

ENERGY WHITE PAPER

Powering our Net Zero Future

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HM Government



TOGETHER
FOR OUR
PLANET

WHAT THE WHITE PAPER DELIVERS – AND BEYOND

This white paper builds on the Prime Minister's Ten Point Plan to set the energy-related measures the Plan announced in a long-term strategic vision for our energy system, consistent with net zero emissions by 2050.

It establishes our goal of a decisive shift from fossil fuels to clean energy, in power, buildings and industry, while creating jobs and growing the economy and keeping energy bills affordable. It addresses how and why our energy system needs to evolve to deliver this goal. And it provides a foundation for the detailed actions we will take in this Parliament to realise our vision.

We estimate the measures in this paper could reduce emissions across power, industry and buildings by up to 230MtCO₂e in the period to 2032 and enable further savings in other sectors such as transport. In doing so, they will support up to 220,000 jobs per year by 2030. These figures include the energy measures from the Prime Minister's Ten Point Plan as well as additional measures provided in this white paper.³⁰

We recognise that more will need to be done to meet key milestones on the journey to net zero, including our ambition for Carbon Budget 6, which we will set next year, taking into account the latest advice from the Climate Change Committee. In the run-up to COP26 we will bring forward a series of sectoral strategies, and our overarching Net Zero Strategy, which will set out more detail on how we will meet our net zero target and ambitious carbon budgets.

FIGURE 1.6 – ESTIMATED CUMULATIVE EMISSION SAVINGS TO 2032 FROM THE ENERGY WHITE PAPER



Source: BEIS analysis

Overview of key commitments

This white paper sets out the government's policies and commitments that will put us on course to net zero, levelling up the country and strengthening the union as we achieve this goal. We will:

TRANSFORM ENERGY

Building a cleaner, greener future for our country, our people and our planet, by measures including:

- ▶ **Targeting 40GW of offshore wind by 2030**, including 1GW floating wind, alongside the expansion of other low-cost renewables technologies.
- ▶ **Supporting the deployment of CCUS in four industrial clusters** including at least one power CCUS project, to be operational by 2030 and putting in place the commercial frameworks required to help stimulate the market to deliver a future pipeline of CCUS projects.
- ▶ **Establishing a new UK Emissions Trading System**, aligned to our net zero target, giving industry the certainty they need to invest in low-carbon technologies.
- ▶ **Aiming to bring at least one large-scale nuclear project to the point of Final Investment Decision** by the end of this Parliament, subject to clear value for money and all relevant approvals.

- ▶ **Consulting on whether it is appropriate to end gas grid connections to new homes being built from 2025**, in favour of clean energy alternatives.
- ▶ **Growing the installation of electric heat pumps**, from 30,000 per year to 600,000 per year by 2028.
- ▶ **Building world-leading digital infrastructure for our energy system** based on the vision set out by the independent Energy Data Taskforce, publishing the UK's first Energy Data Strategy in spring 2021, in partnership with Ofgem.

SUPPORT A GREEN RECOVERY FROM COVID-19

Growing our economy, supporting thousands of green jobs across the country in new green industries and creating new export opportunities, by measures including::

- ▶ **Increasing the ambition in our Industrial Clusters Mission four-fold**, aiming to deliver four low-carbon clusters by 2030 and at least one fully net zero cluster by 2040.

Our key commitments

EFFICIENT ELECTRICITY MARKETS

Electricity markets need to adapt as the deployment of renewable generation increases.

Balancing supply and demand becomes more complex because most renewables are, by their nature, intermittent and generate electricity only when the wind blows or the sun shines.

Gas-fired power stations have traditionally provided the flexibility needed to match supply to demand at peak hours, or when renewables output is low. Increasingly, flexibility will come from new, cleaner sources, such as energy storage in batteries, increased interconnected capacity from neighbouring electricity markets, or from consumers using smart technologies to reduce how much energy they use or shift when they use the energy to different times in the day. New forms of flexibility could lower future costs for consumers, by minimising expensive network reinforcement or reducing the need for additional generation, especially peaking capacity which needs to be deployed quickly to meet spikes in demand.

ELECTRICITY SYSTEM OPERATOR

The whole transmission system is operated by a single Electricity System Operator (ESO), who is responsible for keeping it stable and secure. National Grid ESO perform this function.

- **We will publish a new Smart Systems Plan in spring 2021, jointly with Ofgem, and define electricity storage in law, legislating when Parliamentary time allows.**

We need open, competitive markets which harness the full value of flexibility. In 2017, the government and Ofgem published the first Smart Systems and Flexibility Plan.⁹⁹ We have implemented two-thirds of the policies in the plan and are on track to deliver it in full by 2022, removing barriers to energy storage, enabling smart homes and businesses and properly rewarding providers of flexibility services. But we are now ready to take the next step in driving flexibility deep into the energy system.



In partnership with Ofgem, we will publish a new Smart Systems Plan in spring 2021, which will include a new framework for monitoring flexibility across electricity markets. We will legislate when Parliamentary time allows to define electricity storage in law, removing another barrier to flexibility.

► **Through the Net Zero Innovation Portfolio, we will launch a major competition to accelerate the commercialisation of first-of-a-kind longer duration energy storage, as part of our £100 million investment in storage and flexibility innovation, with delivery from spring 2021.**

Storing excess low-carbon generation over longer periods of time could enable us to decarbonise the energy system more deeply at lower costs.

Novel energy storage technologies show promising cost reductions¹⁰⁰ but some have yet to be demonstrated at scale. First-of-a-kind demonstrations are required to enable cost reduction and de-risk private investment. The Prime Minister's Ten Point Plan announced a further £100 million to address energy storage and flexibility innovation challenges, one of the key priority areas in the over £1 billion Net Zero Innovation Portfolio.

To promote energy storage innovation, we will further accelerate the commercialisation of innovative technologies, excluding proven technologies such as lithium ion and pumped hydro storage. Our support will build on the success of previous funding under the current Energy Innovation Programme.