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Natural gas imports to Europe: The frontline of competition between LNG and pipeline supplies

Gas supply and consumption by the European Union (EU) has suffered significant turmoil over the past decade with problems arising on multiple fronts, including:

- Rapidly declining indigenous natural gas production;
- Declining energy (including gas) consumption in the EU due to poor economic conditions;
- Strong competition from coal and renewable energies (through subsidies and policy mandates);
- Gas on gas competition (short-term hub prices versus long-term contracts indexed to oil products;
- Ongoing, but slow, market liberalisation expanding third-party access to key infrastructure and increasing competition and leading to increased uncertainty for gas utilities and consumers;
- Uncertainties over medium-term and long-term carbon pricing and emissions taxes inhibiting investment in gas infrastructure;
- Increased availability and diversity of LNG supplies, including new entrants, the expansion of supplies from Qatar and, from 2016, LNG from the United States (US) price-indexed to US hubs becoming available;
- Political fallout with Russia over the annexation of Crimea from Ukraine, contrasting with more gas flowing to the EU from Russia bypassing Eastern Europe through Nord Stream, and investment plans to double the capacity along that pipeline route;
- Political infighting and instability along the potential “Southern Corridor” pipeline routes, through Turkey and the Balkan countries, that could deliver Central Asian and Middle East sources of gas to the EU, being delayed by many years; and,
- Uncertainty over technical capability, costs, public opinion and regulation enabling the eventual exploitation of shale gas resources within the EU.

There is little sign of resolution or more clarity emerging on any of these issues in the short term, which makes the EU gas markets challenging for importers, shippers and consumers to formulate strategies or make investment decisions with confidence. Within this turmoil there are several commercial, political, regulatory and public relations battles being fought. Some of these battles involve the longstanding competition between LNG and pipeline gas. In that regard it is interesting to analyse some statistics (BP Statistical Review, 2016) for EU gas production, consumption and imports from Non-EU sources to see how that competition has evolved over the past decade.

1. Underlying contraction in indigenous EU gas supply and consumption drive the pace of change

Indigenous gas production accounted for some 48% of the EU's gas supply in 2003, but has declined rapidly since to just 27% in 2015 (Fig. 1). On the other hand, The EU's gas consumption was 471.6 billion cubic metres (bcm) in 2003 and rose at a modest pace to peak at 499.6 bcm in 2010. Subsequently, the EU's gas consumption declined by more than 20% from that 2010 peak to 384.5 bcm in 2014, recovering by about 4.5%–402.1 bcm in 2015 (Fig. 1). The EU's gas consumption in 2015 remained significantly below what it had been in 2003. If the EU's gas consumption had not contracted since 2010 then the rapid reduction in indigenous EU gas production would have posed much more of a challenge than it has. This significant drop in gas consumption and the current oversupply of gas globally, since 2014, has eased the pressure somewhat on the EU's security of gas supply dilemma.

The scale of decline of the EU's gas production was exacerbated significantly in 2015 by the mandated gas production cutback by some 50% at the giant Groningen gas field in the Netherlands since 2014. This was deemed necessary due to production from the mature field being associated with increased localised earthquakes. In September 2016 (Reuters, 2016) the Netherland's government announced that production from Groningen would be capped at 24bcm annually for the next five years. This is likely to lead to the Netherland's, the last significant EU nation able to sustain gas exports, becoming a net gas importer. At its peak, many years ago, Groningen was responsible for some 10 percent of gas consumed in the EU.

Hence, there is little prospect of EU's declining-trend-of-gas production being reversed without a dramatic change in policies regarding shale gas exploitation. The EU must come to terms with replacing almost all of its indigenous gas supply over the coming decade, and if gas is to play a significant role in the EU's energy mix then an increasing supply of gas imports needs to be secured. The main existing pipeline gas suppliers to the EU are generally well positioned to increase supplies through existing infrastructure, or expansions of capacity to existing routes. However, a political reluctance to become more dependent on Russian, North African or Middle Eastern gas, and concerns over Norway's ability to sustain significant production growth from its available gas resources, means that LNG's greater flexibility continues to attract significant interest to facilitate a diverse and secure future gas supply for several EU nations.

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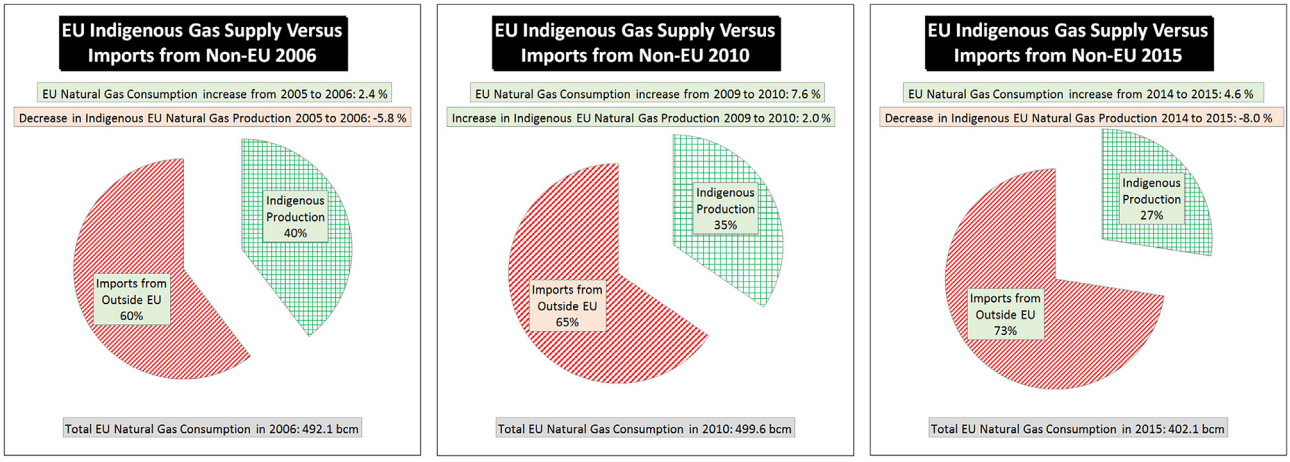

Fig. 1. Natural gas supply, production and consumption snapshots for the EU for 2006, 2010 and 2015 based on data sourced from BP Statistical Review (2016).

2. LNG versus pipeline gas imports to the EU

A more detailed breakdown of gas imports to the EU by source non-EU nation, distinguishing LNG from pipeline supplies, for the three snapshot years (2006, 2010 and 2015) considered in Fig. 1, highlights the prevailing dominance of pipeline imports (Table 1). Imported Gas supply to EU was only 14% by LNG in 2003, but rose progressively to 16% in 2006 to 24% in 2010, reaching a peak of 26% in 2011. By 2014 the LNG contribution had fallen back to 12%, comparable with the 2003 level, and has risen only slightly since to 15% in 2015.

In 2006 only 10% of the LNG imported to Europe came from Qatar, whereas by 2015 that had risen to 55%. Between 2006 and 2010 it appeared that LNG was to set to continue to progressively take market share from pipeline gas, with several new suppliers entering the market (e.g. Equatorial Guinea, Norway, Peru, Yemen) plus some reloaded cargoes from the US. In 2015 most of these new importers failed to deliver to the EU, some because resource and political turmoil prevented it (e.g. Egypt and Yemen; with the former becoming itself a significant LNG importer), others because there were better market opportunities elsewhere (i.e., in Asia, Middle East, Eastern Mediterranean and South America). Indeed, with low gas prices prevailing globally EU became the destination of last resort for many LNG suppliers in 2015 and remained so in 2016.

Although in the past few years the pipeline gas importers to Europe have fared better in terms of market share than LNG importers, in order to do so they have had to lower their prices substantially and include a significant component of gas-hub prices in the prices indexation. In the case of Russia, which imported about 108 bcm of gas to the EU in 2003, exports to the EU have been up and down over the past decade, reaching a low of 106 bcm in 2012 (less than the 2003 level) and a high of 136 bcm in 2013. Norway has fared better than Russia over the period, managing to increase imports from 68 bcm in 2003, rising progressively, except for a slight dip in 2013, to some 113 bcm in 2015. Norway undoubtedly benefitted in market share from Russia's political disfavour with the EU, and by agreeing to re-align its gas-price

Table 1
Sources of LNG and pipeline gas imported to the EU in 2006, 2010 and 2015 based upon data sourced from the BP Statistical Review (2016). * The other pipeline sources that supplied gas in 2006 involves gas from Central Asia to Eastern European EU nations transiting and controlled by Russia.

Natural Gas Imports to the Euroopean Union from Non-EU Sources						
Gas Imports to EU	2006		2010		2015	
NON-EU to EU	Imports	Percentage	Imports	Percentage	Imports	Percentage
Gas Suppliers	bcm	Share	bcm	Share	bcm	Share
Russia [Pipeline]	127.04	40.94%	110.71	33.50%	133.25	41.98%
Norway[Pipeline]	84.00	27.07%	95.88	29.01%	109.55	34.51%
Algeria [Pipeline]	35.62	11.48%	34.73	10.51%	20.67	6.51%
Libya [Pipeline]	7.70	2.48%	9.41	2.85%	6.50	2.05%
Other {Pipeline]*	5.00	1.61%	0.00	0.00%	0.00	0.00%
Algeria [LNG]	18.95	6.11%	15.19	4.60%	9.39	2.96%
Nigeria [LNG]	13.46	4.34%	14.65	4.43%	6.09	1.92%
Norway[LNG]	0.00	0.00%	3.38	1.02%	2.95	0.93%
Equatorial Guinea [LNG]	0.00	0.00%	0.12	0.04%	0.00	0.00%
Egypt [LNG]	8.45	2.72%	4.44	1.34%	0.00	0.00%
Qatar [LNG]	5.36	1.73%	33.92	10.26%	26.10	8.22%
Trinidad [LNG]	3.76	1.21%	5.96	1.80%	1.61	0.51%
Oman [LNG]	1.00	0.32%	0.17	0.05%	0.08	0.03%
Libya [LNG]	0.72	0.23%	0.34	0.10%	0.00	0.00%
United States [LNG]	0.00	0.00%	0.35	0.11%	0.00	0.00%
Peru [LNG]	0.00	0.00%	0.71	0.21%	1.23	0.39%
Yemen [LNG]	0.00	0.00%	0.52	0.16%	0.00	0.00%
Total	**310.34**	**100%**	**330.48**	**100%**	**317.41**	**100%**
LNG / Total EU Gas Imports (%)	**51.70**	**16.4%**	**79.75**	**24.1%**	**47.44**	**14.9%**

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indexation with hub prices more rapidly than Russia. On the other hand, North Africa has lost a significant share of the gas import market to Europe in recent years (Fig. 2). Having increased its gas exports (LNG and pipeline) to Europe from some 54 bcm in 2003 to 68bcm in 2006, North African gas exports to EU hovered around 60 bcm from 2008 to 2010, but then declined rapidly to a low of just 25 bcm in 2014, recovering somewhat to some 37 bcm in 2015. The current political unrest in Libya and poor demand for gas in southern EU countries and competition from LNG from elsewhere are the main reasons for this.

Fig. 2 summarizes the EU's gas import breakdown annually from 2010 to 2015 and revealing the volatile nature of supply and demand over that period and the oscillating fortunes of LNG, North Africa and Russia during that period. Pipeline supplies from Russia and Norway appeared to have the upper hand in the low-priced markets of 2015 and 2016, which inhibited higher-priced LNG cargoes finding EU buyers. The LNG cargo reloading and re-export from EU has been active since 2011, with many cargoes re-exported to higher-priced markets elsewhere through to the end of 2014.

3. Where is the EU's gas supply and markets heading?

With all the uncertainties and volatility described it is impossible to answer that question with any degree of confidence. However, it is worth considering some factors that are likely to be determined over the next few years that will influence the outcome.

1. The arrival of LNG exports into the international markets from the United States during 2016 and volumes increasing as more plants under construction are completed in 2017 it is clear that some of that LNG will be landed in the EU. The quantity and the profitability associated with such deliveries are uncertain, but are likely to be modest on both counts as Russia and Norway are likely to continue to pump sufficient pipeline gas in attempts to prevent US LNG taking market share from them. An expansion of the Nord Stream pipeline will likely help Russia to keep that competition in check, but probably to the long-term disadvantage of EU gas consumers.
2. More concerted efforts by Eastern European EU countries to diversify away from Russian gas may provide an opportunity for US and other international LNG suppliers, but will require investment to build infrastructure to facilitate that to happen.
3. The withdrawal of United Kingdom from the EU over the next few years may also present an opportunity for US and other international LNG to offer security of gas supply, independent of pipeline gas transiting the EU.
4. What strategies will EU gas utilities follow in the future? Historically they have been content to conduct high-priced deals with the main pipeline suppliers, which appear to be to the detriment of large EU gas consumers, but provide the utilities with profitable returns, as they typically have some joint venture shares in transportation and upstream margins.

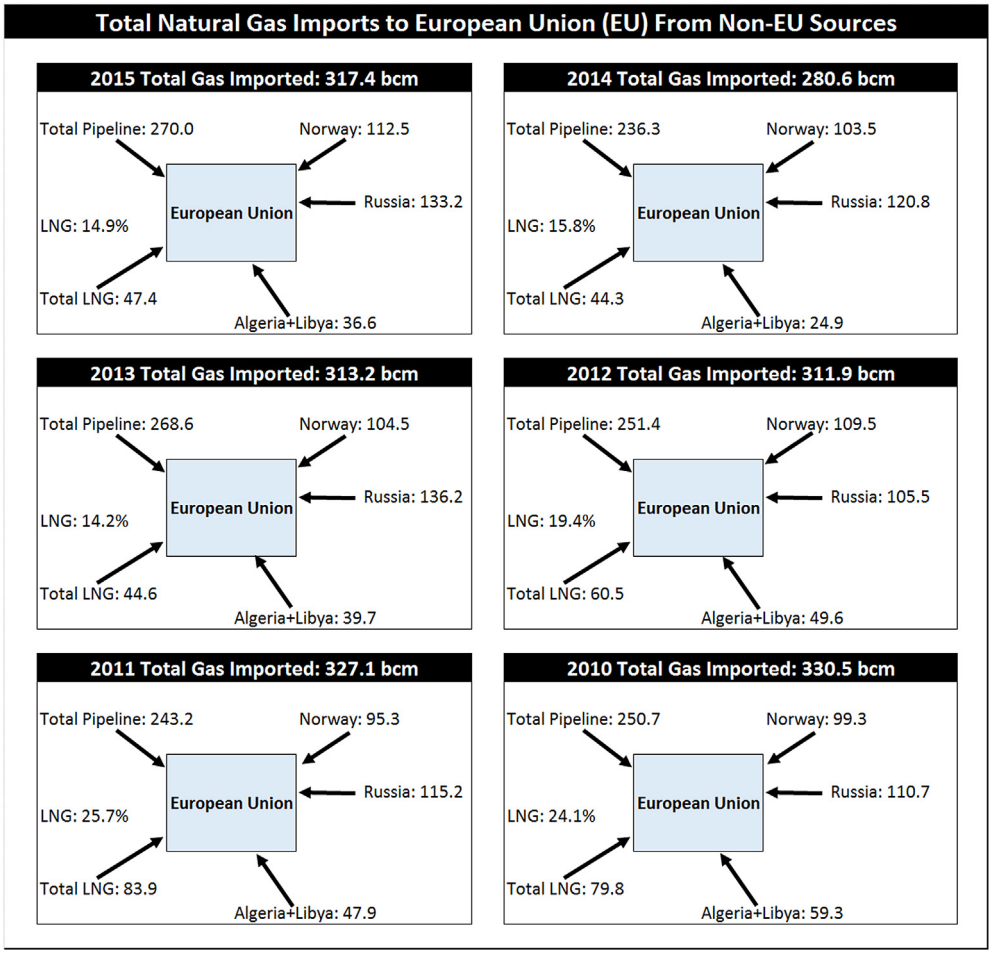

Fig. 2. Annual natural gas imports to EU by type and major Non-EU supply source. Data sourced from BP Statistical Review (2016).

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5. If it had not been for the adoption of hub pricing and short-term and medium-term LNG imports the EU gas market would likely remain tightly controlled by long-term oil-product-indexed contracts. It therefore appears to be in the interests of the EU's large gas consumers to continue to build a diversity of supply that includes LNG and other sources of supply not controlled by the existing major pipeline suppliers or the major EU gas utilities. Some independent petrochemical consumers operating in the EU (e.g. INEOS) have already recognised the advantages of sourcing ethane from outside the EU.
6. Indigenous shale gas developments seem to be going nowhere in the EU currently. At low prevailing gas prices and an over-supplied market in the short term, it is unlikely that political enthusiasm will materialise to take on a vociferous anti-fracking minority of public opinion. It is likely that there will be more pilot studies, perhaps in a UK outside of the EU, but these are unlikely to have a major impact on security of supply, and any significant projects will likely involve and/or be partly controlled by the EU gas utilities in order to gain access to the markets. This does not sound like a positive solution for EUs gas consumers to gain access to cheap sources of gas independent of the major EU gas utilities and the major pipeline gas exporters to the EU.

Due to the conditions that have emerged in the EUs gas markets in recent years the momentum is now back with the major pipeline gas exporters to northern Europe, working in conjunction with the major EU gas utilities and some major international oil and gas companies. It will take some brave and relatively risky investments from major gas consumers to break that control and expand again LNG imports, but unless that happens gas consumers have an uncertain future in terms of pricing and security of supply. Infrastructure investments leading to more gas interconnectivity and LNG imports into Eastern Europe, from north and south, could offer the LNG sector an opportunity to further penetrate the market again.

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