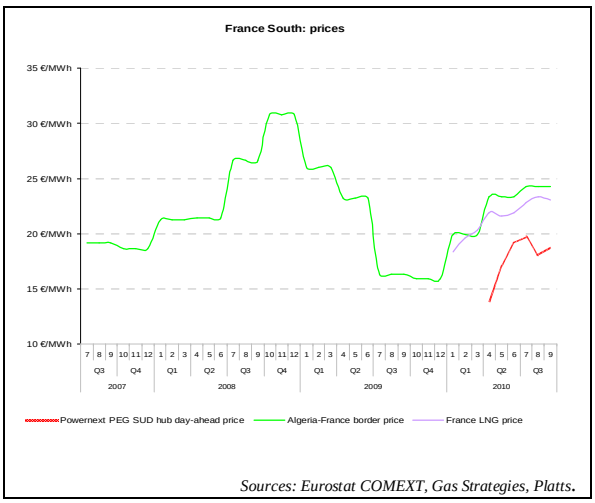
Source: Platts.

South-Western Europe

France South

Day-ahead prices on France's Point d'Echange de Gaz (PEG) Sud, only available since April 2010, followed the same trend as prices on PEG Nord, usually trading at a slight premium to the latter.

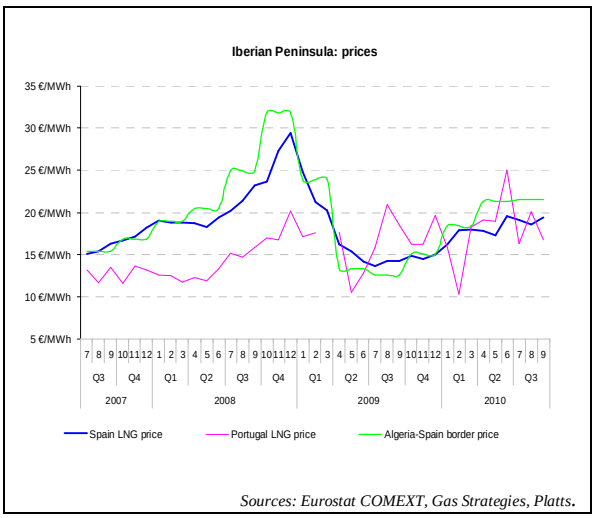
In the same chart, the border price for Algerian gas to France has been plotted, and shows a fairly significant premium to the spot price since April 2010, of 6 €/MWh on average. The relatively high price of French LNG (as mentioned above), also plotted, has generally reached levels nearing the Algerian-France border price, but trading at a slight discount.



Sources: Eurostat COMEXT, Gas Strategies, Platts.

Iberian Peninsula

Looking at a chart plotting prices paid in Spain and Portugal for LNG and piped gas from Algeria, it would appear that prices of LNG deliveries to the two countries varied by quite a margin.



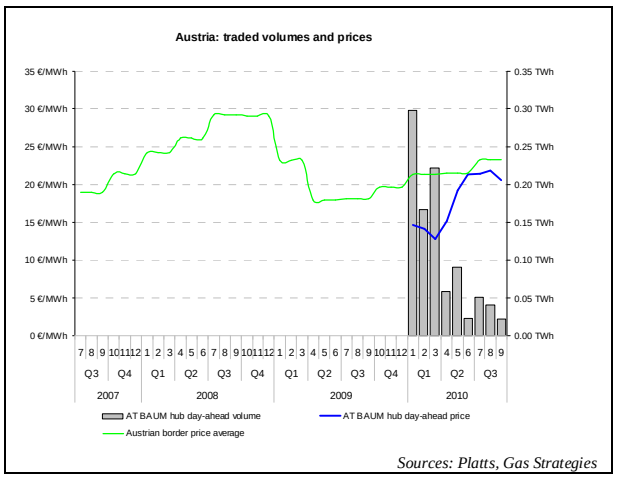
Sources: Eurostat COMEXT, Gas Strategies, Platts.

In comparison to the price of LNG deliveries to France and Belgium – which averaged 23 €/MWh and 18.8 €/MWh respectively, in the third quarter – comparable LNG prices in Spain and Portugal were 19 €/MWh and 17.7 €/MWh, though Portuguese prices recorded a high of 25 €/MWh in the preceding quarter.

Central and Eastern Europe

Austria

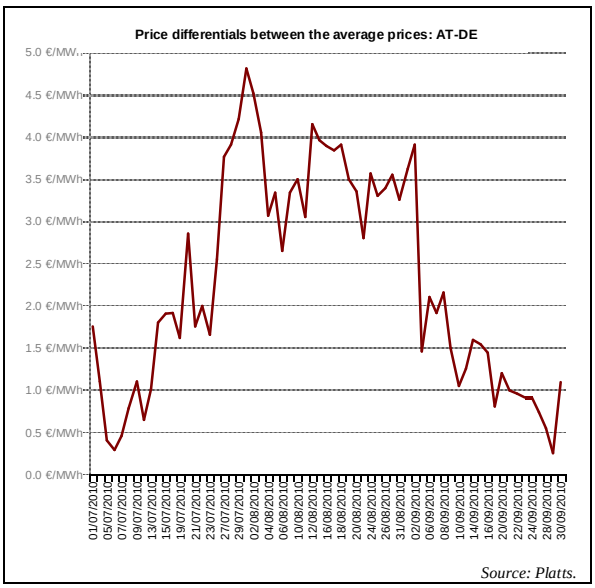
Austria's Baumgarten hub registered very low volumes of traded gas in the third quarter in comparison to previous months. Falling volumes accompanied relatively stable prices, reaching a quarterly high (in terms of monthly average prices) of 21.8 €/MWh in August, after having hit 21.3 €/MWh at the end of the previous quarter.



Sources: Platts, Gas Strategies

The variation in volumes on the Austrian exchange could be explained by use of the spot volumes by market participants primarily to balance their gas needs, which they tend to satisfy via LTC contracts. The relative closeness of Austrian border and spot prices attests to that possibility.

The relative stability of the Baumgarten day-ahead price in comparison to a more volatile German (NCG) hub price meant that a maximum premium of close to 5 €/MWh was attained over the German hub during the course of the third quarter, though prices were back on par by the end of the quarter.



Source: Platts.

While in the second quarter, the Baumgarten day-ahead traded at levels close to the Italian PSV hub, the relationship changed in the third quarter. Relative price stability in the former and a significant increase in prices in the latter meant that Italian spot gas traded at a high premium during much of the period, hitting maxima of close to 10 Euros during the month of July, and then remaining above at least 4 Euros the remainder of the time.

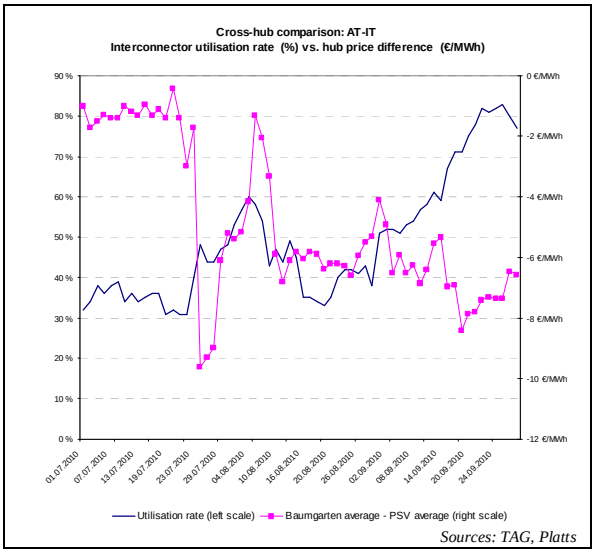
Parallel to these relative price developments, the utilisation rate of the Austrian-Italy interconnector increased

from levels averaging 30 to 40% at the beginning of the quarter to highs of 80% plus by the end of the quarter.

This increased utilisation was at least partly due to the Transitgas outage, as Italy needed to compensate by importing gas from elsewhere. Thus at the Tarvisio entry point of gas coming into Italy from Austria, flows increased from between 30,000 and 45,000 m^3/d in May and June, before the incident, to levels as high as 95,000 m^3/d in September. Tarvisio is the most important entry point of imported gas into Italy, representing 29% of imports (which themselves represent 90% of Italian gas consumption).

As a result, the Transitgas incident also contributed to supporting Baumgarten day-ahead prices, which aside from Italy, was the only hub in Europe which maintained an average day-ahead price for the quarter in excess of 21 €/MWh.

Austria's closeness to Italy, and remoteness from North Sea supplies, makes it more sensitive to occurrences on the Italian market.



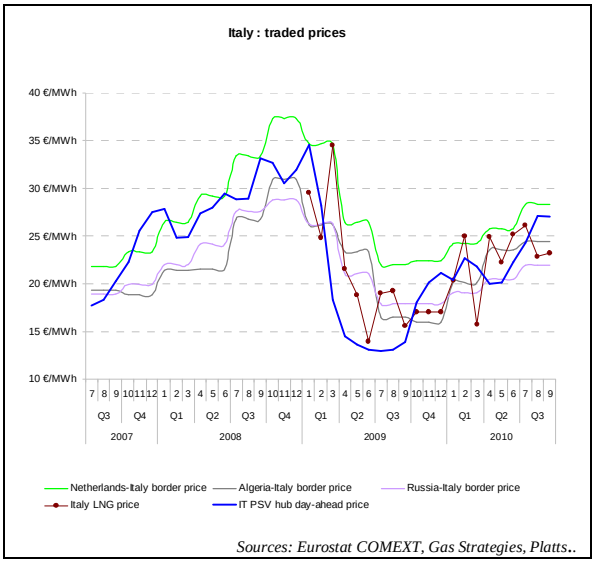
Sources: TAG, Platts

Italy

Italy's Punto di Scambio Virtuale (PSV) experienced a significant increase in day-ahead price over the course of the third quarter. After a second quarter when it followed a similar trend to other European hubs, it went from an average price level of between 20 to 22 €/MWh at the end of the second quarter to reach a range of between 26 and 28 €/MWh by the end of the third quarter, and attaining a monthly average price of 26.2 €/MWh over the quarter.

The jump in prices occurred during the last week of July, coinciding with the outage of the Swiss Transitgas pipeline delivering gas into Italy via the Passo Gries entry point (through which some 17% of Italian gas imports enter the country). The day the outage was announced to the markets on the 26th of July, the PSV day-ahead price jumped 35% from 22 €/MWh to 29 €/MWh. The continued outage of the pipeline during the remainder of the quarter kept prices trading at prices between 25 and 30 €/MWh for the rest of the period.

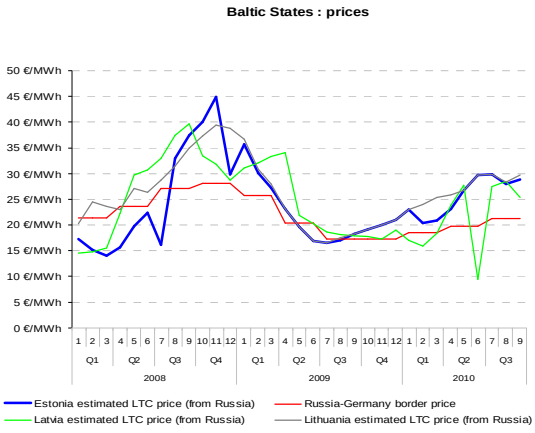
A wide variety of different gas prices are plotted below alongside the hub traded spot price, including a number of Italian border prices and the average price of LNG deliveries to Italy. This comparison reveals that the high level of the Italian hub spot makes it less competitive than the price of spot gas in other European exchanges, relative to border and estimated LTC price of gas from Russia. This being said, the Italian spot price still fares rather favourably relative to other prices.



Sources: Eurostat COMEXT, Gas Strategies, Platts..

Baltic States

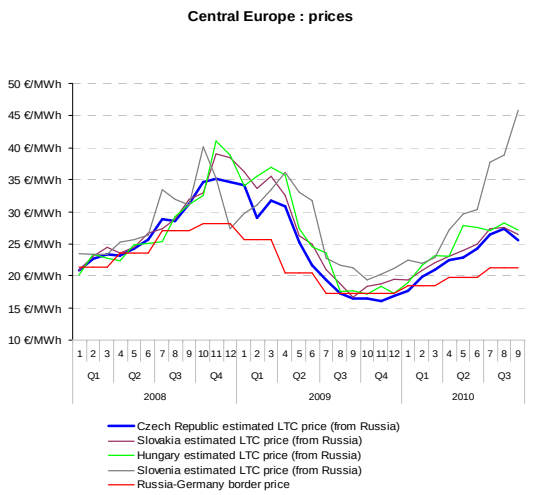
A comparison of estimations of LTC prices of Russian gas to the different Baltic States of the EU reveals notable differences not only in terms of prices but also in terms of variability. Looking specifically at the third quarter, the monthly average price of gas paid in Lithuania, Estonia and Latvia for Russian gas was 29.2, 28.9 and 27.1 €/MWh respectively. In comparison, the average monthly German border price paid in the same quarter was 21 €/MWh, almost equivalent to the average monthly German border price for Russian gas (21.3 €/MWh).



Sources: Eurostat COMEXT, Gas Strategies.
Note that border prices are estimations of prices of piped gas imports paid at the border, based on information collected by customs agencies, and is deemed to be representative of long-term oil-indexed gas contracts.

Other Central EU Member States

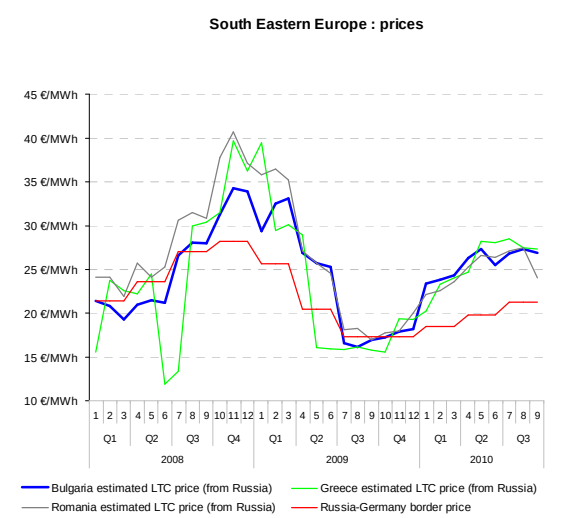
The estimated monthly average LTC price of Russian gas in Central EU Member States in the third quarter of 2010 ranged from 26.5 €/MWh in the Czech Republic to 40.9 €/MWh in Slovenia, with the latter experiencing a high of 45.8 €/MWh for its imports of Russian gas in September 2010.



Sources: Eurostat COMEXT, Gas Strategies.
Note that border prices are estimations of prices of piped gas imports paid at the border, based on information collected by customs agencies, and is deemed to be representative of long-term oil-indexed gas contracts.

Other South-Eastern EU Member States

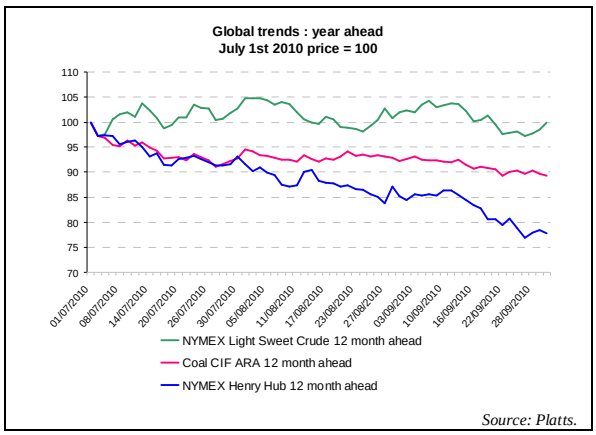
In South-Eastern EU Member States such as Bulgaria, Romania and Greece, the range of average monthly LTC price for Russian gas in the third quarter of 2010 was between 26.2 and 27.7 €/MWh.



Source: Eurostat COMEXT, Gas Strategies.
Note that border prices are estimations of prices of piped gas imports paid at the border, based on information collected by customs agencies, and is deemed to be representative of long-term oil-indexed gas contracts.

A.2.2 EU forward gas markets

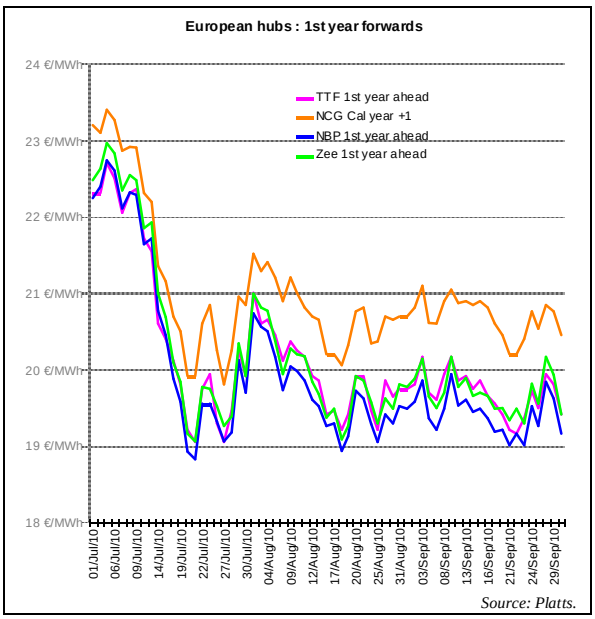
Looking at year-ahead prices for different commodities, it appears that after expecting ever increasing levels of the Henry Hub gas forward in the second quarter, market participants projected a downturn in gas prices in the third quarter of 2010. In comparison, relative stability remained in the NYMEX crude, with anticipation in the third quarter of 2010 that prices a year from then would remain at around the same level. A more negative outlook was also apparent for forward coal prices, after predictions of increasing future prices in the previous quarter.



Source: Platts.

Looking at one year forward prices traded in the third quarter of 2010 on the European hubs, it can be seen that expectations then were for an initial decrease to levels below 20 €/MWh and thereafter for prices to remain in a band between 19 and 21€/MWh, depending on the market.

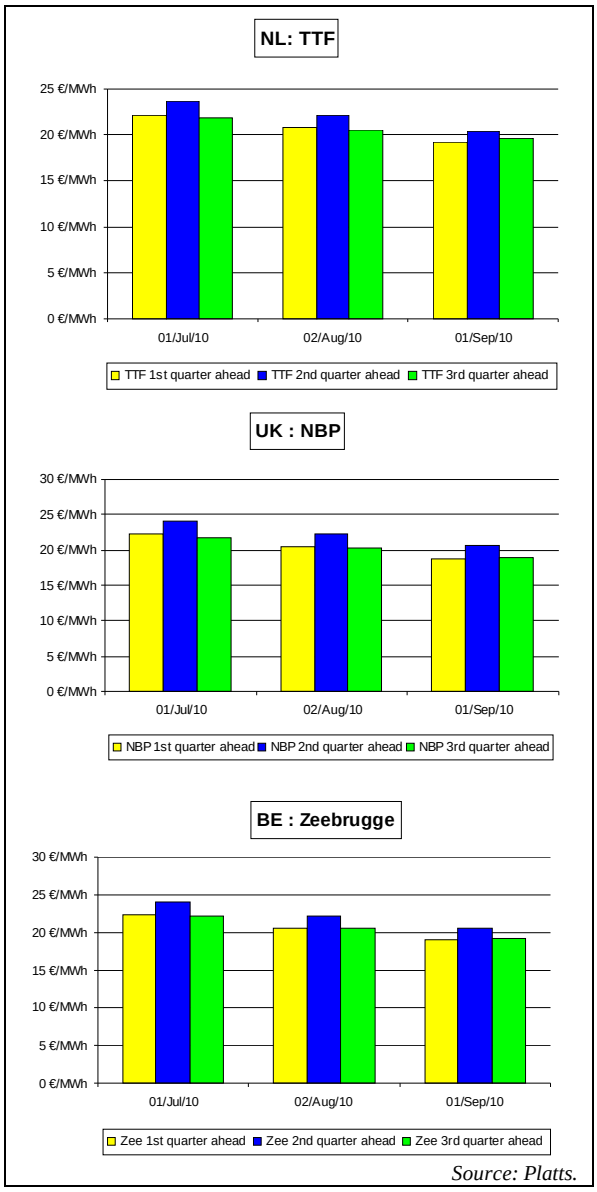
The full impacts of an expected global gas glut due especially to an over supply of shale gas and LNG do not therefore seem to be priced into European markets, even if, compared to the previous quarter, perspectives on the forward market have become much more subdued. Though the perspectives for shale gas in Europe are much less than the US, shale gas finds in the US are having an impact on Europe by limiting the prospects of exporting European gas to the US and also by reducing the pressure on LNG supplies, which would explain why, in spite of high prices in Q3, prospects of weaker future gas prices in Europe would not be unrealistic.



Source: Platts.

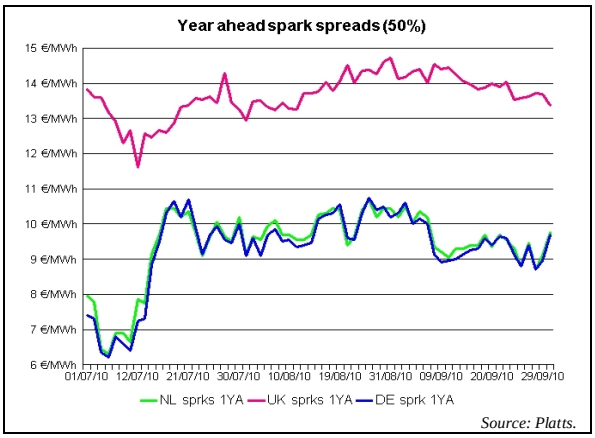
The charts below also show a downward trend in forward prices for quarter-ahead prices in various European hubs.

News in late August that the outage of the Transitgas pipeline would likely continue through to December may well have affected quarter ahead prices of Northern European hubs such as shown below, by possibly contributing to a glut of gas in that part of Europe.



Source: Platts.

In the second quarter, strong increases in European gas prices combined with a rather small increase in power prices, led to a reduction in the theoretical margins of gas-fired power-plants, as evidenced by the significant declines in year-ahead spark spreads[5] in markets such as Germany and the Netherlands. In contrast in the third quarter, spark spreads in these markets recovered some of the falls of the previous quarter and then remained stable. The UK spark spread was also stable, but at a higher level than in Germany and the Netherlands.

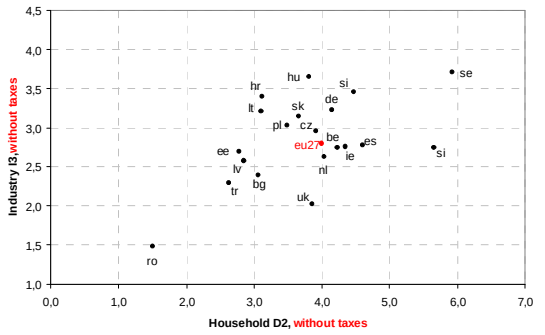


Source: Platts.

[5] 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. Spark spreads are calculated using calendar year gas contracts.

A.2 Retail markets

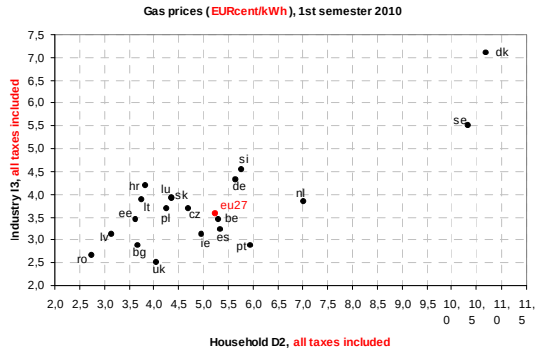
The first two charts below show prices of natural gas paid by households and industrial customers in the 1st half of 2010. For both household and industrial customers the prices of median-level annual consumption bands (corresponding to household consumption band D_2 and industrial consumption band I_3) are illustrated here.[6] The first chart shows gas prices without taxes (net prices) in the EU Member States, Croatia and Turkey. The second chart shows prices including all taxes (gross prices).



Source: Eurostat

Range for annual consumption of :
Household group D2 : [5,56 MWh – 55,6 MWh] ;
Industry group I3 : [2,77 GWh – 27,77 GWh]
Note. Data for Austria, Greece, Finland and Hungary are not available

As in the previous semester, the variations between Member States' gross prices increased again in the 1st half of 2010, both for household and for industrial consumers. In the observed period, the ratio between the highest and the lowest price stood at 7.9 for household and 4.6 for industrial consumers. This corresponds to variations of 8 €cents and 5 €cents respectively.



Source: Eurostat

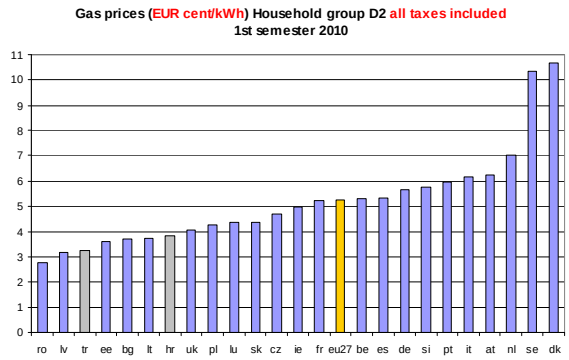
Range for annual consumption of :
Household group D2 : [5,56 MWh – 55,6 MWh] ;
Industry group I3 : [2,77 GWh – 27,77 GWh]

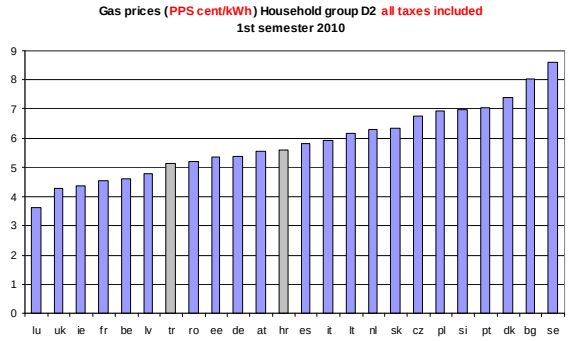
Note. Data for Austria, Cyprus, Greece, Finland and Malta are not available

A.2.1 Price levels

Household consumers in Denmark and Sweden had to pay by far the most for gas, where the price stood at 10.7 €cents/kWh and 10.3 €cents/kWh respectively. The average price for the European Union (5.2 €cents/kWh) remained at roughly half that level. Generally speaking, the prices in the new Member States were still lower than in the old EU15. However, prices in Slovenia are already higher than the EU average and thus Slovene consumers also pay more than consumers in places such as the United Kingdom, Luxembourg and Ireland, who traditionally pay below average prices. The high level of wholesale prices paid at the Slovenian border for Russian gas imports, which are shown in the previous section, may provide an explanation for the high level of retail gas prices observed in Slovenia.

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



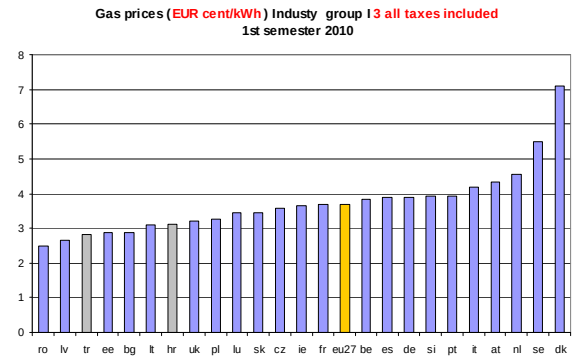


Household group D2 : [5,56 MWh – 55,6 MWh]
Data for Cyprus, Malta, Finland, Austria, Hungary and Greece are not available

Source: Eurostat

Measured in Purchasing Power Standards (PPS), a number of new Member States would be ranked among the more expensive EU countries, as can be seen in the graph above. This is especially the case for Bulgaria, which measured in €cents is among the cheapest countries, but measured in PPS ranks as the second most expensive Member State.

The average price for industrial consumers in the EU stood at 3.58 €cents/kWh. As with household prices, the two Scandinavian member states Denmark (7.12 €cents/kWh) and Sweden (5.52 €cents/kWh) were the countries with the highest absolute costs.



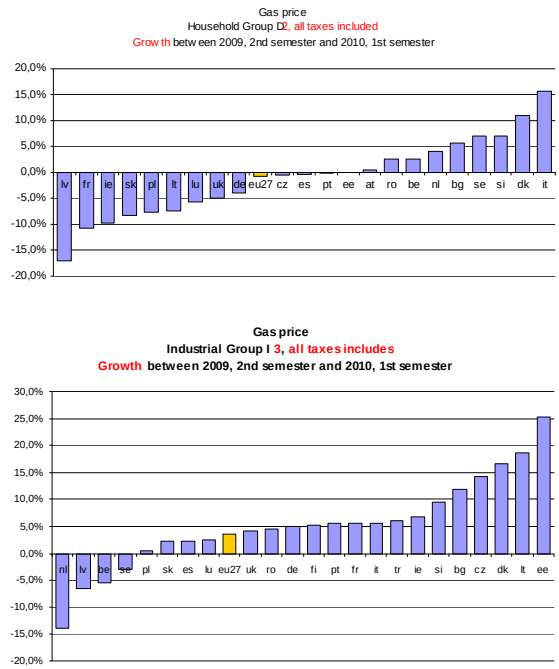
Industry group I3 : [2,77 GWh – 27,77 GWh]
Data for Malta, Cyprus, Greece, Hungary and Austria are not available

Source: Eurostat

In general, the pattern of industrial prices was similar to the one observed for household consumers. One noteworthy difference though is the United Kingdom, which featured the lowest gross price for industrial consumers (2.51 €cents/kWh), while in the case of household consumers it held this position only amongst old Member states and was underpriced by new Member States Lithuania, Bulgaria, Estonia, Latvia and Romania.

A.2.2 Price dynamics

During the period between the 2nd half of 2009 and the 1st half of 2010, prices in the European Union remained on average relatively stable for households (-0.9%), while industrial consumers experienced an average price increase of 3.5%.However, in individual countries significant movements in both directions could be observed. In the case of household prices Italy (15.5%) and Denmark (10.9%) showed the highest positive growth rates, whereas the most significant price falls could be witnessed in Latvia (-17.1%) and France (-10.7%).

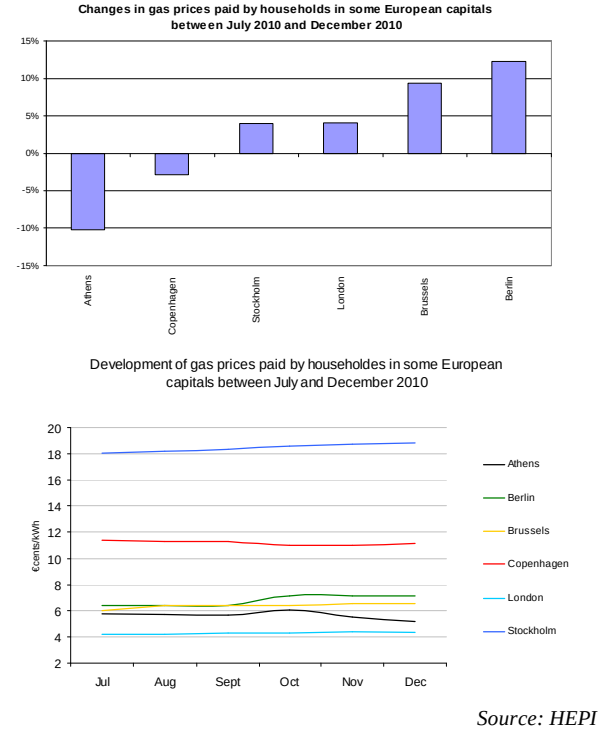


Household group D3 : [5,56 MWh – 55,6 MWh]
Industry group I3 : [2,77 GWh – 27,77 GWh]
Data for Cyprus, Malta, Finland, Austria, Hungary and Greece i not available

Source: Eurostat

For industrial consumers, the most significant price jump happened in Estonia (25.3%) while the steepest fall in prices on the other hand could be observed in the Netherlands (-13.8%).

For the 2nd half of 2010, the HEPI price index[7] provides more recent information on price developments in a number of European capitals. According to the index, prices were stable in Amsterdam, Dublin, Lisbon, Luxembourg, Madrid, Paris, Rome and Vienna. However, relatively modest price increases were experienced in Athens, Berlin, Brussels, Copenhagen, London and Stockholm, as can be seen from the following two graphs.



Source: HEPI

In Berlin and Brussels prices increased by 12.2% and 9.3% respectively. In Athens on the other hand, prices fell by 10.2%. These movements did not however change the general picture of recent semesters (qualify), with price increases being the highest in the Nordic capitals and the lowest in the United Kingdom and Ireland.

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

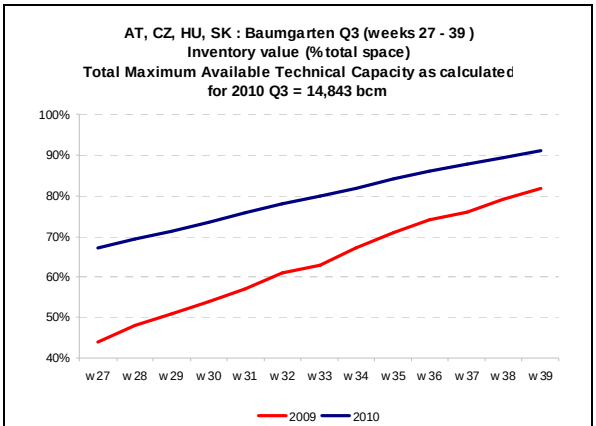
B. Storage

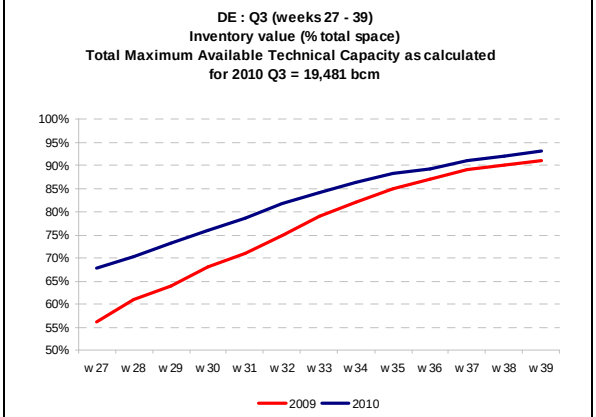
After relatively timid levels of storage reached the previous quarter, the summer injection period went ahead as usual and levels increased quite considerably in preparation for the cooler months ahead.

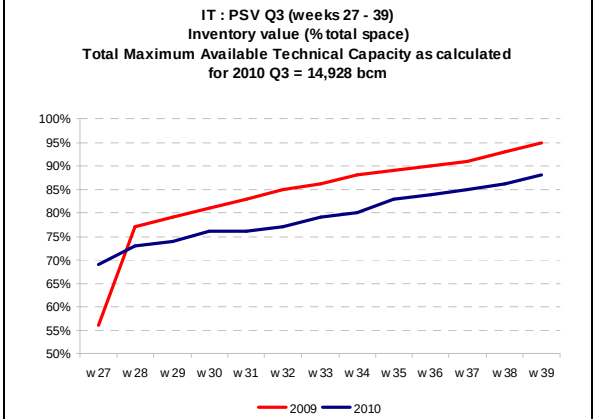
In most European markets however, storage injections and eventual levels for the quarter lagged behind Q3 2009, though ending with relatively comparable, if slightly inferior, storage levels by the end of the quarter.

The continued Transitgas outage might well have put some pressure on Italian storage, while the closure of the UK's Rough storage for two weeks of maintenance in September will have prevented replenishment to higher levels.

In addition, as already highlighted, supply constraints coupled with relatively high prices even led to storage withdrawals being made in June through to mid-July in the UK, high spot prices providing an incentive to withdraw as expectations of lower quarter-ahead prices meant that it was relatively cheaper and therefore more economical to resort to storage gas in the immediate to meet demand.

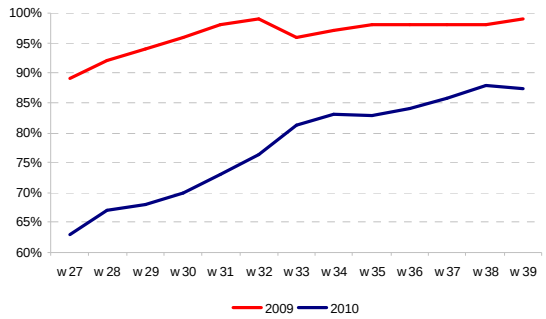




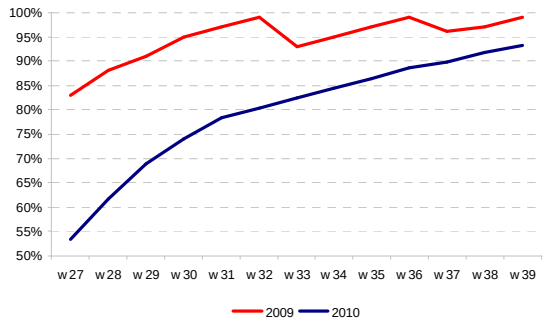


Source: Gas Infrastructure Europe

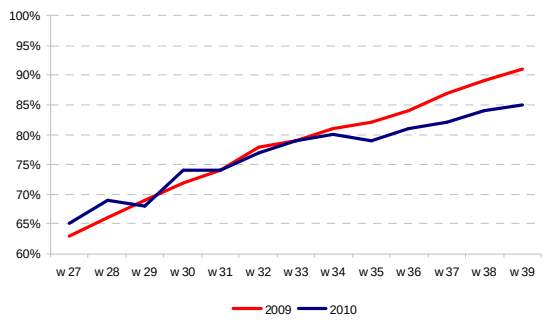
UK : NBP Q3 (weeks 27 - 39)
Inventory value (% total space)
Total Maximum Available Technical Capacity as calculated for 2010 Q3 = 4,756 bcm



BE : Zeebrugge Q3 (weeks 27 - 39)
Inventory value (% total space)
Total Maximum Available Technical Capacity as calculated for 2010 Q3 = 655 bcm

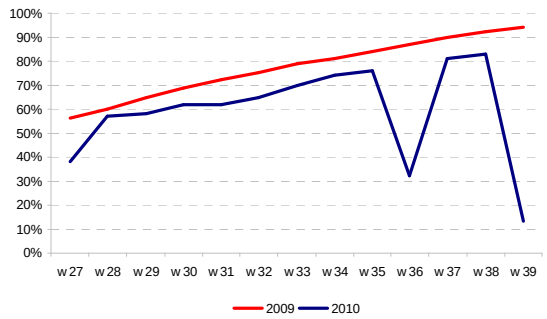


NL : TTF (Eurohub) Q3 (weeks 27 - 39)
Inventory value (% total space)
Total Maximum Available Technical Capacity as calculated for 2010 Q3 = 2,056 bcm

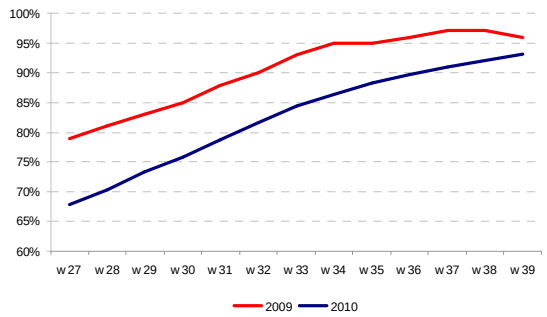


Source: Gas Infrastructure Europe

FR : PEG Nord Q3 (weeks 27 - 39)
Inventory value (% total space)
Total Maximum Available Technical Capacity as calculated for 2010 Q3 = 6,820 bcm



ES, FR (PEG Sud) : Iberian Q3 (weeks 27 - 39)
Inventory value (% total space)
Total Maximum Available Technical Capacity as calculated for 2010 Q3 = 7,944 bcm



Source: Gas Infrastructure Europe

C. *"Focus on LNG carriers"*

Liquefied natural gas (LNG) plays an increasing role in the European Union's efforts to increase its security of supply of gas. It enables imports from countries that don't have any pipeline connections with the EU member states and therefore can contribute to the Union's goal to diversify import routes. After having presented the role that LNG currently plays in diversifying the EU's sources of natural gas, its different uses in Europe and some global trends in a previous issue of this report,[8] the current issue describes the process to transport the LNG from the liquefaction plant in the exporting country to the regasification terminal in the importing country.

The first shipping of LNG in the world took place on the 28th of January 1959. The first commercial voyage then took place in 1964. The LNG shipping industry has a good safety record. Since the beginning of commercial LNG shipments no single incident happened where LNG was lost through a breach of failure of the ship's tanks. According to the International Group of LNG importers, there have been three major grounding incidents, but none of them has resulted in loss of cargo[9]

Today's typical LNG carrier measures approximately 300 metres in length and 43 metres in width and has a draft[10] of about 12 metres. LNG carriers vary in capacity from 1,000 to 267,000 cubic metres. Over the last ten years, the majority of ships have ranged in capacity from 130,000 to 145,000 cubic metres. Around two-thirds of the ships under construction now are in the range of between 150,000 to 180,000 cubic meters. 3,414 voyages of loaded LNG carriers were completed in 2009, which is 3% more than the year before. 37% of the carriers went to Japan, 32% to Europe, 12% to Korea, 8% to the Americas and 4% to India.[11]

The majority of LNG carriers in operation today are either designed to carry LNG in spherical tanks (Moss sphere design) or in geometric membrane tanks (membrane design). Of the ships in existence or on order, 65% feature membrane systems while 30% feature spherical Moss systems. These numbers reflect the fact that the membrane type is considered to be the more favourable design because it's larger capacity relative to a spherical ship of the same size.[12]

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[8] See following issue of the Quarterly Report on European Gas Markets: Volume 3, Issue 1, November 2010

9 International Group of LNG importers: Information Paper No. 3 – LNG ships
http://www.giignl.org/fileadmin/user_upload/pdf/LNG_Safety/2%20-%20LNG%20Process%20Chain%208.28.09%20Final%20HQ.pdf

10 The vertical distance between the waterline and the bottom of the hull (keel), with the thickness of the hull included

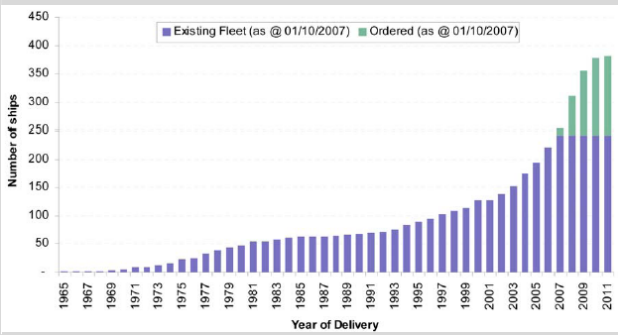
11 International Group of LNG importers: The LNG industry
http://lng.industry.contenu-numerique.com/2010/pdf/giignl_2009.pdf

12 Since most LNG trade routes go through the Suez Canal, where transit fees are calculated according to the size of the vessel and not its load, carriers of the Moss type have to pay higher per unit transit fees. It is therefore expected that the share of carriers with a spherical dome containment system will decline in the future.
Curt, Bob: Marine Transportation of LNG; Presentation at the Intertanko Conference March 24, 2004
http://www.marad.dot.gov/documents/DWP_--_Marine_Transportation_of_LNG.pdf

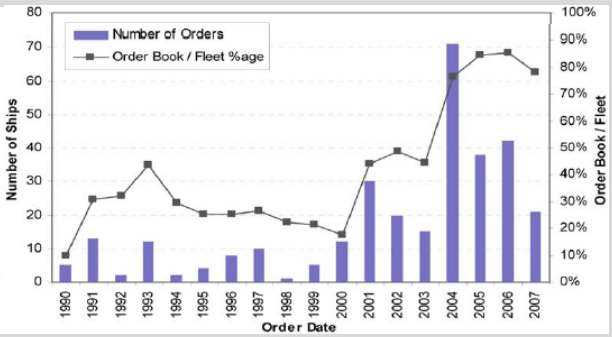
As of February 2010 366 LNG carriers were involved in worldwide trade.[13] Due to the growing importance of LNG, the demand for additional LNG carriers may increase. In 2009 alone, 40 new ships were delivered with 37 additional ones under construction or under firm order. Of the latter, 32 ships will be of the membrane type and five of the Moss sphere design. As of December 2009, 26 ships were expected to be delivered in 2010[14], with an additional 12 already on order for delivery in the period up until 2013.[15]

From 2007 to 2010 the world LNG carrier fleet increased by 20%. However, in the last few years the industry experienced a fall in newly ordered LNG carriers due in part to an increase in capital costs, technical expertise and resources not matching the pace of demand and delay in approval of new supply projects. According to a study for the European Commission this will most likely result in a lower growth rate in the next three to four years.[16]

Development of the LNG fleet:



Number of Orders, Order Book/Fleet Age:



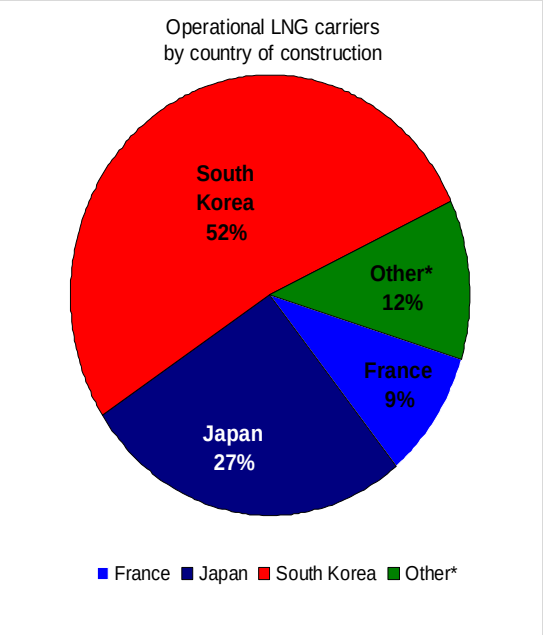
Source : MVV Consulting; LNG study 2008 for the European Commission
http://ec.europa.eu/energy/gas_electricity/studies/doc/gas/2008_05_lng_facilities_part_1.pdf

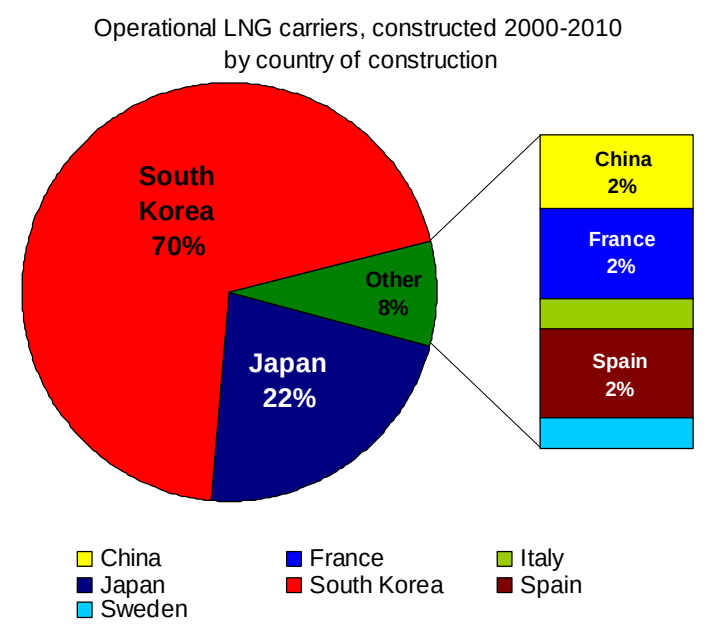
In its World Energy Outlook 2010 Reference Scenario the International Energy Agency predicts total investment in LNG carriers of $75 billion for the period between 2010 and 2035, which represents 12% of the overall investments in LNG infrastructure for this period. The cost of LNG ships today is between $225-250 million for a 135,000 cubic meter carrier, up to approximately $300 million for the larger ships. This would mean that in the next fifteen years, between 250 and 300 new LNG carriers could be constructed. Taking into account that the average life span of a LNG carrier is about 40 years this would mean that by then all ships built before 1995 would have to be scrapped, which corresponds to 79 ships of the current fleet. Nevertheless, these projections would result in roughly 50% to 65% more LNG carriers in 2035 than today. In terms of capacity, the

13 Gas Strategies
14 International Group of LNG importers: The LNG industry
15 Gas Strategies
16 MVV Consulting; LNG study 2008 for the European Commission
http://ec.europa.eu/energy/gas_electricity/studies/doc/gas/2008_05_lng_facilities_part_1.pdf

growth rate can be expected to be even larger, since the newly built ships are almost certainly going to be larger than the ones being scrapped.

Among the LNG carriers in operation today the vast majority has been constructed in either South Korea or Japan, the former accounting for around 51% of the whole fleet. Of the 17% of carriers having been constructed in Europe, the largest fraction originates in France, which accounts for 9% of LNG carriers. South Korea's dominance of the market is even more pronounced when looking at more recent vessels, built between 2000 and 2010, where its market share amounts to 70. From the 31 LNG carriers finally that have been ordered as of February 2010, 4 are being built in Japan, whereas all the other 27 are constructed in South Korea. This is also reflected in the lower median vintage of South Korean carriers in comparison to European ones: The 74 operational LNG carriers that have been built in Europe have a median age of 30 years, whereas the 189 vessels from South Korea have a median age of only four years. These factors may result in a decline of the share of European vessels over the course of the next ten to 20 years. However, Member States continue to build LNG ships which will remain operational within in the next 30 to 40 years.





* Belgium, China, Germany, Italy, Norway, Spain, Sweden, United States

Source: Gas Strategies