



Department for
Business, Energy
& Industrial Strategy

Statutory Security of Supply Report 2022

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Presented to Parliament pursuant to Section 172 of
the Energy Act 2004 as amended by Section 80 of the
Energy Act 2011

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Introduction

1. This report discharges the Government's and GEMA's respective obligations under section 172 of the Energy Act 2004 as amended by section 80 of the Energy Act 2011, including the Government's obligation to report annually to Parliament on the availability of electricity and gas for meeting the reasonable demands of consumers in Great Britain (GB).
2. The technical data presented here has been produced from analysis conducted by the Department for Business, Energy & Industrial Strategy (BEIS), Ofgem and National Grid. The statistics underpinning this document are for GB only where possible. However, in some cases where it is not possible to split the GB data out from the United Kingdom (UK) data, UK statistics have been used. Where this is the case, they have been referred to as UK in the accompanying text.

Electricity

Introduction

3. GB's electricity system has delivered secure electricity supplies to date. Following the publication of the Net Zero Strategy in 2021, which set out the Government's ambition to deliver a secure, affordable and decarbonised power system, in 2022 the Government published the British Energy Security Strategy (BESS). The BESS sets out the Government's ambition to accelerate clean, domestic sources of energy in order to reduce GB's exposure to volatile global energy markets, particularly following Russia's illegal invasion of Ukraine. This includes ambitions to deliver up to double the ambition for low-carbon hydrogen production capacity to 10GW by 2030, and delivering up to 24GW of nuclear power by 2050.¹

Security of supply

4. The Government's reliability standard for security of electricity supply is expressed as a Loss of Load Expectation (LOLE) of three hours per year. LOLE represents the number of hours per year in which supply is expected on average to be lower than demand under normal operation of the system. It is important to note that the LOLE metric is not a measure of the expected number of hours in which customers may be disconnected but represents periods where the system operator may be expected to employ mitigation actions available to it.²
5. National Grid Electricity System Operator's (ESO) Winter Outlook Report for 2022/23 forecasts a capacity margin of 3.7 GW in the base case, equivalent to 6.3%, with a LOLE of 0.2 hours/year.³

¹ <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

² Use of LOLE is a probabilistic approach – the actual amount will vary depending on the circumstances in a particular year, e.g. how cold the winter is; the number of plants experiencing unplanned outages; the power output from wind generation at peak demand; and all the other factors which affect the balance of electricity supply and demand.

³ <https://www.nationalgrideso.com/research-publications/winter-outlook>

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6. This margin is on an underlying demand basis, which aligns with how the ESO calculates the Capacity Market (CM) target capacity recommendations in its annual Electricity Capacity Report.
 7. Russia's illegal invasion of Ukraine has resulted in increased volatility in energy prices in 2022, and wholesale gas and electricity prices are expected to remain high this winter. The Government continues to work closely with Ofgem, National Grid and all relevant stakeholders to monitor the energy supply horizon, and to ensure gas and electricity system operators have the right tools so the market can respond to fluctuations in supply and demand.
 8. The ESO's 2022/23 Winter Outlook Report forecasts that there will be sufficient electricity capacity to meet peak demand this winter, and the ESO has the necessary tools to manage any operability requirements.
 9. The Government and the ESO have also taken a range of mitigating actions to strengthen GB's electricity security for winter 2022/23. The Government increased the target for the 2022/23 T-1 Capacity Market auction (held in February 2022) to secure the maximum amount of capacity available,⁴ the ESO has contracted to retain around 2GW of coal-fired generation on the system this winter which would otherwise have closed, and the ESO has also launched an innovative Demand Flexibility Service to incentivise customers to reduce consumption at periods when margins are tight.⁵
 10. The Net Zero Strategy (published in October 2021) set out the Government's commitment to deliver a decarbonised power sector by 2035, such that all GB's electricity will come from low carbon sources by 2035, subject to security of supply.⁶ In 2022, the Government launched the Review of Electricity Market Arrangements (REMA) following a commitment in the British Energy Security Strategy. REMA is a major review into Britain's electricity market design to radically enhance energy security and to help deliver our world-leading climate targets whilst reducing exposure to international gas markets. A consultation on REMA ran between July and October 2022.⁷
 11. The Government is also considering more immediate reforms to the Capacity Market to improve assurance that capacity will deliver when required and to better align the mechanism with net zero. A summary of responses to the 2021 Call for Evidence on these topics was published in July 2022, and a follow-up consultation is intended in winter 2022/23.⁸

Electricity Networks

Current network reliability

⁴https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1049359/capacity-market-auction-parameters-2022.pdf

⁵ See <https://www.nationalgrideso.com/research-publications/winter-outlook>

⁶ <https://www.gov.uk/government/publications/net-zero-strategy>

⁷ <https://www.gov.uk/government/consultations/review-of-electricity-market-arrangements>

⁸https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1091735/capacity-market-2021-cfe-summary-responses.pdf

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12. The historic overall reliability of supply for the electricity networks (both transmission and distribution) has been high, with reliability for the transmission network at 99.999612% for financial year 2021-22.⁹
 13. As part of the price control process, Ofgem sets target and incentive rates for the number of customer interruptions and customer minutes lost for each Distribution Network Operator (DNO). The Interruptions Incentive Scheme incentivises DNOs to invest in and operate their networks to manage and reduce the frequency and duration of power cuts experienced by their customers, whilst maintaining focus on minimising network costs and securing optimal value for consumers.
 14. The standards encourage DNOs to meet certain expected levels of service and to provide payments to end customers in the event of individual standards not being met. The standards cover a range of activities, including restoring supply during an unplanned interruption and providing notice periods for planned interruptions. All DNOs met their Interruptions Incentive Scheme targets for unplanned interruptions in 2020-21, with the exception of National Grid Electricity Distribution in the South West region. Customer interruptions have thus far fallen by 10% throughout RIIO-ED1 (the current price control covering the period 2015-2023) and the duration of interruptions has reduced by 7%.¹⁰
 15. Offshore Transmission Systems connect offshore generation (such as wind) to the wider National Electricity Transmission System. The regulatory system for Offshore Transmission Owners is distinct from that of Onshore Transmission Owners because regulatory performance incentives are based on system availability, rather than loss of supply. This ensures offshore generators are able to export energy with minimal disruption. For the financial year 2021-22, the annual system availability of offshore networks was 98.99% according to figures provided by ESO.¹¹

Future development of electricity networks

16. In August 2022, the government and Ofgem jointly published the Electricity Networks Strategic Framework. This sets out a shared vision for the transformation of the electricity network that will ensure it can act as an enabler for a clean, secure and low-cost energy system.¹²
17. To continue providing a reliable electricity system and to facilitate the transition to net zero, networks require ongoing investment. Ofgem's price control settlements through its RIIO (Revenue = Incentives + Innovation + Outputs) model are ensuring this investment takes place, while driving further efficiency savings. The 2021 to 2026 transmission price control (RIIO-T2) started on 1 April 2021. The Final Determinations show a lower annual rate of approved funding than in RIIO-T1 but include the potential for significant additional investment through flexibility mechanisms. Ofgem has approved funding of up to £9.9bn for expanding, replacing, and maintaining the Transmission network for RIIO-T2, with a further £8bn available through flexibility mechanisms.

⁹ <https://www.nationalgrideso.com/document/267701/download>

¹⁰ https://www.ofgem.gov.uk/sites/default/files/2022-03/RIIO_ED1%20Network%20Performance%20Summary%202020-21.pdf

¹¹ <https://www.nationalgrideso.com/document/267701/download>

¹² <https://www.gov.uk/government/publications/electricity-networks-strategic-framework>

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18. Transmission owners provide quarterly updates on their major projects to BEIS and Ofgem. The latest update shows that 600 MW of network capacity is under construction, with 11.35 GW delivered since February 2012.¹³
19. The 2015 to 2023 price control for the Distribution Network is ongoing. There are 14 regional electricity DNOs that are regulated through RII0-ED1. Ofgem has approved overall funding of £29.6bn (in 2020 prices) across GB for the period 1 April 2015 to 31 March 2023.¹⁴ This represents a major investment in the distribution network. Ofgem has published its Draft Determinations for the second price control period, RII0-ED2, with Final Determinations published by the end of 2022.¹⁵

Interconnection

20. GB currently has 8.4 GW of electricity interconnector capacity across eight interconnectors:
- 4 GW to France: IFA 2GW, IFA2 1GW, and ElecLink 1 GW, operational since 1986, 2020 and 2022 respectively
 - 0.5 GW to Northern Ireland: Moyle, operational since 2002
 - 1 GW to Netherlands: BritNed, operational since 31 March 2011
 - 0.5 GW to Ireland: EWIC, operational since 20 September 2012
 - 1 GW to Belgium: Nemo Link, operational since 31 January 2019
 - 1.4GW to Norway: NSL, operational since 1 October 2021
21. A high level of outages in the French nuclear fleet has been considered in the modelling for NGESO's Winter Outlook Report for winter 2022/23, which notes that these outages may result in increased exports to France and imports to Great Britain not being available when they are needed. Two additional mitigation strategies are available to the ESO this year, the availability of additional coal generation capacity, and the Demand Flexibility Service, which could be deployed in this scenario.¹⁶
22. There are three projects under construction, which will add a further 3.3 GW of capacity bringing the total to 11.7GW:
- 1.4 GW to Denmark: Viking Link scheduled for completion in December 2023
 - 0.5 GW to Ireland: Greenlink scheduled for completion in June 2024
 - 1.4 GW to Germany: NeuConnect scheduled for completion in 2028
23. Ofgem's Cap and Floor (C&F) regime, launched in 2014, has proven successful in encouraging investment in interconnection. Ofgem introduced investment rounds, estimating that the net total quantifiable impact on GB consumer welfare from Window 1 projects assessed at the initial project assessment (IPA) stage was £13.6 bn, and the equivalent impact for Window 2 projects was £8.9 bn.¹⁷
24. The total capacity of interconnectors in operation and under construction or development with a regulatory agreement from Ofgem is 15.9 GW.

¹³https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1098021/transmission-owner-major-projects-december-2021.pdf

¹⁴ <https://www.ofgem.gov.uk/publications/riio-1-electricity-distribution-annual-report-2019-20>

¹⁵ <https://www.ofgem.gov.uk/sites/default/files/2022-06/RIIO-ED2%20Draft%20Determinations%20Overview.pdf>

¹⁶ <https://www.nationalgrideso.com/research-publications/winter-outlook>

¹⁷ <https://www.ofgem.gov.uk/publications/interconnector-policy-review-working-paper-workstream-1-review-cap-and-floor-regime>

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25. In the Energy White Paper, published December 2020, we stated our ambition for at least 18 GW by 2030. In December 2021 Ofgem concluded their Interconnector policy review (IPR) and announced a third investment application window (1 September to 10 January 2023) for new interconnector projects to come forward to deliver against this ambition.
 26. In parallel, Ofgem also launched a multi-purpose interconnector (MPI) pilot scheme combining connections to offshore wind with connections to other markets.
 27. GB has historically been a net importer of electricity. However, GB switched to being a net exporter in Q2 2022 with net exports of 3.7TWh. Compared to Q1 2022, gross imports decreased by over 60% to 2.5TWh and gross exports increased to 6.1TWh.¹⁸

Capacity Market

28. The purpose of the CM is to ensure security of GB's electricity supply at least cost to consumers, by providing all forms of capacity with the right incentives to be on the system and to deliver electricity when needed. The CM ensures there is sufficient reliable capacity available during periods of electricity system stress, for example during cold, still periods with high demand and low wind generation.
29. The CM works by allowing eligible capacity providers to bid into a competitive auction to provide capacity. Successful capacity providers receive a steady payment to ensure enough capacity is in place to meet demand at times of system stress. These capacity payments incentivise the necessary investment to maintain and refurbish existing capacity, and to finance new capacity where necessary. Capacity providers face penalties if they fail to deliver against their capacity obligation – to provide electricity, or reduce demand, when required during a System Stress Event.
30. The CM is technology neutral – it does not seek to procure allocated volumes of capacity from specific types of technology. All types of technology are able to participate – except for capacity providers in receipt of support from other specific policy measures – provided they can demonstrate sufficient technical performance to contribute to security of supply, and provided they comply with the Capacity Market's emissions limits.¹⁹

Capacity Auctions

T-1 Auction results for 2022/23

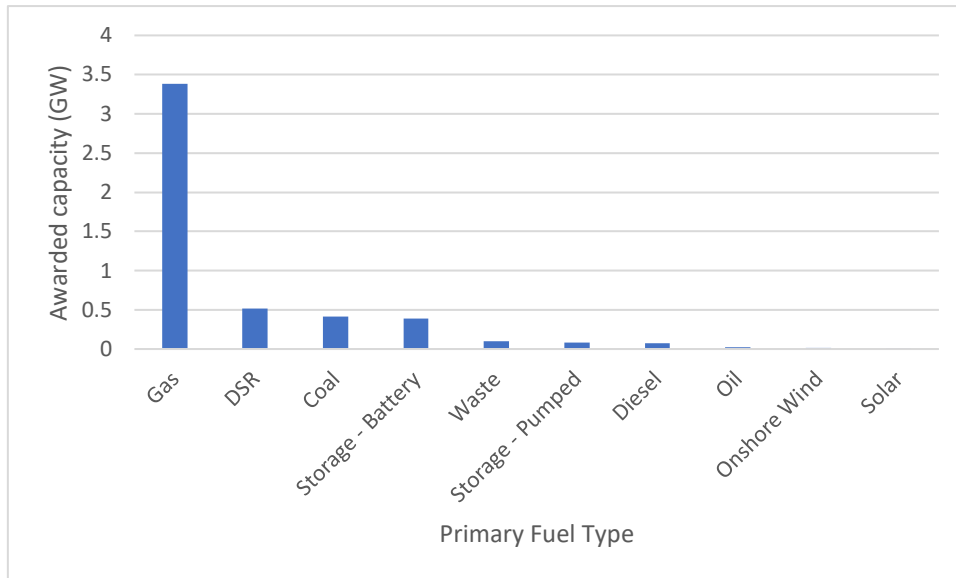
31. The T-1 auction for delivery in 2022/23 concluded on 15 February 2022 and secured 5GW of de-rated capacity at a clearing price of £75/kW per year.²⁰ All 5GW of de-rated capacity that entered the auction received capacity agreements for delivery.

¹⁸ BEIS (2022) Energy Trends: UK electricity – table 5.6 <https://www.gov.uk/government/statistics/electricity-section-5-energy-trends>

¹⁹ <https://www.gov.uk/government/publications/carbon-emissions-limits-in-the-capacity-market>
²⁰ <https://www.emrdeliverybody.com/Capacity%20Markets%20Document%20Library/T-1%20DY%2022-23%20Final%20Auction%20Results%20Report.pdf>

62% of awarded capacity is from existing generation capacity, and 27% from new build generation capacity. The remaining capacity was awarded to unproven demand side response (DSR) (8%) and proven DSR (3%).

Figure 1. T-1 Auction results breakdown of Capacity Agreements awarded by fuel type

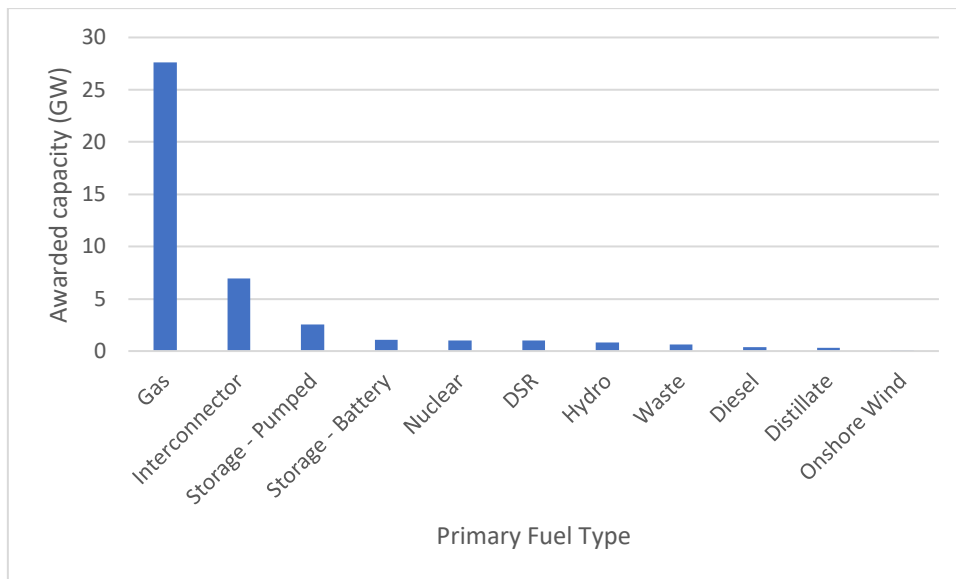


T-4 Auction results for 2025/26

32. The T-4 auction for delivery in 2025/26 concluded on 22 February 2022 and secured 42.4GW of de-rated capacity at a clearing price of £30.59/kW per year.²¹ A total of 48.6GW of de-rated capacity entered the auction, of which 87% received capacity agreements for delivery. 76% of awarded capacity is from existing generation capacity, 5% from new build generation capacity, 10% from existing interconnectors, and 7% from new build interconnectors. The remaining capacity was awarded to unproven DSR, proven DSR and refurbishing generation capacity.

Figure 2. T-4 Auction results breakdown of Capacity Agreements awarded by fuel type

²¹ <https://www.emrdeliverybody.com/Capacity%20Markets%20Document%20Library/T-4%20DY%2025-26%20Final%20Auction%20Results%20Report%20v1.0.pdf>



Capacity Market Payments

33. The Electricity Settlements Company's (ESC) records show that £856m was paid out to CM agreement holders for Delivery Year 2021/22. In the Financial Year 2021/22, ESC received £2m in termination charges (compared to £1m in FY 2020/21).²² 2.9GW of de-rated capacity with agreements beginning in Delivery Year 2021/22 was terminated prior to delivery.²³

Improvements to the Capacity Market

34. Ofgem ran a consultation between 26 November 2021 and 15 January 2022 seeking views on their minded-to position on three policy areas: Evergreen Prequalification, Capacity Market Register ("CMR") and Applicant Notices²⁴. In this consultation, Ofgem prioritised consulting on proposals which would directly impact the functionality of the new EMR Portal for the Prequalification process. This resulted in a decision on 25 February 2022, which provided a summary of the decision to progress with the implementation of all the proposals Ofgem consulted on. The necessary Rules changes were made in February 2022.²⁵

35. In June 2022, the government consulted on two time-limited amendments to the Capacity Market Rules to improve auction liquidity.²⁶ A summary is provided below, and full details can be found in the consultation document. The following changes were implemented through time-limited amendments to the Rules in July 2022 which:

- Postponed the requirement for independent verification of Fossil Fuel Emissions Declarations until the 2023 Prequalification Window. This measure mitigates the risk of Applicants failing to prequalify for the 2023 Capacity Market auctions due to a potential inability to access emissions verification services.

²² <https://www.lowcarboncontracts.uk/annual-reports>

²³ <https://www.emrdeliverybody.com/CM/Registers.aspx>

²⁴ Consultation on Capacity Market Rule amendments (Evergreen, CMR and Applicant Notice) | Ofgem

²⁵ Decision on Capacity Market Rule amendments (Evergreen, CMR and Applicant Notice) | Ofgem

²⁶ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1081288/capacity_market_rules_amendments_to_improve_auction_liquidity.pdf

- Enabled plants which have been mothballed for more than 24 months to prequalify for auctions. This time-limited measure will help to remove barriers to prequalification for Capacity Market auctions for mothballed plant. The Government is now considering making a permanent change to the Rules to enable plant which have been mothballed for more than 24 months to prequalify for auctions, provided appropriate delivery assurance safeguards are in place.

36. The Government is also considering more immediate reforms to the Capacity Market to improve assurance that capacity will deliver when required and to better align the mechanism with net zero. A summary of responses to the 2021 Call for Evidence on these topics was published in July 2022, and a follow-up consultation is intended in winter 2022/23.²⁷

Demand

37. Figure 3 shows the historic and forecast trends of underlying peak electricity demand from ESO. This includes demand met by generation which is connected to the transmission network as well as embedded generation (generation that is connected directly to the distribution network) above 1MW.

38. ESO has published four scenarios for electricity demand to 2050 as part of its Future Energy scenarios (FES) project:²⁸

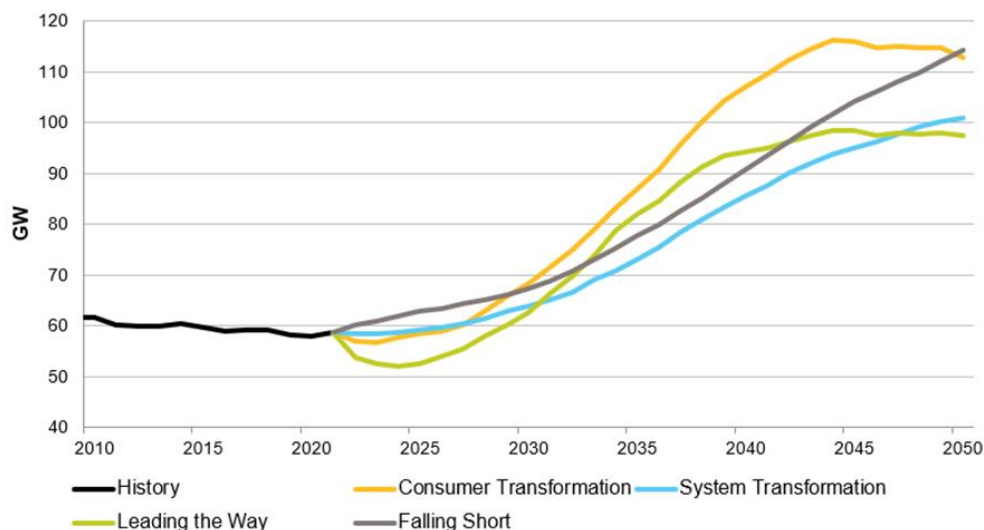
- a) The Consumer Transformation and System Transformation scenarios represent two different ways to reach net zero by 2050 - either by changing the way energy is used or by changing the way in which it is generated and supplied.
- b) In Leading the Way, a combination of high consumer engagement and world-leading technology and investment help to enable the ESO's fastest credible decarbonisation journey. In this scenario, GB reaches net zero in 2047 and goes on to reduce emissions by around 104% by 2050 (compared to 1990 levels) - in other words, it is net negative.
- c) Decarbonisation happens slowest and net zero is not reached in Falling Short,
- d) where 2050 emissions are reduced by around 78% of 1990 levels.

Figure 3. Peak electricity demand (including losses)²⁹

²⁷https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1091735/capacity-market-2021-cfe-summary-responses.pdf

²⁸ <https://www.nationalgrideso.com/future-energy/future-energy-scenarios>

²⁹ <https://www.nationalgrideso.com/future-energy/future-energy-scenarios>



Demand Side Response

38. Demand Side Response (DSR) refers to action taken by consumers in response to a signal (such as price) to reduce or increase the amount of electricity they take off the grid at a particular time. DSR can help consumers save money and improve system efficiency, by using electricity at times that are beneficial to the system and being rewarded for doing so. It supports the integration of intermittent renewables and helps defer or avoid the need for costly network upgrades and new generation capacity.
39. Flexibility from technologies such as DSR, energy storage, smart charging of electric vehicles, flexible heating systems and interconnection could save up to £10 billion (2012 prices) per year by 2050 by reducing the amount of generation and network needed to decarbonise.³⁰ The Government is removing barriers to the increased participation of consumers in DSR through actions set out in the 2021 Smart Systems and Flexibility Plan.³¹
40. Today, industrial and commercial consumers are providing around 1.3GW of DSR to the system.³² Participation from domestic and smaller non-domestic consumers remains at an early stage, but we expect electric vehicle charging, energy smart appliances and electric heating to provide a significant source of flexibility over the next decade and beyond.
41. Following amendments made to the Capacity Market legislation following the Future Improvements consultation,³³ DSR can now prequalify to bid for agreement lengths

³⁰ Smart Systems and Flexibility Plan (2021)

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1003778/smart-systems-and-flexibility-plan-2021.pdf

³¹ Smart Systems and Flexibility Plan (2021)

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1003778/smart-systems-and-flexibility-plan-2021.pdf

³² Winter Review and Consultation, National Grid Electricity System Operator, 2022,

<https://www.nationalgrideso.com/document/261721/download>

³³ <https://www.gov.uk/government/consultations/capacity-market-proposals-for-future-improvements>

of up to fifteen years, if they can demonstrate they meet certain capital expenditure thresholds.

42. The table below shows the amount of DSR winning capacity agreements in T-4 auctions (held four years ahead of delivery).³⁴

Table 1. Outcomes for DSR in Capacity Market T-4 auctions

Year	2021-2022	2022-2023	2023-24	2024-2025	2025-2026
Awarded Capacity (MW)	1187	535	1170	1066	988

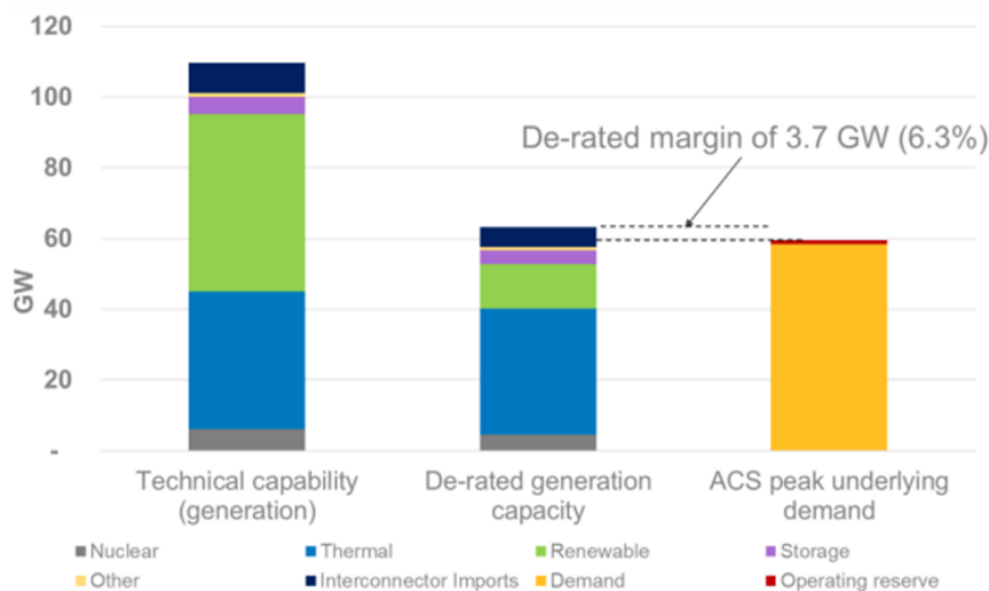
43. In response to increased volatility and uncertainty in energy markets following Russia’s illegal invasion of Ukraine, the National Grid Electricity System Operator has introduced a new Demand Flexibility Service for winter 2022/23. This service will allow consumers, as well as some industrial and commercial users (through suppliers/aggregators), to be incentivised for voluntarily flexing the time when they use their electricity, which will enable the ESO to access additional flexibility during peak winter days which is not currently accessible to the ESO in real time.³⁵

Supply

Present Capacity

44. The ESO’s 2022 Winter Outlook Report assumes a total maximum capacity of 109.6GW this winter (not taking account of any potential breakdown or outage).³⁶

Figure 4. Present Capacity (ESO’s 2022 Winter Outlook Report)



34 <https://www.emrdeliverybody.com/CM/Capacity%20Auction%20Information.aspx>

35 <https://www.nationalgrideso.com/industry-information/balancing-services/demand-flexibility>

36 <https://www.nationalgrideso.com/document/268346/download>

Electricity Storage

45. Electricity storage enables us to use electricity more flexibly and decarbonise our electricity system more cost-effectively. It can offer supply or demand to the electricity system within seconds to minutes alongside other technologies and forms of flexibility, to balance and maintain the integrity of the electricity system. This supports the integration of intermittent renewables and defers or avoids the need for costly network upgrades and new generation capacity. The Government is facilitating the deployment of storage at all scales through actions to remove barriers and reform markets as set out in the 2021 Smart Systems and Flexibility Plan.³⁷
46. According to the ESO there is currently around 5GW of electricity storage capacity in GB, with around 3GW from pumped hydro and around 2GW from battery storage.³⁸ There is a strong and growing electricity storage pipeline representing nearly 23GW of storage: 19GW of battery storage and 4GW of pumped hydro storage.³⁹
47. There is further potential for other storage technologies to deploy in future, such as those using novel battery technologies, compressed air and liquid air energy storage or gravitational storage. The Government will continue to support storage technologies by removing barriers, reforming markets and investing in innovation. The Government is currently supporting the deployment of novel storage technologies through the £68m longer duration energy storage (LODES) demonstration competition, which aims to support the commercialisation of first of a kind longer duration energy storage technologies.⁴⁰ Just over £7.4 million has been awarded to 24 Phase 1 projects across the two competition streams in three technology categories: electrical, thermal and power-to-x.⁴¹
48. Alongside this, Government published a Call for Evidence in July 2021,⁴² seeking evidence about barriers to the deployment of large-scale and long-duration electricity storage, and on different approaches for addressing these barriers. Government published a response in August 2022, alongside external analysis on the benefits of long duration storage,⁴³ and will ensure the deployment of sufficient large-scale and long-duration electricity storage to balance the overall system by developing appropriate policy to enable investment by 2024.

37 2021 Smart Systems and Flexibility Plan <https://www.gov.uk/government/publications/transitioning-to-a-net-zero-energy-system-smart-systems-and-flexibility-plan-2021>

38 National Grid ESO (2020), FES 2020, <https://www.nationalgrideso.com/future-energy/future-energy-scenarios/fes-2020-documents>

39 Figures taken from Renewable Energy Planning Database and include projects that have planning approval, submitted an application for planning or are currently under construction:

<https://www.gov.uk/government/publications/renewable-energy-planning-database-monthly-extract>

40 Longer Duration Energy Storage Demonstration (LODES) competition

<https://www.gov.uk/government/collections/longer-duration-energy-storage-demonstration-lodes-competition>

41 LODES competition successful projects: <https://www.gov.uk/government/publications/longer-duration-energy-storage-demonstration-programme-successful-projects>

42 Large-scale, Long-duration Electricity Storage Call for Evidence: Facilitating the deployment of large-scale and long-duration electricity storage: call for evidence (publishing.service.gov.uk)

43 Facilitating the deployment of large-scale and long-duration electricity storage: government response <https://www.gov.uk/government/consultations/facilitating-the-deployment-of-large-scale-and-long-duration-electricity-storage-call-for-evidence>

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49. Vehicle-to-X (V2X, where X could represent the home, a building or the grid) is an emerging technology enabling the export of energy from an EV battery, and so EVs to act as storage. There are trials worldwide involving hundreds of vehicles, but it is not yet at mass deployment. One estimate of Vehicle-to-Grid (V2G) from the National Grid Future Energy Scenarios (2022) suggests that by 2050, V2G could offer between 8-39 GW of flexible load for the GB electricity market (representing 6-18 % of total flexibility). The amount of available flexibility is likely to vary significantly across the day depending on the number of vehicles plugged in and charge point speed.⁴⁴
50. The UK is a world-leader in V2X energy technologies with a diverse range of innovation projects. BEIS and the Office for Zero Emission Vehicles (OZEV) provided £21m of funding to 20 projects in a Vehicle-to-Grid programme from 2018 to 2022, including feasibility studies, collaborative R&D and real-world demonstrators covering commercial and domestic users. A new £11.4m Vehicle-to-X innovation programme was launched in March 2022 and will run until 2025, as part of the Net Zero Innovation Portfolio's Flexibility Innovation Programme.⁴⁵
51. Alongside the Smart Systems and Flexibility Plan in July 2021, BEIS published a Call for Evidence, seeking views on the potential role of V2X, and the barriers preventing this. The feedback from the Call for Evidence is helping inform Government's next steps to facilitate this source of flexibility, and Government will publish a response this year.⁴⁶

Liquidity in the GB wholesale power market

52. Energy market firms buy and sell their electricity in the wholesale market. The wholesale market allows participants to trade a range of products that enable them to meet their obligation to supply energy whilst also enabling them to mitigate risk. The degree of access to these products relates to the liquidity of the market: low levels of market liquidity can be indicative of an uncompetitive market.
53. Poor liquidity in the wholesale market can prevent consumers from fully realising the benefits that competition can deliver in terms of downward pressure on bills, better service and greater choice. It can also obscure or weaken price signals, inhibiting long term investment decisions in new generating plants with negative consequences for security of electricity supply.
54. Following concerns by Ofgem and industry about the lack of liquidity in the wholesale electricity market, Ofgem activated the 'Secure and Promote' licence condition on 31 March 2014. Ofgem's monitoring of the market since 2014 showed mixed results with an improvement in peak load liquidity but no step change in churn.
55. On 18 November 2019, Ofgem suspended the Secure and Promote Market Making Obligation (MMO).⁴⁷ This followed consideration of the cost-implications of a two party MMO and likely impact on the policy's effectiveness from a further reduction in

44 Future Energy Scenarios 2022 <https://www.nationalgrideso.com/document/264421/download>

45 <https://www.gov.uk/government/publications/v2x-innovation-programme>

46 <https://www.gov.uk/government/consultations/role-of-vehicle-to-x-technologies-in-a-net-zero-energy-system-call-for-evidence>

47 <https://www.ofgem.gov.uk/publications/decision-suspend-secure-and-promote-market-making-obligation-effect-18-november-2019>

the number of obligated parties. The Secure and Promote Supplier Market Access Rules and Reporting Requirements remain in effect.

56. In December 2020, Ofgem announced that no further intervention to replace the MMO would be taken forward.⁴⁸ This followed an assessment⁴⁹ that concluded that, while liquidity in the GB wholesale electricity market is lower compared with other European markets, there is no evident market failure causing this low liquidity. This assessment also concluded that liquidity had not fallen to a level where further intervention would necessarily result in a net consumer benefit. This continues to be our position.
57. Ofgem has continued to monitor the market since suspension of the MMO. Monitoring shows:
- a) Traded volumes in the wholesale market were stable in the months following the suspension. However, total over-the-counter trading during Q1 to Q3 2020 fell to 59.6TWh, down from 65.2TWh during the same period in 2019, though this is more likely attributable to electricity demand shock and uncertainty owing to coronavirus as opposed to the suspension. Trading volumes have since continued a gradual downward trend through 2021 and 2022 so far, largely driven by falls in OTC traded volumes.
 - b) Churn (the number of times electricity which is generated in the market is subsequently traded) has also been on a steady downward trend, falling to an average of 2.2 in the first half of 2022, compared to 2.8 in the same period in 2021 and 3.6 in the equivalent period in 2019.
 - c) Bid-offer spreads have widened overall since the suspension of the MMO as they are no longer subject to a ceiling. So far this year, baseload spreads have narrowed compared to 2020 and 2021 to lower than 1%, which is above the spreads mandated by the MMO but remains in a medium to high liquidity range. Peak load products have widened to an average of 1.9% with some large differences between products, driven by lower traded volumes. This is above the historical average (2009 to 2013) of 1.4%.
58. In light of the above trends, Ofgem and BEIS continue to monitor and assess whether further intervention is required

Gas

Introduction

59. The gas market is crucial to the UK's energy supply because of its significance in heating, industry, and electricity generation. Around 25m households are connected to the gas grid in Great Britain.⁵⁰ In 2021, 37% of UK gas demand was from domestic

⁴⁸ <https://www.ofgem.gov.uk/publications/update-future-liquidity-policy>

⁴⁹ <https://www.ofgem.gov.uk/publications/update-liquidity-policy-review-publication-nera-economic-consulting-options-assessment-report>

⁵⁰ <https://www.gov.uk/government/statistics/sub-national-estimates-of-households-not-connected-to-the-gas-network>

consumers, 30% from electricity generation, and 18% from industrial and commercial users.⁵¹

60. Significant volatility has been seen in wholesale gas markets internationally since 2021, with gas trades reaching record highs at Great Britain's National Balancing Point (NBP). Government is continuing to monitor the effect this is having across sectors. The UK is connected to European gas markets and is therefore affected by changes to European gas flows, such as the recent reduction in Russian gas flows.

Supply

61. GB benefits from highly diverse and flexible sources of gas supply, with more than sufficient delivery capacity to meet demand. To date, the GB gas system has reliably delivered a secure supply.⁵²
62. UK supply sources include domestic production from the UK Continental Shelf (UKCS), which remains the largest single source of gas and met 42% of gas demand in 2021. Norway (Norwegian Continental Shelf (NCS)) continues to be one of our most important energy partners, meeting 41% of gas demand in 2021. Supply capacity of the UKCS and NCS is 117mcm/d and 141mcm/d respectively (see figure 5). As well as interconnectors with Belgium and the Netherlands, which met 5% of demand in 2021, the UK imports Liquefied Natural Gas (LNG), and has one of the largest regasification infrastructures in Europe, accounting for 19% of demand in the same period.⁵³
63. In 2021, imports of Russian liquified natural gas (LNG) accounted for 4% of the UK's gas supply. Following Russia's illegal invasion of Ukraine in February 2022, the UK has legislated to ban Russian LNG imports to the UK. The measure bans the import of LNG originating in, or arriving from, Russia. It also bans the acquisition of LNG in, or originating in, Russia with the intention of the LNG entering the UK. This will come into force on 1 January 2023. However, the impact on UK security of energy supply will be limited, as the last shipment from Russia to the UK arrived on 2nd March, which was the only delivery received after the invasion of Ukraine.
64. The UK's gas infrastructure is designed (taking into account operational measures) to meet the 1-in-20 peak aggregate daily demand.⁵⁴ The 1-in-20 security standard obligation does not apply directly to entry supplies although it is implicit that sufficient transportation capability must be made available such that the security standard can

51 Table 4.1

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1094422/DUKE_S_4.1.xlsx

52 All data is sourced from Digest of UK Energy Statistics unless otherwise specified, Digest of UK Energy Statistics

53 Diversity and security of gas supply in Europe, <https://www.gov.uk/government/publications/energy-trends-december-2021-special-feature-article-diversity-and-security-of-gas-supply-in-europe-2020>

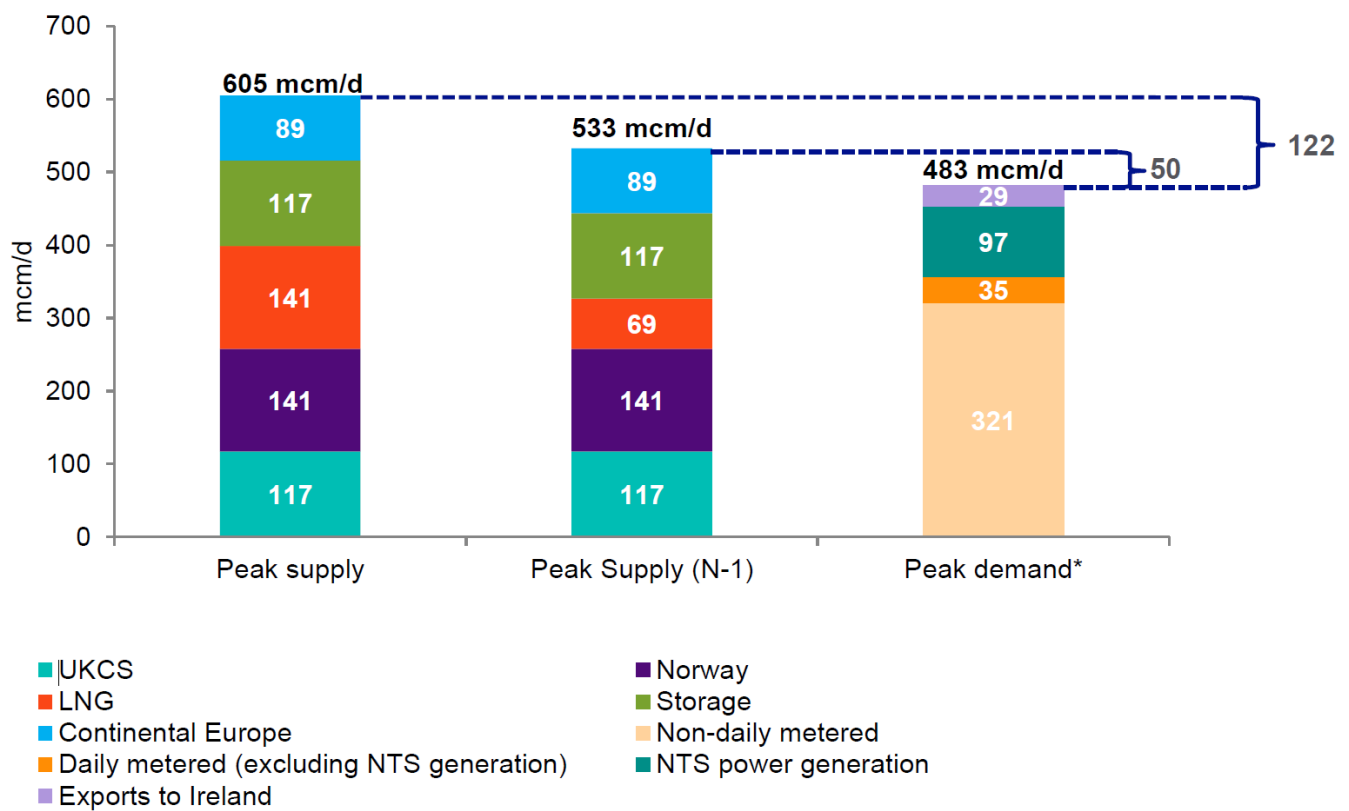
54 Where the 1-in-20 peak aggregate daily demand is the level of daily demand that, in a long series of winters, with connected load held at the levels appropriate to the winter in question, would be exceeded in one out of 20 winters, with each winter counted only once.

be met both in terms of the 1-in-20 peak demand level and a 1-in-50 severe winter.⁵⁵ Hence, sufficient entry capability must be available.

65. Similarly, the N-1 calculation⁵⁶ has been updated by National Grid for their 2022/2023 Gas Winter Outlook Report.⁵⁷ For the coming winter, the supply margin at peak 1-in-20 demand under N-1 conditions has increased from a 32mcm/day surplus last winter to a 50mcm/day surplus.

66. While GB’s gas market, trading at the NBP, has experienced unusually high wholesale prices like other international hub markets, the market continues to balance supply with demand by adjusting the price at which trades occur.

Figure 5. Peak gas supply and demand (National Grid Gas Winter Outlook 2022/2023)⁵⁸



**Peak day total demand contains shrinkage and therefore will not tally*

55 The 1-in-50 standard is a function of the requirement for transportation arrangements to be consistent with the suppliers’ “domestic customer supply security standards” regarding available annual supplies.

56 The N-1 calculation tests that the National Transmission System (NTS) has been designed to meet the 1-in-20 peak day demand even with the failure of the single biggest piece of infrastructure.

57 <https://www.nationalgrid.com/gas-transmission/insight-and-innovation/winter--outlook>

58 <https://www.nationalgrid.com/uk/gas-transmission/insight-and-innovation/winter--outlook>

Import capacity and outlook

67. The UK has a diverse set of import routes, including direct connection to the Norwegian Continental Shelf via several pipelines, including the Langeled, Vesterled, Tampen, and Gjoa pipelines. GB is connected to international markets via two interconnectors to mainland Europe and three LNG import facilities. The Interconnector Ltd interconnector to Belgium links the GB NBP to the Belgian *Zeebrugge* gas trading hub, and the Balgzand-Bacton Line (BBL) interconnector links to the Dutch *Title Transfer Facility* (TTF). GB has one of the largest LNG import infrastructures in Europe, with facilities at Isle of Grain, Kent, and two in Milford Haven, Southwest Wales (Dragon and South Hook).
68. Currently, the UK has import deliverability of ~55 billion cubic metres per year (bcm/y) from Norway, ~43 bcm/y from capacity connected to the Continent, and ~48 bcm/y from LNG import terminals.⁵⁹ Capacity is not itself a measure of utilisation. To date, GB has always secured the gas required, and BEIS, Ofgem and National Grid analysis has all concluded that it will remain well-positioned to do so. A key factor in GB's ability to secure the necessary gas is an appropriately incentivised, flexible and accessible market. This is discussed under Market Functioning below.

Production

69. Indigenous production met 42% of UK demand in 2021, with the remainder supplied by imports. Imports increased by 17% in 2020 due to record low production, the result of an extensive planned maintenance schedule, including the shutdown of several major terminals and the Forties Pipeline System, which serves a significant proportion of UK oil and gas production.⁶⁰ For the same reason, exports reached their lowest level since 1998, resulting in reduced exports to the Netherlands and Belgium (down 55% and 46% on 2020, respectively), but exports to the Republic of Ireland increased.⁶¹

Demand

70. Gas is a critical part of the UK's energy demand and is expected to continue to play a role as we transition to net zero emissions by 2050. Nonetheless, the long-term trend of demand is downwards, with gas demand in 2021 24% lower than 2000.⁶² UK Gas demand increased by 5.9% in 2021 compared with 2020, largely due to easing of restrictions in place to curb the COVID-19 pandemic coupled with weaker performance from renewable generation and colder temperatures. Despite the overall increase, demand remained slightly below pre-pandemic levels and varied by sector.⁶³

59 <https://www.nationalgrid.com/uk/gas-transmission/insight-and-innovation/gas-ten-year-statement-gtys>

60 Digest of UK Energy Statistics, chart 4.1

61 Digest of UK Energy Statistics, chart 4.5

62 Digest of UK Energy Statistics, table 4.1

63 Digest of UK Energy Statistics, table 4.1

71. Domestic demand dropped by 34% in Quarter 2 2022, as warmer temperatures reduced heating demand in comparison with the same Quarter in the previous year. Consumption by other final users (e.g., commercial use) also fell, though the effect of warmer temperatures was offset by increased demand following the removal of restrictions relating to the COVID-19 pandemic. Industrial demand remained stable on the previous year.⁶⁴

Demand side response

72. The National Grid Gas System Operator's Demand Side Response (DSR) scheme is aimed at reducing demand for gas at times when expected available supplies are forecast to be insufficient to meet forecast demand by the end of a gas day. Only large gas users, those whose use is greater than 5.33mcm of gas each year, are eligible for the scheme and contract for it through their shipper.

73. Under the scheme, eligible gas consumers are able to choose to reduce their gas consumption in a way that best suits the needs of their business and would be paid for reducing their demand at these times. This year, the scheme has been reformed such that National Grid will issue a tender in which shippers will be able to commit, on behalf of large consumers, to offer DSR in advance for the current/forthcoming winter and the next two winter periods and receive an availability/option payment as compensation.

74. If use of the scheme is required, National Grid will accept the bids that offer the best value for money to make up the forecast shortfall between supply and demand. The payments would then be passed by the shipper (via the supplier) to the consumer who reduces their demand, subject to the contractual terms negotiated between these parties.

Gas Storage

75. GB Storage is not a source of supply as such but does play an important role in providing system flexibility in responding to short-run changes in supply and demand. GB does not operate a 'strategic reserve' storage model as the diversity of GB's sources of gas supply precludes a reliance on storage meeting demand during cold weather.

76. Prior to winter 2022, GB has around 1.5bcm of natural gas storage which is made available to the market.⁶⁵ As of December 6th, 2022, this storage stock was 100% full.⁶⁶ This has a maximum deliverability of 117mcm/day.⁶⁷ GB storage is made up of seven mid-range sites – meaning they can cycle regularly – and one long-range storage site. The long-range storage site, Rough, has recently reopened, and will contribute an extra 0.8bcm⁶⁸ in storage capacity to the 1.5bcm provided by medium-range storage sites.

64 From Energy Trends: UK Gas, table 4.1, available at: <https://www.gov.uk/government/statistics/gas-section-4-energy-trends>

65 <https://www.ofgem.gov.uk/publications/gb-gas-storage-facilities-2021>. These figures exclude Rough, as figures are still being tested.

66 <https://agsi.gie.eu/#/graphs/0>. This figure excludes Rough.

67 National Grid, Gas Winter Outlook 2021/22, October 2021

68 Figure provided by Centrica.

GB's relatively lower level of storage capacity (due to diverse and indigenous sources of supply) compared to some European countries has had minimal effect on the price spikes we have experienced in the wholesale gas market, with prices being determined primarily by global trends in supply and demand rather than by GB's domestic storage capacity.

77. The economics of storage relies on gas price variations over time: injections are incentivised when prices are low so that gas can be withdrawn when prices are higher. Seasonal price spreads (i.e., the difference between wholesale prices in summer versus winter) have minimised over time due to increased import infrastructure and access to global markets, which impacts the economic model of long-range storage. Short-term changes in wholesale prices continue to incentivise mid-range storage which can flexibly respond to market conditions. The value GB derives from gas storage is its ability to respond to short-run changes in supply and demand, rather than as a strategic reserve. The Government will continue to monitor the efficacy of GB's storage model as the dynamics of the gas market continue to evolve.

Market Functioning

78. The GB gas market has delivered security of supply to date. The market's churn ratio – which measures how many times a unit of gas is traded before it reaches the final consumer – is a metric for assessing market liquidity. The churn ratio ranged between 5 and 12 in 2021, averaging 8.5 over the year.⁶⁹ A churn ratio of 8 and above is considered the benchmark for a functioning wholesale market.⁷⁰ The average gas churn rate between January 2022 and June 2022 was 7,⁷¹ meaning we are likely to see a year-on-year reduction in one of the market's measures of liquidity, falling below the international benchmark of 8.

79. In September 2022, to support the liquidity of UK energy markets, HM Treasury (HMT) and the Bank of England announced a joint scheme to address the extraordinary liquidity requirement faced by energy firms operating in the UK gas and/or electricity markets. The Energy Markets Financing Scheme has been designed to encourage banks to extend additional lending to energy firms to support their ability to meet margin calls generated by potentially volatile energy prices in the following months.⁷²

80. Access to international markets allows GB to meet annual gas demand by supplementing indigenous production from the UKCS, bolstering security of supply by reducing reliance on any one source.

69 Gas trading volumes and monthly churn ratio by platform (GB), <https://www.ofgem.gov.uk/energy-data-and-research/data-portal/wholesale-market-indicators>

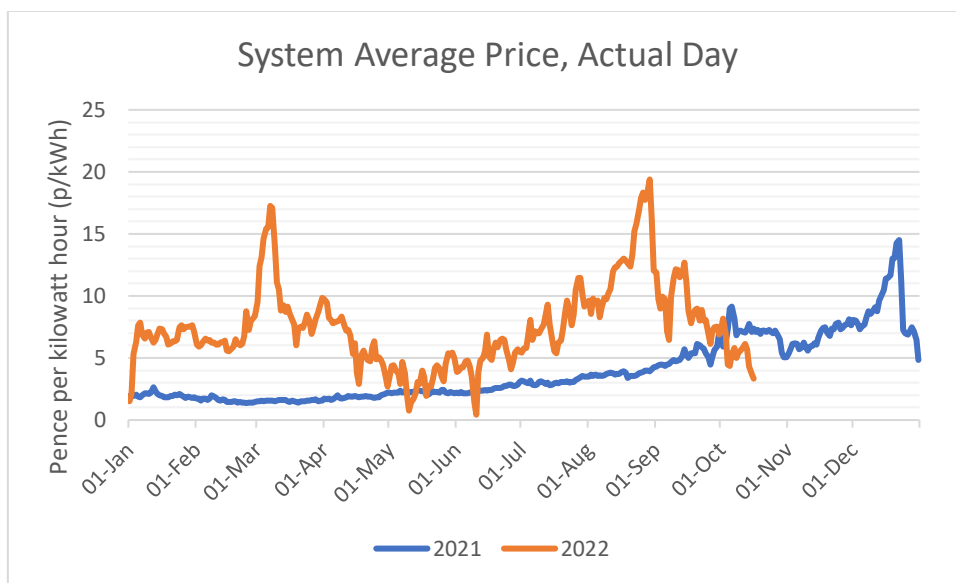
70 The European Union Agency for the Cooperation of Energy Regulators (ACER) set, in its Gas Target Model, a threshold criterion of 8 for Member States' wholesale markets. While the UK is no longer a Member State of the European Union, this figure can be used as an indicative benchmark in assessing liquidity. Microsoft Word - APPGEC Wholesale Gas Market Report final.docx (ecappg.org.uk), P.8

71 Gas trading volumes and monthly churn ratio by platform (GB), <https://www.ofgem.gov.uk/energy-data-and-research/data-portal/wholesale-market-indicators>

72 <https://www.bankofengland.co.uk/markets/energy-markets-financing-scheme>

81. As with many international hub markets in 2022, GB's market (trading at the NBP) has seen elevated prices. According to ONS System Average Prices,⁷³ prices traded in the day-ahead market for Q3 2021 averaged more than 5 times the level of Q3 2020. The NBP has also seen significant volatility in prices, with the day-ahead market experiencing over 10% swings in closing prices during September and October. The sustained increase in prices relative to previous years is due to global trends in supply and demand, in addition to some upstream supply disruption to the UK as necessary maintenance projects were completed.

Figure 6. National Grid, System Average Price Data⁷⁴



82. The UK has an established reputation in promoting transparent market-based approaches and fully supports the evolution towards a liquid, transparent and flexible global gas market. Market flexibility is essential to promoting global security of supply, ensuring that gas is delivered where it is most needed.

83. While elevated wholesale prices have been seen internationally in 2022, the existing market mechanism in the UK continues to balance supply with demand.

⁷³ The System Average Price (SAP) of gas is the average price of all gas traded through the balancing market. This data can be used to understand the general trend of gas prices within the UK, however, should be treated with caution as these can be subject to extreme within-day trading prices and may skew actual traded prices. It must also be noted that while these prices reflect spot prices on the day, traders can opt for futures contracts where the buyer and the seller agree the market-determined price for gas for a future date. The daily SAP is used to determine the futures price and is therefore a useful indicator of supply constraints and demand pressures.

Available at

<https://www.ons.gov.uk/economy/economicoutputandproductivity/output/datasets/systemaveragepricesapofgas>

⁷⁴ <https://mip-prd-web.azurewebsites.net/DataItemExplorer/Index>

Network Reliability

84. The UK gas transmission network facilitated the delivery of 100% of gas requirements for customers in 2021/2022.⁷⁵

Oil

Introduction

85. Oil formed around a third of total UK energy demand in 2021, similar to 2020 but low compared with 2019. Following 2020 lows, demand for petroleum products increased by 4.1% in 2021, with much of this growth coming from the transport sector as Covid-19 restrictions eased. Demand for key road fuels grew, with petrol and diesel demand up 11% and 10% respectively.

86. In 2021, UK production of primary oils fell to a 7-year low at 41 million tonnes, which was 17% lower than in 2020, and the UK returned to being a net importer of primary oils, at 7.9 million tonnes. Low production was a result of several factors, including maintenance of the Forties Pipeline System and delayed maintenance in 2020. Refinery production remained stable on last year, following refinery maintenance and delays to maintenance in 2020.

87. Most sectors showed signs of recovery following the 2020 lows, as final consumption increases by 4.4%. Whilst overall growth was seen in industry, up 4.4%, the chemical sector fell 11% and vehicle manufacturing fell 5.6%. Non-energy use fell 17% following reduced demand for Naphtha. Domestic consumption increased by 3.9% following lower temperatures and the agricultural sector grew 8.7% as 2021 offered more favourable growing conditions than in 2020. Jet fuel demand continued to be heavily impacted by Covid-19 restrictions and fell to its lowest point since 1983. Global restrictions on international travel were slower to ease and demand dropped 8.4% on the 2020 low.

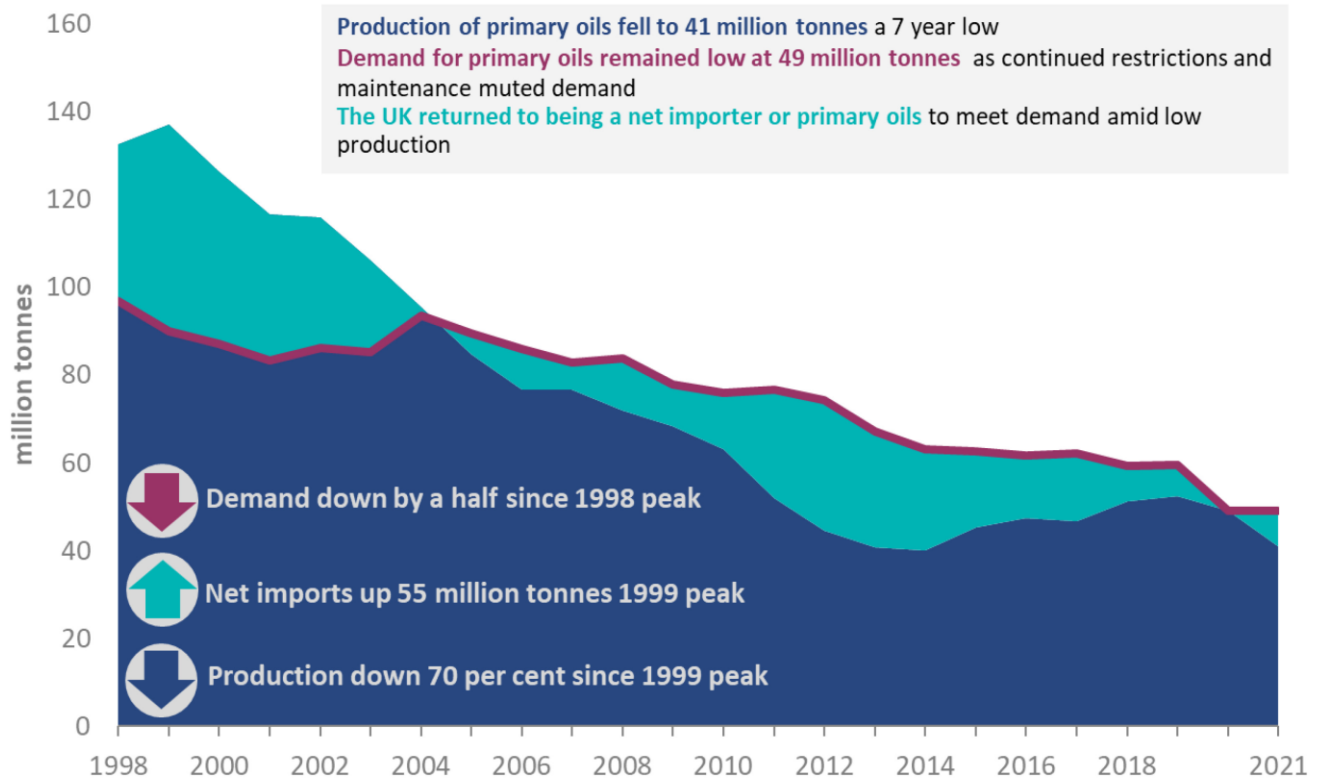
88. All data are sourced from the Digest of UK Energy Statistics unless otherwise specified.⁷⁶

Primary Oil Supply and Demand

Figure 7. Supply and demand for primary oils, 1998 – 2021

⁷⁵ <https://www.nationalgrid.com/gas-transmission/about-us/riio-2-2021-2026/how-we-are-performing>

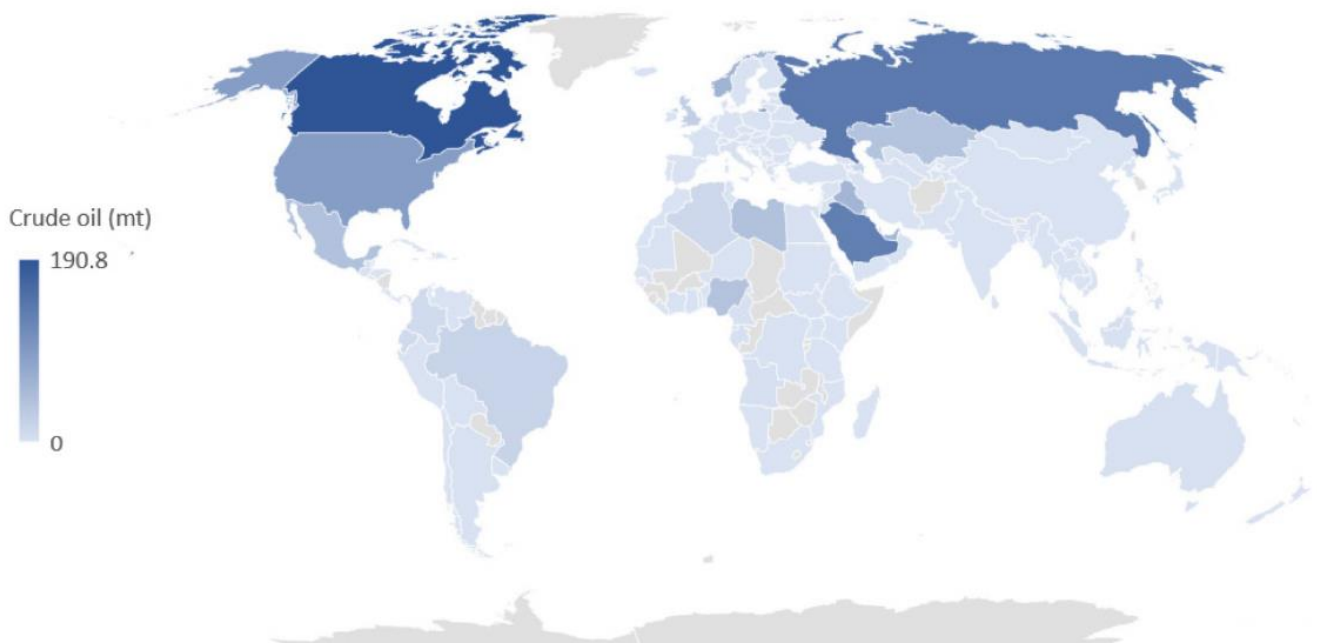
⁷⁶ Digest of UK Energy Statistics



89. In 2021, refineries took receipt of 6.8 million tonnes of crude produced from the UK Continental Shelf (UKCS), meeting 14% of refinery demand.
90. The UK trades extensively in primary oils globally, exporting to meet demand for Brent crude from refineries in the Middle East and importing from Norway and increasingly from the US. In 2021 the UK imported 41.8 million tonnes of primary oils compared to 51.5 million in 2019.
91. The map at Figure 8 shows the diversity of sources of crude imports in 2021. For further information, see the article Diversity of supply for oil and oil products in OECD countries, 2020.⁷⁷

Figure 8. Worldwide crude oil exports to OECD countries in 2021 (million tonnes)

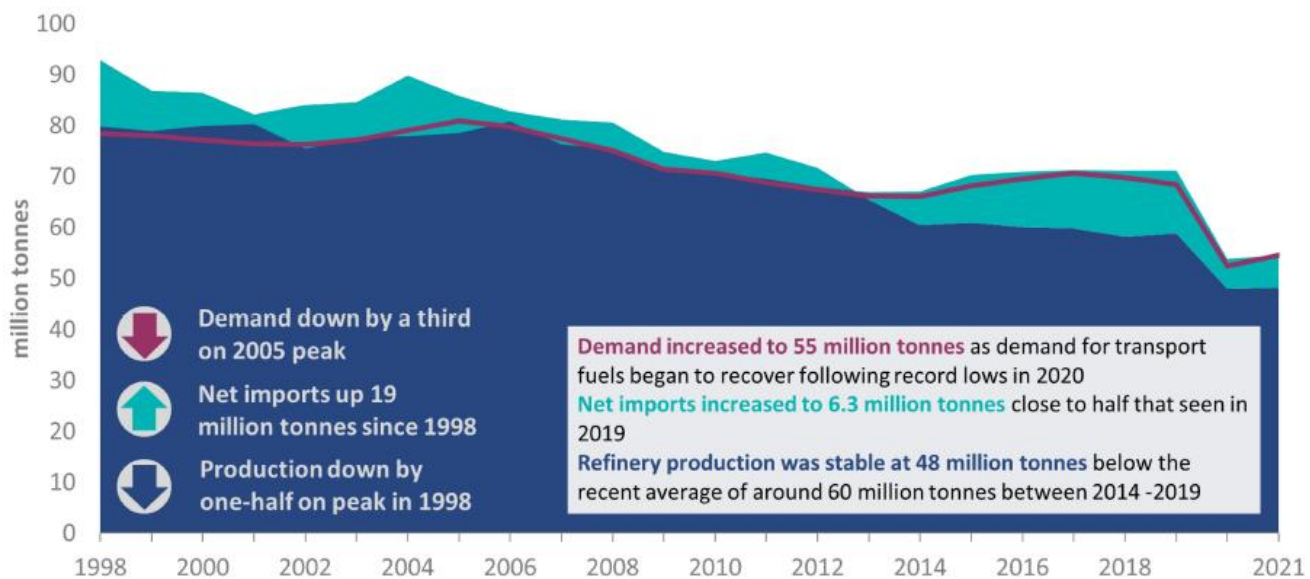
⁷⁷ Energy Trends September 2021: Diversity of supply for oil and oil products in OECD countries in 2020



92. Norway remains the largest import source of crude due to its proximity and shared infrastructure in the North Sea. Crude imports from Norway were up 11% compared with 2020, accounting for 36% of total crude imports. However, Norway's share of crude imports has decreased in recent years from the high of 62% in 2016. Imports of crude from the US have increased in recent years, accounting for 30% of total crude imports in 2021.
93. Russia was the third largest source of primary oil imports in 2021 (3.6 million tonnes), but substantially smaller than Norway (15.0 million tonnes) and the US (10.9 million tonnes). Following the Russian invasion of Ukraine, the Government announced that it would ban the import of Russian oils by the end of 2022. Provisional data shows that the UK did not import crude oil from Russia in the three months to September 2022, with refineries sourcing alternative supplies from other countries.
94. Imports from current OPEC countries have decreased following the peak in 2013 and accounted for 20% of the UK's crude imports in 2021, which is a 60% increase compared with the previous year's low.
95. The UK is a significant exporter of crude oils as well as an importer. Crude oil exports fell by 16% to 30 million tonnes in 2021, compared to 36 and 41 million tonnes in 2020 and 2019 respectively. This is in line with reduced production.

Refined Product Demand and Supply

Figure 9. Supply and demand for petroleum products, 1998 – 2021



Production of key petroleum products

96. The UK has been a net importer of petroleum products since 2013 and continued to be in 2021. Refinery production remained stable last year, following refinery maintenance and delays to maintenance in 2020. Domestic supply and demand are not matched on a product-by-product basis. The UK's refineries were developed to produce petrol, and as such the UK was the seventh largest exporter of petrol products in the OECD in 2021.

97. Conversely, to meet domestic demand, the UK is one of the larger importers of diesel and jet fuel. Some 55% of diesel and 40% of jet fuel demand were met with domestic production. The UK benefits from ready access to international maritime trade in oil products, including the Antwerp, Rotterdam, Amsterdam trading hub, with the Netherlands and Belgium combining to provide the majority of the UK's oil product imports.

98. In 2021 Russian imports of diesel accounted for a third of total diesel imports (4.2 million tonnes). Following the Russian invasion of Ukraine, the Government announced that it would ban the import of Russian oils by the end of 2022. Provisional data shows that imports of Russian primary oils fell significantly in the three months to September 2022.⁷⁸ The ban on Russian oils came into force on 5th December 2022.

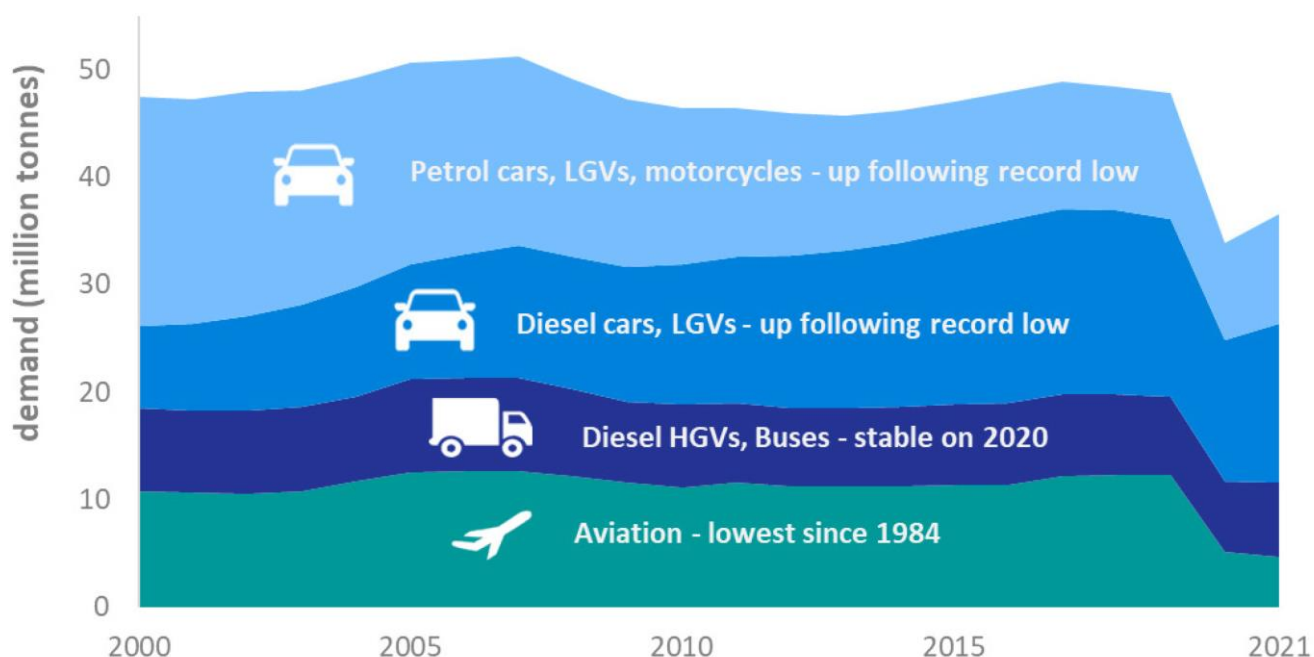
99. The majority of jet fuel imports come from refineries in Middle East countries (Kuwait, UAE, Saudi Arabia).

Consumption of key petroleum products

100. Overall demand for petroleum products in 2021 remained lower than pre-pandemic levels, down a fifth compared with 2019, at 54.6 million tonnes.

⁷⁸ <https://www.gov.uk/government/statistics/oil-and-oil-products-section-3-energy-trends>

Figure 7. Demand for petroleum products



101. The transport sector is the primary use for petroleum products in the UK. In 2021, demand for road fuels increased by 11% compared to record lows in 2020. This follows fewer domestic travel restrictions compared to 2020 and the end of all restrictions by the summer of 2021. Demand for petrol increased by 11% and diesel increased by 10%. In recent years demand for diesel has been around twice that of petrol, as commercial fleets tend to use diesel-engine vehicles. In Quarter 1 2021, demand for petrol reached its second lowest level since 1998, as strict Covid-19 related restrictions were in place. However, by Quarter 3 2021, demand was comparable with that seen before the pandemic

102. Demand for jet fuel was most severely impacted by Covid-19-related restrictions continuing to fall in 2021, down 8.4 per cent on 2020. This follows both national and international restrictions on international travel through the year. Demand for jet fuel was just 4.7 million tonnes, the lowest level since 1983 and 62 per cent lower than that seen in 2019.

Table 2. Demand for oil products 2021

Petroleum Product	Quantity (million tonnes)
Petrol	10.2
Road Diesel	21.7
Jet Fuel	4.7
Burning Oil	3.5
Gas Oil	4.9

Fuel Oil	0.4
Other	9.3

103. Non-energy use of oil products was down by 17% in 2021 compared to 2020. Much of this fall was due to the fall in demand for Naphtha, a core component in the manufacturing of ethylene and propylene, as a major plant was shut down for maintenance throughout the final quarter of the year.

Resilience

104. The UK remains well supplied by a combination of domestic refining and imported fuels and there were no significant disruptions to the overall supply of oil products and fuels during 2021. The continuing demand destruction caused by Covid-19 resulted in ongoing commercial strains on the downstream oil sector with reduced volumes and profit margins across most of the supply chain. However, these eased as restrictions on travel were relaxed during the year.
105. As with many sectors, a shortage of drivers to deliver fuel to petrol forecourts in 2021 led to a loss of resilience in this last part of the supply chain for transport fuels. Reporting of these issues in late September 2021 led to increased consumer demand which temporarily overwhelmed the capacity of the supply chain to maintain forecourt stock levels. The Government took action to support the industry by making available additional capacity in the form of the BEIS reserve road tanker fleet and military drivers. Forecourt stock levels recovered during early October.
106. Following the Russian invasion of Ukraine, the Government established an Oil Taskforce to ensure that the UK could end the import of Russian oils while maintaining a secure supply of products to UK consumers. The import ban on Russian oil and Russian oil products came into force on 5th December 2022.

Emergency Oil Stocks

107. The UK government is required to hold stocks of oil which could be released in the event of severe disruption to global supply. The UK achieves this obligation by directing companies to hold minimum levels of stocks. Before 1 January 2021, the UK was obligated to hold oil stocks as a member of both the European Union (EU) and International Energy Agency (IEA).
108. From 2021, following the UK's exit from the EU, the UK is only obliged to hold stocks as a member of the IEA.⁷⁹ At the end of 2021, the UK held 10.3 million tonnes of stocks, the equivalent of 905 days of imports, which is substantially higher than the required 90 days of net imports set by the IEA. This was a fall of 32% when compared with 2020. Companies may choose to hold stocks within the UK or abroad via legal agreements with other countries. Following the reduction in stocking requirements many

⁷⁹ <https://www.iea.org/areas-of-work/ensuring-energy-security/oil-security>

companies chose to reduce their stocks held abroad. In 2021, 7.0% of stocks were held abroad, this compares to 24% in 2020.

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