Gas Markets Sector Report

1. This is a report for the House of Commons Committee on Exiting the European Union following the motion passed at the Opposition Day debate on 1 November, which called on the Government to provide the Committee with impact assessments arising from the sectoral analysis it has conducted with regards to the list of 58 sectors referred to in the answer of 26 June 2017 to Question 239.

2. As the Government has already made clear, it is not the case that 58 sectoral impact assessments exist. The Government's sectoral analysis is a wide mix of qualitative and quantitative analysis contained in a range of documents developed at different times since the referendum. This report brings together information about the sector in a way that is accessible and informative. Some reports aggregate some sectors in order to either avoid repetition of information or because of the strong interlinkages between some of these sectors.

3. This report covers: a description of the sector, the current EU regulatory regime, existing frameworks for how trade is facilitated between countries in this sector, and sector views. It does not contain commercially-, market- or negotiation-sensitive information.

Description of sector

4. This paper covers the wholesale gas market, the gas transmission and distribution networks and the retail market.

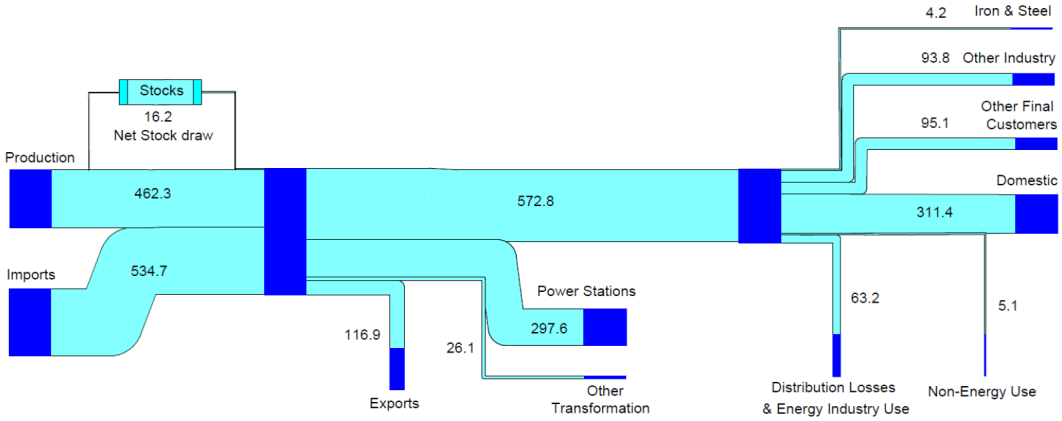
Introduction to the gas sector

5. Gas plays a pivotal role in fuelling our economy and improving our living standards. Over one third of our energy needs are met by gas.[1] It is critical for heating; around 70 per cent of all the heat used in the UK – in homes, in commercial buildings and in industrial processes – comes from gas.[2] Around 40 per cent of our electricity is generated using gas and gas generation is one of the most flexible and reliable sources of power generation.[3], Gas is also used in several industrial processes (e.g. iron and steel and chemical plants) as raw material and feedstock.

6. Gas can be supplied through domestic production or imported. Once it reaches the UK's shores, it is traded on the wholesale market between suppliers and shippers. Shippers then transport the gas through the country's transmission and distribution networks and pay network owners to flow gas through their pipes. They then either sell it directly to end users or to energy suppliers who transact on behalf of end users in the retail market.

[1] Digest of UK Energy Statistics 2017 (BEIS, July 2017)
[2] Energy consumption in the UK 2017 (BEIS, July 2017)
[3] Digest of UK Energy Statistics 2017 (BEIS, July 2017)

Chart 1: Natural gas flow chart 2016 (TWh)



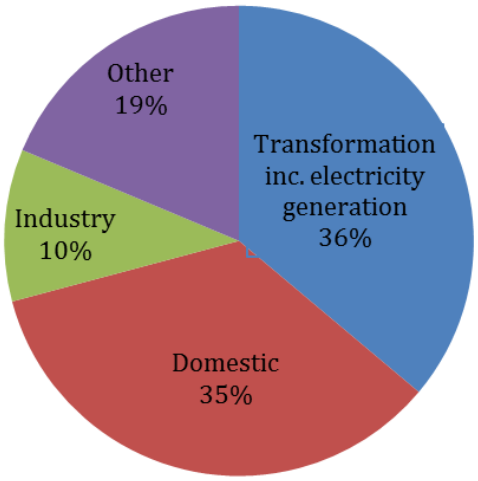
Source: Digest of UK Energy Statistics 2017 (BEIS, July 2017)

Wholesale gas market

Demand

7. Total UK demand for natural gas was 897 Terawatt hours (TWh) in 2016. Approximately 40 per cent was used for electricity.[4] The remaining gas was used within homes and by businesses and industry. Chart 2 breaks down gas demand by sector.

Chart 2: Gas Demand by Sector



Source: Digest of UK Energy Statistics 2017 (BEIS, July 2017)

[4] Digest of UK Energy Statistics 2017 (BEIS, July 2017)

Supply

8. Great Britain can receive gas from a diverse range of sources:
    a. Extracted from Great Britain's gas reserves, most of which are located offshore;
    b. Five pipelines connected directly to Norwegian offshore gas fields;
    c. Two pipeline connections to mainland Europe (the Netherlands and Belgium);
    d. Three Liquefied Natural Gas (LNG) terminals accessing the global LNG market, with the majority of supply currently from Qatar;
    e. Eight storage sites. These store gas during times of low demand and withdraw it during times of high demand.

9. Northern Ireland (NI) receives gas via:

    a. A pipeline connecting NI to Scotland (a spur off the interconnector from Scotland to Ireland);
    b. A pipeline connecting NI to Ireland (which helps Great Britain supply Ireland with a high proportion of their total gas consumption[5] and helps reinforce NI's security of gas supply to allow gas to be flowed from Ireland to Northern Ireland to address potential shortages).

[5] To note, Great Britain sends around 22 TWh gas to Ireland, making up a significant share of their total gas consumption

Map 1: Great Britain Gas Import/Export and Storage Infrastructure[6]

10. In 2016, around 463 TWh of gas was produced domestically in the UK making up 51 per cent of total supply; a further 2 per cent was drawn from stock and the remaining 47 per cent came from net imports. The majority of these imports (65 per cent) came from Norway with a further 21 per cent arriving as LNG from Qatar. The rest mainly arrives through pipeline from the Netherlands.[7]

11. Table 1 below presents the daily average gas supplies during winter 2015/16 from different sources, alongside infrastructure capacity showing the maximum possible flows for Great Britain. This demonstrates that on the average day that winter, gas infrastructure was heavily underutilised. On a cold winter's day utilisation would rise but even with the highest daily demand ever recorded in Great Britain (465 million

[6] 2010 to 2015 Government Policy: UK Energy Security (DECC, updated 2015)

[7] Digest of UK Energy Statistics 2017 (BEIS, July 2017)

cubic metres (mcm)), there is still more than enough infrastructure capacity (613 mcm) to meet this level of demand.[8]

Table 1: Great Britain Gas infrastructure capacity and flows during winter 2015/16 (mcm/day) (Note: this was prior to Rough closure)

	UK Continental Shelf	Norwegian imports (estimated)	Continental Pipeline Imports	LNG Imports	Storage
Average daily flow	97 (87% of capacity)	98 (72% of capacity)	17 (14% of capacity)	35 (35% of capacity)	23 (16% of capacity)
Capacity	112	136	119	100	146

Source: Data from National Grid

12. The National Balancing Point (NBP) is one of Europe's most liquid gas hubs. Over the last ten years, there has been a significant expansion of gas import infrastructure with new pipeline interconnectors to Europe and LNG terminals. This has increased competition for suppliers and reduced market dominance of large companies. The UK also has a large influence on gas policy in the EU, with EU gas market rules and policy often modelled on the UK position.

Transmission and distribution networks

13. Great Britain's transmission system is made up of nearly 8,000 km of pipelines with gas flowing through them at a typical speed of 38 km/hour.[9] These pipelines are owned and maintained by a single transmission owner, currently National Grid Gas.

14. After flowing through the transmission system, gas enters the distribution networks. Great Britain is split into twelve different regions, known as local distribution zones, with each of these containing a separate distribution network of gas pipelines. These networks are owned by five companies (some companies own multiple networks).

15. There are similar transmission and distribution networks in Northern Ireland. There are two transmission pipelines which cross NI and these are each owned by separate companies. There are also two distribution networks owned by Phoenix Natural Gas Ltd and Firmus Energy.

16. The regulators, Ofgem (for Great Britain) and the Utility Regulator UREGNI (for Northern Ireland), regulate the activities of these natural monopolies through a price control regime in order to protect consumers' interests, where they set the maximum amount of revenue that they can recover from users. These arrangements also set targets for reliability, customer service and environmental performance.

[8] Gas Security of Supply Report - Risks and resilience appendix (Ofgem, Nov 2012)
[9] Our networks & assets (National Grid)

Domestic retail gas market

Background

17. In March 2016, there were around 21 million domestic gas customers in Great Britain. The great majority of these customers were supplied by one of the six large suppliers (Big Six), Independent suppliers have been growing in number (there are now over 50 for domestic customers) and taking an increasing share of the market. The majority of domestic suppliers supply both gas and electricity. Ten of the independent companies now have over 250,000 domestic customer accounts (includes both gas and electricity), including one with over 7 million customer accounts[10].

18. Natural gas was introduced to Northern Ireland much more recently than Great Britain and there are about 195,000 households and 12,500 businesses with a gas supply (including power generators).[11]

19. There are two gas suppliers for domestic customers in NI. There are six suppliers for industrial & commercial customers.[12]

20. In Great Britain, nearly all customers are currently on one of two types of tariffs: Standard Variable Tariffs (SVTs) and fixed term fixed price tariffs. Disengaged customers, i.e. those who do not look to switch their supplier, are more likely to be on SVTs and tend to remain with the same supplier for several years. The latest information from Ofgem shows that 15 million households are on SVTs. This includes three million households on pre-payment meters whose prices have been capped since April 2017.[13]

21. In September 2017 the average dual-fuel (electricity plus gas) standard variable tariff with a Big Six company was £1,135. The cheapest available tariff on the market was £827 – a difference of £308.[14]

Prices and bills

22. Wholesale prices largely dictate the average domestic energy bill, and these have fluctuated over recent years. Average household gas prices rose 5 per cent (in real terms) between 2010 and 2016, mainly driven by rising wholesale energy costs and, to a lesser extent, rising network costs. Policy costs form a small proportion of the retail gas price for households (2 per cent).[15]

23. All major energy suppliers reduced their standard gas tariffs in 2015 and 2016 due to falls in wholesale gas costs. During 2017 four of the six largest companies raised their gas SVT prices by between 1.2 per cent and 4.8 per cent.[16]

[10] Ofgem data portal; number of non-prepayment customer accounts by supplier (Ofgem)
[11] Market overview (Urgeni)
[12] Market overview (Urgeni)
[13] State of the energy market report 2017 (Ofgem, 2017)
[14] Data from the Ofgem Data Portal (Ofgem, October 2017)
[15] Breakdown of a gas bill (Ofgem)
[16] Information on price changes; Eon, https://www.edfenergy.com/for-home/price-change

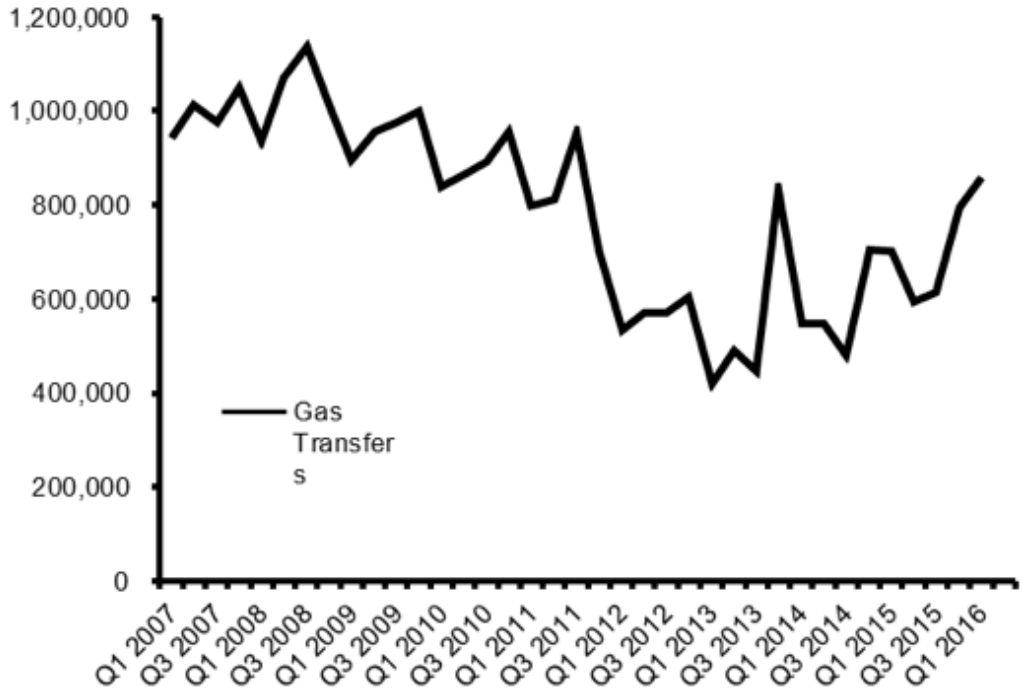
24. Since 2010, improvements in household energy efficiency have acted to offset some of the energy price increases on household fuel bills – in 2016, the average household dual fuel (electricity plus gas) bill was estimated to be around £1,100 to £1,200 (split roughly equally between gas and electricity).[17]

Switching

25. Customers' ability to switch easily drives increased competitiveness in retail markets. Switching rates are continuing to rise, having risen consistently over the last three years after reaching record lows in 2013 (see chart 3).

26. Ofgem are leading the switching programme to introduce reliable next day switching.

Chart 3: Switching statistics



Source: BEIS switching statistics, published 30/06/16

Future developments

27. Wholesale prices have recently increased, with winter 2017/18 gas forward prices up by ~10 per cent over the last summer.[18]

Sector's contribution to Gross Value Added (GVA)

28. The gas sector directly delivers 0.5 per cent of the UK's total GVA.[19]

29. However, the direct GVA figures do not capture the full importance of gas to the economy. Gas is a vital input in almost all businesses, without which businesses may

[17] Infographic; bills prices and profits (Ofgem, 2017)
[18] BEIS analysis on data from ICIS HEREN
[19] UK GDP(O) low level aggregates (ONS, 30th June 2017)

have to cease trading/production. It is also pivotal in providing heat for homes, businesses and industry.

Employment

30. There were 45,500 workforce jobs in the UK gas sector in 2016, making up 0.1 per cent of the total workforce.

31. Employment in the gas sector is mostly focused in England, which contains 79 per cent of the workforce. Scotland also has a significant proportion of the workforce, at 15 per cent. Within England, around half of jobs are concentrated in East of England, East Midlands and South East. There are no regions with particularly high concentration levels.

Table 2: Level of employment in 2016

	Workforce jobs	**% of total workforce jobs**
UK[1]	45,500	0.1%
of which[2]:		***% of total workforce jobs in the gas sector***
England	***36,000***	***79%***
North East	*200*	*0%*
North West	*5,600*	*12%*
Yorkshire and the Humber	*3,100*	*7%*
East Midlands	*7,500*	*17%*
West Midlands	*8,300*	*18%*
East of England	*1,00*	*2%*
London	*1,000*	*2%*
South East	*8,300*	*18%*
South West	*900*	*2%*
Wales	***2,400***	***5%***
Scotland	***6,600***	***15%***
Northern Ireland	***400***	***1%***

Source: BEIS internal analysis

Note: Table includes: Manufacture of gas, distribution of gaseous fuels through mains (SIC 35.2); and Stream and air conditioning supply (SIC 35.3). Figures may not sum correctly due to rounding

32. Less than 5 per cent of workers in the electricity and gas sector (manufacturing and distribution only) are from outside of the UK.[20] These are split roughly evenly between non-EEA and EEA workers.

Pattern of trade

Table 3: UK Gas Imports and Exports

	Imports		**Exports**	
Country	*GWh*	*% of total imports*	*GWh*	*% of total exports*
EU	62,858	12%	107,434	94%
Norway	347,005	65%	1	0%
Rest of the World	122,310	23%	6,859	6%
Total	**532,173**	**100%**	**114,294**	**100%**

Source: Digest of UK Energy Statistics 2017 (BEIS, July 2017), internal data from BEIS analysts

33. In 2016, the UK imported around 532 TWh of gas, 59 per cent of total supply. As North Sea gas production declines, the UK's dependence on imported gas is projected to increase into the future.[21]

34. Norway is the biggest single supplier of imported gas to the UK with around 65 per cent of gas imports coming from Norway in 2016; 23 per cent of imports come from non-European sources through LNG, with Qatar making up the largest share. The additional 12 per cent of imports arrive via the interconnectors from the Netherlands and Belgium.[22]

35. In 2016, Great Britain exported around 114 TWh of gas, almost all of which went to Europe. Over half flowed out to Belgium via the interconnector with another 19 per cent to Ireland. The majority of the remaining gas flowed to the Netherlands.[23]

36. Great Britain exports around 22 TWh gas to Ireland, making up a significant share of their total gas consumption. Their own production came on stream in December 2015. It is expected to deliver a maximum of 60 per cent of total consumption in

[20] BEIS internal analysis
[21] Digest of UK Energy Statistics 2017 (BEIS, July 2017)
[22] Digest of UK Energy Statistics 2017 (BEIS, July 2017)
[23] Digest of UK Energy Statistics 2017 (BEIS, July 2017)

2016-17, declining thereafter, with the UK being the only other potential gas supplier.[24] Great Britain also supplies all of NI's gas consumption.[25]

37. Around 107 TWh of gas exports flow to mainland Europe (Belgium and the Netherlands) with 63 TWh imported; 12 per cent of the total.[26] Therefore, the EU is a net importer of gas from the UK. In 2015, UK imports to the EU made up 3 per cent of total EU (excluding the UK) imports.[27] The majority of EU imports come from Russia and Norway.

Historical trends and future prospects for the sector

38. UK Continental Shelf (UKCS) production of natural gas has been in decline since the turn of the millennium, although a small increase due to new fields has been seen in 2015 and 2016. Between 2000 and 2013, gas production fell at an average rate of 8 per cent per year. In 2016 production increased by 2.4 per cent, the second year-on year increase since the peak of 2000. Production in 2016 was 37 per cent of the level produced in 2000. Despite this, the UK along with the Netherlands, remains one of the two major gas producing nations within the EU.[28]

39. As the UK's import dependency has risen, there have been significant developments in import infrastructure with pipelines connecting the UK to Europe and additional LNG import terminals. This provides the facilities necessary for the UK to obtain gas from a wide range of sources, improving security of supply.

40. Into the future, LNG is expected to play an increasing role in UK gas supply. Current UK LNG import infrastructure has scope to receive further shipments if the market signals are there.

EU funding to the sector

41. As of May 2017, Connecting Europe Facility funding has been allocated to a number of UK energy infrastructure projects, with €41.213 million for gas projects (all benefiting Northern Ireland / Ireland).

The current EU regulatory regime

Main sector-specific rules governing the provision of this activity in the EU

42. The Internal Energy Market (IEM) provides a technical framework for the transmission, distribution and efficient trading of electricity and gas; transparency to ensure fair access to others' networks; a regulatory co-operation mechanism; and measures to ensure security of supply and to deal with energy shocks.

[24] Gas (DCCAE)
[25] UK risk assessment on security of gas supply (BEIS)
[26] UK risk assessment on security of gas supply (BEIS)
[27] Energy Trends: December 2016, special feature article - Physical gas flows across Europe and diversity of gas supply in 2015 (BEIS, 2016)
[28] DUKES Chapter 4

43. It is a long-term project to liberalise and integrate the energy markets of individual EU Member States. The IEM also facilitates the fair trading of electricity and gas across the EU, enabling new gas and electricity suppliers to enter EU Member States' markets, and domestic and industrial consumers to select their own suppliers. It is being reformed (through the European Commission's proposals on a new electricity market design) to better facilitate the integration of low carbon energy sources. The UK has been a leading advocate for the development of the IEM and has heavily influenced the EU-wide rules, which draw on UK practice.

44. The legal basis of the IEM is Article 194 TFEU. EU energy policy is predominantly set out through Regulations, which are directly applicable, and through Directives, which require domestic transposition. There is a significant amount of technically-detailed tertiary legislation, known as network codes and guidelines, which take the form of Commission Regulations.

45. Competence under the energy legal base (Art 194 TFEU) is shared, as stipulated in Article 4(2)(i) TFEU, although the EU has exercised its competence in many areas of energy policy. The relevant legal framework recognises some areas where Member States continue to be able to adopt domestic measures. For example, both the Electricity Regulation (714/2009) and the Gas Regulation (715/2009) provide that the requirements to develop network codes (Commission Regulations), to address cross-border network and market integration issues, are without prejudice to Member States' right to establish national network codes which do not affect cross-border trade.

Areas of devolved responsibilities or issues relating to Gibraltar, the Crown Dependencies or Overseas Territories

46. Energy policy is devolved to Northern Ireland, but largely reserved for Scotland and Wales. The Internal Energy Market legislation does not apply to Gibraltar, or the Crown Dependencies, or the Overseas Territories.

47. The Scottish Government has stated, in discussions with UK officials, it would like to see the maintenance of full access for Scottish businesses of the benefits of the Internal Energy Market, the UK remaining part of EU-wide solidarity mechanisms, continued benefits from greater security alternatives offered by interconnection and the continued integration and interconnection of gas, electricity and hydrocarbon markets and infrastructures, and the continued free movement of labour that in their view is vital for energy engineering, offshore oil and gas and research collaboration. This includes maintaining access to EU funds to support R&D and energy infrastructure investment.

48. In addition, the Scottish Government would like to see the UK remaining part of EU-wide solidarity mechanisms in the event of acute supply crises; continuing to benefit from greater security alternatives offered by interconnection; and retaining power of EU collective bargaining with third parties.

Existing frameworks for how trade is facilitated between countries in this sector

49. The arrangements described in this section are examples of existing arrangements between countries. They should not be taken to represent the options being considered by the Government for the future economic relationship between the UK and the EU. The Government has been clear that it is seeking pragmatic and innovative solutions to issues related to the future deep and special partnership that we want with the European Union.

50. It should be noted that there are various global frameworks for trading oil and gas products (these are covered in other reports). CETA, for example, sets tariffs on most oil and gas products to zero (but a 0.7 per cent tariff could be applied for natural gas in liquid and gaseous form (bound rate), with no quotas, and temporary entry for service providers.[29] The EU import tariffs are generally low for imported energy products.

51. Non-EU countries looking to export products into the EU will need to comply with EU Ecodesign and energy labelling standard requirements. Such products may be subject to customs controls to ensure compliance. In some cases, (e.g. with the voluntary US 'energy star' labelling scheme for office equipment), the EU has existing agreements in place with non-EU countries to ensure their mutual recognition with EU standards.

52. There are also some small tariffs in place for environmental goods.[30] The EU is party to the WTO's discussions to agree a new Plurilateral Environmental Goods Agreement which aims to remove tariffs on a wide-variety of these goods.

53. There are some references in EU Energy legislation to trading with third countries; for example in the Capacity Allocation Mechanisms Code (Commission Regulation 2017/459) and in the IGA Decision requiring Member States to notify the Commission of planned gas agreements with third countries.

54. The EU has a close relationship with EEA and EFTA state members, particularly where EU legislation is EEA and EFTA relevant. In the gas sector Norway is a key partner for the EU as it provides over 20 per cent of Europe's gas needs.[31]

[29] WTO Consolidated Tariff Schedules database

[30] The WTO classify these as "products that can help achieve environmental and climate protection goals, such as generating clean and renewable energy, improving energy and resource efficiency, controlling air pollution, managing waste, treating waste water, monitoring the quality of the environment, and combating noise pollution".

[31] Today in energy, (U.S Energy Information Administration, 2014)

Sector views

[This information was provided by the Government to the Committee, but the committee has decided not to publish this section]

Annex: Stakeholder engagement on European Union Exit (EU Exit) in the Department for Business, Energy and Industrial Strategy

[This information was provided by the Government to the Committee, but the Committee has decided not to publish this section]