

Clean Power 2030

One of the government's key missions is to decarbonise the power sector by 2030. It has defined its 'Clean Power 2030' mission as follows: "In a typical weather year, the 2030 power system will see clean sources produce at least as much power as Great Britain *consumes* in total over the whole year, and at least 95% of Great Britain's *generation*". (The definition implies that Great Britain will become a net exporter of electricity.)

The government commissioned the National Energy System Operator (NESO) for advice on how to achieve Clean Power 2030 and subsequently set out a Clean Power Action Plan. As set out in the plan, decarbonising the power sector by 2030 will require the following:

- Approximately trebling offshore wind capacity, from 15GW to around 43-50GW.
- Approximately doubling onshore wind capacity, from around 14GW to around 27-29GW.
- Approximately trebling solar capacity, from 17GW to 45-47GW.
- Ensuring that 3-4GW nuclear capacity remains by 2030, down from 6GW at present.
- Increasing long duration energy storage capacity (e.g. pumped storage hydro), from 3GW to 4-6GW.
- Increasing battery storage capacity, from 5GW to 23-27GW.
- Increasing interconnector capacity, from 10GW to 12-14GW.
- Increasing consumer-led flexibility capacity, from 3GW to 10-12GW.
- Around twice as much new transmission network infrastructure will be needed by 2030 as has been delivered in the past decade.
- Total investment in the electricity system (across generation, transmission, distribution and offshore networks) will need to increase from around £11bn per year (for 2020 to 2024) to around £45bn per year for 2025 to 2030.

Net Zero 2050

Clean Power 2030 is primarily about ensuring our current electricity demand can be provided for by clean energy sources. However, as part of the government's wider objective to decarbonise the whole economy by 2050 (Net Zero 2050), demands on the electricity network will continue to grow significantly over the 2030s and 2040s, as other sectors electrify to decarbonise. The government believes that its clean power mission will help ensure the power sector is prepared for the rapid growth in power demand expected from 2030 to 2050.

The government's Clean Power Action Plan and the Climate Change Committee's 7th 'Carbon Budget' suggest that achieving Net Zero will require the following developments from 2030 to 2050:

- Gross annual electricity demand will increase from 333TWh to 692TWh.
- Offshore wind capacity to increase from 43-50GW to 125GW.
- Onshore wind capacity to increase from 27-29GW to 37GW.
- Solar capacity to increase from 45-47GW to 106GW.
- Nuclear capacity to increase from 3-4GW to 11GW (this will require the equivalent of two large-scale nuclear power stations in addition to Hinkley Point C and Sizewell C, once current operational capacity goes offline).
- Low-carbon dispatchable capacity (hydrogen and gas with carbon capture and storage) to increase from 3GW to 38GW.
- Interconnector capacity to increase from 12-14GW to 28GW.
- Significant 'anticipatory' investment to reinforce both transmission and distribution networks (estimated at £113bn), with over two-thirds of this investment taking place in the 2030s.