

BREXIT AND CRISIS MANAGEMENT

Gas Supplies

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This briefing examines the implications of Brexit for the prevention and management of gas supply crises. It assesses whether Brexit increases the risk of gas supply crises in the short-term and what the longer-term challenges are in this policy area once the UK leaves the European Union (EU).

This briefing is part of an ongoing research project on the impact of Brexit on crisis management in the UK. It is based on analysis by the author and information drawn from interviews conducted with various stakeholders that have expertise and/or direct input into the management of gas supply disruptions in the UK and North Western Europe.

Stakeholder interviews include representatives from the Energy Community, Eurogas, the European Federation of Energy Traders, European Network of Transmission System Operators for Gas (ENTSO-G), Interconnector UK, Ofgem, Oil and Gas UK, and the UK Government. Officials from the Commission for Regulation of Utilities (Ireland), Department for the Economy (Northern Ireland) Department for Exiting the EU (UK), European Commission, and National Grid declined to be interviewed for this research.

The role of gas in the UK

Gas plays a particularly important role within the UK's energy supply. It is the second most significant fuel in the UK's overall energy mix (see figure 1) and the single largest source of fuel in the electricity generation mix (see figure 2). Gas is also the dominant fuel for heat generation, accounting for 85% in 2017.

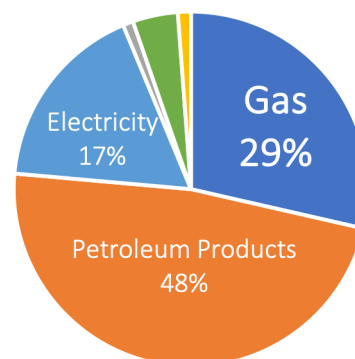
The UK is the second largest gas market in the EU and a net importer of gas. While the UK is also the third largest producer of gas in Europe, with 53% of supplies produced domestically in 2017, it needs to import gas to meet demand. Most of these supplies come by pipeline from Norway and liquefied natural gas (LNG) imported mainly from Qatar. The UK also imports and exports gas to continental Europe, and is an exporter of gas to Ireland (see figure 3).

Future levels of gas demand in the UK are uncertain. The UK's transmission system operator, National Grid, has recently published a report in which it identifies a range of scenarios up to 2050 where gas consumption

Key points

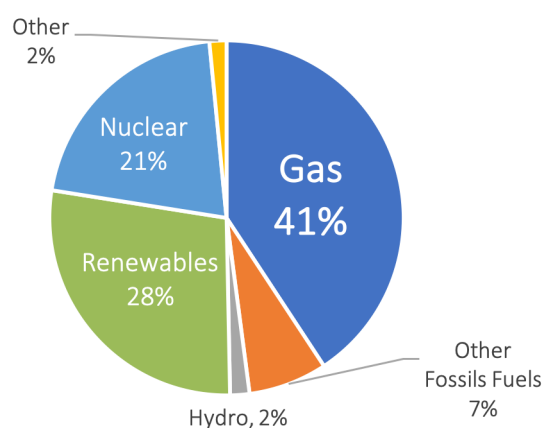
- The UK has a robust set of arrangements for preventing gas supply disruptions which are linked to, but independent of, EU-level arrangements
- Leaving the EU should not substantially increase the risk of gas supply disruptions, even under a no deal Brexit
- Nonetheless, the UK faces several longer-term challenges to its energy security. Addressing these will become increasingly difficult once the UK is no longer part of decision-making processes within the EU
- Once the UK leaves the EU, it will need to invest considerable time and resources in its attempts to influence the future development of the EU internal energy market.

Figure 1: UK Final Energy Consumption 2017



Source: UK Digest of Energy Statistics 2018, Table 1.1

Figure 2: UK Electricity Generation 2017



Source: UK Digest of Energy Statistics 2018, Table 5.1

increases (through the decarbonisation of gas) or decreases (through increased electrification).¹ An evaluation of these scenarios is beyond the scope of this paper. What is clear, however, is that the UK will still require large quantities of gas over at least the next decade under any of the scenarios.

Gas supply deficits and emergencies

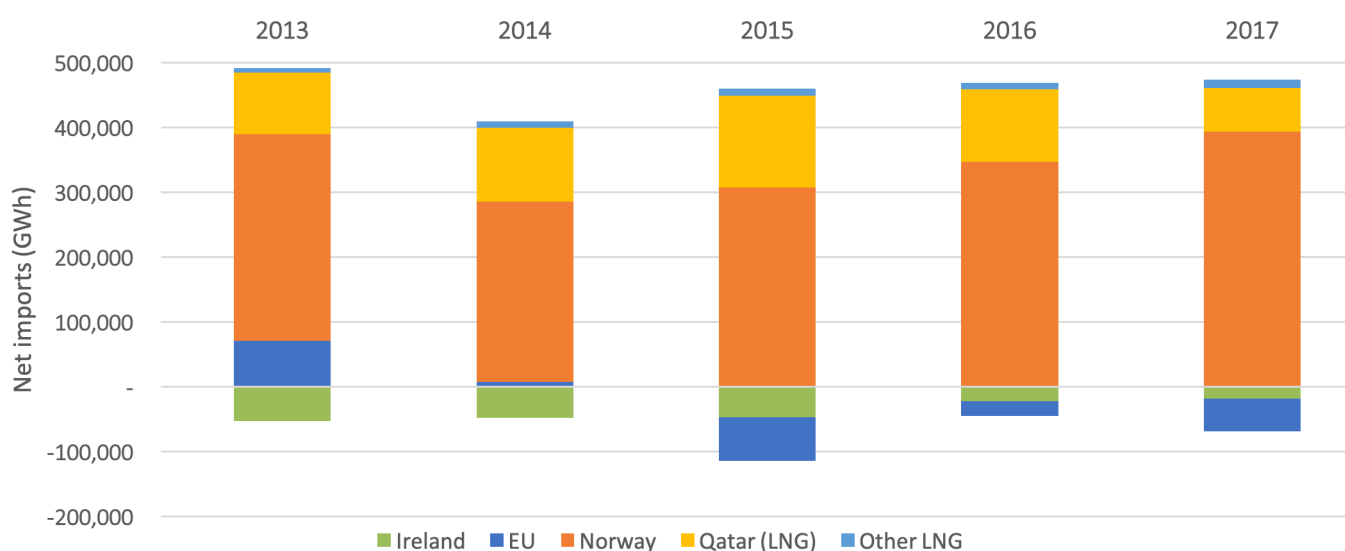
Emergency or crisis situations in which gas supplies to consumers are at risk of disruption are most likely to occur when there is a 'gas supply deficit'. This is when there are insufficient supplies available to meet demand, and can be caused by a wide variety of difficulties on both the supply and demand side.

Gas supplies can, for instance, be curtailed if there are technical problems or damage to key infrastructure such as import pipelines, production facilities, or the gas transmission system within a territory. They can also in some cases be curtailed due to contractual disputes or politically-motivated disruptions. Gas demand could increase due to seasonal weather conditions or unexpected spikes in demand due to exceptional weather conditions. There is higher demand for gas in winter than summer due to colder temperatures, while unseasonably low temperatures can result in unexpected and rapid increases in demand. Weather conditions can also affect the demand for gas as a fuel for electricity generation, particularly in systems with high levels of renewable electricity generation capacity.

Gas supply deficits will not result in a supply emergency in every situation. This depends on whether an energy system can adapt to and manage this deficit effectively, which is based on the interplay between three main factors:

- Supply/demand-side responses
During a gas supply deficit, various technical and operational responses may be available, depending on current energy infrastructure and market conditions. On the supply side, shortfalls could be addressed through increased domestic production, imports of alternative sources of supply (or through alternative routes) or greater utilisation of gas storage, provided the infrastructure and spare capacity exists for these different options. On the demand side, reductions to certain types of consumer (e.g. large industrial consumers or gas-fired power plants) could free up supplies that can flow to consumers who do not have the ability to switch to other fuels.
- Market responsiveness
The type of market plays an important role in the system's ability to utilise these measures in a timely and effective manner, as well as whether market participants can respond in the absence of government intervention. Markets that are driven by supply and demand changes (as reflected in price changes) may be more capable of attracting supplies and reducing demand in a timely manner

Figure 3: Net imports of gas to the UK by supplier



Source: UK Digest of Energy Statistics 2018, Table 4.5
Negative volumes mean that the UK was a net exporter

than more restricted markets. This may reduce the need for direct government intervention, although potentially at the cost of price volatility.

- Crisis governance

The robustness of emergency prevention and management procedures matters for ensuring an effective response to a crisis. This usually includes clear definitions of roles and responsibilities, and mechanisms for the coordination of public and private actors, and for the exchange of information for managing a crisis.

How does the UK manage gas supply deficits and prevent supply disruptions?

The UK's approach to the management of gas supply deficits is grounded in its highly-liberalised gas market. It has one of the most developed and responsive national gas markets in Europe, and has been at the forefront of the efforts to both liberalise and integrate electricity and gas markets within the EU. Through its membership of the EU, the UK is part of the internal gas market and forms part of the most liquid and developed part of that market – the North-West region – along with Belgium, France, Germany, Ireland, the Netherlands, and Luxembourg.

Based on this market-led approach, the balance between supply and demand is addressed through the market under normal circumstances. If there are, for instance, technical problems with supply infrastructure, or increases in demand, then this should be reflected in the price paid for gas in the UK based on this approach. To the extent that these price signals function, this allows the UK market to cope with unexpected shifts in supply and demand, without requiring direct government intervention.

There may, however, be circumstances when the market is not able to respond without some degree of government coordination or intervention. The UK has plans in place for different levels of response depending on the severity of the situation.ⁱⁱ Across the various stages, responsibility for the technical and operational aspects of crisis management lies predominantly with gas and electricity companies, while the Department for Business, Energy and Industrial Strategy (BEIS) is responsible for assessing the situation, coordinating industry actions and, if necessary, invoking the use of emergency powers by central government through escalation of the crisis to the National Security Council.

Emergency Responses and Crisis Levels

BEIS may decide, either pre-emptively or in response to a sudden shock, to establish an Emergency Response Team comprised of different actors in the UK energy sector, typically includes Ofgem (the energy regulator), National Grid (the transmission system operator) and others as required. The purpose of this team is to monitor the situation and decide on the level of response required.

In the 'early warning' and 'alert' stages, a gas deficit warning may be issued, indicating that there is significant potential for an emergency to develop. The rationale behind this is to send a clear signal to the market to attract additional supplies to the UK market based on higher prices, and to enable the National Grid's demand-side response mechanisms under which large consumers (mainly industry and electricity generators) will voluntarily reduce their demand for gas supplies. It is also possible at this stage to make appeals to domestic and smaller industrial/commercial users to reduce their gas consumption if necessary.

During these first two stages, the market is given the opportunity to respond without direct Government intervention in the market. If this is insufficient then an 'emergency' can be declared, at which point the Government may compel the various participants in the gas market to source additional supplies, release gas in storage, directly allocate supplies and isolate parts of the system to maintain sufficient pressure to maintain supplies to consumers.

EU Regulation on the Security of Gas Supplies

Since 2010, the UK's crisis preparations have been aligned with EU legislation on the security of gas supplies.ⁱⁱⁱ Under the current regulation (2017/1938) EU member states are required to conduct risk assessments based on harmonised gas supply and infrastructure standards (see figure 4), and set out preventative action and emergency plans to mitigate these risks and specify how disruptions will be managed. The regulation also specifies arrangements under which crisis levels can be declared at a regional or EU level, and puts restrictions on when non-market measures can be used to address a crisis.

Unlike some other areas of crisis management, where the UK and EU operate a highly-coordinated prevention and management system, regulation 2017/1938 has a minimal impact on how the UK handles gas supply deficits. Certainly, the UK and EU crisis levels and

security standards are aligned, and the regulation places some formal requirements on the UK for reporting plans to the European Commission. The development of the regulation has, however, been heavily influenced by the UK's own emergency planning arrangements and therefore hasn't resulted in major changes to what the UK already did before the legislation came into force. The regulations predecessor, 994/2010, was negotiated in the immediate aftermath of the 2009 Russia-Ukraine gas disruption and was explicitly developed to provide a legal basis for assisting and supporting central and eastern EU member states which face greater risks to their security of supply than western EU member states.

Solidarity and Information Exchange

There are, however, two aspects of the legislation which do matter to the UK. First, the regulation includes a 'solidarity clause' (article 13) which requires member states to provide additional gas supplies to other member states that are directly connected to it, if there is an emergency and the article is invoked. The article is designed to be used as a last resort to ensure that so-called 'protected customers' (typically households and essential public services) do not have their supplies disrupted. For the UK, this means that it may have to interrupt some of its own non-protected customers to assist Ireland, Belgium and the Netherlands in exceptional circumstances. However, it also allows the UK to benefit from those arrangements if had insufficient supplies to keep its own protected customers connected.

Second, the regulation helps the UK to have greater oversight over the supply situation in continental Europe through the Gas Coordination Group (GCG). This is an EU body that meets on a semi-regular basis or during emergency situations. It is composed of representatives of the EU Member States, the European Commission, the Agency for the Cooperation of Energy Regulators (ACER), the coordination body for gas transmission system operators (ENTSO) and other energy industry representatives. Its aim is to facilitate information exchange across the EU, particularly during emergency situations, and to assist the member states in coordinating their emergency responses if there is a regional and European gas emergency.

Will the UK be more at risk of gas supply disruptions once it leaves the EU?

To evaluate the impact that Brexit has on the risk of supply disruptions there are two main considerations, which are interlinked. First, how secure are the UK's gas supplies? Second, will leaving the EU mean that the UK is less able to manage a crisis, should one arise?

The answer to the latter question is clearly affected by the terms under which the UK leaves the EU. At the time of writing, it is not yet clear if the UK will leave with or without a withdrawal agreement. This may be clearer by the time anyone reads this. Therefore, for the sake of simplicity, this evaluation is based on the UK leaving with 'no deal', working on the principle that this would

Figure 4: EU supply and infrastructure standards and how they are applied in the UK

Infrastructure standard (Article 5)

Member states are required to ensure that they can meet their total gas demand even if their largest capacity infrastructure was unavailable during a day of exceptionally high gas demand (with a statistical probability of once in 20 years). This is also known as the N-1 standard.

The UK meets this standard based on the Felindre pipeline which connects two LNG terminals (South Hook and Dragon) to the national grid.

This standard can also be met on a regional basis. Ireland currently meets this based on the UK's N-1 calculation.

Gas supply standard (Article 6)

Member states are required to ensure that gas supplies to 'protected customers' continue in each of three cases:

- a) There are extremely cold temperatures during a '1-in-20 years' winter, measured over 7 days
- b) There is exceptionally high demand for 30 days, during a '1-in-20 years' winter
- c) The single largest gas infrastructure is disrupted for 30 days under average winter conditions

The UK defines its protected customers as household consumers, SMEs, and essential social services where gas disruptions could endanger health.

be the most potentially disruptive scenario. This is the default outcome of the negotiations under Article 50, and would arise if the UK and EU fail to agree and ratify the terms of the UK's withdrawal. This would mean that the UK leaves the EU at 11pm on 29th March 2019, at which point the UK would no longer be a member of the internal gas market or bound by regulation 2017/1938.

There is a clear consensus among those interviewed for this research that the UK should not be at risk of gas supply disruptions because of its decision to leave the EU. This does not mean that there are no risks. Absolute security is a practical impossibility, and it is always possible to imagine extreme scenarios in which there are simultaneously major problems on the supply and demand side. Likewise, it is possible that emergency situations in other policy areas have an impact on the gas sector or the UK Government struggles to deal with multiple crisis situations at once due to 'no deal'. However, the key considerations when evaluating the potential for supply disruptions are the current level of security in the UK and the direct impacts that leaving the EU without a deal would have. Focusing on these aspects, there are reasons to be relatively optimistic.

The UK has diverse infrastructure and a responsive market that allows it to adapt to gas supply deficits

There was a clear consensus among those interviewed that the UK has a high level of gas supply security and should be able to respond to gas supply deficits under most circumstances, even during and after Brexit.

Figure 5: UK import and export infrastructure

	Maximum Daily Flow (mcm)	Annual capacity (bcm)
Import Pipelines		
Norway	163	59.5
Belgium (IUK)	74	27.0
Netherlands (BBL)	45	16.4
Liquefied Natural Gas		
South Hook	58	21.2
Dragon	21	7.7
Isle of Grain	56	20.4
Teeside	11	4.0
TOTAL IMPORT CAPACITY	428	156.2
Export Pipelines		
Belgium (IUK)	55	20.1
Ireland (IC1/2)	30	11.0
TOTAL EXPORT CAPACITY	85	31.1

Source: UK Digest of Energy Statistics 2018, Table 4.4.

The UK has diverse infrastructure for importing gas supplies from Norway, continental EU and LNG (see figure 5). This means that the UK has multiple options for coping with a gas supply deficit, regardless of whether it is a member of the EU or not. Several interviewees with knowledge of North Sea gas production noted that even during periods of high demand, there is usually spare production capacity from both the UK and Norway that can be temporarily increased to address sudden shocks. Similarly, the UK also has a very high level of LNG import capacity in comparison to most EU countries.

While the physical capacity for the UK to increase production and imports exists, much depends on both the availability of these supplies and the UK's attractiveness as a market. Many interviewees noted that UK prices are highly responsive to shifts in supply and demand. While this can result in price volatility, this does mean that it sends very clear price signals to potential shippers of gas to the UK (as well as to UK consumers who may be able to reduce their demand). This is particularly important for attracting LNG cargoes, which are usually more expensive than pipeline gas. Because of this, short-term price increases can make the UK a particularly attractive destination for LNG supplies, although the downside is that it can take several days for shipments to arrive in the UK.

The UK has a strong track record of dealing with gas supply deficits without intervening in the market

Another key factor mentioned by interviewees is that the UK has never had to declare a gas supply emergency whenever gas supply deficits have occurred in the past. In all cases, ranging from a major fire at the Rough storage facility in 2006, supply disruptions to the EU from Russia in 2006 and 2009, and extremely cold winters in recent years, the UK government has not had to resort to non-market measures to manage the situation.

One recent example which illustrates this is a period of extremely cold weather in February and March 2018, known as the 'Beast from the East' when demand increased rapidly. This was compounded by multiple disruptions to supply infrastructure within the UK and continental Europe. In this case, exports to Ireland were reduced, gas demand from the power sector and industry were reduced voluntarily (based on the gas deficit warning and price rises), and supplies increased from continental Europe and Norway. Imports of

electricity also increased to help make up the shortfall from reduced generation within the UK.^{iv} However at no point were non-market measures used.

Several interviewees highlighted this case as a particularly difficult test of UK crisis preparedness, which it passed without having to use non-market measures. While one interviewee involved in crisis response admitted that they had a rather 'uncomfortable' day monitoring the situation when the Beast from the East hit the UK, the market responded and the UK was not close to having to interrupt supplies to consumers.

Gas flows from the EU to the UK should continue, even if the UK leaves with 'no deal'

Turning to the impact of Brexit, there are widespread concerns that a no deal scenario could result in crisis situations across numerous policy areas. While the energy sector is not immune to such concerns, according to those interviewed for this research, such disruptions to EU flows are unlikely, even in a 'no deal' scenario. While the UK will leave the internal gas market and this may result in some friction in how gas is traded in the future, interviewees did not express major concerns about the continuation of gas trade between the UK and EU for two main reasons.

First, the UK and EU will not enter a legal vacuum. Both are signatories of the Energy Charter Treaty, which

contains provisions on both trade and transit. Aside from including commitments to open markets, the Treaty also prohibits the interruption of supplies transiting the territory of any of its signatories. This means that if the UK imported gas which had to transit across the EU to reach its destination then it should not be disrupted by the EU. The one proviso is that this gas would have to follow EU rules while it is in transit. This would mean that there are no entry/exit fees for each of the EU member states that the gas had to cross. This would similarly apply in cases where the UK is acting as a transit state for supplies to an EU member state, which would become the case with supplies from the EU or Norway to Ireland.

Second, and quite aside from the legal arrangements, there is a clear political incentive to ensure gas can flow from the EU to the UK during an emergency because of the knock on effects this could have on Ireland, as a continuing EU member state. This is because Ireland is entirely dependent on the UK's gas network for importing gas. While there are plans to construct a new liquefied natural gas (LNG) terminal at Shannon to reduce this dependence, this will not become active until the early 2020s. This is around the same time that the Corrib gas field, which is the source of almost all of Ireland's domestically produced gas, will have declined. While Ireland currently produces 57% of the gas it consumes, by the early 2020s it will be entirely



Construction of a pipeline between Cluden and Brighthouse in Scotland, as part of the Scotland-Ireland interconnector project that has recently received financing from the European Investment Bank

Image by Alistair Hamilton, licensed under CC BY 2.0.

dependent on imported sources. If there were to be a disruption to supplies from the EU to the UK then this could result in a gas supply deficit and possibly a supply emergency in Ireland.

This is clearly not in the UK or EU's interests and it seems likely that all efforts would be made to ensure that gas flows continued to the UK and Ireland if an emergency were to arise. These political incentives are underpinned by changes that were made to the solidarity clause during the negotiation of EU regulation 2017/1938. This legislation, which was negotiated during the Article 50 negotiations, includes a key provision that relates to the UK:

A Member State shall also provide the solidarity measure to another Member State to which it is connected via a third country unless flows are restricted through the third country. Such an extension of the measure shall be subject to the agreement of the relevant Member States, who shall involve, as appropriate, the third country through which they are connected.

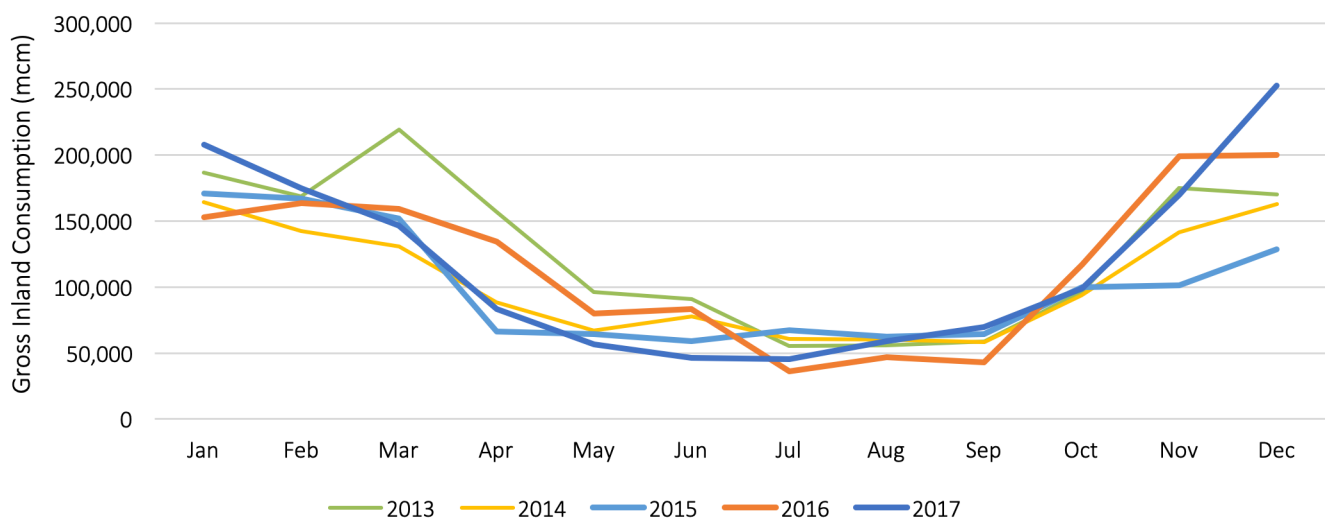
Based on this, the Netherlands and Belgium, which are connected to Ireland via the UK, would be expected to reduce their own demand so they can provide gas to Ireland. This would necessarily involve discussions with the UK as a third country. While this provision has not been tested, it provides some reassurance that EU gas supplies to Ireland via UK would not be disrupted.

Unanticipated problems should be mitigated by the seasonality of gas demand

While it is very unlikely that there would be disruptions to physical gas flows from the EU to the UK during a 'no deal' Brexit, some interviewees noted that EU supplies are an important source of flexibility during gas supply deficits in winter. Although the UK does not import large amounts of gas from the EU (see figure 3 earlier in this brief), it does make use of these supplies during winter when consumption is highest (see figure 6). The interconnector and BBL serve a dual function – they are used for gas trading within the North-West European market (by connecting the British and Dutch gas hubs) and for meeting seasonal demand needs. Even if disruptions to these supplies are very unlikely

The good news is that the timing of the UK's exit from the EU under a 'no deal' scenario is relatively fortuitous. If the UK leaves the EU without a deal on 29th March 2019, then it will coincide with a reduction in gas demand, thereby reducing the strain on the UK's gas supply system during a period of political and economic uncertainty. While this doesn't tell us anything about the UK's longer term ability to prevent gas supply emergencies, it does mean that 'no deal' itself is unlikely to be a cause of supply problems. On the other hand, if the current withdrawal agreement were to be signed, this would include a transition period during which EU rules would continue to apply to the UK. When this ends on 31st December 2020 during the height of winter demand, the situation could look different if supplies from the EU were needed.

Figure 6: Monthly gas consumption in the UK over the past five years



Source: Eurostat

Future Challenges

Future Flexibilities

While the UK gas system is currently able to handle gas crises, at least based on the analysis above, there are some question marks over its future security. In particular, there is a concern that some of the flexibility it has been able to rely on may reduce over time as domestic production reduces further.

In 2017, while the Brexit negotiations were underway, Centrica announced that it was going to permanently close Rough, the UK's single largest gas storage facility. This has reduced the UK's storage capacity from 6% of annual demand to 1.6% and removes one of the flexibilities within the system, particularly as Rough was long-range storage which was predominantly used in winter when demand was highest to both address supply shortfalls and to prevent major price fluctuations.

Some interviewees have noted that this may mean that the UK becomes more reliant on the flexibility provided by supplies from the EU than in previous years. Others were relatively relaxed about the closure of Rough, noting that it was not available as a source of flexibility during the Beast from the East incident, and was not required. This latter view is broadly in line with the UK Government's own position. In its analysis of gas security published in October 2017, the UK Government argued that the closure of Rough would not have a major impact on the UK's ability to meet gas demand, except in the most extreme of circumstances.

The UK government has traditionally resisted calls to develop or subsidise strategic storage on the basis that this would reduce the incentives for companies to invest in commercial storage. While there are no indications that this position will change, some interviewees thought it likely that calls for government investments in storage would increase as a result of Brexit. Whether this happens remains to be seen.

It is also worth noting that even if Rough is not required as a source of supplies, its role in reducing price volatility should not be underestimated. The International Energy Agency has argued that if Rough had been fully operational during the 'Beast from the East' then it would have helped to mitigate some of the price volatility that was experienced during that period, when prices increased dramatically to a 20-year high.

It is reasonable to ask whether price spikes of this magnitude are an acceptable means of ensuring the security of supplies, particularly when these prices will have a knock-on effect on the prices paid by consumers. This raises issues about the trade-offs involved in addressing energy security and energy poverty concerns.

Changing policy networks and channels of influence

When the UK leaves the EU, it will leave the internal market for gas and electricity. Aside from the wider economic impact that leaving the internal market will have in the electricity and gas sectors (which are beyond the scope of this paper), this will also mean that the UK will lose much of the influence it currently enjoys within the EU's networks and institutional structures.

Having influence over the rules of the internal market and EU energy policy more broadly will still matter to the UK post-Brexit. It will remain physically connected to the EU market and will engage in some level of electricity and gas trade with it. Having no ability to shape the rules of that market may result in divergence in the regulatory regimes of the UK and EU over time. Several interviewees expressed concerns that if this were to happen it would likely impose additional costs on the electricity and gas industry.

While it has been a member, the UK's influence in the EU gas sector has mainly come from four sources: its historical role as a leading advocate and source of expertise on the liberalisation of energy markets, the UK Government's power within the European Council and Council of Ministers as one of the largest member states, Ofgem's expertise and institutional role within the Agency for the Cooperation of Energy Regulators (ACER), and National Grid through the European Network of Transmission System Operators (ENTSO-G).

Most interviewees noted that while the UK is a valued member of the EU, it is likely that it will no longer be able to participate in key institutional bodies and will inevitably lose influence as a result. Aside from the UK Government no longer being part of the Council it is clear that Ofgem will not be able to remain a full member of ACER. They may be able to have observer status, subject to negotiations, and could therefore potentially participate in working groups. They would not, however, be represented on the board or have voting rights. This is because ACER is an agency of the

EU and under the terms of withdrawal (or in a 'no deal' scenario) the UK cannot remain a member. It is less clear if National Grid will similarly be ejected from ENTSO-G, although if it does remain it will probably be in an observer capacity. This substantially reduces the UK's ability to exercise influence.

The other body that the UK will no longer be a member of is the Gas Coordination Group. As noted above, there is some potential for the UK to be involved in discussions with the Netherlands, Belgium and Ireland in the event of gas supply deficits in North West Europe, but it is unclear if this would include the right for the UK to participate in Gas Coordination Group meetings.

While it is inevitable that the UK's influence will wane over time, there are some options for maintaining some level of engagement. The UK has been actively exploring these, but at the time of writing there is no information on how advanced or not discussions may be.

One option mentioned by several interviewees was the possibility of the UK maintaining some level of engagement by joining the Energy Community. This is an organisation that was designed for exporting EU legislation on the internal energy market to non-EU members in South East Europe and further afield. Joining this organisation could, for instance, allow the UK to participate in the Gas Coordination Group as other Energy Community members currently do.

Another suggested option was for the UK to become more active in a variety of non-EU organisations. On the regulatory side, this includes the Council of European Energy Regulators (CEER), which is the so-called

'political arm' of ACER's members. Others suggested that the International Energy Agency could be 'beefed' up to deal with gas security issues, although what this would actually involve is very unclear.

The viability of these different options is beyond the scope of this paper. What is clear, however, is that the UK will have to be creative in how it attempts to develop new channels of influence once it is no longer a member of the EU. This has resource implications for the British state because, as one interviewee noted, the UK will need to work much harder than it does now just to stand still.

ⁱ In March 2018, National Grid published its latest Future of Gas report, which includes these scenarios. This can be accessed at <http://futureofgas.uk/news/future-of-gas-how-gas-can-support-a-low-carbon-future/>

ⁱⁱ See the *National Emergency Plan: Downstream Gas and Electricity*, which is available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/577707/National_Emergency_Plan_for_Downstream_Gas_and_Electricity_2016.pdf

ⁱⁱⁱ The UK's crisis preparations were also previously affected to the forerunner of the 2010 Regulation, Directive 2004/67/EC. This earlier legislation did not, however, set out any detailed requirements or guidance for EU member states to follow. Instead it merely required member states to have gas security policies in place, which the UK already had.

^{iv} For further details, see International Energy Agency (2018) *Global Gas Security Review 2018* (Paris: OECD/IEA), pp. 31-34.



This briefing is part of an ongoing research project examining the implications of Brexit for the governance of crises in the UK which is being conducted by Dr Andrew Judge at the University of Glasgow and Dr John Connolly at the University of the West of Scotland. It has been funded by a Carnegie Trust for the Universities of Scotland Research Incentives Grant.

Interviews conducted part of this research were granted under the condition of anonymity. The views expressed in this briefing are those of the author alone, and do not reflect the views of interviewees or Policy Scotland.

Image of Cluden-Brighouse pipeline is available at: <https://bit.ly/2LfglIQ>