Despite ambitious political targets, achieving Net Zero in the power sector under the current policy and market environment is unlikely before the 2050s

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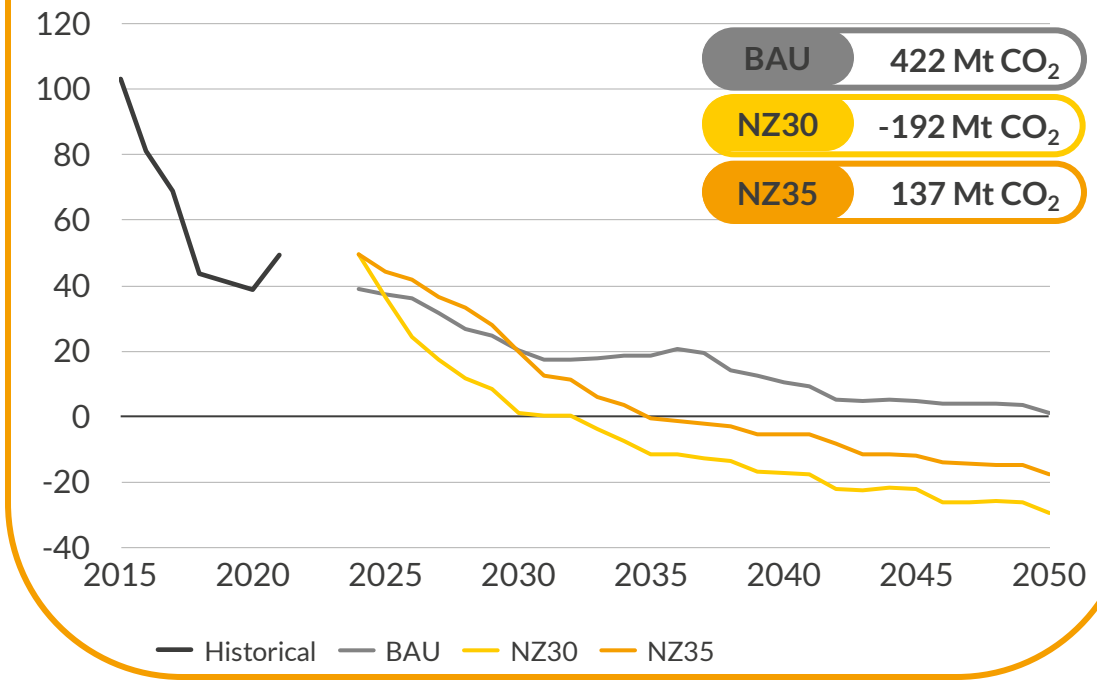
Net Zero power is unlikely to be reached before the 2050 given current policy direction

- Under current policy, GB is not set to reach Net Zero until 2051
- Net Zero power could be reached by 2035, although significant new interventions are required. Achieving Net Zero power before this is likely to be infeasible due to limited time to achieve the transformation

Power Sector Carbon Emissions[1]
$MtCO_2e$

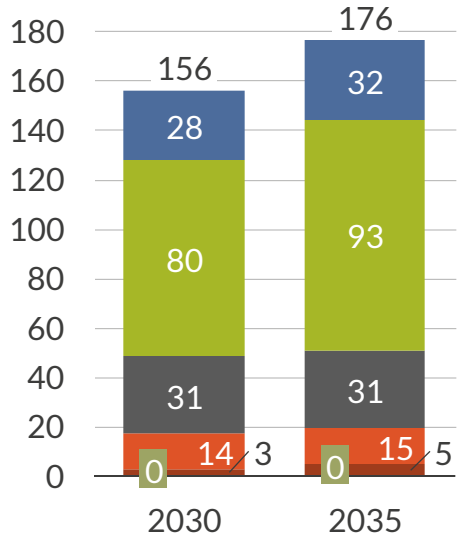
Total 2024–2050



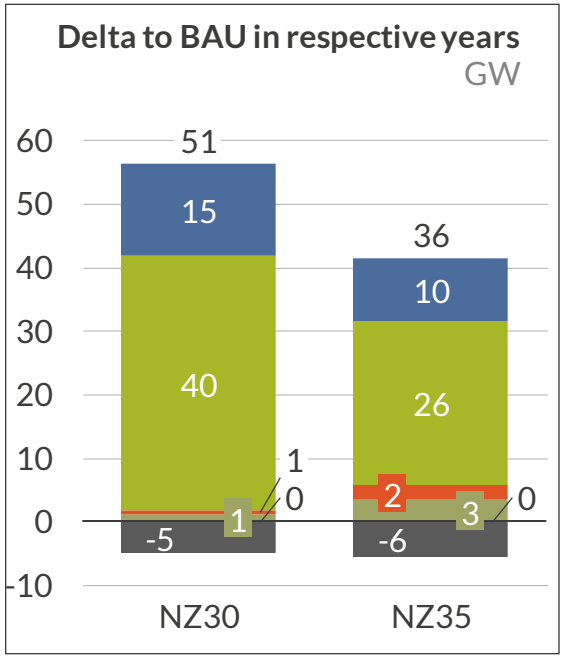
Reaching Net Zero in 2030 or 2035 would require extensive system change

- Net Zero in 2035 would require a rapid increase in renewables deployment alongside enabling technologies, including BECCS
- However, Net Zero in 2030 would require unrealistic acceleration of renewables deployment, and direct intervention to restrict unabated gas

Installed Capacity in BAU
GW



Delta to BAU in respective years
GW



Other[3]
Intermittent Renewables
Unabated thermal
Interconnectors
BECCS
Nuclear[2]

1) Includes negative emissions from BECCS assuming a factor of -941 gCO2 /kWh; BECCS capacity initially offsets emissions, then generates greater negative emissions as the system decarbonises (renewables, gas CCS, hydrogen). 3 GW of additional BECCS expected post-2030/2035 for growing demand.; 2) Assumes Hinkley Point C, Sizewell C and Bradwell B delays, with an upsizing of expected future capacity; 3) Includes capacity from storage, demand-side response (DSR), hydrogen peaking plants, hydrogen CCGTs, biomass and gas CCS .

Source(s): Aurora Energy Research

Intensive and accelerated policy support is required for achieving Net Zero Power

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Extensive policy intervention and central support is required to reach power sector Net Zero

- **Accelerate Development:** Streamline planning and development processes to reduce early-stage project timelines.
- **Stabilise Markets:** Implement market design reforms that provide consistent revenues for flexible technologies and predictable network charges for renewable developers.
- **Invest in Innovation:** Increase policy support for early-stage technologies, including finalizing the long-duration energy storage (LDES) mechanism and expanding carbon capture and storage (CCS) clusters.
- **Address Operability:** Proactively address operational challenges in a system increasingly dominated by renewables and flexible generation.
- Coherent policy action, market design and financial support if enacted at a large scale and high speed **could potentially enable a Net Zero 2035** target to be reached if legislative action is taken imminently
- **Net Zero power in 2030 cannot realistically be reached**, as the combination of legislative timeline, planning, permitting and project development and supply chain limitations means that it is infeasible for the necessary system overhaul to be completed in this timeframe

Source(s): Aurora Energy Research

All scenarios result in a diverse power system, however matching network build is necessary to enable renewables deployment

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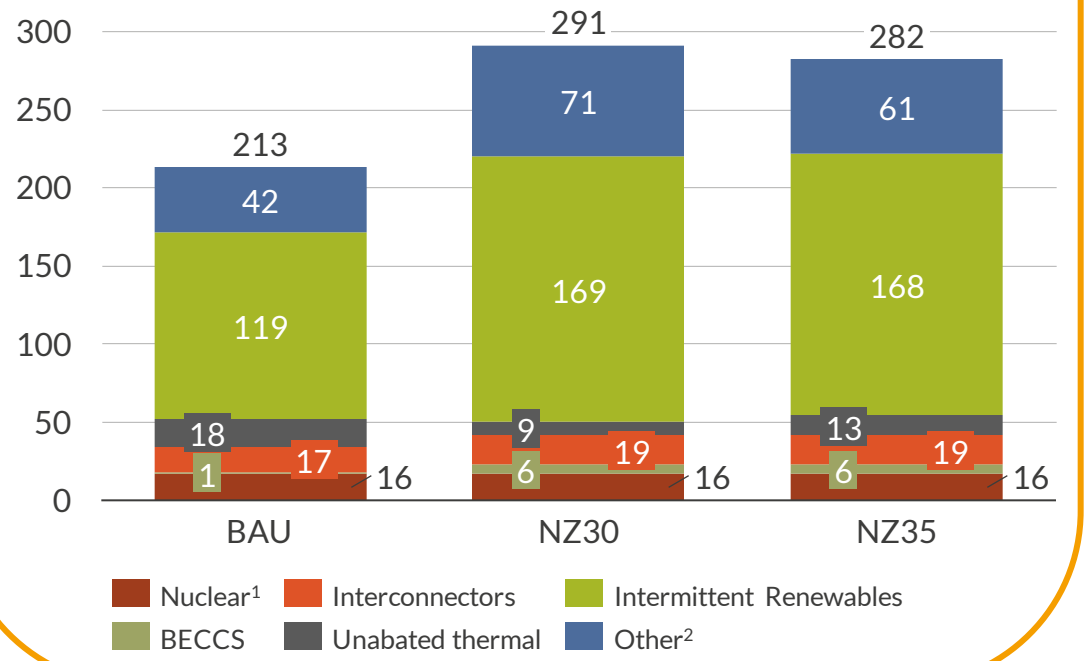
Whilst a shift in system composition is necessary to reach short-term Net Zero, the long-term capacity mix remains consistent

- To reach Net Zero accelerated deployment of renewables, flexible technology and networks are necessary
- Targeting Net Zero power earlier results in more renewables and less unabated gas as less offsetting negative emissions technology is available

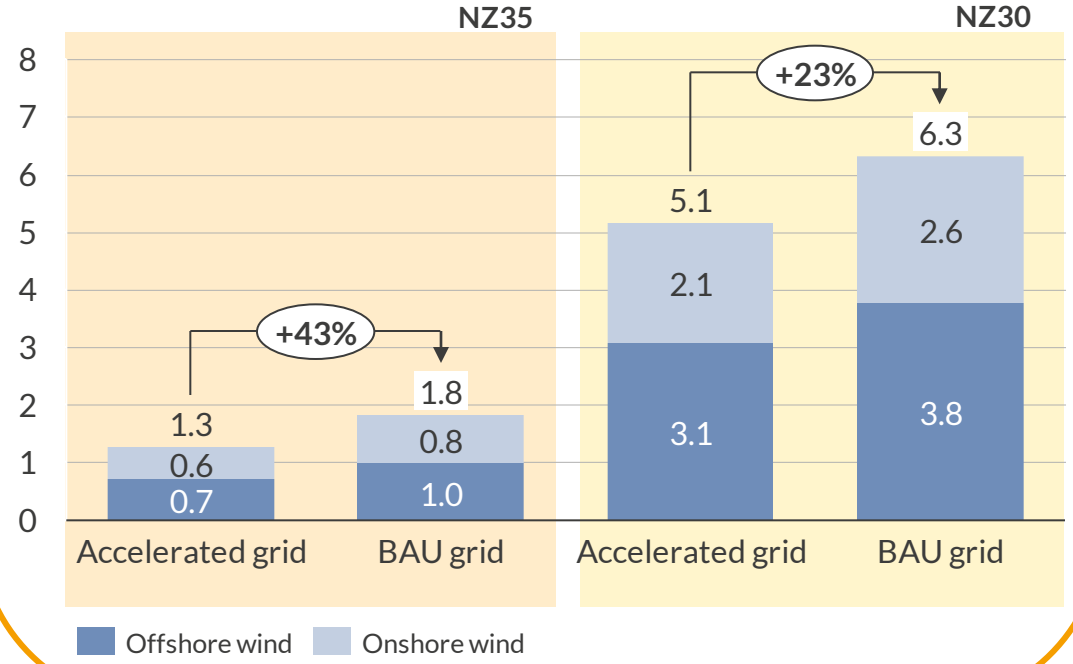
Installed capacity in 2050, GW



Net Zero power scenarios are not successful without sufficient network build to transport renewables

- Expanding grid capacity is vital to prevent wind curtailment as renewable generation increases.
- A 2030 Net Zero target risks significantly higher wind curtailment than a 2035 target, even with current grid build acceleration targets.

Yearly average curtailed wind volumes for 2025–2035, TWh



1) Assumes Hinkley Point C, Sizewell C and Bradwell B delays, with an upsizing of expected future capacity; 2) Includes generation from storage, demand-side response (DSR), hydrogen peaking plants, hydrogen CCGTs, biomass and gas CCS .

Source(s): Aurora Energy Research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