



Quarterly Report on European Gas Markets

DG ENERGY

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Directorate A

Energy Policy

Unit A

Energy Policy & Monitoring of electricity, gas, coal and oil markets
Market Observatory for Energy

Dear readers,

This Quarterly Report on European Gas Markets presents developments covering the fourth quarter of 2011 and the first quarter of 2012.

The major event over the course of this period was the sudden and unexpected fall to record low temperatures at the beginning of February 2012 across Europe. This led to a sharp and significant increase in demand for natural gas which in turn put pressure on gas supplies. As a consequence, wholesale hub prices increased significantly, providing the signals for gas flows and bringing all available generation capacities online.

Reverse flows (both virtual and physical) were fully utilised to allocate gas to where it was most valuable. For instance, gas from Germany was sent to Poland, Austria and the Czech Republic. In addition, numerous swaps took place between the TSOs of Germany, Switzerland, Belgium and France to transport gas from East to West, while avoiding congested areas, such as Southern Germany. Attracted by higher prices on the continent, physical flows of gas were supplied from the UK to other parts of North Western Europe via the reversible UK-Belgium pipeline, thereby quickly contributing to reducing the price differential.

Substantial withdrawals from underground storages that were almost full due to the mild winter conditions of the previous months also greatly contributed to meet the sudden increase in gas demand.

The normal interplay between demand and supply for natural gas could quickly and efficiently be re-established following an unforeseen, exceptional situation, thereby underlining the benefits of an increasingly flexible, integrated EU gas market which we are committed to continue developing.

Our 'Focus-on' section offers an insight on the impact of the development of the production of unconventional gas in the US on the EU markets.

For the editing team:
Dinko Raytchev

HIGHLIGHTS

- Continuing the trend of previous quarters, 4th quarter 2011 natural gas consumption in the EU fell on a yearly basis, contributing to a full year 2011 level of gas consumption for the EU which was less than any of the years since the effects of the crisis could be observed (2009+), and even registering the lowest level since 2000;
- By the fourth quarter of 2011, falling imports of natural gas could be observed along with falling consumption. This is in contrast to observed trends in the three previous quarters of the year, when positive growth in imports could be observed. Overall, imports of natural gas fell between 2010 and 2011;
- First signs of falling gas imports had been observed in the third quarter of 2011 as Q3 yearly LNG imports fell by 14%, after growing by 20% in the previous quarter. By the fourth quarter of 2011, all exporters of LNG considerably reduced their exports, such that 26% less LNG was imported into the EU in the second half of 2011 relative to the first half of 2011, in contrast to increasing levels of exports between the 1st and 2nd half of the previous year;
- Although LNG prices paid in the EU in recent times have been rising faster than hub prices, Asian markets such as Korea and Japan were paying a significant premium relative to EU importers for LNG. There is therefore a possibility of much reduced volumes of LNG coming into the EU going forward, should these price differentials persist;
- Mild temperatures and weak economic growth contributed to low demand for gas and to a relative stability of the day-ahead prices of natural gas on the European hubs throughout the fourth quarter. Prices then became extremely volatile in early February as weather-driven demand for natural gas increased to unexpected, higher than average levels. However, by mid-February prices went back to more normal levels, settling at slightly higher levels than before the cold snap, but reverting to stability for the remainder of the quarter.
- By March 2012, the UK NBP average of 23.9 €/MWh represented 68% of the Platts NWE GCI (North West European Gas Contract Indicator), which is a theoretical price calculated using a traditional “pure oil-link” formula. This compares to 67% in December 2011, 63% in September 2011, 77% in June and 92% in March 2011.
- The divergence between the long term oil-indexed and spot prices for gas has therefore stabilised. A large gap between the two persists however, which continues to give grounds for concern from European utilities having to buy gas under long term, oil-indexed contracts, but asked by their own customers to sell at lower spot levels.

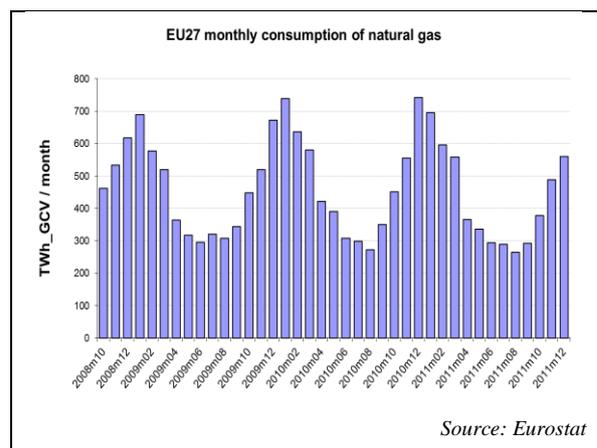
QUARTERLY REPORT ON EUROPEAN GAS MARKETS

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A. Recent developments in the gas markets across Europe

A.1 Gas consumption, production and imports

- 2011 fourth quarter EU natural gas consumption fell to historically low levels. Only 1,427 TWh of natural gas were consumed in the EU in the fourth quarter of 2011. This is less than for the equivalent period of any of the eight previous years.
- Comparing full year figures, natural gas consumption in 2011 was less than any of the years since the effects of the crisis could be observed (2009+).



- Such record lows in consumption were accompanied by a continued slow-down

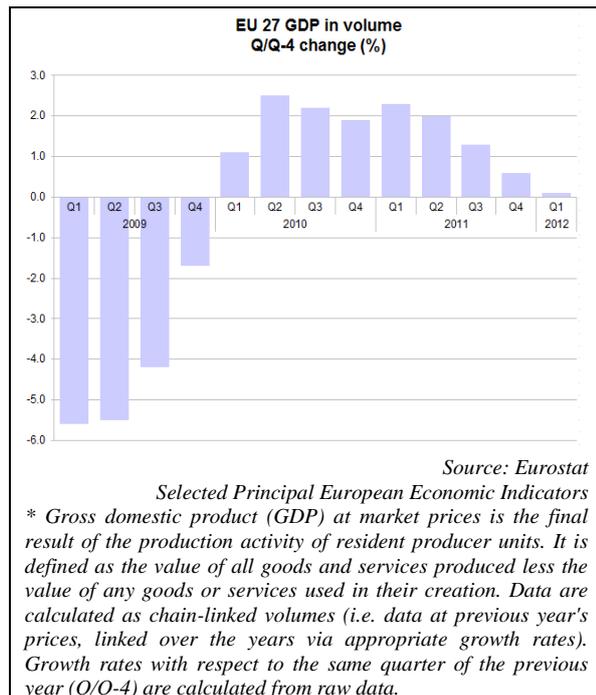
Disclaimer

This report prepared by the Market Observatory for Energy of the European Commission aims at enhancing public access to information about prices of natural gas in the Members States of the European Union. Our goal is to keep this information timely and accurate. If errors are brought to our attention, we will try to correct them. However the Commission accepts no responsibility or liability whatsoever with regard to the information contained in this publication.

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in economic growth, with Q1 2012 growth reaching the lowest level since the fourth quarter of 2009, when the EU economy was in recession.



- The weather was also a reason for low consumption levels. According to the number of heating degree days¹ recorded for each months of the fourth quarter of 2011, October and December 2011 were particularly mild months, relative not only to previous months, but also historically. Compared to a 36 year long term average, there were less

heating degree days in Q4 2011 than at any other time during that period.

- In Q1 2012, weather was also an important determinant of natural gas consumption, although in that period the situation was temporarily reversed from that experienced in the last quarter. Whereas in January 2012, the number of heating degree days continued to be lower than average, as observed in the previous months, February 2012 experienced a particularly high number of heating degree days, way higher than the long term average, as shown on the map next page. This resulted from unusually low temperatures felt across many parts of Europe. It can however be seen that by March 2012, the climate went back to being warmer than usual, taking into account the number of heating degree days for that month.
- Though full EU 27 natural gas demand data was not yet available for Q1 2012 at the time of going to press, data for some EU Member States had been reported, which shows that demand for natural gas in February 2012 was much higher than usual. In countries such as France, Germany, Italy, Hungary, the Netherlands and Poland, February 2012 demand for natural gas was higher than any of the three previous years by an average of 17%.

¹¹ Heating degree days (HDDs) express the severity of a meteorological condition for a given area and in a specific time period. HDDs are defined relative to the outdoor temperature and to what is considered as comfortable room temperature. The colder is the weather, the higher is the number of HDDs. These quantitative indices are designed to reflect the demand for energy needed to heat a building

Minimum daily temperature 05.02.2012 [done 05.02.2012]

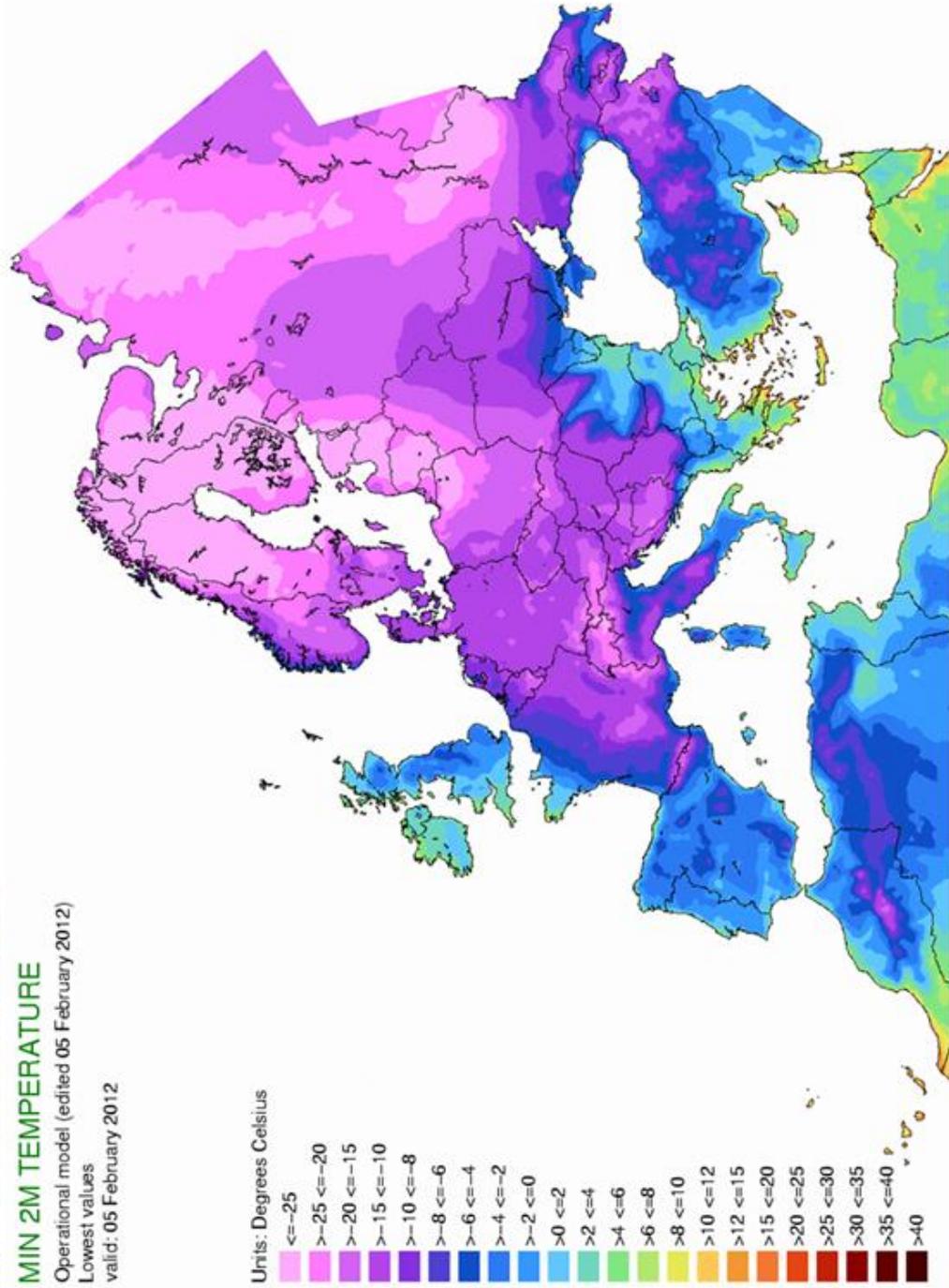
map : in absolute values

MIN 2M TEMPERATURE

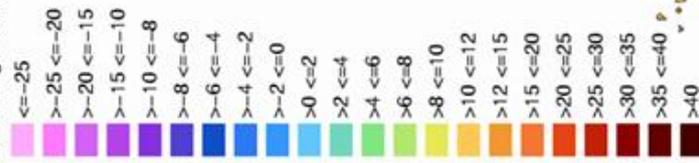
Operational model (edited 05 February 2012)

Lowest values

valid: 05 February 2012



Units: Degrees Celsius



The geographical borders are purely a geographical presentation and are only intended to be indicative. These borders do not necessarily reflect the EC position.

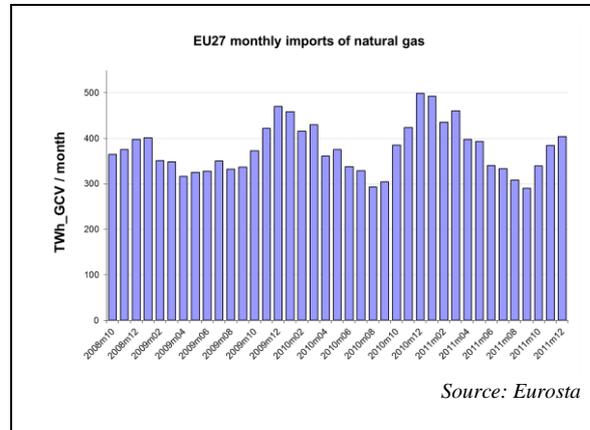
Data from **ECMWF**
Processed by **ECMWF**

JRC
EUROPEAN COMMISSION

MARS

EU 27 Heating Degree Days in Q4 Values for 2009, 2010, 2011 and 1975 – 2011 average			
	October	November	December
2009	249.62	318.69	520.91
2010	269.28	385.58	609.43
2011	234.30	354.44	450.97
LT avg.	236.95	391.82	512.14

Source : Eurostat /JRC



EU 27 Heating Degree Days in Q1 Values for 2010, 2011, 2012 and 1975 – 2011 average			
	January	February	March
2010	624.23	499.45	421.50
2011	551.74	509.88	423.14
2012	537.48	584.40	367.47
LT avg.	545.97	471.03	412.40

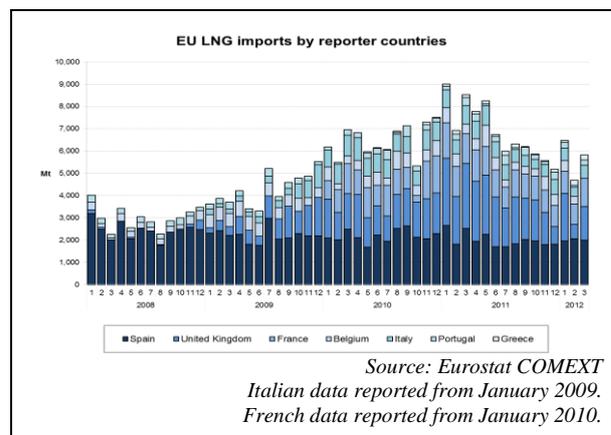
Source : Eurostat /JRC

- In Q4, LNG imports to the EU fell both on yearly and quarterly. In fact, after quasi uninterrupted and continuous growth in LNG imports on a quarterly basis, quarterly levels of LNG imports began falling in the second quarter of 2011, after which they fell further each successive quarter.

- The fall in consumption in Q4 2011 was such that even EU imports of natural gas began to fall. Fourth quarter 2011 natural gas imports were significantly less than the same period of the two previous years, for instance (reaching 1,128 TWh, compared to levels of 1,308 and 1,265 TWh in the previous two years).

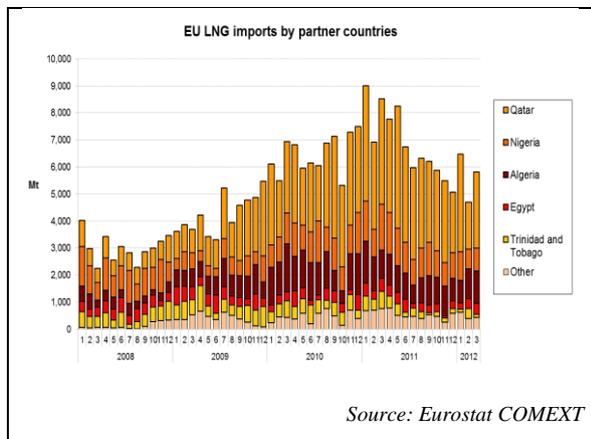
- And figures for the 1st quarter of 2012 reveal that LNG imports were at the same level as the previous quarter, even if they were at much reduced levels than the two previous years.

- This is in contrast to observed trends in the three previous quarters of the year, when positive year-on-year growth in imports could be observed. This led to a fall in imports of natural gas between 2010 and 2011, although 2011 levels of imports were higher than in 2009 and even 2008.

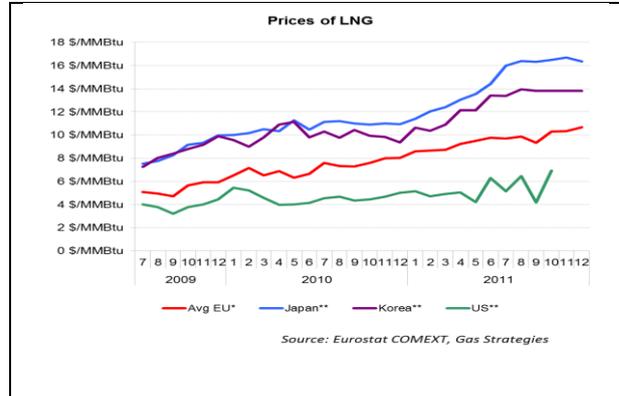


- Looking at EU LNG imports by partner countries, it could be observed that all exporters of LNG considerably reduced

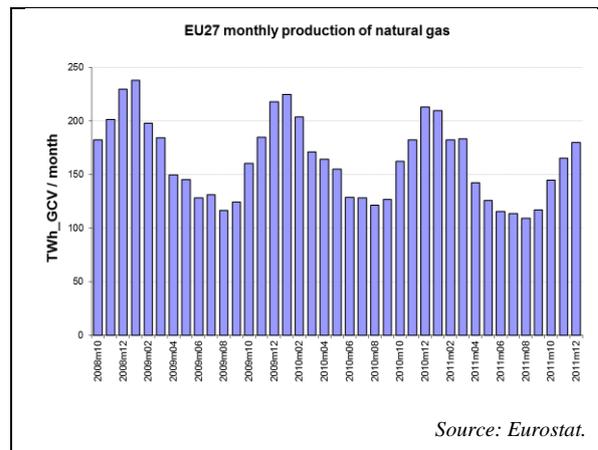
their exports to the EU in the second half of 2011 relative to the first half of 2011 (by 26%), in contrast to increasing levels of exports between the 1st and 2nd half of the previous year. Qatar, the biggest exporter of LNG to the EU (47% of total EU LNG imports in 2011) reduced imports by 22% in that period.



- If we turn to the graph below, showing a comparison of LNG prices in competing markets of the EU, Korea and Japan, it can be seen that the latter are attracting key LNG exporters with much higher prices than the EU.
- There is therefore a risk of much reduced volumes of LNG coming into Europe, and given the growing importance of LNG as a source of gas supply in the EU – in 2011 it represented 20% of total gas imports, up from half that only ten years ago – this is could be a source of concern, not least as a possible driver of gas prices going forward even if, right now, lower demand will relieve some of the pressure.



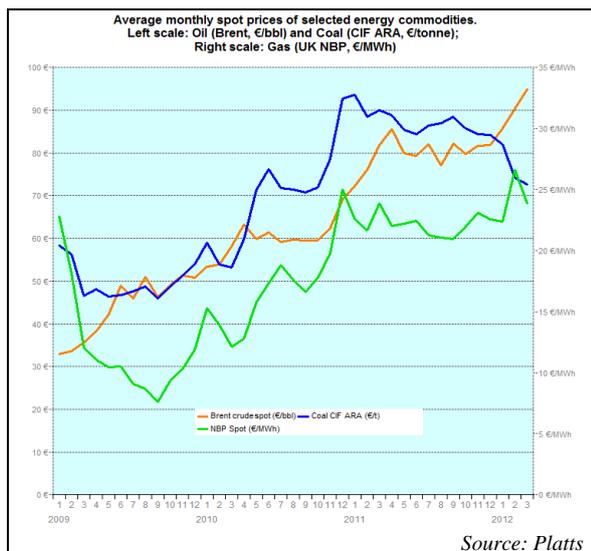
- Lastly, EU production of natural gas continued its long term decline. In 2011, it was below 1788 TWh which is about 30% below production levels in 2003.



A.2 Wholesale markets

A.2.1 Overview and summary

- After the significant correction experienced by all energy commodity prices during the second half of 2008/first half of 2009, there was a period of renewed growth which lasted until the last quarter of 2010/first quarter of 2011.
- By that point, the price of Brent crude attained a record average daily level (of 87.8 €/bbl), while both the price of coal and natural gas had risen significantly, reaching respectively 95.2 €/tonne and 25.7 €/MWh, somewhat short of their historic daily highs, of respectively 135.8 €/tonne and 32.1 €/MWh, reached in August 2008. Thus, between more or less late 2008 and early 2011, the prices of energy commodity prices followed a similar upward trend.

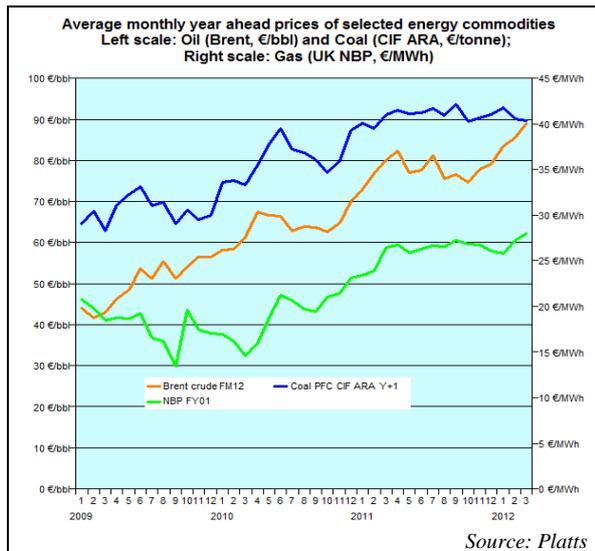


- Since the beginning of 2011 however, there has been a clear decoupling between coal prices on the one hand and

oil and gas prices on the other. Coal has followed a slight downward trend throughout 2011, reaching a year end level of 85.9 €/tonne. In the first quarter of 2012, it fell more sharply, reaching a daily level by the end of March 2012 of 76.5 €/tonne. As explained in the focus on section of the current report, significant discoveries and technological advances are reshaping the power generation mix on the US power markets in favour of natural gas. As a result, additional amounts of competitive US coal are available for the European energy market.

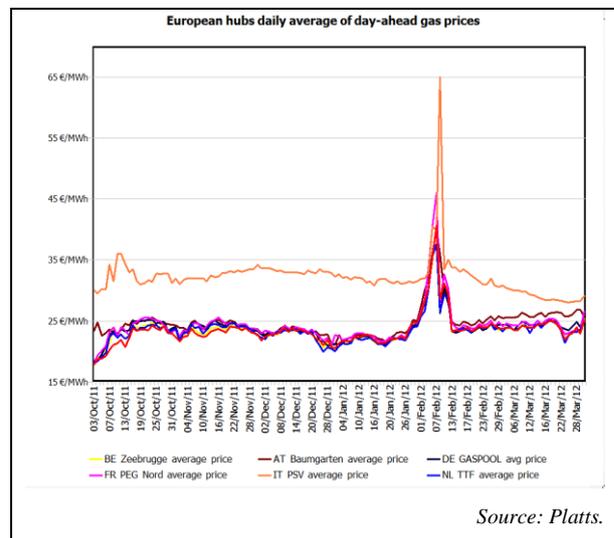
- In contrast, the price of Brent stabilised at around 80 €/bbl during the course of 2011, but then increased again, reaching a new record daily level of 97.7 €/bbl by mid March 2012.
- Similarly, the price of the NBP day-ahead for gas remained within a range of between 20 and 24 €/MWh during 2011, but then attained new record levels of 40.7 €/MWh in early February 2012, as a result of a sudden and unexpected cold snap.
- By the end of March 2012, a price level of 25.2 €/MWh was recorded which, not counting the exceptional February levels, was the highest price attained by the NBP day-ahead since the first quarter of 2011.
- Turning now to year ahead prices of coal, oil and gas contracts, it can be seen in the graph below that in spite of some corrections, the trend continues to be bullish at least with regards to oil and gas, while there have been expectations

of one year forward prices of coal plateauing at around 90 €/tonne.

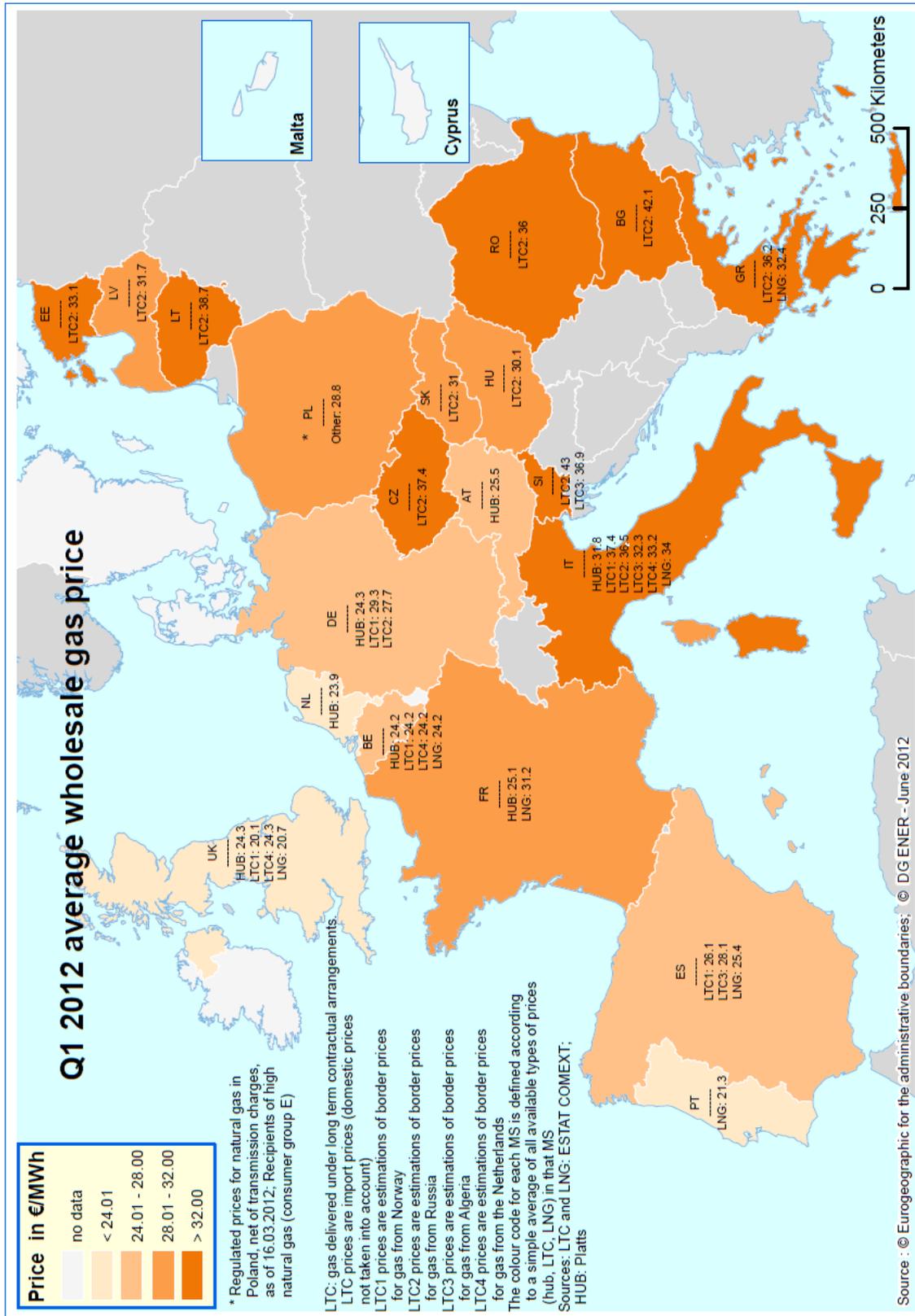


- Looking in more detail at the evolution of European hub day-ahead natural gas prices in the fourth quarter of 2011 and the first quarter of 2012 (see graph below) it can be seen that mild temperatures and weak economic growth which contributed to low demand for gas kept prices stable throughout the fourth quarter.
- Prices then became extremely volatile in early February as weather-driven demand for natural gas increased to unexpected, higher than average levels.
- There were other supply-side constraints which compounded the difficulties of meeting the sudden increases in demand in February, and which contributed to price volatility. A number of Member States (see further details below) reported receiving up to 30% less natural gas deliveries from Russia.

- However, by mid-February prices went back to more normal levels, settling at slightly higher levels than before the cold snap, but reverting to stability for the remainder of the quarter.
- On the graph, it can be seen that prices in some hubs reached extremely high levels. The day-ahead on the PSV Italian hub reached 65 €/MWh, which represented a doubling of normal levels, while most NWE (North-West European) hubs experienced short-lived highs of around 40 €/MWh, as against normal levels ranging between 22 and 25 €/MWh. The French hubs of PEG Nord and PEG Sud experienced the highest of any of the NWE hubs, recording 46 €/MWh on the 7th of February 2012.

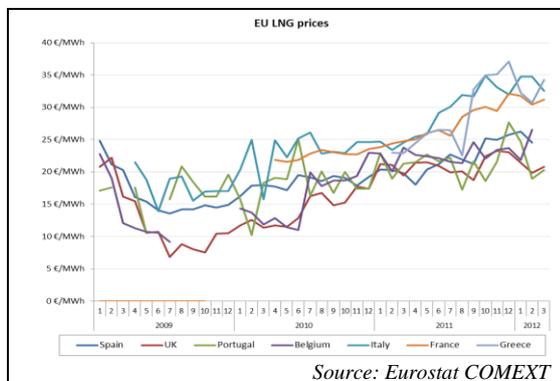


- Price levels on the Italian PSV hub were also influenced by bad weather conditions rendering difficult the delivery of LNG at Rovigo, on the Adriatic Coast.



A.2.2 Gas contracts and pricing mechanisms

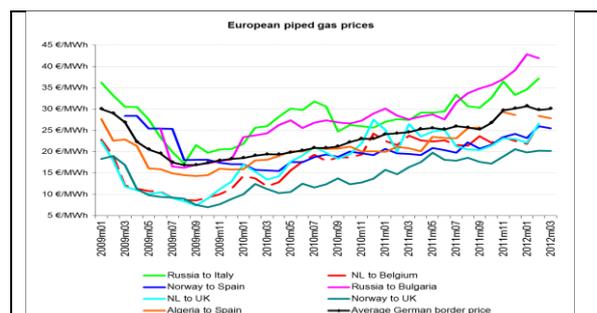
- Estimated monthly average spot LNG prices in the EU² in the fourth quarter of 2011 and first quarter of 2012 traded within a wide price range of between 20.7 and 35.7 €/MWh for the seven countries for which data is available.



- This represents a narrower range than in the third quarter of 2011 (of between 18.8 and 40.1 €/MWh). It also represents a continuation of increases in LNG prices in the EU, uninterrupted since mid-2009. The continued rising trend of LNG prices as against one of relatively stable hub day-ahead prices means that the gap between the two, which had already been narrowing in the second quarter and third quarters of 2011, was further reduced.
- This is in fact true of only the cheapest LNG contracts, as the EU's LNG importers can be further split into two price groups: one group which, in spite of increases, benefits from levels which are close to or at a discount to hub prices, trading in a range for the two

quarters of between 20.7 and 25.4/MWh and which is composed of the United Kingdom, Spain, Portugal and Belgium and another group which typically pays much higher prices for its LNG than hub day-ahead prices, which recorded a range of prices for the same period of between 27.2 and 35.7 €/MWh, and which is composed of France, Greece and Italy.

- Looking at a selection of estimated Long Term Contract (LTC) oil-indexed border prices for piped gas in Europe, shown in the graph below, reveals an average price of 27.2 €/MWh for the fourth quarter of 2011 and 28.4 €/MWh for the first quarter of 2012. This compares to average prices for the same selection of contracts of 24.9, 23.7, 22.7 and 21.5 €/MWh in the four preceding quarters. As with LNG prices, the trend for LTC prices is very much one of positive increases.



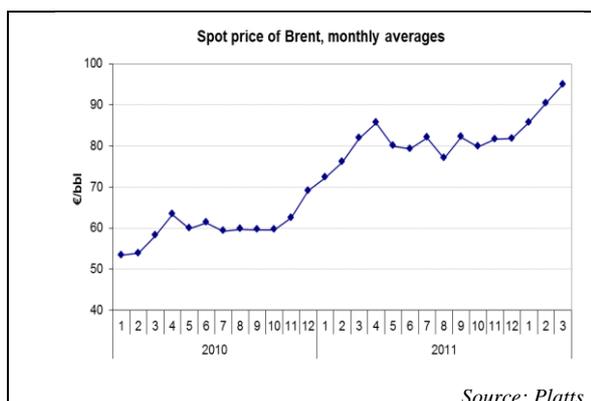
Border prices are estimations of prices of piped gas imports paid at the border, based on information collected by customs agencies, and is deemed to be representative of long-term oil-indexed gas contracts.

- Based on estimations from the Eurostat external trade database, LTC prices for gas imports from Russia continue to be among the highest prices for gas. In Q4

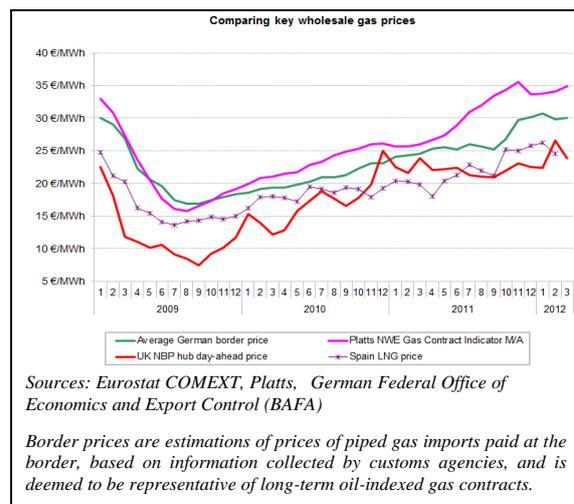
² Based on Eurostat external trade data.

2011 and Q1 2012, the majority of countries importing gas from Russia paid on average upwards of 30 €/MWh. In contrast, average estimated LTC prices of gas from Norway to Belgium, Germany, Spain and the UK were less than 30 €/MWh over both quarters, and in the case of the UK, at around or less than 20 €/MWh. Gas imports from Norway to Italy were the highest, averaging at more than 35 €/MWh over both quarters.

- Prices of estimated LTC gas from the Netherlands and Algeria also varied quite considerably, depending on the destination, from 29 €/MWh in Spain in the fourth quarter, to 36.7 €/MWh in Slovenia in the first quarter of 2012 for gas from Algeria; and from 22.5 €/MWh in the UK in the fourth quarter, to 33.2 €/MWh in Italy also in the fourth quarter for gas from the Netherlands.
- On the basis of a 6 to 9 month time lag, the relevant oil price references for LTC gas prices in Q4 2011 and Q1 2012 were oil prices between Q1 of 2011 and Q3 of 2011, when the Brent went between being in an ascendancy phase, to being relatively stable (see graph below).



- The graph below shows a selection of different wholesale price contracts for natural gas in the EU for a closer comparison.



- The graph shows the UK NBP price for traded gas, which is the European hub benchmark, as well as the price of LNG delivered to Spain, the main importer of LNG in Europe, contributing some two thirds of Spanish gas supply.
- The pink line shows the Platts North Western Europe gas contract indicator, which is a theoretical price calculated using a traditional “pure oil-link” formula, while the green line shows the price of actual gas imports at the German border, as published by the German Federal Office of Economics and Export Control (BAFA). This price has also traditionally been taken as an indicator showing the price of oil-linked gas into Europe.
- Comparing these two lines, it can be seen that the German border price, which had increasingly been dropping

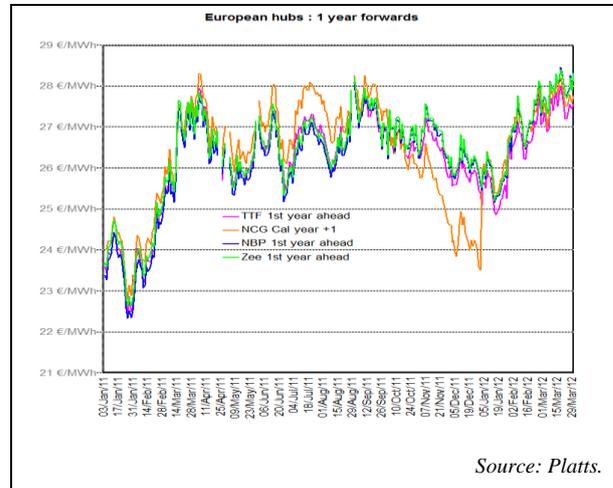
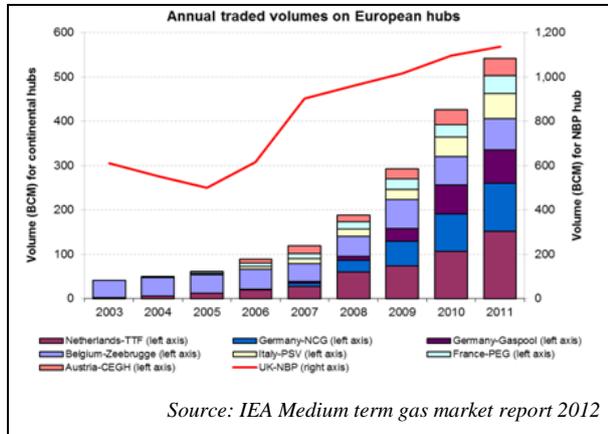
away from the Platts NWE GCI oil-indexed price indicator towards the spot gas price, has reconverged with the price indicator in the first quarter of 2012.

- In March 2012, the UK NBP average of 23.9 €/MWh represented 68% of the Platts NWE GCI, compared to 67% in December 2011, 63% in September 2011, 77% in June and 92% in March 2011. The divergence between the long term oil-indexed and spot prices for gas has therefore stabilised.
- A large gap between the two persists however, which continues to give grounds for concern from European utilities having to buy gas under long term, oil-indexed contracts, but asked by their own customers to sell at lower spot levels.

A.2.3 Regional markets

North and South Western Europe

- Mild temperatures and weak economic growth which contributed to low demand for gas kept hub day-ahead prices stable throughout the fourth quarter of 2011 in North-West European (NWE) markets.
- Prices then became extremely volatile in early February as weather-driven demand for natural gas increased to unexpected, higher than average levels. However, by mid-February prices went back to more normal levels, settling at slightly higher levels than before the cold snap, but reverting to stability for the remainder of the quarter.
- Physical throughputs on the Belgian and UK hubs both fell in Q1 2012 on a yoy basis, while both hubs recorded positive growth on a qoq basis, as is usually the case between Q4 and Q1. Q4 2011 throughputs in the UK and Belgian hubs were much reduced relative to the equivalent period of 2010, most likely the consequence of a very mild fourth quarter 2011, especially compared to Q4 2010, which registered very low temperatures.
- In contrast, the Dutch, German and French hubs continued recording impressive growth in physical deliveries and trade volumes for both quarters (Q4 2011 and Q1 2012), both on a yearly (upwards of 20% in both quarters for all three hubs, with the exception of the German hub in the fourth quarter, which grew by 11%) and quarterly basis.
- While such developments clearly contribute towards the creation of deep and liquid European gas hubs, the levels of traded volumes and physical deliveries made on continental European hubs are still relatively small compared to the UK hub, as the chart below reveals for traded volumes.

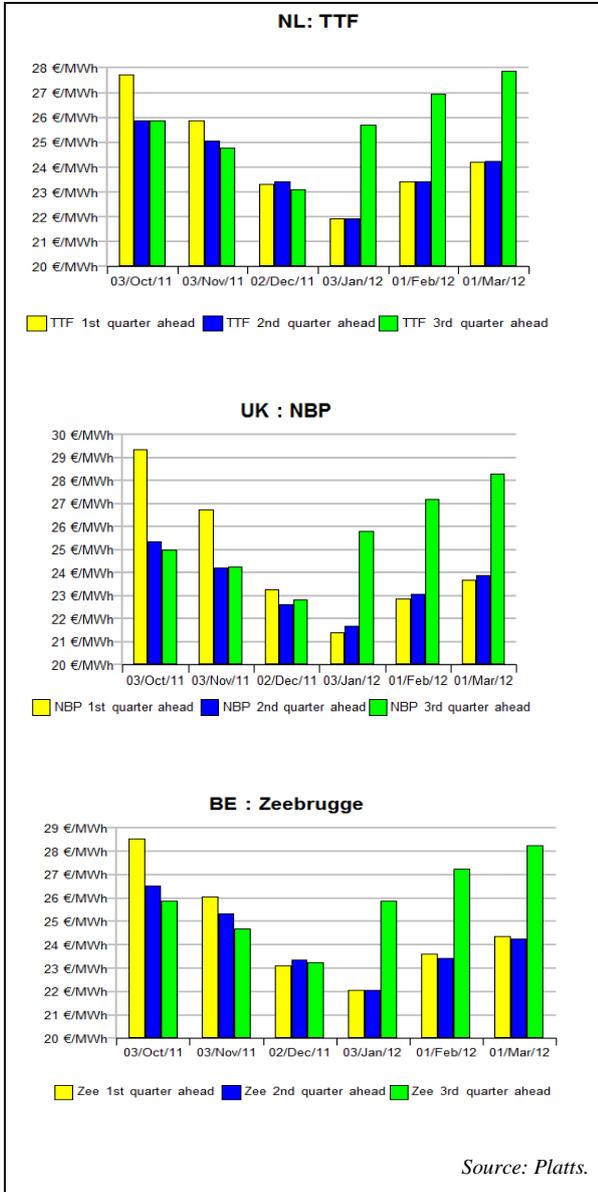


- However, by mid-February prices went back to more normal levels, settling at slightly higher levels than before the cold snap, but reverting to stability for the remainder of the quarter. Thus, prices on the NWE hubs which averaged at around 22 €/MWh before the cold snap in January 2012, were averaging 24 €/MWh by the end of the first quarter of 2012.
- With regard to one year forward prices on the NWE hubs, after a 'see-saw' type evolution of such prices during the first three quarters of 2011, NWE one year contracts experienced a downward trend in the last quarter of the year. This trend was then reversed, such that forward prices returned to the highs of 2011, registering around 28 €/MWh by the end of the first quarter, which represents a premium of some 4 €/MWh on prices for the same period.

- The near-forward gas curve also followed a similar trend, with gas prices in the fourth quarter initially in backwardation³, while contracts reverted to contango⁴ in the first quarter of 2012, as can be seen if first to third quarter ahead prices are examined for any of the three dates shown in the graphs below.
- To a large extent the reversal of the near-term forward curve is linked to seasonal effects.

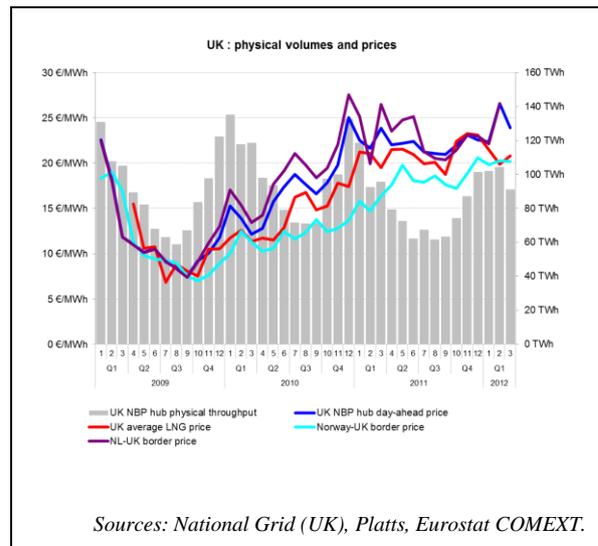
³ The situation of *backwardation* occurs when the closer-to-maturity contract is priced higher than the contract which matures at a later stage.

⁴ The situation of *contango* arises when the closer to maturity contract has a lower price than the contract which is longer to maturity on the forward curve.



United Kingdom

- Looking at the chart below showing estimates of LTC UK border prices for piped gas, it can be seen that prices paid for both Norwegian and Dutch piped gas in the UK continue to compare rather favourably to other prices, whereas typically recent prices of LTC purchased gas have tended to exceed hub and LNG prices in other parts of the EU. The cheapest gas consumed in the UK since the second quarter of 2010 continues to be gas imported from Norway.



- An analysis of adverse flows shows that there are relatively few occurrences of FAPD events⁵ on the UK – Belgium

⁵ By combining daily price and flow data, Flow Against Price Differentials (FAPDs) are designed to give a measure of the consistency of economic decisions of market participants in the context of close to real time operation of natural gas systems. With the closure of the day-ahead markets (D-1), the price for delivering gas in a given hub on day D is known by market participants. Based on price information for adjacent areas, market participants can establish price differentials. Later in D-1, market participants also nominate commercial schedules for day D.

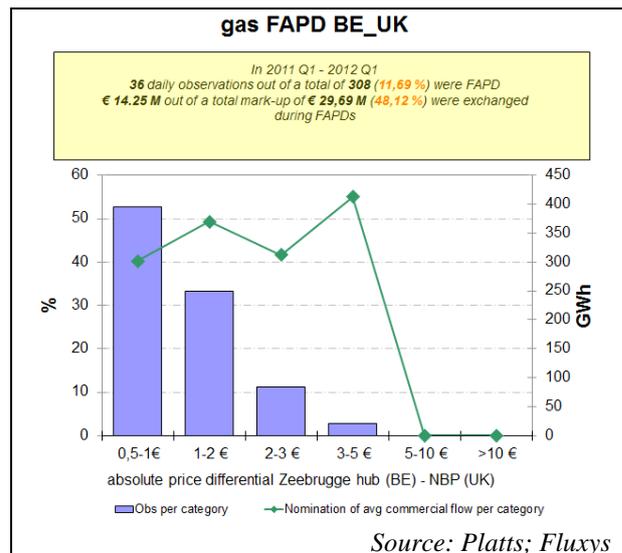
An event labelled as an FAPD occurs when commercial nominations for cross border capacities are such that gas is set to flow from a higher price area to a lower price area. The FAPD event is defined by the minimum threshold of price difference under which no FAPD is recorded. The minimum threshold for gas is set at 0.5 €/MWh.

After the day ahead market closes, market participants still have the opportunity to level off their positions on the balancing market. That is why a high level of FAPD does not necessarily equate to irrational behaviour. In addition, it should be noted that close-to real time transactions represent only a fractional amount of the total trade on gas contracts. The FAPD chart provides detailed information on adverse flows. It has two panels:

The first panel estimates the ratio of the number of days with adverse flows to the total number of trading days in a given period. It also estimates the monetary value of energy exchanged under adverse flow conditions (mark-up) compared to the total value of energy exchanged across the border. The mark-up is also referred to as "welfare loss". A colour code informs about the relative size of FAPD events in the observed sample, going from green if less than 10% of traded days in a given period are FAPDs to red if more than 50% of the days are FAPDs.

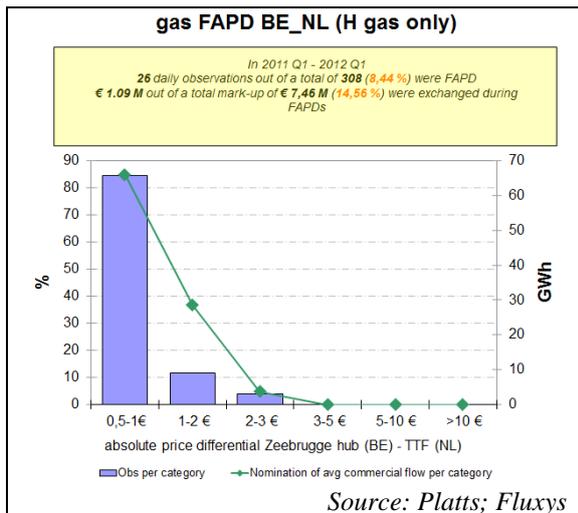
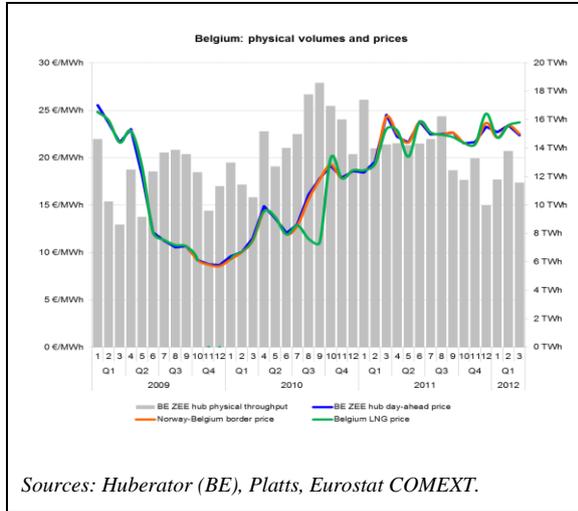
The second panel gives the split of FAPDs by sub-category of pre-established intervals of price differentials. It represents the average exchanged energy and relative importance of each sub-category on two vertical axes.

interconnector which are mainly concentrated on the low price differential range.



Belgium

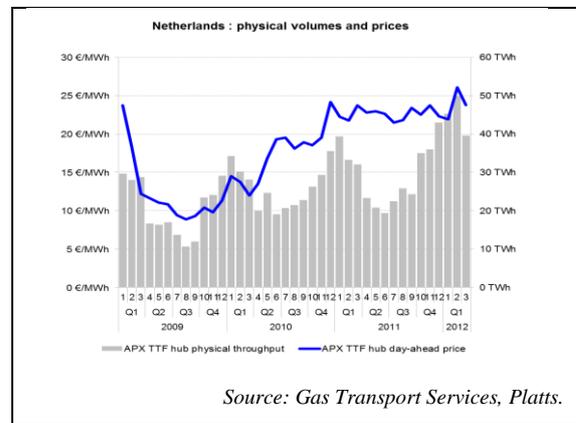
- The graph below shows that there is very little difference between the price of Belgian imported gas from Norway and the ZEE-day ahead price, which is itself also highly correlated with the LNG price.
- Such developments implies that gas delivered under long term contracts from Norway are cleared more and more often against spot prices and not under some form of oil indexation.



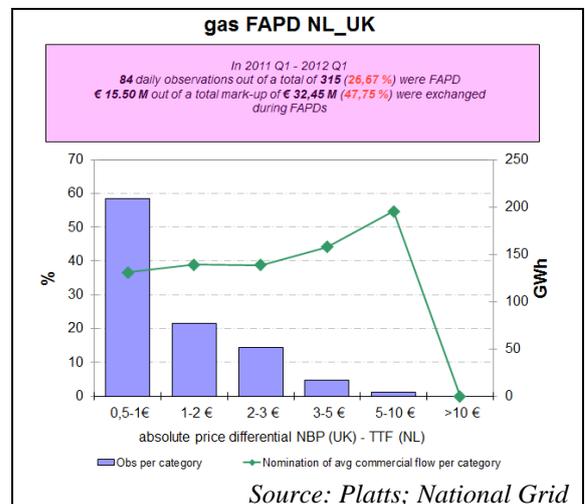
- Adverse flow events on the Dutch – Belgium are rare and concentrated on the low price differential range, which implies that market participants are shipping gas from the low to the high price area.

Netherlands

- Of note in particular on the Netherlands TTF hub in the fourth quarter of 2011 and first quarter of 2012 is the continued growth in physical volumes of gas delivered through the hub. Year on year growth in throughputs increased by 25% in the fourth quarter and by 29% in the first quarter of 2012.



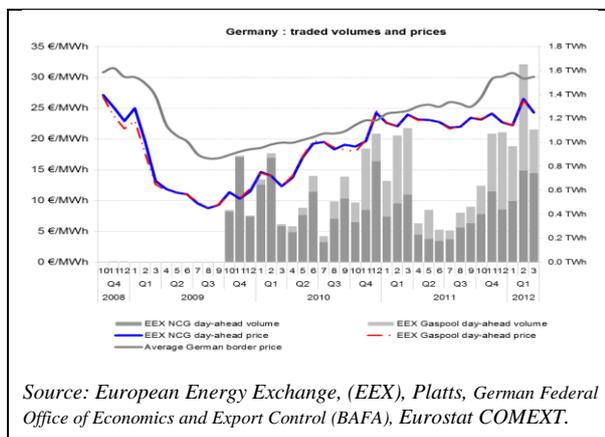
- It seems that FAPD events are more frequent on the Dutch – UK interconnection. From January 2011 to March 2012, gas flew from the high price area to the low price area in approximately 1 in 4 days.



- Among the factors that could explain the relatively high proportion of FAPD events are the absence of physical reverse flow possibility for a large part of the observed period on the BBL pipeline as well as the fact that a large part of the nominated capacity on the BBL is attributed to gas deliveries under long term contractual arrangements. The relative share of the mark-up in the total trade on gas contracts is much smaller on the BBL as the day-ahead trade may be just a fraction of the total transacted volume.
- The latest developments are interesting as the previously observed narrowing of the gap in prices seemed to suggest that the prices being paid for gas in Germany were being increasingly influenced by spot gas prices, as major importers demanded concessions from their suppliers to account for the oil-link/spot gas price divergence. The renewed divergence puts into question such an interpretation.

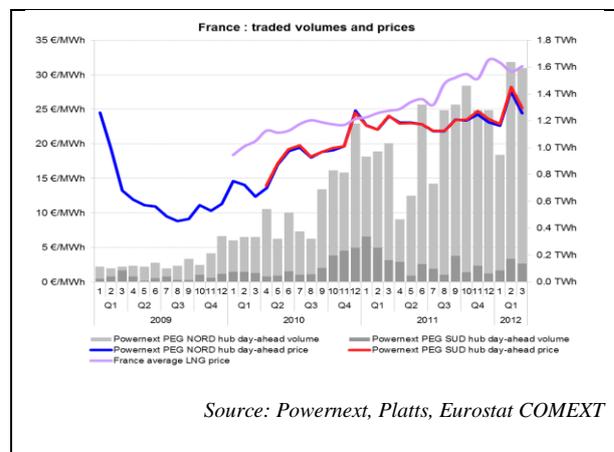
Germany

- In addition to hub prices and volumes, the graph below displays the evolution of a number of German border prices, estimated using Eurostat external trade data. It clearly shows that in 2009 and parts of 2010, the average German border price exceeded the German hub prices by a considerable amount. Then, in the second half of 2010 and in 2011 up to the third quarter, the gap between the two was substantially reduced. In the fourth quarter of 2011 and the first quarter of 2012 however, the gap has grown again.

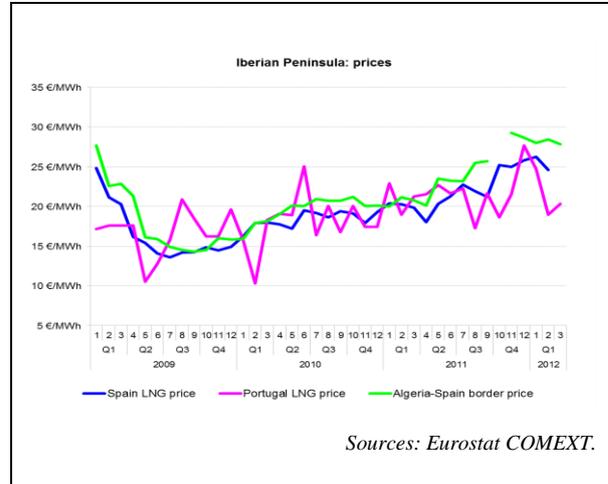
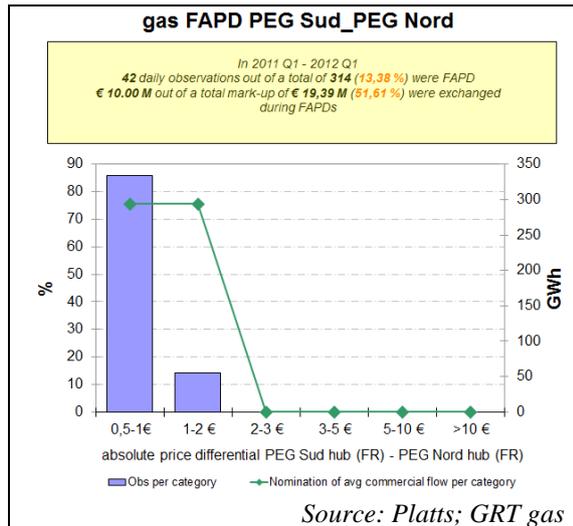


France

- At an average price of 31.2 €/MWh for the first quarter of 2012, the price of LNG imports paid in France continued to exceed that of the UK, Spain, Belgium and Portugal, but was less than that paid by Italy and Greece. It is also interesting to highlight that unlike other LNG importing countries such as the UK and Belgium, the price of LNG delivered to France is quite significantly higher than the price of piped gas traded on the hubs.



- There were very few adverse flow events observed between the two price areas of the French PEG hub.



Iberian Peninsula

- Some two thirds of natural gas supplies to Spain and Portugal comes in the form of LNG. The price paid for LNG in the Iberian Peninsula is therefore a key determinant of the cost of imports of natural gas in that region of the EU.
- This continues to represent an advantage given the continued relative cheapness of LNG, especially compared to pipe gas delivered under LTC. This being said, Spain also benefits from relatively cheap supplies of LTC piped gas from Algeria.

Central and Eastern Europe

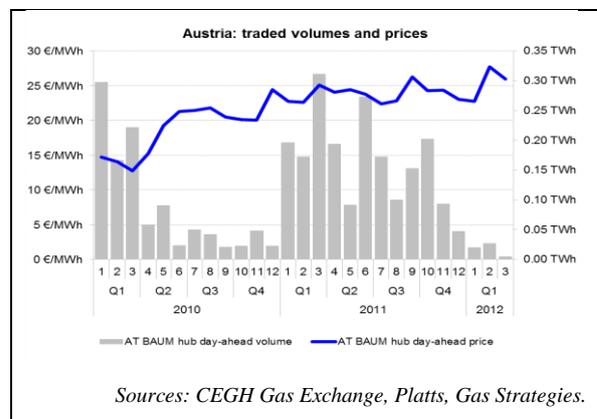
- During the first two weeks of February, many Central and Eastern European Member States received less gas from Russia than normal (around 2.3 bcm less)⁶. Reductions of gas volumes from Russia were registered in Slovakia, Austria, Poland, Italy, as well as Germany, and South Eastern Europe (Romania, Bulgaria and Greece).⁷
- Gas deliveries from Russia increased gradually from the 4th of February, notably for South Eastern Europe, while deliveries to Italy, Austria and Germany did not come back to normal until mid-February. EU gas companies confirmed that gas supplies from Russia were in line with their contractual obligations, as long as ToP contracts typically allow for certain volume flexibility for both supplier and buyer, subject to some financial penalties.

Austria

- Traded volumes on the Austrian Baumgarten hub increased considerably on a yearly basis in the fourth quarter of 2011 (by 266%), continuing the trend of previous quarters. However, volumes recorded for the first quarter of 2012

were significantly lower than volumes traded a year earlier during the same period.

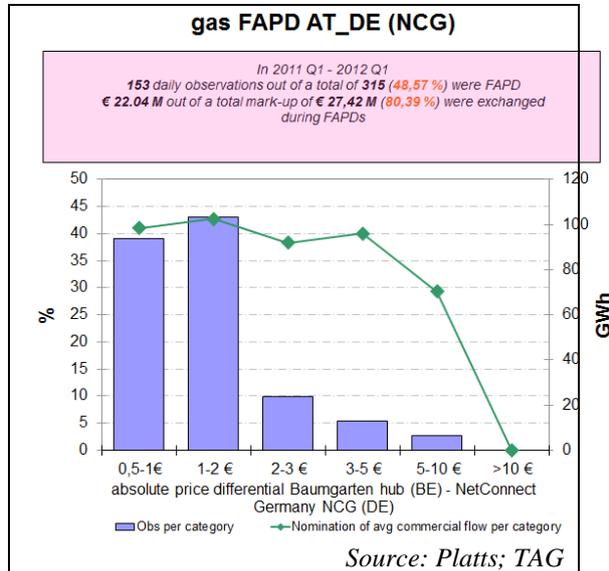
- As regards prices on the Austrian hub, those traded close to NWE hub levels, averaging 24.7 €/MWh over the two quarters under observation.



- The chart on FAPD events indicates that these are quite frequent on the Austrian – German border. For the 15 months between January 2011 and March 2012 gas went in the adverse direction in almost each second day. This may be interpreted as an indication that the pricing signal from the Baumgarten hub is most likely used for close to real time balancing, as witnessed by the small turnover. When it comes to longer term commercial strategies, it seems that market participants continue to rely on alternative price sets.

⁶ Russian gas exports dropped 11.5% to 20.508 bcm in February compared to the same period last year.

⁷ The reductions were as follows: Slovakia (up to 35% less), Austria (37% in Baumgarten and 34% in Oberkappel), Poland (3-5%) and Italy (28.5%). In the South Eastern region (Bulgaria and Greece) around 30-40% less gas was delivered from Russia through Moldova.



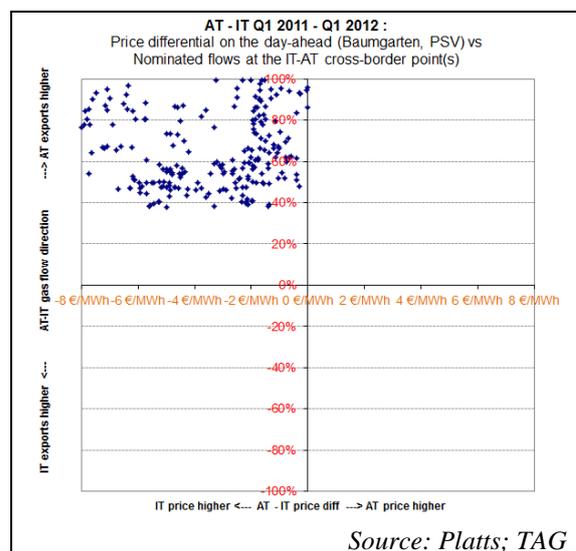
volatility in prices in February 2012, recording a high of 65 €/MWh.

- Though Italy imports gas from a variety of places and via different types of contracts, it continues to remain one of the most vulnerable gas markets to external shocks. In 2011, it experienced continued price pressure due to a series of external events constraining its gas supplies, such as maintenance work on the Trans Austrian pipeline supplying Russian gas to Italy through Austria, the closure of the Greenstream pipeline, which brings gas into Italy from Libya (and represents some 10% of Italian imports in normal times).

Italy

- Day-ahead contracts on Italy's PSV hub continued to trade at levels exceeding other European hubs, with an average price over the 1st quarter of 2012 of 31.8 €/MWh, compared to a NWE average of around 25 €/MWh, representing a considerable premium.
- Prices of other gas contracts paid in Italy were close to the high hub price, all averaging upwards of 30 €/MWh in the first quarter of 2012. Italy also continues to pay very high prices for its LNG, averaging at above 34 €/MWh over the same quarter. This places Italy among the more expensive places for LNG imports in the EU.
- Italy suffered perhaps more acutely the cold snap than NWE markets, as it reported much reduced deliveries of Russian gas and also had trouble landing LNG on its adriatic coast. This led it to experience the most extreme

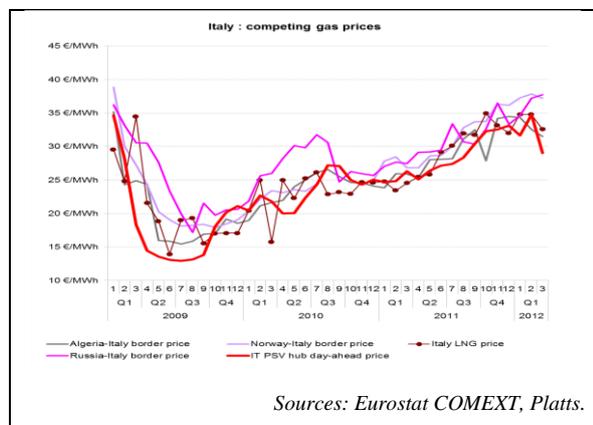
- The next scatter plot traces price differentials against utilisation rate of interconnection capacity for Italy and Austria.



- The Italian gas price was systematically higher than the Austrian one during the observed period. It seems however that the size of the Italian premium was not influenced by the utilisation rate of the connecting pipeline capacity. The

cloud-like form of the scatter plot implies low correlation between price difference and utilisation rate.

- Italy's isolation from NWE markets, and the illiquidity of its hub also contribute to its gas supply vulnerability and price volatility.

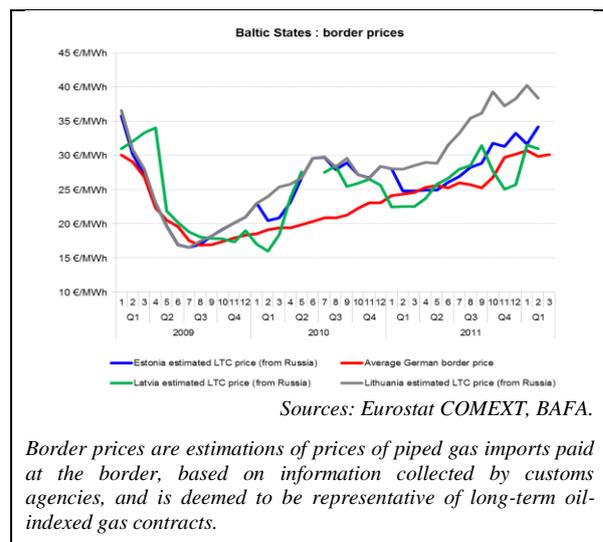


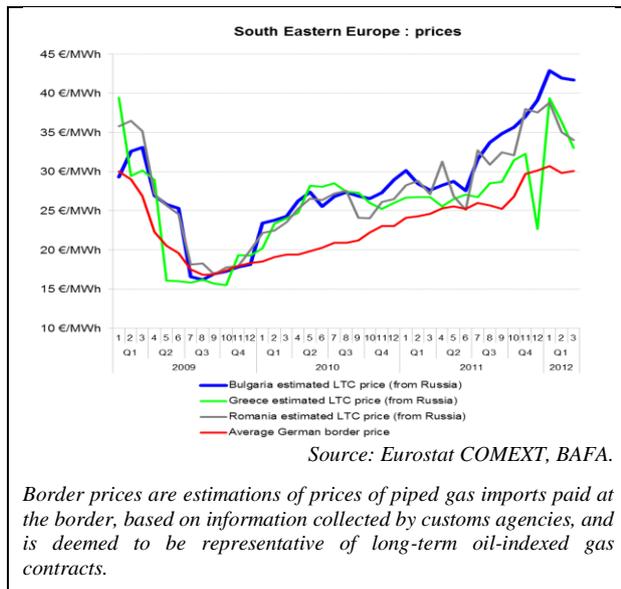
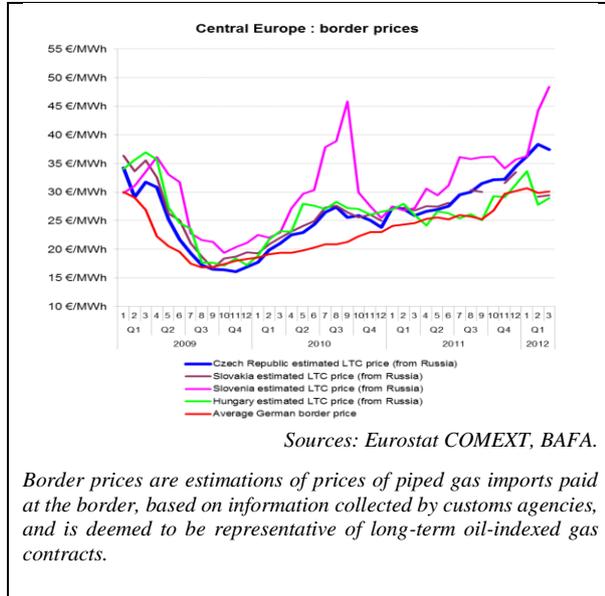
Baltic States, other Central and South-Eastern Member States

- The next 3 charts illustrate the fact that countries from Eastern and Southern part of the continent continue to pay some of the most expensive gas prices in Europe. As a rule, for the majority of those Member States the estimated gas prices under long term contracts were priced at a premium to the German border price in Q1 2012. A combination of two factors could explain such price development.
- On one side, the Baltic states and the countries in Central and Southern Europe do not have a diversified portfolio of gas supply sources and in a lot of cases they do not have a choice on the gas supply route. This was already

felt in 2009 during the gas dispute between Ukraine and the Russian Federation.

- In addition, these countries have not yet developed active hub trade and are paying for their gas deliveries prices which are indexed against crude and refined products. As seen in previous sections of the current report (page 8), this pricing mechanism has been consistently more expensive than the hub based gas-on-gas competition prices since several years.





A.3 Retail markets

Dear readers,

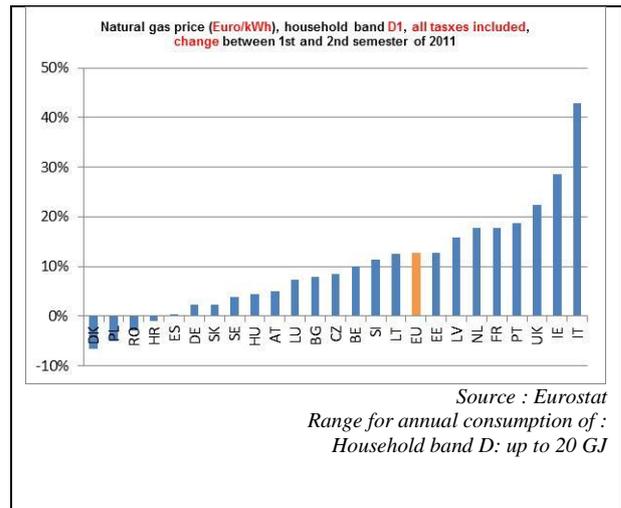
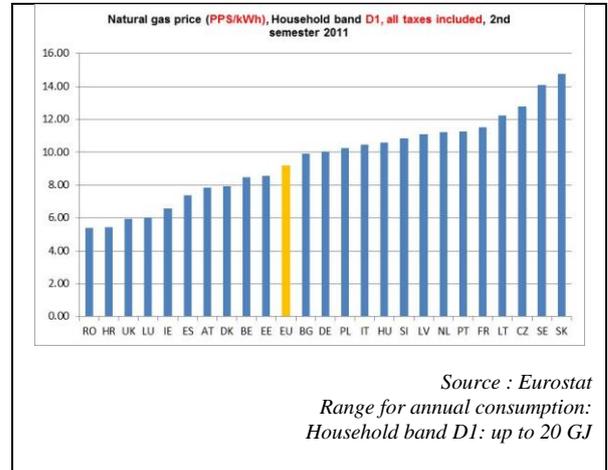
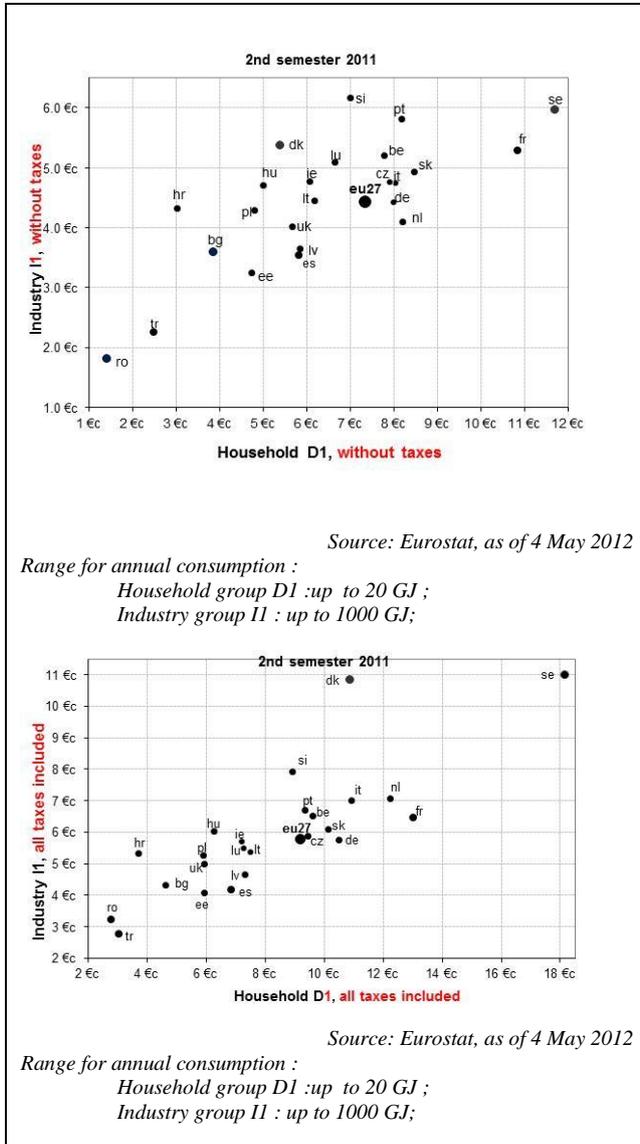
From this quarter onwards, we will have to align the reporting on developments in the retail markets across Europe with the data dissemination frequency of our principal data provider.

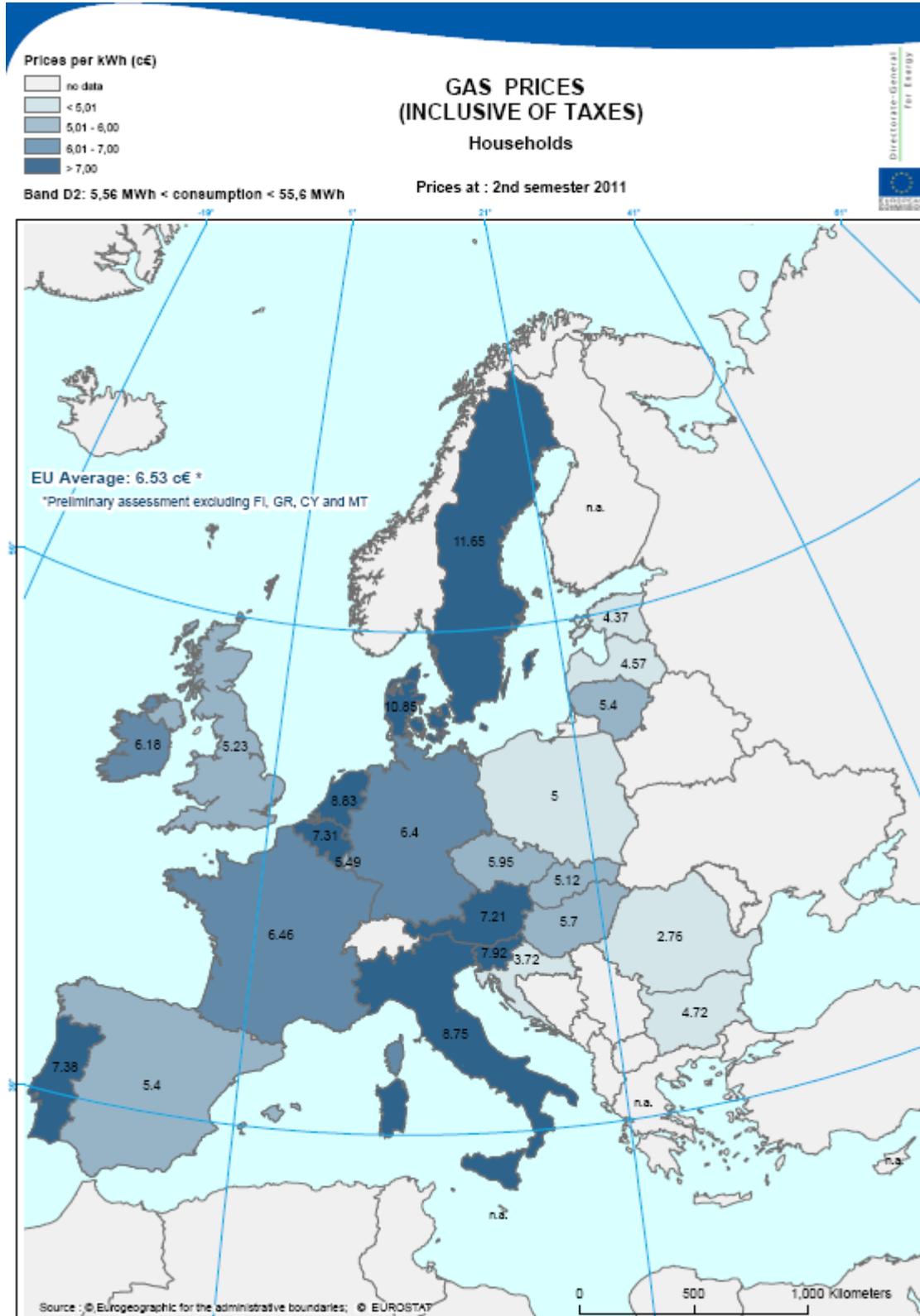
We will provide detailed analysis on the European retail natural gas markets only in each second issue of our reports (respectively Q2 and Q4 of each year), to match the half yearly data release on household and industrial gas price data by Eurostat.

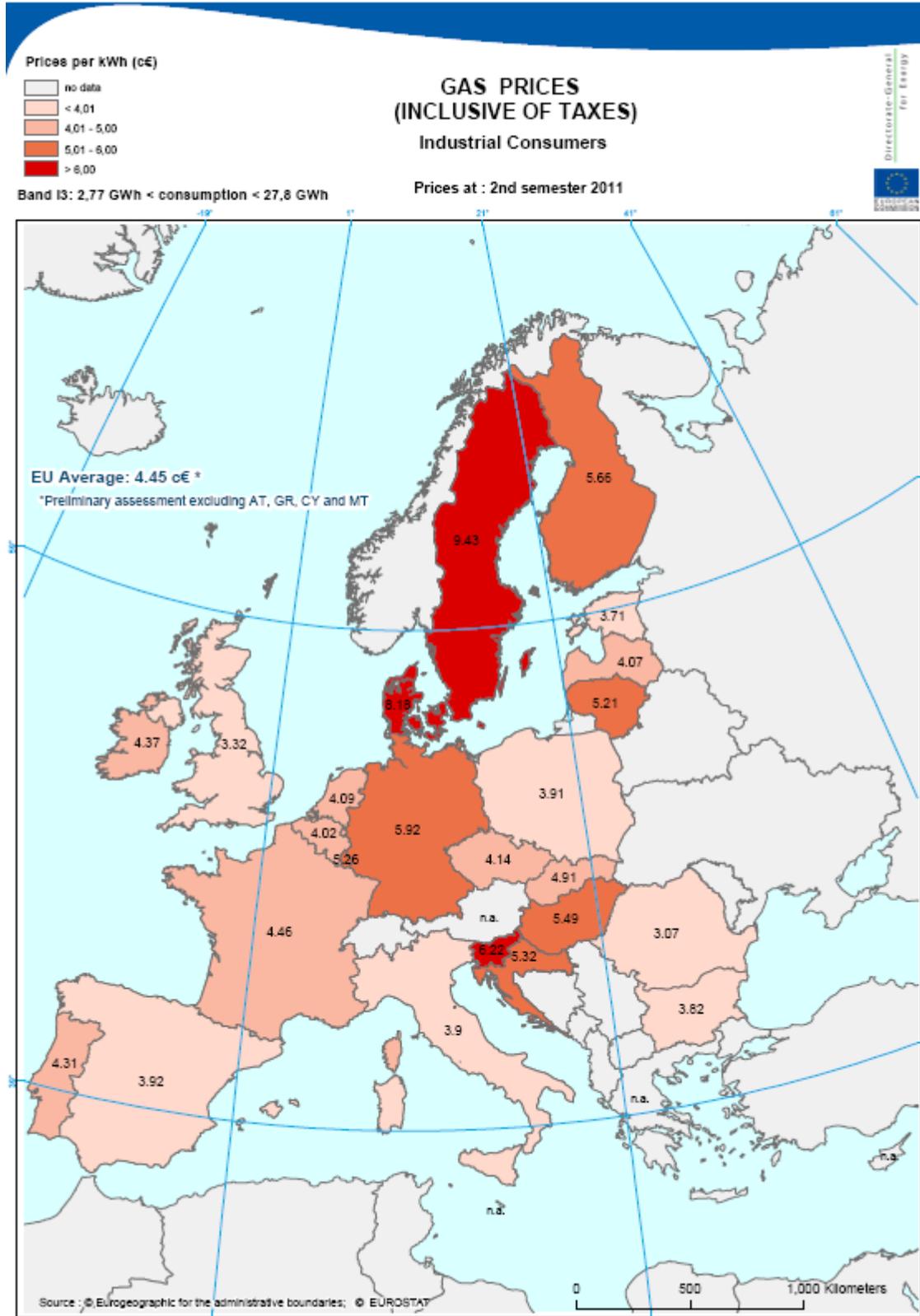
However, we will continue to present in each quarterly publication scatter plots, charts and maps showing the latest data on retail gas prices paid by households and industrial customers.

We will resume the detailed quarterly reporting when harmonised and up-to-date retail data becomes available at a higher frequency.

Thank you for your understanding.

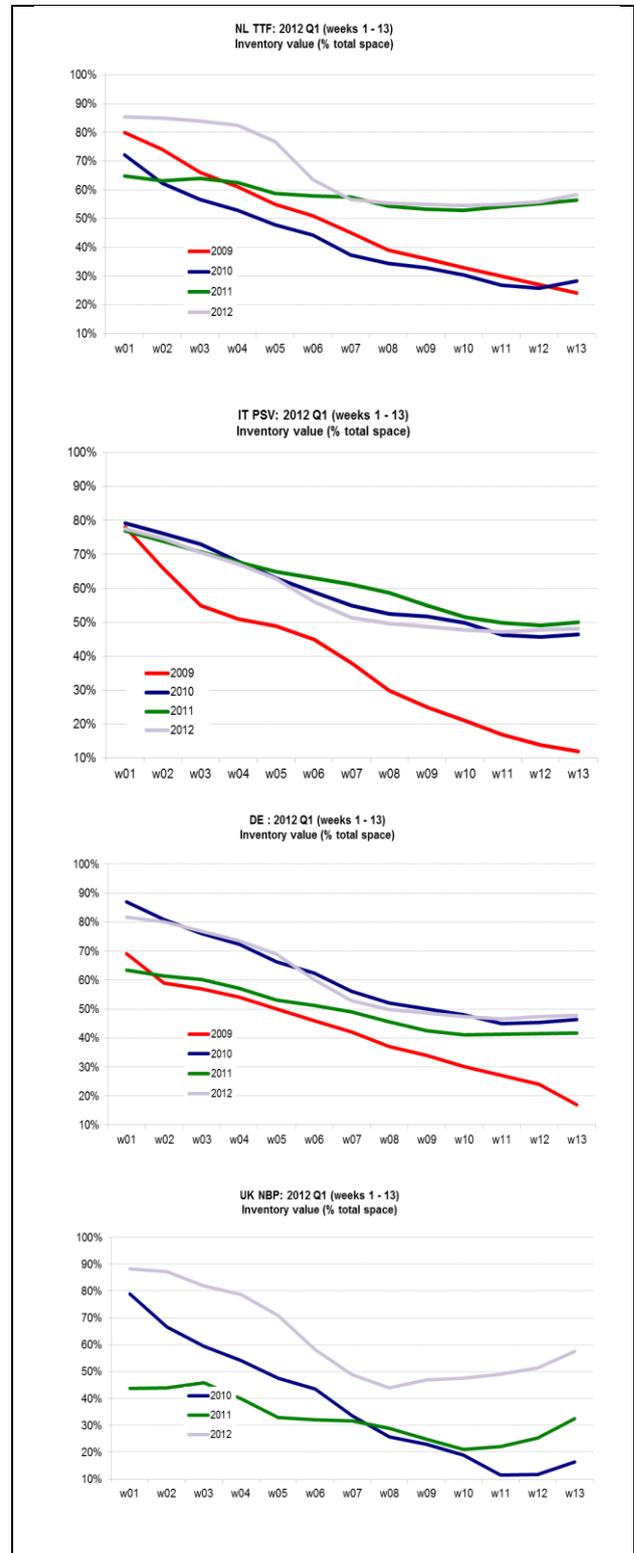
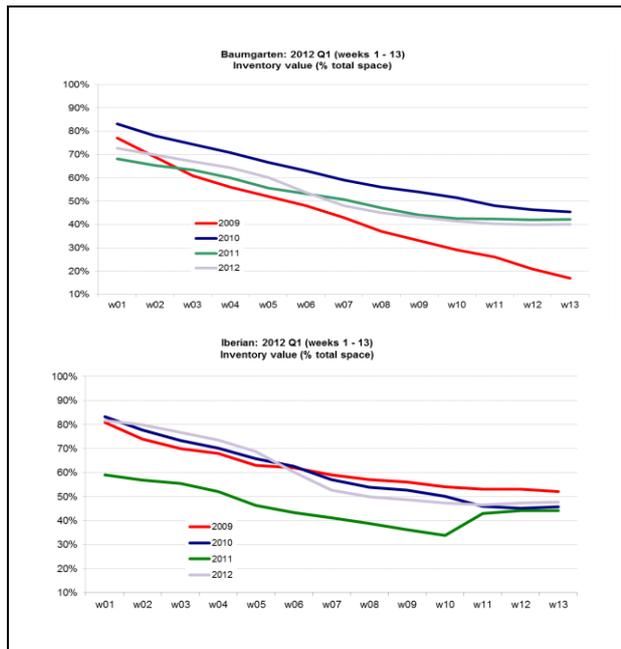


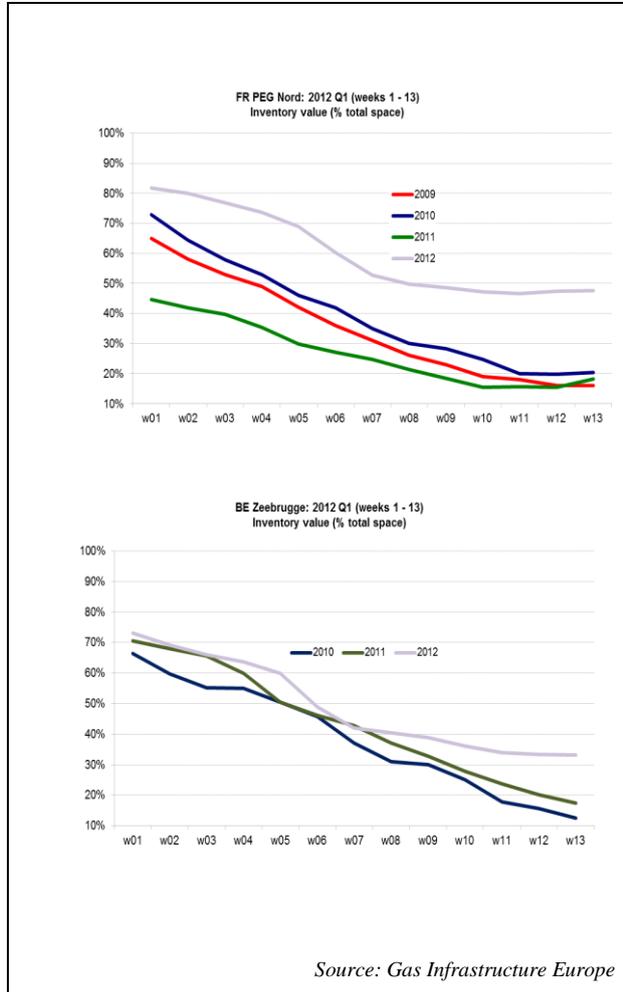




B. Storage

- By the end of January 2012, storage levels at EU hubs (see separate section on storage levels) were generally higher than usual, thanks to a clement fourth quarter of 2011, which led to a reduced need to complement supplies with storage withdrawals. Had this not been the case, prices could have been more volatile than they already were when demand increased significantly in February 2012.
- This allowed significant withdrawals of gas from storage during the cold snap. On average, storage levels across Europe fell by around 30% between week 5 and week 11, when storage levels hit their lowest levels across Europe.





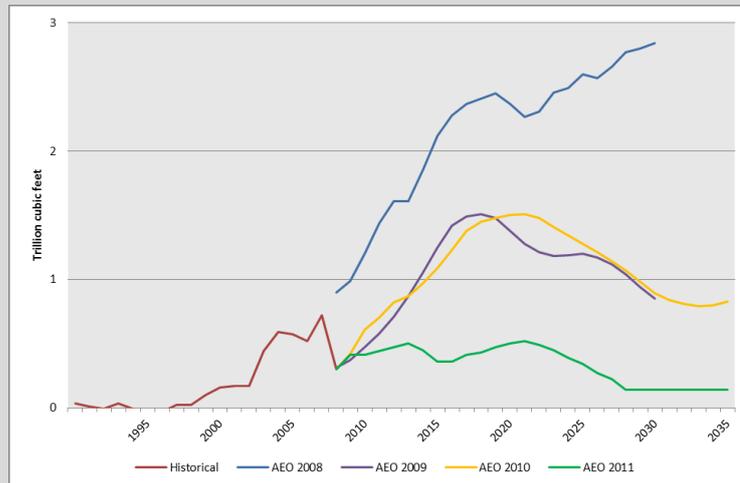
C. Focus on the Impact of US unconventional gas production on EU gas markets.

Unlike the oil market, natural gas markets are not globally integrated. This means that there are wide disparities in the prices paid for gas around the world, from less than \$1 per million British thermal units (MBtu) (3 €/MWh) in Saudi Arabia to around 2 \$/MBtu (6 €/MWh) in the USA and upwards of 16 \$/MBtu (55 €/MWh) in the LNG-dependent Asian markets. In the EU, natural gas trades at price levels which fall between the levels of US and Asian prices. But even within the EU itself, there are significant differences between the 'spot' prices in North West European Member States and oil-indexed prices in Central and Eastern European Member States (see detailed price comparison in section A.2.3 of this issue).

In spite of the fragmentation in the global gas system, the last decade has seen gradual, but unmistakable change in particular due to the unconventional gas revolution in the USA, with ripple effects being felt worldwide. The natural gas system has gone from being comprised of distinct regional or national markets to one where inter-regional trade flows are having a noticeable impact on physical supply-demand dynamics. Global growth in the trade of LNG has underpinned this transformation. Whereas the concept of a 'world gas market' was almost unthinkable ten years ago, a surge of new global LNG liquefaction capacity, much of which is inherently destination unspecific (flexible) or 'self-contracted', has introduced the first elements of inter-regional gas price competition. In early 2010, the increasingly globalised LNG market combined with two other key factors to create a 'perfect storm' that resulted in a glut of global gas supply, namely the boom in unconventional gas production in the USA; and less than anticipated demand levels as a result of the economic recession.

Unconventional gas production in the USA has increased markedly in the last decade. It accounted for 58% of US domestic production in 2010, causing the USA to surpass Russia as the largest gas producer in the world. Much of the expansion has been due to shale gas, which accounted for 23% of total US natural gas production in 2010. Before significant unconventional gas production began, it was expected that the USA would need to import substantial quantities of LNG, which led to massive investments in LNG infrastructure in the last decade. The reality, however, is that the USA currently uses less than 10% of its 150 bcm re-gasification capacity.

Figure 1: Historical and projected net US LNG imports⁸



Global LNG trade volumes doubled between 2000 and 2010, and increasing LNG liquefaction and regasification capacity will continue to drive growth in the coming years. As a major consumer of natural gas, Europe is robustly contributing to this trend: the EU's current regasification capacity of 150 bcm looks set to double by 2020. There is ample evidence that this growth in LNG trade is changing the characteristics of global gas markets. Whereas the high cost of transporting gas had previously restricted trade to specific regions, the constant price-driven rebalancing of LNG exports from key swing suppliers such as Qatar, Nigeria and Trinidad and Tobago,⁹ have enabled fluctuations in supply and demand – and hence prices – to be increasingly transmitted across the Atlantic Basin, and even further afield.

When US net imports of natural gas fell by 30% between 2007 and 2010, rapidly increasing LNG capacity in receiving terminals in North-West Europe allowed the EU to absorb cargoes originally destined for the US market. This strengthened the link between the UK and US gas hub prices between 2009 and 2010, enabling many EU Member States to benefit from the cheap spot-traded gas partially resulting from increased unconventional gas production in the USA.

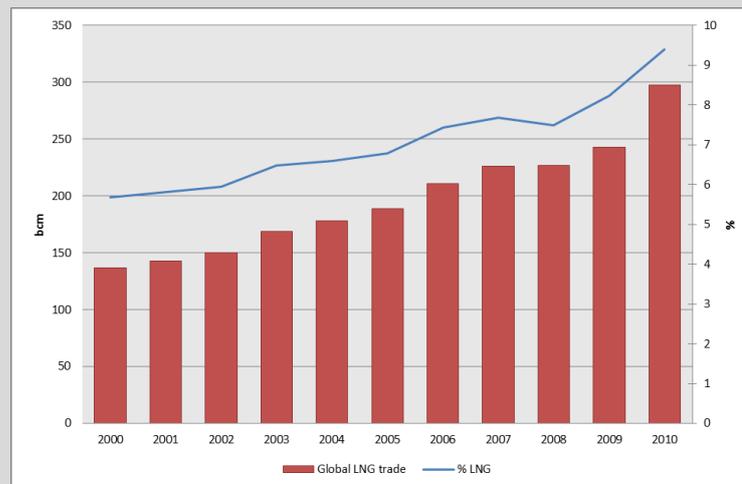
With gradually disappearing legal and technical barriers to spot-trading of gas in the EU, the sharp fall in spot prices witnessed in 2009 placed pressure on utilities locked into buying gas on oil-indexed, take or pay, terms as they were gradually priced out of the market by competitors able to source cheaper gas from LNG terminals or the EU hubs. Caught between their long-term contractual obligations and pressure from their

⁸ EIA, 'Annual Energy Outlook', (Washington, DC: US Energy Information Administration, Various).

⁹ Which supply both US and European LNG terminals.

(principally industrial) customers to supply cheaper gas, these utilities in turn pressed their suppliers for contract renegotiations on price and volumes.

Figure 2: Global LNG trade volumes and LNG as a percentage of global gas consumption¹⁰



The close correlation between the US and EU gas hub prices came to an end between the first and second quarters of 2010 as a result of unforeseen demand-side events, including the Fukushima disaster. However, the current balance of expert opinion suggests that the EU will continue to move slowly away from oil indexation because of the persisting risk of future exposure to discount hub prices.

The paragraphs above illustrate how the impact of unconventional gas on the European gas markets could be more complex and far reaching than might be expected. A comprehensive report covering this topic will be released from the Joint Research Centre of the European Commission in the coming weeks¹¹.

¹⁰ BP, 'Statistical Review of World Energy', (BP, 2011).

¹¹ The report "Unconventional Gas: Potential Energy Market Impacts in the EU" will be available on the following hyperlinks:

http://ec.europa.eu/energy/studies/energy_en.htm

<http://ec.europa.eu/dgs/jrc/index.cfm?id=2510>



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