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QUARTERLY REPORT ON EUROPEAN GAS MARKETS

Q2 2015

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HIGHLIGHTS OF THE REPORT

- EU gas consumption increased by 12% in the first quarter of 2015, followed by an estimated 6% increase in the second quarter, both on a year-on-year basis. Last year's demand was however exceptionally low because of mild weather.
- Imports of gas from Russia picked up in the second quarter as falling oil-indexed prices provided an incentive for buyers to increase purchases. Norwegian deliveries were constrained by maintenance activity. As a result, Russia regained the EU's top supplier title. LNG imports were flat year-on-year.
- As a result of falling prices, the EU's gas import bill is expected to decrease from around 73 billion euros in 2014 to around 67 billion euros in 2015.
- Because of high demand due to colder weather and lower imports from Russia, stocks were considerably lower this year at the end of the withdrawal season (which runs usually from October/November to March/April) compared to last year. However, injections were muted as expectations of decreasing prices provided an incentive to delay replenishment of stocks. On 30 June 2015, storage level was 22% below the level at that time last year.
- International gas prices remained relatively stable in the second quarter of 2015. While European prices remain well above those in the US, the premium of Asian LNG prices over European hub prices has almost disappeared.
- European hub prices showed a slightly decreasing trend as low oil prices and steady LNG supply put downward pressure on prices. Natural gas prices have become historically low: if the temporary price drop in the summer of 2014 is disregarded, the average NBP price in July 2015 was the lowest since 2010.
- The continued weakness of oil prices means that oil-indexed gas prices are set to decrease further, thereby closing the gap between hub prices and oil-indexed prices. In 2014, hub pricing had a leading role in Europe but oil-indexation still accounted for 32% of gas consumption.
- Trading activity on European hubs decreased by 3% in the second quarter. In terms of volume and liquidity, the market continues to be dominated by the Dutch TTF and the UK NBP hubs.
- Retail prices remained relatively stable compared to last year. The decreasing wholesale prices experienced in the last few years are to some extent reflected in the retail prices for industrial customers but retail prices for households remain steady.

EXECUTIVE SUMMARY

- **EU gas consumption increased by 12% in the first quarter of 2015** compared to the same period in 2014, mainly driven by colder weather. This was the biggest year-on-year increase in EU consumption since the second quarter of 2010, albeit from a very low base.
- **Production in the first quarter was up by 2% year-on-year**, while net imports decreased by 9%. In spite of the reduced production cap for the Groningen field, Dutch gas production increased in the first quarter of 2015 but plummeted afterwards.
- Preliminary Eurostat data show that **the momentum lasted into the second quarter: consumption increased by 6% year-on-year**.
- After the gradual decrease seen during 2014 and early 2015, **imports from Russia picked up in the second quarter of 2015**. Russian gas represented 45% of total imports, up from 33% in the first quarter. Norwegian deliveries, on the other hand, were constrained by maintenance activity and decreased considerably compared to the previous two quarters. As a result, Russia regained the title of EU's top supplier.
- **LNG imports were flat year-on-year** and represented 13% of total EU imports in the second quarter. Imports decreased for the two main LNG buyers, Spain and the UK, but this was offset by increasing imports into the other markets. As in previous years, Qatar has been the top LNG supplier to the EU, covering 57% of total LNG imports in the second quarter of 2015. As Asian and European LNG prices levelled off, opportunities for re-exports decreased considerably.
- As a result of falling prices, the EU's gas **import bill is expected to decrease** from about 73 billion euros in 2014 to about 67 billion euros in 2015. The estimated import bill was about 18 billion euros in the second quarter of 2015.
- **Deliveries from EU Member States represented 63% of total Ukrainian imports** in the second quarter of 2015. From 1 July 2015, Naftogaz halted Russian gas imports as no agreement was signed for the third quarter. In late September, the parties agreed on the terms of a binding protocol to secure gas supplies for the coming winter.
- Because of colder weather and low imports from Russia, storage withdrawals in 2015 were faster than in the previous year and **at the end of the withdrawal season stocks were considerably lower than last year**. In the second quarter, **injections have been relatively muted** as expectations of decreasing prices provided an incentive to delay replenishment of stocks.
- **International gas prices remained relatively stable** in the second quarter of 2015. While European prices remained 2.5 times higher than those in the US, the premium of Asian LNG prices over European hub prices was below 1 USD/mmbtu.
- **Spot prices at European gas hubs** were in the 20-22 Euro/MWh range for most of the second quarter and showed a slightly decreasing trend as low oil prices and steady LNG supply put downward pressure on European hub prices.
- Oil prices continued their decline in mid-2015 and therefore **oil-indexed prices are now set to decrease further**, at least until the fourth quarter of this year. This will help to close or even remove the gap between hub prices and oil-indexed prices. By August, the difference between Platt's North West Europe Gas Contract Indicator (GCI) and the NBP day-ahead price dropped below 2 Euro/MWh, while in 2014 it regularly exceeded 10 Euro/MWh.
- After the record liquidity seen in the first quarter of 2014, **trading activity has been relatively muted on European gas hubs in the second quarter**. Total traded volumes reached 8,100 TWh, a 3% decrease compared to the same period of 2014. The UK and Dutch hubs continued to dominate gas trade in Europe, covering 88% of hub-traded volumes.
- **Retail prices for both households and industry remained relatively stable**. While some long-term convergence can be observed, there are still significant price differences across Member States, particularly in the case of households.

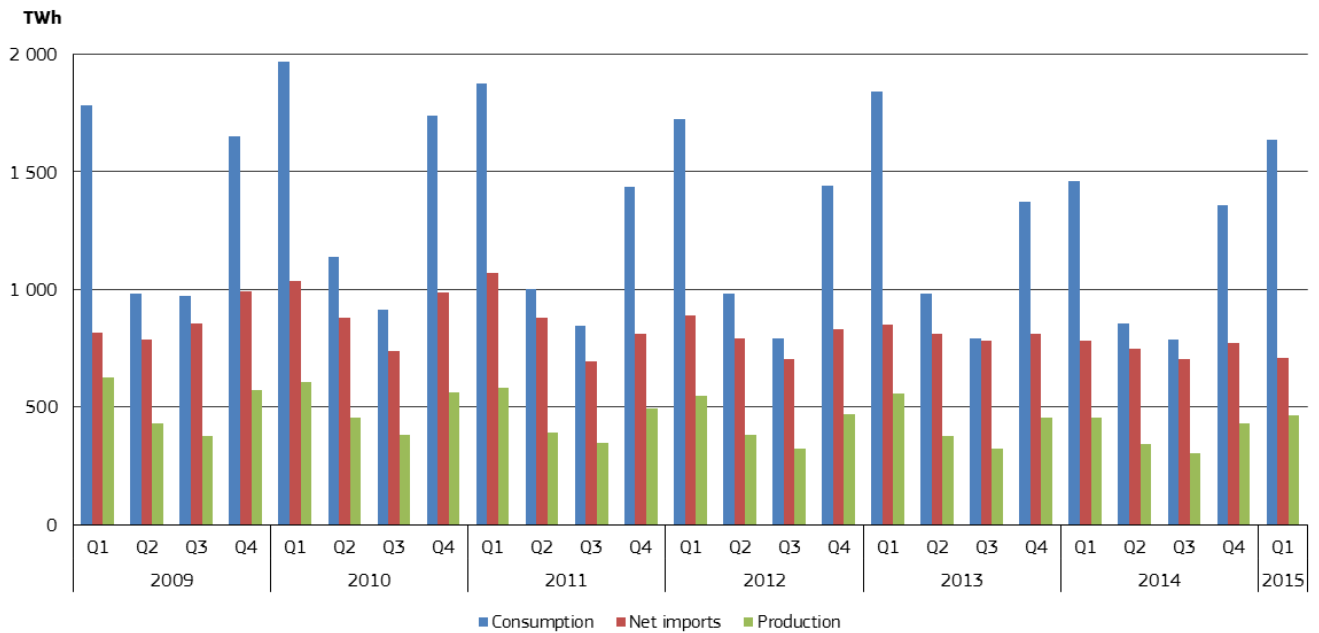
1. Gas Consumption – Production – Imports

- After an 11% decline in 2014, gas consumption in the EU gained momentum in 2015. In the first quarter, consumption increased by 12% compared to the same period of 2014. This was the biggest year-on-year increase in EU consumption since the second quarter of 2010. In the largest market, Germany, consumption increased by 19% and an additional eleven Member States experienced double-digit growth rates: Belgium (23%), Croatia (13%), France (17%), Hungary (13%), Italy (11%), Luxembourg (19%), the Netherlands (12%), Portugal (13%), Slovakia (24%), Slovenia (14%) and the UK (11%). On the other hand, consumption decreased in Greece, Finland, Sweden and the Baltic States.
- The increase can be mostly attributed to the weather: in most parts of Europe, temperatures were significantly lower than in the unusually mild first three months of 2014. In fact, if consumption figures are compared to earlier years, the picture is not so bright: first quarter consumption in 2015 was lower than in any year in the 2009-2013 period. Figure 3 shows that in the first quarter there is a significant deviation of consumption across the years while consumption seems to follow more or less the same path during the rest of the year.
- According to preliminary Eurostat data, the momentum lasted into the second quarter: consumption increased by about 6% compared to the same period of 2014, helped by continued strong growth in Germany (12%).
- Based on a sample of nine Member States covering about two-thirds of EU consumption (but excluding Germany), Societe Generale estimates that consumption increased by only 1% in the second quarter of 2015.¹
- In 2014, EU gas production fell by 10%. In the first quarter of 2015, however, output increased by 2% year-on-year. Production grew in the three main producing countries, the Netherlands (7%), the UK (2%) and Romania (1%). These three Member States covered 83% of total EU output.
- Dutch gas production increased in the first quarter in spite of the reduced production cap for the Groningen field announced in February 2015, although from a low base: production in the first quarter of 2014 was a record low because of the mild weather. According to a new announcement made on 23 June 2015, output at the field will be capped at 13.5 bcm in the second half of 2015 and at 30 bcm for the whole year. The government said an additional 3 bcm can be extracted from the previously dormant Norg facility this year. Before 1 January 2016, the Dutch government will look into other approaches to gas extraction and the possibility of increasing natural gas imports.² In April and May, production plummeted to well below previous years' levels.
- In spite of the growing consumption, net imports decreased by 9% year-on-year in the first quarter of 2015, helped by increasing indigenous production and high storage withdrawals. This compares to an 8% decrease in the whole of 2014. Russian imports were unusually low in the first three months of 2015.

¹ SG Energy Pulse July 2015 Update

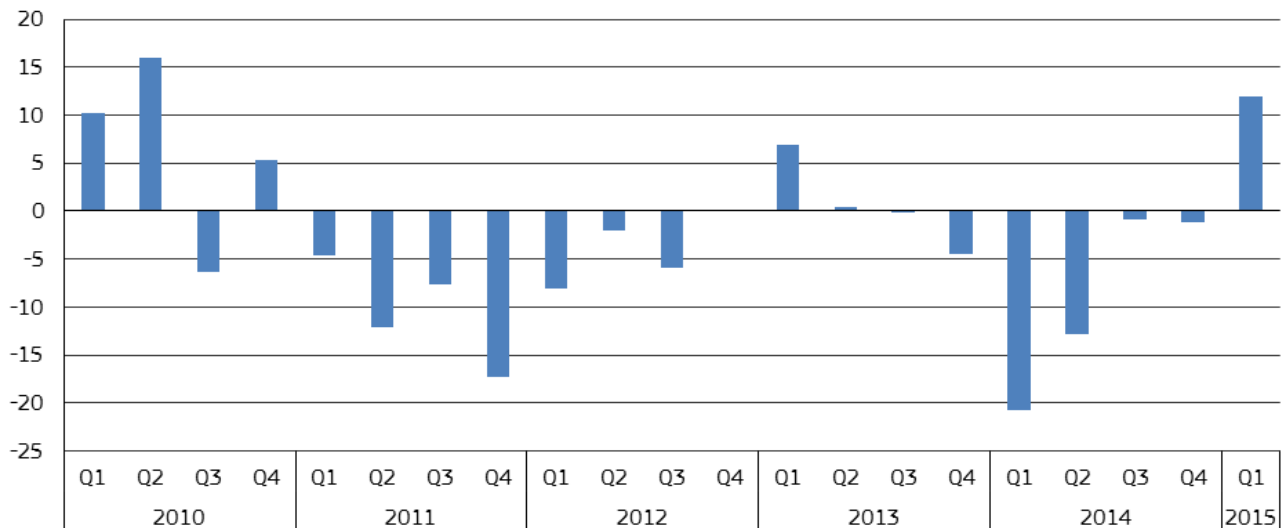
² <https://www.government.nl/ministries/ministry-of-economic-affairs/news/2015/06/23/groningen-gas-extraction-further-reduced-to-30-billion-cubic-metres-in-2015>

Figure 1. EU gas consumption, imports and production



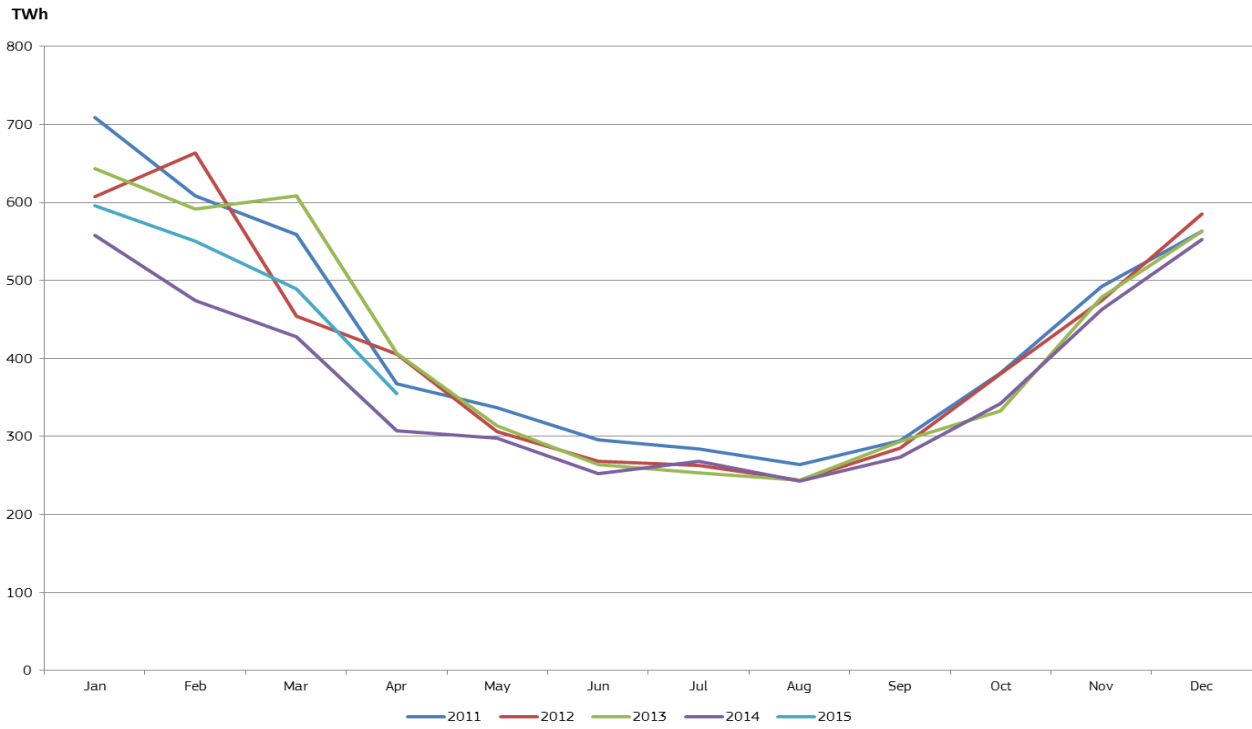
Source: Eurostat, data as of 27 August 2015 from data series nrg_103m. Net imports refer to imports minus exports. Note: Eurostat methodological change in reporting import volumes effective as of January 2013. Before January 2013 monthly import volumes of gas were reported on country-of-origin basis. After this date, they are reported on border basis.

Figure 2. EU gas consumption Q/Q-4 change (%)



Source: Eurostat, data as of 27 August 2015 from data series nrg_103m; calculations of DG Energy

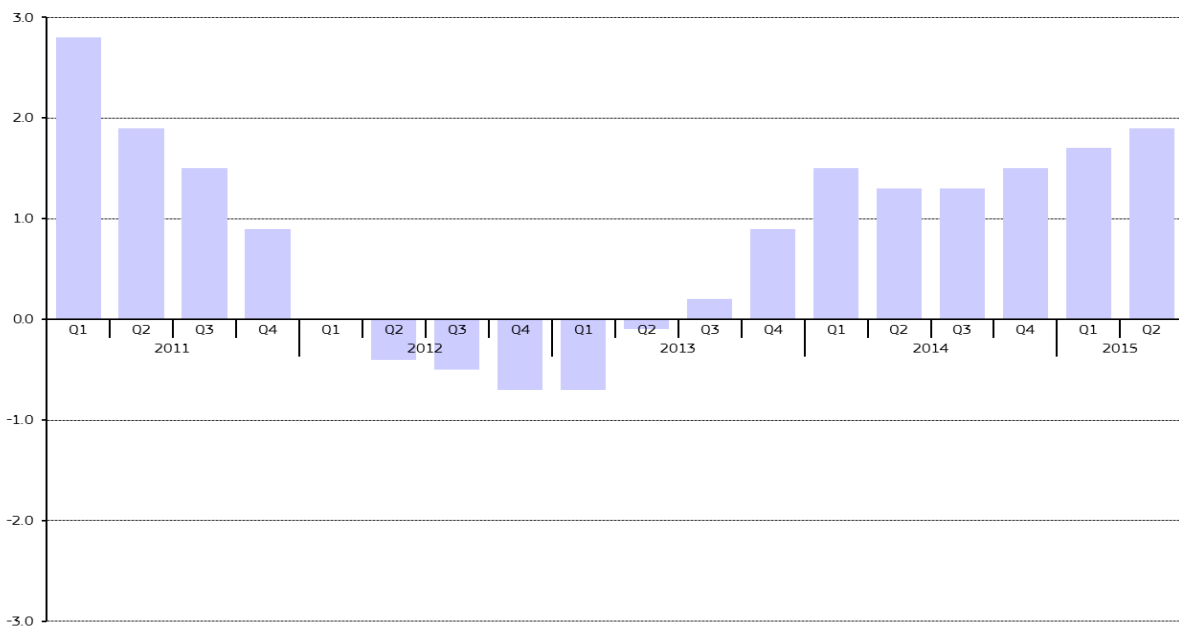
Figure 3. Monthly gas consumption in the EU in 2011-2015



Source: Eurostat, data as of 27 August 2015 from data series nrg_103m

- **In the second quarter of 2015, the seasonally adjusted Gross Domestic Product (GDP) of the EU rose by 1.9%** compared to the same quarter of the previous year which is the highest growth rate since 2011. Gross value added in the industry sector also gained momentum: the growth rate was 1.7% year-on-year, well above the rate seen in the previous quarters.

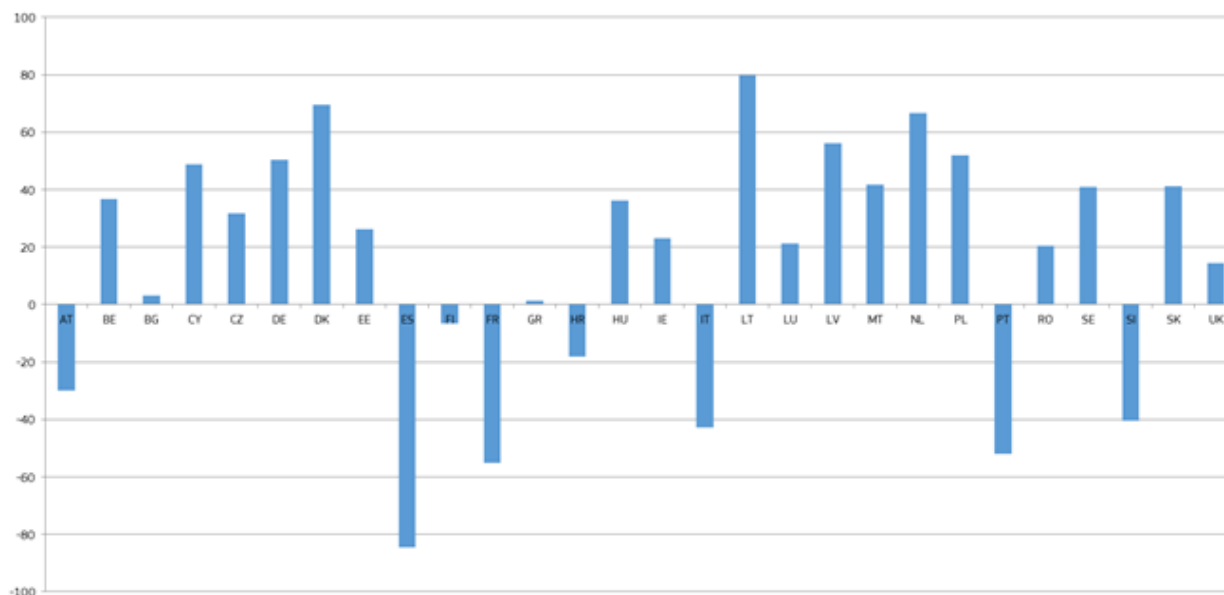
Figure 4. EU GDP Q/Q-4 change (%)



Source: Eurostat

- Figure 5 shows the deviation of actual heating degree days (HDDs) from the long term average in individual EU Member States in the second quarter of 2015. In the majority of Member States the number of actual heating degree days was above the long term average in this period, implying that temperatures were lower than the seasonal averages. For the EU as a whole, however, the number of heating degree days more or less corresponded to the long-term average and was also similar to the heating degree days experienced in same period of 2014.

Figure 5. Deviation of actual Heating Degree Days (HDDs) from the long term average, April-June 2015



Source: Eurostat/JRC

- In four of the five markets for which data are reported (Table 1) gas use in power generation increased year-on-year in the first three months of 2015. In the second quarter, three of these countries continued to experience an increase: 5% in Italy, 18% in Spain and 67% in France. Belgium continued to experience a decreasing trend (-49% in the second quarter) while UK consumption started to decline (-11%) after the modest increase in the first quarter.
- Hub prices, LNG prices and oil-indexed prices all decreased during the first half of 2015 (see details in section 3), theoretically improving the competitiveness of gas. However, prices of other fuels, in particular coal, also decreased. Muted growth in electricity consumption (electricity consumption in the EU-28 remained practically unchanged in the first five months of 2015 compared to the same period of the previous year) and the continuing penetration of renewables has also limited growth in the role of gas in European power generation.
- UK clean spark spreads – measuring the profitability of gas-fired generation – fluctuated in the 10-15 €/MWh range in the first quarter of 2015 but remained negative in Germany (where wholesale electricity prices are lower), pointing to the unprofitable nature of German gas-fired generation.³ In Germany, gas use in power plants continued to decrease in the second quarter (by 18% year on-year) and its share fell below 6%.⁴

Table 1. Natural gas intake in the power generation sector of selected EU countries (bcm)

	2008	2009	2010	2011	2012	2013	2014	2015Q1	2015Q2
Italy	33.4	28.7	29.8	27.5	24.2	20.1	16.8	5.0	3.7
UK	24.8	23.1	25.3	19.5	13.2	13.1	14.2	3.2	3.0
Spain	16.0	13.7	11.6	9.4	7.2	4.8	4.4	1.2	1.1
Belgium	n.a.	n.a.	n.a.	7.1	8.4	7.4	6.4	1.1	0.8
France	n.a.	n.a.	2.2	2.5	1.5	1.2	0.7	0.6	0.1

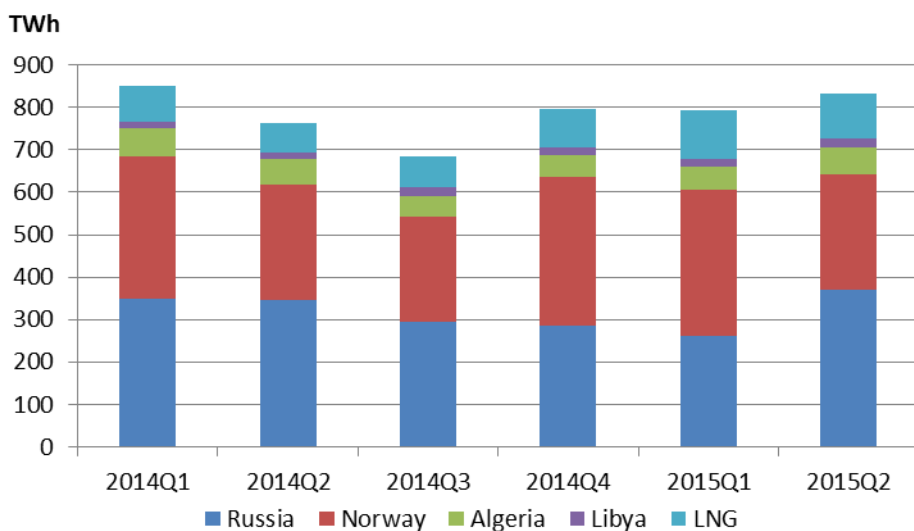
Source: Bentek/Platts

³ Charts of clean spark spreads in Germany and the UK can be found in the Quarterly Report of European Electricity Markets

⁴ <https://www.destatis.de/EN/FactsFigures/EconomicSectors/Energy/Production/Tables/ElectricityProductionSupply.html>

- During 2014, gas imports from Russia decreased gradually. The trend continued in the beginning of 2015 but volumes bounced back from March. In the second quarter of 2015, Russian imports were 42% higher than in the first quarter; year-on-year, the increase was 7%. The share of Russia from total extra-EU imports increased to 45%, the highest level since the second quarter of 2014.
- Imports from Norway reached record high levels in the fourth quarter of 2014 and the first quarter of 2015, overtaking Russia as the main gas supplier of the EU. In the second quarter of 2015, imports have been stable year-on-year but were 21% lower than in the first quarter. As a result, the share of Norway decreased to 33% of total extra-EU imports. Maintenance at Troll, the country's biggest gas field, reduced Norwegian output and exports in the second quarter.
- Pipeline imports from North Africa showed a 12% increase in the second quarter compared to the same period of 2014, with most of the additional volumes coming from Libya. The combined share of Algeria and Libya remained 10% of total extra-EU imports.
- Imports of LNG covered 13% of EU total gas imports in the second quarter of 2015. For the whole year of 2014 this share was 10%.
- As a result of falling volumes and prices, the estimated gas import bill of the EU decreased from around 95 billion euros in 2013 to around 73 billion euros in 2014. As prices continue to fall in 2015, the import bill is expected to decrease further, to around 67 billion euros. The estimated import bill was around 18 billion euros in both the first and second quarters of 2015.

Figure 6. EU imports of natural gas by source, 2014-2015

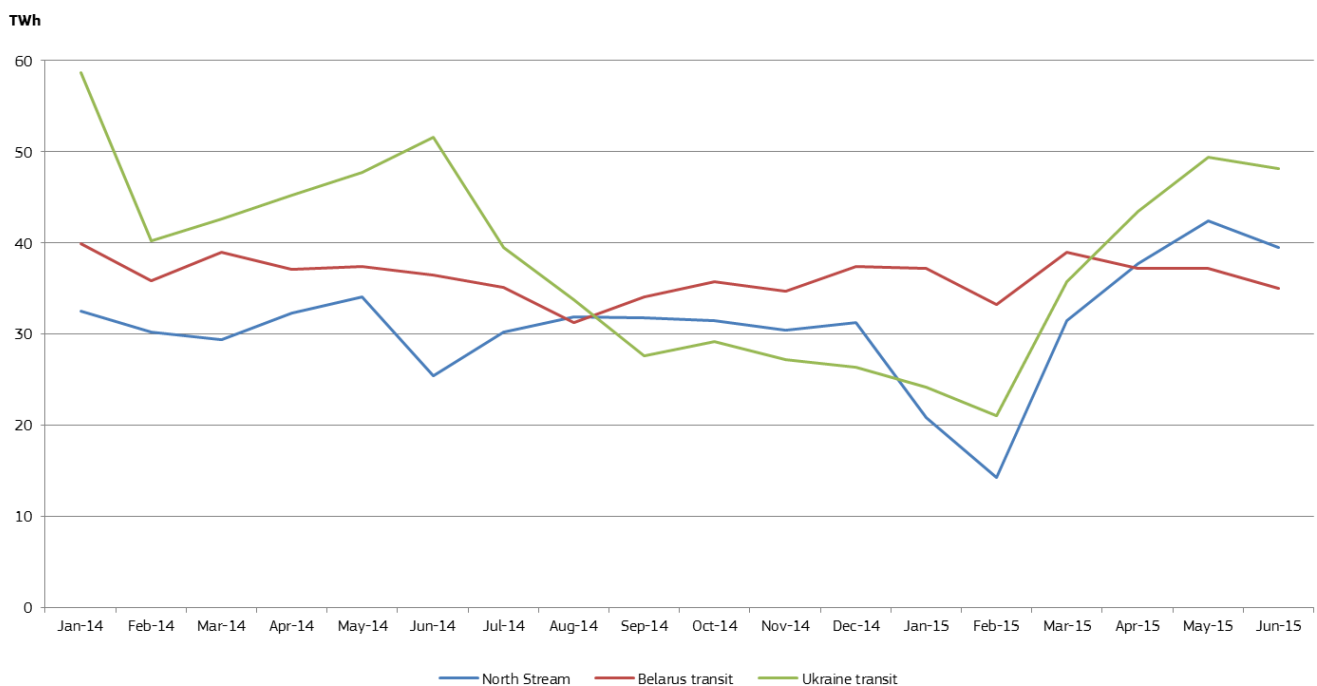


Source: Based on data from the ENTSO-G Transparency Platform
 Russian deliveries to Estonia, Finland and Latvia are not included
 Some of the ENTSO-G data for 2015Q1 have been revised, resulting in higher gas flows from Russia in that period compared to the previous report

- Looking at the main supply routes of Russian gas imports, one can see that in 2014-2015 the gas flows which transited through Belarus (including the Yamal Pipeline and Lithuanian supplies) were relatively stable while the volumes on the Nord Stream and the Ukrainian route (which includes the Brotherhood Pipeline and the Balkan route) have varied significantly.
- Volumes arriving through Ukraine, traditionally the main supply route of Russian gas to the EU, significantly declined in the second half of 2014 but recovered by May 2015. In the second quarter of 2015, volumes were only 3% lower than in the same period of 2014.
- Gas flows on the Nord Stream pipeline have been stable throughout 2014 but dropped in January and February 2015. This was largely offset by an increase in the second quarter when the utilisation of the pipeline reached up to 80%. While in the first quarter of 2015 volumes decreased 28% year-on-year, the second quarter has seen a 30% increase compared to the same period of 2014.

- According to market reports, the fall in imports from Russia in the beginning of 2015 was mainly due to importers' expectations that oil-indexed supply would be cheaper later in the year. The flexibility of long-term contracts allows buyers to delay purchases. As oil-indexed prices continue to decline, imports from Russia are expected to remain high in the third quarter. Imports also tend to increase before the winter season in order to fill storage capacity.
- In the second quarter of 2015, the Ukraine route regained the top spot, covering 38% of total Russian imports (up from 29% in the last quarter of 2014), followed by the Nord Stream (32%) and Belarus (30%) routes. In spite of increasing utilisation, there remains significant spare capacity on the Ukrainian route, particularly at Velke Kapusany on the Slovakian-Ukrainian border.
- In June 2015, Gazprom announced an agreement with three European companies to expand the Nord Stream pipeline. The two additional pipelines, to be completed by 2019, would double the current capacity of the route.⁵ A shareholders' agreement to construct the new pipelines was signed in early September. "Nord Stream 2" would considerably increase transmission capacity from Russia to the EU although existing transport capacity, currently used at around 50%, already well exceeds the EU's needs for likely future supplies.

Figure 7. EU imports of natural gas from Russia by supply route, 2014-2015



Source: Based on data from the ENTSO-G Transparency Platform
Deliveries to Estonia, Finland and Latvia are not included; transit volumes to the Former Yugoslav Republic of Macedonia, Serbia and Turkey are excluded

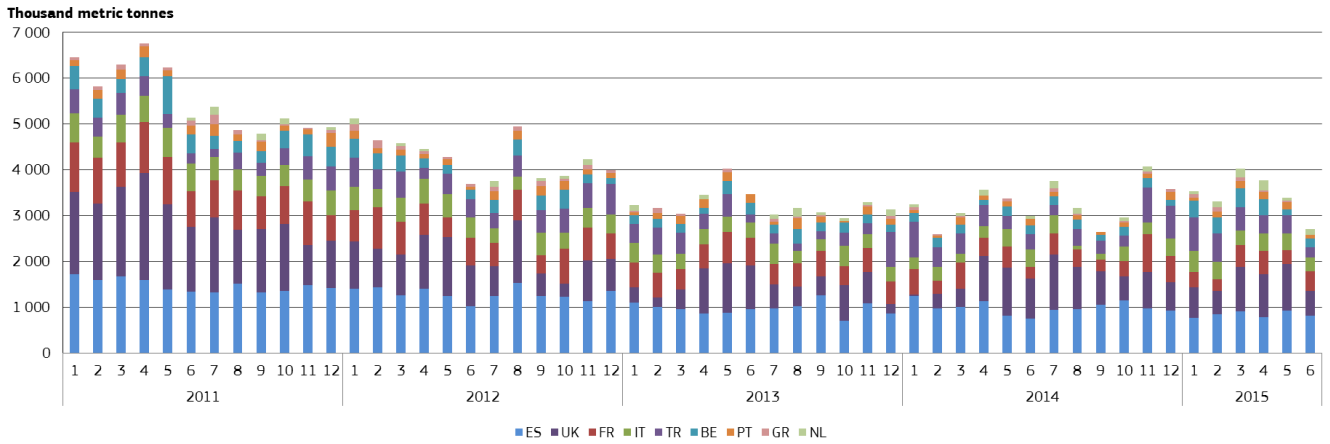
- European LNG imports started to rise in the last quarter of 2014, facilitated by subdued demand in Asia and increasing global supplies. The convergence of Asian and European prices has made Europe a more attractive destination for LNG cargoes. Analysts expect this trend to continue in 2015 and the 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.
- After the increase seen in the last quarter of 2014 (10%) and the first quarter of 2015 (24%), LNG imports in the EU were flat in the second quarter compared to the same period of the previous year. Deliveries to the two main LNG buyers, Spain and the UK, decreased (-6% and -15% respectively) but this was offset by increasing imports to the other markets. LNG deliveries to the Netherlands more than doubled. In spite of the decrease, Spain remained the top LNG importer in the EU.
- In 2014, Asia became a major consumer of European LNG: nearly 2.7 million tons were re-exported to Asia, mostly from Spain, attracted by the higher spot prices. A further 1.3 million tons were re-exported to South America.⁶ In 2014, about

⁵ <http://www.gazprom.com/press/news/2015/june/article229578/>

⁶ ICIS Heren European Gas Markets, 16 March 2015

14% of EU LNG imports were re-exported to other destinations. However, as Asian and European LNG prices levelled off, opportunities for re-exports decreased considerably in 2015.

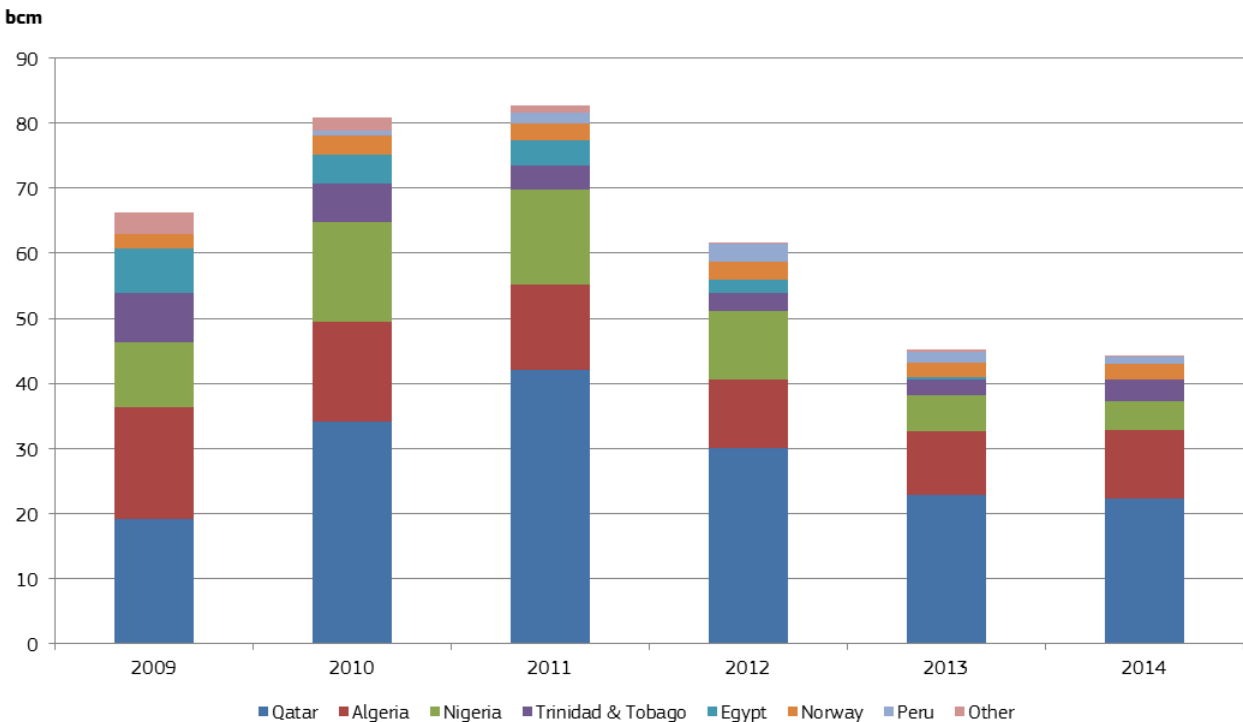
Figure 8. Imports of LNG into Europe by country



Source: Thomson-Reuters Waterborne
Lithuania is not included

- Since 2009, Qatar has been the top LNG supplier to the EU. In spite of the fluctuating volumes, its market share has been remarkably stable, covering 49-51% of total imports in the last four years. In 2014, Qatar was followed by Algeria (24%) and Nigeria (10%). While Algerian supplies have been relatively stable in the last few years, imports from Nigeria declined significantly.
- In the second quarter of 2015, Qatar maintained the top spot (57%), followed by Algeria (24%), Nigeria (9%), Norway (6%), Trinidad & Tobago (3%) and Peru (2%). Qatar had a dominant role in the Belgian, Italian and UK markets while Algeria was the principal supplier of France and Greece. The Netherlands, Portugal and Spain had a relatively balanced portfolio, with no single supplier covering more than 50% of LNG imports.

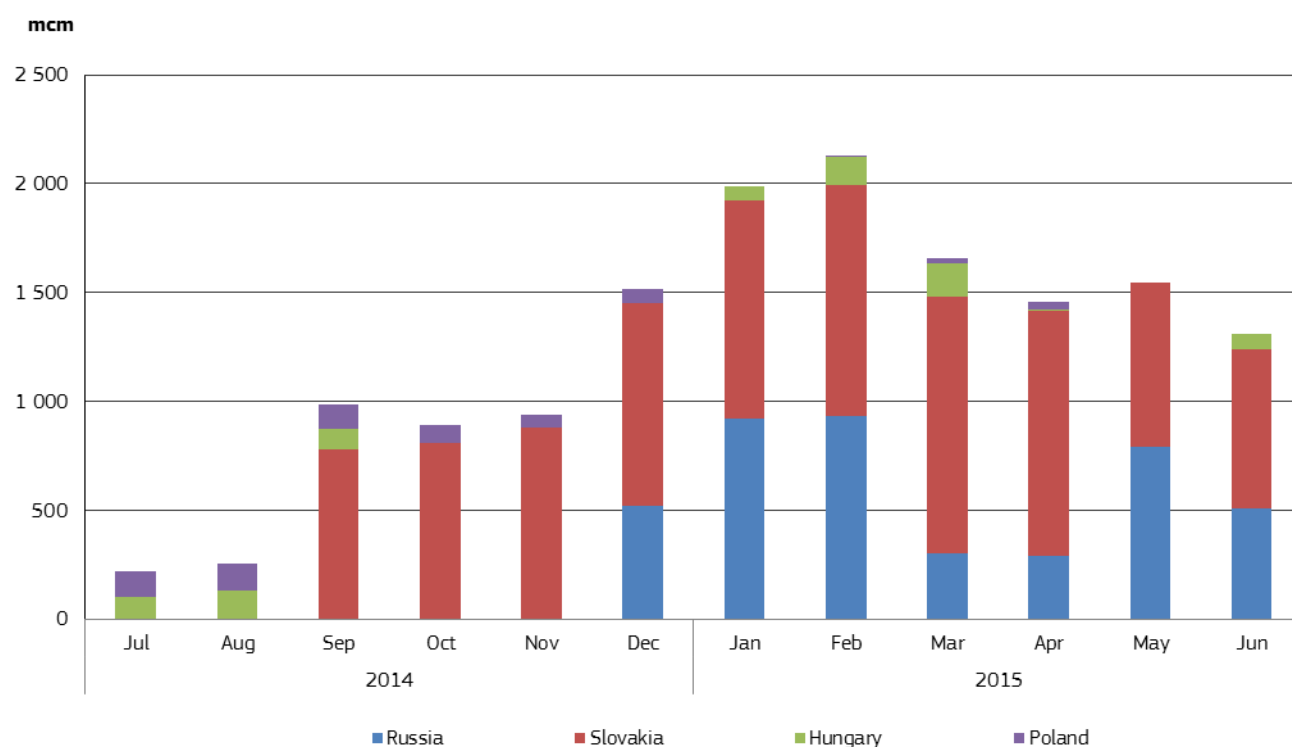
Figure 9. LNG Imports to Europe by supplier



Source: Bloomberg/Poten & Partners
Imports to Lithuania are not included

- On 2 April 2015, Russia and Ukraine agreed on the supply terms for the second quarter of 2015. The terms were similar to those in the "winter package" which expired at the end of March, with deliveries subject to prepayment by Naftogaz. In spite of the agreement, Ukraine continued its efforts to diversify gas supplies and is reportedly looking into the option of importing gas from Romania.
- In the second quarter of 2015, Ukrainian gas imports coming from Europe continued to exceed Russian deliveries and covered 63% of total imports, although the average cost of gas imported from Europe was slightly higher than that of Russian gas.⁷ Slovakia remained the main supplier of the country; imports from Hungary stopped for almost two months from early April to early June while no imports were reported from Poland in May and June.
- The trilateral discussions between Russia, Ukraine and the European Commission failed to reach an agreement for the third quarter and from 1 July Naftogaz halted Russian gas imports. Although the interruption had no impact on the transit flows to the EU, it provided support to European hub prices.
- After several rounds of trilateral and bilateral negotiations, on 25 September 2015 the European Commission, Russia and Ukraine agreed on the terms of gas deliveries to Ukraine for the period from 1 October 2015 until 31 March 2016. The new Winter Package, once ratified by the respective governments, will ensure that Ukraine has sufficient gas supplies in the coming winter and that there is no threat to gas transit from Russia to the EU.⁸
- On 9 April 2015, the Ukrainian Parliament adopted a law on the natural gas market, aligning the Ukrainian gas market with the norms defined in the EU's third energy package. The law which was developed in close cooperation with the Energy Community Secretariat is to be applicable from 1 October 2015.⁹

Figure 10. Gas imports to Ukraine from Russia and the EU, July 2014 – June 2015



Source: Data from ENTSO-G Transparency Platform and Naftogaz

⁷ <http://naftogaz-europe.com/article/en/StatisticsGasPrices>

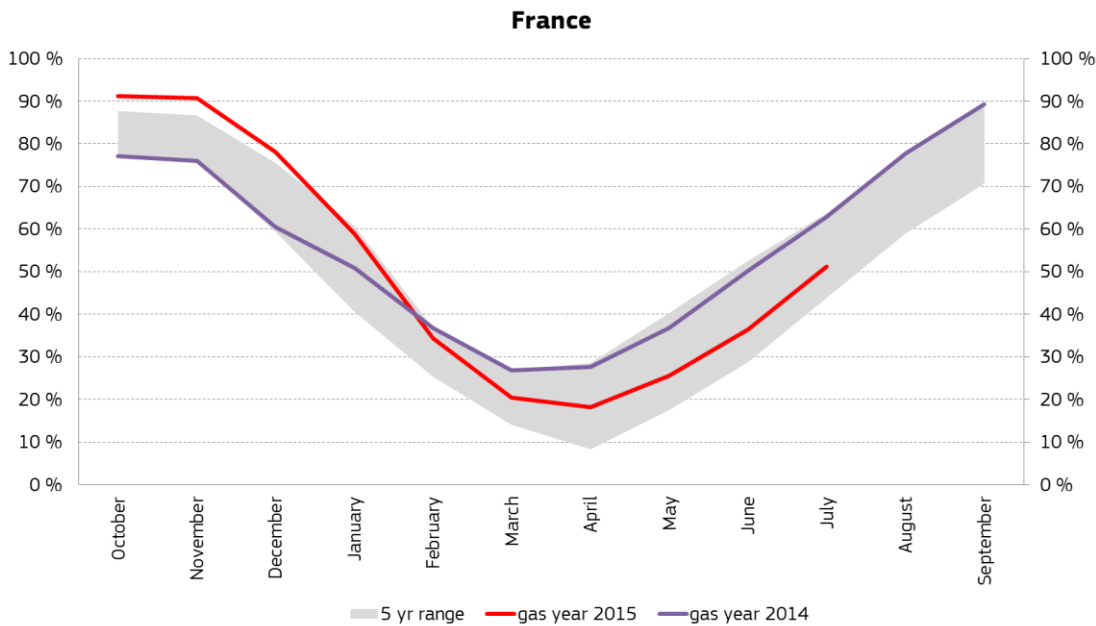
⁸ http://europa.eu/rapid/press-release_STATEMENT-15-5724_en.htm

⁹ <http://naftogaz-europe.com/article/en/naftogazzakonaukrainyorynkeprirodnogogaza>

2. Gas storage

- Although Europe started the 2014/2015 winter with record storage levels, in the first three months of 2015 withdrawals were stronger than in the previous year. Colder weather and low imports from Russia were the main reasons for higher-than-average storage withdrawals.
- Storage levels bottomed out on 9 April at a level of 23 bcm, 25% of storage capacity. To compare, in 2014 the minimum level occurred on 30 March, at 36 bcm (45% of storage capacity). Withdrawals continued longer than usual due to cool weather, relatively high hub prices and expectations of falling oil-indexed prices.
- Expectations of decreasing prices also provided an incentive to delay storage injections. As a result, in the second quarter, injections were relatively muted. As oil prices started to fall again in the summer, oil-indexed prices are set to decrease further, providing an opportunity to replenish stocks with cheaper gas at a later date.
- On 30 June 2015, storage level stood at 44 bcm (48% of storage capacity), 12.5 bcm below the level at that time last year, but 7 bcm more than at the same time of 2013.
- In the UK, storage levels dropped below the 5-year range over the summer. High withdrawals to compensate for lower supplies from Norway and a restriction at the Rough storage facility contributed to this development. Rough is a depleted offshore gas field and the UK's main gas storage site. In March, a potential technical issue was discovered and the operator decided to limit the maximum operating pressure of the wells, resulting in a reduction of storage capacity by about 25%. The limit will remain until at least the end of the summer 2016 injection season.¹⁰ The reduced storage capacity triggered expectations that British utilities would divert gas to storage facilities in the continent.¹¹

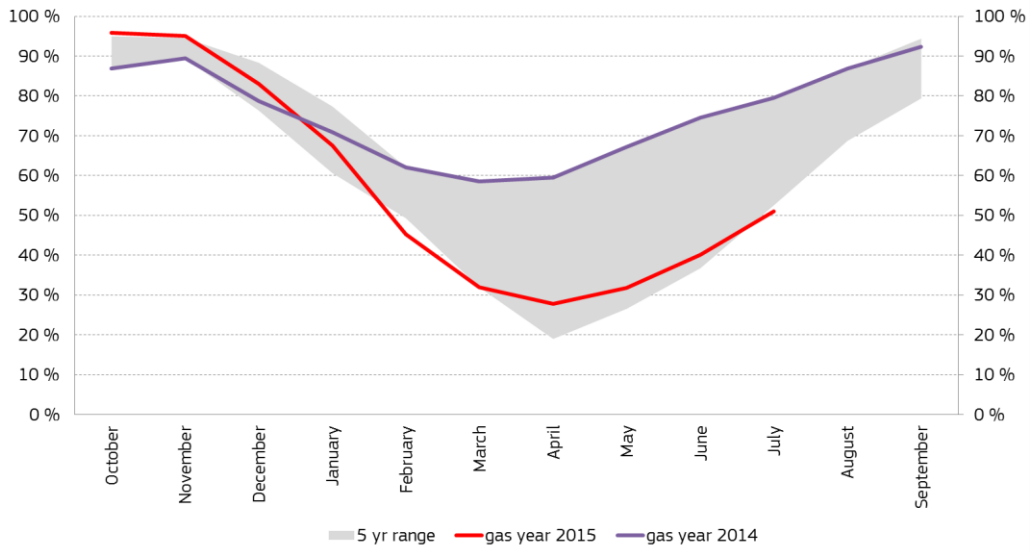
Figure 11. Gas storage levels as % of maximum gas storage capacity in selected countries



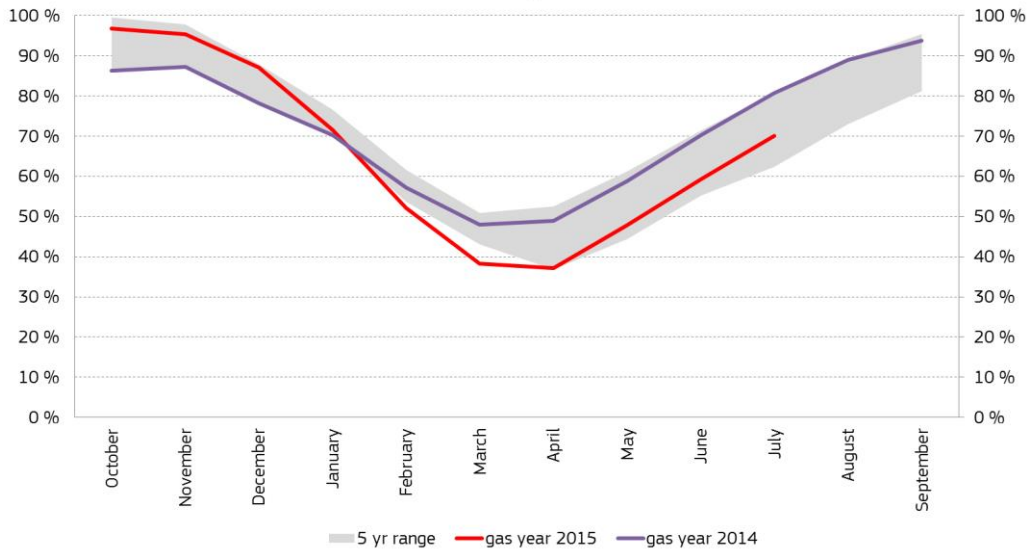
¹⁰ <http://www.centrica-sl.co.uk/index.asp?PageID=22&Year=2015&NewsID=201>

¹¹ ICIS Heren European Gas Markets, 30 April 2015

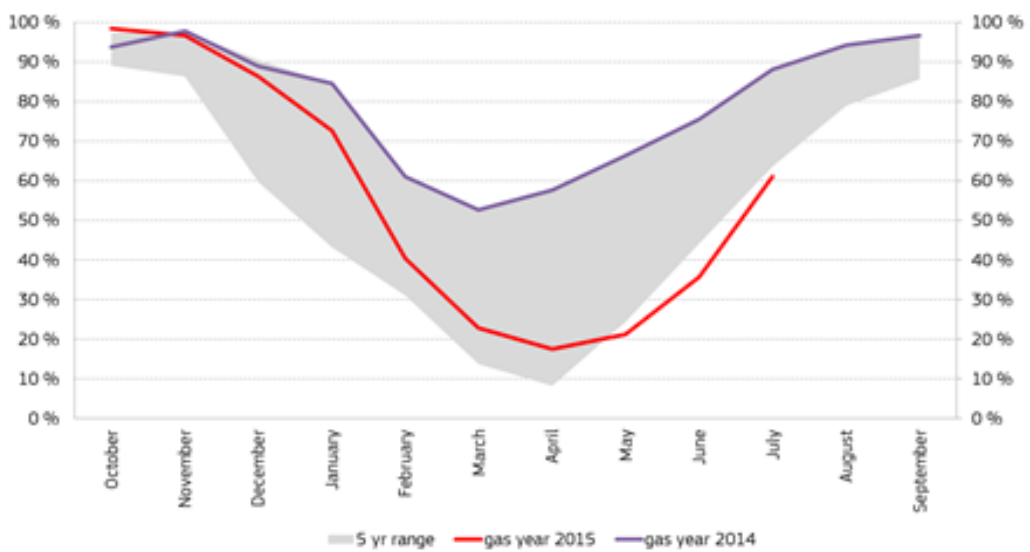
Germany



Italy



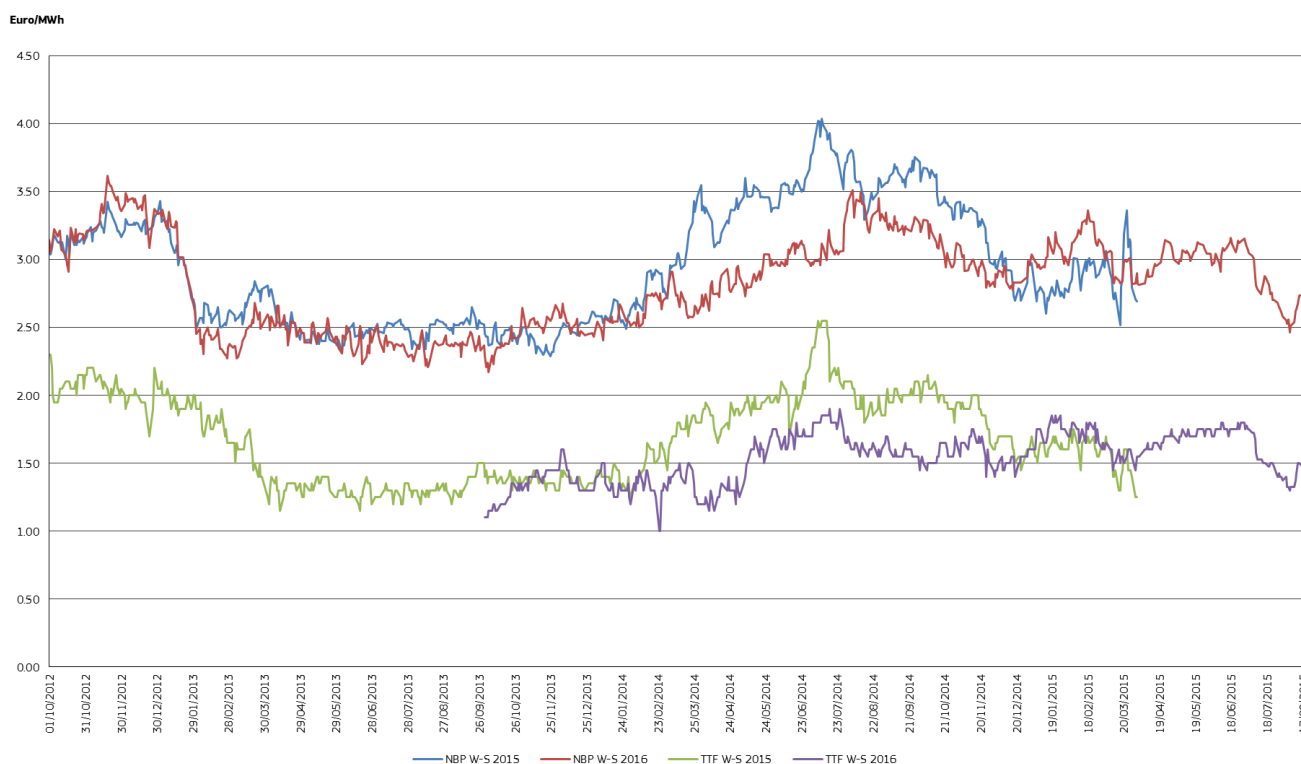
UK



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 11 shows that seasonal spreads significantly increased in the first half of 2014, 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 2014, as spot prices recovered, spreads decreased again but remained higher than in 2013.
- In the first half of 2015, seasonal price spreads remained relatively stable, around 3.0 Euro/MWh on the UK hub and around 1.7 Euro/MWh on the Dutch TTF. Dutch spreads are lower because the Netherlands has access to more flexible storage.
- The winter-summer spreads started to fall again in July and by early August were as low as 2.5 Euro/MWh on the NBP and 1.3 Euro/MWh on the TTF. If seasonal price spreads remain low, this may curb much-needed storage injections before the 2015/2016 winter.

Figure 12. Winter-summer spreads in the Dutch and British gas hubs



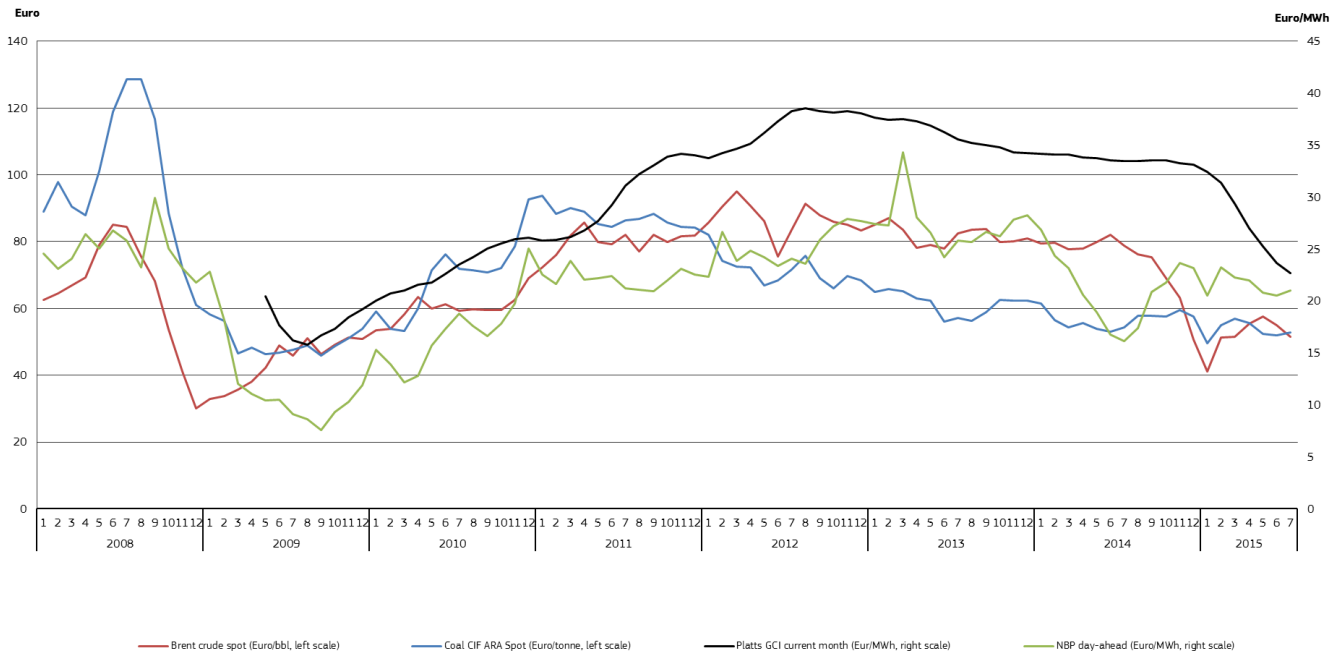
Source: Platts

3. Wholesale gas markets

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

- After reaching a 6-year low in January 2015, Brent started to increase as the falling number of active rigs in the US and the news about oil companies cutting upstream spending had raised expectations that supply growth could soon ease. Rising tension in the Middle East also supported prices. From mid-May, however, oil prices started to decrease again, driven by the continuing over-supply in the global market. In an effort to retain market share, OPEC output remains at near-record levels while so far US tight oil production has proved to be rather resilient to low prices. The Iran nuclear deal signed in July also raised the spectre of lasting over-supply. On the demand side, the Greek debt crisis and concerns over China's growth prospects also contributed to the price drop. These developments suggest that prices will remain relatively low for a prolonged period.
- The NBP spot price has been volatile in 2014, with the average monthly price falling by 40% between January and July and then increasing by 47% between July and November. In comparison, prices remained relatively stable in the first half of 2015, although there was a clear decreasing trend as falling oil prices and steady LNG supply put downward pressure on European hub prices. In the second quarter, NBP has been fluctuating in the 20-22 Euro/MWh range and averaged 21.1 Euro/MWh, 12% more than a year earlier. Section 5.3.2 looks at the main drivers of European wholesale gas prices.
- Falling oil prices directly affect oil-indexed gas prices, albeit with a 6-9 month time lag. Oil-indexed prices were previously expected to bottom out in mid-2015 but are now set to decrease further, at least until the fourth quarter of this year. Platt's North West Europe Gas Contract Indicator (GCI), a theoretical index showing what a gas price linked 100% to oil would be, continued to fall in the second quarter of 2015 and by July its premium over NBP has reduced to less than 2 Euro/MWh, the lowest level since December 2010. Oil indexed prices have an important but diminishing role in the European market: according to a recent report of the International Gas Union¹², oil-indexation accounted for 32% of gas consumption in 2014, down from 43% in the previous year. In Northwest Europe this share was only 12% in 2014.
- Coal prices have been on a declining trend since 2011, driven by the global over-supply. This trend continued in 2015 but the decline slowed. Although China dominates the global coal market, recent concerns about the Chinese economic outlook seem to have had a muted impact on coal prices. Since late 2014, the development of European spot prices of coal and gas show a remarkable similarity, suggesting that the relative competitiveness of the two fuels has stabilized.

Figure 13. Spot prices of oil, coal and gas in the EU



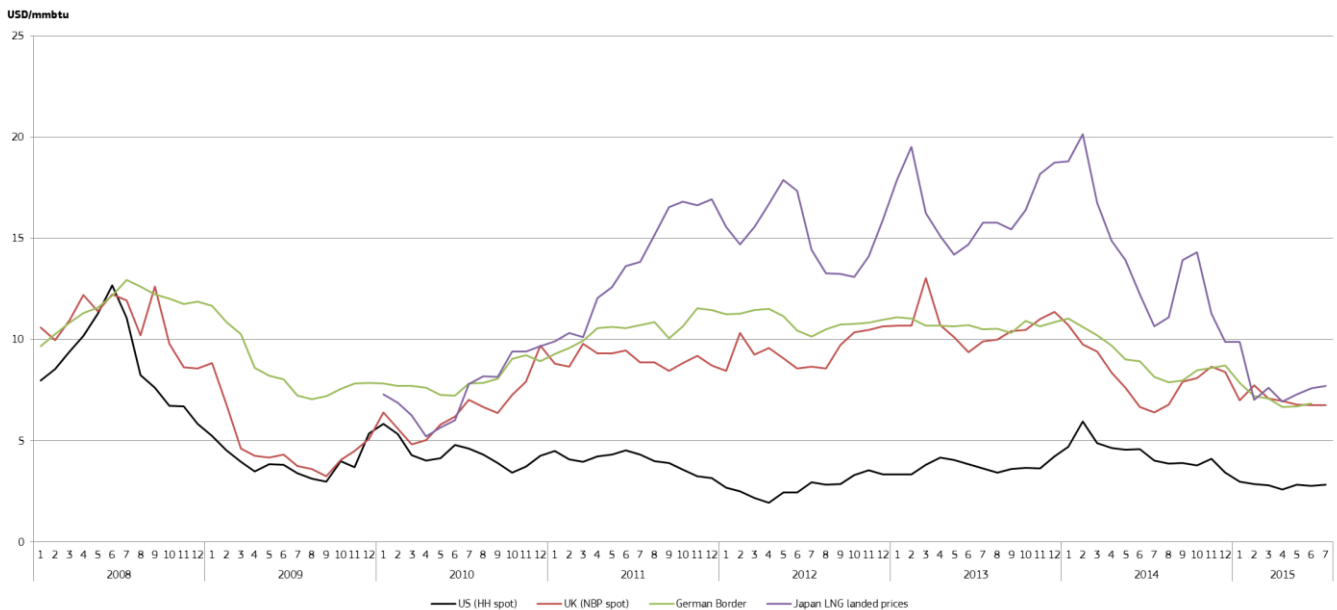
Source: Platts

¹²Wholesale Gas Price Survey - 2015 Edition

3.2 International gas markets

- Figure 14 shows an international comparison of wholesale gas prices. After the significant decrease seen in 2014 and early 2015, wholesale prices have been relatively stable since February.
- Asian spot LNG prices decreased by 65% within a year due to weak demand and increasing supply compared to the 2011-2013 period. By February 2015, LNG traded at 7 USD/mmbtu, on a par with the price at NBP, the UK gas hub, for the first time since 2011. Since then, LNG prices slightly increased, with Japanese landed prices averaging 7.3 USD/mmbtu in the second quarter but their premium over NBP remained less than 1 USD/mmbtu (compared to 3-10 USD/mmbtu in previous years).
- European prices decreased slowly in the first half of 2015. In the second quarter, NBP averaged 6.8 USD/mmbtu (21.1 €/MWh). The German border price closely followed the development of NBP in the first six months of 2015 which seems to indicate that Germany's gas trading partners have turned to hub-based pricing.
- The average monthly Henry Hub price remained below 3 USD/mmbtu in the second quarter of 2015. In April the average price was 2.58 USD/mmbtu, the lowest level since June 2012. Increasing production, mild weather and high stocks helped to keep prices down.
- After the convergence experienced in 2014 and early 2015, the ratio of international wholesale prices stabilized. The ratio of the Japanese LNG price and US Henry Hub was 2.7 in the second quarter, well below the 4-5 range seen in 2013. The average NBP/Henry Hub ratio was 2.5, unchanged from the previous quarter. While the euro significantly weakened compared to the US dollar over 2014 and the first quarter of 2015 (thereby lowering European prices expressed in dollars), it slightly strengthened in the second quarter.

Figure 14. International comparison of wholesale gas prices



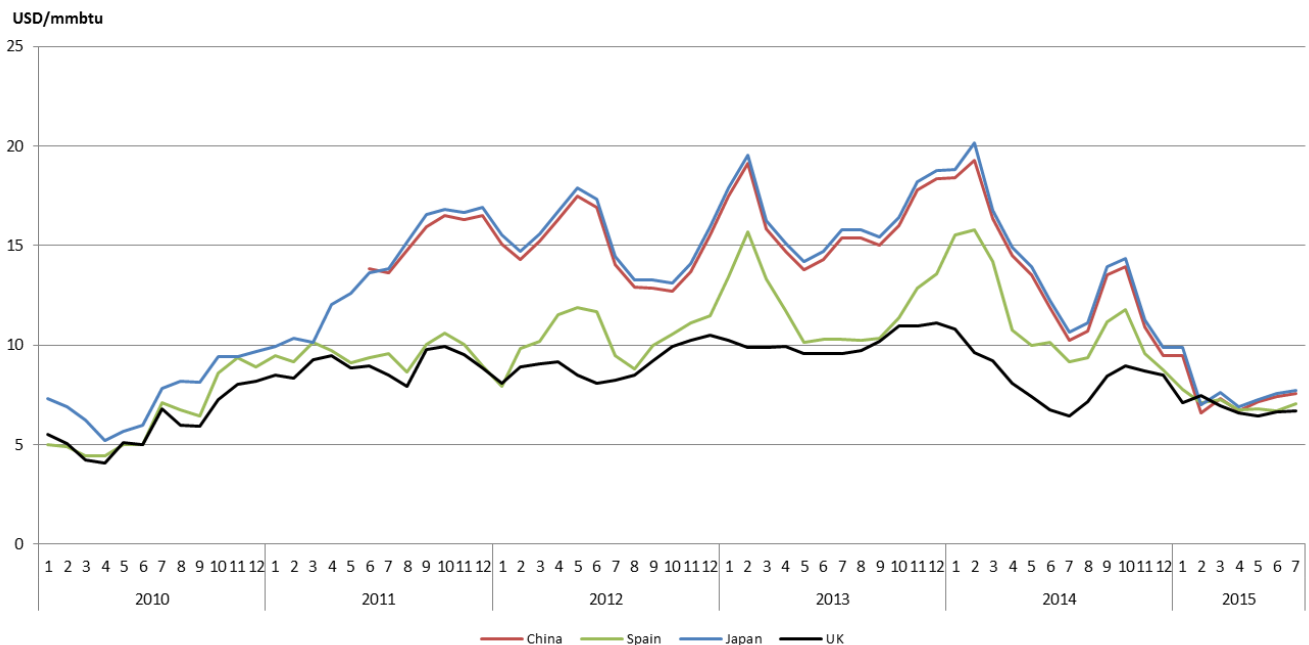
Sources: Platts, Thomson-Reuters, BAFA

3.2.1 LNG markets

- Spot LNG prices have significantly decreased in 2014 and early 2015 in both Asia and Europe, driven by weak demand in Asia. The decrease was steeper in Asia and as a result the premium of Asian LNG prices over European ones, which regularly exceeded 5 USD/mmbtu in previous years, has disappeared.
- Since February 2015, spot LNG prices have been relatively stable, moving in the 6.5-7.7 USD/mmbtu range. In the second quarter, Asian prices slightly increased despite the continuing weak demand but the premium over European prices remained below 1 USD/mmbtu. UK and Spanish prices averaged 6.6-6.7 USD/mmbtu while the average price in Japan and Korea was 7.3 USD/mmbtu in April-June 2015.

- Demand in Asia continued to be subdued in the second quarter of 2015. Compared to the same period of 2014, imports decreased into the three largest markets of Japan, Korea and China which was only partly offset by increases in India, Taiwan and Thailand. Latin American imports also decreased, contributing to the weak global demand picture.
- In the second quarter, Japanese imports decreased by 9% year-on-year. In August, Japan restarted Unit 1 of the Sendai Nuclear Power Plant, the first nuclear reactor after almost two years with no nuclear power generation in the country. Unit 2 of the same plant is set to restart in October. Another three reactors received approval from the Nuclear Regulation Authority but are still awaiting for consent by the local prefectures. Before the Fukushima accident, nuclear plants covered about 30% of the country's electricity generation. If the restart of the reactors gains pace, it is likely to displace some fuel oil- and gas-fuelled plants.
- Three new LNG buyers appeared in the market in 2015: Egypt, Jordan and Pakistan. Egypt has traditionally been an LNG exporter but increasing domestic demand forced it to divert most of the indigenous gas to the domestic market. (The country had been an important supplier to the EU, with most cargoes going to Spain, but no deliveries were reported in 2014.) Of the two Egyptian liquefaction plants, one was idled while the other operates at a low utilisation rate. In addition, a floating storage and regasification unit was installed, allowing the country to import LNG. In August, Eni announced the discovery of a supergiant gas field in Egyptian waters, the largest ever found in the Mediterranean Sea. After its full development, the Zohr field will be able to satisfy the country's gas demand for decades and may allow Egypt to resume LNG exports.¹³
- In April 2015, Yemen's sole LNG plant declared force majeure because of war in the country. While the closure was a bullish factor, new plants coming on stream in Australia and the US in 2015-2018 are expected to keep LNG prices at a subdued level. Worldwide, 16 projects with total capacity of 170 bcm are under construction. Several additional projects have been proposed but recent low oil prices are likely to delay many of these.
- Not all LNG is traded in spot markets. In fact, 74% of global LNG trade was indexed to oil in 2014. In Europe, this share was 64%, with oil-indexed pricing having a dominant role in the Mediterranean countries.¹⁴ With falling oil prices, prices of such contracts are also decreasing. LNG trade in Asia is typically based on the Japan Crude Cocktail (JCC) price mechanism. The price of Japan's JCC LNG dipped below 9 USD/mmbtu in July but remained above Asian spot prices (7.7 USD/mmbtu in July).

Figure 15. Spot LNG prices in the EU and Asia

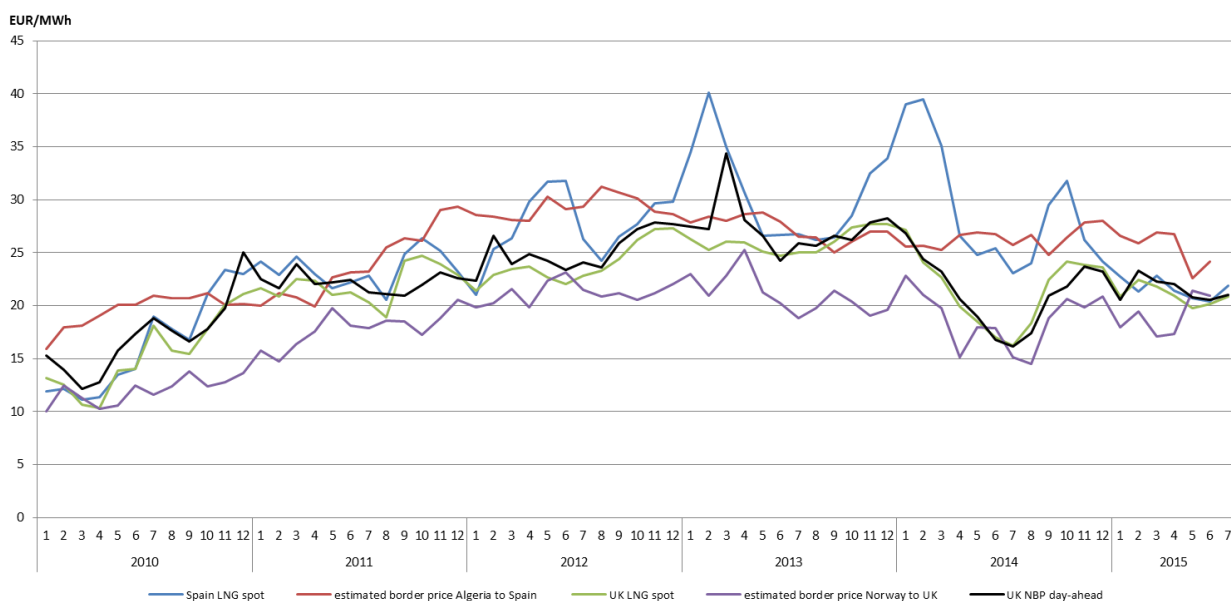


Note: Landed prices for LNG
Source: Thomson-Reuters Waterborne

¹³ http://www.eni.com/en_IT/media/press-releases/2015/08/Eni_discovers_supergiant_gas_field_in_Egyptian_offshore_the_largest_ever_found_in_Mediterranean_Sea.shtml
¹⁴ Wholesale Gas Price Survey - 2015 Edition, International Gas Union

- Figure 16 shows the evolution of spot LNG prices paid in the UK and Spain and 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. The fall in LNG prices has helped to narrow the gap between the prices of pipeline and LNG imports in the EU: the significant differences seen in previous years have clearly shrunk in the second quarter of 2015.
- In the UK, spot LNG prices closely follow the NBP price and for most of the time have been above the estimated price of Norwegian imports. However, in May and June 2015, when Norwegian supplies were limited by maintenance work on the country's gas infrastructure, the estimated price of Norwegian gas slightly exceeded both the NBP and the spot LNG price.
- In Spain, there seem to be seasonal differences in the price development of Algerian pipeline imports and spot LNG: in previous years, LNG had a high premium during the winter months but was cheaper than Algerian pipeline gas in summer. In the 2014-2015 winter, however, LNG prices plummeted and remained consistently below the price of Algerian pipeline imports; in the second quarter of 2015, the difference was about 4 Euro/MWh.

Figure 16. 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

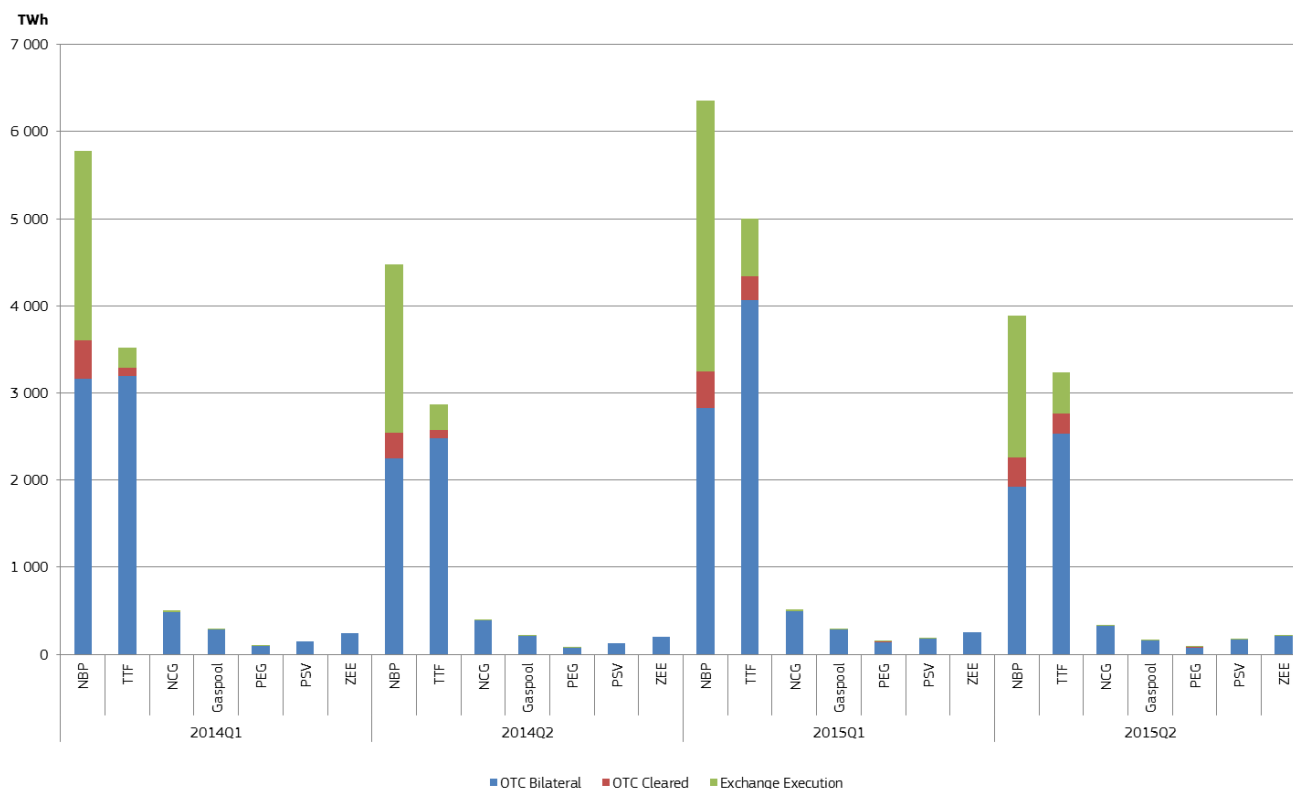
3.3 European gas markets

3.3.1. Wholesale markets in the EU

- While in previous reports we used the trading data available from the public websites of TSOs and hubs, this time we rely on the monthly Trayport Euro Commodities Market Dynamics Reports. The reports cover the UK (NBP), Dutch (TTF), German (NCG and Gaspool), French (PEG), Italian (PSV) and Belgian (Zeebrugge) hubs and distinguish three sorts of trades: broker (OTC) bilateral, broker (OTC) cleared and exchange execution. Brokered volumes include spot volume but exchange volumes do not.
- Total volumes traded on the main European gas hubs reached 12,750 TWh in the first quarter of 2015 (20% over the year-ago level) but decreased to about 8,100 TWh in the second quarter (a 3% decrease compared to the same period of 2014). Trading activity was relatively low in April and May but bounced back in June.
- The UK and Dutch virtual trading points dominate gas trade in Europe, covering 88% of hub traded volumes in the second quarter of 2015. This share has not changed since last year; it was the same in the second quarter of 2014. Volumes at the NBP decreased by 13% year-on-year while TTF volume increased by 13%. The Italian PSV showed the biggest year-on-year increase, with 36%.
- OTC markets had a 74% share of total traded volumes in the second quarter of 2015, up from 73% in the same period of 2014. 10% of OTC volumes was cleared at a clearinghouse; one year ago this share was only 6%.

- On the UK NBP hub, 42% of total traded volumes were executed directly on an exchange in the second quarter of 2015. This share was 14% on the Dutch TTF hub while other hubs remain almost entirely OTC traded.

Figure 17. Traded volumes on European gas hubs



The chart covers the following trading hubs: UK: NBP (National Balancing Point); Netherlands: TTF (Title Transfer Facility); Germany: NCG (NetConnect Germany) and Gaspool; France: PEG (Point d'Echange Gaz); Italy: PSV (Punto di Scambio Virtuale); Belgium: Zeebrugge beach.

OTC volumes include spot volume but exchange volumes do not.

Source: Trayport Euro Commodities Market Dynamics Report

3.3.2. Wholesale price developments in the EU

- For most of the 2014/2015 winter, European hub prices remained in the 22-24 Euro/MWh range. In January 2015, however, prices reached a low of about 20 Euro/MWh as mild weather and high storage levels kept demand at relatively low levels.
- From February 2015, hub prices showed a decreasing trend as low oil prices and steady LNG supply put downward pressure on European hub prices. In the second quarter, prices at most hubs moved in the 20-22 Euro/MWh range.
- Average day-ahead gas prices in the second quarter of 2015 were about 7% higher than in the same period of 2014.
- If Italy is not taken into account, the difference between the highest and the lowest priced hub in North-West Europe was 0.4-0.8 Euro/MWh in the second quarter, below the 0.8-1.7 Euro/MWh difference experienced in the first three months of the year.
- Prices at the Italian PSV hub remained relatively high in the second quarter but the premium (1-2 Euro/MWh above TTF) was slightly lower than during the winter. Italy is the third largest gas consuming country in the EU but the liquidity of the PSV market is low: in 2014 the churn rate (traded volume divided by consumption) was 1.4, well below the European average (9.2).¹⁵

¹⁵ European Gas Trading 2015, Prospex Research

- On 1 April 2015, a common market area was implemented in southern France under the name “Trading Region South” (TRS) replacing the existing GRTgaz PEG Sud and the TIGF market areas.¹⁶ In the second quarter of 2015, the average premium of TRS over PEG Nord was only 0.36 Euro/MWh; the North-South bottleneck was offset by weak demand and high LNG send-out rates in the TRS area during most of the period.

Figure 18. Wholesale day-ahead gas prices on gas hubs in the EU



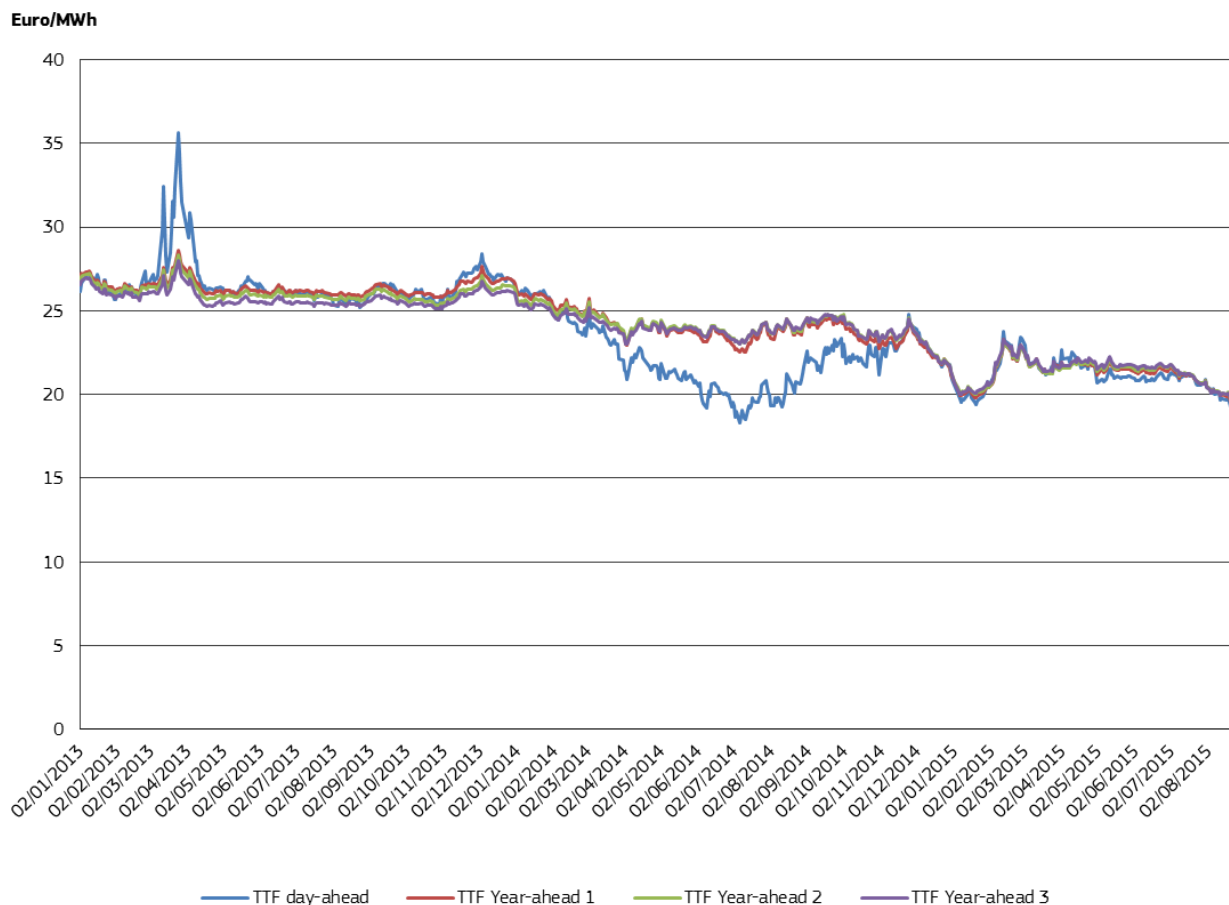
Source: Platts

- Figure 19 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 contango¹⁷, whereby closer to the present date prices are lower than prices for future deliveries. With seasonally high stock levels and 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.
- Since the end of 2014, day-ahead and forward prices have been at more or less parity. In the second quarter of 2015, the year-ahead price on average was 0.25 Euro/MWh more expensive than the day-ahead price.

¹⁶ <http://www.grtgaz.com/medias/tous-les-communiqués/detail-actus/article/trading-region-south.html>

¹⁷ See the glossary for a definition of contango

Figure 19. Forward gas prices on the Dutch gas hub



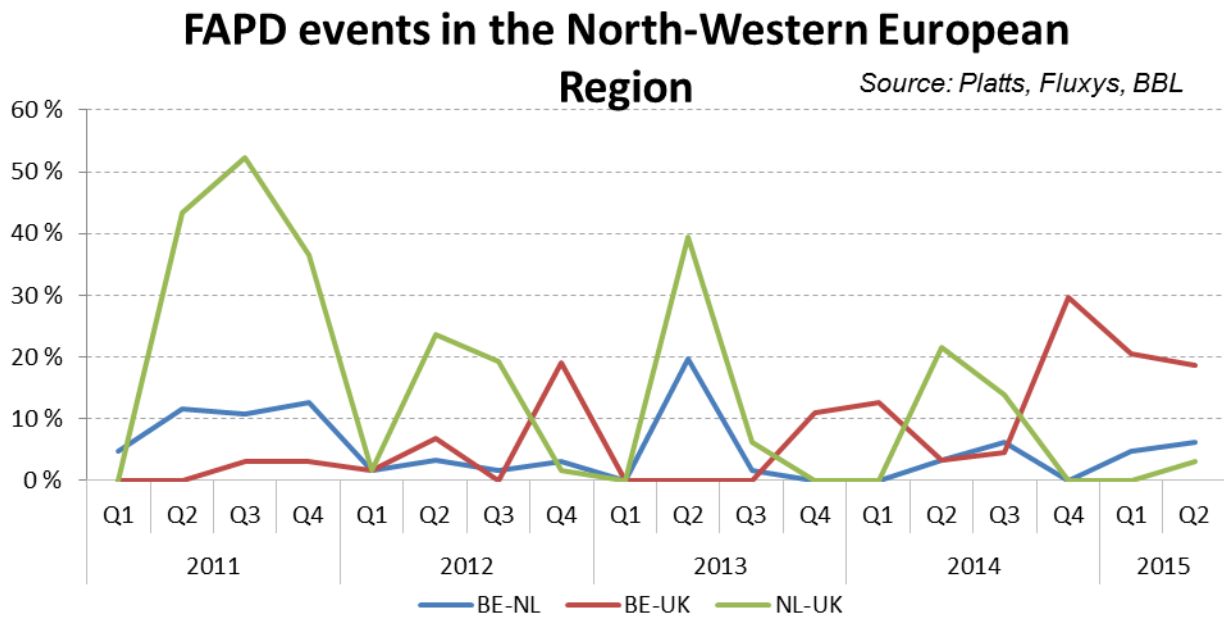
Source: Platts

- Figure 20 traces the occurrence of adverse nominations – the so-called flow against price differential events (FAPD)¹⁸ – in North Western Europe (NWE) since 2011. 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. The number of FAPD events in the NWE region decreased in 2012 and 2013 but slightly increased in 2014 and the first half of 2015.
- There have been no FAPD events between the Netherlands and the UK in the last quarter of 2014 and the first quarter of 2015 but two such events were registered in the second quarter of 2015. On this interconnector, most of the gas flows are going from the Netherlands to the UK; on two days this happened in spite of the higher Dutch prices. Most of the capacity of the BBL pipeline is covered by long-term contracts, preventing price signals to have an impact.
- Since the last quarter of 2014, a relatively high number of FAPD events were observed between Belgium and the UK. In the second quarter of 2015, on 12 occasions, i.e. on 19% of traded days, net flows went from the more expensive area, the UK, to the cheaper area, Belgium. The likely reason was the increase in the commodity charge levied by the National Grid on gas entering the UK system from 1 October 2014; the charge was further increased from 1 April 2015.¹⁹ On average, the UK NBP price has been 0.25 Euro/MWh higher during the second quarter of 2015 which is considerably less than the commodity charge applicable to gas entering the UK from 1 April (0.62 GBP/MWh).
- The UK-Belgium interconnector stopped for planned maintenance from 10 to 24 June; therefore no FAPD events were registered during this period.

¹⁸ See the glossary for a definition of the FAPD event.

¹⁹ <http://www2.nationalgrid.com/WorkArea/DownloadAsset.aspx?id=40927>

Figure 20. FAPD events in the North-Western European Region

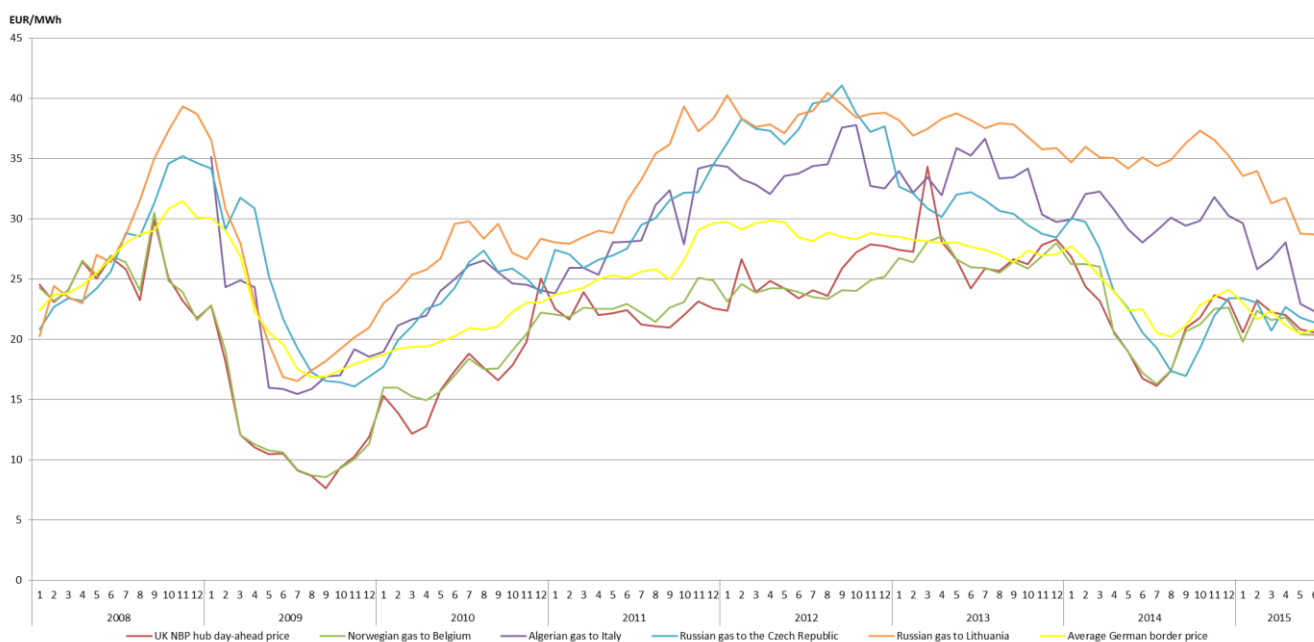


Sources: (1) Price data: Platts; (2) Flow nomination data: Fluxys, BBL

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 terms of price levels and, to a smaller extent, in terms of price dynamics.
- Compared to large variations experienced in 2014, hub-based prices were relatively stable in the first half of 2015. On the other hand, oil-indexed prices fell in line with the oil price drop observed in the second half of 2014. The estimated price levels of Russian gas to Lithuania and Algerian gas to Italy remained the highest but their premium to the other – mainly hub-based – prices shrunk. The other contracts more or less followed the movement of the NBP price, albeit in some cases with a delay.
- The difference between the estimated prices of Russian gas delivered to the Czech Republic and Lithuania remained high but decreased in the first half of 2015 as falling oil prices passed through to the Lithuanian contract. In June 2015, the estimated price in Lithuania was about 7 Euro/MWh higher than in the Czech Republic while in September this difference was 19 Euro/MWh. Since mid-2013, estimated Czech prices are well below the theoretical pure oil-indexed contract, indicating that the Czech-Russian contract now has a significant hub pricing element. In the second quarter, the estimated price of Russian gas in Lithuania was practically the same as the estimated price of the LNG arriving into the country.
- As a result of falling oil-indexed prices, the differentials across European wholesale prices have substantially narrowed in the first half of 2015. Oil prices started to fall again in May, suggesting that oil-indexed prices will continue the decreasing trend, at least until the fourth quarter of the year. As a result, price convergence is likely to continue in the coming months.

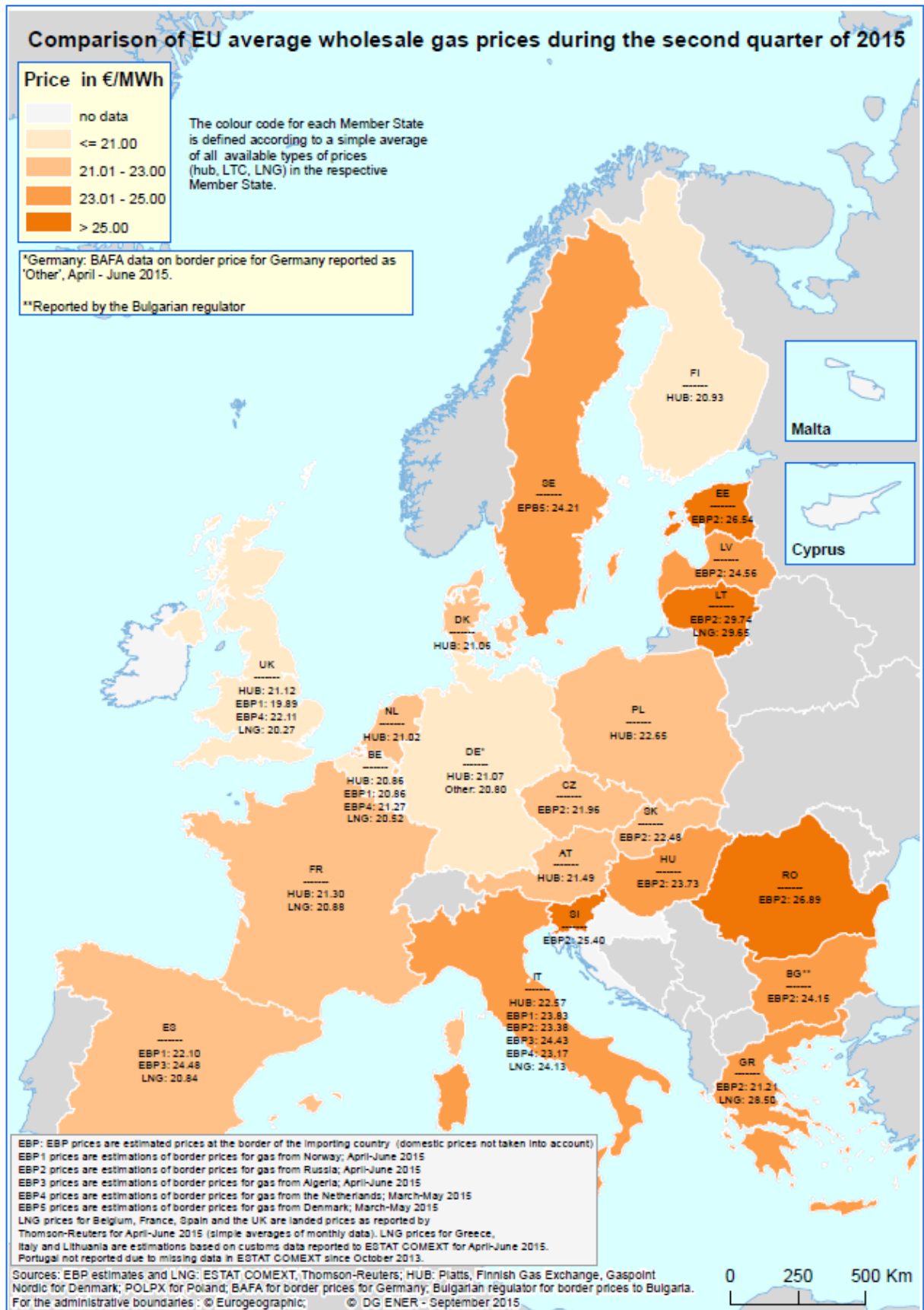
Figure 21. Comparison of EU wholesale gas price estimations



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

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 second quarter of 2015

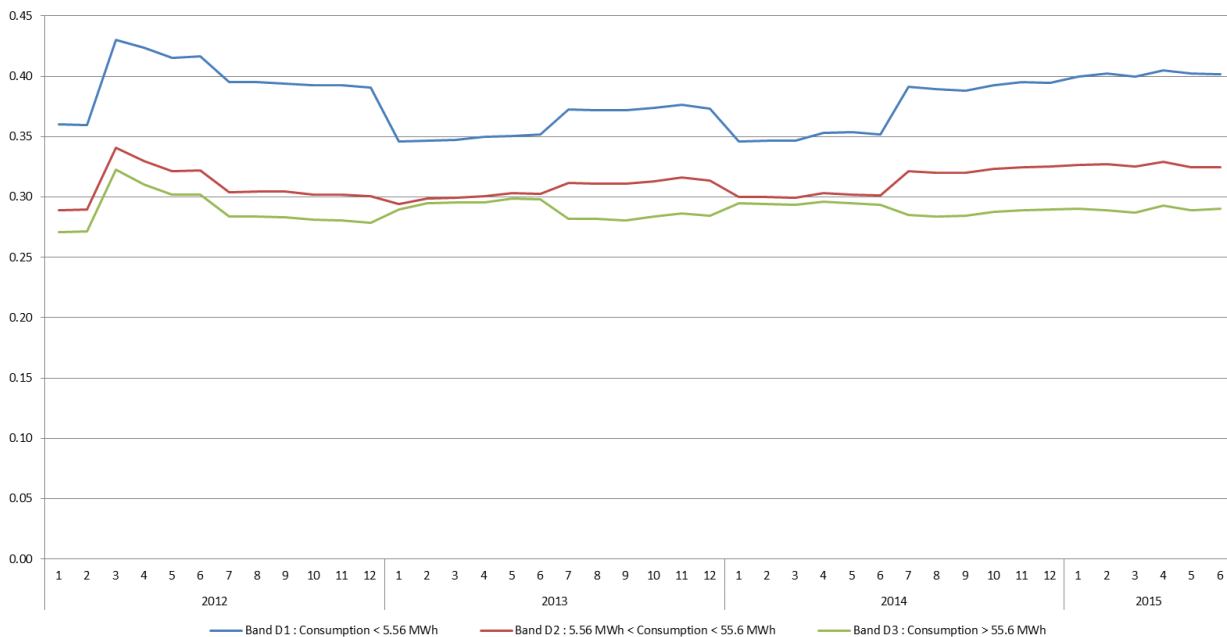


Note: Border prices are estimations of prices of piped gas imports paid at the border of the importing country, based on information collected by customs agencies, and are deemed to be representative of long-term gas contracts.

4. Retail prices in the EU

- Figures 22 and 23 show the convergence of retail gas prices for household and industrial consumers, using as a metric the relative standard deviation²⁰ of the prices in individual Member States. Monthly retail prices are estimated by using half-yearly prices from Eurostat (with the latest available figures relating to the second half of 2014) and Harmonised Consumer Price Indices (HICP) for the household prices and Producer Price Indices (PPI) for industrial consumers.
- For household consumers, the estimated average retail price (including all taxes) showed an increasing trend in recent years. In the most typical consumption band, D2, the estimated average price in June 2015 was 6% above the June 2014 level but in ten Member States prices decreased during this period.
- The relative standard deviation has been relatively stable over the last three years, indicating a lack of price convergence. There are still significant differences in retail gas prices across the EU: in June 2015, the lowest estimated household price in consumption band D2 could be observed in Romania (3.09 Eurocent/kWh), while the highest price was recorded in Sweden (11.42 Eurocent/kWh), resulting in a price differential ratio of 3.7 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.

Figure 22. Relative standard deviation of gas prices paid by household consumers in EU Member States



Note: all taxes included.

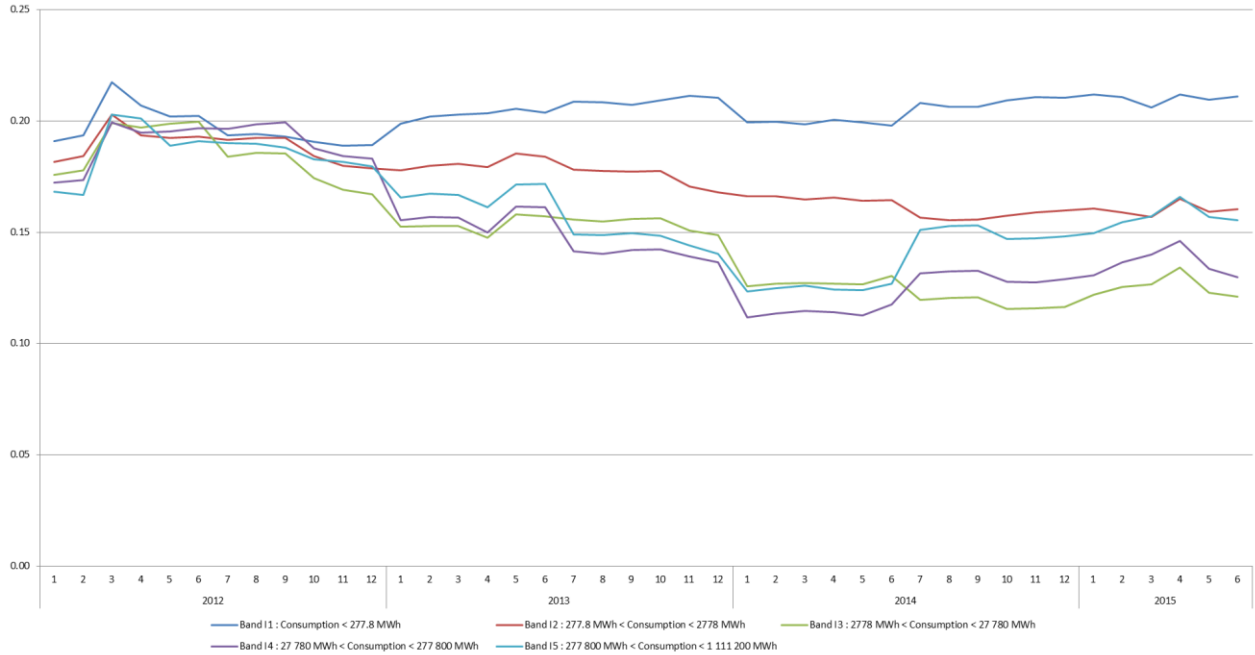
Source: European Commission estimates based on Eurostat data on consumer prices adjusted by the HICP

- Estimated industrial prices have been decreasing since 2014, with the average June 2015 price (VAT and other recoverable taxes excluded) in consumption band I4 being 7% below the June 2014 level. Prices decreased in this period in the majority of Member States, with the most significant decreases in Lithuania (25%) and the Netherlands (20%). In Croatia, on the other hand, prices increased by 13%
- For industrial customers, the relative standard deviation has been significantly lower than in the case of households and, with the exception of consumption band I1, there is a noticeable decreasing trend. This indicates a clear convergence of prices across Europe. In June 2015, Belgium had the lowest estimated industrial price in consumption band I4

²⁰ The relative standard deviation is calculated by dividing the standard deviation with the average. It shows the extent of variability in relation to the mean of the sample.

(2.59 Eurocent/kWh), while the highest price was observed in Greece (4.10 Eurocent/kWh), resulting in a price differential ratio of 1.6 between the cheapest and the most expensive Member State of the EU. In 2012 this ratio reached up to 2.3.

Figure 23. Relative standard deviation of gas prices paid by industrial consumers in EU Member States

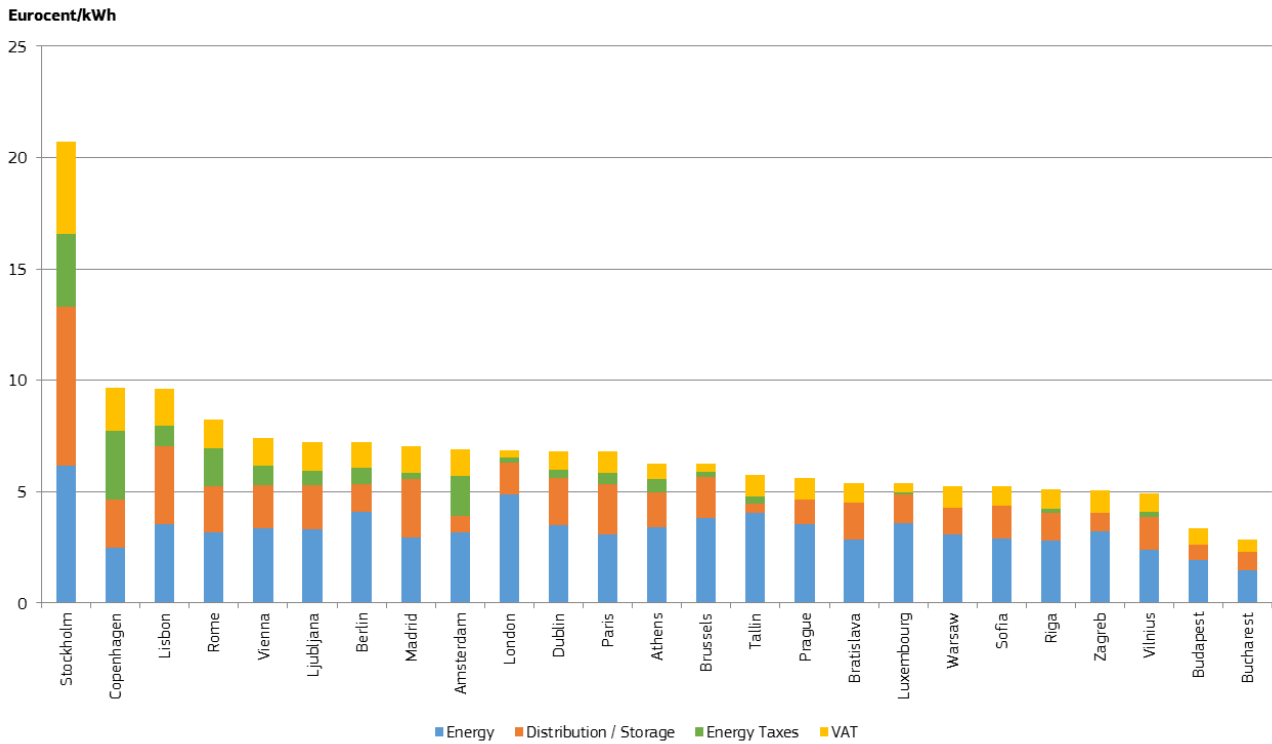


Note: Excluding VAT and other recoverable taxes.

Source of data: European Commission estimates based on Eurostat data on industrial prices adjusted by the PPI

- Figure 24 shows the level and the breakdown of residential end-user gas prices paid by typical households in European capitals in June 2015. On average, 53% of the price covers the gas itself, while the rest covers distribution/storage costs (25%), energy taxes (7%) and VAT (16%). However, there are significant differences across Member States, with the share of energy cost ranging from 26 to 72%, the share of distribution/storage costs ranging from 7 to 38% and the share of taxes ranging from 8 to 52%. In Copenhagen, taxes make up more than half of the price while in London and Luxembourg their share is less than 10%.

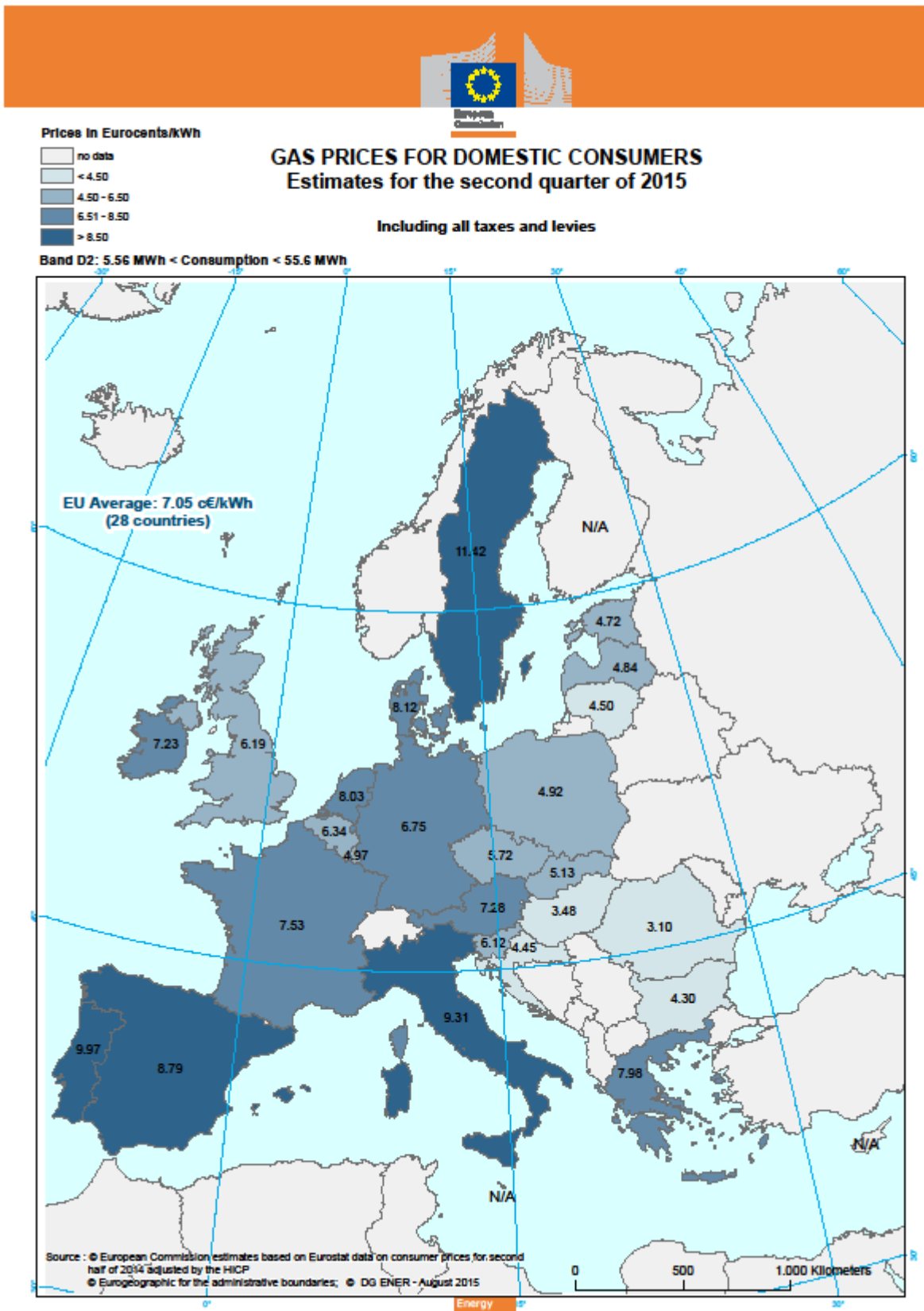
Figure 24. The breakdown of gas price paid by typical household customers in European capitals, June 2015



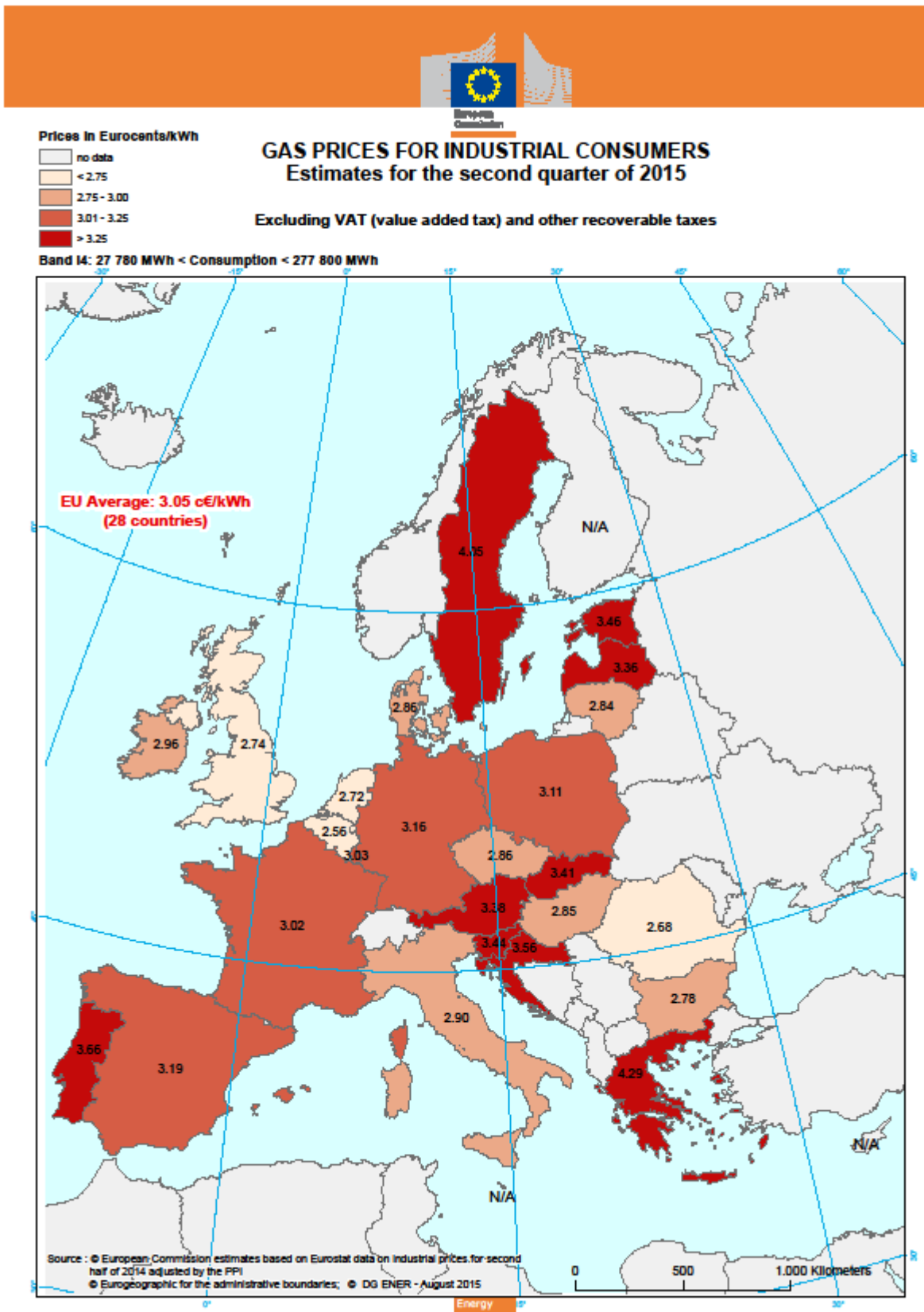
Source: VaasaETT

- 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 – 2nd quarter of 2015



Map 3. Retail gas price estimates for industrial consumers in the EU – 2nd quarter of 2015



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.