

# Our energy insights

## Seasonal gas supply – opportunities and challenges for GB

**Cold dark nights might well lead you to turn your central heating up and light your gas fire. At the moment, the supply of gas to meet this increased demand over winter comes from a number of different sources. But as this thought piece explores, some of these gas sources will bring both opportunities and challenges in the coming months and years. As the GB gas System Operator, we will work with government and industry to ensure that we understand and evaluate the new dynamics emerging in the GB gas market.**

It might not surprise you to hear that the amount of gas that we consume as a nation changes across the seasons. In winter, with cold weather, dark nights and more time spent indoors, demand for gas tends to peak in January, with around 8 billion cubic metres of gas consumed across the month. By contrast, a summer month could see less than half of this amount of gas supplied to GB consumers. So how are these large swings in supply accommodated across the year?

In Great Britain, an important source of supply of gas is from the UK continental shelf (UKCS). In previous years, the UKCS was the main source of gas for GB, and there were few other sources of supply in winter. There was little choice but for the UKCS to provide this seasonal 'swing'. The price differential between summer and winter gas prices also meant that it was worthwhile for producers to undertake the cost and effort involved in increasing gas production over the winter.

Today however, the UKCS only provides around half of GB gas supply, and this production is forecast to decline significantly over the next 30 years. Supply from the UKCS also remains relatively constant over the seasons, as can be seen in the chart overleaf. Underlying this, the GB price differential between summer and winter gas prices has narrowed, making it potentially less valuable to increase gas production in winter - a point we'll return to in a moment.

### Gas storage

If it is difficult for UKCS gas production to change according to seasonal demand, how else can supply be increased in winter? One option might be to produce gas in the summer and then store it until the winter when it is needed. There are in fact a number of storage facilities in GB that provide the option to do



exactly that. Shippers are charged for putting their gas into the site (injection) and then for taking it out again (withdrawal). In the chart overleaf, in months where shippers have put more gas *into* storage than they have withdrawn, this is shown as a negative number – and vice versa.

As it costs money to store gas, over and above the costs of gas production, there needs to be a financial incentive to do so. Traditionally, the difference between summer and winter gas prices (the ‘spread’) provided this incentive. Gas would be bought at a low summer price, stored and then sold at a higher price in winter, with gas shippers making money from the price difference.

However in the last few winters in GB, we have seen the difference between summer and winter gas prices hovering at around 5 pence per therm<sup>1</sup> – not enough to justify the cost of storing gas. Essentially, when we look at annual demand, there are lots of potential sources of gas to meet this demand. There is therefore little scarcity, and so an increase in demand over winter doesn’t lead to a very big increase in price. And whilst a short period of very cold weather and associated high gas demand could cause a short term spike in prices, this would be unlikely to shift the winter gas price in the longer term. Storage facilities have therefore needed to adapt as the market has changed.

Great Britain’s biggest gas storage facility, Rough, is owned by Centrica Storage and can store around 3.3 billion cubic metres of gas. In 2016, maintenance issues at Rough meant that it was closed for much of the summer, the traditional period for injecting gas. Centrica Storage then announced in June 2017 that they would be closing Rough, as it is no longer

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<sup>1</sup> Gas prices are often quoted in p / therm, an older unit of energy, whereas consumers pay for gas in kWh.

commercially viable to run this storage facility. Some commentators noted that this closure could increase gas scarcity in winter, nudging up winter prices or making them more volatile, and increasing the winter / summer price differential to some extent. This could then open up more commercial opportunities for flexible, seasonal gas supplies once again. However, there was minimal movement in winter prices in response to the Rough closure announcement, suggesting that this risk had already been priced into the market.

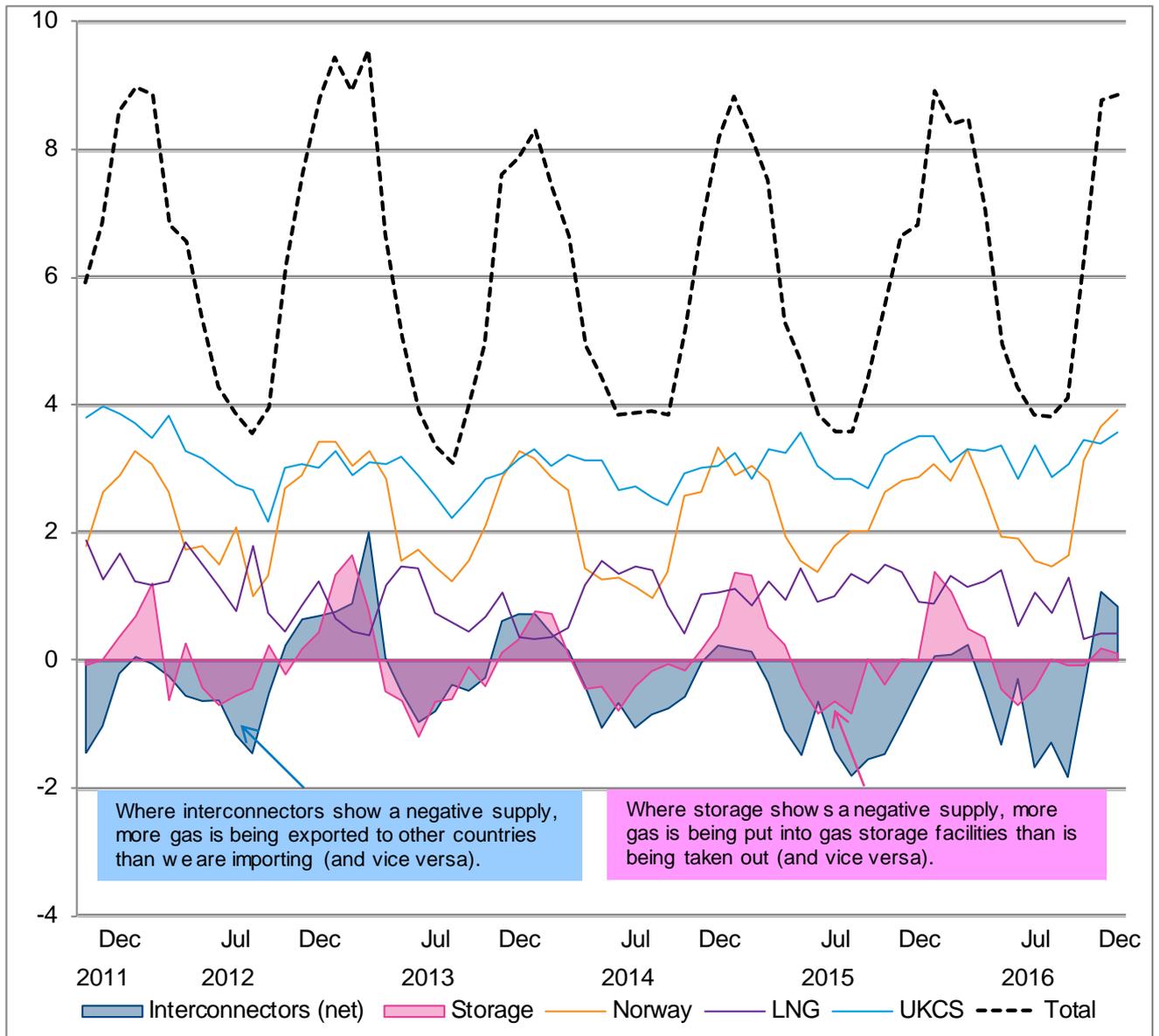


### Different sources of gas

There are other options to increase gas supply over winter. The chart overleaf shows a number of different sources of GB gas supply across the seasons since 2011. One of these sources of gas is interconnectors. Gas interconnectors connect gas transmission systems from other countries to the GB gas network. GB is currently connected to Belgium via the IUK link, the Netherlands via BBL and the island of Ireland via Moffat.

These links allow shippers to import and export gas from Europe, and export gas to the island of Ireland. GB is also connected by pipeline to Norwegian gas fields, providing another source of supply. In the chart overleaf, both Norwegian and interconnector supplies can be seen to increase gas supply into GB over the winter, with positive figures over winter indicating that GB is receiving a net import of gas from these sources.





**Figure 1: Monthly GB gas supply 2011 to 2016 - billion cubic metres (Source: Energy Trends)**

But it is worth noting that storage facilities in other European countries have been closing too. This gives these countries less flexibility in domestic supply, potentially reducing what they may want or be able to export in seasons of high demand.

Furthermore limited capacity on IUK has been sold beyond the expiration of long term capacity agreements after 2018. Similarly, BBL lost a number of long term contracts at the end of 2016. And last but not least, the UK's decision to leave the European Union casts

some uncertainty on how our energy trade with Europe may evolve.

Another option for GB is to import Liquefied Natural Gas (LNG). However the flexibility of this fuel also means that shippers can respond quickly to changes in the world market – and the LNG will travel to wherever it can make the most money. If demand, and by association, prices, go up in Asia for example, LNG shippers will move their supplies there and GB may not be able to import the LNG it was hoping for, or may need to raise prices more sharply in order to do so. We saw this happen



in 2011 when nuclear power stations in Japan were closed following the tsunami damage to the Fukushima plant. Demand for LNG in Japan for power generation rose sharply, leading to higher LNG prices across the globe. Looking at this from a GB perspective, in the chart previously, you can see that LNG coming into GB doesn't currently follow our seasonal requirements, but rather imports and exports are driven by changes in the world market.

Moreover the speed at which we can import LNG needs to be considered. Whilst some LNG may be accessed immediately if tanks at terminals are well stocked, it can then take 1-2 weeks to get LNG delivered from elsewhere in the world. In the longer term, if LNG becomes a more important source of supply for GB over the winter, we can expect the market to adjust somewhat as shippers forecast this winter need and buy LNG in response.

In addition, in GB a large amount of imported LNG comes from Qatar, which has recently had sanctions applied by other countries. However early indications show that sanctions have had a minimal effect on LNG trade.

Lastly, our Future Energy Scenarios<sup>2</sup> and Future of Gas<sup>3</sup> work highlights that in the future we may be using new sources of gas (such as bio gases, shale and hydrogen) for some of our energy needs. It is too early to say how flexible some of these sources will be, and hence whether they will be able to provide seasonal supply of energy when it is most needed.

## Conclusions

We anticipate that GB demand for gas will continue to vary across the seasons in the future. At the moment, this is unlikely to lead to big changes between summer and winter

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<sup>2</sup> fes.nationalgrid.com

<sup>3</sup> futureofgas.uk

prices in the short to medium term. This lack of price differential has made life more complex for gas storage providers, and we have recently seen the closure of GB's largest gas storage facility, reducing one source of flexible gas supply. Other flexible sources of gas, such as LNG and gas interconnectors, provide both opportunities and challenges - particularly when considering issues on the GB network that could require rapid response such as a supply loss or a sudden extended cold snap leading to sustained high demand.

The growing diversity of gas sources for GB is to be welcomed as the UK continental shelf diminishes. But we cannot be complacent about the challenge of managing a secure network with many different gas sources, each with different complexities and response times. It is increasingly important for all industry parties to work together to understand these market dynamics and to anticipate any 'tipping points' for different sources of gas in the future.

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