



# Quarterly Report

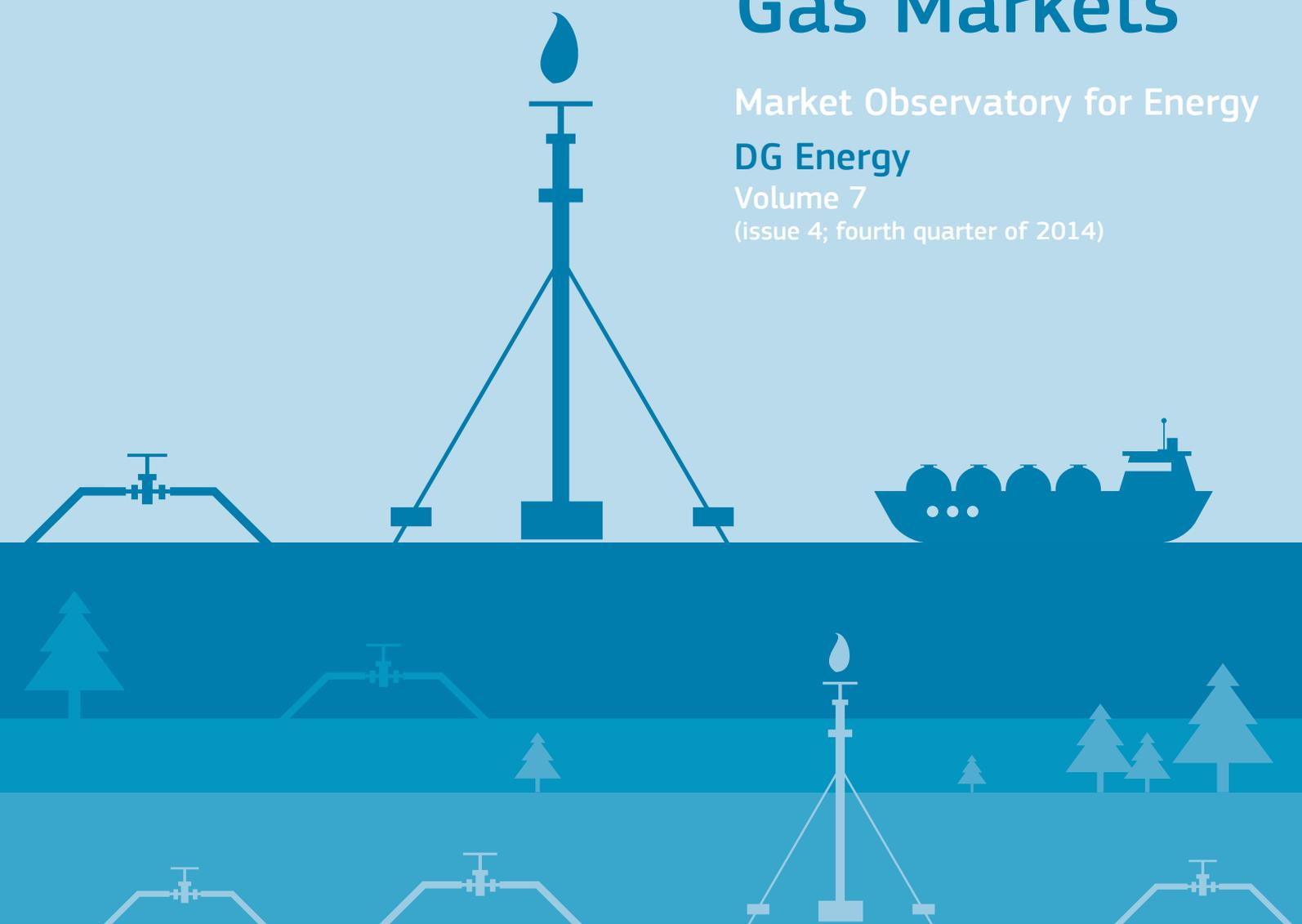
## on European Gas Markets

Market Observatory for Energy

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# Highlights of the report

- Gas consumption decreased by an estimated 10% in 2014. After a sharp decline in the first half of the year, the third and fourth quarters were relatively stable.
- Russian imports fell, especially in the second half of 2014, driven by a decline on the Slovakian import route.
- Norwegian imports increased but Russia remained the top supplier in 2014. The combined share of Russia and Norway reached 80% of total EU imports.
- Historically high levels of storage and mild weather were experienced in the fourth quarter.
- After 3 years of decline, LNG imports increased in the last quarter of 2014, as the price difference between Asia and Europe almost vanished.
- The liquidity of European hubs increased in 2014, with the Dutch TTF overtaking the UK NBP.
- European hub prices increased from a historical low reached in the summer of 2014 but remained below 2013 levels.
- Although European wholesale gas prices decreased in 2014, relative prices of gas vis-à-vis coal should need to drop further to trigger coal-to-gas switching. However, coal prices are also falling, making this possibility less likely.
- International prices converged as the premium of Asian LNG and the UK NBP over the US Henry Hub decreased.
- The fall in crude oil prices is set to pass through oil-indexed contracts gradually, starting in 2015, which leads to the expectation of further gas price falls in 2015.
- Retail prices decreased in 2014, both for households and industry.

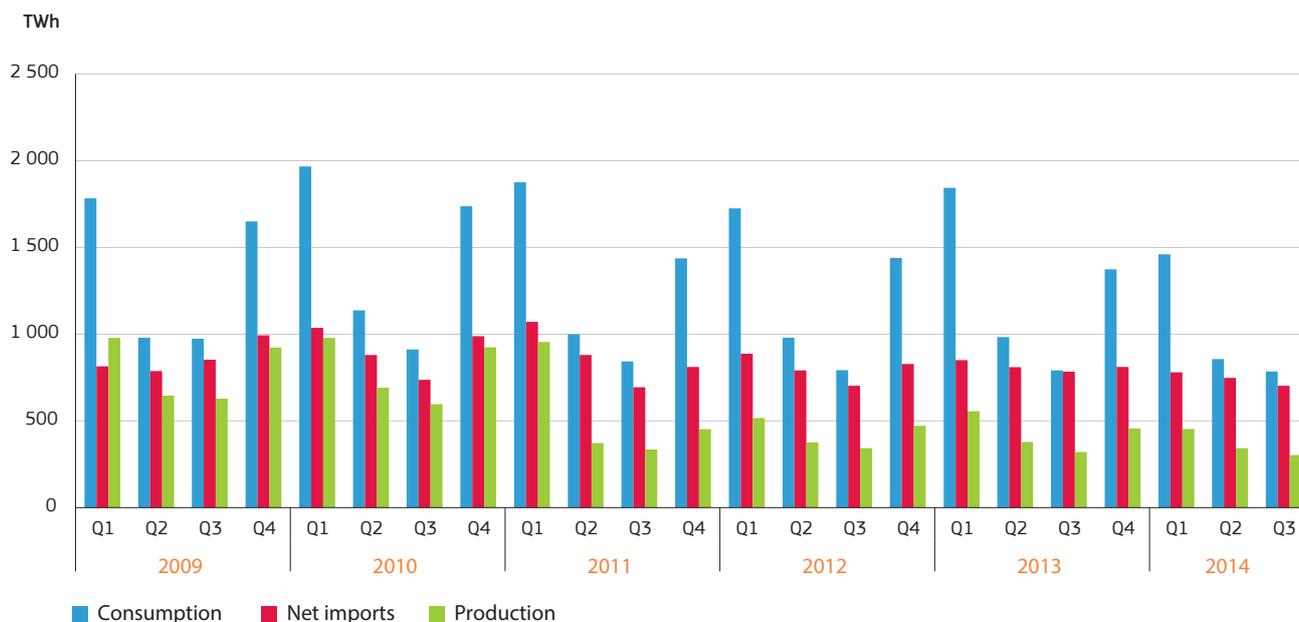
# Executive summary

- **EU gas consumption declined by 14% in the first nine months of 2014** relative to the year before, mainly driven by weather conditions, the slow recovery of economic activity and the poor competitiveness of gas in the power sector. In the third quarter, the decrease was only 1% year-on-year. Production and net imports were down by 12% and 9%, respectively, in the first three quarters of 2014.
- Preliminary Eurostat data show that **consumption decreased by 2% in the fourth quarter** year-on-year, indicating a 10% decline for the whole of 2014.
- **Russian imports fell in 2014** but the country remained the top gas supplier of the EU. Russian imports on the Slovakian route decreased by more than 40%, which was only partly offset by the rise on the Nord Stream. Norwegian imports increased and **in the last quarter Norway clearly outperformed Russia**. Market reports suggest that Russia is limiting supplies to Europe in order to minimise reverse flows to Ukraine. On the other hand, importers with oil-index priced contracts have been reducing their gas purchases in anticipation of lower prices.
- **In 2014, Russia and Norway covered 80% of total EU imports**, up from 64% in 2010.
- The **EU-brokered winter package** allowed the resumption of Russian supplies to Ukraine while Ukraine continued to buy gas from EU suppliers.
- Europe started the new gas year with **historically high storage levels**. Mild weather in the fourth quarter and expectation of geopolitical instability with respect to the situation in Eastern Ukraine kept average filling rates at a relatively high level.
- Weak demand and falling prices in Asia made Europe a more attractive destination for LNG cargoes. As a result, after three years of decline, **LNG imports increased by 10% year-on-year in the last quarter of 2014**. On an annual basis, LNG imports decreased by 3% but the UK imported 20% more than in 2013.
- In December 2014, **Lithuania became an LNG importer** as it received its first commercial shipment from Norway.
- After bouncing back in September-October, **LNG prices continued their downward trend** in the end of the year. By December, the premium of Asian LNG prices over European ones had almost disappeared. LNG and pipeline prices in the major LNG importing countries in the EU moved closer together.
- In spite of the increase from the historically low levels of summer 2014, **spot prices at European gas hubs were about 15% lower in the fourth quarter of 2014** compared to the same period of 2013.
- **Although European wholesale gas prices decreased in 2014, relative prices of gas vis-à-vis coal should need to drop further to trigger coal-to-gas switching**. However, coal prices are also falling, making this possibility less likely.
- **Total volumes traded on European gas hubs increased by 18% in 2014** to 30,800 TWh. With a robust 59% increase on the TTF, the Dutch hub **surpassed the NBP** and it is set to grow further in 2015. Growing liquidity entails increasing price transparency and decreasing transaction costs.
- **Differences between international gas prices were reduced in 2014**: the premium of Asian LNG prices and the UK NBP over the US Henry Hub price have declined. Nevertheless, the difference remains substantial, with the Japanese LNG price being 3 times higher and the UK NBP being around 2 times higher than the US Henry Hub at the end of the year.
- **Oil-indexed gas prices are expected to fall from the second quarter of 2015**, due to falling oil prices in 2014.
- **Retail prices for both households and industry decreased in 2014**. While some convergence can be observed, there are still significant price differences across Member States, particularly in the case of households.

# 1. Gas Consumption – Production – Imports

- Gas consumption and net imports of gas in the EU declined respectively by 14% and 9% in the first nine months of 2014 in comparison to the same period in 2013.<sup>1</sup> Consumption declined in all Member States, with the biggest decrease in Estonia (31%), Germany (30%) and Slovakia (40%). Much of this decrease in consumption resulted from an unseasonably mild weather in the first half of 2014 compared to an unusually cold winter and spring of 2013.
- After the sharp 18% decline in the first half of the year, in the third quarter of 2014 consumption decreased by only 1% year-on-year. Several countries registered a growth in demand, including Austria (9%), Belgium (10%), Luxembourg (12%), the Netherlands (4%) and the UK (11%), while German consumption continued its downward path (-8%).
- According to preliminary Eurostat data, consumption decreased by 2% in the fourth quarter year-on-year. This implies that in 2014 EU gas consumption declined by 10%. Based on a sample of eight Member States covering about 60% of EU consumption, Societe Generale estimates that consumption decreased by 9% in the fourth quarter.<sup>2</sup>
- In the first nine months of 2014, production of natural gas in the EU fell by 12% year-on-year. UK output was stable (-1%) but Dutch gas production decreased significantly (-22%), although the rate of decline was much smaller in the third quarter (-12%) than in the first half of the year (-24%). In December, the Dutch government again reduced the annual cap on production from the Groningen field because of concerns over earthquakes in the area. In February 2015, the government further reduced the cap for the first half of 2015, projecting a continuation of the decline in gas production.

**FIGURE 1 - EU GAS CONSUMPTION, IMPORTS AND PRODUCTION**

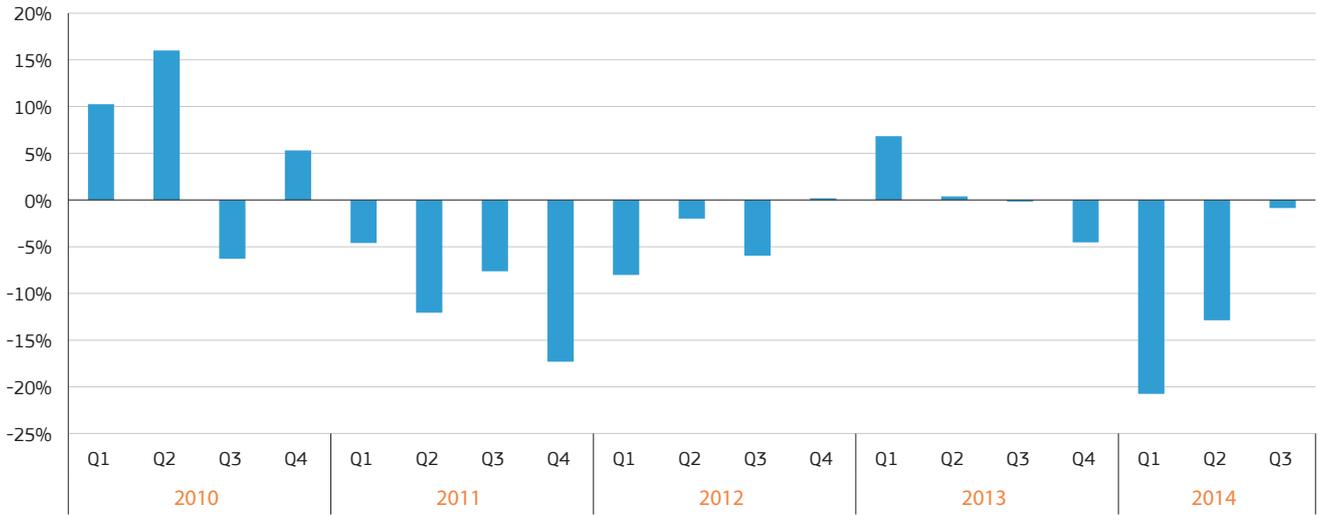


Source: Eurostat, data as of 24 February 2015 from data series nrg\_103m. Net imports refer to imports minus exports. Note: Eurostat methodological change in reporting import volumes effective as of January 2013. Before January 2013 monthly import volumes of gas were reported on country-of-origin basis. After this date, they are reported on border basis. Q1 and Q2 2014 figures have changed compared to the previous report because of retroactive revisions to consumption and net import data made by Germany.

1. Eurostat data series nrg\_103m as of 24 February 2015

2. SG Energy Pulse January 2015 Update

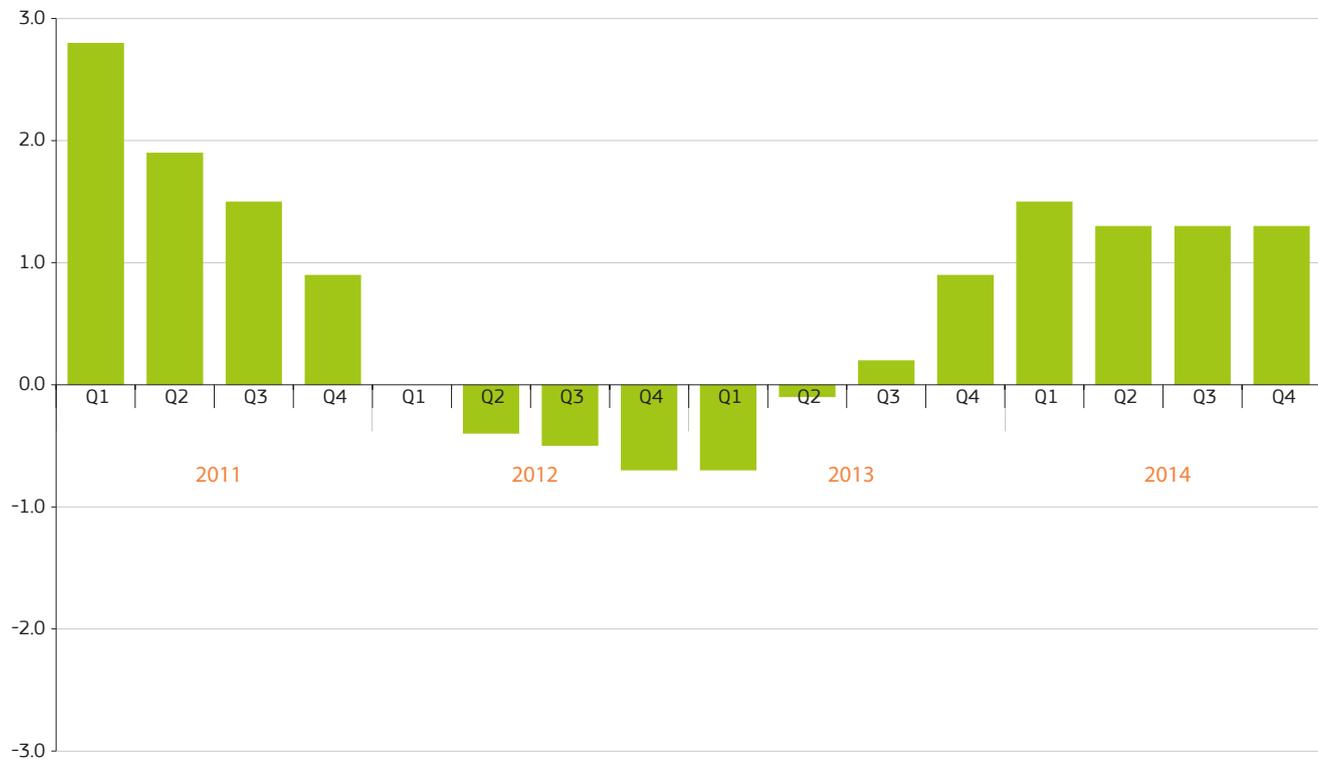
**FIGURE 2 - EU GAS CONSUMPTION Q/Q-4 CHANGE (%)**



Source of data: Eurostat, calculations of DG Energy

- In the fourth quarter of 2014, the seasonally adjusted Gross Domestic Product (GDP) of the EU rose by 1.3% compared to the same quarter of the previous year, unchanged from the growth rate seen in the second and third quarters. In the third quarter of 2014 (which is the latest period with detailed data available) gross value added in economic sectors consuming a significant amount of energy showed only moderate growth. The growth rate in the industry segment was 1.0%, which is below the level of the previous three quarters.

**FIGURE 3 - EU GDP Q/Q-4 CHANGE (%)**



Source: Eurostat

- Gas use continues to fall in power generation, driven by stagnating electricity consumption, the poor competitiveness of gas vis-à-vis other fuels and the growing penetration of renewables. Four of the five markets for which data are reported (Table 1) have seen a fall in the gas input to the power sector in 2014. In the last six years, gas consumption in the electricity sector has halved in Italy and decreased by more than 70% in Spain.
- Germany also saw a significant decline: gas use for power generation fell by 34% between 2010 and 2014. In 2014, the share of gas in the electricity mix tipped below 10%, with most of the gas use limited to combined heat-and-power plants which have long-term heat supply contracts. Although the gap between coal and gas prices narrowed in 2014, electricity from old hard-coal plants continues to be cheaper than power from new gas-fired plants.<sup>3</sup> German clean spark spreads – measuring the profitability of gas-fired generation – remained negative throughout 2014.<sup>4</sup>
- Although European wholesale gas prices decreased in 2014 (see details in section 3), relative prices of gas vis-à-vis coal should need to drop further to trigger coal-to-gas switching. However, coal prices are also falling, making this possibility less likely.
- Contrary to most other markets, the UK has experienced an 8% rebound in gas consumption in the power sector in 2014, after three years of reduction. The underlying reasons for this increase include the significant fall in spot prices for gas in the first half of the year and the availability of cheap spot LNG eroding the competitive advantage of coal fired generation over gas, along with structural factors related to the electricity sector of the UK. In the fourth quarter of 2014, clean spark spreads in the UK remained relatively robust at around 10 Euro/MWh although significantly decreased in December.

**TABLE 1 - NATURAL GAS INTAKE IN THE POWER GENERATION SECTOR OF SELECTED EU COUNTRIES 2008-2014 (BCM)**

	2008	2009	2010	2011	2012	2013	2014
<b>Italy</b>	33.4	28.7	29.8	27.5	24.2	20.1	16.8
<b>UK</b>	24.8	23.1	25.3	19.5	13.2	13.1	14.2
<b>Spain</b>	16.0	13.7	11.6	9.4	7.2	4.8	4.4
<b>Belgium</b>	n.a.	n.a.	n.a.	7.1	8.4	7.4	6.4
<b>France</b>	n.a.	n.a.	2.2	2.5	1.5	1.2	0.7

Source: Bentek/Platts

- In 2012-2013, a significant decrease in LNG imports in the EU was observed as booming demand for LNG in Asia and Latin America led to high LNG prices there. LNG imports decreased by 27% in 2012 and by 24% in 2013. The shift away from LNG slowed down in 2014 (-3%) and in the fourth quarter of 2014, LNG imports actually increased year-on-year by 10%.
- The decrease in LNG imports was partly offset by pipeline imports, rising by 3% in 2012 and by 7% in 2013. Most of this increase came from Russia: after an 8% decline in 2012, Russian imports increased by 28% in 2013. Norwegian imports grew in 2012 but slightly decreased in the following year.
- In 2014, the increase in pipeline imports came to an end with flows falling by 4%. While supplies from Norway increased by 5%, imports from both Russia and North Africa declined, by 11% and 9%, respectively.
- Looking at Russian flows, there was a significant decline of volumes arriving through Ukraine/Slovakia which has traditionally been the main supply route of Russian gas to the EU. Deliveries on this route declined by 41% in 2014, but in the second half of the year the decline was 64% year-on-year. This was partly offset by the increase on the Nord Stream where 2014 volumes were 49% higher than in the previous year. As a result, in 2014, Nord Stream deliveries slightly exceeded the volumes on the Slovakian route. From the deliveries arriving on the Nord Stream in 2014, 17.8 bcm fed the OPAL pipeline, implying an average utilisation rate of about 50% of this route. Part of the volumes carried on the OPAL pipeline reaches the countries of Central and Eastern Europe, traditionally supplied by Russian gas through Ukraine.

3. Agora Energiewende, [http://www.agora-energiewende.de/fileadmin/downloads/publikationen/Analysen/Jahresauswertung\\_2014/Agora\\_Energiewende\\_Review\\_2014\\_EN.pdf](http://www.agora-energiewende.de/fileadmin/downloads/publikationen/Analysen/Jahresauswertung_2014/Agora_Energiewende_Review_2014_EN.pdf)

4. Charts of clean spark spreads in Germany and the UK can be found in the Quarterly Report of European Electricity Markets

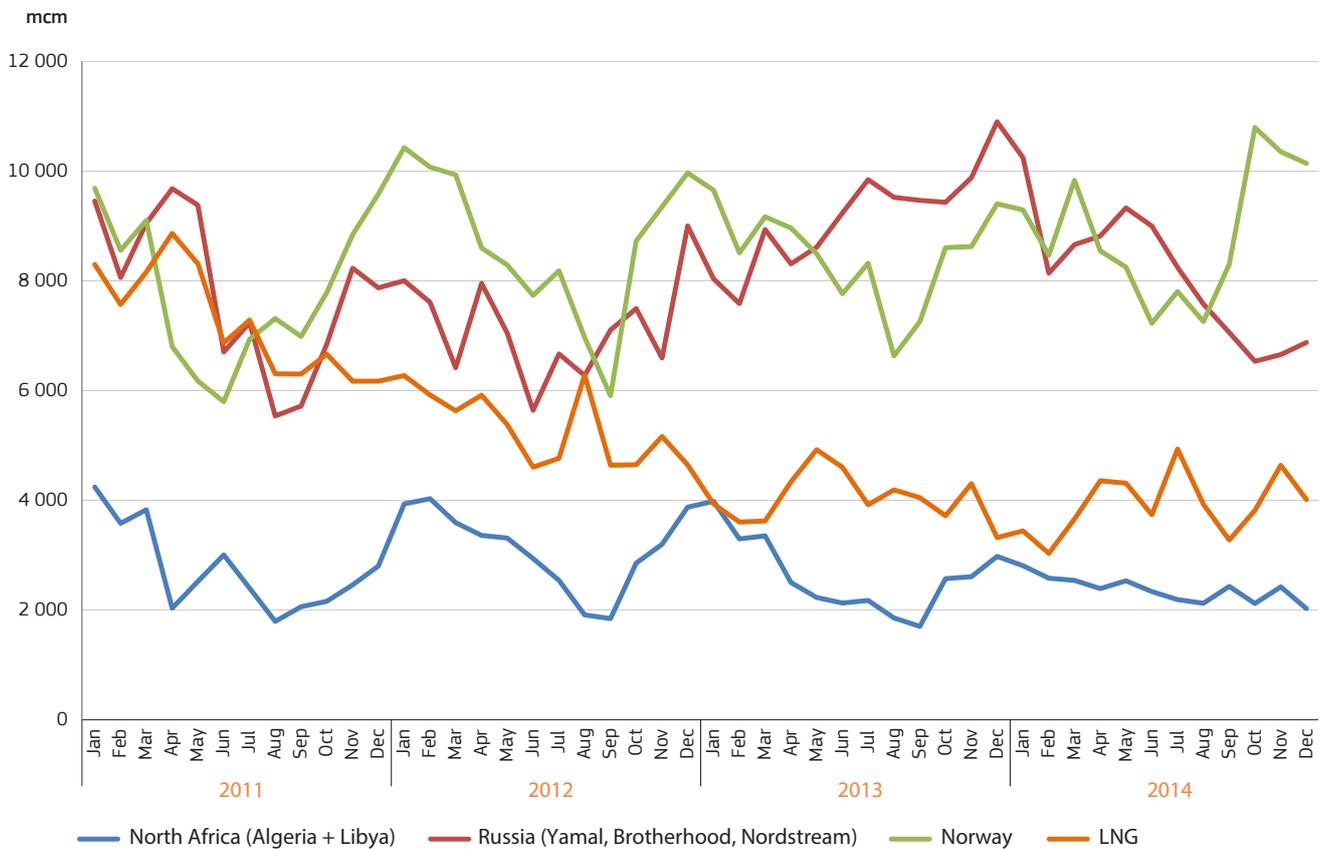
**TABLE 2 - EU GAS IMPORTS ON SELECTED SUPPLY ROUTES (BCM)**

	2011	2012	2013	2014
<b>Norway</b>	93.6	104.2	101.4	106.3
<b>North Africa</b>	32.9	37.4	31.4	28.5
<b>Nord Stream</b>	0.5	10.6	22.1	32.8
<b>Yamal pipeline</b>	22.8	25.0	30.6	29.8
<b>Ukraine/Slovakia</b>	70.4	51.8	53.5	31.4
<b>LNG</b>	87.0	63.9	48.5	47.2

Source: Bentek/Platts, Thomson-Reuters Waterborne. Yamal volumes include deliveries to Poland.

- In the fourth quarter of 2014 imports from Norway clearly outperformed those coming from Russia which plunged to an unusually low level for this time of the year (20.1 bcm on the main supply routes indicated in Figure 4). At the same time, Norwegian flows increased to record levels (31.3 bcm). It is believed that Russia is limiting supplies to Europe in an attempt to minimise reverse flows to Ukraine. On the other hand, in anticipation of lowering prices, importers with oil-index priced contracts are apparently reducing their purchases from Russia.

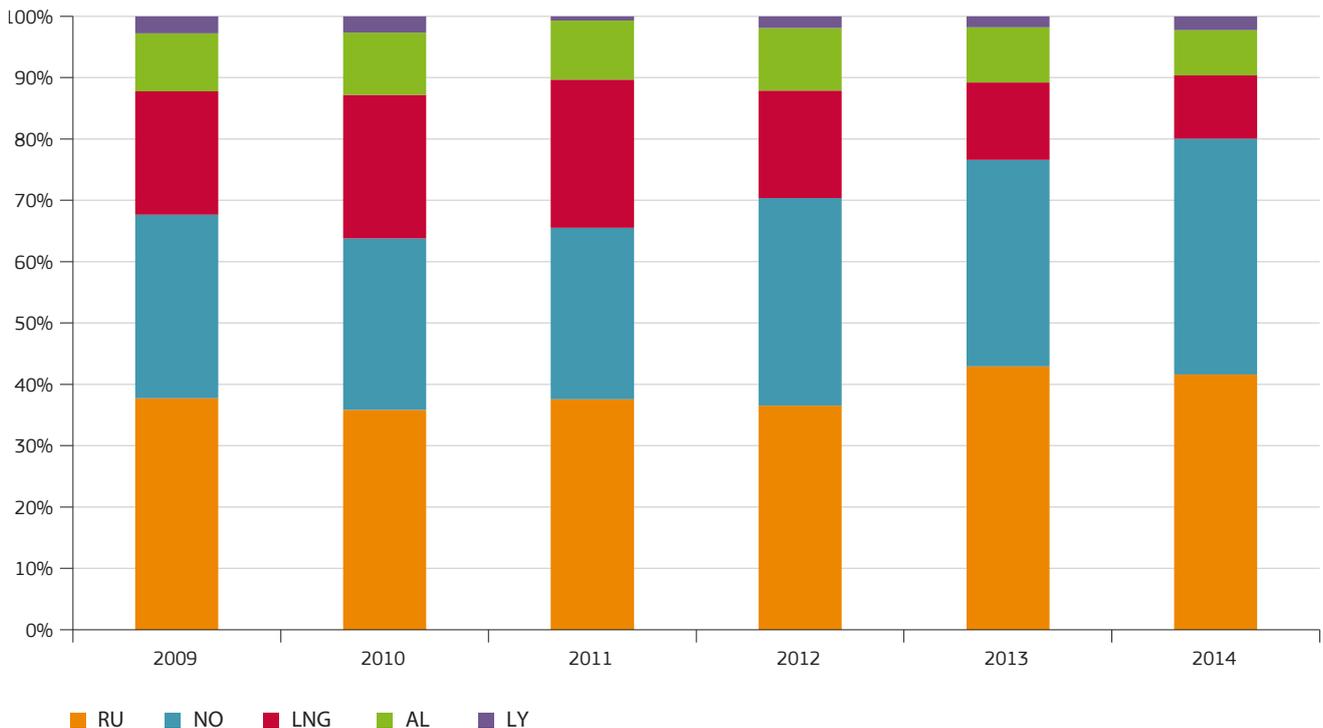
**FIGURE 4 - PHYSICAL PIPELINE FLOWS AND LNG IMPORTS INTO THE EU**



Source: Bentek/Platts, Thomson-Reuters Waterborne. Note: Russian flows include landing points Velke Kapusany, Drozdowicze, Wysokoe, Mal-lnow, Greifswald-NEL, Nordstream Greifswald. Norwegian flows include landing points Zeebrugge, Dunkerque, Dornum, Emden, St Fergus and Easington. LNG imports to Spain, UK, France, Italy, Belgium, Portugal, Greece, and the Netherlands.

- On an annual basis, the share of Norway of EU imports increased from 34% in 2013 to 38 % in 2014. Russia remained the EU's main gas supplier but its share of total imports decreased from 43% to 42%, while in volume terms Russian imports decreased by more than 10%. Algerian imports also showed a double-digit decline.
- Looking at the longer-term developments, the combined share of Russian and Norwegian imports shows a significant increase. Last year the two top suppliers covered 80% of the EU's gas imports while in 2010 their combined share was "only" 64%.

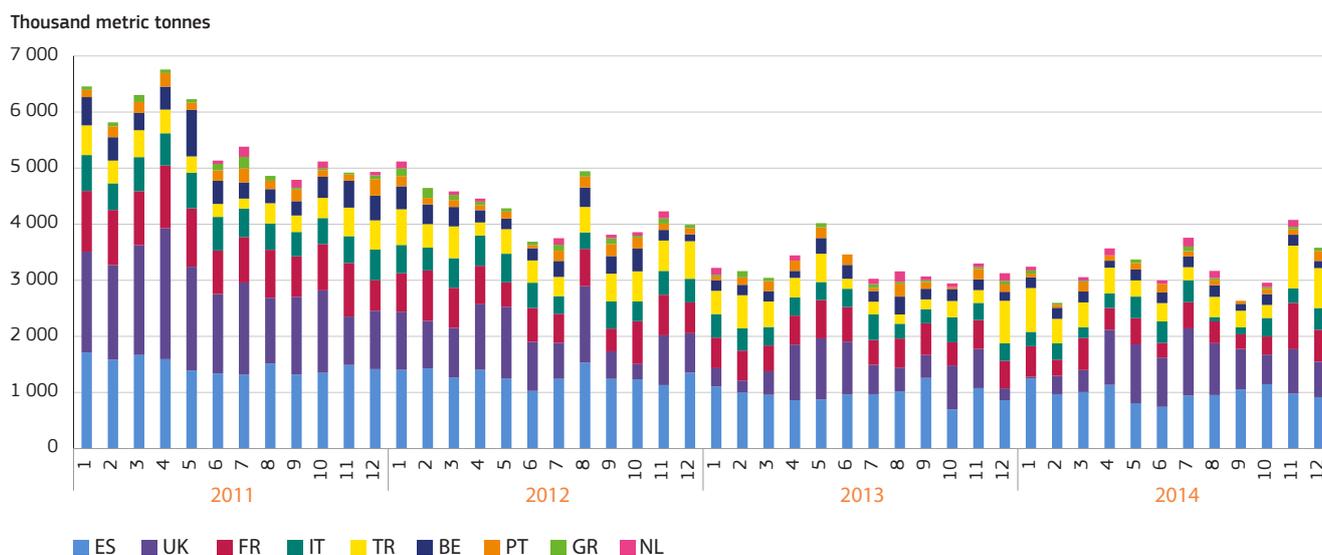
**FIGURE 5 - IMPORTS OF NATURAL GAS BY SOURCE, 2009-2014**



Source: Based on data from the ENTSO-G Transparency Platform

- Spain remained the top LNG importer of the EU in 2014 with imports increasing by 2% while UK imports grew by a robust 20%. Lithuania became the latest LNG importer in the EU: its floating terminal was opened in 2014 and received the first commercial LNG cargo from Norway in late December. Imports to other countries declined, with the biggest decrease registered in Portugal (-26%).
- Apart from Lithuania, other countries around the Baltic Sea are also planning LNG infrastructure to facilitate the diversification of gas supply. On 17 November 2014, Estonia and Finland agreed to build two LNG terminals, connected by the Balticconnector pipeline by 2019. Poland's LNG terminal which was originally due to come on stream in mid-2014 is now expected to start commercial operations in the second half of 2015.
- The overall downward trend for LNG imports in Europe seems to have halted in the second half of 2014 with subdued LNG demand in Asia and Latin America leading to falling LNG prices and spot cargoes looking to attract new buyers. These factors have prompted a price convergence between LNG and pipeline deliveries of gas for the first time since Fukushima set LNG spot prices on an upward trajectory. In the fourth quarter of the year, LNG imports increased by 10% compared to the same period of 2013.
- This trend is likely to continue in 2015 and the following years as Asian markets are unlikely to absorb the significant additional LNG volumes from new projects coming on stream in the rest of the decade. Several new LNG export terminals will start operating in 2015, principally in Australia.
- As discussed in section 5 of the report, Asian spot LNG prices have halved during the first half of 2014, as a result of mild weather, high stock levels, the authorisation of a first Japanese nuclear restart and the expectation of new plant start-ups (although, for the time being, all Japanese nuclear plants remain offline). This has made Europe a more attractive destination for LNG cargoes and put pressure on European hub prices. This development highlights the increasing exposure of Europe to the global gas market through LNG trade.

**FIGURE 6 - LNG IMPORTS TO EUROPE BY COUNTRY (THOUSAND METRIC TONNES)**



Source: Thomson-Reuters, Waterborne

- After several rounds of negotiations, the talks of 30 October 2014 moderated by Günther H. Oettinger, then Vice-President of the European Commission responsible for energy, resulted in the signature of a “winter package” by Russia, the Ukraine and the EU. With the support of the Commission, the two countries found preliminary agreement on their outstanding debt issues and on an interim solution enabling supplies to continue until the end of March 2015, following advanced, monthly payments by Ukraine.
- As a result of the agreement, gas deliveries from Russia to Ukraine – which were cut off on 16 June 2014 due to Ukraine’s increasing gas debt – resumed in December. However, in anticipation of lower oil-indexed prices in 2015, Ukraine tried to minimise gas purchases from Russia at the end of 2014.
- In the fourth quarter of 2014, Ukraine continued buying gas from European suppliers. While deliveries from Hungary to Ukraine stopped on 25 September 2014 (and resumed only in January 2015), gas flows continued from Poland and Slovakia, with combined monthly volumes of about 1 bcm. Deliveries from Slovakia represented more than 90% of total EU gas flows to Ukraine; volumes on this route increased in November when the Slovakian TSO increased the capacity of the Vojiny pipeline from 26 to 30.5 mcm/day.

**TABLE 3 - NATURAL GAS INTAKE IN THE POWER GENERATION SECTOR OF SELECTED EU COUNTRIES 2008-2014 (GWh)**

	September	October	November	December
<b>PL -&gt; UKR (Hermanowice)</b>	1 224	868	648	670
<b>SK -&gt; UKR (Budince)</b>	8 248	8 559	9 293	9 871
<b>HU -&gt; UKR (Beregdaróc)</b>	957	0	0	0
<b>Total</b>	10 429	9 428	9 941	10 540

Source: Data from ENTSOG Transparency Platform

5. [http://europa.eu/rapid/press-release\\_IP-14-1238\\_en.htm](http://europa.eu/rapid/press-release_IP-14-1238_en.htm)

## FOCUS ON: THE ENERGY UNION

On 25 February 2015, the Commission tabled its much-awaited Energy Union strategy<sup>6</sup>, one of the top priorities put forward in President Juncker's political guidelines. The strategy sets out, in five interrelated policy dimensions, the goals of an energy union and the detailed steps the Commission will take to achieve it.

Gas features prominently in the document and several of the envisaged actions will have a significant impact on the supply or the demand of gas in the coming years and decades.

When it comes to energy security, the strategy underlines the importance of diversification of supply. In the case of gas, work must continue on the Southern Gas Corridor and, similarly to Northwest Europe, liquid hubs with multiple suppliers should be established in Central and Eastern Europe and in the Mediterranean. Apart from constructing new infrastructure to deliver gas to the EU, interconnections have to be improved also within the EU. Indigenous production of unconventional gas can also play a role, provided that issues of public acceptance and environmental impact are adequately addressed.

The document highlights the potential of LNG and envisages an LNG and storage strategy to be prepared by 2016. Not only does increasing LNG trade provide new supply sources, it also helps to bring world gas prices closer together. Global LNG trade is set to grow significantly over the coming years which should allow the EU to diversify its gas supplies.

In addition to diversification of supply, the strategy stresses the importance of crisis management and solidarity, to be addressed in the forthcoming revision of the Security of Gas Supply Regulation. The Commission will also assess options for voluntary demand aggregation mechanisms for collective purchasing of gas during a crisis and where Member States are dependent on a single supplier.

The document calls for ensuring more transparency in gas contracts, while safeguarding the confidentiality of sensitive information. Agreements related to the buying of gas from third countries have to be fully compliant with EU law. To ensure this, the Commission should be informed and involved from an early stage of negotiations.

One of the five dimensions is the fully-integrated internal energy market. To complete this internal market, more cross-border connections are needed, including to the remaining energy islands. In addition, full implementation and strict enforcement of existing legislation, in particular the 3<sup>rd</sup> Internal Energy Market Package, is also essential.

On the regulatory side, transmission system operation have to become more integrated, with a bigger role for the European Network of Transmission System Operators for Gas (ENTSO-G) and the creation of regional operational centres. The powers and independence of the Agency for Cooperation of Energy Regulators (ACER) are also to be reinforced.

The strategy highlights the importance of energy efficiency as a contribution to the moderation of energy demand. One of the main targets is the buildings sector. As gas has a significant role in space heating, an improvement of energy efficiency in this sector can have massive implications for future gas demand.

Climate policy is an integral part of the Energy Union strategy which will require the decarbonisation of the economy. In particular, the document sets the ambitious target for the EU to remain world leader in renewable energy. As the current report underlines, renewables already have an increasing role in power generation in the EU.

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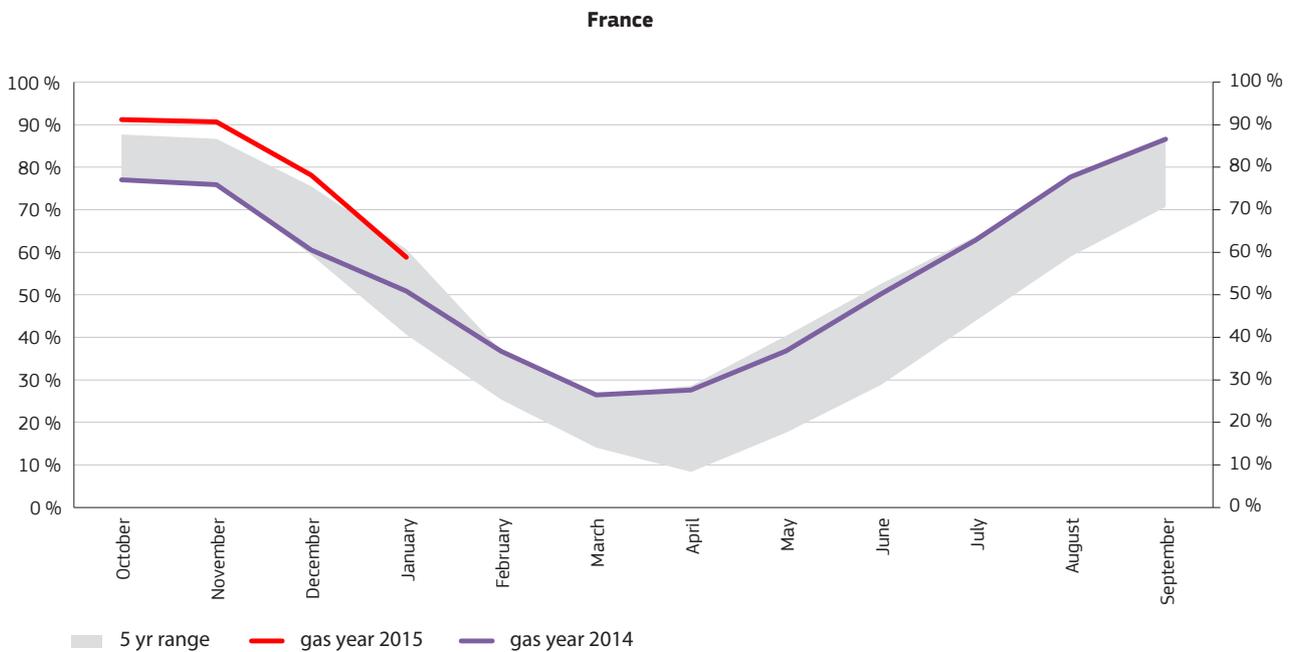
6. [http://ec.europa.eu/priorities/energy-union/index\\_en.htm](http://ec.europa.eu/priorities/energy-union/index_en.htm)



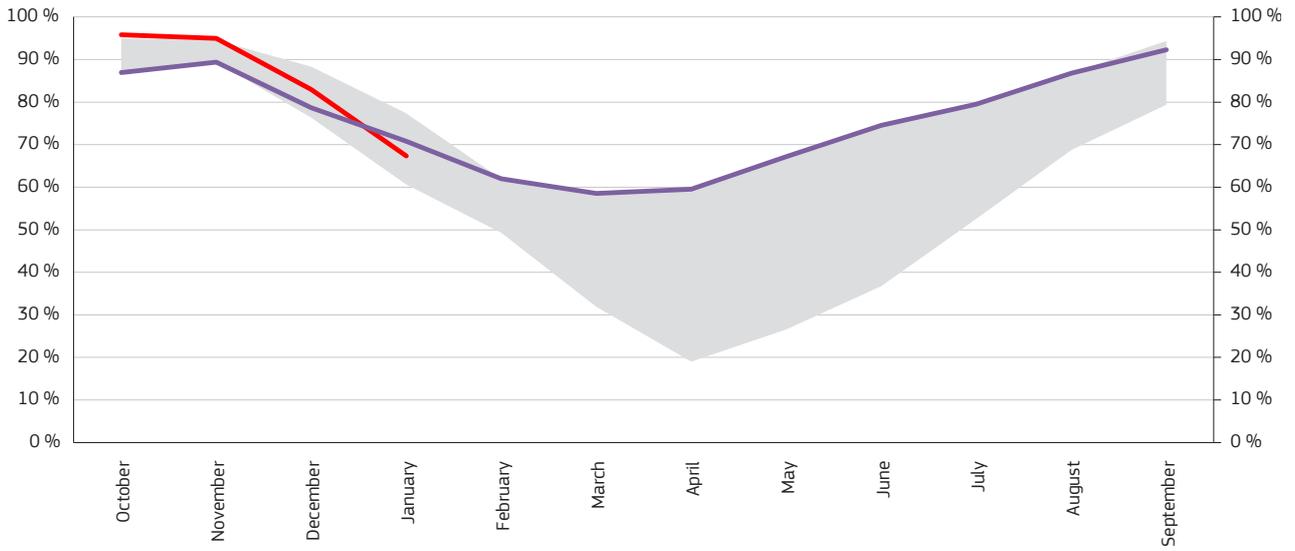
# 2. Gas Storage and heating degree days

- Europe came out of the mild 2013/2014 winter with relatively high gas inventories and by the end of October storage levels exceeded 78 bcm, equivalent to 94% of storage capacity. This is the highest level in the last four years and nearly 13 bcm higher than a year earlier. High storage levels provide a robust energy security buffer in the context of uncertainty about Russian supplies through Ukraine.
- As Europe is going through another mild winter, storage levels remained relatively high, with January 2015 average filling rates remaining above the 2013 and 2014 levels in the majority of countries.
- Storage facilities in the countries with the highest capacities reached higher maximum levels than a year earlier, with French sites exceeding the 90% filling rate for the first time in the last five years.

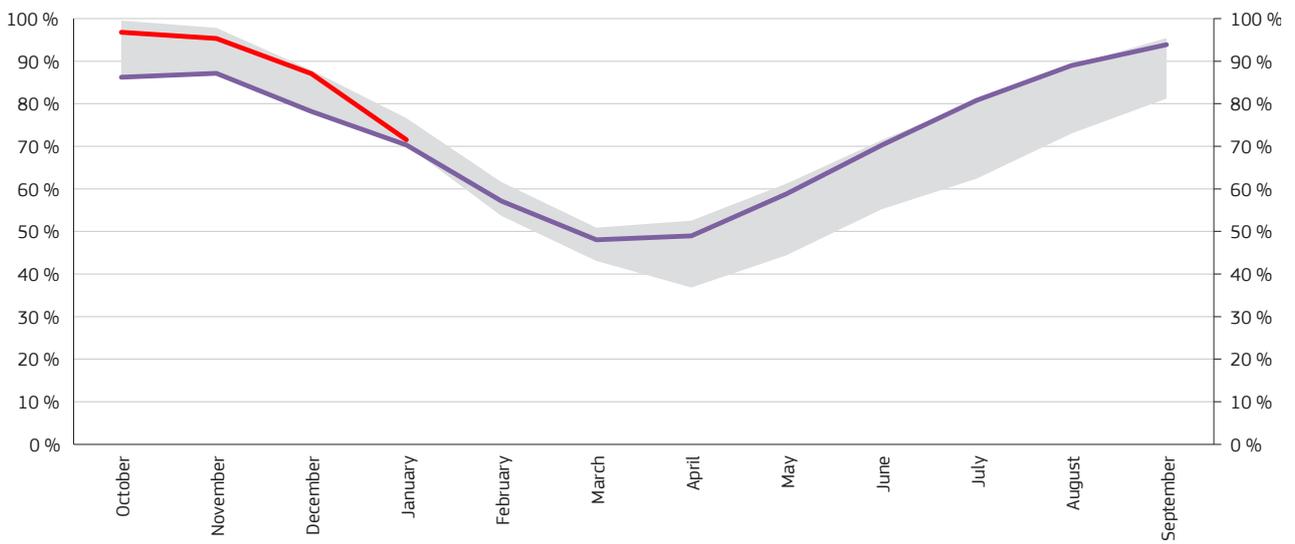
**FIGURE 7 - GAS STORAGE LEVELS AS % OF MAXIMUM GAS STORAGE CAPACITY IN SELECTED COUNTRIES**



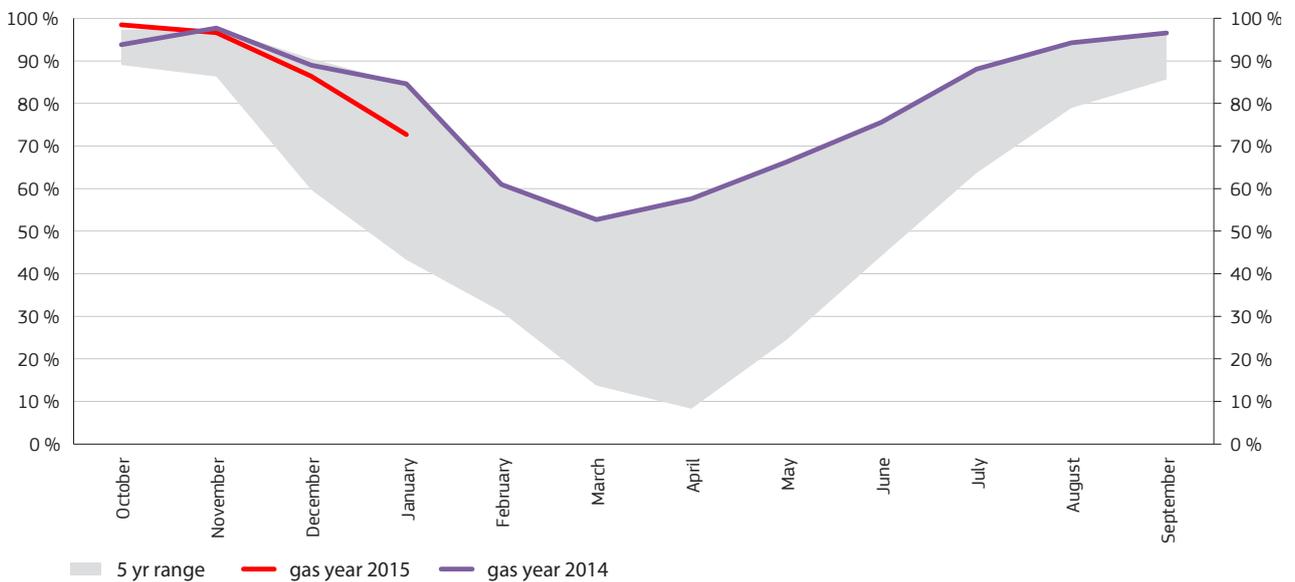
### Germany



### Italy



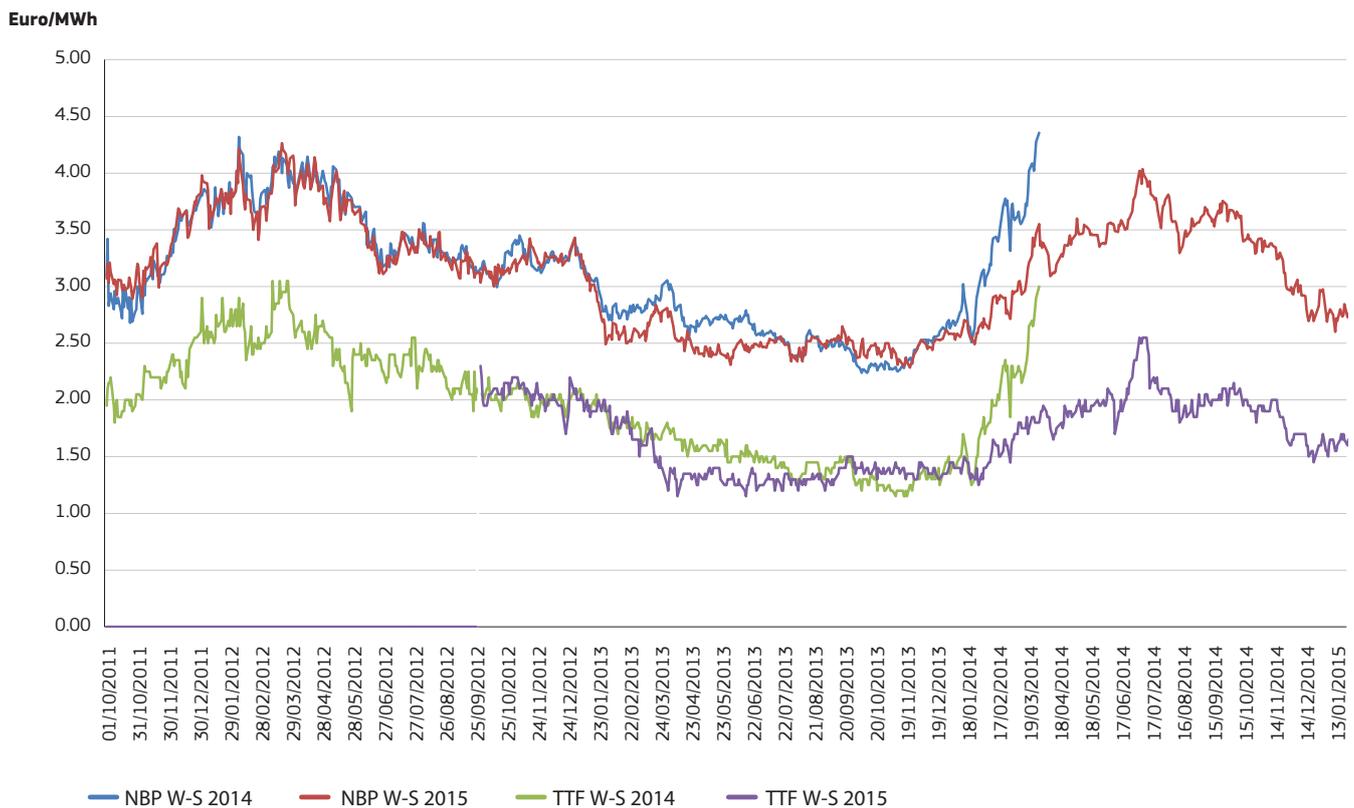
### UK



Source: Gas Storage Europe, Thomson-Reuters

- A high seasonal price spread between winter and summer contracts on the major hubs indicates a financial incentive to inject gas into storage. Figure 8 shows that the seasonal price spread on contracts at the NBP and TTF fell during 2012 and 2013. In the first half of 2014, seasonal spreads significantly increased, in line with the falling spot prices in the summer of 2014 and concerns about winter supplies in the wake of the Ukrainian crisis. This contributed to the high storage levels seen in 2014.
- In the second half of the year, as spot prices recovered, spreads decreased again but remained higher than in 2013. Although the Ukrainian crisis is far from over, seasonal price spreads are near to pre-crisis levels which may curb the filling of storage facilities during 2015.

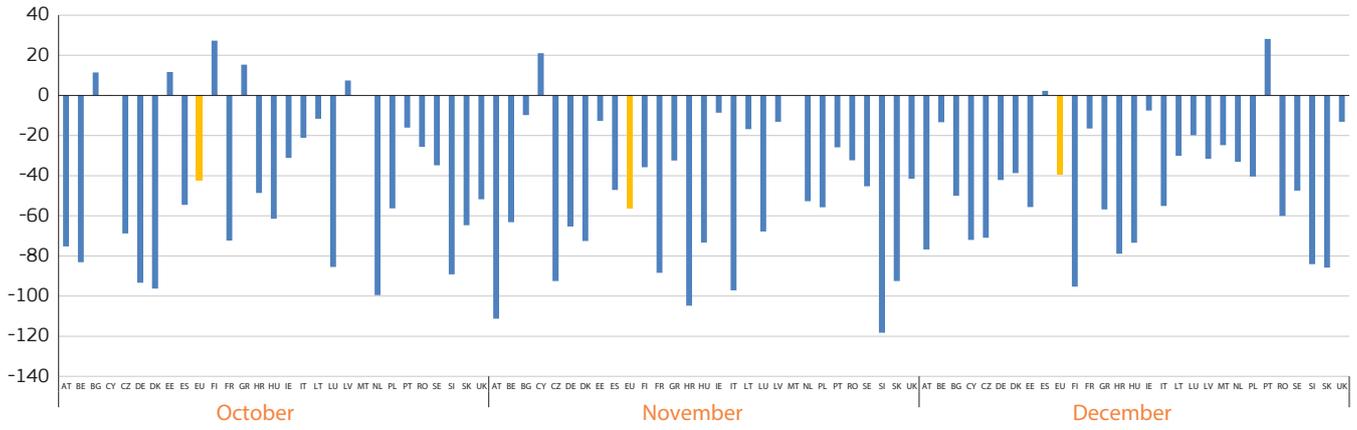
**FIGURE 8 - WINTER-SUMMER SPREADS IN THE DUTCH AND BRITISH GAS HUBS**



Source: Platts

- Figure 9 shows the monthly deviation of actual Heating Degree Days (HDDs) from the long term average in EU Member States in the last three months of 2014. In practically all Member States the number of actual heating degree days was markedly below the long term average in this period, implying that temperatures were higher than the seasonal averages. For the EU as a whole, the number of heating degree days was 12% lower than the long-term average.
- At the beginning of the heating season this mild weather reduced gas demand for heating purposes, translating into further downward pressure on gas consumption.

**FIGURE 9 - DEVIATION OF ACTUAL HEATING DEGREE DAYS (HDDs) FROM THE LONG TERM AVERAGE, OCTOBER-DECEMBER 2014**



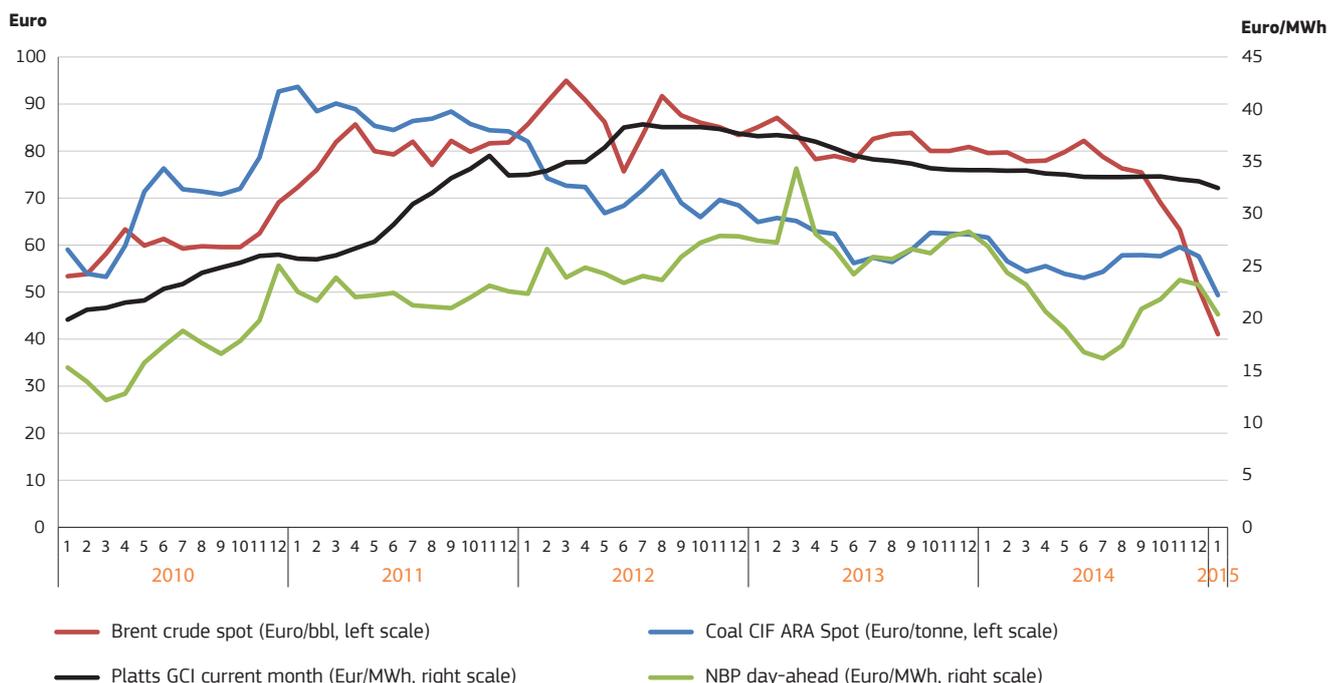
Source: Eurostat/JRC. The colder the weather, the higher the number of HDDs.

# 3. Wholesale Gas markets

## 3.1 The broader energy commodity picture: comparisons between oil, gas and coal prices in the EU

- The fall of oil prices, driven by weak demand and robust supply growth, which started in mid-2014 continued in the fourth quarter of the year. The trend gained momentum after OPEC, in its meeting on 27 November, decided not to cut output. By mid-January 2015, Brent dropped below 46 USD/barrel. In 7 months, the oil price decreased by 60%, its biggest decline since 2008, but recovered in February to about 60 USD/barrel.
- Spot gas prices in the EU showed an opposite trend: the average monthly gas price at the NBP increased from 16.1 Euro/MWh, a 4-year low, in July to 23.7 Euro/MWh in November. However, as the winter set in, the price started to decline, helped by easing concerns about Russian supplies after the agreement on the winter package and an increase in LNG imports in the last two months of the year. The December average price (23.2 Euro/MWh) was 18% lower than a year earlier. Section 3.3.2 looks at the main drivers of European wholesale gas prices.
- The falling oil price will have an immense but delayed impact on oil-indexed gas prices. Russian export prices are typically based on the price of gas oil and fuel oil, applying a time lag. Accordingly, the recent oil price drop should pass through to such gas contracts gradually, in most cases starting from the 2nd quarter of 2015. Platt's North West Europe Gas Contract Indicator (GCI), a theoretical index showing what a gas price linked 100% to oil would be, showed only a slight decrease in the fourth quarter of 2014.
- Coal prices slightly increased during the autumn months but, similarly to gas, started to fall again from December. Global oversupply keeps European coal prices on a steady declining trend since early 2011. By January 2015 the CIF ARA Spot price of coal reached its lowest level in the last five years.

FIGURE 10 - SPOT PRICES OF OIL, COAL AND GAS IN THE EU

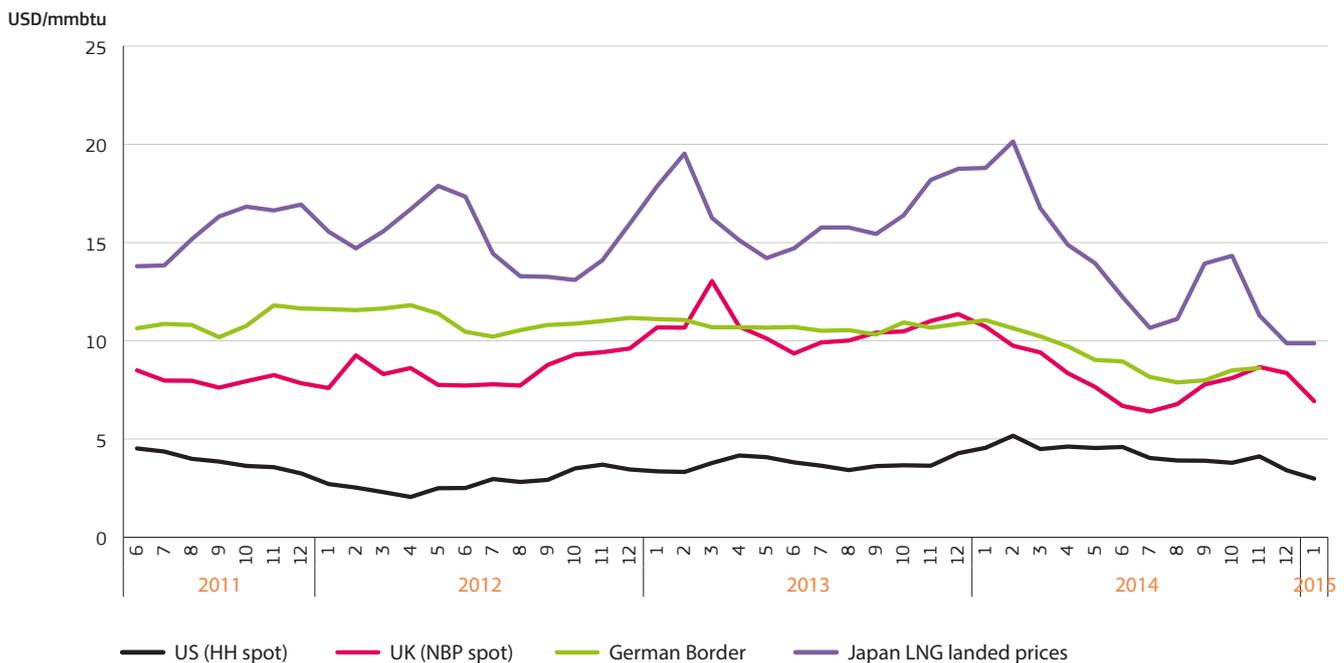


Sources: Platts

## 3.2 International gas markets

- Figure 11 shows an international comparison of wholesale gas prices. Over 2014, wholesale prices decreased in all regions.
- LNG prices showcased the biggest decrease, with Japanese landed prices halving between February and December. LNG prices started to fall at the end of the 2013/2014 winter, mainly because of weak demand in Asia, the biggest LNG market. Unlike in previous years, the current winter failed to reverse the downward trend and after a rebound in September–October prices continued to fall, reaching a 4-year low in December. New plants coming on stream in Australia in 2015 are expected to keep LNG prices at a subdued level.
- European prices significantly decreased in the first half of 2014. After a partial recovery in the autumn months, prices started to fall again at the end of the year. German border prices remained above NBP for most of the year, with the premium exceeding 5 EUR/MWh in June.
- The average monthly Henry Hub price reached a 4-year high in February 2014 but by December it had decreased by a third. In January 2015 the price fell below 3 USD/mmbtu for the first time since mid-2012. While the fall of the oil price cut the production of associated gas from oil shale plays, the resulting cost deflation helps the gas producers as they focus on gas-rich fields.
- International gas prices showed a tangible convergence in 2014. The ratio of the Japanese LNG price and US Henry Hub has fallen below 3 at the end of 2014 while a year earlier this indicator was in the 4–5 range. The NBP/Henry Hub ratio declined to 1.45 in June, the lowest level since 2010; it bounced back above 2 in the fourth quarter but remains below 2012–2013 levels. The price convergence observed in 2014 was partly driven by exchange rate developments: during 2014 the Euro weakened by more than 10% compared to the US dollar, thereby lowering European prices expressed in dollars.

**FIGURE 11 - INTERNATIONAL COMPARISON OF WHOLESALE GAS PRICES**

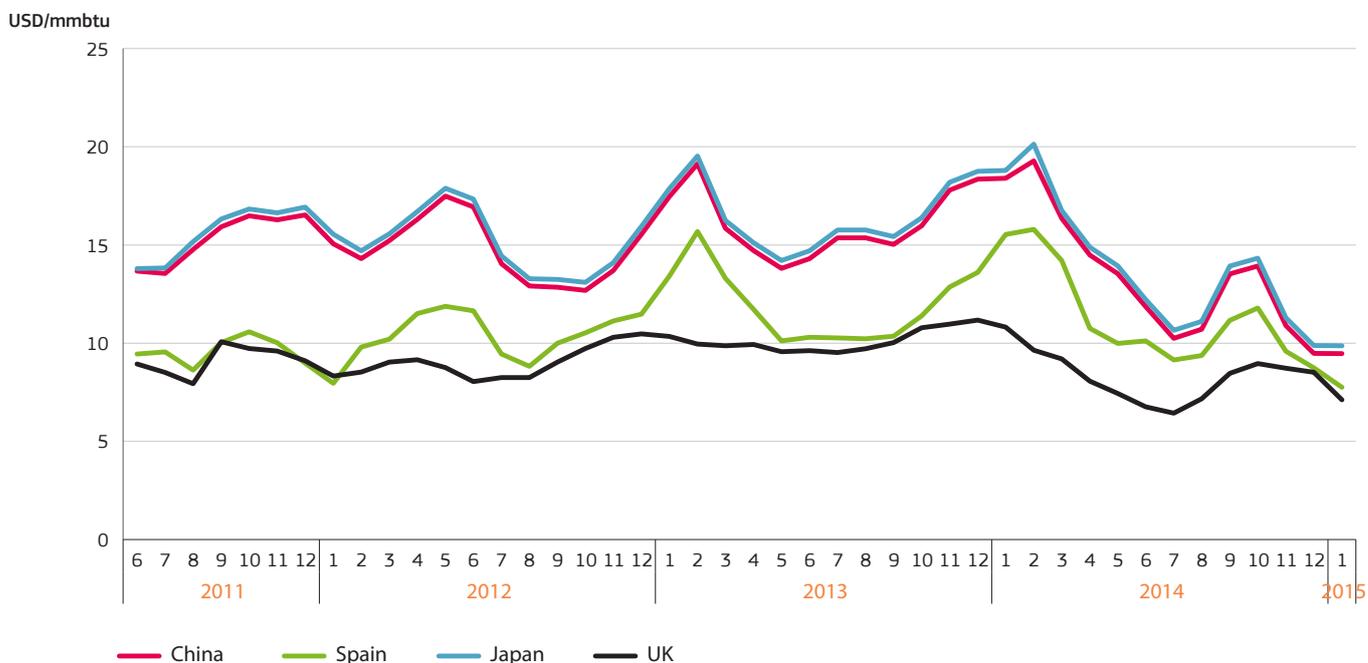


Sources: Platts, Thomson Reuters, BAFA

### 3.2.1 LNG markets

- In the first half of 2014, LNG spot prices fell to levels unseen since Fukushima. After a small recovery in the autumn, prices continued the downward trend, with Asian prices below 10 USD/mmbtu and European prices below 9 USD/mmbtu in December.
- Falling prices are driven by weak demand in Asia, the main LNG market, where mild temperatures and modest economic performance curbed gas consumption. High LNG prices of recent years, coupled with the fall of coal prices (the Asian Market Price of Platts decreased by more than 50% since early 2011) also triggered some gas-to-coal switching.
- In Japan, electricity demand has not recovered to pre-Fukushima levels, some of the demand destruction after the earthquake appearing to be permanent. High storage levels and expectation of nuclear plant start-ups also contributed to the weak demand outlook. In Korea, the restart of nuclear capacity and switch to coal caused LNG demand to fall in 2014.
- While Asian LNG imports stagnated in 2014, Latin American imports increased by about 10% compared to 2013. However, the dynamic increase stalled in the second half of the year: after increasing by 18% year-on-year in the first six months of 2014, in the second half of the year imports grew by only 2%. In the last quarter, imports actually decreased, contributing to the weak global demand picture.
- As the majority of LNG trade is oil-indexed, typically with a lag of several months, the drop in crude oil prices is expected to put downward pressure on oil-indexed LNG prices from early 2015. In anticipation of lowering oil-indexed prices, LNG buyers reduce their offtake, making more LNG available for the spot market and further reducing spot prices. In general, LNG prices pick up in winter but the expectation of falling oil-indexed prices has apparently put a cap on LNG spot price recovery.
- The plunge of Asian LNG prices was steeper than in Europe. As a result, by December, the premium of Asian prices has almost disappeared: the difference between average Asian and European prices shrunk to 1 USD/mmbtu. In previous years, the difference regularly exceeded 5 USD/mmbtu.

**FIGURE 12 – LNG PRICES IN THE EU AND ASIA**

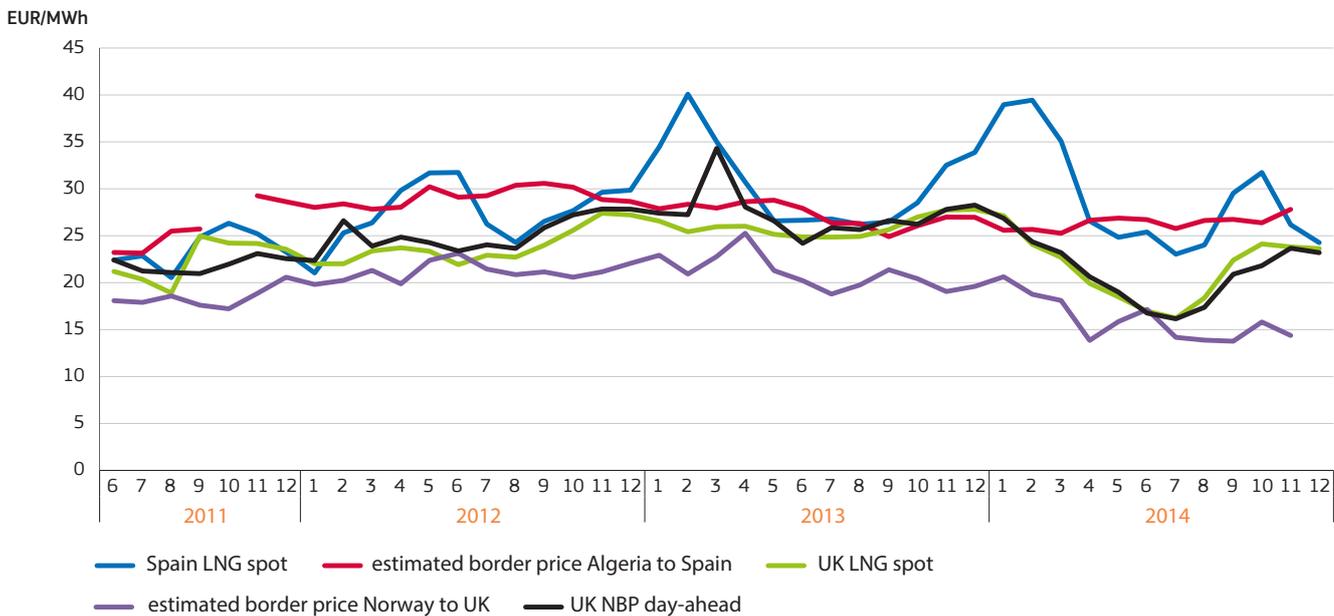


Note: Landed prices for LNG.

Source: Thomson-Reuters Waterborne

- The fall in LNG prices has contributed to narrowing the gap between the prices of pipeline and LNG imports in the EU. Figure 13 shows the evolution of spot LNG prices paid in the UK and Spain vis-à-vis the evolution of estimated border prices for pipeline imports from Norway and Algeria, which account for the major part of pipeline imports in the UK and Spain, respectively. The evolution of the day-ahead prices on the UK NBP hub is also presented.
- In the UK, spot LNG prices closely follow the NBP price and in the last two years have been consistently above the price of Norwegian imports. However, in the summer of 2014, when the UK LNG price was at its lowest, for a short period the premium of LNG over Norwegian pipeline supplies disappeared. Since then, the premium is again on the rise.
- In Spain, Algerian pipeline imports are often cheaper than spot LNG; the premium of LNG jumps during the winter months. In the summer of 2014, LNG was noticeably cheaper than Algerian imports. In the autumn, LNG prices rose again but to a lesser extent than in previous years.

**FIGURE 13 – PRICE DEVELOPMENTS OF LNG AND PIPELINE GAS IN THE UK AND SPAIN**



Note: Landed prices for LNG.

Source: Platts, Thomson Reuters, European Commission estimates based on Eurostat COMEXT data

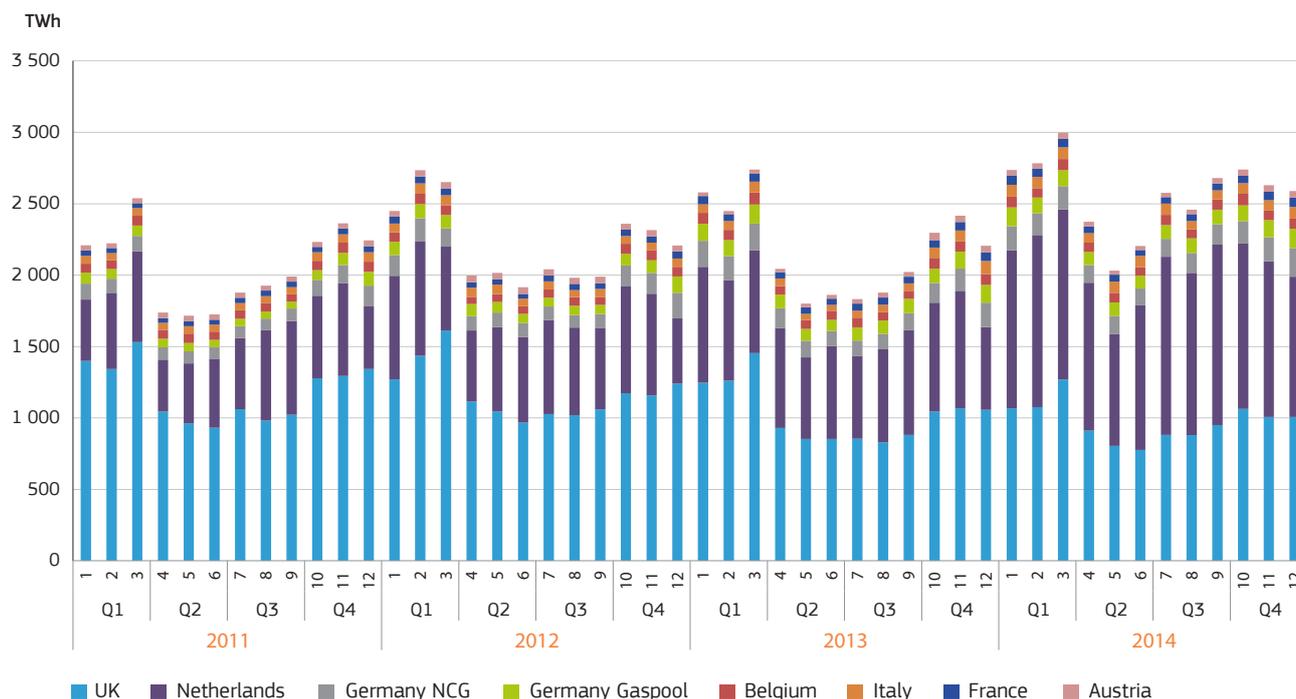
### 3.3 European gas markets

#### 3.3.1 Wholesale markets in the EU

- Gas hub liquidity in the EU has continued to grow in 2014: in each quarter, traded volumes exceeded those of the same period in the preceding year. Total volumes traded on European gas hubs in 2014 exceeded 30,000 TWh, an increase of 18% over the previous year. In the last quarter of 2014, the increase was 15% year-on-year. The UK NBP and Dutch TTF virtual trading points continue to have a dominant position.
- In 2014, the TTF overtook the UK NBP as the most liquid hub with traded volumes at the Dutch hub increasing by a robust 59% compared to 2013. In the same period, traded volumes at NBP decreased by 5%. The location of the Dutch hub, its good connection to various supply sources and the common currency with other EU Member States are some of the factors which make the Dutch hub attractive for traders. TTF is also having an increasing role in long-term contracts. The launch of Gas Storage Bergermeer, Europe's largest open-access gas storage facility (already partly operational), in April 2015 is expected to trigger further liquidity growth at the hub.<sup>7</sup>

7. ICIS Heren EGM, 28 November 2014

**FIGURE 14 – TRADED VOLUMES ON EUROPEAN GAS HUBS**



The chart covers the following trading hubs: UK: NBP (National Balancing Point); Belgium: Zeebrugge beach; Netherlands: TTF (Title Transfer Facility); France: PEG (Point d'Echange Gaz); Italy: PSV (Punto di Scambio Virtuale); Germany: GASPOOL, NCG (NetConnect Germany); Austria: CEGH (Central European Gas Hub)

Sources: National Grid (UK), GTS (Netherlands), Huberator (Belgium), Gaspool (Germany), NCG (Germany), GTTGaz (France), Snamrete (Italy), CEGH (Austria)

Note: CEGH volumes after January 2013 are not directly comparable with the values before that date due to the entry into force of entry/exit system. Previously TTF volumes were reported based on GTS nominations only; the figures have been now revised to also include OTC and exchange traded volumes.

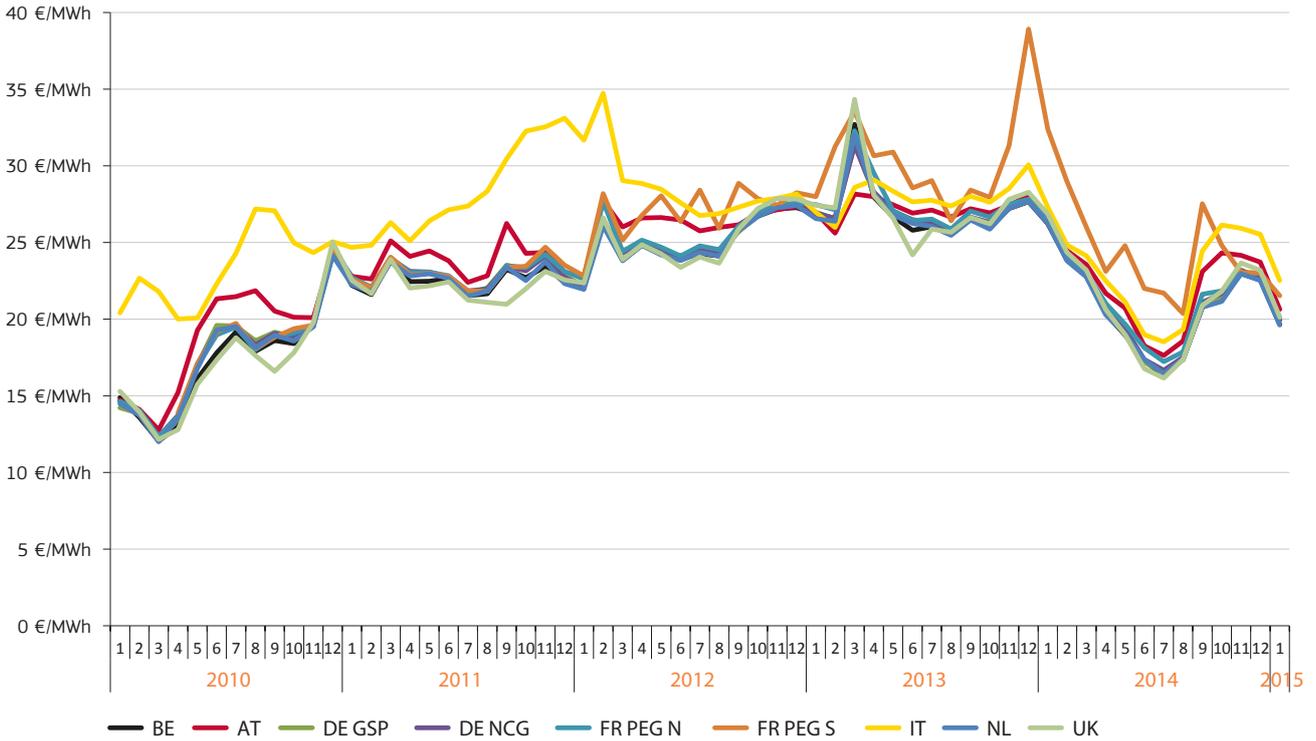
### 3.3.2 Wholesale price developments in the EU

- The next chart presents the evolution of European hub day-ahead natural gas prices in the period from January 2009 until January 2015, showing the convergence in the day-ahead price on major European gas hubs.
- If the French PEG Sud<sup>8</sup> is not taken into account, the difference between the highest and the lowest priced hub in North-West Europe has been on average at around 2 Euro/MWh over 2013 and 2014. This price convergence is a result of market integration whereby improved transport capacity access has allowed price signals from larger and more liquid hubs in Northwest Europe to pass through to hubs in Central and Southern Europe.
- In the last quarter of 2014, prices became more divergent, with relatively high prices at the Italian and Austrian hubs, driven by rising demand, geopolitical uncertainties in Ukraine and reduced flows coming from Russia and, for some days, from Libya.
- Day-ahead gas prices on European hubs plunged to an unusually low 16-18 Euro/MWh level during the summer of 2014, mainly because of weaker than usual demand for storage injection after a mild winter across Europe. Weak LNG demand in Asia and falling LNG prices also contributed to the low hub prices. The increasing availability of LNG cargoes is likely to influence European gas prices also in 2015.

8. PEG Sud remains disconnected from North-West European markets due to a combination of factors such as constraints on the North-South link within France and heavy reliance LNG import flows.

- With the approach of the new gas year, prices started to increase from the lows of summer. Apart from the seasonal increase of demand, the uncertainty about Ukraine and concerns about the possible disruption of Russian gas flows also helped prices to rise.
- After reaching 23–26 Euro/MWh in November, prices fell again. Mild weather, high storage levels and reduced supply concerns after the signature of the “winter package” (see section 3) all contributed to the price drop.
- Average day-ahead gas prices in the fourth quarter of 2014 were about 15% lower than in the same period of 2013.

**FIGURE 15 – WHOLESale DAY-AHEAD GAS PRICES ON GAS HUBS IN THE EU**



Source: Platts

- Figure 16 looks at the development of forward prices one, two and three years ahead in comparison to the development of the day-ahead price on the Dutch TTF. For most of 2014, there has been a situation of contango, whereby closer to the present date prices are cheaper than prices for future deliveries. With ample physical supply, spot prices significantly decreased in the first half of the year, while higher forward prices reflected the general uncertainty about future developments, in particular the Russia-Ukraine conflict.

**FIGURE 16 – FORWARD GAS PRICES ON THE DUTCH GAS HUB**



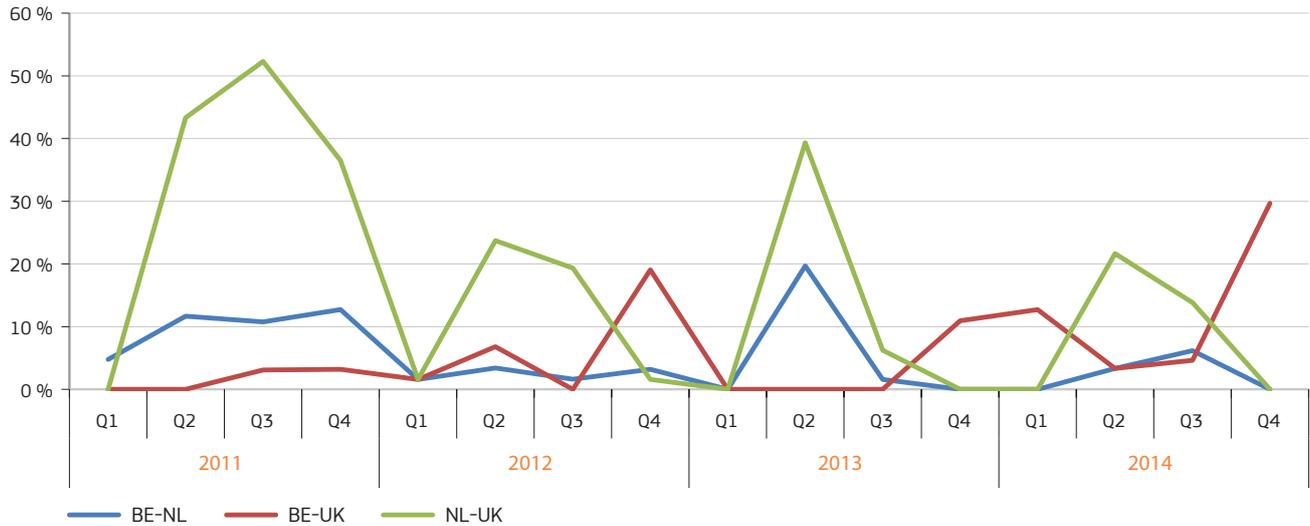
Source: Platts

- Figure 17 traces the occurrence of adverse nominations – the so-called flow against price differential events (FAPD<sup>9</sup>) – in North Western Europe (NWE) during the last 3 years. Day-ahead nominations of flows from a high price area to a low price area are not frequent for adjacent areas with active hub trading. In 2011, there were 112 FAPD events in the NWE region (out of a total of 753 traded days for the three hubs). This number dropped to 51 in 2012, 48 in 2013 but increased to 60 in 2014.
- In the fourth quarter of 2014, similarly to 2013, there have been no FAPD events between Belgium and the Netherlands and between the Netherlands and the UK. Long-term contracts cover most of the capacity of the BBL pipeline connecting the Netherlands and the UK, preventing price signals to have an impact. However, the offering of a backhaul virtual capacity has clearly decreased the occurrence of adverse nominations.
- On the other hand, a relatively high number of 19 FAPD events were observed between Belgium and the UK, i.e. on 30% of traded days net flows went from the more expensive area to the cheaper area, in this case from the UK to Belgium. The likely reason is the increase in the commodity charge levied by the National Grid on gas entering the UK system from first of October 2014. While the UK NBP price has been higher throughout the 4th quarter, the high entry cost has prevented traders from exploiting the arbitrage opportunity.<sup>10</sup>

9. See the glossary for a definition of the FAPD event.

10. ICIS Heren EGM, 15 October 2014

**FIGURE 17 – FAPD EVENTS IN THE NORTH-WESTERN EUROPEAN REGION**

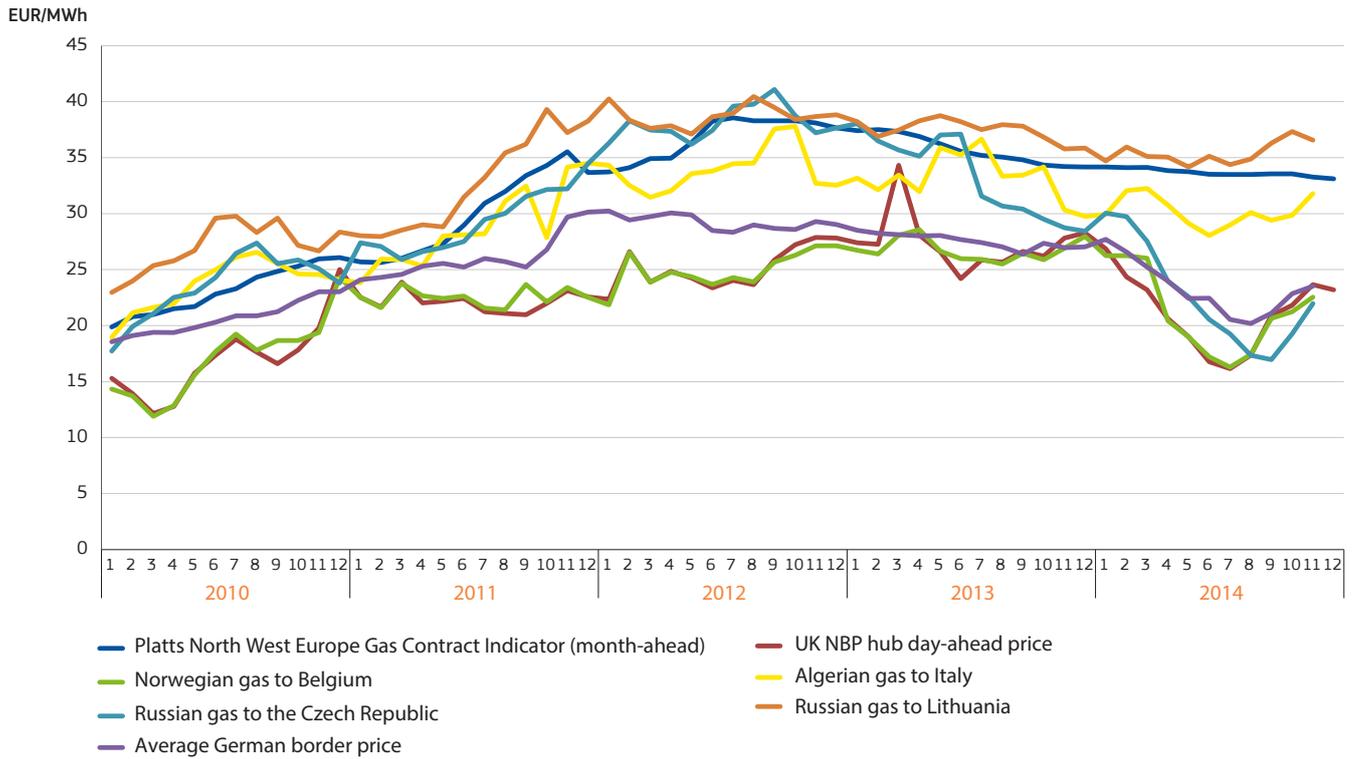


Sources. (1) Price data: Platts; (2) Flow nomination data: Fluxys, BBL

### 3.3.3 Comparing the prices of different contracts for gas in the EU

- A comparison of a selection of estimated border prices of gas deliveries from the main exporters to the EU – Norway, Russia and Algeria – shows significant variation in price levels and, to a smaller extent, in price dynamics.
- Estimated prices of most of the contracts reported on Figure 18 decreased in the first half of 2014 but bounced back in the autumn months. The estimated price levels of Russian gas to Lithuania and Algerian gas to Italy were the highest throughout the year and these contracts showed the lowest volatility. The other contracts more or less followed the movement of the NBP price.
- There is a growing difference between the estimated price of Russian gas delivered to the Czech Republic and Lithuania. While in 2012 these prices were comparable, in 2014 the gas delivered to Lithuania was on average 60% more expensive. Estimated Czech prices are now significantly below the theoretical pure oil-indexed contract (represented by the Platts North West Europe Gas Contract Indicator on the graph), indicating that the Czech-Russian contract now has a significant hub pricing element and is no longer purely indexed on oil products. In 2015 it will be interesting to see whether the commissioning of the Lithuanian LNG terminal will have an impact of Russian import prices; the facility is supposed to strengthen Lithuania's bargaining position with Gazprom. According to the recent news reports, Lithuania may not extend its long-term natural gas import deal with Gazprom after the current one expires at the end of 2015.
- After the price convergence seen in the fourth quarter of 2013, 2014 has been characterized by increasing price divergence. In July, the estimated price of Russian gas to Lithuania was more than double the NBP price. In 2015, as oil-indexed prices are set to decline, prices are expected to converge again.

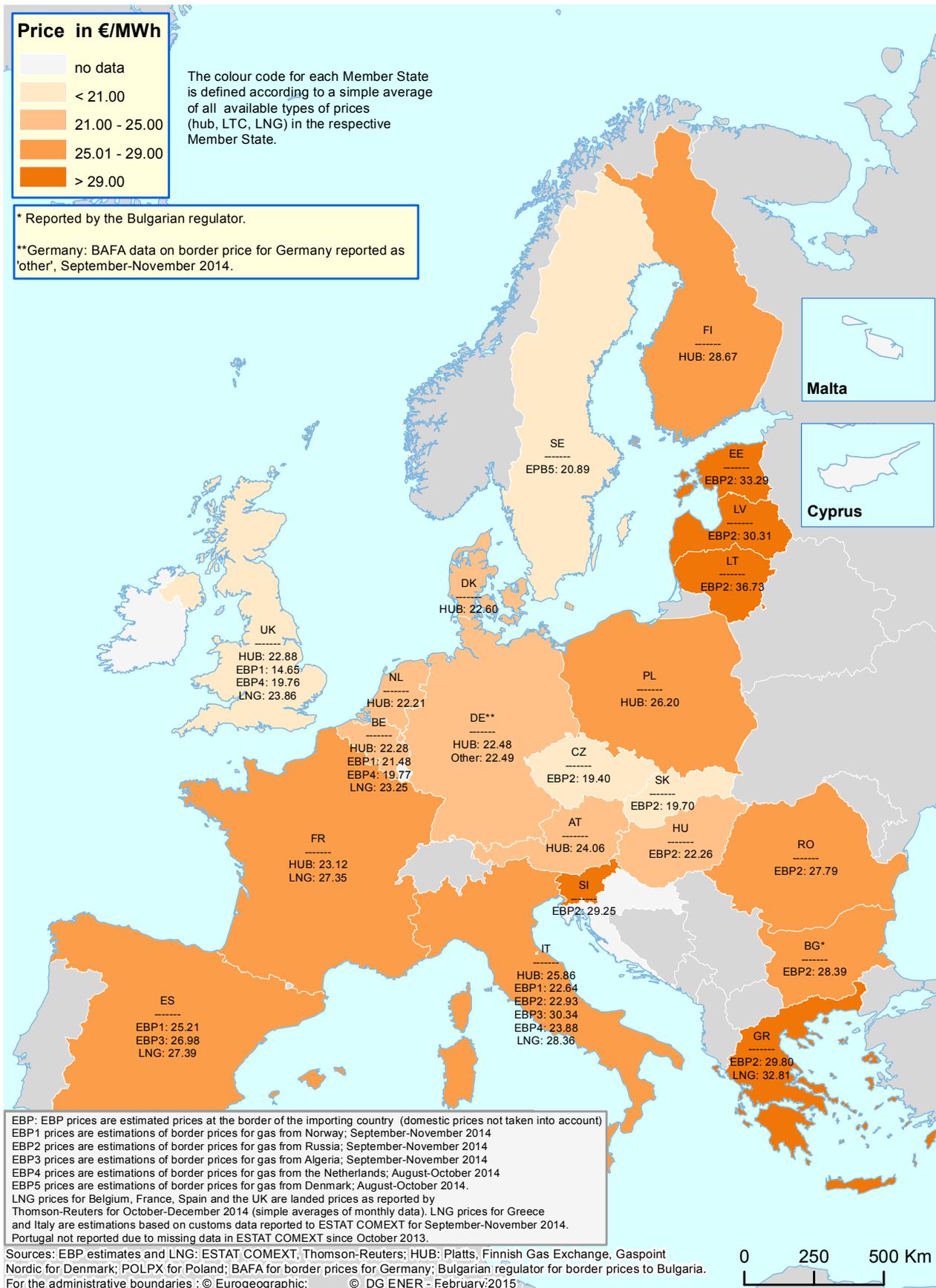
**FIGURE 18 – COMPARISON OF EU WHOLESALE GAS PRICE ESTIMATIONS**



Source: Eurostat COMEXT and European Commission estimations, BAFA, Platts, Bulgarian regulator

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

**MAP 1 – COMPARISON OF EU WHOLESALE GAS PRICES IN THE FOURTH QUARTER OF 2014**

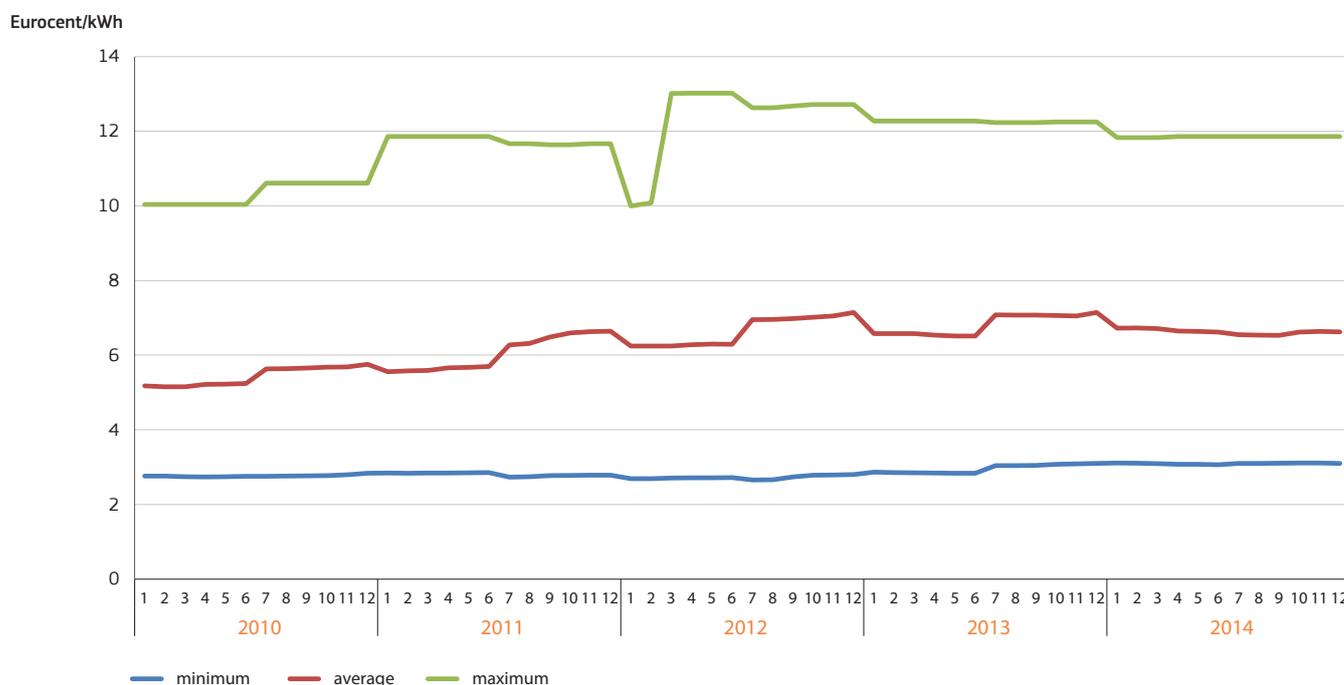


Note: Border prices are estimations of prices of piped gas imports paid at the border of the importing country, based on information collected by customs agencies, and are deemed to be representative of long-term gas contracts.

# 4. Retail gas prices in the EU

- Figures 19 and 20 show the retail gas price ranges for household and industrial consumers in the last five years for selected consumption bands. Monthly retail prices are estimated by using half-yearly prices from Eurostat and Harmonised Consumer Price Indices (HICP) for the household prices and Producer Price Indices (PPI) for industrial consumers.
- After three years of increase, the estimated average retail price (including all taxes) dropped in 2014, with the December 2014 price in consumption band D2 being 7% below the December 2013 level. Prices decreased during this period in almost every Member States.
- There are significant differences in retail gas prices across the EU: in December 2014, the lowest estimated household price in consumption band D2 could be observed in Romania (3.10 Eurocent/kWh), while the highest price was recorded in Sweden (11.86 Eurocent/kWh), resulting in a price differential ratio of 3.8 between the cheapest and the most expensive Member State in the EU. While this ratio is rather high, it shows a declining trend since March 2012 when it was 4.8. Note that the differences persist even if one excludes taxes.

**FIGURE 19 - RANGES OF GAS PRICES PAID BY HOUSEHOLD CONSUMERS IN CONSUMPTION BAND D2 (5.56 MWh < CONSUMPTION < 55.6 MWh) IN EU MEMBER STATES**

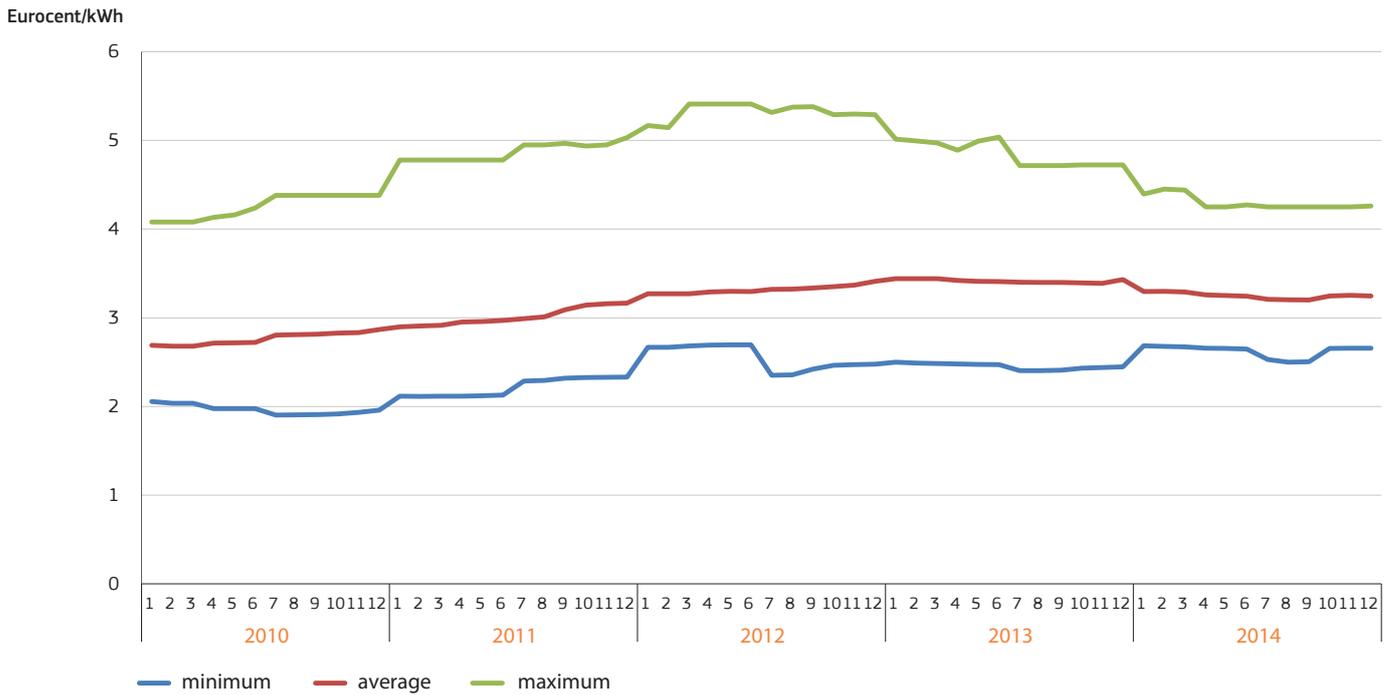


Note: all taxes included.

Source: European Commission estimates based on Eurostat data on consumer prices adjusted by the HICP

- Industrial prices also decreased in 2014, with the average December 2014 price (VAT and other recoverable taxes excluded) in consumption band I4 being 5% below the December 2013 level. Prices decreased in this period in most Member States; in Croatia, Denmark and Lithuania the decrease exceeded 15% while Dutch and Romanian prices increased by nearly 10%.
- In December 2014, Belgium had the lowest estimated industrial price in consumption band I4 (2.66 Eurocent/kWh), while the highest price was observed in Greece (4.26 Eurocent/kWh), resulting in a price differential ratio of 1.6 between the cheapest and the most expensive Member State of the EU. This ratio decreased noticeably over the last three years, indicating a gradual convergence of industrial prices.

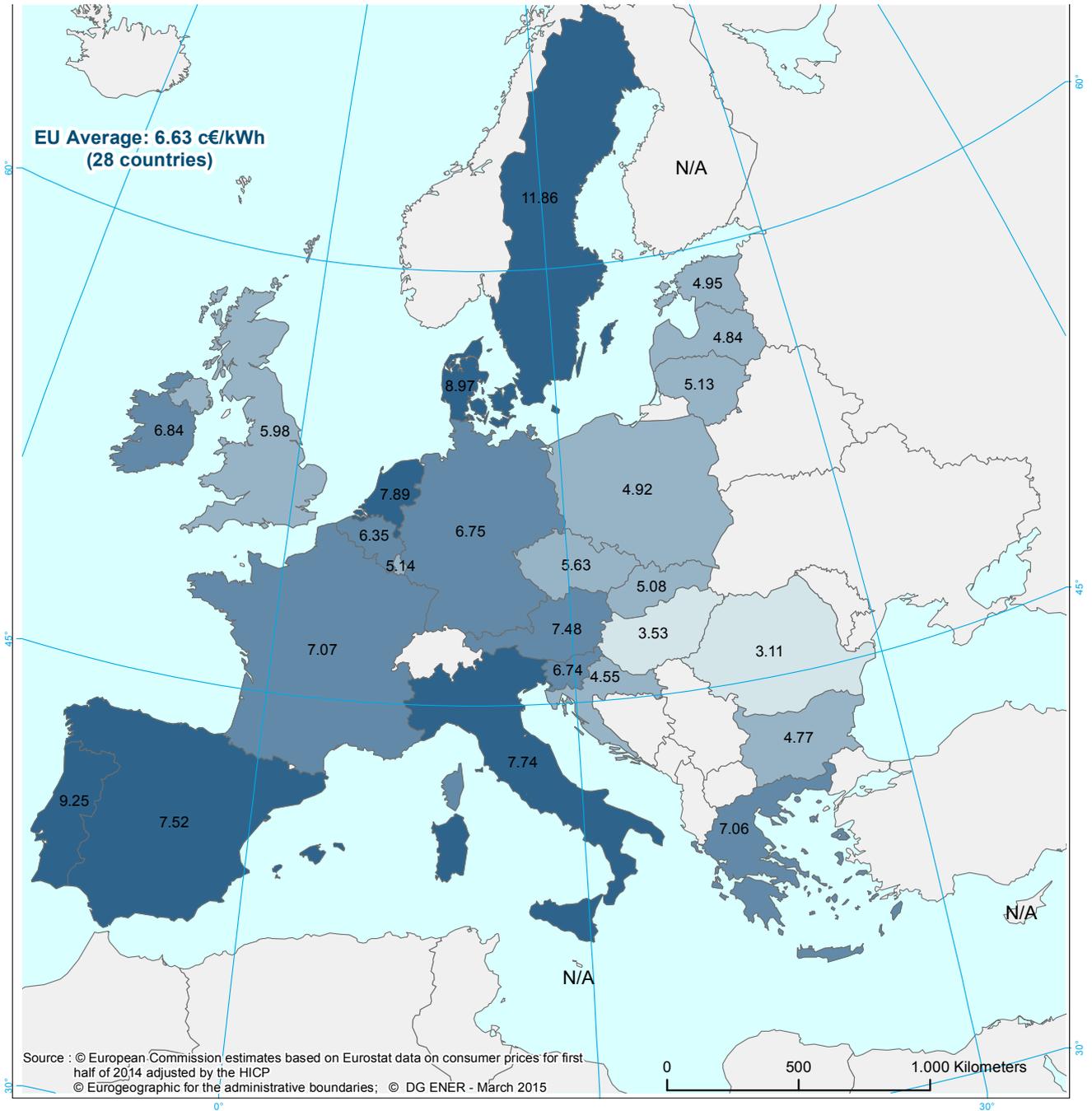
**FIGURE 20 - RANGES OF GAS PRICES PAID BY INDUSTRIAL CONSUMERS IN CONSUMPTION BAND I4 (27 780 MWH < CONSUMPTION < 277 800 MWH) IN EU MEMBER STATES**



Note: Excluding VAT and other recoverable taxes.  
 Source: European Commission estimates based on Eurostat data on industrial prices adjusted by the PPI

- Maps 2 and 3 show the estimated retail gas prices paid by households and industrial consumers in the fourth quarter of 2014.

**MAP 2 - RETAIL GAS PRICE ESTIMATES FOR HOUSEHOLDS IN THE EU - 4TH QUARTER OF 2014**

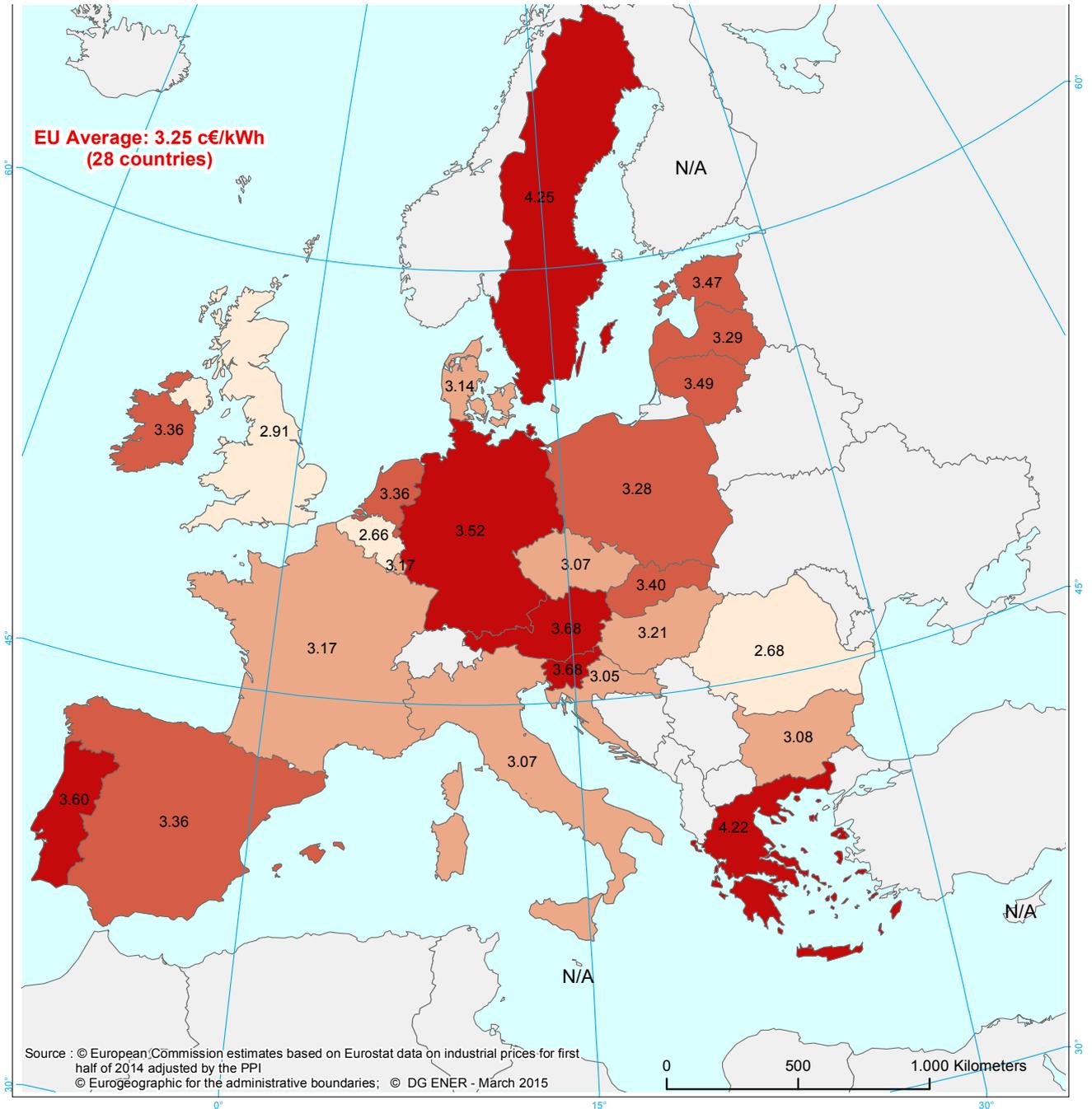


**Prices in Eurocents/kWh**

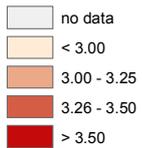
- no data
- < 4.51
- 4.51 - 6.00
- 6.01 - 7.50
- > 7.50

**Band D2: 5.56 MWh < Consumption < 55.6 MWh**

**MAP 3 - RETAIL GAS PRICE ESTIMATES FOR INDUSTRIAL CONSUMERS IN THE EU - 4TH QUARTER OF 2014**



**Prices in Eurocents/kWh**



**Band I4: 27 780 MWh < Consumption < 277 800 MWh**

# 5. Glossary

**Backwardation** occurs when the closer-to-maturity contract is priced higher than the contract which matures at a later stage

**Clean dark spreads** are defined as the average difference between the price of coal and carbon emission, and the equivalent price of electricity. Dark spreads are reported as indicative prices giving the average difference between the cost of coal delivered ex-ship and the power price. As such, they do not include operation, maintenance or transport costs. Spreads are defined for a coal-fired plant with 35 % efficiency. Dark spreads are given for UK and Germany, with the coal and power reference price as reported by Platts.

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

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

**Flow against price differentials (FAPDs):** 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.

**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.

**LNG sendout** expresses the amount of gas flowing out of LNG terminals into pipelines.

