

UNITED KINGDOM

KEY FACTS:

- Domestic gas production is in sharp decline, but still accounts for over 40% of gas demand.
- The UK is the 2nd biggest gas consumer in the EU
- Gas demand dropped by 22% between 2004 and 2017.
- Gas pipelines link the UK to Norway, Belgium and the Netherlands.
- The UK has four LNG terminals, with projects to increase their capacity
- The government is cutting subsidies to RE, with high implications for its rapid and steady growth.

1. GAS DEMAND

- Gas represented 37% of UK's energy mix in 2016.
- UK consumed around 82.8bcm of gas in 2016.
- Gas demand dropped by 22% between the 2004 UK demand peak and 2017.
- 80% of the UK's 25 million homes are powered by gas — and around a quarter of the country's electricity is generated by gas-fired power stations.¹

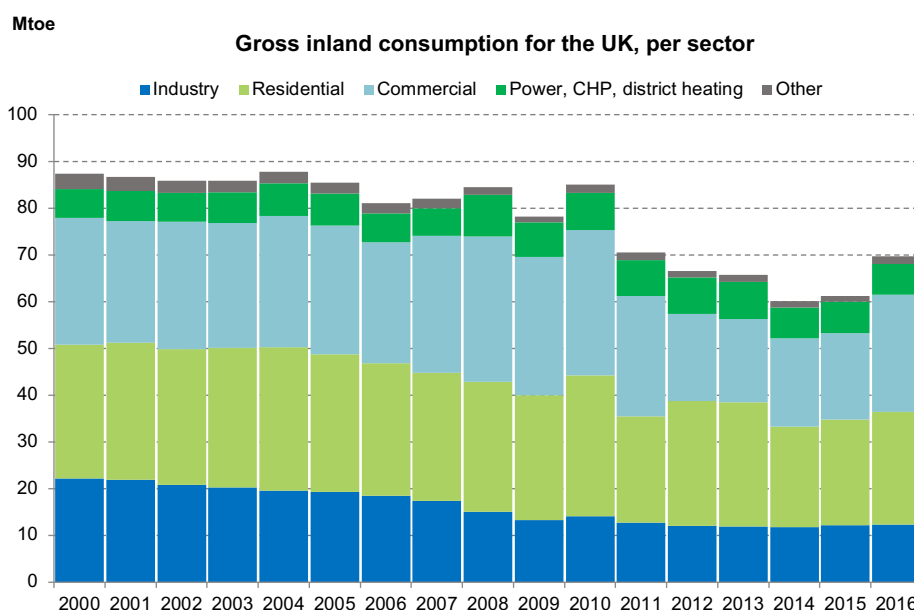
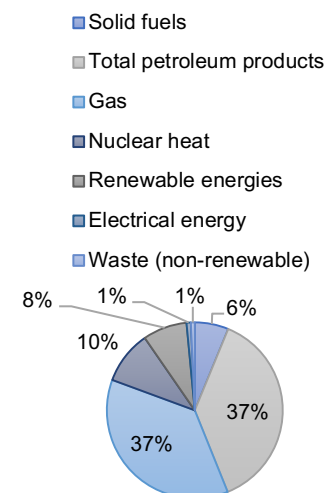


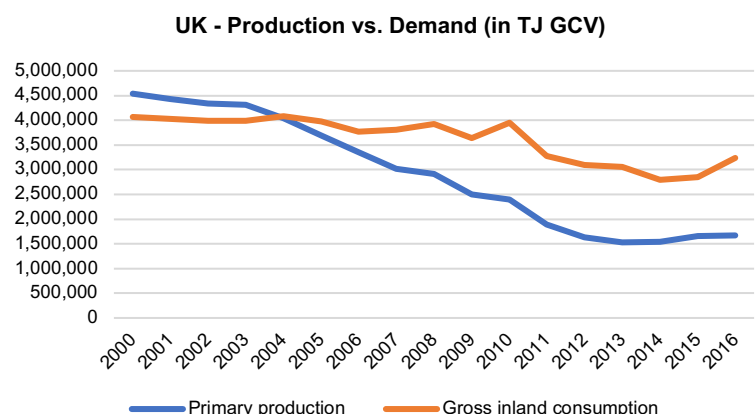
Figure 1: UK 2016 Energy Mix



2. GAS SUPPLY

UK gas production comes primarily (99.9%) from offshore fields – mostly from the North Sea but also from the Irish Sea. Production peaked in 2000 at 115bcm and has declined quickly since then at a rate of about 6% per year. In 2016, total gas production was **43.6bcm** – **almost three times less than the level in 2000**² (see graph), which corresponds to more than half of the UK's needs. Gas production also hadn't picked up by 2017 and stood at about 42bcm and in the mid- and longer-term indigenous production is projected to continue falling³. In December of 2016, the Cygnus gas field in the North Sea started production and might contribute to 5% of the UK's gas demand for a few years.⁴

Both the Cygnus (one of the main 2017-18 producing fields) and the Laggan and Tormore gas condensate fields west of Shetland produced over 5bcm of gas in 2017⁵.



¹ <https://www.britishgas.co.uk/the-source/our-world-of-energy/energys-grand-journey/where-does-uk-gas-come-from>

² http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nrg_cb_gas&lang=en

³ <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2019/07/Gas-Production-from-the-UK-Continental-Shelf-NG-148.pdf?v=7516fd43adaa>

⁴ <http://www.upi.com/Gas-flowing-from-North-Sea-bright-spot/9531481801238/?nli=1>

⁵ <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2019/07/Gas-Production-from-the-UK-Continental-Shelf-NG-148.pdf?v=7516fd43adaa>

The United Kingdom has been a net importer of gas since 2004, and these imports keep on increasing year after year (54% in 2015 compared to 7% in 2005).⁶ In 2016, 38bcm of gas was imported through pipelines while LNG is now making 12% of the UK imports.⁷ Gas imports are relatively diversified, coming from **Norway** (66%), **Qatar** (30%) and the **Netherlands** (9%) [2016].⁸ In 2017, the main partners through which the UK imported gas were Norway: 76.1 %, Qatar: 12.2 % and Belgium: 5.6 %.⁹

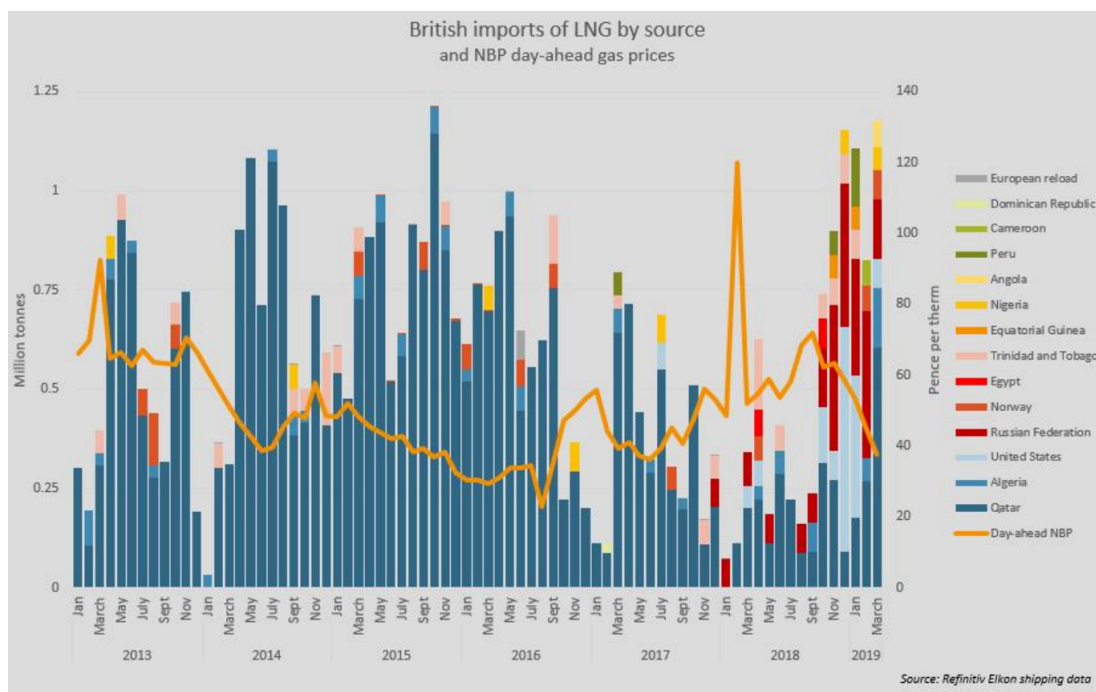
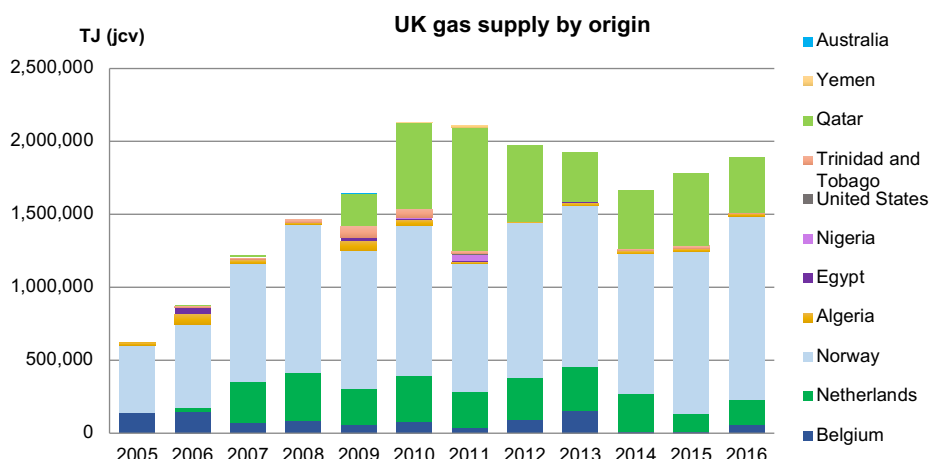
Over the past few years, the UK has been trying to offset the decline of their gas production

and to further diversify their gas suppliers through different ways which have created a lot of controversies:

- A lot of speculative numbers about potential shale gas resources in the country¹⁰ have pushed the UK government to lead an **aggressive pro-shale gas policy**. This has resulted in the granting of many exploration licenses, but has also resulted in strong and growing public opposition from those concerned about the catastrophic environmental records of the shale industry in the US.¹¹ The UK's first fracking operations in 2011 triggered earth tremors, which forced the authorities to impose a temporary moratorium, later lifted in 2013.
- **In October 2018** after a long legislative and on the ground battle that lead to a jail sanction for three activists (sanctions that were further lifted), **fracking operations led by Cuadrilla, resumed in Lancashire at the Preston New road site**. After just a few weeks of operations the first tremors have been recorded, and forced the site to shut-down for several days.¹² Since then, operations

resumed and with them the tremors.

- In 2013, Centrica, the largest gas supplier in the UK (and spin-off of the assets from formerly state-owned British Gas) signed a **20-year contract with Cheniere** to import some 2.5bcm of **shale gas from the US** in the form of liquefied natural gas (LNG), from September 2018.¹³ In the past years, the import of fracked US LNG to the UK rose significantly¹⁴ - see map.



⁶ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/560125/UK_Risk_Assessment_Gas_BEIS_template_Final_4_.pdf

⁷ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/651297/gas-security-supply-assessment.pdf

⁸ http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nrg_cb_gas&lang=en

⁹ <https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2c.html>

¹⁰ <http://www.bgs.ac.uk/research/energy/shaleGas/howMuch.html>

¹¹ <http://concernedhealthny.org/compendium/>

¹² <https://drillordrop.com/2018/10/27/cuadrilla-tremor-tracker/>

¹³ <https://www.centrica.com/news/centrica-signs-long-term-us-lng-export-deal-cheniere> & <http://www.naturalgasworld.com/uk-centrica-contracts-vessel-for-sabine-pass-34072>

¹⁴ https://ec.europa.eu/energy/sites/ener/files/eu-us_lng_trade_folder.pdf and <https://uk.reuters.com/article/uk-britain-lng-imports-graphic/surging-lng-imports-drive-down-british-wholesale-gas-prices-idUKKCN1QZ1J4>

3. GAS INFRASTRUCTURE

In order to compensate for the decline in production, the UK has **expanded and diversified its gas import infrastructure**. UK gas security of supply relies primarily on diversification of import sources, infrastructure and supply routes, backed up by substantial **gas storage facilities**.¹⁵

The UK can import **more than 100bcm/y through its six pipelines**: four of which link the UK gas network to Norway (Vesterled, Tampen, Langeled and Gjøa – with a combined import capacity of 56.6bcm/y) while the other two pipelines link the UK to Europe via Belgium (UK-Belgium interconnector – IUK – import capacity: 27bcm/y) and the Netherlands (UK-Netherlands – BBL pipeline – Import capacity: 19.3bcm/y).¹⁶ Over the past years, the pipeline carrying most gas to the UK was Langeled pipeline.¹⁷

After Spain, the UK holds the second largest LNG infrastructure¹⁸ and the two biggest regasification terminals in EU-28. The UK has also **four liquefied natural gas (LNG) import terminals** with a combined **regasification capacity of 52.3bcm/y and gas storage capacity of around 2bcm/y**: **Teesside GasPort** (capacity 4.2bcm/suspended¹⁹), **Isle of Grain** (capacity 19.5bcm), **South Hook** (21bcm) and **Dragon LNG** (7.6bcm) in Milford Haven.²⁰

The £250m Dragon LNG terminal in Wales, UK is an exceptional case as the average utilisation rate for the project seems to have been 0 for the last decade. This project has been undergoing "planned maintenance" work and doesn't appear to supply the UK with gas.²¹ Without taking Dragon into account, the average LNG utilization rate of UK LNG terminals stood at only 22% between January 2012 and March 2019, with Dragon LNG even less (~14%).²²

Map 4.28.2 Gas infrastructure of the United Kingdom



The working fossil gas **storage capacity** of the United Kingdom is approximately **4.7bcm**: the maximum daily delivery from storage is 135mcm/d. This is around a quarter of the peak-demand estimate of the National Grid (511mcm/d for winter .2013/14) and 29% of the highest actual demand (465mcm/d) recorded in January 2010. On average, **gas storage makes up about 10% of the overall gas supply mix over the winter period**.²³ It has to be mentioned, however, that Centrica closed the UK's biggest gas storage in Rough in 2018, as the site reached the end of its design life.²⁴

Despite this extremely comfortable situation where the UK seems amply equipped with the infrastructure necessary to be able to fully diversify its suppliers and ensure the energy security promoted by EU and UK authorities and the urgent calls to reduce fossil fuel consumption, more gas projects are currently planned, with extremely questionable needs considering the low and decreasing gas demand and growing competitiveness of truly sustainable and low-carbon energy sources:

Thanks to the PCI process, the UK has already been awarded over €33 million for a project aiming at twinning an onshore pipeline in

¹⁵ <https://www.iea.org/publications/freepublications/publication/ENERGYSUPPLYSECURITY2014.pdf>

¹⁶ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/560125/UK_Risk_Assessment_Gas_BEIS_template_Final_4_.pdf

¹⁷ <https://fingfx.thomsonreuters.com/gfx/ce/7/3609/3602/Pasted%20Image.jpg>

¹⁸ 31 International Energy Agency, Natural Gas Information 2016

¹⁹ https://www.gie.eu/download/maps/2019/GIE_LNG_2019_A0_1189x841_FULL_Final3.pdf

²⁰ <http://www.gie.eu/index.php/maps-data/lng-map> & <https://www.iea.org/publications/freepublications/publication/ENERGYSUPPLYSECURITY2014.pdf>

²¹ <https://www.dragonlng.co.uk/commercial/planned-maintenance>

²² <https://www.foodandwaterurope.org/wp-content/uploads/2019/07/EU-LNG-Terminals-average-2019.pdf> and <https://alsi.gie.eu/#/>

²³ <https://www.iea.org/publications/freepublications/publication/ENERGYSUPPLYSECURITY2014.pdf>

²⁴ <https://www.ft.com/content/68fa2c3e-55ad-11e7-80b6-9bfa4c1f83d2>

Scotland.²⁵ There are also **proposed projects aimed at increasing direct and indirect LNG capacity** and diversity of supply. e.g. a floating Regasification and Storage Union (FSRU), Port Meridian LNG, with planned capacity of 5bcm as which has been discussed for years but its future is still unclear.²⁶ Considering that the UK has been using its LNG import capacities at less than 30% of its capacities in 2015,²⁷ even despite the quickly depleting domestic production, one should wonder whether it is necessity and consider instead the commercial viability of such extension of current capacity.

Reverse flow project at the Moffat interconnection point, in the UK (PCI project).²⁸ Possibly in the context of new production in the Irish Corrib gas field and of a potential construction of the ever delayed Shannon (or Cork) LNG terminal in Ireland, a PCI project would consist in allowing bi-directional flows of gas from the Moffat entry point, so the UK could also receive gas from Ireland. This project also includes improvements and transformations throughout diverse point of the UK transmissions facilities in order to transport and allocate the gas coming from Ireland:

- The **upgrade of the SNIP pipeline** (PCI) going from Scotland to Northern Ireland to accommodate physical reverse flow between the two countries.
- The **Development of the Islandmagee Underground Gas Storage** (UGS) (PCI) facility in Northern Ireland with a planned injection capacity of 3.4bcm/year and a withdrawal capacity of around 8bcm/year, with an approximated cost of 400 million pounds.²⁹ The project raises immense environmental concerns similar to those of an energy project in close vicinity which has been abandoned.

This cluster of projects already received over €7 million through the CEF thanks to its PCI status.³⁰

However, with its immense but poorly used LNG import capacities, it is very unclear why the UK would need more import capacities.³¹ As to Ireland, the short-term production of the Corrib gas field and the high uncertainty about the construction and commercial viability of the Shannon LNG or Cork LNG terminal cast serious doubt on its ability to become a gas exporter.



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²⁵ https://ec.europa.eu/inea/sites/inea/files/cefpub/cef_energy_factsheet_uk.pdf

²⁶ <http://interfaxenergy.com/article/34452/uks-port-meridian-fsru-back-on-despite-doubts>

²⁷ <http://www.igu.org/publications/2016-world-lng-report> (p.48)

²⁸ http://ec.europa.eu/energy/maps/pci_fiches/pci_5_1_1_en_2017.pdf

²⁹ <https://www.hydrocarbons-technology.com/projects/islandmagee-storage-project/>

³⁰ https://ec.europa.eu/inea/sites/inea/files/cefpub/cef_energy_factsheet_uk.pdf

³¹ <http://www.igu.org/publications/2016-world-lng-report>