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Department for
Energy Security
& Net Zero

Policy paper

Powering Up Britain: Energy Security Plan

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Contents

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Introduction: A plan for Britain's energy security

This plan sets out the steps the government is taking to ensure the UK is more energy independent, secure and resilient.

Putin's illegal invasion of Ukraine 12 months ago has put the need for energy security in stark perspective. Never again will we allow our energy security to be threatened. The Prime Minister has tasked the new Department for Energy Security and Net Zero (https://www.gov.uk/government/organisations/department-for-energy-security-and-net-zero) with improving the UK's energy security, creating greater energy independence consistent with net zero and reducing the risk of higher bills.

Energy security necessarily entails the smooth transition to abundant, low-carbon energy. If we do not decarbonise, we will be less energy secure. We want our energy to be cheap, clean and British.

We will build on our ambitions set out in the 'British Energy Security Strategy (https://www.gov.uk/government/publications/british-energy-security-strategy)' and the 'Net Zero Strategy (https://www.gov.uk/government/publications/net-zero-strategy)' for increasing the overall share of domestic energy production and reducing energy demand. We will move towards energy independence by aiming for a doubling of Britain's electricity generation capacity by the late 2030s, and we remain absolutely committed to maximising the vital production of UK oil and gas as the North Sea basin declines.

This is not the same as energy isolationism. Britain needs and benefits from importing energy, now and in the future. Our own energy production is also key to our export strategy so that we can work with our friends and allies in securing a flexible and resilient market, even as we export these fuels to our neighbours. Where we need to import energy, we will ensure this is built on relationships with strong, trusted partners and diversified sources of supply. But we recognise that we cannot be complacent and will build in resilience to our system to ensure that if there are disruptions to imports, consumers still have a reliable supply of energy.

This plan is complemented by the 'Net Zero Growth Plan (https://www.gov.uk/government/publications/powering-up-britain)', with a focus on our long-term decarbonisation trajectory and how it can improve the UK's competitiveness, deliver an industrial renaissance and level up the whole of the UK. It should be read together with this plan.

Energy security matters

Cheap, clean, and secure energy is not pursued as an end in itself. It is essential for enabling economic growth. Businesses and jobs in all sectors are dependent on energy. Britain led the world with the industrial revolution, off the back of a plentiful supply of coal. A future of abundant and clean energy will help to boost our economic prosperity, attract future investment and support our industrial heartlands. The cheaper our energy, the greater the competitive advantage we have.

Delivering on energy security also unleashes huge opportunities for the country. Aside from reinvigorating our industrial capability, we will see thousands of jobs protected, created and secured across our 4 nations. The policies and ambitions we have committed to in the 'Net Zero Strategy' and 'British Energy Security Strategy' will help leverage around £100 billion of private investment in the period up to 2030, as we develop new industries and innovative low-carbon technologies, and our ambitions will support up to 480,000 jobs in 2030.

For families, business owners and workers, energy security starts in the home or workplace. It is as simple as whether we can get the energy we want, when we want it, at an affordable price. As we make the transition to a secure and low-carbon electricity system, affordability will remain at the centre of our thinking, and we will take steps to ensure Britain has among the cheapest wholesale electricity prices in Europe by 2035.

It was right that the government acted at speed to soften the blow of increasing prices, by paying around half of a typical household's energy bill this winter and around half of wholesale energy costs for some businesses. But we must learn from the last 12 months, consider how these schemes should evolve from April 2024, target support to those who most need it and take steps to fix broken energy retail markets for the long term.

Our energy strategy

This does not mean we have to redefine our strategic approach to energy. The government has set out through the 'Ten Point Plan for a Green Industrial Revolution (https://www.gov.uk/government/publications/the-ten-point-

plan-for-a-green-industrial-revolution)' and 'Energy White Paper (https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future)' in 2020, the 'Net Zero Strategy' in 2021 and in last year's 'British Energy Security Strategy' a clear and consistent set of strategic objectives to enable the transformation of the energy system so it is secure, low-cost and low-carbon. We remain committed to these goals, including the ambitions for clean energy technologies set out in the 'British Energy Security Strategy'.

Demand for oil, gas, and other fossil fuels will decline but they retain a crucial role. They are critical transition fuels, key to ensuring secure energy supplies and will form an important part of our future economy. We must take the necessary steps to ensure we can rely on the supply of gas and oil, whether from domestic production or from importing these fuels.

Strengthening the UK's energy security and the transformation of the energy system in line with net zero demands significant levels of capital investment. The government's energy strategy creates a wide range of options across different types of infrastructure deployment for UK and international investors seeking attractive opportunities for their funds.

Securing our gas supply

The UK's energy security remains hugely dependent on a reliable, resilient and affordable supply of gas.

This winter we took several crucial steps to ensure our supply of energy remained robust. We supported an increase in domestic gas production, as well as welcoming Centrica's reopening of the Rough gas storage facility, which brought on 50% more storage capacity. Our markets and system responded well to ensure our energy system was supplied at all times.

We have learnt from our experiences of the last year and will build on this to ensure secure supplies over next winter and over the longer term. The future demand for gas will decline as we decarbonise. We will engage with industry, consumer groups and other stakeholders to discuss the future of the gas system and how we can secure the necessary levels of investment in resilient, efficient infrastructure as we transition to a clean energy system.

Security through strong international partnerships

We cannot achieve this in isolation. Our international relationships are crucial to achieving our domestic and global objectives.

This winter, we worked closely with key international partners, including European partners, to monitor and share information on energy supply and demand, and preparedness for the winter. This was central to ensuring reliable supply. Beyond the EU we work with strong trusted partners and allies including through our ‘Strategic Energy Dialogues’ to help tackle national and global energy challenges.

A rapid shift to clean energy generation and greater energy efficiency provides the most effective route to ensuring both climate and energy security, helping to avoid risks associated with dependency on fossil fuel imports. We have been working to achieve this globally, including with our G7 partners, and more locally in the North Sea.

This transition relies on critical minerals and there is an impending risk that minerals markets become tighter, with the potential for price spikes and supply chain disruptions. Globally, the demand for critical minerals may quadruple by 2040. As a result, the security of and accessibility to essential critical minerals supply chains is a rising priority for the UK and many of our allies. To support this work internationally, in the last year we have announced a partnership to deepen collaboration on minerals mining and energy with the Republic of South Africa, and collaborations with Canada and Kazakhstan on critical minerals.

A future of cheap, clean and British energy

The best way of protecting households and businesses is by lowering the costs of the energy we consume and reducing the volumes used. This means taking further steps on energy efficiency and building out a low-cost, low-carbon energy system which reduces our reliance on fossil fuels.

The ‘Energy White Paper’ and the ‘Net Zero Strategy’ set out our approach to transforming the energy system, moving from fossil fuels to home-grown, clean energy to eliminate emissions and tackle climate change. The ‘British Energy Security Strategy’ set out the key actions to accelerate delivery of

clean energy, recognising its importance in delivering our climate goals whilst simultaneously providing energy security and securing greater energy independence.

How much energy we use and the ways in which we use it are essential components of energy security. Reducing energy consumption by investing in energy efficiency measures helps keep bills affordable and makes us more energy secure. Building a smart and flexible energy system that actively manages the scale and nature of demand will enable a more efficient, secure and lower cost system.

Our strategy to increase supply of low-carbon energy is dependent on enhancing our strengths on wind, solar and nuclear power generation alongside hydrogen production and carbon capture, usage and storage. This includes the infrastructure to produce, store and transport low-carbon energy around the country and to capture, transport and store carbon dioxide. We aim to remove barriers and address blockages, whilst developing new options.

An evolving plan

This plan, and the complementary 'Net Zero Growth Plan', do not set out every action we will need to take over the next decade to deliver the transition to a cheap, clean and secure energy system. Determining the exact configuration of the future energy system is not sensible. We need to retain the flexibility to adapt to changing circumstances, develop market frameworks that incentivise a low-cost, reliable system and provide the opportunity for innovation to develop new approaches and drive down costs.

Together these plans set out the actions we are taking, and the timeline for issues that need further work, providing certainty to the industry, to investors and to the British public on the direction of government policy and our commitment to delivery.

Some of the actions we set out in in this plan are in response to recommendations made in the 'Independent Review of Net Zero (https://www.gov.uk/government/publications/review-of-net-zero)', led by the Rt Hon Chris Skidmore MP and published in January 2023. Further detail on the review and its recommendations can be found in the 'Net Zero Growth Plan (https://www.gov.uk/government/publications/powering-up-britain)' and its annexes.

We will continue to review our plans, drawing on advice from experts to test

our approach and adjust our course to ensure that we remain on track to deliver our objective for a reliable, low-cost energy system, one which remains consistent with our net zero target. Delivery of the commitments in this plan will be in accordance with the devolution settlements with Scotland, Wales and Northern Ireland.

Our key commitments

We will issue an update by the autumn looking at the future role that **gas storage and other sources of flexibility** can play in gas security.

We will deliver vital energy efficiency upgrades through the **Great British Insulation Scheme** and will extend the **Boiler Upgrade Scheme** to 2028 to further encourage the adoption of clean heat technologies.

We will set up **Great British Nuclear**, with the responsibility to lead delivery of the new nuclear programme, backed with the funding it needs.

We are launching a competitive process to select the best **Small Modular Reactor technologies**, with the first phase commencing in April 2023.

We are launching the **Floating Offshore Wind Manufacturing Investment Scheme**, to provide up to £160 million to kick start investment in port infrastructure projects.

We will publish action plans this year on reducing the **development time for transmission network projects** and on **accelerating electricity network connections**.

We are announcing the Track-1 negotiation project list of **carbon capture projects**, will launch a process to enable expansion of the Track-1 clusters and have launched Track-2 of the CCUS cluster sequencing process to establish 2 further **CCUS clusters**.

We are announcing a shortlist of projects for the first **electrolytic hydrogen production** allocation round (capital co-funding and revenue support) which we intend to enter due diligence with and intend to **launch a second allocation round in Q4 2023**.

We are announcing successful applicants of the first competition window for Strands 1 and 2 of the **Net Zero Hydrogen Fund**

(development and capital co-funding) and intend to **launch a second competition window in the spring**, to be run by UKRI.

We are publishing for consultation revised energy **National Policy Statements** which underline the national need for new energy infrastructure with the intention of expediting planning processes.

We intend to consult in summer 2023 on options for **a new approach to consumer protection** in the energy markets from April 2024 onwards and on the **future of the price cap on default tariffs**.

We accept the 'Independent Review of Net Zero' recommendation that government should commit to outlining a clear approach to **gas vs electricity 'rebalancing'** by the end of 2023/4 and should make significant progress affecting relative prices by the end of 2024.

1. Decisive action for this winter and next

The government has taken decisive action over winter 2022 to 2023 to avert supply constraints and to support households and businesses with rising energy bills.

Our gas and electricity supplies

Gas from the UK Continental Shelf (UKCS) and the Norwegian Continental Shelf forms the majority of Britain's gas supply (average of 80% across 2017 to 2021). However, Liquified Natural Gas (LNG) plays an increasingly important role. These sources are supported, during times of peak demand, by imports through interconnectors with the continent.

Meanwhile, Britain's electricity market is highly diversified, with approximately 40% generated from renewables and 15% from nuclear in 2021. However, a significant proportion (around 40% in 2021) of generation capacity is provided by gas-fired power stations, which is particularly important during peaks in demand and when renewable generation is low.

Security of supply in winter 2022 to 2023

While Britain has little direct exposure to Russian gas, which constituted only 4% of gas supplied to the UK in 2021, we face significant indirect impacts through our links to European gas networks and global LNG markets.

Broadly average temperatures have assisted energy resilience this winter. However, the cold spell during the first half of December 2022 was one of the most significant spells of low winter temperatures since December 2010.

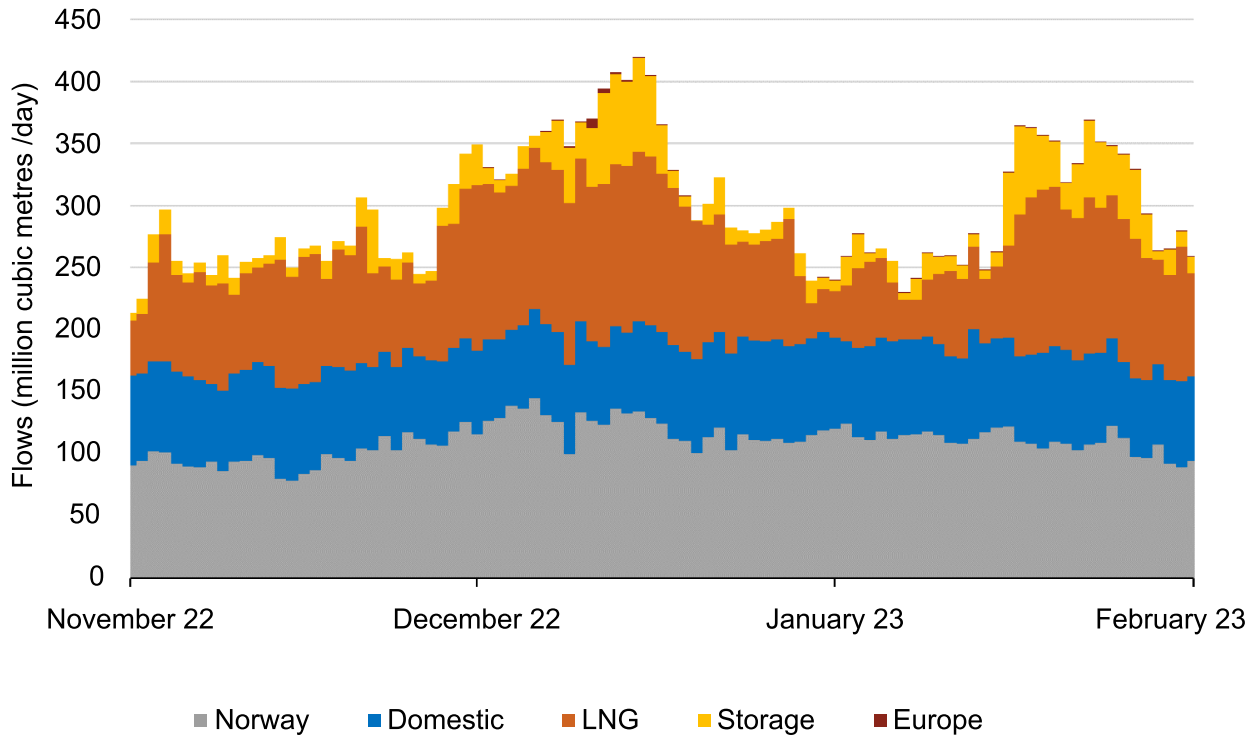
Security of gas supply in winter 2022 to 2023

In the face of these challenges, our markets and our system responded well with our gas system well supplied, including through the December cold snap, which saw the highest daily gas demand (416 million cubic metres on 15 December 2022) since the 'Beast from the East' in 2018.

We took several crucial steps to secure our gas supply. We supported an increase in domestic gas production, and collaborated closely with our international partners, including the European Union, Norway, Qatar and the US, to share information about energy supply and demand, and about our collective preparedness for the winter.

We received significantly above average LNG deliveries in Q4 2022, in addition to reliable gas flows from the UK Continental Shelf and Norwegian Continental Shelf in line with previous winters. This has helped us maintain healthy levels of storage throughout this winter (88% on average from 1 October to 19 February) and facilitated high levels of net exports to mainland Europe, with Britain acting as a delivery hub to support EU states' efforts to fill gas storage prior to winter. This reversed historical patterns, in which the UK exports gas to the continent over the summer and imports over the winter.

Sources of GB Gas Supply, November 2022 to February 2023



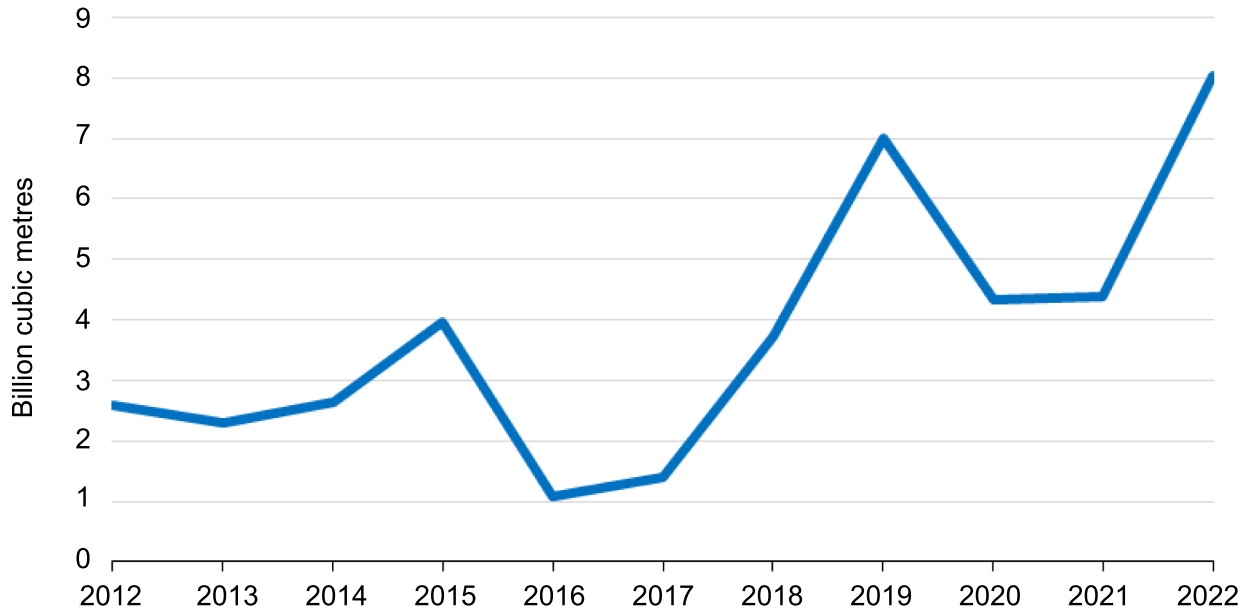
Source: National Grid

Data for figure 1

(flows in million cubic meters per day)

	01/11/2022	02/11/2022	03/11/2022	04/11/2022	05/11
Norway	91	95	102	102	
Domestic	72	70	72	73	
LNG	44	48	80	102	
Storage	6	12	23	20	
Europe	0	0	0	0	

Q4 UK Liquefied natural gas imports



Source: ICIS LNG EDGE (Independent Commodity Intelligence Services)

Data for figure 2

Underlying data cannot be provided and must be accessed via ICIS LNG Edge.

In spring 2022 National Gas Transmission reviewed the Operating Margins (an additional flexibility that is available under times of specific system stress). This resulted in an additional 11 million cubic metres being procured from 1 December 2022, bringing the total gas procured under the Operating Margin to 90 million cubic metres for winter 2022 to 2023.

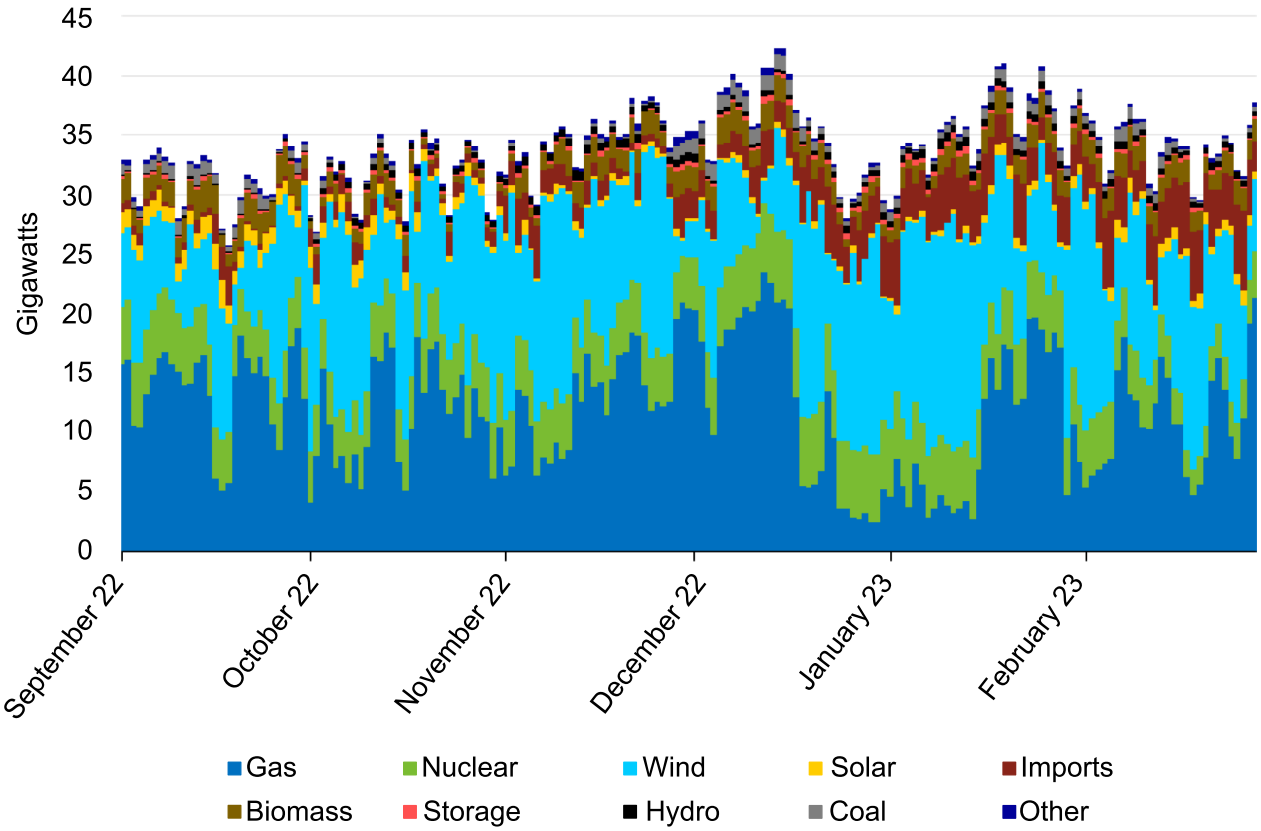
In October 2022, the Rough gas storage facility reopened, representing an increase in British gas storage capacity this winter of approximately 50%. It is an important tool to bolster our energy system's resilience.

Security of electricity supply in winter 2022 to 2023

As is common during the winter months, there have been some days on which electricity margins between demand and supply have been 'tight', but we have maintained secure supplies throughout.

Our electricity system has inherent strengths which support security of supply. We benefit from a diverse electricity mix, including interconnection to other countries that can make a valuable contribution to security of electricity supply, offering mutual support. In addition, the Capacity Market ensures the country can count on a secure supply of power even when demand is high.

Power generated by type in winter 2022 to 2023



Source: National Grid ESO

Data for figure 3

(Gigawatts)

	01-Sep-22	02-Sep-22	03-Sep-22	04-Sep-22	05-Sep-22	06-Sep-22	S
Gas	16	16	11	10	13	15	
Nuclear	5	5	5	5	5	5	

	01-Sep-22	02-Sep-22	03-Sep-22	04-Sep-22	05-Sep-22	06-Sep-22	S
Wind	6	6	10	9	9	8	
Solar	2	2	1	1	2	1	
Imports	1	1	1	1	1	1	
Biomass	2	2	1	1	2	1	
Storage	0	0	0	0	0	0	
Hydro	0	0	0	0	0	0	
Coal	1	0	0	1	1	1	
Other	0	0	0	0	0	0	

However, National Grid Electricity System Operator (ESO) put in place additional measures on a prudent basis this winter to be ready in the event of gas shortages for electricity generation or reduced imports of electricity through interconnectors.

It launched its Demand Flexibility Service, paying consumers to reduce consumption during periods of peak demand. Operating on 2 evening peaks during the winter, the Service helped ensure healthy operating margins were maintained on the electricity system. The scheme also demonstrated the potential of managing demand flexibly to bolster energy security, as well as the willingness of consumers to participate.

The government also welcomed measures by the ESO to keep Britain's remaining coal plants available, if called upon to provide additional generation capacity. This prudent step represented further insurance against shortfalls in supply.

Support for households and businesses

Historically high wholesale energy prices, driven by rising international gas

prices, have added significant pressure to household and business energy bills, driving inflation up and making the cost of living a real challenge for many families. We took swift and decisive action at unprecedented scale to support households and businesses, through the Energy Bills Support Scheme until March 2023 and the Energy Price Guarantee until March 2024 for domestic consumers, and the Energy Bills Relief Scheme until March 2023 and the Energy Bill Discount Scheme until March 2024 for non-domestic energy consumers. Additional support for the most vulnerable households is available through specific cost of living payments.

Without the domestic schemes, the typical household dual fuel bill would have more than tripled between October 2021 and January 2023.

As announced at the Spring Budget, we are keeping the Energy Price Guarantee at £2,500 for an additional 3 months from April to June. This means we will have covered nearly half a typical household's energy bill through the Energy Price Guarantee and Energy Bills Support Scheme since October - with a typical family saving £1,500.

The Energy Price Guarantee will also eliminate the premium paid by households on prepayment meters from 1st July. This will cut energy bills for over 4 million families across the UK by bringing their costs into line with those paid by comparable customers on direct debits.

The government supports Ofgem's ongoing work to review prepayment meter costs and has asked the regulator to report by the autumn on any additional regulatory options, including options for ending the prepayment meter standing charge premium, so that they are ready for implementation when the Energy Price Guarantee ends in April 2024. All savings derived from equalising the unit costs of prepayment meter and direct debit costs are required to be passed on by suppliers to their consumers.

Preparing for next winter and beyond

The ongoing geopolitical uncertainty caused by Russia's invasion of Ukraine means we expect the UK and mainland Europe to experience similar pressures on energy security next winter as those seen in 2022 to 2023. This plan sets out how we are going to build on the experience of the last 12 months to ensure that all potential options to bolster security of supply are explored.

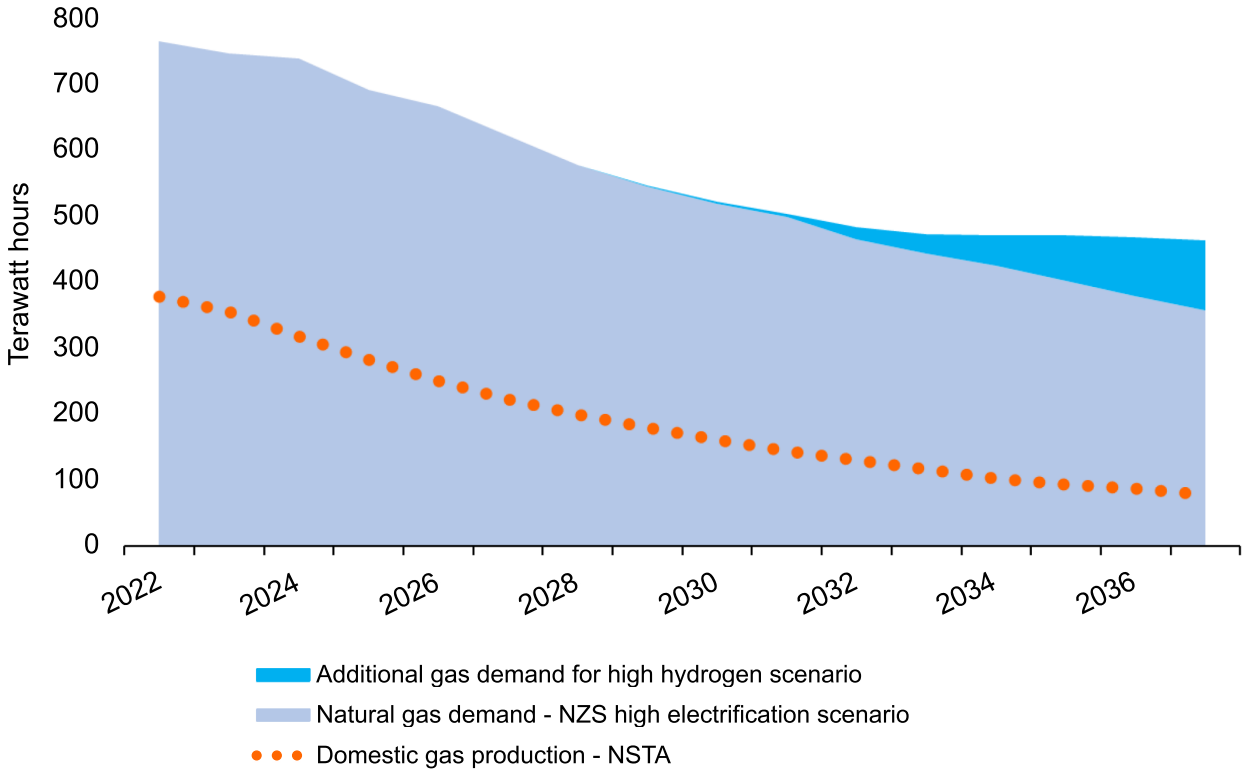
Our focus cannot be limited to the short term. Even when we meet our net

zero targets in 2050, we are still likely to require gas, and we will still need oil for manufacturing essential products such as plastics, medicines, and fertiliser. This is consistent with achieving our net zero target if their use is combined with carbon capture and storage, and any residual emissions are balanced by negative emissions from greenhouse gas removal technologies.

Taking these considerations together, this means we need to support maximising the production of UK oil and gas as the North Sea basin declines and minimise our reliance on overseas imports. Over-reliance on overseas LNG imports is less secure, and significantly more carbon intensive from a global perspective compared to UK gas, having on average double the emissions intensity.

However, even with continued exploration and production, annual production of gas is expected to fall to around 30% of current levels by 2035 due to the declining reserves in the basin. It is expected to remain below the projected demand for gas out to 2050. So we also need to ensure that where the UK still needs to import energy, those imports are built on relationships with strong, trusted partners and diversified sources of supply. And we need to ensure that our import and storage infrastructure is resilient so that if there are disruptions to imports, consumers still have a reliable supply of energy.

Natural gas supply and demand, 2022 to 2037



Source: Department for Business, Energy and Industrial Strategy (Net Zero Strategy, 2021)

Data for figure 4

(Terawatt hours)

	2020	2021	2022	2023	2024	2025	2026	202
Natural gas demand - NZS high electrification scenario	853	800	766	748	740	692	668	62
Natural gas demand	853	800	766	748	740	692	668	62
Additional gas demand for high hydrogen	0	0	0	0	0	0	0	

	2020	2021	2022	2023	2024	2025	2026	202
scenario								
Domestic gas production – NSTA	387	321	379	356	318	283	251	22

2. Enhancing security of gas supply

Our key commitments

- We will issue an update by the autumn looking at the future role that gas storage and other sources of flexibility can play in gas security.
- We will task the Future System Operator to conduct a gas supply security assessment, and to assume a whole system coordination role for improving the security and resilience of our energy systems.
- We have legislated to change the Wobbe Number meaning a greater volume of gas can, from April 2025, be injected into the National Transmission System without the need for blending.
- We will consult on introducing a policy framework for biomethane from 2026 to follow the current Green Gas Support Scheme.

Gas will continue to play a declining but still significant role in our energy system for decades to come and it is essential we take action to strengthen the security of our gas supplies. Drawing from the lessons we have learnt since Putin’s invasion of Ukraine, the government will put in place measures to ensure we have the supplies we need for the long term and increased resilience in the gas system to withstand supply shocks, if they do occur. We will do this by:

- maximising supply of UK gas
- maintaining and securing our gas import and export capacity

- increasing system resilience
- ensuring long term investment in gas networks

Maximising supply of UK gas

33rd Licensing Round

Delivering on the commitment made in the 'British Energy Security Strategy', the North Sea Transition Authority (https://www.gov.uk/government/organisations/north-sea-transition-authority) launched the 33rd oil and gas exploration licensing round in October last year, attracting a total of 115 bids. The Authority is analysing the bids and is expected to award the first licences from the second quarter of this year.

Accelerating production

The 'British Energy Security Strategy' also announced the Gas and Oil New Projects Regulatory Accelerators, a cross-regulator initiative that is aiming to cut the approval times for consents to potentially bring forward production dates, subject to environmental considerations. Accelerating the regulatory process will benefit the development of projects that are awarded new licences in 2023, as well as existing projects that already have a licence and are working their way through the regulatory process to be considered for consent. Regulators now meet on a regular basis to discuss upcoming developments and to work on streamlining processes. Early engagement meetings have already taken place on several projects across the UK Continental Shelf.

Supporting long-term investment

The government recognises that fiscal policy plays an important role in securing long-term investment in the UK Continental Shelf and supporting the sector to maximise domestic production of gas. The government has announced a review into the UK's long-term fiscal regime for oil and gas, to ensure that it delivers predictability and certainty, supporting investment, jobs and the country's energy security.

Updates to Gas Safety Management Regulations

The government has legislated to lower the Wobbe Number, which is used to measure gas quality, by a change to the Gas Safety (Management) Regulations which will come into force in April 2025. This means that a greater volume of gas from the UK Continental Shelf can, from then, be injected into the National Transmission System without the need for blending. At peak times, we expect this to increase the volume of UK

Continental Shelf gas by over 1% of baseline production in the second half of the 2020s (or almost 1 million cubic metres per day). This change will also enhance resilience of UK supplies.

Maintaining and securing our gas import and export capacity

Interconnectors

Gas pipelines connect Britain to continental Europe and the island of Ireland for the transmission of natural gas. There are currently 3 gas interconnectors which connect to Britain's National Transmission System:

- Interconnector Ltd, a bi-directional pipeline connecting Belgium and the UK
- The Balgzand Bacton Line, a bi-directional pipeline connecting the UK and the Netherlands
- The Moffat Interconnection Point, a unidirectional interconnector pipeline that flows gas from Britain to Ireland, Northern Ireland, and the Isle of Man

Each pipeline is governed by an international agreement with the relevant state on the other end of the interconnection. These agreements set out the responsibilities of each state with respect to the cross-border interconnector and provide a framework for settling disputes between the parties. The agreements with EU member states are underpinned by the 'Trade and Cooperation Agreement' between the UK and the EU.

The efficient functioning of our interconnectors is underpinned by international agreements and regular dialogues. These dialogues are also an opportunity to discuss and enhance the agreements that govern these pipelines. The government is in the final stages of agreeing a Memorandum of Understanding on gas security of supply with Ireland. This will enhance cooperation on gas security and emergency preparedness across Great Britain, Northern Ireland, and Ireland.

Liquefied natural gas imports

The UK has the second-largest liquified natural gas (LNG) import capacity in Europe and is located close to major centres of demand for gas in northwest Europe, which helps to attract LNG to our country. We have 3 import terminals with a total annual import capacity of around 48 billion cubic

metres and estimated peak supply of 141 million cubic metres per day:

- Grain LNG, on the Isle of Grain
- South Hook LNG, in Milford Haven
- Dragon LNG, in Milford Haven

The government is working with industry to increase LNG import capacity and make best use of existing facilities. The operators of the Grain and South Hook LNG terminals are investing in upgrades to their facilities to increase capacity. The upgrade at Grain LNG is already underway and will deliver an increase to the terminal's annual import capacity in 2025. South Hook LNG announced a final investment decision in November 2022 to proceed with plans to increase terminal capacity. Once completed, the 2 projects will together increase the UK's LNG import capacity to around 59 billion cubic metres.

In addition to this, a small number of commercial firms are developing proposals to install floating LNG import terminals known as floating storage and regasification units (FSRUs), which could further increase the resilience of the UK's gas importation capability. The Department of Energy Security and Net Zero, together with National Gas Transmission and Ofgem, are working with these parties to support these developments, as once moored and connected to the existing gas transmission infrastructure, an FSRU is able to receive LNG cargos from the global market and re-gasify them ready for injection into the National Gas Transmission System. An FSRU can be quickly linked to the UK gas network without the need for extensive new infrastructure; and can be readily re-deployed to other markets should the UK no longer require the additional capability in the future.

A new UK-US Energy Security and Affordability Partnership was announced by the Prime Minister and President Biden in December 2022. The focus of this is on energy efficiency, gas supply, nuclear collaboration, and international cooperation. The Partnership included a commitment that the US will strive to export at least 9-10 billion cubic metres of LNG in 2023 via UK terminals.

International relationships

We are securing energy supplies by ensuring that where the UK is dependent on imports those imports are built on diversified sources of supply and relationships with strong, trusted partners and allies. We are working with the EU through the UK-EU Specialised Committee on Energy, and bilaterally with our connected countries, to be better prepared for winter and to have greater energy security.

Beyond the EU, our Strategic Energy Dialogues help to accelerate our international energy priorities by bringing together governments to share best practice and identify projects and partnerships that will achieve shared goals. Discussing our energy policy with partners in this way plays a crucial role in helping tackle national and global energy challenges. We have Strategic Energy Dialogues with various countries, including the USA, Qatar, Norway, Japan, and China.

At the UK-US Strategic Energy Dialogue in February 2023, energy ministers discussed the current state of global energy markets and their countries' leading roles in addressing immediate energy security concerns, particularly as a result of Russia's illegal invasion of Ukraine, as well as long-term support for global and regional energy security through the advancement of clean energy technologies.

Increasing system resilience

Future System Operator
The forthcoming establishment of the Future System Operator (FSO), with roles across the electricity and gas systems and a legislative objective to ensure security of supply, provides an opportunity to strengthen our gas and electricity security of supply. The government therefore intends to give the FSO 2 new functions in relation to security of supply.

Firstly, to complement existing security of supply standards focussed on supply infrastructure capacity, the FSO will deliver a new medium range Gas Supply Security Assessment. This assessment will consider gas supplies according to availability, reliability and deliverability against a peak demand scenario at the end of winter, across a 5-to-10 year time horizon. We expect this new assessment to form the basis of advice from the FSO to government and Ofgem, and information to wider industry. This assessment will inform actions that are needed by National Gas Transmission (NGT), FSO, and wider industry to maintain security of energy supply across the GB system, including investment where needed.

The Assessment is being developed with input from industry, and the government will look to publish the methodology in summer 2023, alongside a plan for implementation.

We will also be reviewing the existing gas infrastructure standards that inform network capability, and by extension availability and reliability, of associated network assets (NGT and/or others) to accept and efficiently

transport the gas supplies to meet demand.

Secondly, the FSO will also take on a whole system coordination role for improving the security and resilience of gas and electricity systems, and the interactions between them. This role will also include an emergency management function that will work with existing government structures and relevant key stakeholders to provide effective incident management. The government and Ofgem will consult on the detail of this new role this summer.

The government will work closely with the Electricity System Operator, NGT, Ofgem and others to ensure this role is taken on in such a way that gas and electricity supply security needs are met, while ensuring this does not impact on the transition to the FSO, or on its ability to discharge other vital functions once established.

Gas storage

The UK's gas market and storage has operated successfully during this winter and helped to meet demand caused by cold weather spells. However, as part of the wider measures we are exploring to enhance our gas security of supply, we will consider the future role that storage, and other sources of flexibility, can play longer-term, taking account of the need to align with future plans for hydrogen and CO_2 storage. As part of this, we will consider if there is a need for greater UK gas storage capacity. We plan to issue an update on this work before the autumn, setting out next steps.

Reducing demand at peak times for energy security

As the UK has a resilient energy system underpinned by diverse sources of gas supply, it has not been necessary to implement additional new demand reduction measures for energy security.

National Gas Transmission, as the Gas System Operator, implemented a series of reforms to its existing Demand Side Response Scheme for winter 2022 to 2023, designed to incentivise industry, shippers and consumers to participate in the scheme. The government is working with NGT to increase the available volumes for industrial demand reduction for winter 2023 to 2024 and investigate options for how domestic and smaller business gas consumers could participate more in future schemes.

Ensuring long term investment in gas networks

Long-term decarbonisation and gas security of supply
Future demand for gas will decline as we decarbonise, albeit with the peak demand expected to stay high during this transition. This means that the gas system will need to change to maintain resilience against increasingly dynamic and unpredictable requirements.

In the future direct use of natural gas in homes will reduce, with low-carbon alternatives taking its place. Increasing volumes of domestically produced biomethane will be injected into the gas grid through the Green Gas Support Scheme (GGSS) which will reduce carbon emissions, decrease reliance on natural gas and provide diversity in gas supply. The GGSS will deliver enough biomethane gas grid injection to heat around 200,000 homes per year at peak production. We will consult on introducing a policy framework for biomethane to follow the current GGSS, which closes to new applicants in 2025. Hydrogen has the potential to form an increasing part of the energy mix. Other low-carbon technologies, such as heat pumps, will also reduce the demand for gas, alongside more energy efficiency measures in our housing stock.

The government recognises that the implications of the transition to clean energy could create uncertainty in the gas market, including for consumers. We will act decisively to mitigate this risk. As long as natural gas remains an important part of our energy mix, we will continue to ensure that consumers can rely on secure gas supplies at affordable prices via an appropriately resilient and flexible network that is also efficiently regulated.

This will require the right governance, markets and infrastructure. We will work with industry, consumer groups and other partners to understand the impact of delivering net zero on gas infrastructure, market participants and consumers. This will enable us to determine how the gas system will need to evolve to ensure the market and regulatory signals are in place that incentivise the right level of investment and maintenance throughout the transition. We will address the implication of the transition for consumers, particularly households in fuel poverty, so that support can be provided to those who most need it.

3. Energy efficiency and clean heat

Our key commitments

- We will deliver vital energy efficiency upgrades through the Great British Insulation Scheme.
- We will extend the Boiler Upgrade Scheme to 2028 to further encourage the adoption of clean heat technologies.
- We are announcing an extension to the Industrial Energy Transformation Fund, increasing total grant funding available by £185 million.

Energy security is not just about adding capacity or strengthening the resilience of the supply side. The country will be more energy secure if we also lower our demand, which can be delivered through more energy efficient buildings and products or appliances, as well as more efficient low-carbon heating systems and industrial processes.

Energy efficiency measures in the fabric of our buildings, such as loft and cavity wall insulation, will lead to less demand on the electricity and gas grids, which in turn could help us reduce our need for imported fossil fuels and mitigate the impact of high and volatile international gas prices. This could also reduce energy bills for businesses and consumers, as well as helping vulnerable households out of fuel poverty.

More energy efficient buildings also complement more efficient, low-carbon heat sources, reducing consumption further. For example, air source heat pumps are around 3 times more efficient compared to fossil fuel boilers. Using less energy means lower carbon emissions, which helps the UK meet our net zero commitments. Improving business energy efficiency brings benefits beyond energy security too, making UK firms more competitive, driving innovation and lowering the cost of decarbonising.

The government has set a new and ambitious target to reduce final energy demand from buildings and industry by 15% by 2030. We are pursuing an integrated programme, including:

- improving the energy performance of buildings
- supporting the roll-out of energy efficient products
- exploring how the energy retail market can support improved energy efficiency
- delivering our commitment to replace fossil fuel heating with clean heat alternatives
- improving energy efficiency across all businesses and industrial

processes

Our programme is underpinned by £6.6 billion of public spending in this Parliament, with a commitment to provide a further £6 billion for the period 2025 to 2028. The government has also created a new Energy Efficiency Taskforce, charged with driving improvements that will bring down energy bills for households and businesses, as well as for the public sector.

Forward look

Improving the energy efficiency of our buildings
Alongside this document we are publishing, following consultation, our plans for a new Energy Companies Obligation scheme – the Great British Insulation Scheme. Based on proposals announced last year as ECO+, this will deliver £1 billon additional investment by March 2026 in energy efficiency upgrades, such as loft and cavity wall insulation. It will extend help to a wider group of households in the least efficient homes in the lower Council tax bands, as well as boosting help for those on the lowest incomes. We plan to lay legislation by the summer to take it forward.

The Future Homes Standard for homes and Future Buildings Standard for non-domestic buildings are designed to ensure that new buildings are built with low-carbon heating and high levels of energy efficiency. We will consult on the technical specification for the Future Homes Standard and Future Buildings Standard in 2023 and intend to introduce the necessary legislation in 2024 to implement both from 2025.

We will provide grant funding to a range of organisations to test novel green finance products through the Green Home Finance Accelerator, with pilots expected to begin in early 2024. This will empower more consumers to decarbonise their homes.

We will deliver Phase 2 of the Home Upgrade Grant from April 2023, having allocated up to £630 million to Local Authorities to upgrade around 25,000 homes, with annual bill savings of £220 per household.

We will deliver Wave 2 of the Social Housing Decarbonisation Fund from April 2023, as part of our commitment to decarbonising the social housing sector by 2030. This will allocate up to £778 million of grant funding, with around £1.1 billion of further co-funding, to housing associations and local authorities, and save social housing tenants an average of £220 on their energy bills.

Following the 2020 Social Housing White Paper, the 2021 ‘Heat and Buildings Strategy’ committed government to consider setting a new regulatory standard of EPC Band C for the social rented sector.

We have committed to begin the consultation process on a minimum energy efficiency standard for the social rental sector, within 6 months of the Social Housing Regulation Bill receiving Royal Assent.

We will publish a summary of responses to the consultation on improving the energy performance of privately rented homes and respond to the consultation on improving home energy performance through lenders.

We are planning to consult by the end of this year on how to improve the energy efficiency of owner-occupied homes.

We will continue to support the decarbonisation of the public sector, with £1.425bn in grant funding for low-carbon heat and energy efficiency retrofits made available over the period 2022 - 2023 to 2024 - 2025.

We will develop the government’s advice and information service, helping domestic consumers in choosing which decarbonisation measures suit them best. This includes an enhanced government website with tailored advice and options on spend-to-save energy efficiency improvements for their homes, a dedicated national phoneline, and local advice demonstrator projects.

Energy efficiency products

We will raise minimum energy performance standards and strengthen energy labelling requirements for energy-using products, to help reduce their energy demand. This will start with a consultation on lighting, open until 2023, followed by other technologies over the next year.

Market reform

Following an earlier consultation, we will investigate how future electricity market arrangements under consideration in the Review of Energy Market Arrangements programme can incentivise the deployment of energy efficiency measures and deliver permanent reductions in electricity demand.

Phasing out fossil fuel heating for clean alternatives

The government has an ambition to phase out all new and replacement natural gas boilers by 2035 at the latest, and will further consider the Net Zero Review’s recommendation in relation to this.

We have consulted on phasing out new and replacement fossil fuel heating systems for off gas grid properties, and will respond to these consultations.

We are announcing the launch of the £30 million Heat Pump Investment Accelerator competition, to incentivise the UK manufacture of heat pumps to improve supply of low-carbon heat.

We will support training for heat pump and heat network installers through the £5 million Heat Training Grant launched earlier this month.

To further encourage the adoption of clean heat technologies we can confirm that the Boiler Upgrade Scheme will be extended to 2028. The government is committed to increasing heat pump deployment under the Scheme and will extend and enhance the current marketing campaign to increase consumer awareness and take-up.

We are implementing the Clean Heat Market Mechanism in 2024, a market-based incentive for manufacturers to increase installation of low-carbon heating systems relative to the sale of fossil fuel boilers.

We expect to announce the location of the hydrogen heating village trial later in 2023 and the neighbourhood trial will go live in 2024, in order to help build our evidence base for making strategic decisions on hydrogen for heating by 2026.

Heat networks will play an important role for affordable, low-carbon heating in any scenario. We are continuing to grow and decarbonise the UK heat network market through the Green Heat Network Fund and the Heat Network Efficiency Scheme. We can now confirm that capital support will be extended to 2028 to facilitate the continued growth of low-carbon heat networks, including £220 million for the Heat Network Transformation Programme over 2025/6 and 2026/7.

We expect to introduce a regulatory framework for heat networks and begin the implementation of heat network zoning by 2025.

Improving energy efficiency across all business and industrial processes

We will work with the new Energy Efficiency Taskforce to drive greater private sector action on resource and energy efficiency. The Taskforce, co-chaired by NatWest CEO Alison Rose and Lord Callanan, was launched in February 2023 and will shortly begin work on developing an action plan which will be published in the summer.

We are announcing an extension to the Industrial Energy Transformation Fund (IETF), increasing total grant funding available to £500 million. Subject to business case approval, we intend to open Phase 3 of the IETF for new applications in early 2024, supporting industry to cut their energy bills and

carbon emissions through investing in energy efficiency and low-carbon technologies.

As announced at the Budget, we are extending the Climate Change Agreements Scheme by 2 years, which provides reduced Climate Change Levy rates for eligible businesses in over 50 industrial sectors worth an estimated £300 million a year. We are also publishing a consultation on the detail of the extension and views on a potential future Climate Change Agreements Scheme.

We plan to launch a digital energy advice service for small businesses this year to give impartial, trusted advice on improving non-domestic energy efficiency, reducing their energy use and bills. We will also be piloting a new audit and grant scheme this year enabling small businesses to move from insight to implementation of energy efficiency measures.

The government has consulted on proposals for the private rented sector and will publish the government response in due course. We will also consider how we can further support greater energy efficiency in owner-occupied commercial buildings.

4. A future of cheap, clean and British energy

Strengthening Britain’s energy security means moving from fossil fuels to home-grown, clean energy to eliminate emissions and tackle climate change. Secure, low-cost and clean electricity is central to this. In 2050, it will be the predominant form of final energy consumption and a key means of decarbonising other sectors. By the middle of the next decade, demand may grow by up to 60% as we electrify transport and heat.

The government has committed to achieving fully decarbonised electricity by 2035, subject to security of supply. We are taking the actions that will set us on course for this. As we make the transition to a secure and low-carbon electricity system, affordability will remain at the centre of our thinking. This is why we have set a new ambition. By 2035, our goal is for Britain to have among the cheapest wholesale electricity prices in Europe.

Our strategy for delivering this is set out in the ‘Energy White Paper’, ‘Net Zero Strategy’, ‘British Energy Security Strategy’ and this plan. These set out the need to build out a range of low-carbon generation, flexible

technologies and networks at pace whilst also developing new options, and set out the actions we are taking to deliver this.

They also set out the critical role that unabated gas generation currently plays in keeping the UK electricity system secure and stable, noting that it will be used less frequently in the future as we develop and deploy the low-carbon alternatives that can fully replicate its role within the electricity system, running only when the system most needs it for security of supply.

Low-cost renewables will be central to our goal. Key to the pace of the roll out of renewables technologies has been the move to annual Contract for Difference (CfD) auctions building on the largest ever allocation round in 2022, which secured almost 11 gigawatts of additional capacity.

Nuclear generation is a vital component of our future electricity system. We signed the contract for the first nuclear power station in a generation at Hinkley Point C, have made a ground-breaking investment of £700 million in Sizewell C in partnership with EDF, and have established Great British Nuclear to deliver a nuclear programme.

It is essential that we bring forward power Carbon Capture, Usage and Storage (CCUS) and other flexible technologies, which can either increase supply or reduce demand at short notice to close any gap between consumer demand and what is being generated by renewables and nuclear technologies.

We are developing the technology options for delivering flexibility on both the supply side, through power CCUS, hydrogen to power and storage, and the demand side, through electric vehicle charging or smart appliances (demand side response). In aggregate, flexibility could save up to £10 billion per year by 2050, by reducing the amount of generation and network needed to decarbonise electricity.

We propose to bring forward flexibility through market reform, and bespoke support where necessary to ensure efficient operational and investment signals are in place for all types of low-carbon flexibility, as well ensuring it can attract the required investment to deploy when technologies are at different stages of maturity.

The benefits aren’t limited to the electricity system either. Rolling out smart and flexible technologies could create 24,000 jobs across the country – another example of how the energy transition will support economic growth and promote the government’s levelling up ambitions.

In addition, we are working with the Electricity System Operator to

reimagine the design and construction of the networks which connect generation to demand, integrating offshore wind with mainland networks. And we are reforming governance and operating rules of the electricity market, all essential enablers of an efficient, low-cost system.

Whilst electricity is central to our decarbonisation strategy other low-carbon technologies also have a key role to play. The government sees low-carbon hydrogen as a critical component of our broader strategy to deliver energy security, create economic growth and contribute to our net zero target. We set out our plans to deliver a thriving low-carbon hydrogen sector in the 'UK Hydrogen Strategy' in 2021. This was followed by the 'British Energy Security Strategy' last year in which we set out our ambition to have up to 10 gigawatts of low-carbon hydrogen production capacity in the UK by 2030, subject to affordability and value for money, with at least half from electrolytic hydrogen.

CCUS is an emerging sector that is a central pillar of government's plan to deliver net zero. It is the key to unlocking decarbonisation of industrial sectors, delivering engineered greenhouse gas removals, and enabling low-carbon hydrogen production and flexible low-carbon electricity generation to complement renewables. CCUS forms part of the most cost-effective route to net zero, and represents a significant economic opportunity, with the potential to support up to 50,000 jobs in our industrial heartlands and across the supply chain, and deliver £4-5 billion in Gross Value Added by 2050 through exports. We are building on skills and experience gained via our well-developed offshore industry and our significant storage potential.

Innovation will be needed to accelerate development of this range of new low-carbon technologies to support their deployment at scale over the coming decades. This includes supporting a UK advanced nuclear industry by demonstrating Advanced Modular and Small Modular Reactors, aiming to unlock the potential of floating offshore wind, and developing innovation solutions for electricity system flexibility as well as longer duration energy storage. The government is also supporting the development of low-carbon hydrogen production and next-generation CCUS, aiming to reduce costs and bring new solutions to market. Research and development in fusion will capitalise on UK expertise and provide potential longer-term energy options.

Central to delivering this infrastructure is an efficient planning system. It can take many years to get a major project through the planning system, and as volume and complexity increases, so the system is increasingly facing delays and challenges. The government is committed to ensuring that the town and country planning, Electricity Act planning, and Nationally Significant Infrastructure Project (NSIP) regimes are more effective in

supporting our energy security and net zero goals. As part of this, last month government published its action plan for reforming the Nationally Significant Infrastructure Programme (https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-nsip-reforms-action-plan) to make the system faster, greener, fairer and more resilient.

National Policy Statements (NPS) are the cornerstone of the system. They set out the national need for infrastructure and give guidance on planning considerations for individual projects. Alongside this plan, the government is publishing 5 revised energy NPSs covering Renewables, Oil and Gas Pipelines, Electricity Networks, Gas Generation, and an overarching Energy Statement for consultation. These reflect the importance of energy security and net zero with clear, strong statements of national need for new energy infrastructure which can help expedite planning.

The revised draft Renewables NPS introduces the concept of 'critical national priority' for offshore wind and supporting transmission infrastructure, and the revised draft electricity Networks NPS is strengthened by reference to strategic network plans that ensure our connecting infrastructure is developed in a joined-up way to reduce impacts.

The government is also developing a new nuclear NPS, which will cover the siting and policy framework for nuclear electricity generating infrastructure beyond 2025. As a first step, we will consult on the proposed approach to siting new nuclear projects later this year and aim to designate the new NPS following consultation and Parliamentary scrutiny by early 2025.

As with all large-scale infrastructure, energy projects can have a significant impact on our surroundings, but also bring opportunities and investment that can conserve and enhance the environment. In line with Biodiversity Net Gain and the biodiversity duty, public authorities should ensure that energy infrastructure and associated decisions should deliver opportunities to conserve and enhance biodiversity.

Given the scale and speed of low-carbon infrastructure development needed, we expect that more planning reform will be required. We are looking closely at what other countries have done to speed up infrastructure deployment, including recent developments in Europe. This is a global challenge, where managing the balance between local and environmental protection, securing energy supplies in an unstable world, and urgently tackling climate change are an issue for governments across the world.

We also need the workforce to deliver on our targets and secure the economic opportunity it presents. In 2024, the Green Jobs Delivery Group, will publish a 'Net Zero and Nature Workforce Action Plan'. This plan will

outline the headline actions and solutions that the group is progressing to deliver the net zero workforce needed. We are starting with a set of head start actions from the Net Zero Power and Networks pilot working group now, followed by a suite of comprehensive actions for this sector by summer 2023, which can be used as a template for the other sectoral assessments.

Nuclear

Our key commitments

- We will deliver a programme of new nuclear projects beyond Hinkley Point C and Sizewell C.
- We will set up Great British Nuclear, with the responsibility to lead delivery of the new nuclear programme, backed with the funding it needs.
- We will launch a competitive process to select the best Small Modular Reactor technologies, with the first phase commencing in April 2023.
- We will support the development of Advanced Modular Reactors through the Advanced Nuclear Fund to support a demonstration by the early 2030s.

The government is committed to ensuring that the UK is one of the best places in the world to invest in civil nuclear power and is taking the steps to revitalise the UK's nuclear industry. The 'British Energy Security Strategy' set out our ambition for deploying up to 24 gigawatts by 2050, around 25% of our projected 2050 electricity demand.

Riding the momentum of the government's landmark deals for Hinkley Point C and its investment in Sizewell C, we are now building a pipeline of additional projects to create certainty for the sector. The project pipeline will comprise a mixture of technologies including Small Modular Reactors (SMRs), Advanced Modular Reactors (AMRs) and gigawatt-scale reactors.

Our commitment to a nuclear programme and to Great British Nuclear (GBN) will enable the UK to be on a path to achieve its ambition to become a global leader in civil nuclear power and SMRs, which could include the creation of high-value jobs and the development of our capabilities.

We will deliver this by:

- moving the Sizewell C project to the point of final investment decision in this Parliament
- establishing a pipeline of new nuclear projects
- supporting the development of new nuclear technologies
- strengthening Britain's nuclear supply chain

Forward look

Progressing Sizewell C
Working with EDF, the government will take the necessary steps to help secure our energy future by progressing the Sizewell C project to the point of a final investment decision in this Parliament, subject to value for money and all relevant approvals.

Establishing a pipeline of new nuclear projects
The government is committing to a programme of new nuclear projects beyond Sizewell C, giving industry and investors the confidence they need to deliver projects at speed, reducing costs through learning and replication. To deliver this, we have launched Great British Nuclear (GBN), which will be an arms-length body responsible for driving delivery of new nuclear projects, backed with the funding it needs. GBN will operate through British Nuclear Fuels Limited.

The organisation will be initially led by an interim Chair and CEO and we will be launching the recruitment for a permanent Chair and CEO shortly. In parallel, GBN will also begin recruiting a fully staffed team. GBN will be located in or around the Greater Manchester area.

We are working towards bringing forward legislation setting out a statutory role for GBN when parliamentary time allows. In the meantime, work will continue at pace to achieve our ambition within the existing legal framework to support delivery of the government's ambitions.

The first priority for GBN is to launch a competitive process to select the best SMR technologies. This will commence in April with market engagement as the first phase. The second phase – the down selection process – will be launched in the summer, with an ambition to assess and decide on the leading technologies by autumn.

The government will provide co-funding that will be deployed by GBN to support the development of these selected technologies, and will work with successful bidders on ensuring the right financing is in place, in line with its

commitment to take 2 Final Investment Decisions next parliament. The total level of development funding will be subject to future Spending Reviews.

In addition, GBN will work with wider government on access to potential sites for new nuclear projects to achieve our long-term ambition. GBN will also support the government's consideration of further large gigawatt-scale projects to help us deliver on our net zero ambitions.

We launched the Future Nuclear Enabling Fund of up to £120 million to provide targeted support for new nuclear to address barriers to entry and will announce a shortlist of applications to begin pre-grant award due-diligence.

The government has accepted the main recommendation of the 'Independent Review of Net Zero' and will be producing a roadmap later in 2023, following the establishment of GBN and the launch of the competitive technology selection process.

We will work closely with the Nuclear Skills Strategy Group to deliver the 'Nuclear Skills Strategic Plan' to provide the future roles and job the sector needs.

Supporting the development of new nuclear technologies
We are also supporting the development of Advanced Modular Reactors through the Advanced Nuclear Fund to support an AMR demonstration by the early 2030s.

Delivery of Phase A of the Advanced Modular Reactor Research, Development and Demonstration programme, which provided up to £2.5 million across 6 projects in 2022 to 2023, is concluding and we are analysing the outputs.

We have also launched Phase B of the AMR RD&D programme, which was announced in December 2022 (to run 2023 to 2025) and will provide up to £55 million across up to 2 projects and up to £5 million to support the UK's regulators. Successful bids will commence work in early summer 2023.

Strengthening our nuclear supply chain
The Nuclear Fuel Fund opened for applications in January 2023, with grant awards planned for later in 2023 following assessment of the proposals put forward for funding.

We are also developing the programme, under the Advanced Nuclear Fund, for the further development of Coated Particle Fuel, which are needed to power future reactors.

The development of the nuclear roadmap will support further action to ensure a resilient supply chain and identify opportunities to develop UK capabilities.

Renewables

Our key commitments

- We are launching the Floating Offshore Wind Manufacturing Investment Scheme, to provide up to £160 million to kick start investment in port infrastructure projects.
- We will establish a solar government-industry taskforce and we will publish a solar roadmap setting out a clear step by step deployment trajectory to achieve 70GW of solar by 2035.
- We have committed to annual Contracts for Difference auctions to help drive the rapid deployment of renewable electricity.

Low-cost renewable generation will be the foundation of the electricity system and will play a key role in delivering amongst the cheapest wholesale electricity in Europe. The UK is already at the forefront of many renewable technologies, with renewables currently accounting for over 50 gigawatts of the UK's electricity generation, and we are taking forward a range of actions to further accelerate deployment, including many of the relevant recommendations from the 'Independent Review of Net Zero'.

Improved networks and grid connections are fundamental to rapid renewables deployment. The details of the government's ambitions for a modernised grid can be found in the section on Power Networks, Interconnection and System Governance.

Cross-cutting developments

Forward look

Investment

The government launched the Contracts for Difference (CfD) Allocation

Round 5 in March 2023, which is the first round to run on an annual basis. This move to annual auctions will help drive the rapid deployment of renewable electricity and improve investor certainty. The government has set an initial budget of £205 million, with the ability to increase this budget once we have greater certainty about the participating pipeline, at valuation stage in the summer. This round will have a 2-pot structure, to maintain support for both established and emerging technologies, including offshore wind, onshore wind, solar, tidal, geothermal and floating offshore wind.

We are considering whether it might be appropriate to introduce reforms to the CfD scheme to ensure it remains adaptable and helps address emerging barriers to renewable energy deployment – notably around supply chain bottlenecks and capacity. In April 2023, the government will launch a call for evidence on non price factors. Such factors could focus on system integration and supply chain development.

The government will consider how to ensure investment in repowered assets is appropriately valued in the market, to ensure locations with good energy resource continue to contribute to electricity security. This will include considering the potential of the CfD to support repowered projects as part of a CfD consultation response by spring 2023.

As we set out in the ‘British Energy Security Strategy’, we are actively exploring the potential for international projects to provide clean, affordable and secure power. For example, the government is interested in the Xlinks project, a proposed large scale onshore wind, solar and battery electricity generation site in Morocco that would exclusively supply power to the GB grid via high voltage direct current subsea cables. The government is considering – without commitment – the viability and merits of the proposal to understand if it could contribute to the UK’s energy security.

Planning reform

The government is taking important steps to cut the time taken to build renewable electricity plants, including by creating a more conducive planning environment. We are working to accelerate the planning consent processes by designing a fast-track consenting timeframe, which will be available for certain Nationally Significant Infrastructure Projects that meet defined quality standards, reducing the maximum formal examination period to 12 months. The Levelling-up and Regeneration Bill also includes the power for the Secretary of State to shorten the maximum examination timeframe. We will consult on our proposals for fast-track consenting, including proposed quality standards in spring 2023.

Skills, infrastructure, and supply chain

In line with the recommendations on skills from the 'Independent Review of Net Zero', the renewables industry is working within the Green Jobs Delivery Group to develop the 'Net Zero Skills and Workforce Action Plan' to be published in 2024, which will address emerging workforce challenges, including for solar and onshore wind. Solar Energy UK is also working with training partners and local bodies such as Mayor of London's Office to provide grants, learning tools, and training and placement programme.

In line with the recommendations from the 'Independent Review of Net Zero', we are exploring policy options for increasing the deployment of on-site electricity generation at manufacturing facilities, to encourage manufacturers to produce their own energy. This will help decarbonise business and reduce dependence on imported energy.

The government has launched a Task & Finish Group for Critical Mineral Resilience in UK Industry. Consisting of independent industry experts, the Group's remit is to investigate the critical mineral dependencies and vulnerabilities, including within the manufacture of clean energy technology. The Group will produce a report at the end of 2023.

Offshore Wind

The 'British Energy Security Strategy' increased the UK's ambition for offshore wind to up to 50 gigawatts by 2030, with up to 5 gigawatts from floating wind and set out proposals to accelerate deployment rapidly. The UK's Offshore Wind Champion, Tim Pick, and the Offshore Wind Acceleration Taskforce has been supporting the government to remove barriers and accelerate deployment. In addition, the government provided grants to manufacturing facilities through the Offshore Wind Manufacturing Investment Scheme – we expect new manufacturing facilities, such as SeAH Wind's monopile factory and JDR Cables' subsea cable facility, will begin to complete their construction and operations by the end of 2024, boosting supply chain capacity for the offshore wind industry.

Forward look

Planning reform

We will put legislation in place to streamline the offshore wind consenting process.

The government's flagship Energy Bill contains measures to introduce the Offshore Wind Environmental Improvement Package announced in the 'British Energy Security Strategy', including regulations to adapt environmental assessments for offshore wind, enable strategic

compensation, review the way in which Habitats Regulation Assessments are carried out and introduce Marine Recovery Funds.

Offshore wind projects that meet the necessary quality criteria will also be able to benefit from the new Fast Track consenting process being implemented in the Levelling Up and Regeneration Bill. The Energy Bill and Levelling Up and Regeneration Bill are expected to gain Royal Assent during this Parliamentary Session, with pilots for the Fast Track consenting process beginning from late autumn.

Skills, infrastructure, and supply chain

Alongside this plan we are launching the Floating Offshore Wind Manufacturing Investment Scheme (https://www.gov.uk/government/publications/floating-offshore-wind-manufacturing-investment-scheme). The scheme will provide up to £160 million to kick-start investment in port infrastructure projects needed to deliver our floating offshore wind ambitions. This will give investors the confidence to back this emerging sector, which will make a vital contribution to the UK's energy security and net zero.

The government also welcomes the work of the offshore wind industry to consider the strategic funding of key supply chain, innovation and skills priorities. Working alongside industry, the government will remove barriers to help modernise The Crown Estate's investment capability to help unlock investment and growth in key sectors, including offshore wind.

We are working with the Offshore Wind Industry Council and Ministry of Defence to put in place suitable mitigation that avoids offshore wind turbines compromising air defence and air traffic radar systems. Developers will fund a procurement competition to identify a solution, launching in autumn 2023.

As set out in the Power Networks, Interconnection and System Governance section of this plan, in December 2022 we also launched the Offshore Coordination Support Scheme, a grant scheme with up to £100 million available for offshore electricity projects.

Onshore wind

With over 14 gigawatts currently deployed in the UK, low-cost onshore wind is an important part of the energy mix, accounting for around a quarter of installed renewable capacity. Contracts for Difference Allocation Round 4 secured almost 1.5 gigawatts of onshore wind power, including 900 megawatts of mainland projects. In 2022, the government confirmed that it would continue to support onshore wind through annual Contracts for Difference auctions.

Forward look

Planning reform

Recognising that onshore wind is an efficient, cheap and widely supported technology, government has consulted on changes to planning policy in England for onshore wind to deliver a more localist approach that provides local authorities more flexibility to respond to the views of their local communities. We also consulted on proposed measures to support the repowering of onshore wind, in line with commitments made in the 'British Energy Security Strategy'. We will respond to the National Planning Policy Framework consultation by spring 2023.

The government will shortly launch a new consultation to seek views on how to develop local partnerships for onshore wind in England, recognising the importance of good community engagement and participation to delivering more onshore wind in a sustainable way.

Solar

The UK has huge deployment potential for solar power, and we are aiming for 70 gigawatts of ground and rooftop capacity together by 2035. This amounts to a five-fold increase on current installed capacity. We need to maximise deployment of both types of solar to achieve our overall target.

Deploying rooftop solar remains a key priority for the government, and it continues to be one of the most popular and easily deployed renewable energy sources; over a million homes now have solar panels installed. Solar can benefit households and businesses by allowing them to reduce electricity bills significantly and receive payment for excess electricity generated. Warehouses, distribution centres and industrial buildings with high electricity demand can offer significant potential for solar deployment, which can rapidly pay for itself by means of energy bill savings. The government is looking to facilitate and promote extensive deployment of rooftop solar on industrial and commercial property in order to make maximum usage of available surfaces for business as well as environmental and climate benefits.

Ground-mounted solar is one of the cheapest forms of electricity generation and is readily deployable at scale. The government seeks large scale ground-mount solar deployment across the UK, looking for development mainly on brownfield, industrial and low and medium grade agricultural land. Solar and farming can be complementary, supporting each other financially, environmentally and through shared use of land. We consider that meeting energy security and climate change goals is urgent and of critical

importance to the country, and that these goals can be achieved together with maintaining food security for the UK. We encourage deployment of solar technology that delivers environmental benefits, with consideration for ongoing food production or environmental improvement. The government will therefore not be making changes to categories of agricultural land in ways that might constrain solar deployment.

The government considers that there is a strong need for increased solar deployment, as reflected in the latest draft of the Energy National Policy Statements. We recognise that as with any new development, solar projects may impact on communities and the environment. The planning system allows all views to be taken into account when decision makers balance local impacts with national need.

Forward look

Investment

To meet the demand for rooftop solar, the government is working to facilitate low-cost finance from retail lenders for homes and small business premises, aligning with recommendations in the ‘Independent Review of Net Zero’.

To provide certainty to investors in the solar industry, in line with the ‘Independent Review of Net Zero’ recommendation the government will publish a solar roadmap in 2024, setting out a clear step by step deployment trajectory to achieve the five-fold increase (up to 70 gigawatts) of solar by 2035. The government will also establish a government/industry taskforce, covering both ground mounted and rooftop solar to drive forward the actions needed by government and industry to make this ambition a reality.

Planning reform and building standards

To accelerate further the deployment of rooftop solar, the government is currently consulting on changes to permitted development rights. Our proposals seek to simplify planning processes for larger commercial rooftop installations and introduce a new permitted development right for solar canopies on non-domestic carparks, enabling more solar installations to benefit from the flexibilities and planning freedoms permitted development rights offer.

As part of a consultation on the Future Homes and Building Standards to be published later in 2023, the government will explore how it can continue to drive onsite renewable electricity generation, such as through rooftop solar

where appropriate in new homes and buildings. The government will also publish practical guidance to support the installation of rooftop solar on its own estate and the wider public sector estate.

Bioenergy

Bioenergy, produced from biomass, is considered a renewable, low-carbon energy source, because its inherent energy comes from the sun, it removes carbon dioxide from the atmosphere as it grows, and it can be used to directly displace oil, coal and natural gas. Whilst it also has uses in heating and transport, electricity from bioenergy offers both baseload and seasonably dispatchable renewable electricity supply. When combined with carbon capture and storage (power BECCS), it can deliver negative emissions, which is key to delivering net zero.

The Biomass policy statement, published in 2021, set out the government's strategic aims for sustainable biomass use in sectors across the economy including electricity. It presented, for the first time, the government's position that bioenergy with carbon capture and storage (BECCS) can play a role in contributing to net zero and presented the potential routes for BECCS deployment. We are driving our bioenergy agenda forward by:

- publishing a new 'Biomass Strategy'
- incentivising deployment of power BECCS through development of a bespoke business model

Forward look

Biomass Strategy

The government will publish the 'Biomass Strategy' by the end of June 2023. The 'Biomass Strategy' will set out further details on how biomass can best contribute towards net zero across the economy.

The strategy will review the amount of sustainable biomass available to the UK and how this resource could be best utilised across the economy to help achieve the government's energy security and net zero goals, consistent with our wider environmental commitments.

The strategy will also establish the role which BECCS can play in reducing carbon emissions across the economy and set out how the technology could be deployed.

Incentivising deployment of power BECCS projects

The government is preparing for the deployment of power BECCS and made substantial progress in 2022 launching a business model consultation and project submission process.

Two projects passed the deliverability assessment for the power BECCS project submission process, Drax Power Ltd and Lynemouth Power Ltd. They have not been selected for initial deployment in Track-1 negotiation, but the department will engage further with these projects following the assessment outcome. Track-1 is not the extent of our ambition, and the department remains committed to achieving 5 million tonnes per annum of engineered greenhouse gas removals by 2030. Further details of the wider CCUS programme, including the launch of Track-2 and plans for the expansion of Track-1 clusters, have been set out in the Hydrogen and CCUS section of this plan.

The government will imminently publish a response to a consultation on business models for power BECCS. The consultation set out the government's intention to address the immediate market and technology risks through contract-based business models, subject to affordability and value-for-money.

Flexibility

Our key commitments

- The project negotiation list for Track-1 CCUS projects has been announced and includes Net Zero Teeside Power which could become the UK's first power CCUS project.
- We intend to consult in 2023 on the need and potential design options for market intervention to support hydrogen to power.
- We are continuing to deliver the 2021 'Smart Systems and Flexibility Plan', and alongside this plan has published the government response on delivering a smart and secure electricity system.

Meeting our 2035 commitment for a decarbonised power system, subject to security of supply, will mean transitioning away from unabated gas generation, where possible. Whilst unabated gas generation currently provides much of our flexible capacity at present, ensuring the power system is stable and secure, its role will reduce as low-carbon alternatives

mature.

The government is supporting this transition by developing enablers for existing high carbon flexible capacity to have clear decarbonisation pathways and facilitating the deployment of low-carbon flexibility technologies and services. These actions will need to happen at pace and be driven for all forms of low-carbon flexibility, from larger flexible generation plants, to unlocking the value of demand side flexibility from households and businesses.

The government will enable the acceleration of low-carbon flexible technologies and services deployment through:

- driving the deployment of power Carbon Capture Usage and Storage (CCUS) in the 2020s and beyond
- consulting on the need and potential design options for hydrogen-fired electricity generation 'hydrogen to power' market intervention
- facilitating the deployment of electricity storage
- developing enablers for clear decarbonisation pathways for unabated generation
- unlocking demand side flexibility and digitalisation at scale
- updating and reforming electricity market arrangements and governance to support flexibility

Forward look

Driving the deployment of power CCUS in the 2020s and beyond
The government is on track to deliver the first power CCUS project, as the project negotiations list for Track-1 CCUS projects has been announced and includes Net Zero Teesside Power which could become the UK's first power CCUS project, subject to the project and the cluster successfully demonstrating affordability and value for money in the upcoming negotiations. Further details of the wider CCUS programme, including the launch of Track-2 and plans for the expansion of Track-1 clusters, have been set out in the Hydrogen and CCUS section of this plan.

To support the deployment of power CCUS projects, the government has designed the Dispatchable Power Agreement - a bespoke model dedicated to ensuring power CCUS can run ahead of unabated gas and provide non-weather dependent generation to complement variable renewables.

The government will issue a response to the call for evidence on the future policy framework for power CCUS in spring 2023.

Consulting on the need and potential design options for hydrogen-fired electricity generation 'hydrogen to power' market intervention

The government believes hydrogen to power can provide reliable low-carbon flexible generation while creating a decarbonisation pathway for unabated generation; supporting our decarbonisation ambitions while maintaining security of supply. Government analysis shows that having hydrogen available in the power sector could achieve lower emissions at a lower cost than scenarios without hydrogen. We are committed to ensuring that market frameworks can support the development of new hydrogen to power projects. The government, therefore, intends to consult in 2023 on the need and potential design options for market intervention to support hydrogen to power.

Hydrogen to power deployment faces investment uncertainty from being a first of a kind technology and the uncertainties of enabling transport and storage infrastructure deployment. Any intervention options would look to address these uncertainties and be based on the need for market-based solutions to support investment in low-carbon flexible technologies as outlined in our Review of Electricity Market Arrangements (REMA) consultation. They would consider existing government subsidies and support in the hydrogen value chain, and any future policy encouraging investment in large scale long duration electricity storage. The government will also continue to identify and develop appropriate policy to tackle non-financial barriers to the deployment of hydrogen to power.

Developing enablers for clear decarbonisation pathways for unabated gas generation

The government is enabling clear pathways for the decarbonisation of high carbon flexible capacity. In March 2023, we published the Decarbonisation Readiness consultation which outlines proposals for requiring new build and substantially refurbishing combustion power plants to demonstrate how their plant could decarbonise by either converting to 100% hydrogen fuel or by installing CCUS technology within the plant's lifetime. The government will issue a response this summer.

Alongside this, the January 2023 Capacity Market (CM) consultation sought views on ways that unabated gas capacity may be able to leave their long-term CM agreement early to decarbonise, subject to certain security of supply conditions being met. The government has also proposed strengthening the CM emissions limits for new build and refurbishing plant from 1 October 2034. Proposals also cover options for removing barriers for

low-carbon technology to participate in the CM.

Facilitating the deployment of electricity storage

The government is facilitating the deployment of electricity storage at all scales through the joint government and Ofgem 'Smart Systems and Flexibility Plan'. Our approach centres on creating a best-in-class regulatory framework by removing regulatory and policy barriers to the implementation of storage, ensuring that markets reflect the value of flexibility to the system and investing in innovation. This will ensure storage can enter the market and compete fairly alongside other new or established energy solutions.

The UK Infrastructure Bank (UKIB) has announced, that following an expressions of interest process, it will appoint managers for equity funds covering both short and long duration electricity storage. UKIB will invest on a matched basis, crowding-in wider sources of finance. Going forward, UKIB expect to make direct investments in the electricity storage sector, which was identified as an investment opportunity in their strategic plan.

The government will put in place an appropriate policy framework by 2024 to enable investment in large scale long duration electricity storage (LLES), with the goal of deploying sufficient storage capacity to balance the overall system.

The government is working with the industry-led Storage Health and Safety Governance Group to ensure an appropriate, robust and future-proofed health and safety framework is sustained as electricity storage deployment increases. In 2023, we will publish a product and installation standard (known as a Publicly Available Standard) for domestic/small-scale battery storage as well as guidance for grid-scale storage.

The government will announce further recipients of funding in early 2023 under the second phase of the Longer Duration Energy Storage programme which aims to accelerate the commercialisation of innovative longer duration energy storage projects. This has already awarded £33 million to successful projects to support a build and demonstration phase.

Unlocking demand side flexibility and digitisation at scale

The government is working in partnership with industry to empower consumers of all sizes and types to engage in flexibility – this will reduce systems costs for all.

As at the end of December 2022, 55% of all meters in homes and small businesses in Britain were smart or advanced. The government will continue to roll out smart meters and confirm the fixed minimum annual installation requirements for energy suppliers for the remainder of the smart meter

policy framework in 2023.

The government will implement the actions set out in the 'Electric Vehicle Smart Charging Action Plan (https://www.gov.uk/government/publications/electric-vehicle-smart-charging-action-plan)', published in January 2023. These commitments stretching out to 2026 will maximise the benefits which electric vehicles offer for energy flexibility, and to make sure the system is ready to respond in time for the upturn in energy demand.

Alongside this plan, The government has published a response to the consultation Delivering a smart and secure energy system to take forward a multi-year programme that: develops a competitive and well-regulated market for energy smart appliances with powers being sought in the Energy Bill; positions the UK as a leader in supporting a strong market in demand side response services; and, in turn will allow for electricity demand to be shifted to reduce electricity system costs and to benefit consumers in terms of their energy costs and choices.

The government will deliver the Flexibility Innovation Programme, worth up to £65 million, which seeks to enable large-scale widespread electricity system flexibility. This has already awarded over £17.5 million to successful projects through competitions including Interoperable Demand Side Response, Alternative Energy Markets, Vehicle-to-Everything, Inclusive Smart Solutions and a range of Data and Digitalisation programmes. The government will announce further recipients of funding in 2023.

The government will work with Ofgem and Innovate UK to roll out digitalisation within the energy sector, building on our response to the recommendations of the Energy Digitalisation Taskforce.

In 2023, the government will also assess evidence from innovation projects under the Net Zero Innovation Portfolio to identify the appropriate environment for energy data sharing and integration of digital energy infrastructure. This includes a feasibility study exploring the needs case, benefits, scope, and costs of an energy system 'digital spine', a competition supporting the development of solutions to automatically register domestic small scale low-carbon assets, and a competition to determine the technical and commercial feasibility of a smart meter energy data repository.

Later in 2023, Ofgem will respond to the Call for Input on the Future of Distributed Flexibility; setting out a way forward to incentivise the deployment of distributed flexibility at scale, including options for a technical solution to coordinate flexibility markets.

Updating and reforming electricity market arrangements and

governance to support flexibility
The government is taking the necessary steps to ensure flexibility solutions can attract the investment needed to deploy, for example, through REMA. The next steps on REMA are set out in the Markets and Affordability section of this plan.

Ofgem will publish its decisions later in 2023 on proposals to ensure governance arrangements for local energy institutions are fit for purpose for delivering a smart and flexible energy system.

Power networks, interconnection and system governance

Our key commitments

- We will publish an action plan this year in response to Electricity Networks Commissioner Nick Winser's recommendations on halving the development time for transmission network projects.
- We will publish an action plan in the summer to accelerate electricity network connections, including reform of the connections process.
- We will introduce guidance on community benefits for network infrastructure later this year, subject to responses to our consultation on these measures.
- The government and Ofgem will consult this summer on the detail of the Future System Operator's new roles in resilience and security and provide an update on implementation plans.
- We will work with partners to realise an increase in interconnection capacity – aiming for at least 18 gigawatts by 2030, over double the current capacity of 8.4 gigawatts.

As we transition to a more resilient and clean energy system, we anticipate that demand for electricity could double by 2050. Between now and then, the system will need to enable 50 gigawatts of offshore wind by 2030; and the decarbonisation of the power system, subject to security of supply, by 2035. To meet this challenge, it is crucial that we ensure we have the right electricity network infrastructure, governance arrangements of the system, and interconnection with European neighbours.

Network connection is often on the critical path for building new energy infrastructure, so it is essential that we prevent networks from becoming a blocker to progress. The government is aware that the current processes for building new networks and connecting new generation and demand projects to the grid need to be speeded up significantly and addressing this is a high priority. As described in this chapter, there are several important actions in hand to reduce timelines, but more needs to be done to reform systems and processes which we are progressing as a priority.

The government has introduced legislation, as part of the Energy Bill, to establish a new, publicly owned Future System Operator (FSO). Depending on a number of factors, including timings of the Energy Bill and discussing timelines with key parties, our aim is for the FSO to be operational by, or in, 2024.

We have 3 key priorities for our system:

- accelerating delivery of the strategic infrastructure we need to support a doubling of electricity demand
- anticipating future need so that money and resources can be saved by planning and building ahead
- maximising flexibility to enable the matching of supply and demand to minimise energy wastage and cost

The actions set out in this chapter aim to ensure investment in the electricity networks, at transmission and distribution level, at the scale and pace needed.

The areas that we are focusing on to deliver these priorities and speed up delivery of new electricity infrastructure are:

- halving development time for transmission network projects
- taking a whole systems approach to network planning
- enabling an effective legislative and regulatory framework
- accelerating electricity network connections
- expanding and optimising our electricity interconnection with neighbours

Halving development time for transmission network projects

The government is working closely with Ofgem and industry to achieve our goal of reducing development time for transmission network projects. Last July we appointed Nick Winser as the Electricity Networks Commissioner to advise on how this can be done. The Commissioner is developing options

under 8 themes:

- strategic plan
- design standards
- planning approval
- regulatory approval
- supply chain
- people and skills
- outage planning
- end-to-end process

He will deliver his recommendations in June 2023, and we expect that he will be able to set out a package of measures to halve delivery times, based on a significant programme of reform. We accept that substantial changes to current processes are likely to be needed to achieve our aims and will respond with an action plan during 2023.

We aim to accelerate every stage in the delivery process and set out below actions on strategic network planning, improving the development consent process and community engagement, and effective legislation and regulation. We also describe action to reform the networks connections process, as well as work to optimise interconnection with other countries.

Taking a whole systems approach to network planning

Establishing a Future System Operator to manage our energy system

Our energy landscape is becoming increasingly integrated and complex in our drive to net zero. This calls for a central body that is able to weigh up and advise on the impacts and trade-offs across vectors and plan from a whole systems perspective to map the most efficient and resilient path ahead. This why we are establishing the FSO at the heart of the energy system to play a vital role in ensuring security of gas and electricity supply, whilst driving progress towards our decarbonisation targets and enabling an efficient and economic system to keep consumer bills affordable.

Alongside current Electricity System Operator roles, including their crucial responsibility for keeping the lights on, the FSO will plan the network from a strategic whole systems perspective and provide impartial expert advice to the government to enable us to make policy decisions based on robust technical evidence with consideration of whole system network impacts.

The FSO will also be charged with implementing the gas Supply Security Assessment and adopt a whole energy system coordination role to ensure resilience and security across gas and electricity.

The government and Ofgem will consult this summer on the detail of the FSO's new roles in resilience and security and provide an update on implementation plans for the FSO. Ofgem will also consult on the creation of the FSO's new electricity and gas licences. We are launching a consultation on a 'Strategy and Policy Statement for Energy Policy in Great Britain' to which the FSO (as well Ofgem) must have regard. We will work closely with Ofgem and the parties involved to ensure a smooth transition and ensure the safety and stability of the energy system is maintained.

Transitioning to a strategically designed network

Our Electricity Networks Strategic Framework, which we published jointly with Ofgem last August, set out a shared vision for the transformation of the electricity network, bringing together policy on network investment, smart solutions and data, network planning and management and connections to the network. National Grid ESO published the Holistic Network Design (HND) in July 2022, setting out for the first time a strategic, coordinated plan for the electricity network needed to support 50 gigawatts of offshore wind by 2030.

The transition to a strategic approach to the grid will continue this year:

- The Electricity System Operator will build on the HND by offering a blueprint that will give grid connections to the remaining offshore wind projects leased through the ScotWind leasing round in January 2022 and projects in the Celtic Sea.
- Once this is complete, the FSO will then create the first full pCentralised Strategic Network Planp in 2025, to set out a blueprint for the whole electricity network.
- The government will conclude the Offshore Transmission Network Review (OTNR), which was set up to establish a more coordinated approach to the design of connections for offshore wind, with the publication this summer of recommendations for a Future Framework. The Future Framework builds upon changes already implemented under the OTNR, including the HND approach, to enable delivery of a more strategic approach to offshore wind and associated transmission infrastructure.
- And to encourage near term projects which already have a grid connection to move to a more coordinated, strategic approach to their network connections, in December 2022 we launched the Offshore

Coordination Support Scheme, a grant scheme with up to £100 million available for offshore electricity projects. The scheme will conclude in the summer.

Improving planning consents and engaging with communities

The next step is to improve the planning process to ensure that electricity infrastructure projects can be built without undue delay. Alongside this, we are committed to ensuring that projects benefit not only the nation as a whole, but also the communities in which they are built.

- The government is publishing for consultation changes to the energy National Policy Statements, including to reflect the strategic importance of and need for network infrastructure.
- To ensure communities hosting transmission network infrastructure can benefit from supporting the delivery of cheaper, secure and low-carbon energy for all of Britain, the government has published a consultation on community benefits for network infrastructure. The consultation proposes to introduce guidance on the appropriate levels and forms of benefits, in order to give communities the knowledge, power and flexibility to decide what benefits they want, in consultation with the project developer, whilst ensuring a consistent approach to the development of community benefits. We also intend to introduce a recommended level of funding for community benefits, which we believe will increase the level of funding from that seen in existing examples of community benefits for electricity transmission network infrastructure.
- We will publish a response this year to our call for evidence seeking views on whether land rights and consents processes for electricity network infrastructure are fit to accommodate the rapid, transformative change to the electricity network that is needed.
- The government is supporting the Electricity Transmission (Compensation) Bill to bring forward proposals to ensure landowners have access to alternative dispute resolution processes in cases where there is disagreement on compensation when land or rights to access land have been acquired by electricity network operators for building network infrastructure. We will establish a taskforce this year to develop proposals on facilitating access to affordable, binding alternative dispute resolution.

Enabling an effective legislative and regulatory framework

Ensuring investment in the network ahead of need

To ensure that the networks are an enabler, rather than a barrier to the

energy system transformation, network infrastructure needs to be built and available ahead of need. The government and Ofgem are committed to creating policy and regulatory frameworks to support the anticipatory investment required for this and to increase the pace of infrastructure delivery.

The strategic context for network regulation has changed and Ofgem is changing how it regulates in response:

- We welcomed Ofgem's Accelerating Strategic Transmission Investment decision in December 2022, which sets out an accelerated regulatory approval process for around £20 billion of transmission projects identified in the Holistic Network Design and confirmed that these will not be subject to competition. This provided certainty to network companies who have now started to line up their supply chain to accelerate the delivery of these strategic projects, ready for 2030.
- For the distribution networks, the regulatory settlement announced in November enables more than £22 billion of initial investment in the local networks and Ofgem will continue to work to ensure the price control is agile, allowing flexibility in funding to suit network needs as they arise.
- Ofgem is undertaking a strategic review of future network regulation to ensure it is an enabler to net zero. This will inform future price control processes that determine investment by network operator companies. A consultation will be taking place over the next few months, following last September's Open Letter, with a policy decision on the way forward anticipated in the summer.

Strategy and Policy Statement
To provide a clear direction of travel on the regulatory framework for networks, the government is launching a consultation on a draft 'Strategy and Policy Statement' for energy policy in Britain, which sets out the government's strategic priorities for the energy sector.

The draft makes it clear that strategic network planning, accelerated delivery of network infrastructure, cost-effective anticipatory investment and timely network connections are key policy outcomes.

Energy Bill
The government has introduced legislation via the Energy Bill that will:

- enable competition in onshore electricity networks, which is expected to save consumers up to £1 billion by 2050 by improving efficiency and stimulating innovation in network solutions

- create a new governance framework for the energy codes, which set out much of the detail underpinning the operation of the electricity and gas networks, and the wholesale and retail markets. This will empower Ofgem to set a strategic direction for how the detailed rules of the energy system should evolve each year and create licensed code managers to ensure that direction is delivered. With the government's support, Ofgem will then implement these reforms within the following 7 years

Accelerating network connections

Connection timelines have become a very significant issue affecting new electricity generation and demand projects in parts of the country, driven by the need for significant investment in the network described above, as well as by a process for connections which is no longer fit for purpose for the scale and pace of electrification. There are over 250 gigawatts of generation in the transmission connection queue (compared to circa 80 gigawatts that is currently connected). Transmission connection offers to be sent out in the first quarter of 2023 will exceed the total for the whole of 2022, which in turn was circa 85% higher than 2021.

Reducing connection timescales is a high priority for government. As well as the actions above to accelerate infrastructure, this requires reform to connections process and we are committed to exploring all options to do this, including potential regulatory changes. We expect the following actions to result in significant reductions in connection timescales.

- The government is working with Ofgem, network companies and connection stakeholders to support the ESO GB Connection Reform project, with a consultation expected to be published by the ESO in May 2023. The project is identifying solutions to improve the transmission network connection process so that it better meets the needs of connection customers and the energy system as a whole.
- In the meantime, the ESO is working to release network capacity and improve management of the transmission connection queue, for example through improved modelling of the network impacts of new connections and proposals to remove slow moving projects from the connection queue, allowing other projects to connect faster. These actions should reduce network connection timescales in the coming months.
- We will continue working with the Energy Networks Association to assess ways to speed up connections to the distribution network. The Association has established a Strategic Connections Group comprising transmission and distribution network companies, government and Ofgem, which aims to improve the connection process, particularly at the transmission/distribution interface, and to agree best practice approaches

to ensure consistency across the country.

- Bringing together and building on this work, we will publish an action plan to accelerate connections, including reform of the connections process, in summer 2023.

Optimising our electricity interconnection with neighbours

Power cables that link our electricity network to those of neighbouring countries – known as interconnectors – provide an important source of resilience and efficiency in our power systems. They allow us to import power at times of low renewable energy output and to export excess green power at times of high renewable energy output, enabling us to keep British wind turbines spinning even once British demand has been met.

In 2022, Britain exported more power than we imported for the first time and in future we expect to see exports of electricity from Britain more frequently as the deployment of offshore wind continues at pace. Collaboration with European partners is also essential to ensure effective and efficient trade of power over interconnectors and to enhance energy security across the UK and our European partners. The government is working closely with Ofgem, developers and our European partners to realise:

- an increase of interconnection capacity, with an ambition of realising at least 18 gigawatts by 2030, over double the current capacity of 8.4 gigawatts
- the building of our first multi-purpose interconnectors (MPIs). These combine interconnection with direct connections to offshore windfarms, thus facilitating more coordinated connections from the windfarms to shore whilst reducing capital and operational costs

A number of interconnector and multi-purpose interconnector projects have applied to the third Ofgem cap and floor window for point-to-point interconnectors and the first Ofgem MPI pilot scheme. Ofgem is currently assessing applications with a view to taking Initial Project Assessment decisions by the end of 2023. Work is also ongoing to deliver a regulatory, legal and policy framework for the operation of MPIs and consider interconnection needs beyond 2030. The government therefore intends to:

• set out an ambition for interconnection beyond 2030 before spring 2024

The UK also signed a Memorandum of Understanding with the North Seas Energy Cooperation (NSEC) in December 2022. This will enable us to work with NSEC members to develop renewables projects in the North Seas, specifically hybrid projects such as MPIs. To ensure this capacity is put to best use, we are in parallel developing more efficient electricity trading

arrangements in line with our Trade and Cooperation Agreement with the EU.

Hydrogen and Carbon Capture and Storage

Our key commitments

- We are announcing successful applicants of the first competition window for Strands 1 and 2 of the Net Zero Hydrogen Fund (development and capital co-funding) and intend to launch a second competition window in the spring, to be run by UKRI.
- We are announcing a shortlist of projects for the first electrolytic hydrogen production allocation round (capital co-funding and revenue support) which we intend to enter due diligence with. Successful projects in this round will be funded by government until the hydrogen levy is in place. We intend to launch a second allocation round in Q4 2023
- To design hydrogen transport and storage infrastructure business models by 2025, we are also aiming to introduce legislative powers when parliamentary time allows.
- We are announcing the Track-1 negotiation project list of capture projects which include projects across hydrogen, power, industry, and waste sectors.
- We will launch a process, later in 2023, to enable further expansion of the Track-1 clusters, beyond the initial deployment, identifying and selecting projects within HyNet and East Coast Cluster which could be potential alternatives to any of the initial Track-1 projects, if any are unable to agree contracts within the criteria and timelines required.
- We have launched Track-2 of the CCUS cluster sequencing process alongside this publication to establish 2 further CCUS clusters

Hydrogen

The updated Hydrogen Investor Roadmap provides examples of opportunities across the hydrogen value chain. Our expectations are that up to 2 gigawatts of low-carbon hydrogen production capacity will be in operation or construction by 2025, on the way to our 2030 ambition of having up to 10 gigawatts of low-carbon hydrogen production capacity,

subject to affordability and value for money, with at least half of this coming from electrolytic hydrogen. CCUS-enabled hydrogen projects are also expected to play a key role in scaling up production into the 2030s. This could potentially provide the necessary certainty to unlock up to £11 billion of private investment and support more than 12,000 jobs we want to see by 2030.

The 'Hydrogen Sector Development Action Plan (https://www.gov.uk/government/publications/hydrogen-sector-development-action-plan)', published in July 2022, sets out actions that the government and industry are taking to maximise the economic opportunities that hydrogen presents for the UK. Recognising this critical partnership between the government and industry in delivering hydrogen projects, in July 2022 we appointed a UK Hydrogen Champion, Jane Toogood.

We aim to support the development of the hydrogen economy through the decade by:

- bringing forward a business model and funding for low-carbon hydrogen production projects
- developing business models for hydrogen transport and storage infrastructure
- facilitating the use of low-carbon hydrogen

Forward look
Bringing forward business models and finance for hydrogen projects

The first competition window for Strands 1 and 2 of the Net Zero Hydrogen Fund (NZHF) ran April to July 2022, aimed at projects which require development or capital costs without revenue support, and the successful applicants have been announced alongside this plan. The government intends to launch a second competition window for Strands 1 & 2 of the NZHF in the spring, to be run by UKRI and provide further funding routes for development and capital costs of production projects that do not require revenue support.

In July 2022, the government launched the first electrolytic hydrogen allocation round (HAR1), jointly offering NZHF capital expenditure and Hydrogen Production Business Model (HPBM) revenue support to electrolytic hydrogen projects. We expect to award contracts totalling up to 250 megawatts of capacity from HAR1, subject to affordability and value for money. We aim for contracts to be awarded in Q4 2023, with first projects operational in 2025. The government has published a shortlist of 20 projects we intend to enter due diligence with alongside this plan. HPBM payments

for projects awarded contracts through HAR1 will be funded by the government until the hydrogen levy comes into effect.

The government intends to launch a second allocation round (HAR2) in Q4 2023 and aim to award contracts to up to 750 megawatts of capacity in early 2025, subject to affordability and value for money, to deliver up to 1 gigawatt of electrolytic hydrogen production capacity in construction or operation by 2025.

The government intends to move to price competitive allocation in 2025 subject to legislation and market conditions.

Through the ongoing CCUS Cluster Sequencing process, the government is entering into bilateral negotiations with 2 CCUS-enabled hydrogen projects.

The government is legislating in the Energy Bill to provide the legal framework to deliver business model support for low-carbon hydrogen production and CCUS, and we are also publishing a consultation on proposed regulations in relation to the hydrogen production and Industrial Carbon Capture business models.

Building on this progress, the government will take forward the Net Zero Review recommendation to develop a delivery roadmap in 2023 to show how hydrogen production can be scaled up over the coming decade.

Developing business models for hydrogen transport and storage

Our overarching strategic objective for hydrogen transport and storage infrastructure is that this will be a key element of wider energy system architecture and will need to be available to meet the needs of users in the emerging hydrogen economy, including for users in power, industry, transport and potentially heat. To enable this, we have committed to designing hydrogen transport and storage business models by 2025 as stated in the ‘British Energy Security Strategy’.

To bring forward hydrogen T&S business models, the government will introduce legislative powers when parliamentary time allows, which will be crucial to designing these new business models by 2025.

We recently consulted on the need and potential approaches for T&S infrastructure strategic planning. The government response to the consultation is planned to be published by the end of June 2023 with any further details to align with the production roadmap.

Driving the use of low-carbon hydrogen

We have launched a consultation on a Low Carbon Hydrogen Certification Scheme, to demonstrate the emissions intensity of hydrogen and facilitate international trade. The government will respond in 2023.

We are working to remove barriers to hydrogen use, focussing on sectors which show the greatest potential in creating early and large-scale offtake. For example, in the Flexibility section of this plan the government announced its intention to consult on the need and potential design options for hydrogen to power market intervention.

The UK Hydrogen Champion role has been extended for a further 6 months to July 2023 to work with the government and industry to overcome delivery challenges in early hydrogen projects. This will build on recommendations set out in the Hydrogen Champion's independent report, published on 22 March 2023. The Hydrogen Champion is now driving action against these recommendations, including a focus on overcoming blocks in the supply chain and on jobs and skills, maximising the economic opportunity for the UK.

We are planning to take a strategic policy decision in 2023 on whether to seek to enable the blending of hydrogen in the existing gas distribution network. Further details will be provided this year including through the government response to our consultation on hydrogen transport and storage infrastructure, which we aim to publish in Q2 2023.

The government continues to support hydrogen innovation. The 5 winners of follow-up funding in the NZIP Low Carbon Hydrogen Supply 2 competition have been announced this week. They have been allocated a combined total of £19.4m to demonstrate cutting-edge technologies so they can reach the market swiftly. The reports from all feasibility projects are also being published.

Carbon Capture, Usage and Storage

By 2030 the Carbon Capture, Usage and Storage (CCUS) sector is expected to underpin a major proportion of cross economy CO_2 reductions in legally binding decarbonisation ambitions, and our international obligations under the Paris Agreement. Our geography means that the UK has one of the largest CO_2 storage potentials of any country in the world. It is estimated that the UK Continental Shelf could safely store 78 billion tonnes of CO_2, which might be the equivalent of 200 years of the UK's annual CO_2 emissions. We are committed to deploying CCUS in 2 industrial clusters by the mid-2020s and 4 clusters by 2030, with the aim of capturing and storing 20-30 million tonnes of CO_2 per year by 2030. Our objectives for these clusters include to capture and store up to 6 million tonnes of CO_2 a

year from industrial sectors, at least 5 million tonnes of CO_2 a year from engineered greenhouse gas removals (such as BECCS and DACCS), deliver the power CCUS capacity required in the 2020s and beyond to support our aims to decarbonise the electricity system and deliver CCUS-enabled blue H2 to support the delivery of our ambition for up to 10 gigawatts of low-carbon hydrogen production. CCUS may need to reach capacity for a total of around 50 million tonnes a year of CO_2 storage by the mid-2030s.

On 15 March 2023, the Chancellor announced that the government will provide up to £20 billion in funding for early deployment of CCUS. This unprecedented level of funding will unlock private investment and jobs across the UK, particularly in the East Coast, Northwest of England, and North Wales, and kick-start the delivery of subsequent phases of this new sustainable industry in the UK. In addition to this, we expect the actions set out in this plan to crowd-in billions of pounds of additional private capital as our private partners also commit to the CCUS programme, putting us on track to deliver up to 50,000 jobs and bringing investment to our industrial heartlands.

The UK Infrastructure Bank has also identified CCUS as an investment opportunity in its first strategic plan. The Bank is engaging the market and projects, focusing on how it can accelerate delivery of the UK's first CCUS clusters. Projects are encouraged to contact the UK Infrastructure Bank about their financing needs. Subject to proposals meeting its investment principles, the bank stands ready to invest.

We continue to deliver towards these aims by:

- progressing through the Track-1 Cluster sequencing process and planning Track-1 expansion
- launching Track-2 of the CCUS Cluster sequencing process
- setting out a vision for the future of the UK CCUS sector
- developing rules and regulations to support future CCUS infrastructure

Forward look

Progressing through the Track-1 Cluster Sequencing process and Track-1 expansion

HyNet (Northwest England and North Wales) and the East Coast Cluster (Teesside and Humber) were selected as the first 2 clusters. Alongside this

document, we are announcing the Track-1 negotiation project list of 8 capture projects for these clusters across the hydrogen, power, industry, and waste sectors will be sequenced to proceed to negotiations in the next stage of the programme. The selected projects are:

- **HyNet**
  - Hanson Padeswood Cement Works Carbon Capture and Storage Project
  - Viridor Runcorn Industrial CCS
  - Protos Energy Recovery Facility
  - Buxton Lime Net Zero
  - HyNet Hydrogen Production Plant 1 (HPP1)
- **East Coat Cluster**
  - Net Zero Teesside Power
  - bpH2Teesside
  - Teesside Hydrogen CO_2 Capture

These projects use a range of innovative CCUS technologies that could, if successful in the subsequent stages of the cluster sequencing process, accelerate decarbonisation, generate economic benefits, kick start the hydrogen economy and support energy security. We will launch, later this year, a process to bring in further projects within the Track-1 clusters by 2030. This will select additional projects to connect into the HyNet and East Coast Clusters – including the Humber and their associated stores as they become viable, and we will engage the sector shortly on how to deliver this. We will work to identify projects that could be potential alternatives to any of the initial Track-1 projects, if any are unable to agree contracts within the criteria and timelines required.

The support package includes funding from the £1 billion CCS Infrastructure Fund and Net Zero Hydrogen Fund, as well as support through the underpinning business models, which could support capture projects across multiple sectors of the economy alongside CO_2 transport and storage infrastructure in the 2 clusters.

Setting this represents a fundamental milestone for the UK CCUS industry by strengthening our commitment and enabling negotiations to start with Track-1 projects. This does not guarantee funding for any of these projects, which remains subject to: the outcome of negotiations, the passing of necessary legislation, compliance with subsidy control rules, and costs

finalised after any negotiations are completed.

As mentioned in the Renewables section of this plan, 2 projects passed the power BECCS project submission deliverability assessment for deployment by 2027, Drax Power Ltd and Lynemouth Power Ltd.

The government will launch a process, later in 2023, to enable further expansion of the Track-1 clusters, beyond the initial deployment, identifying and selecting projects within HyNet and East Coast Cluster – including the Humber – and their associated stores as they become viable, to be operational by 2030, we will engage the sector on how to deliver this. Subject to criteria under development, the government is minded to enable engineered greenhouse gas removals (GGRs) to apply to Track-1 expansion and Track-2.

To meet our sector aims and the net zero target, we are committed to further development of industrial carbon capture, waste, CCUS-enabled hydrogen, power CCUS, and engineered greenhouse gas removals. As part of this, we will work closely with electricity generators currently using biomass to facilitate their transition to power BECCS, subject to value for money, taking account of energy security on the road to net zero.

Launching Track-2 of the CCUS cluster sequencing process

The government has launched Track-2 of the CCUS cluster sequencing process alongside this publication to establish 2 further CCUS clusters.

At this stage, we are seeking to identify 2 transport and storage systems that can deliver government's objectives for Track-2 and considers Acorn and Viking T&S systems as able to meet the Track-2 eligibility criteria, and best placed to deliver on government objectives for Track-2, subject to due diligence and value for money assessments.

Other transport and storage systems that are able to meet the eligibility criteria now have the opportunity to express an interest in being considered for Track-2. The deadline for submitting an expression of interest is 28 April 2023. We intend to provide an update in the summer, following the closure of the expression of interest process.

Setting out a vision for the future of the UK CCUS sector

The Net Zero Review acknowledges the critical role CCUS has in reaching net zero and the key opportunity CCUS has in creating growth.

The government recognises the importance of providing further certainty for

industry beyond our 2030 ambitions. We will therefore continue to work with stakeholders to set out a vision for the UK CCUS sector, which will provide clarification on the future of CCUS, how it will support our net zero ambitions, and crucially provide the confidence and certainty developers, investors, and other stakeholders are looking for in the long run.

Developing rules and regulations to support future CCUS infrastructure

This is a developing global sector, and the government is in the process of ensuring that the correct regulatory framework is in place to support the industry as it grows. The government has, therefore, developed business models across the value chain, introduced the required legislation in the Energy Bill, and are developing the rules and regulations that will govern a new set of CO_2 networks across the UK.

Innovation case study: Fusion

The UK is a global leader in fusion energy technology. It offers potential to be the ultimate clean power solution, delivering low-carbon, safe, continuous and sustainable energy without the issue of very long-lived, high-level radioactive waste. We have an opportunity to capitalise on our leadership and create a new fusion energy technology sector in the UK, creating jobs, economic growth and export potential even before fusion energy is on the grid.

In 2021, the ‘UK Fusion Strategy’ set out ambitious objectives to demonstrate the commercial viability of fusion by building a prototype fusion power plant capable of providing energy to the UK grid by 2040, and to build a world-leading fusion industry with high-export potential.

The UK government has committed £222 million for the first 5 years of UKAEA’s Spherical Tokamak for Energy Production (STEP) programme, which aims to design, develop, and build, by 2040, the prototype fusion power plant. This will demonstrate a path to the commercial viability of fusion energy and is at the heart of the Fusion Strategy.

The government has also provided £42 million for the Fusion Industry Programme. This initiative will galvanise commercial fusion innovation through a challenge fund, designed to support UK businesses in important technical challenges of fusion.

The Fusion Cluster is a community of public organisations and

> businesses working together at the Culham Centre for Fusion Energy to share knowledge and drive fusion energy from theory to reality. Members have access to cutting edge technical facilities, start-up business support and experienced peers.

Progress so far
The government has already identified and announced a site for the STEP power plant, which will be bult in West Burton, transforming the site of an existing coal power plant in a green energy cluster. It has set up the company that will deliver this power station and begun developing the commercial relationships needed to build it.

The UK is the only country in the world to develop and introduce legislation for a proportionate regulatory regime for fusion that encourages innovation whilst putting safety at the heart of our fusion sector.

Taken together, the government's clear strategy and investment in fusion energy R&D, and regulation and development of the sector has made the UK the best place in the world to do fusion innovation. Fusion companies from around the world are interested in collaborating with the UK and several companies have made announcements about plans to build new facilities or experiments in the UK because of the unique programme started by the UK.

5. Markets and affordability

Markets are at the heart of the Great British energy system. They provide price signals which guide decisions on supply and demand, investment in new capacity, and the efficient operation of the system. This ultimately helps to deliver clean, reliable, affordable energy supplies for consumers. In order to deliver on our ambition to provide amongst the cheapest energy prices in Europe by 2035, we need to take a fundamental review of how to reform these markets and make them work for consumers.

Retail markets and affordability

Our key commitments

- We intend to consult in summer 2023 on options for a new approach to consumer protection in the energy markets from April 2024 onwards.
- We intend to consult on the future of the price cap on default tariffs in summer 2023
- We accept the 'Independent Review of Net Zero' recommendation that government should commit to outlining a clear approach to gas vs. electricity 'rebalancing' by the end of 2023/24 and should make significant progress affecting relative prices by the end of 2024.
- We commit to launching a call for evidence in summer 2023 on how the regulatory framework needs to evolve to support new ways of offering energy supply, before a consultation on options later this year.

The energy retail market is the main interface between consumers and the energy system. It is therefore a critical enabler of consumer choice and participation as that system decarbonises. However, the retail market is not working as it should and has been under significant strain as a result of high global gas prices and resulting market volatility.

The focus on price competition and the incentives for suppliers to follow the hedging methodology underpinning Ofgem's Price Cap methodology have contributed to a retail market which is overly focused on the short-term. More investment is needed in new technologies and products to enable and drive the innovation and changes in consumer behaviour that the future energy system needs – for instance, the growing uptake of EVs and low-carbon heating, or to ensure that consumers are rewarded for shifting demand to times when more electricity is available.

The government continues to believe that energy suppliers play a key role in the system, and it is therefore not right to say that a total overhaul of the regulatory framework is appropriate. The government does not want to disrupt energy suppliers' delivery of a range of critical programmes, however, there is a strong case for a focused programme of reform so that the market works better for consumers and acts as a driver for the transition to a secure, low-cost and low-carbon energy system.

That is why our new vision for the energy retail market is one that is focused on 3 key themes:

- **Better for consumers**: ensuring that energy bills remain fair and we can work towards abundant cheap energy. Energy must be affordable for all

consumers, while we need to uphold and improve consumer standards.

- **More resilient and investable**: better prepared for future wholesale price volatility and better able to shield consumers from the costs of supplier failure, combined with a return to competition and profitability for well-run suppliers offering value for consumers.
- **Supports wider energy system transformation**: unlock greater innovation within the retail market by tackling regulatory barriers, alongside the delivery of wider system changes such as the smart meter rollout and Market-wide Half-Hourly Settlement.

Forward look

Better for consumers

The government intends to move away from universal energy bill support and towards better targeted support for those most in need, as part of a new approach to consumer protection in energy markets from April 2024 onwards. The government intends to consult on options for a new approach in summer 2023.

The Price Cap on default tariffs will ensure falling wholesale energy prices are passed onto households. However, it is not a long-term solution, and the government intends to consult on the future of price protections in summer 2023.

Following the unacceptable treatment of some vulnerable consumers, the government is working with Ofgem and industry to improve the processes in place for installing or switching customers to prepayment meters. This includes delivery of a new code of practice for the sector and further potential measures identified through Ofgem's recent call for evidence that could reduce the need for prepayment meters to be installed and improve the prepayment experience for customers.

Ofgem will continue its programme of Market Compliance Reviews, aimed at improving sector practice and customer service.

We will consider whether sufficient consumer protections are in place in the non-domestic market, supported by Ofgem's ongoing review of the market. Ofgem published initial findings ahead of Spring Budget 2023 and their Call for Input closes on 31 March.

We will launch a Call for Evidence by summer 2023 to review the situation for domestic consumers that receive their energy via non-domestic contracts. This will inform a decision on whether additional long-term

consumer protections are required for this group.

More resilient and investable

Ofgem is developing and implementing new financial controls, including ringfencing and capital adequacy requirements, to increase the resilience of energy suppliers. The government and Ofgem will ensure that this increased resilience means that consumers are less exposed to the cost of supplier failure and offers the foundation for sustainable competition. The process is already underway.

We are reviewing the lessons learnt from the Bulb Special Administration Regime (SAR) and supplier failures, to ensure we can continue to respond effectively as market conditions evolve. The government will also examine whether there are changes to SAR and Supplier of Last Resort (SoLR) that could improve the processes for managing supplier exits in the future retail market.

Through the Economic Regulation Review, the government is considering (among other issues) how to increase the attractiveness to investors of the energy sector, with the intention of ensuring that Ofgem is empowered to deliver the right conditions for additional investment. The government will be consulting on the proposals later in spring.

Under the current Price Cap, Ofgem will continue to ensure that well run suppliers can earn a return which is appropriate to the retail energy sector and which promotes the long-term investment needed to drive innovation.

Supports wider energy system transformation

Energy suppliers will continue to play a valuable role in the retail market. However, the government believes that specific features of the current regulatory framework act as barriers to innovation. In summer 2023 we will launch a Call for Evidence on how the framework needs to evolve to support new ways of offering energy supply, before a consultation on options later in 2023.

We accept the ‘Independent Review of Net Zero’ recommendation that government should commit to outlining a clear approach to gas vs. electricity ‘rebalancing’ by the end of 2023/4 and should make significant progress affecting relative prices by the end of 2024. Rebalancing will generate the clear short-term price signal necessary to shift both households and businesses to lower-carbon, more energy efficient technologies like heat pumps. This is vital to meet government’s existing decarbonisation commitments, including our goal of 600,000 heat pumps installed per year by 2028.

The government expects Ofgem and industry to work together to ensure timely implementation of Market Wide Half-Hourly Settlement, as a key enabler of the energy market of the future.

Review of Electricity Market Arrangements

Our key commitments

- We aim to publish a second consultation on the Review of Electricity Market Arrangements in autumn 2023, and will take decisions on shorter-term reforms more quickly where it is viable to do so throughout the programme.

The government is committed to ensuring that electricity market arrangements continue to be enhanced in the short to medium term. For example, we are continuing to improve and refine the existing Contracts for Difference scheme and Capacity Market scheme. We are committed to reviewing the electricity reliability standard to ensure Great Britain has a robust and enduring capacity adequacy framework.

As part of the 'British Energy Security Strategy', we announced the Review of Electricity Market Arrangements (REMA) programme. It is exploring enduring reforms to Britain's electricity (non-retail) market arrangements to ensure that they remain fit both for today and future generations – harnessing the benefits of cheap, abundant renewables in Britain, enhancing energy security, and helping to deliver our world-leading climate targets while ensuring a fair deal for consumers.

The programme is aiming to fulfil the following objectives:

- ensure a cost-effective transition as we move to our future net zero consistent power sector
- maintain a secure electricity supply throughout the 2020s and beyond, as we continue to move away from fossil fuel-based generation technologies
- ensure our decarbonisation ambitions are delivered, so that the power sector contributes towards our legally-binding carbon budgets and we achieve our aim of a fully decarbonised power sector by 2035, subject to security of supply

We ran our first REMA consultation from July to October 2022. It considered the key whole systems issues that need to be addressed through electricity market arrangements to deliver an energy system for the future. In March 2023, we published the summary of responses to the first REMA consultation. Based on the feedback received, we set out areas that we will continue to explore, as well reform options that will not be taken forward into the next round of assessment.

Forward look

Driving forward our review of electricity markets arrangements
To sustain momentum on this important programme while ensuring robust evidence gathering, we aim to publish a second REMA consultation in autumn 2023 and will take decisions on shorter-term reforms more quickly where it is viable to do so throughout the REMA programme. Following the discounting of some options in response to the first consultation, we will continue to narrow down and refine potential policy options that will bring about market changes to meet the REMA objectives:

- we will assess these policy options against 5 assessment criteria, which we have updated following stakeholder feedback to our initial consultation. These are Deliverability, Investor Confidence, Whole-System Flexibility and Adaptability, as previously set out, and Value for Money (previously ‘least cost’). We think this better reflects the broader costs and benefits of change for consumers and the energy system
- our aim for the second consultation is to set out a direction of travel, next steps and support a smooth transition to any new arrangements over time. We aim to significantly narrow the options - identifying lead options where achievable, shifting the debate to focus on a handful of foundational policy areas and their interactions

The government will continue to engage extensively with stakeholders throughout this period. We will also continue to conduct external research projects to inform policy development and assist in constructing policy packages. These activities complement the extensive evidence-gathering done to date. We will also continue to ensure coherence across our work to reform energy markets, particularly in considering the relationship between wholesale electricity and retail energy markets.

6. Delivery timelines

Enhancing security of gas supply

Maximising supply of UK gas

33rd Licensing Round
- **2023**: From Q2 - NSTA awards first licences.

North Sea Transition Deal
- **2025 to 2035**: The Deal targets a reduction in upstream production emissions, against a 2018 baseline, by 10% in 2025, 25% in 2027 and 50% in 2030, while reducing carbon emissions to zero by 2050.

Accelerating production
- **2023 to 2030**: New projects will benefit from an accelerated regulatory process.

Updates to Gas Safety Management Regulations
- **2023**: HSE has laid SI that amends, amongst other things, the 'Wobbe Number'.
- **2025 to 2030**: Q2 - Change to the 'Wobbe Number' take effect.

Maintaining and securing our gas import and export capacity

Memorandum of Understanding with Ireland
- **2023**: Government agreeing a Memorandum of Understanding on gas security of supply with Ireland.

LNG terminals
- **2023 to 2030**: Operators of the 'Grain' and 'South Hook' LNG terminals investing in upgrades to their facilities to increase capacity.

UK-US Energy Security and Affordability Partnership
- **2023**: US will strive to export at least 9-10 billion cubic metres of LNG in 2023 via UK terminals.

Increasing system resilience

Gas Supply Security of Assessment

- **2023**: Government to publish methodology and implementation plan.
- **2024 to 2030**: Delivery by FSO when established.

Gas Security - role of gas storage and other forms of flexibility

- **2023**: Government to issue an update on this work before the autumn setting out next steps.

Demand side response

- **2023**: Government is working with NGT to increase the available volumes for industrial demand reduction for winter 23/24.

Ensuring long term investment in gas networks

Biomethane and Green Gas Support Scheme

- **2023 to 2024**: GGUS operational – set to deliver enough biomethane gas grid injection to heat around 200,000 homes per year at peak production.
- **2025 to 2030**: Government to introduce policy framework for biomethane from 2026 to follow the current GGSS.

Energy efficiency and clean heat

Objectives

- Ambition to reduce energy demand by 15% by 2030.

Energy efficiency schemes

Green Homes Grant – Local Authority Delivery scheme

- **2023**: LAD 3 delivery planned to end September – December 2023 after agreement from BEIS / HMT Ministers for a managed closure of projects.

Home Upgrade Grant

- **2023 to 2030**: Deliver upgrades to around 45,600 homes by March 2025 under HUG 1, 2 and CLR.

HUG 3 would see this number go up to 106k homes treated by 2030.

Social Housing Decarbonisation Fund

- **2023 to 2030**: Deliver upgrades to around 94,000 homes from April 2023 - Sept 2025. Wave 3 and 4 targets to 2030 tbc
  818,700 homes treated across SHDF Demo, Wave 1, Wave 2, Waves 3 and 4.

Public Sector Decarbonisation Scheme

- **2023**: PSDS phase 3c launch expected Q2-3.
- **2024 to 2025**: PSDS phase 3 running to March 2025.

Energy Company Obligation Schemes (ECO4)

- **2023 to 2030**: Deliver upgrades – ECO4 will upgrade 300,000 homes from 2022 to 2026.

Great British Insulation Scheme

- **2023 to 2030**: Deliver mainly single insulation measures from around spring 2023 to March 2026. GBIS will upgrade over 300,000 homes.

IETF Extension Phase 3

- **2024 to 2035**: Launch in early 2024, 3 application windows will run until closure in April 2025. Projects to complete by 2032 at the latest, 5 year monitoring period will conclude 2037.

Consumer advice and comms

SME Energy Advice Service

- **2023**: Launch digital SME advice service; SME energy advice scheme pilot.

Green Home Finance Accelerator Competition

- **2023**:
  Discovery Phase: March 2023 to September 2023
  Pilot Phase projects selected: October 2023
  Pilot Phase starts: December 2023.
- **2024 to 2030**:
  Accelerator Pilot phase: running to March 2025
  Programme Evaluation: March 2025 to August 2026

Heating

Hydrogen heating trials and town pilot

- **2023**: Announcement of village trial location.
- **2024**: Neighbourhood trial begins.
- **2025**: Village trial begins; Publish town pilot plans.
- **2031 to 2035**: Potential rollout of hydrogen heating subject to 2026 policy decisions.

Boiler Upgrade Scheme

- **2023 to 2030**: Deliver heat pumps under scheme to March 2028 and begin Clean Heat Market Mechanism (2024).

Heat Pump Investment Accelerator

- **2023**:
  Launch Competition - March 2023
  Competition live to bids - May 2023
- **2024**:
  Grant funding agreed and public announcement of winners – April 2024
- **2024 to 2026**: Projects under construction (to March 2026)

Heat networks

- **2023 to 2024**: Pilot heat network zones
- **2023 to 2025**: Heat Network Efficiency Scheme
- **2024**: Heat Network Market Framework begins
- **2023 to 2028**: Heat Network Transformation Programme incl. Green Heat Network Fund
- **2025 to 2030**: Enable heat network zones to be designated by 2025

Phasing out fossil fuel heating

- **2023**: Respond to consultations on phasing out fossil fuel heating in off gas grid areas.
- **2031 to 2035**: Ambition to end sale of new and replacement gas boilers by 2035.

Legislation and other policies

Smart Meter Installation Targets Framework
- **2023**: Mid-point consultation and response.

Minimum energy efficiency standards - non domestic (PRS)
- **2023**: Publish government response for non-dom PRS regulations consultation.
- **2025 to 2030**: Ambition to introduce a minimum energy efficiency standard of EPC B by 2030.

Product standards
- **2023**: Consulting on requirements for lighting.
  Consult on new requirements for domestic cooking and small-mid size space heating appliances.
- **2023 to 2025**: consult on/ consider the introduction of MEPS for professional cooking appliances and updated MEPS for water pumps.

Minimum energy efficiency standards- privately rented homes
- **2023**: Publish summary of responses by end of 2023.

Improving home energy performance through lenders
- **2023**: Respond to consultation by end of 2023.

Improving energy performance of owner occupied homes
- **2023**: Publish consultation on options by end of 2023.

Climate Change Agreement (CCA) Scheme
- **2023**: Published consultation on 2-year extension of scheme. Publish government response to consultation. Lay legislation for extension.
- **2025 to 2027**: 2-year extension.

Nuclear

Objectives
- One Final Investment Decision this parliament, progressing 2 in the next parliament.
- Ambition to increase deployment of civil nuclear to up to 24 gigawatts by 2050 (up to 25% of projected demand).

Deliver one FID this parliament

Sizewell C - Final Investment Decision
- **2024**: FID by end of this Parliament.

Two FIDs next parliament, including Small Modular Reactors

Launch Consultation on new Siting Strategy to inform National Policy Statement
- **2023 (by end of year)**

Launch of GBN with aim to launch market engagement in April
- **2023 (April)**

Ambition to select the leading SMR technologies and co-fund this exciting new technology for the UK
- **2023 (by autumn)**

Projects progressed to FID including SMRs
- **2025 to 2029**

Launch Nuclear Fuel Fund , including funding to Westinghouse for Springfields fuel facilities
- **2023 (January - February)**

Advanced Modular Reactors

AMR R&D programme
- **2023**: Summer - commence work on Reactors and Fuels.
- **2025**: March 2025 - Phase B concludes.
- **2025 to 2035**: Phase C Construction subject to SR decisions.

Renewables (cross cutting developments and solar)

Objectives

- Up to 70GW solar (roof and ground mounted) by 2035.

Cross-cutting renewables pipeline development, skills, infrastructure, and supply chain

Consider reforms to the CfD scheme, this will include the potential to support repowered projects and non-price factors

- **2023**: CfD AR5 opens in March, results in late summer
- **2024**: CfD AR6 opens in March, results in late summer
- **2025 to 2030**: Potential non-price factor legislation in force, takes effect from AR7.

Strengthening the Energy National Policy Statements (NPS)

- **2023**: Publish the draft for consultation. Designate the final suite of NPSs by end 2023.
- **2025 to 2030**: Review and update.

Introduce legislation to streamline the consenting process for Nationally Significant Infrastructure Projects, including offshore wind and other renewable projects that defined meet quality standards

- **2023**: Levelling Up and Regeneration Bill Royal Assent expected early summer.Pilots for Fast Track consenting process, from late autumn

Work through the Net Zero Green Jobs Delivery Group to upskill existing trade industries and facilitate interventions to increase new entrants to the sector

- **2023**: Develop government and industry actions to unlock power and networks sector workforce and skills, end of 2023.
- **2024**: Net Zero Skills and Workforce Action Plan published in 2024.

Launching the Task & Finish Group for Critical Mineral Resilience to investigate critical mineral dependencies and vulnerabilities across UK industry sectors, while supporting end-users to promote resilience and diversity in their critical mineral supply chains

- **2023**: Deliver findings at the end of the year.
- **2024**: In consultation with other departments, Department for Business and Trade will respond early 2024.

Explore policy options for increasing the deployment of on-site

generation in manufacturing. This will help decarbonise business and reduce dependence on imported energy

- **2023**:
  Ofgem reducing costs for connection applications from 1 April 2023
  Government publishing action plan in summer to accelerate connections

Incentivising investment for rooftop and ground mounted solar

Establish a government/industry taskforce to drive forward the actions needed by government and industry to deliver the 70GW ambition

- **2023**: Taskforce set up

Publish a solar roadmap setting out a clear step by step deployment trajectory to achieve the five-fold increase, up to 70GW, of solar by 2035 to demonstrate the government's clear commitment to the sector and provide certainty to investors

- **2024**: Roadmap published

Assess how low-cost finance options can be provided to households and small businesses for solar technology

- **2023**: Look at facilitating low-cost finance from retail lenders for homes and small business premises.
- **2024**: Implement policy interventions required, Q1-2.
- **2025 to 2030**: Monitor impact and assess if further intervention required
  Removal of VAT on solar panels installed on residential accommodations until March 2027
- **2031 to 2035**: Range of green technologies exempt from business rates until March 2035.

Planning reform and building standards for solar

Consult on permitted development rights to support solar deployment

- **2023**:
  Published consultation on changes to Permitted Development rights in Q1

Regulations amended and guidance strengthened Q4

- **2024**: Implement, Q1
- **2025 to 2035**: Monitor impact and assess if further intervention required

Develop and publish guidance for the installation of solar on the government and wider public sector estate

- **2023**:
  Published public sector decarbonisation guidance
  Publish central government guidance

Continue to encourage the use of solar PV, where appropriate, in new homes and buildings

- **2023**: Publish consultation on Future Homes and Buildings Standard
- **2025 to 2030**: Future Home Standard and Future Buildings Standard in force, further uplifting energy performance in new homes and buildings, by 2025.

Renewables (wind and biomass)

Objectives

- Up to 50GW by 2030, including up to 5GW floating wind.

Planning reform to accelerate wind deployment

Introduce legislation and guidance to implement a new Offshore Wind Environmental Improvement Package

- **2023**:
  Energy Bill Royal Assent expected early summer
  Introduce environmental strategic compensation measures, strategic monitoring, environmental standards and marine recovery fund by end of 2023
  Amend Habitats Regulations Assessment

Consult on changes to the National Planning Policy Framework in England to deploy more onshore wind

- **2023**: DLUHC government response and publication of updated NPPF

Publication of updated planning guidance.

Develop local partnership model for onshore wind in England

- **2023**:
  - Launch local partnership consultation
  - Government response to consultation

Infrastructure, skills and supply chain

Floating Offshore Wind Manufacturing Investment Scheme supporting floating wind infrastructure investment

- **2023**: Scheme launch 30 March.
- **2025 to 2030**: End of scheme March 2025.

Offshore Wind Manufacturing Investment Scheme supporting investment in fixed-bottom offshore wind manufacturing and port facilities

- **2023**: End of scheme (March)
  Continue to monitor grant awards after March.
- **2024**: Construction of facilities supported through scheme expected to complete end of 2024.

Address the radar interference challenges from offshore and onshore wind turbines to air defence and air traffic radar systems

- **2023**: Procurement competition, launching in autumn 2023 to identify a solution.

Biomass

The 'Biomass Strategy' will set out how sustainable biomass could be best utilised across the economy to help achieve the government's net zero and wider environmental commitments while also supporting energy security

- **2023**: Publish 'Biomass Strategy'

Power BECCS

Power BECCS project submission process

- **2023**:
  Outcome of project assessment announced
  Engagement with projects that passed the deliverability assessment for the project submission process for power BECCS

Business models for power BECCS

- **2023**: Government response to consultation on power BECCS business models.

Flexibility

Driving the deployment of power CCUS in the 2020s and beyond

Track-1 and Track-2 CCUS programme

- **2023**: Track-1 project shortlist announced, and negotiations commence
- **2023**: Launch Track-2 and Track-1 expansion
- **2025 to 2030**: Track-1 power CCUS project operational
- **2025 to 2035**: Potential power CCUS project(s) operational from Track-2 and Track-1 expansion

Future policy framework for power CCUS

- **2023**: Publish call for evidence response in Spring

Hydrogen to power

Hydrogen to power market intervention

- **2023**: Consult on the need and potential design options for market intervention to support hydrogen to power
- **2023**: Identifying and tackling non-financial barriers to the deployment of hydrogen to power

Developing enablers for clear decarbonisation pathways for unabated gas generation

Decarbonisation Readiness

- **2023**: Published Decarbonisation Readiness consultation, response to be issued in summer
- **2024**: 1 July 2024 proposed date for updated Decarbonisation Readiness requirements to apply from

Capacity Market

- **2023**: Published Capacity Market consultation covering proposals to strengthen security of supply, tightening emissions limits and a call for evidence on ‘managed exits’ to enable high carbon capacity to leave their long term CM agreements early to decarbonise, subject to certain conditions being met.

Facilitating the deployment of electricity storage

Policy framework to enable investment in large-scale long-duration electricity storage

- **2023**: Put in place an appropriate policy framework by 2024 to enable investment in large scale long duration electricity storage , with the goal of deploying sufficient storage capacity to balance the overall system.

Product and installation standard

- **2023**: Publish a product and installation standard (known as a ‘Publicly Available Standard’) for domestic/small-scale battery storage as well as guidance for grid-scale storage.

LODES programme

- **2023**: Announce further recipients of funding in early 2023 under the second phase of the Longer Duration Energy Storage (LODES) programme.

Unlocking demand side flexibility and digitalisation at scale

Delivering a smart and secure energy system

- **2023**: Publish response to a consultation on ‘Delivering a smart and secure energy system’

Net Zero Innovation Portfolio

- **2023**: Government to assess evidence from innovation projects under the Net Zero Innovation Portfolio to identify the appropriate environment for energy data sharing and integration of digital energy infrastructure.

Flexibility Innovation Programme

- **2023**: Announce further recipients of funding.

Governance and markets to support flexibility

- **2023**: Ofgem will respond to the Call for Input on the Future of Distributed Flexibility; setting out a way forward to incentivise the deployment of distributed flexibility at scale, including options for a technical solution to coordinate flexibility markets.
- **2023**: Ofgem to publish its decisions later in 2023 on proposals to ensure governance arrangements for local energy institutions are fit for purpose for delivering a smart and flexible energy system.

Energy Market Reform

Review of Electricity Market Arrangements (REMA)

- **2023**: Aim to publish second REMA consultation in autumn 2023.

Power networks, interconnection, and system governance

Halving development time for transmission network projects

Electricity Networks Commissioner review

- **2023**: Q2 – Electricity Networks Commissioner (Nick Winser) delivers recommendations

Government action plan and delivery

- **2023**: Government publishes action plan in response to Electricity Networks Commissioner recommendations
- **2024 to 2030**: Government implements transmission networks action plan.

Taking a whole systems approach to network planning

Establish Future System Operator

- **2023**: Government and Ofgem launch consultations on the detail of the FSO's new roles in resilience and security.
- **2024**: Establish FSO by or in 2024

Centralised Strategic Network Plan

- **2023**: Second Transitional CSNP - deliver High level Network Design follow-up exercise and wider network reinforcements by late 2023
- **2025**: Full CSNP to be delivered in 2025 by the Future System Operator once established.

Offshore transmission – Future Framework

- **2023**: Government to publish proposals in summer for a Future Framework for strategic offshore transmission.

Offshore transmission – Coordination support scheme

- **2023**: Funding distributed under Offshore Coordination Support Scheme by summer 2023.

Develop community benefits offer

- **2023**: Government response to community benefits consultation and publication of guidance.
- **2024**: Implementation of community benefits in line with guidance.

Revise National Policy Statement for networks

- **2023**: Government publishing consultation on updating the NPS for networks.

Enabling an effective legislative and regulatory framework

Distribution networks

- **2023**: Ofgem's ED2 price control for distribution networks starts April 2022, allowing agile investment flow into local networks.

Network regulation

- **2023**: Ofgem conducting strategic review of future network regulation.
- **2025 to 2030**: Ofgem to implement changes to network regulation ahead of next price control periods.

Strategy and Policy Statement

- **2023**: Government to publish proposals in summer for a Future Framework for strategic offshore transmission.

Offshore transmission – Coordination support scheme

- **2023**: Government consulting on draft 'Strategy and Policy Statement' setting out strategic priorities for the energy sector including in relation to network regulation.

Introduce onshore network competition

- **2023**: Pass primary and secondary legislation to introduce onshore network competition subject to Parliamentary time.
- **2024**: First competition could be run in late 2024.

Accelerating electricity network connections

Government action plan

- **2023**: Government to publish in summer an action plan to accelerate network connections.
- **2024 to 2030**: Government, Ofgem and Industry implement plans to accelerate network connections.

ESO GB Connection Reform project

- **2023**: ESO will publish consultation on connection reform (expected June) and implementation plan in November.

ESO releases network capacity and management of transmission connection queue

- **2023**: ESO improving modelling of network impacts and management of the queue. Capacity released will enable revised (earlier) connection dates to be offered.

Distribution networks connections

- **2023 to 2024**: Government working with Energy Networks Association, Ofgem and network companies to improve the distribution connection process. Implementation of shorter-term measures from April 2023.

Optimising our electricity interconnection with neighbours

Increasing interconnection to 18GW by 2030

- **2023 to 2024**: Project development, construction and operation of projects
- **2025 to 2030**: Government aim to realise – with Ofgem, developers and European partners - 18 GW of interconnection by 2030.

Building first multi-purpose interconnectors

- **2023**: Ofgem initial project approval decisions.
- **2024**: Project development of window 3 and MPI pilot projects.
- **2025 to 2035**: Ongoing project development, construction and operation of projects.

Hydrogen

Objectives

- Ambitions for up to 10GW of low-carbon hydrogen production capacity by 2030 with at least half from electrolytic hydrogen
- Ambitions for up to 1 GW of CCUS-enabled and up to 1 GW of electrolytic production in operation or construction by 2025
- Hydrogen Certification Scheme set up by 2025
- Business models for hydrogen transport and storage designed by 2025

Net Zero Hydrogen Fund Strands 1 and 2 (providing development and capital support to low- carbon hydrogen production projects)

First funding round for Strands 1 and 2 (launched in 2022)

- **2023**: Grant offer letters issued for successful applicants in Q1 2023.
- **2024**: Complete Strand 1 funded activities by March 2024.
- **2025 to 2030**: Strand 2 projects operational from March 2025.

Second funding round for Strands 1 and 2

- **2023**: Launch in spring.

Hydrogen allocation rounds (hydrogen production business model and possible NZHF support for electrolytic and potentially other non-

CCUS hydrogen production)

Round 1 (launched in 2022)
- **2023**: Aiming for contracts to be awarded in Q4
- **2025 to 2035**: First projects operational in 2025, delivering up to 250 megawatt capacity.

Round 2
- **2023**: Intention to launch in Q4
- **2025 to 2035**: Aim to award contracts of up to 750 megawatt capacity in early 2025

Annual allocation rounds
- **2025 to 2035**: Aim to run annual allocation rounds, moving to price-based competitive allocation in the mid-2020s, as soon as legislation and market conditions allow

CCUS-enabled hydrogen 'blue hydrogen'

CCUS Programme – Track-1
- **2023**: Begin negotiations with shortlist of projects.
- **2024**: Negotiations end.
- **2025 to 2035**: Projects operational from mid 2020s, delivering up to 1 gigawatt.

CCUS Programme - Track-2
- **2023**: Launch process
- **2025 to 2035**: Projects operational from 2030s

Hydrogen economy

Certification
- **2023**: Government response to consultation on a Low Carbon Hydrogen Certification Scheme.
- **2025**: Launch certification scheme by 2025.

Hydrogen transport & storage

- **2023**: Government response to consultation on Hydrogen Transport & Storage Business Models Q2
- **2025**: Design business models by 2025

Hydrogen use

- **2023**:
  Blending: Policy decision on the role of blending by the end of 2023
  Power: Consult on the need and potential design options for a market intervention
- **2026**:
  Heating: Decisions on the role of hydrogen for heat in 2026.

Carbon Capture, Usage and Storage

Objectives

- Deploy 2 industrial clusters by the mid 2020s
- Deploy at least 1 power CCUS plant by the mid 2020s
- Deploy 4 industrial clusters by 2030
- Capture 20-30mtCO_2 pa by 2030, including 6mtCO_2 pa from Industrial CCS by 2030
- Deploy at least 5mtCO_2 pa of engineered GHG removals (GGRs) by 2030
- 50,000 jobs enabled by CCUS by 2030

Progressing through the Track-1 Cluster Sequencing process and Track-1 expansion

CCUS Programme Track-1

- **2023**:
  - Project shortlist announced
  - Negotiations with projects start
  - FEED work continues
- **2025**:
  - Negotiations with projects end
  - Publication of CCUS Network Codes

- Construction starts

- **2025 to 2030**: Track-1 projects operational.

Track-1 expansion

- **2023**: Launch Track-1 expansion process.
- **2025 to 2035**: Track-1 expansion projects operational.

Launching Track-2 of the CCUS programme

CCUS Programme Track-2

- **2023**:
  - Launch Track-2 process
  - Complete expression of interest
  - Announce next steps
- **2025 to 2030**: Track-2 projects operational.