Chapter 4: Natural Gas

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Key headlines

Natural gas made up 38 per cent of total energy demand and close to two thirds of domestic demand in 2022 and continues to play an important role in the UK energy mix.

UK gas demand decreased by 7.9 per cent in 2022 compared with 2021, due to the warmest year on record, higher prices impacting on consumer behaviour, and record renewable output.

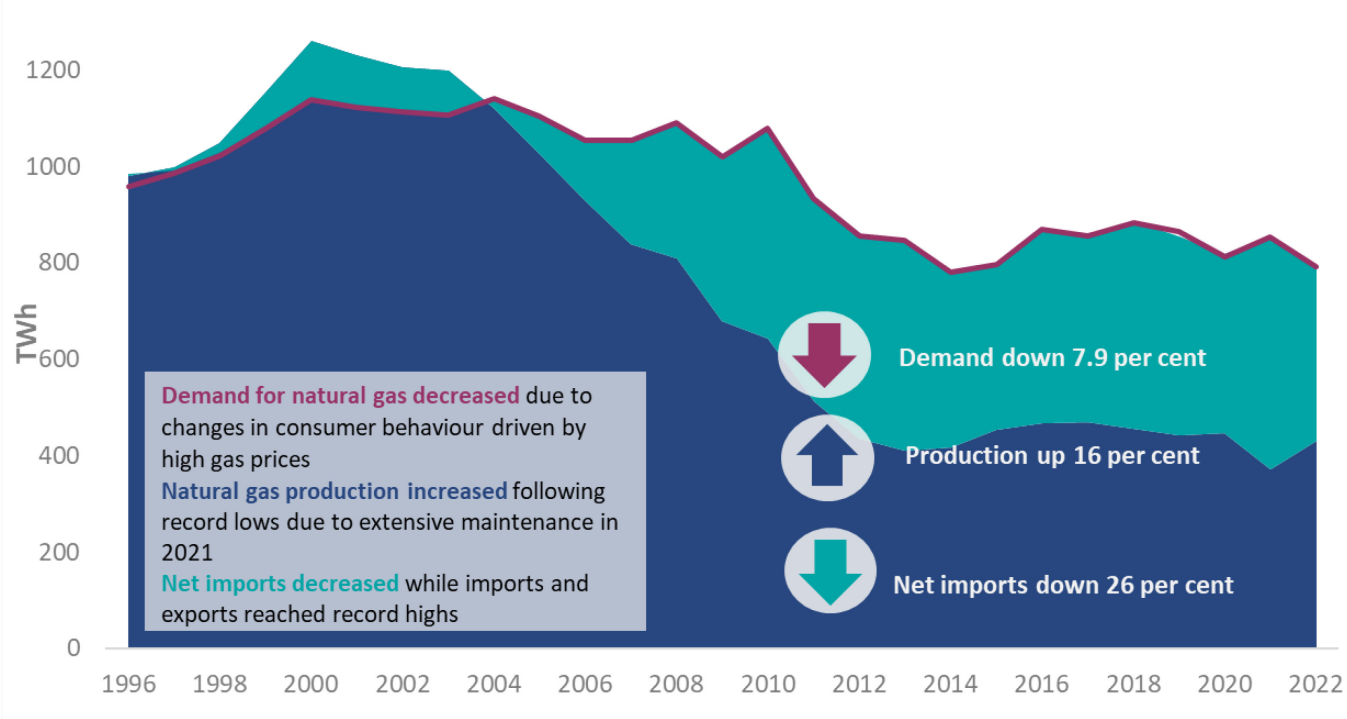
Both domestic and industrial demand reached levels last seen in the 1970s as, for the first time, households and businesses changed their behaviour in response to cost. Final consumption was down 14 per cent in 2022 compared with 2021, with the most significant reduction in the domestic sector which saw a drop of 18 per cent in the same period. Demand was reduced across the board with industry down 4.7 per cent and services (including sectors like commercial and public admin) down 9.7 per cent.

Exports tripled in 2022 compared to 2021 reaching a record high. Disruption to global gas supply following Russia's illegal invasion of Ukraine saw substantial shifts in UK trade patterns. Imports also reached a record high, up 10 per cent, and driven by a significant increase in **imports of LNG, up 74 per cent in the same period.** The UK has the second largest LNG regasification infrastructure in Europe (after Spain); this was utilised to support European efforts to move away from Russian gas. The UK operated as a land bridge using interconnectors for exports to Belgium and the Netherlands.

LNG accounted for almost half of total imports with imports of LNG from the US overtaking those from Qatar for the first time. American LNG was equivalent to half of total LNG imports and 22 per cent of total imports. LNG was also imported from a record 13 countries and from further afield with Peruvian imports more than doubling compared to the previous year.

Gross gas production increased by 16 per cent in 2022 compared with a record low in 2021 when an extensive summer maintenance schedule saw shutdowns at several major terminals. Production in 2022 was just a little short of output in 2019, the last full year before the Covid-19 pandemic.

Chart 4.1 Supply and demand for natural gas, 1996-2022 (DUKES Table 4.1)



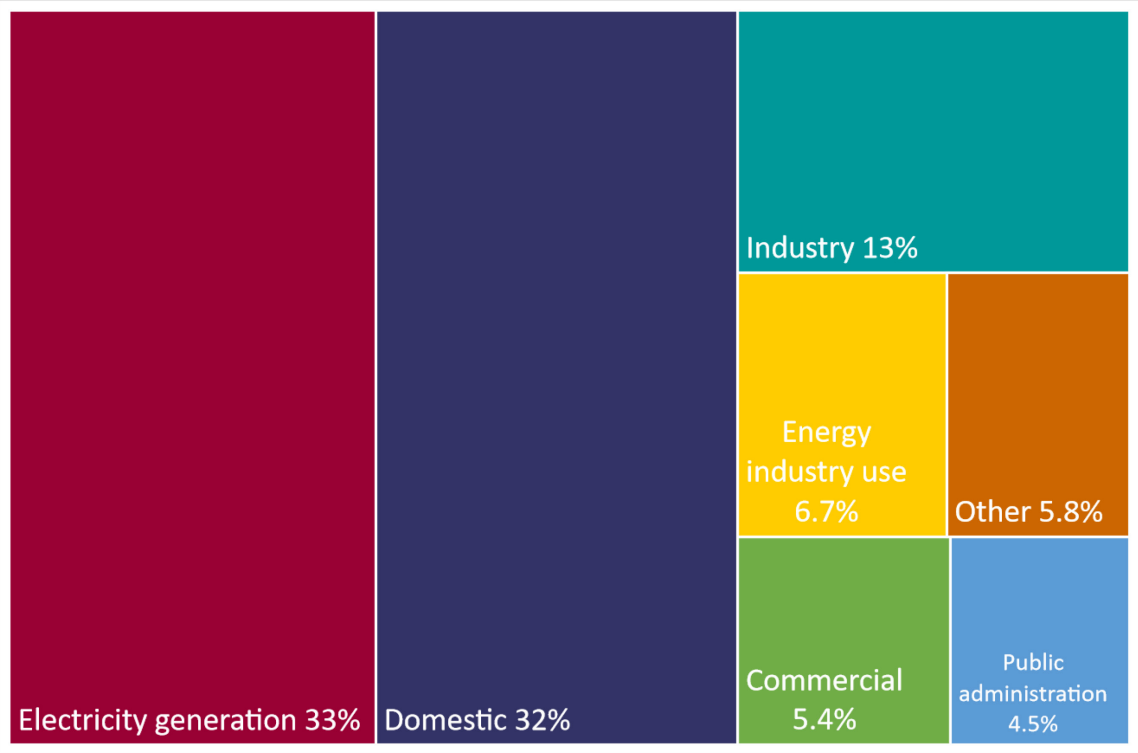
Natural gas accounted for 33 per cent of total energy production and 38 per cent of total energy demand in 2022 and is an important part of the UK energy mix. Demand for natural gas is met through indigenous production and imports. The UK is a net importer of natural gas but continues to export; mostly via pipeline to mainland Europe and historically more so in the summer when demand is low.

Gas production increased 16 per cent, to 423 TWh, in 2022 following a record low in 2021. This follows extensive summer maintenance on North Sea infrastructure in 2021 when several major terminals, including the Forties Pipeline System (FPS), were shutdown. Gas production recovered in 2022 and was 3 per cent below pre-pandemic levels.

Indigenous production of gas was equivalent to over half of demand in 2022, with the remainder met via imports. Indigenous production has been equivalent to around half of demand for over a decade, reaching 54 per cent in 2022 due to notably low demand.

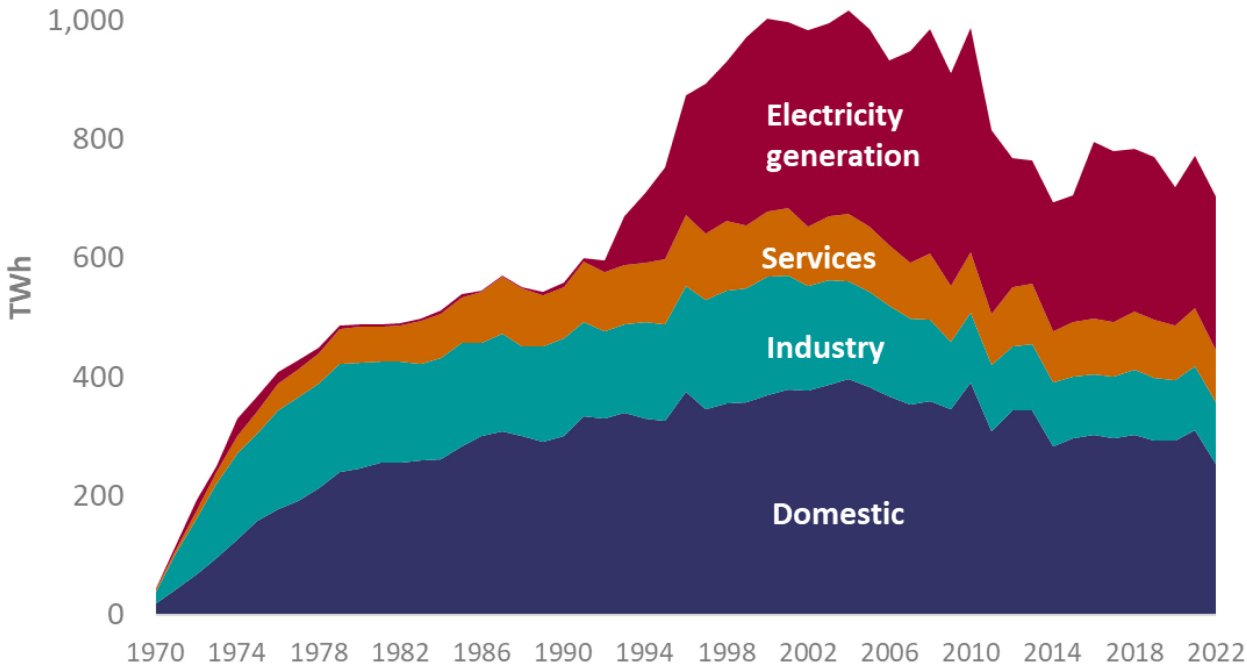
The North Sea Transition Authority (NSTA, previously the Oil and Gas Authority (OGA)) produces analysis on oil and gas reserves which can be found in the Oil and Gas reserves publication.

Chart 4.2a Sectoral consumption of natural gas, 2022 (DUKES Table 4.1)



Demand for natural gas decreased by 7.9 per cent in 2022 compared with 2021. Gas is used across many sectors in the UK. In general gas used for electricity generation, domestic consumption, and other sectors (including industrial consumption) each make up around a third of demand. Gas used for electricity generation remained stable compared to 2021, up 1.5 per cent. This was the result of reduced nuclear and wind output compared to previous years (see Chapter 5 for more information). Reduced demand was driven by final consumers due to record high temperatures and increased prices. Wholesale gas prices reached record highs in 2022 as the Russia-Ukraine conflict intensified strained market conditions.

Chart 4.2b Sectoral consumption of natural gas, 1970- 2022 (DUKES Table 4.1.1)

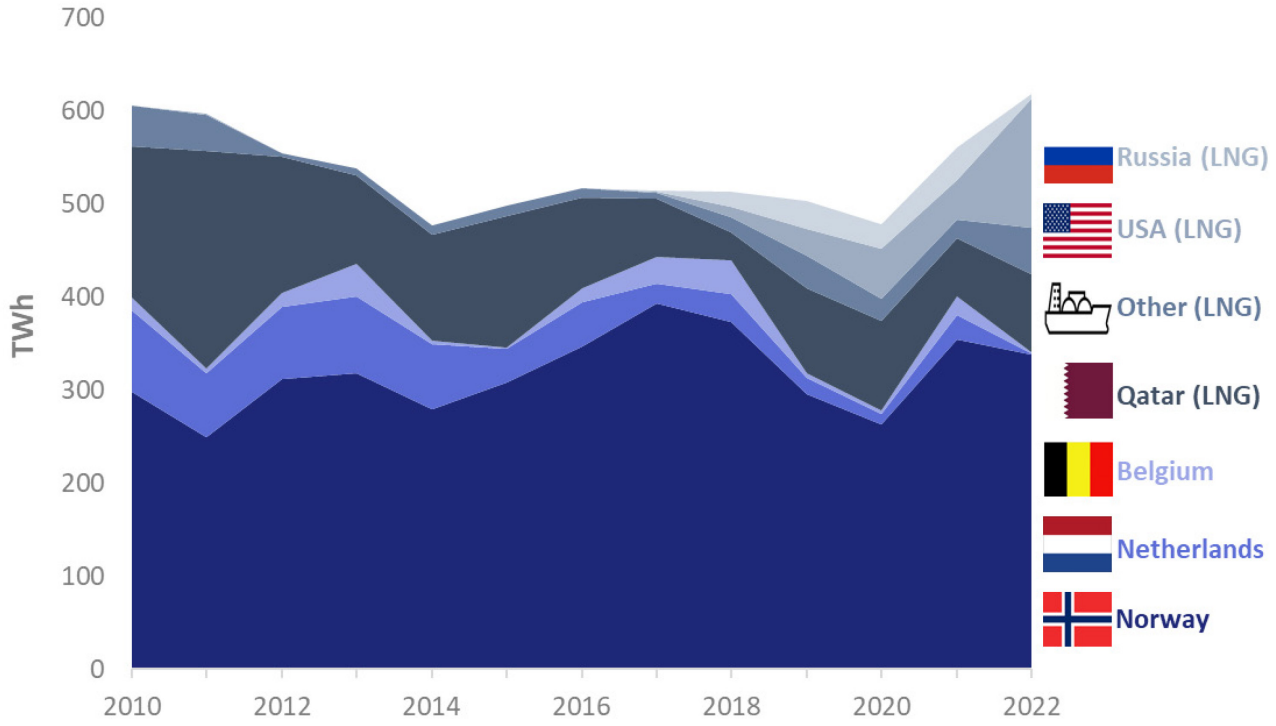


Domestic demand was down by 18 per cent in 2022 compared with 2021, reaching levels last seen in the early 1970s when coal was the main household fuel. Domestic gas consumption is used for space and water heating as well as for appliances such as ovens and hobs. Temperatures will have reduced demand for heating in addition, gas prices are a likely factor in changing consumer behaviour and reducing consumption levels. Overall, natural gas met almost two-thirds of total domestic energy demand in 2022 (See Table 1.1 for further details).

Industrial demand also dropped to levels last seen during the Covid-19 pandemic and in the early 1970s. Industrial demand fell 4.7 per cent in 2022 compared to 2021, due to reduced industrial output, some of which will have been driven by higher energy and other prices. The trend varied slightly across the industrial sectors with the highest falls in the chemicals and the paper and printing sectors.

Gas demand by public administration and commercial sectors also fell, down 10.2 and 9.8 per cent respectively. Other services which includes sectors such as agriculture also saw declines as high prices likely impacted consumer behaviour numerous sectors of the economy.

Chart 4.3 Imports of natural gas, 2010-2022 (DUKES Table 4.5)



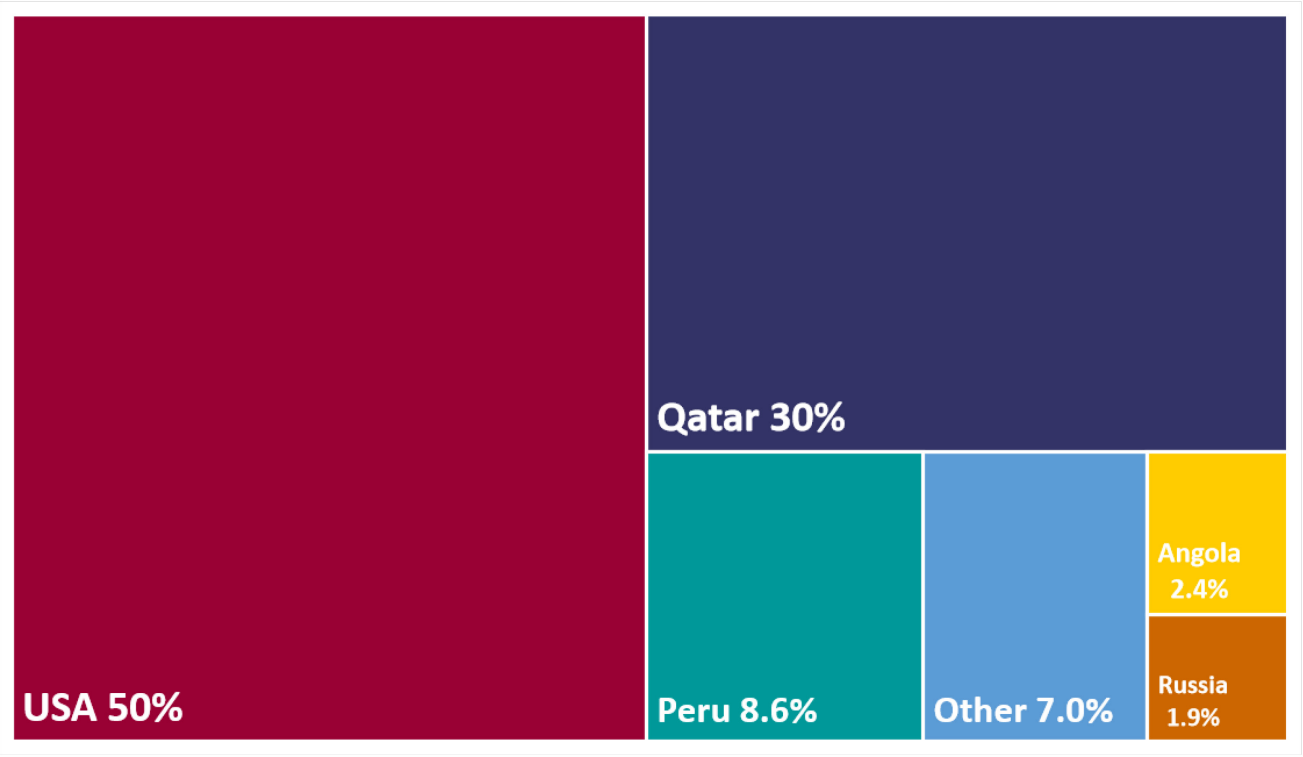
The Russian invasion of Ukraine and subsequent sanctions on Russian commodities saw significant changes to trade patterns. **This resulted in record high imports and exports in 2022.**

Natural gas imports increased by 10 per cent. The largest increase was of liquified natural gas (LNG) which reached an annual record high of 278 TWh, up 74 per cent in 2022 compared to 2021. The UK has the second largest LNG regasification infrastructure in Europe and operated as a land bridge to support European efforts to move away from Russian gas. For more information on the supply of LNG see the special feature article. UK imports also arrive via pipeline from Norway, Belgium, and the Netherlands.

Norway remained the UKs largest import source, accounting for 33 per cent of gross supply. Gross supply is calculated as production plus imports. Norway has historically been the UKs largest import source due to proximity and shared infrastructure in the North Sea. Norwegian gas imports accounted for 55 per cent of total imports and whilst substantial were down 4.6 per cent in 2022 compared to 2021. 2022 saw large drops in Belgian and Dutch imports as interconnectors[1] were mainly used for exports.

[1] Interconnectors are pipelines which can be used to import or export gas.

Chart 4.4 UK LNG import sources, 2022 (DUKES Table 4.5)

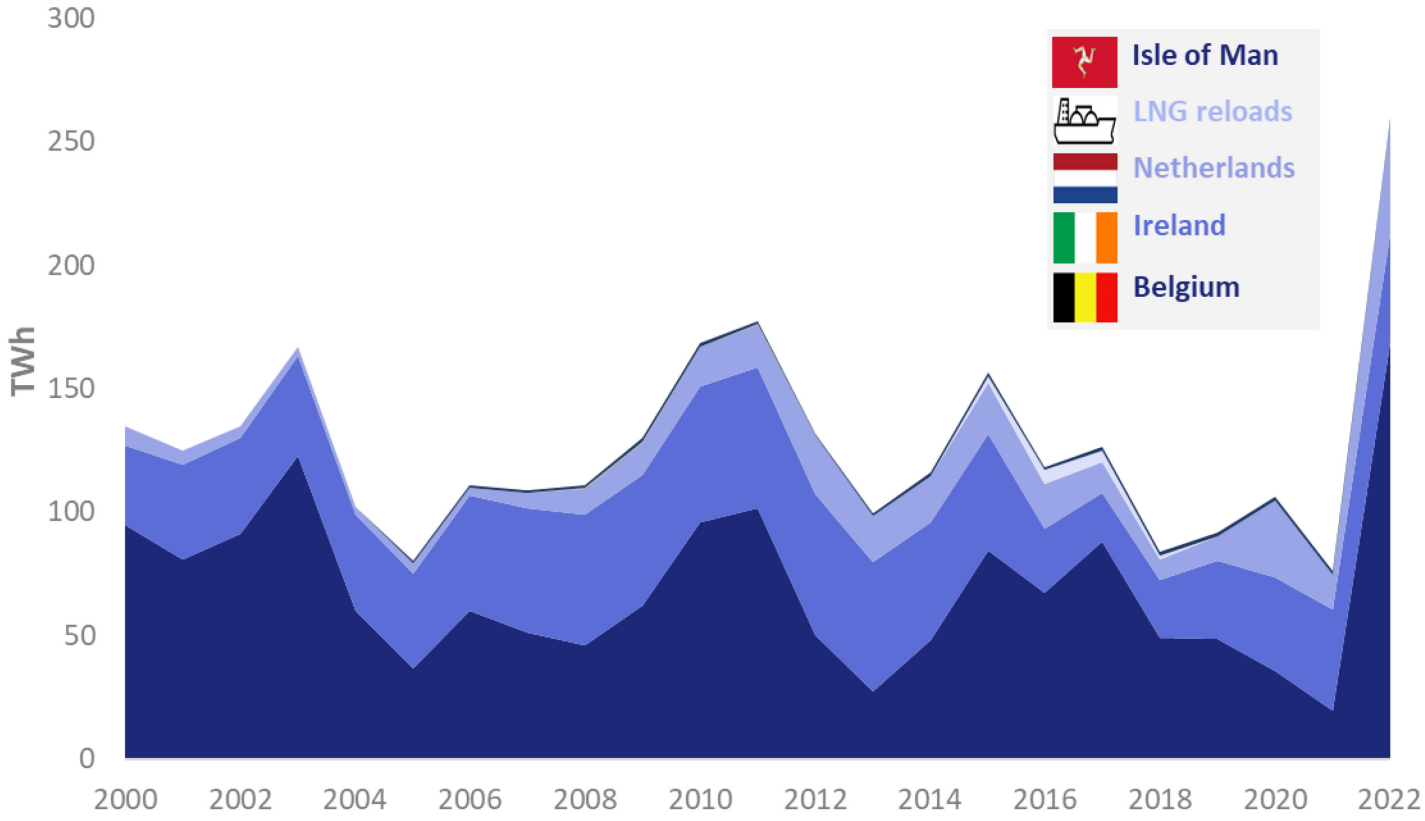


Imports from the USA tripled making the US the largest source of LNG to the UK for the first time. Imports of LNG from the USA accounted for 50 per cent of total LNG imports and 22 per cent of total imports. LNG from the US has been increasing considerably since the first import in 2017 reflecting increases to their liquification capacity. Recent provisional data indicates that in the first five months of 2023, US LNG imports have accounted for almost two-thirds of total LNG imports (see Energy Trends Table 4.4 for further information).

Historically, a large proportion of LNG has come from Qatar, peaking at 98 per cent of total LNG imports in 2011. Qatari imports were the second largest source in 2022 accounting for just under one-third of total LNG imports, having previously held the highest share between 2009 and 2021. This reflects substantial increases to LNG imports and increasing diversification of import sources. The UK imported LNG from thirteen countries in 2022, the highest on record. Peruvian LNG imports more than doubled compared to 2021, as well as increased African imports which included Angola, Egypt, and Nigeria.

Following Russia's invasion of Ukraine and subsequent sanctions (and self-sanctioning) the last cargo of Russian LNG was received in March 2022. In 2022 Russian imports of natural gas made up 0.9 per cent of total gas imports, this compares to 6.2 per cent in 2021.

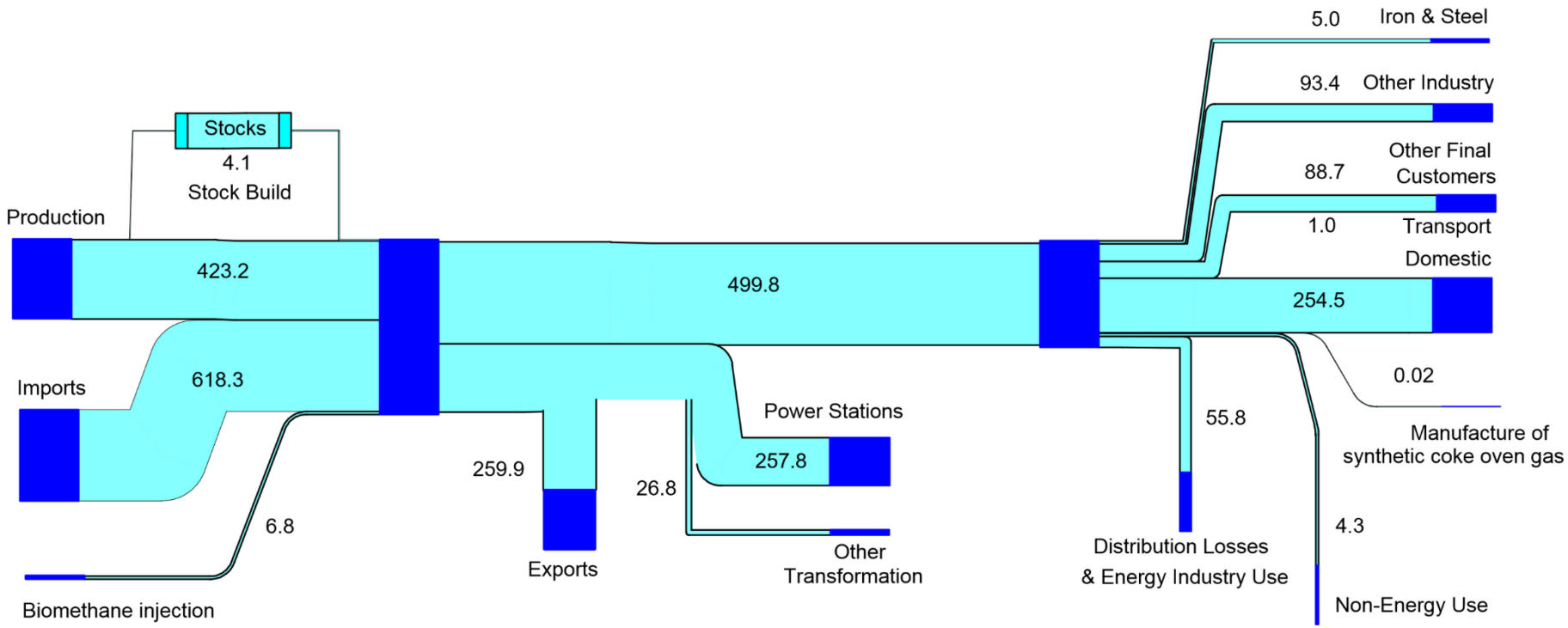
Chart 4.5 Exports of natural gas, 2000-2022 (DUKES Table 4.5)



Natural gas exports more than tripled in 2022 compared to 2021. At 260 TWh, exports reached the highest level on record, 47 per cent higher than the previous record set in 2011. The UK supported European efforts to move away from Russian gas, utilising substantial LNG regasification and shared infrastructure with mainline Europe. Increased exports were driven by increased supply to Belgium and the Netherlands in 2022, with exports to Belgium almost nine times higher than levels seen in 2021.

The flow chart on the following page shows the flows of natural gas from production and imports through to consumption. It illustrates the flow of gas from the point at which it becomes available from indigenous production or imports (on the left) to the final use of gas (on the right), as well as that transformed into other forms of energy or exported. The widths of the bands are proportional to the size of the flow they represent.

Natural Gas Flow Chart 2022 (TWh)



Note:

This flow chart is based on data that appear in Table 4.1, excluding colliery methane.

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