



UK Oil & Gas Report

Market overview 2023

Contents

This overview of the UK's oil and gas market starts with a look at the UK's primary energy supply and final consumption. We provide an analytical snapshot of the UK's oil and gas reserves and production volumes. Next on our agenda are the analysis of the last five years' oil and gas trade dynamics and the liquified natural gas infrastructure snapshot. We also map the UK's trade partners.

We supplement our market overview with the outlook for market regulations and the licensing regime. There is a section on the major drivers behind investments and price movements. Finally, we provide analysis of current market trends and the opportunities and challenges we expect the UK oil and gas market to face in the future.

1. Macroeconomic and geopolitical insights **03**

2. Energy mix **05**

3. Market snapshot **06**

4. LNG Terminals and storage capacities **08**

5. Market regulation **10**

6. Snapshot of investment **12**

7. Market prices **13**

8. Market trends and developments **14**

9. Future outlook **16**





1. Geopolitical tensions reshaped energy supply and boosted gas production in Europe

The Russian invasion of Ukraine has forced the EU to reconsider the importance of energy reserves in the North Sea region, especially oil and gas. Developing resources in the North Sea region has grown in strategic importance. However, this has been tempered by the growing appetite for clean energy sources and green technologies globally.

Key macroeconomic and geopolitical insights in 2022

1

Weaker economic growth perspective

The Russian invasion of Ukraine has contributed to a sharp slowdown in global economic growth through commodity price shocks and a decline in international trade. Its effects have the potential to lead to weaker economic growth worldwide over the next 30 years.



2

Investments in green technologies

EU funding programmes actively encourage energy efficiency investments in all sectors, co-financing projects through initiatives like the Recovery and Resilience Facility¹, Cohesion policy funds, and the Modernisation Fund². Moreover, the North Seas Energy Cooperation³ fosters offshore grid development and taps into the region's substantial renewable energy potential.



3

Increasing focus on energy security

Concerns over energy security are driving countries to prioritise energy supply and affordability. There has been a shift away from dependence on imported energy and increased promotion of domestic energy production. The UK's long-term energy security policy is unclear. The Conservative Party, currently in government, plans to increase oil and gas production. Labour Party policy is to reduce imports by developing more renewable energy.



4

The new mix of global energy supplies

In 2022, the Russian invasion of Ukraine caused a 50% YoY drop in pipeline gas trade from Russia to Europe. That year, the EU imported 59% of its gas from the North Sea region, mainly from Norway and the Netherlands. The EU also increased LNG⁴ imports by 58%, mainly from the USA, Qatar, and Algeria and looked to the USA, Azerbaijan, and Kazakhstan for crude oil imports. The EU increased its oil and gas imports from the UK by 68% and 242% YoY, respectively.

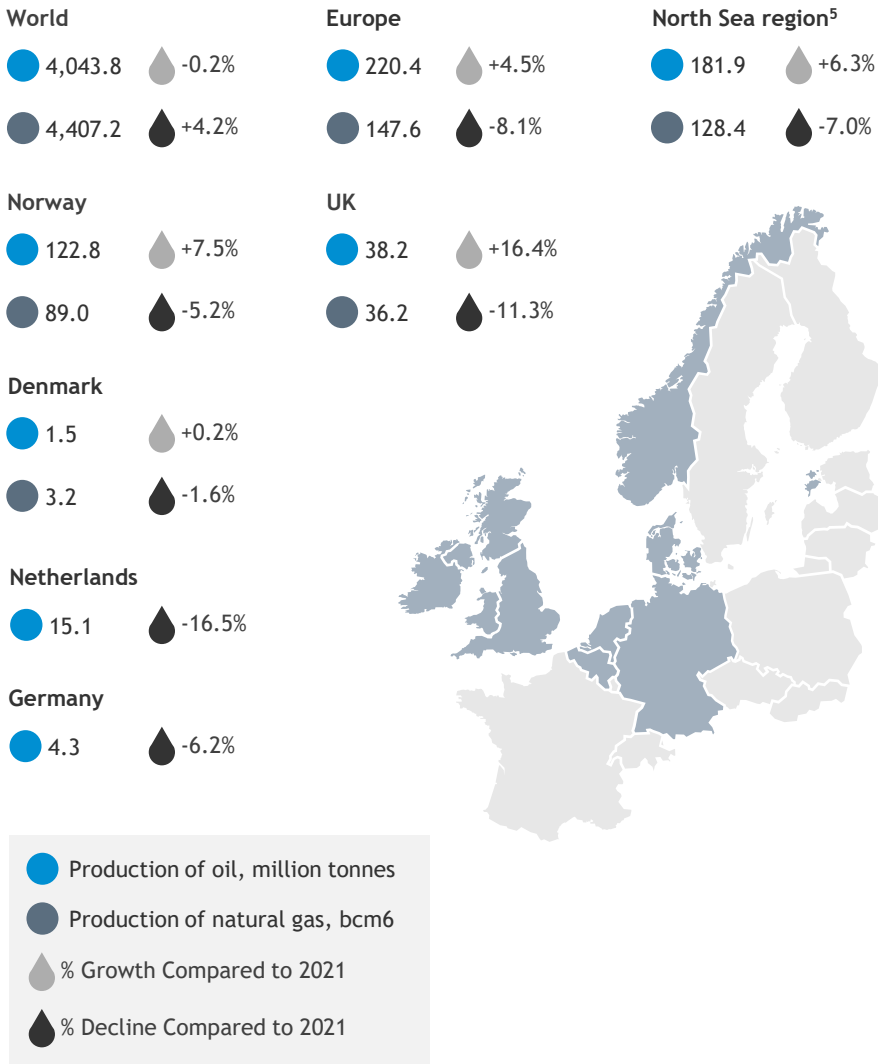


Source: BP – Energy Outlook – [2023]; Energy Institute – 72 Edition of the Statistical Review of World Energy – [2023]; Media overview

Notes: (1) The EU initiative to recover from the COVID-19 pandemic and prepare for the green and digital transitions by providing grants and loans to EU Member States until 2026; (2) The EU programme to support ten Member States to meet 2030 energy targets by helping to modernise energy systems and improve energy efficiency; (3) Belgium, Denmark, France, Germany, Ireland, Luxembourg, the Netherlands, Norway, Sweden, and the European Commission are currently members of the NSEC; (4) Liquefied Natural Gas; (5) Selected countries; (6) Billion cubic metres

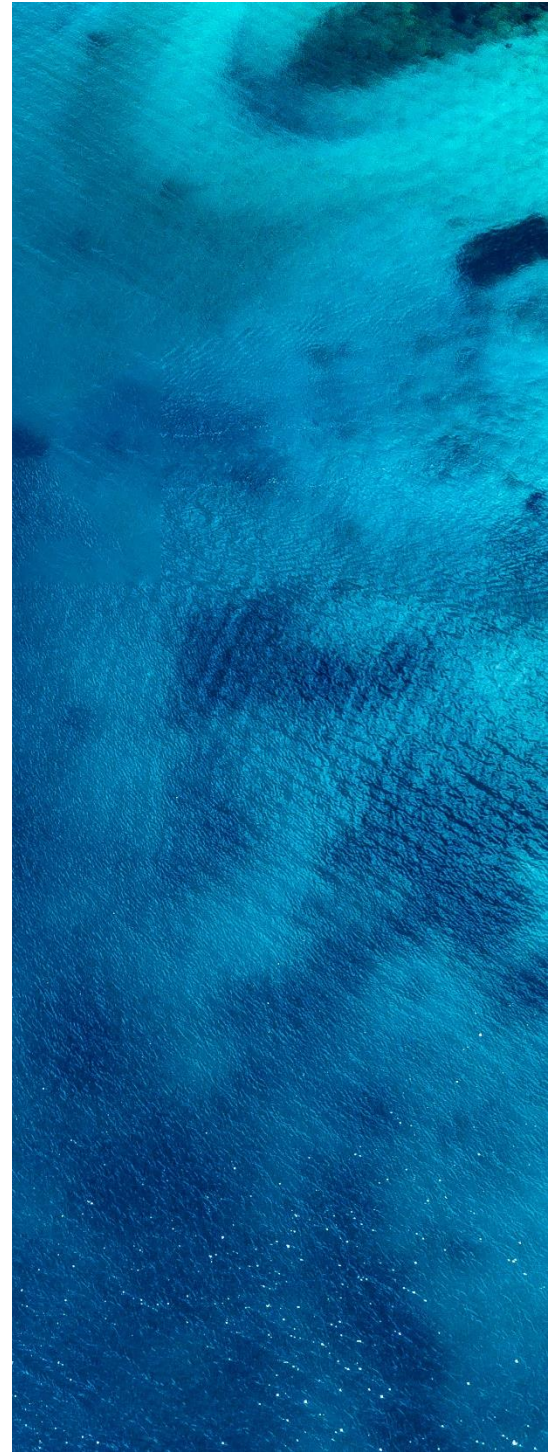


Oil and gas production in key selected North Sea region countries in 2022



Rising investment in both exploration and production drove increased European natural gas production in 2022. Investments in the North Sea are expected to average £36.1bn annually over 2023-2026 reflecting a desire to reduce reliance on gas imports from outside Europe.

At the same time, oil production in Europe declined due to the maturation of existing oil fields and heightened efforts to reduce carbon emissions.



Source: BP – Energy Outlook – [2023]; Energy Institute – 72 Edition of the Statistical Review of World Energy – [2023]; Media overview

Notes: (1) The EU initiative to recover from the COVID-19 pandemic and prepare for the green and digital transitions by providing grants and loans to EU Member States until 2026; (2) The EU programme to support ten Member States to meet 2030 energy targets by helping to modernise energy systems and improve energy efficiency; (3) Belgium, Denmark, France, Germany, Ireland, Luxembourg, the Netherlands, Norway, Sweden, and the European Commission are currently members of the NSEC; (4) Liquefied Natural Gas; (5) Selected countries; (6) Billion cubic metres



2. Oil and natural gas continued to dominate as contributors to the UK's energy mix

Over the last decade, the UK has experienced a significant shift in its energy landscape. Reliance on coal for electricity generation has reduced from 39% to 2%, which simultaneously has been replaced by low-carbon energy sources such as solar and wind, which constituted 21% of the UK's energy supply in 2022.

Despite the reduction in coal and move to renewables, other fossil fuels such as oil and gas contribution to the country's energy mix has remained unchanged over the last decade at just over 70%

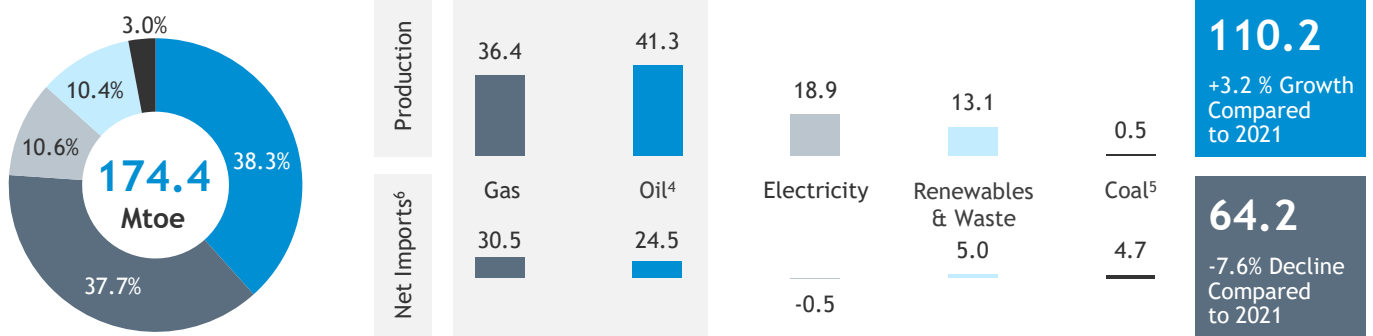
The UK's energy production had been falling since 2018 but surged in 2022 driven by rises in gas, nuclear, and renewables output.

However, in Q1 2023, the UK's energy production declined by nearly 8% vs. Q1 2022.

Even with the UK's commitment to achieving Net-zero by 2050, the oil and gas sector remains a significant contributor to the UK's energy mix, accounting for 76% of the energy supply in 2022 and almost 83% in Q1 2023.

Production in the UK covered only 63% of national demand in 2022. The energy gap of 37% was covered by imports primarily from Norway and the USA. In contrast, 2022 saw the UK become a net exporter of electricity for the first time in more than 40 years.

Total primary energy supply² in the UK by energy source in 2022, Mtoe³

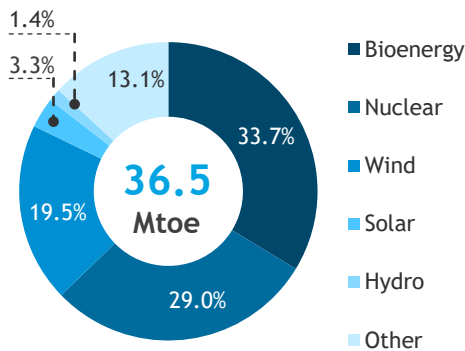


Energy supply from low-carbon sources in the UK grew by 6% YoY in 2022 as nuclear production by 5% and wind by 24%. Wind energy capacities increased by 12% with the construction of 254 new wind turbines. The UK now operates nearly 11,500 wind turbines on 2,604 onshore and 43 offshore wind farms. The energy supply from bioenergy fell due to outages.

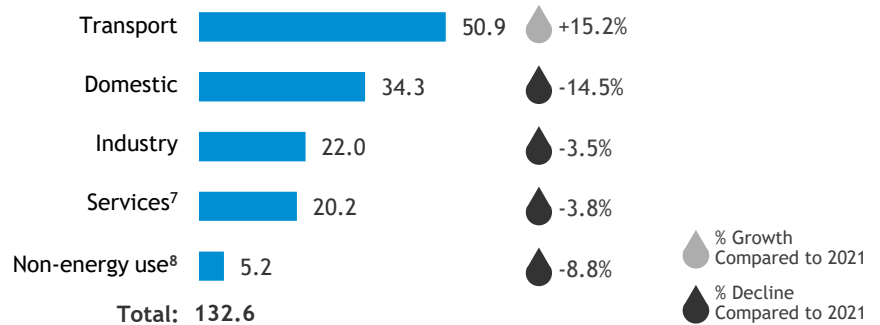
The transport sector continues to be UK's largest energy consumer as road transport grew 3% in 2022 and air travel energy consumption almost doubled.

In Q1 2023, the transport sector consumption grew by 7% and was the only sector to show growth. The ban on new diesel and petrol cars and vans from 2035 may drive further energy consumption through the higher energy demands of Evs, if the policy goes ahead.

Primary energy supply from low-carbon sources in the UK in 2022



Total final consumption of energy in the UK in 2022, Mtoe



Source: Department for Energy Security and Net Zero – UK Energy in Brief – [2023]; Department for Energy Security and Net Zero – Digest of UK Energy Statistics – [2023]; Wind Europe – Wind Energy in Europe – [2023]; The UK Government website; Media overview

Notes: (1) Gross value added; (2) The Office for National Statistics adjusted the data for 2021 in 2023; (3) Million tonnes of oil equivalent; (4) Includes primary oils and petroleum products; (5) Includes coal and manufactured fuel; (6) Net imports is calculated with marine bunkers and stock exchange differences; (7) Agriculture, public and commercial services; (8) Petroleum, natural gas and manufactured fuels that have not been used directly

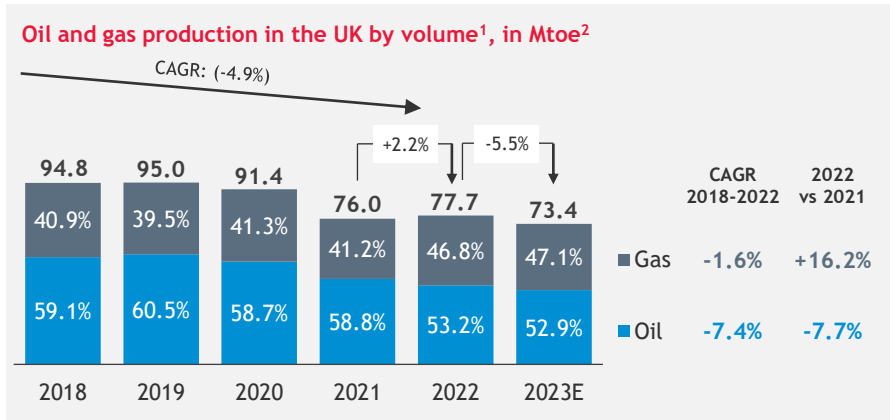


3. In 2022, the total consumption of oil and gas in the UK exceeded production by 21%

In 2022, the opening of new fields in the Southern North Sea pushed up gas production, reversing a downward trend that started in 2018.

Oil production declined to historical lows amid extensive maintenance of the production fields. By the end of 2023, oil and gas production in the UK are expected to decline by 6% and 5%, respectively.

Over the last five years, capacities of the proven and probable oil and gas reserves in the UK have declined at annual compound rates of 11% and 9%, respectively. Falling investments by offshore firms and the growing focus on sustainability may lead to an 80% drop in the North Sea region's proven and probable oil reserves by 2030.

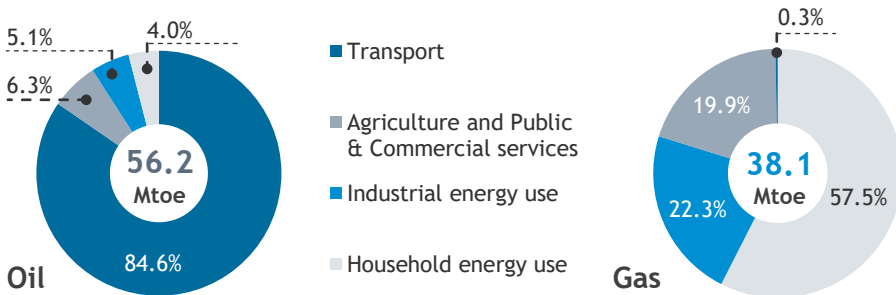


Oil consumption in the UK increased by almost 12% YoY in 2022. The transport sector, the largest consumer of energy, increased consumption of petroleum products by 14% YoY.

However, it remained below the pre-COVID-19 pandemic level by 21%. In Q1 2023, the rising trend continued with a 4% rise in the UK's oil consumption, compared to Q1 2022.

Gas consumption fell by 15% in 2022 and that trend continued in Q1 2023 with a 7% YoY drop. The fall was driven by high prices, the embargo on Russian gas and warm weather.

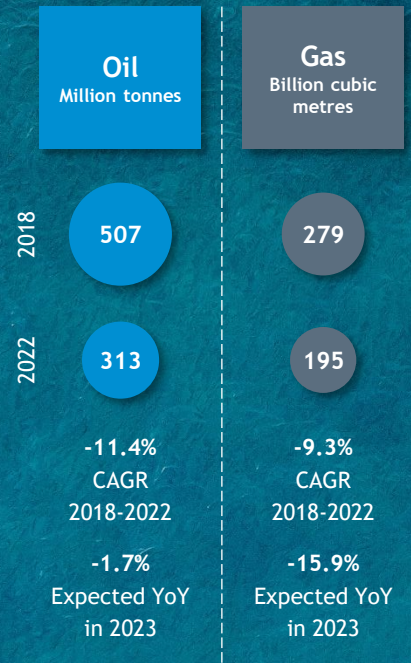
Oil and gas final consumption in the UK in 2022



Source: Department for Energy Security and Net Zero – UK Energy in Brief – [2023]; Department for Energy Security and Net Zero – Digest of UK Energy Statistics (DUKES): Petroleum – [2023]; OEUK – Energy Supply Crisis – [2022]; OEUK – Economic Report – [2022]

Notes: (1) The data is provided by the UK Government's Department for Energy Security and Net Zero and may differ from other sources; (2) Million tonnes of oil equivalent

Oil and gas proven and probable reserves capacity in the UK



In 2022, the consumption of oil and gas in the UK exceeded the production

Oil final consumption surpassed the production by:

36.1%

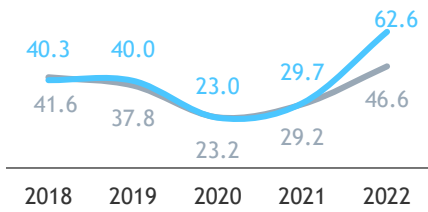
Gas final consumption surpassed the production by:

4.7%



3. The UK is becoming more dependent on oil and gas imports from Norway and the USA

UK oil trade value¹ (£bn)



Exports	% CAGR 2018-2022	% Change ² H1 2023 vs H1 2022
Crude and refined oil	+2.9%	-10.6%
Natural gas	+46.6%	-2.0%

Key trade indicators in 2022

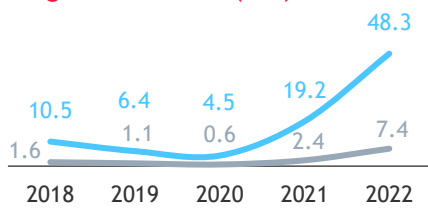
Oil

- 9.7% in total imports
- 11.2% in total exports
- 2nd place in exported goods

Gas

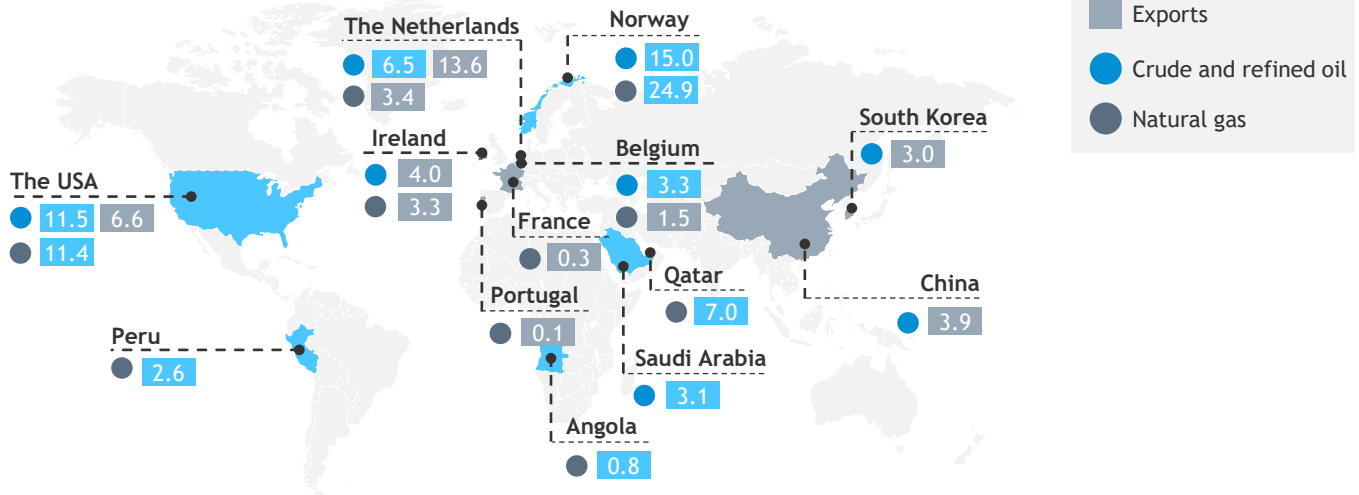
- 7.5% in total imports
- 1.8% in total exports
- 1st place in imported goods

UK gas trade value¹ (£bn)



Imports	% CAGR 2018-2022	% Change ² H1 2023 vs H1 2022
Crude and refined oil	+11.6%	+4.4%
Natural gas	+46.5%	-10.4%

Key UK oil and gas trade partners³ by value in 2022 (£bn)



Recent developments in the UK oil and gas trade

Increased gas exports to the EU to support the shift from Russian gas

The UK exported nearly three times more gas to Europe in 2022 than in 2021, with the Netherlands and Ireland the major importers. However, gas exports to Europe decreased by nearly 3% in H1 2023 vs. H1 2022.

Record high levels of oil and gas imports

The oil and gas imports into the UK more than doubled in 2022 vs 2021, with the USA and Norway as the top providers. The surge was fuelled by rising prices and a bid to reduce European dependency on Russian gas.

Termination of oil and gas imports from Russia

In 2021, Russia was the second and fourth largest exporter of oil and gas to the UK, respectively. However, the UK banned oil and gas imports from Russia in 2022 in response to Russia's invasion of Ukraine.

Source: Department for Energy Security and Net Zero – UK Energy in Brief – [2023]; Department for Energy Security and Net Zero – Digest of UK Energy Statistics (DUKES): Petroleum – [2023]; OEUK – Energy Supply Crisis – [2022]; OEUK – Economic Report – [2022]; Media overview

Notes: (1) The Office for National Statistics adjusted the data for 2020 and 2021 in 2023; (2) Oil changes in Mtoe and gas changes in mcm; (3) Represent each of the Top-5 countries in terms of oil and gas trade; (4) Major gas pipeline from the UK to Europe through Belgium



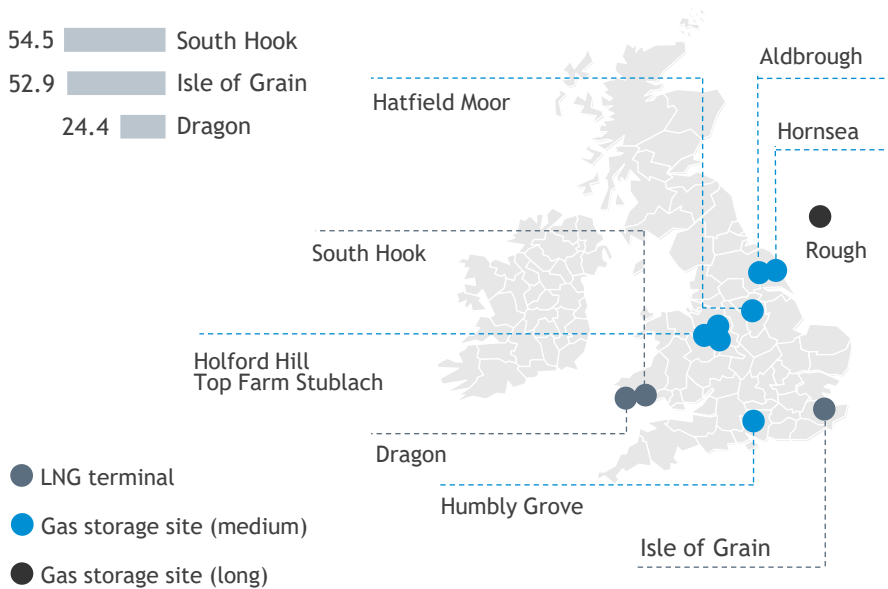
4. UK's LNG infrastructure and export pipelines offer Europe a bridge to energy security

European LNG imports rose by 71% in the last year, reaching 155 bcm¹ and driving high global prices. The surge in demand was caused by a shift away from Russian gas supply and met by increased supply from Qatar, Australia and the USA.

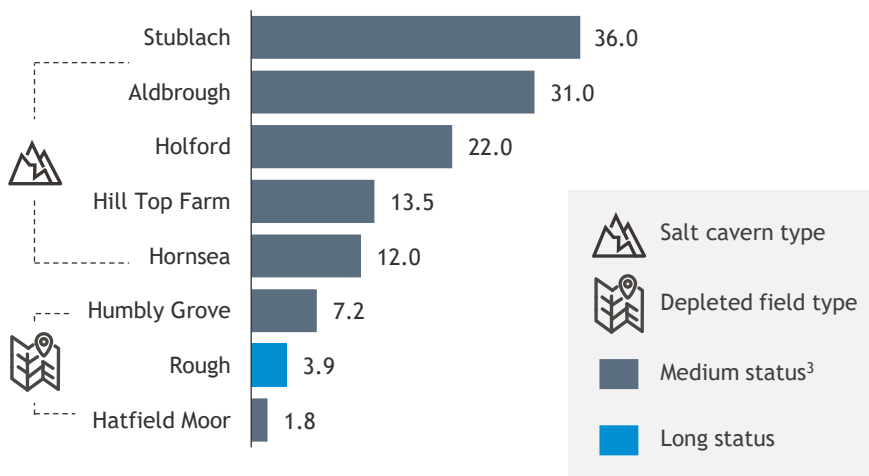
The UK imported a record 26 bcm of LNG in 2022, a 74% increase on 2021. The USA supplied half of those imports, ending Qatar's 13-year period as the largest provider of LNG to the UK. The UK did diversify its supply of LNG, including a significant boost in Peruvian imports.

LNG terminals in the UK, regasification capacity mcm² per day

- 54.5 South Hook
- 52.9 Isle of Grain
- 24.4 Dragon



The UK's gas storage sites, delivery mcm per day



Natural gas export-import facilities in the UK

Import:

8

The number of import pipeline systems

372 mcm

Total import daily capacity

Export:

3

The number of export pipeline systems

100 mcm

Total export daily capacity



The growing importance of LNG in global gas supply is reflected in the expansion of liquefaction capacity worldwide. The UK is Europe’s second-largest LNG hub with three LNG terminals having a combined regasification capacity of 48 bcm per year. It also has two interconnectors with mainland Europe, allowing bidirectional trade with Belgium and the Netherlands.

The UK currently has nine gas storage sites with a total gas volume of 3,130 mcm, representing 6 TWh⁴. This amounts to just 2% of annual demand. Gas storage capacities are significantly lower than in the EU leaving the UK more reliant on pipelines and LNG imports.

The oil and oil products storage capacities in the UK

41

The number of coastal storage terminals

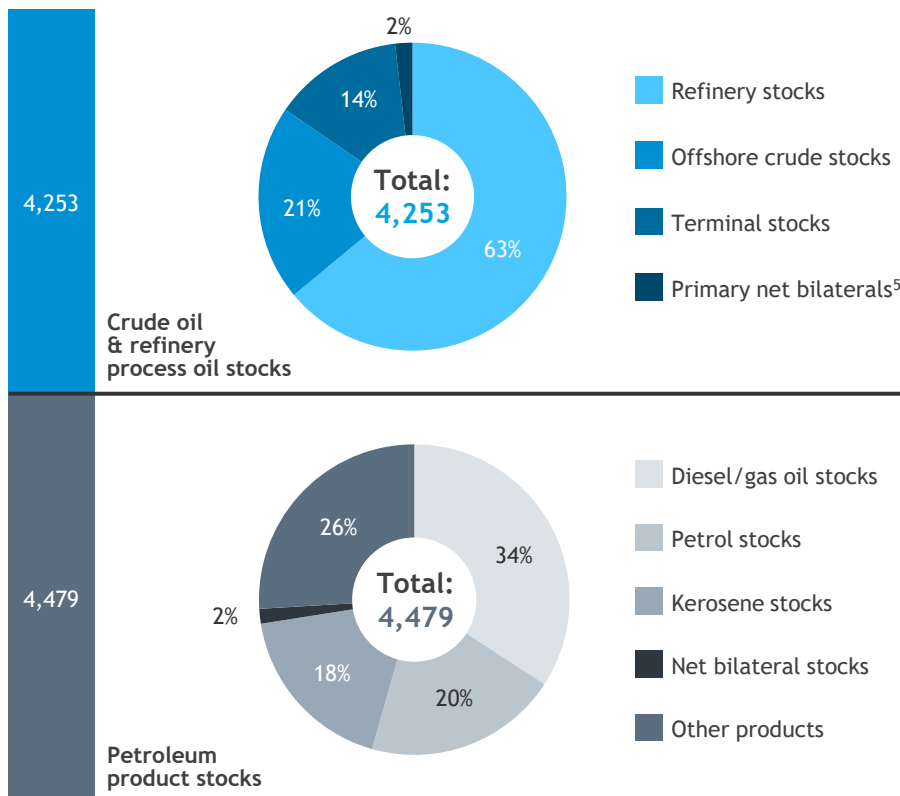
20

The number of inland storage terminals

As of 2022, the UK held 9 million tonnes of oil stock, equivalent to over 188 days of net imports, exceeding the 90 days required by the International Energy Agency. The UK oil stocks decreased by 13% YoY in 2022, mainly due to disruptions in the supply chain caused by the Russian invasion of Ukraine. Internationally, average oil stocks in H1 2023 were also lower by more than 3% compared to H1 2022.

The stocks of oil and petroleum products in the UK in 2022, thousand tonnes

8,732



Source: Department for Energy Security and Net Zero – Digest of UK Energy Statistics: Oil and Oil Products – [2023]; Department for Energy Security and Net Zero – Digest of UK Energy Statistics: Natural Gas – [2023]; Department for Energy Security and Net Zero – Digest of UK Energy Statistics: Supply of LNG in the UK – [2022]; The UK Government website; Media overview
 Notes: (1) Billion cubic metres; (2) Million cubic metres; (3) Status describes storage range determined by capacity, injection, deliverability, and recycling rates; (4) Terawatts hour; (5) The difference between stocks held abroad for the UK and stocks held in the UK for foreign use



5. The UK Government controls the oil and gas sector through numerous public authorities

The UK law vests all rights to petroleum resources, including any mineral oil and natural gas, to the Crown. However, the UK regulatory authorities can grant local and international¹ companies licences to explore and produce oil and gas. The companies must pay annual industry levies and taxes on profits from oil and gas activities.

In May 2022, the UK introduced a ‘windfall tax’ on energy profits to address the companies’ profits from the rising and fluctuating oil and gas prices. The windfall tax may be cancelled if prices remain stable for six months. In FY 2022/2023, oil and gas taxes raised £11bn, including almost £3bn in ‘windfall tax’, a four-fold increase on FY 2021/2022.

Key regulations for the oil and gas sector in the UK

<p>Petroleum Act 1998</p> <p>Basic law that regulates all offshore and onshore activities with oil and gas resources in the UK.</p>	<p>Corporate Act 2010 and Energy (Oil and Gas) Profits Levy Act 2022</p> <p>Regulate tax rates for the oil and gas sector, including the new energy profits levy, introduced in 2022.</p>	<p>Selected tax rates in 2023</p> <table border="1"> <thead> <tr> <th>Tax</th> <th>Tax rates</th> </tr> </thead> <tbody> <tr> <td>Ring fence corporation tax</td> <td>30%</td> </tr> <tr> <td>Supplementary charge on adjusted profits</td> <td>10%</td> </tr> <tr> <td>Energy profits levy (temporary tax on profits)</td> <td>35% (Since May 2022)</td> </tr> </tbody> </table>	Tax	Tax rates	Ring fence corporation tax	30%	Supplementary charge on adjusted profits	10%	Energy profits levy (temporary tax on profits)	35% (Since May 2022)
Tax	Tax rates									
Ring fence corporation tax	30%									
Supplementary charge on adjusted profits	10%									
Energy profits levy (temporary tax on profits)	35% (Since May 2022)									
<p>Infrastructure Act 2015</p> <p>The law set up the rights for people to establish and use energy infrastructure.</p>	<p>Energy Act 2016</p> <p>The law establishes and determines the functions of the Oil and Gas Authority (OGA).</p>									
<p>The Petroleum Licensing (Applications) Regulations 2015</p> <p>The law modernised the licensing process with the introduction of the digital application platform.</p>	<p>The Oil and Gas Authority (Levy and Fees) Regulations 2023</p> <p>The law establishes new fees for licence applications and obliges licence holders to pay levies.</p>	<p>Selected industry levy amounts (£)</p> <table border="1"> <tr> <td>Production licence</td> <td>130,912</td> </tr> <tr> <td>Exploration licence</td> <td>26,799</td> </tr> </table> <p>As of 2023, the industry levy is applied only to the offshore sector</p>	Production licence	130,912	Exploration licence	26,799				
Production licence	130,912									
Exploration licence	26,799									

Selected regulatory bodies for the oil and gas sector in the UK



Main governmental authorities regulating oil and gas activities

Department for Energy Security and Net Zero (DESNZ) 2023²

The UK Government’s department is responsible for secure supply, efficient energy use, and control of energy markets.

North Sea Transition Authority (NSTA) (legal name – Oil and Gas Authority) 2016

The executive body of DESNZ for granting licences, resolving disputes, preparing strategies for the oil and gas industry transition to net zero.

In March 2022

The UK Government renamed OGA to NSTA to highlight the importance of energy transition. However, the legal name in all documents will remain the OGA.



Selected government bodies impacting the oil and gas sector

Health and Safety Executive (HSE)	Environment Agency (EA)
Health and safety standards 1975	Sustainability promotion 1996
Mineral Planning Authorities (MPA)	Maritime and Coastguard Agency (MCA)
Minerals extraction planning 1981	Compliance with maritime rules 1998

Selected responsibilities in the oil and gas sector | Year of establishment

Source: NSTA website; NSTA – Annual Report – [2023]; The UK Government website; The UK law; Media overview

Notes: (1) Assuming they have a branch in the UK; (2) The department was established in 2023 to replace the previous department for Business, Energy & Industrial Strategy, operating since 2016



5. The massive offshore licensing round does not imply ending the UK's path to sustainability

Oil and gas licence types issued by the NSTA and application fees

Production licences		Exploration licences		Other licences	
Seaward production licence	£2,100	Seaward exploration licence	£2,250	Carbon Capture and Storage licence	£18,060
Landward production licence	£1,400	Landward exploration licence	£2,250	Gas Storage licence	£9,030
				Methane Drainage licence	£180

Application is available only through licensing rounds¹ Application is available at any time Application fee

Under the Petroleum Act 1998, companies can only explore for and produce oil and gas under licences issued by the NSTA. In issuing licences, the NSTA operates under its legal name, OGA.

Production licences cover oil and gas exploration, appraisal and production activities, while exploration licences grant the exclusive right to explore existing oil and gas licence areas.

The Carbon Capture and Storage licence is the most expensive among the UK's oil and gas licences. Its application fee surged by 204% with the introduction of The Oil and Gas Authority (Levy and Fees) Regulations in April 2022.

Key steps of the oil and gas licence obtaining process in the UK



For the 30th offshore licensing round in 2017, the NSTA introduced a new Seaward production licence called 'Innovate', which replaced the previous 'Traditional', 'Frontier', and 'Promote' licence subtypes.

The new licence obliged companies to have a work programme consisting of three terms. The start of oil and gas production is only allowed for the third term.

In 2022, the NSTA opened a massive 33rd offshore licensing round to support the UK's energy sector and reduce import dependency. The NSTA will determine the winners of licences in October 2023. The winners may be obliged to comply with the Climate Combability Checkpoint⁴.

Despite the preparation of numerous blocks for oil and gas licensing, the future of licensing rounds is uncertain as the Labour Party, that aims to stop drilling in the North Sea, looks likely to get into power in 2024.

Terms of the new 'Innovate' subtype of the Seaward production licence

- Initial Term (six years)**
- ▶ Phase A. Optional Geotechnical studies
 - ▶ Phase B. Optional Seismic surveys
 - ▶ Phase C. Mandatory Drilling.
- Second Term (four years)**
- ▶ Appraisal and approval of a Field Development Plan.
- Third Term (18 years)**
- ▶ Field development, oil and gas production.

Key insights of the 33rd offshore licensing round with change compared to the 32nd round

<p>Duration From 7 October 2022 to 12 January 2023</p>	<p>Number of companies applied 76 ▲ +17.1%</p>	<p>Total number of blocks offered 932 ▲ +7.0%</p>	<p>Number of blocks companies applied for 258 ▲ +5.3%</p>
---	---	--	--

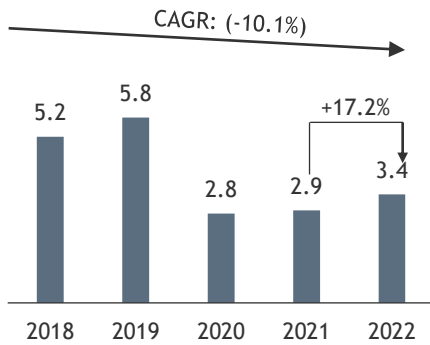
Source: NSTA website; NSTA – Annual Report – [2023]; The UK Government website; UK law; Media overview
 Notes: (1) Launched by the NSTA competitive work programmes for companies to receive a licence on oil and gas activities; (2) The Petroleum Licence Applications Repository system of the NSTA; (3) Includes the company's technical capability, sustainable governance, financial viability, and residence in the UK; (4) Planned by the UK's Government introduction of tests for oil and gas companies to comply with net-zero objectives



6. Declining capital expenditures and windfall tax stimulate the oil and gas import gap

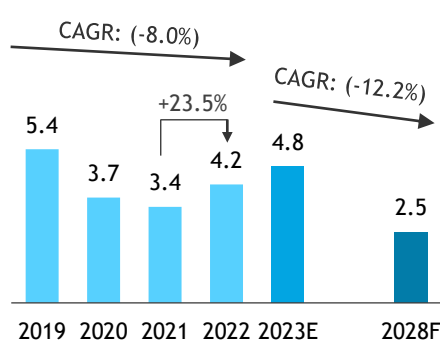
Over 2018-2022, the volume of investments in oil and gas extraction in the UK decreased, caused mainly by the COVID-19 pandemic. Although investments started to recover in 2022, they remained significantly below the pre-pandemic level due to the introduction of the ‘windfall tax’.

Investments in the oil and gas extraction in the UK, (£bn)



Capital expenditure by UK oil and gas companies is expected to rise due to the approval of new North Sea oil and gas production licences. However, future licensing will depend on the 2024 general elections and the political environment.

Capital expenditures of the UK oil and gas companies, (£bn)



The UK’s Energy Profits Levy (windfall tax) imposes an additional 35% tax rate on North Sea oil and gas production, which takes the overall tax burden to 75%.
The deployment of the tax generally met negative perceptions among oil and gas establishments due to concerns regarding its effect on the investment climate and profitability of the sector.

Key investment challenges of the UK oil and gas sector

Inconsistent political support

The Labour Party may suspend new drilling permits if it wins the election in 2024.

Regulatory delays

Difficulties with necessary permits, such as lengthy procedures for obtaining production licences.

High tax rates

The total tax burden with windfall tax introduction amounts to 75%.

Lack of supply chain capacity

Two out of three OEUK¹ companies indicated hurdles to attract investment in supply chain capacity improvements.

Cost increases

In 2023, inflation pushed operating costs of oil and gas companies in the UK up by 15% YoY.

Skilled labour shortage

Workers are looking elsewhere amid the uncertainty caused by the transition to zero emissions.

Key investment challenges of the UK oil and gas sector



Domestic production constraint

The Windfall tax may negatively affect domestic oil and gas production volume increasing the country’s reliance on foreign supply.



Pressure on investment climate

Windfall tax may deter investment in new projects as companies may not consider them economically viable due to higher tax rates when obtaining a license.



Risk of layoffs

As companies face diminished profitability and scale down investments in new projects, this may lead to substantial job cuts.

85% possible gap between consumption and production of oil and gas in the UK by 2030.



TotalEnergies² will reduce its investments in the North Sea by **25% in 2023**.



Harbour Energy³ confirmed a **cut of 350 onshore jobs** due to the windfall tax.

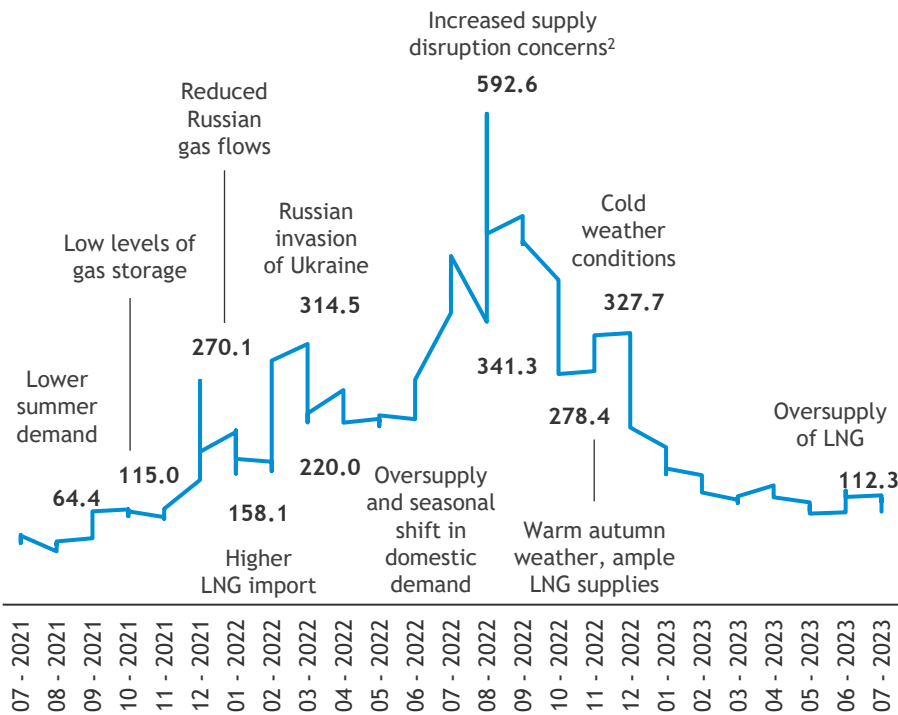
Source: NSTA website; The UK Government website; Statista website; Offshore Energies UK – Business Outlook – [2022]; Media overview

Notes: (1) Offshore Energies UK, a trade association of the maritime energy industry in the UK; (2) A French-based producer of oil, gas, renewables, and other energy sources; (3) The UK-based oil and gas production company



7. Wholesale oil and gas prices are going down in the UK, and this trend is likely to continue

UK gas prices: wholesale forward delivery contracts – weekly average (pence per term¹)



Speculation around Russian gas supplies has had a substantial impact on UK gas prices. Russia's reduction of gas exports to Europe by 25% at the end of 2021, pushed UK wholesale gas prices to unprecedented levels. The subsequent Russian invasion of Ukraine, embargo discussions, and concerns about supply disruptions continued to push up UK gas prices through 2022.

Since September 2022, ample stock levels, warm weather conditions and import diversification have all helped drive down UK gas prices. European countries are working to fill gas storage facilities with worldwide LNG supplies to reduce their dependence on Russian gas. This eases concerns about shortages and increases optimism about replacing Russian supplies for the Winter of 2023-2024.

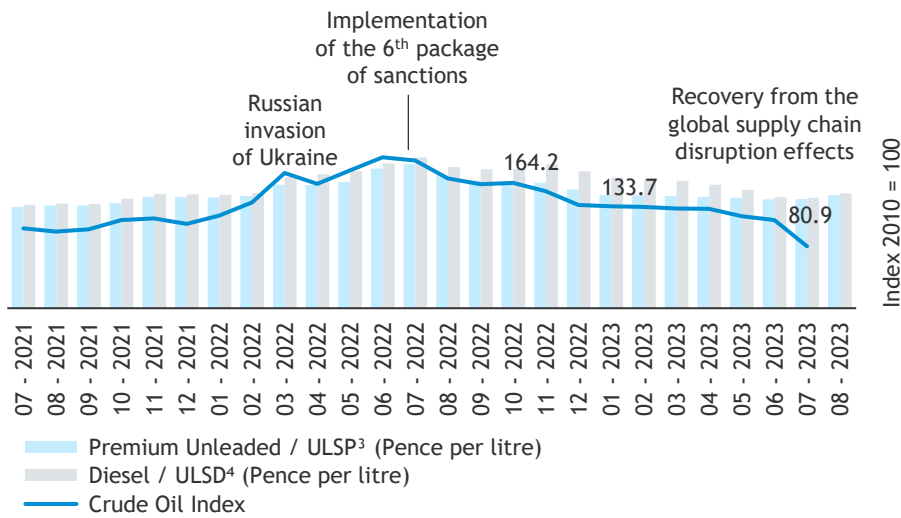
In the first half of 2022, oil prices rose steadily reflecting an underlying increase in demand combined with lower than expected supply from OPEC⁵. The Russian invasion of Ukraine and the 6th package of sanctions against Russia⁶ fuelled the growth in oil prices.

Since June 2022, crude oil prices have decreased as the world has adjusted.

In August 2023, both ULSP and ULSD prices showed a slight rise of 4% compared to the previous month due to the tighter supplies from Saudi Arabia and investor concerns over a potential drop in global demand.

The hundreds of new licences for oil and gas exploration in the North Sea issued by the UK Government may ensure better energy security.

Price indicators for crude oil and oil products in the UK (pence per litre)



Source: House of Commons – Domestic Energy Prices – [June 2023]; House of Commons – Oil Prices – [November 2022]; The Office of Gas and Electricity Markets website; The UK Government website; Media overview
 Notes: (1) A unit for quantity of heat that equals 100,000 British thermal units; (2) Temporary shutdown of the Gazprom pipeline between Germany and the UK due to maintenance; (3) Ultra-Low-Sulphur Petrol that is commonly used at petrol stations across the UK; (4) Ultra-Low-Sulphur Diesel that is commonly used at petrol stations in the UK; (5) The Organisation of the Petroleum Exporting Countries; (6) The package was adopted in June 2022 and implied an import ban on all Russian seaborne crude oil and petroleum products



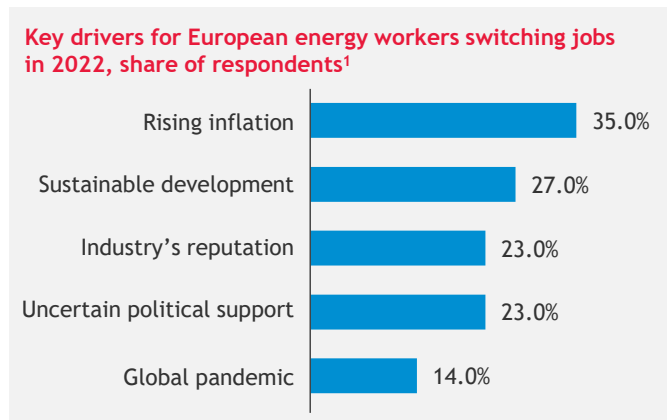
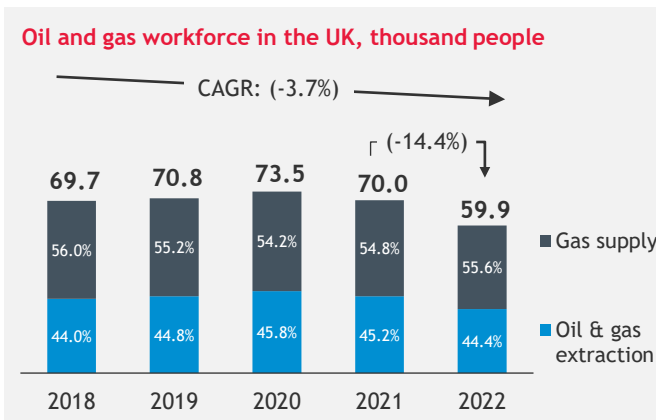
8. The ageing and underskilled workforce affected the oil and gas sector development

Employment trends in the UK as of H1 2023 compared to H1 2022

Workforce share in total population	79.8% ▼ (-0.1 p.p.)	Employment rate	61.1% ▲ (+0.2 p.p.)	Economic inactivity rate	36.3% ▼ (-0.4 p.p.)
-------------------------------------	------------------------	-----------------	------------------------	--------------------------	------------------------

Through 2018-2022, the oil and gas industry in the UK experienced a decline in workforce numbers. Inflation, concern about sustainable development and the industry’s poor reputation were the primary reasons for the people leaving the industry in 2022.

In 2023, the UK Government announced a £16bn plan to create 250,000 jobs in low-carbon industries. This plan may prompt employees of oil and gas companies to seek alternative employment opportunities in the renewables and low-carbon sectors.



Top skills required by the oil and gas sector by 2027, the share of respondents²

64% Analytical thinking	41% Creative thinking	36% Leadership and social influence	32% AI and Big Data	32% Motivation and self-awareness
--------------------------------	------------------------------	--	----------------------------	--

The oil and gas sector will need to improve working conditions and retrain staff to retain employees. In 2021, almost 90% of oil and gas companies in the UK struggled with a lack of skilled applicants.

The sector’s ageing workforce makes it more conservative and is an obstacle for companies embarking on net-zero transition and digital transformation. In 2021, only 12% of the UK oil and gas employees were under 30.

Possible strategies to address employee shortages in the UK oil and gas sector

Training programmes for workforce The employees’ upskilling with ESG competence to enhance net-zero transition.	Benefits and compensation packages Employees seek better financial reward packages due to rising inflation.	Implementation of flexible work schedule The COVID-19 crisis changed employee behaviour towards flexibility.	Hiring professionals from the IT sector High-skilled IT specialists can ensure successful digital transformation.
---	---	--	---

Source: Department for Energy Security and Net Zero – UK Energy in Brief – [2023]; World Economic Forum – The Future of Jobs Report – [2023]; OEUK – Workforce Insight – [2022]; Media overview
 Notes: (1) According to a study conducted by Brunel and Oilandgasjobsearch.com, which collected over 24,000 data points from the global survey from August to November 2022; (2) Based on the global survey held by the World Economic Forum in the Future of Jobs Report 2023 among 6,1 million employees



8. The oil and gas sector in the UK is facing a shift towards a digital and low-carbon future

Market trends and developments

- 1 Transition to low-carbon future**
 The UK Government has increased pressure on the oil and gas industry with its commitment to achieving net-zero by 2050. In April 2022, the UK Government published a British Energy Security Strategy, which encourages energy companies to develop new clean technologies such as hydrogen and carbon capture storage. In addition, NSTA launched the first carbon storage licensing round in June 2022, offering 13 areas in the North Sea.
- 2 Rising number of collaborations**
 UK oil and gas companies are actively exploring collaboration opportunities to improve their operational efficiency and drive innovations. For instance, in 2023, Stanlow Terminals Ltd.¹ and Eni UK Ltd.² partnered to study carbon capture, storage, and transportation projects in the UK. The goal was to create accessible carbon emission terminals for various industry players.
- 3 The growing value of cybersecurity**
 The oil and gas industry is one of the critical infrastructure sectors in the UK that is increasingly vulnerable to cyber-attacks. In 2021, cyber-attacks in the energy sector accounted for 24% of the total number in the UK. Many energy companies are striving to improve their security processes. For instance, Harbour Energy³ ordered external services to test the security of its facilities. The company also uses penetration tests and phishing simulations as well as providing training to its cybersecurity teams.
- 4 Digital transformation**
 Advanced digital technologies, such as AI⁴ and digital twins⁵, are transforming operations of the oil and gas sector in the UK, enabling companies to optimise their asset performance, reduce operating costs and personalise drilling plans.

 To date, Shell has used over 160 AI projects throughout its oil and gas supply chain to improve exploration and drilling techniques and minimise gas extraction expenses.

Major sustainable developments in the UK oil and gas market

Key insights of the first carbon storage licensing round in the UK

In May 2023, the NSTA announced the winners of the UK's first carbon storage licences, which can contribute to storing around 10% of annual emissions in the UK by 2030.

12 companies | **20** carbon storage licences | **12,000 km** in the North Sea

Selected sustainable initiatives of oil and gas companies in the UK



Shell will invest up to £12bn⁶ over 2023-2025 in various low-carbon energy solutions, including biofuels, hydrogen, carbon capture, and storage sites.



In 2023, bp invested in Advanced Ionics⁷ for future partnership, aiming to implement green hydrogen technologies in its product portfolio.

Key indicators of sustainable development in 2022

£20bn budget of the UK Government for carbon capture and storage projects by 2043 | **Over 2% reduction** in CO₂ emissions in the UK in 2022 vs 2021, up to 332 million tonnes | **26,648 ktoe⁸** renewable energy use, which grew by 5% in 2022 compared to 2021

Source: The UK Government website; Shell website; bp website; Offshore Technology website; Oil & Gas IQ website; Media overview.

Notes: (1) The UK-based oil and gas storage company; (2) The UK-based oil and gas producer; (3) The UK-based oil and gas production company; (4) Artificial intelligence;

(5) A digital copy of a physical object; (6) The numbers are converted from USD to GBP due to the average annual exchange rate by the Office for National Statistics;

(7) The US-based start-up developing green hydrogen technologies; (8) Thousand tonnes of oil equivalent.



9. The UK's oil and gas sector is to prioritise ESG, technology, and people to address challenges

Oil & gas sector's highlights in 2022

55%

of global energy consumption is supplied by oil and gas

£4.7tn

annually required funding to enable global energy transition by 2050

Key strength of oil & gas companies



Plentiful capital

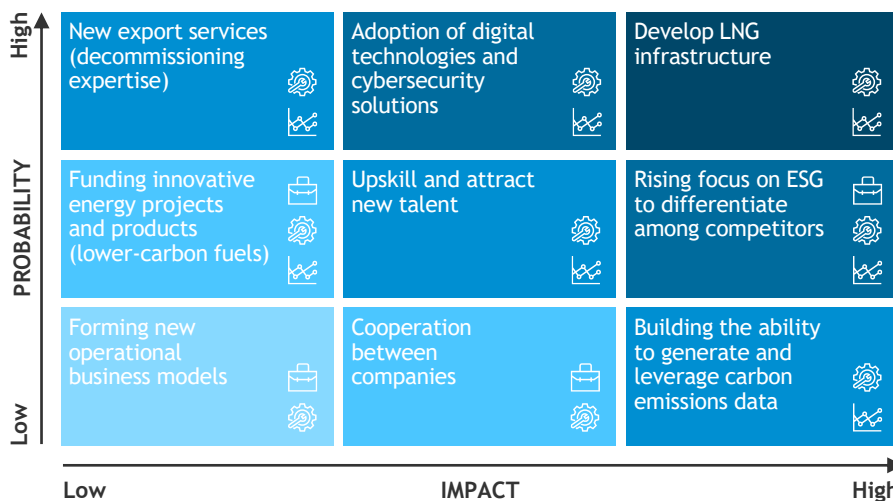


High technical expertise



Most harmonised global supply chains

Opportunity matrix for the oil and gas industry in the UK



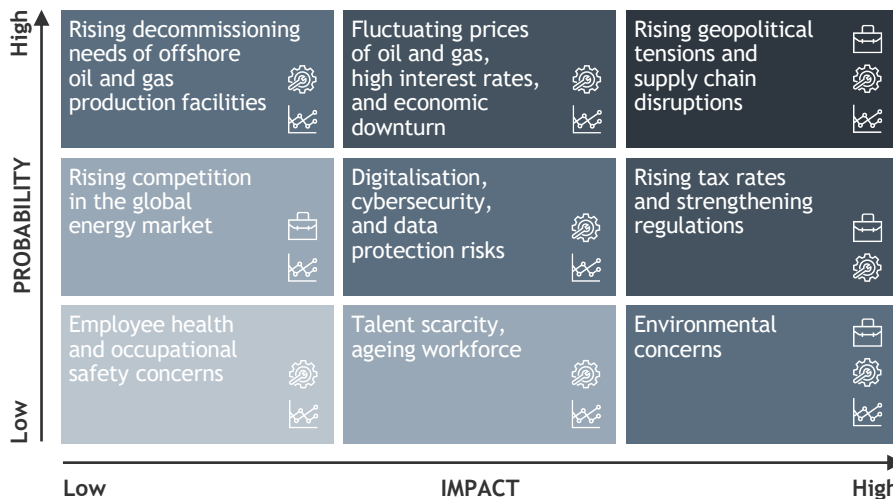
Key: Impact on

- Portfolio
- Operation efficiency
- Investments

Key future needs

- ▶ In 2022, **55%** of energy companies worldwide plan to invest in advanced technologies in the coming years.
- ▶ As of 2022, **67%** of UK oil and gas workers required upskilling to succeed in low-carbon energy roles.
- ▶ Global offshore decommissioning demand is projected at almost **£80bn** by 2030.

Risk matrix for the oil and gas industry in the UK



Key future challenges

- ▶ **Oil and gas prices** in the UK are expected to decrease by 2027 but will **fluctuate** and **stay higher** than the price level in 2021.

Average prices	2021	2022	2023F	2027F
(£ per term)	1.2	2.6	1.5	1.3
(£ per barrel)	51.5	80.1	66.4	60.6

- ▶ The **oil and gas production** in the UK is projected to **decrease at a CAGR of 7%** during 2022-2028¹.
- ▶ Due to the ageing workforce, **80,000 retirements** are expected in the UK oil and gas by 2035.

Source: BP – Annual Report – [2022]; KPMG – Building and Sustaining Resilience: The 2022 Energy CEO Outlook – [2023]; Shell – Annual Report – [2022]; EY – Five Ways Oil and Gas Can Lead the Race to Decarbonisation – [2022]; The UK Government website; Statista website; Media overview.

Notes: (1) Due to the North Sea Transition Authority.

FOR MORE INFORMATION:

Matt Crane

UK Head of Natural Resources
and Energy

matt.crane@bdo.co.uk

This publication has been carefully prepared, but it has been written in general terms and should be seen as containing broad statements only. This publication should not be used or relied upon to cover specific situations and you should not act, or refrain from acting, upon the information contained in this publication without obtaining specific professional advice. Please contact BDO LLP to discuss these matters in the context of your particular circumstances. BDO LLP, its partners, employees and agents do not accept or assume any responsibility or duty of care in respect of any use of or reliance on this publication, and will deny any liability for any loss arising from any action taken or not taken or decision made by anyone in reliance on this publication or any part of it. Any use of this publication or reliance on it for any purpose or in any context is therefore at your own risk, without any right of recourse against BDO LLP or any of its partners, employees or agents.

BDO LLP, a UK limited liability partnership registered in England and Wales under number OC305127, is a member of BDO International Limited, a UK company limited by guarantee, and forms part of the international BDO network of independent member firms. A list of members' names is open to inspection at our registered office, 55 Baker Street, London W1U 7EU. BDO LLP is authorised and regulated by the Financial Conduct Authority to conduct investment business.

BDO is the brand name of the BDO network and for each of the BDO member firms.

BDO Northern Ireland, a partnership formed in and under the laws of Northern Ireland, is licensed to operate within the international BDO network of independent member firms.

Copyright © October 2023 BDO LLP. All rights reserved.
Published in the UK.

www.bdo.co.uk