

# Can the UK reach net zero greenhouse gas emissions?

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**Policy Context:** Achieving 'net zero' greenhouse gas (GHG) emissions by 2050 is a target set in the Climate Change Act, with the UK Government pursuing even more stringent and specific intermediate targets from 2030. The term 'net' arose to address sectors with emissions deemed too difficult to become emission-free, by 2050, otherwise the overall emissions reduction target and endeavour might be undermined. The Sixth Carbon Budget, revealed in December 2020, reflects this target.

**Advice:** Reaching net zero by 2050 is not possible. To be realistic about achieving an ambitious emissions reduction target by 2050 and its ongoing sustainability, the UK Government should instead consider a near zero emissions target based on technology options demonstrating continuous improvement in efficiency. All analysis of future energy scenarios which inform policy should consider the whole economy and be based on defensible physics and engineering assumptions.

## Key research findings

Our report '[What price near zero emissions? Energy and economic modelling for the UK using real-world data to 2050 and beyond](#)' examines the country's capacity to transition to a low-carbon future and the options for realistic evidence-based policies to that end (using the 7see framework and model). Although plausible, the pathway is extremely challenging for engineering, requires investment at a scale not seen in recent times, and may be considered unpalatable.

- > **The UK Government's existing measures will cut GHG emissions attributed to the UK economy only 57% between 2019 and 2050 compared with the 1990 level.**
- > **A 'near zero by 2050' target is plausible for the UK, but is dependent on a small set of technologies. This pathway can only be achieved by aggressive growth of both fixed and floating offshore wind, complemented by the rapid introduction of hydrogen.** Extensive use of hydrogen is required across the economy where electrification is not feasible, and as a precursor to introducing renewably produced ammonia. Aviation – the sector hardest to decarbonise – can be fuelled by ammonia which is a near-term technology, alongside ammonia for maritime.
- > **Retrofitting heat pumps to existing dwellings will be incomplete by 2050**, requiring hydrogen for heating as a transition.
- > **Hydrogen produced from natural gas (decarbonised using (unproven) carbon capture and storage, CCS) will be needed as a transition fuel in 2050.** Modelling to 2080 shows that reduced dependence on this non-renewable hydrogen would only be possible if all ammonia is imported.
- > **Costs for the additional investment to reach and maintain this pathway would likely rise to 3.0% of GDP annually with a slow decline to 2.5%.** This is a significant commitment requiring widespread societal buy-in to succeed.

## Policy recommendations

- > **All policy underpinning ‘net zero by 2050’ should be revisited, and new policy should look beyond 2050.** The UK Government’s current measures cannot deliver net zero at any point in the foreseeable future. Furthermore, [mandating changes that reduce consumer demand carries risk](#) and is unlikely to be a successful strategy.
- > **Consider mechanisms to incentivise investment in, and support of, floating offshore wind technology development and deployment.** Floating wind systems are being trialled but are in their infancy. With the right support there is potential for the UK to become a world-leader in this technology.
- > **Pursuing net-zero related emissions targets must consider risks arising from unintended consequences such as stranded assets or becoming locked-in to technological pathways with short-term uses but long-term disadvantages.** Emissions sources considered too difficult to reduce should be addressed now and not left for future technological solutions. Renewably produced ammonia should be rigorously evaluated for aviation, along with investment in hydrogen combustion engines for heavy goods vehicles.
- > **Explore trade policy and agreements for importing ammonia from countries which have good potential for renewable power generation.** UK low-emission energy generation will not keep pace with demand. Relying on domestic ammonia production from decarbonised hydrogen is a poor long-term policy as this requires gas imports and infrastructure for unproven CCS.
- > **Remove barriers to UK companies increasing investment and creating jobs, enabling them to be competitive.** ‘Green jobs’ receive much attention, but the supply chains for low-carbon energy systems are embedded throughout the economy. Reducing the cost of employing people and the complexities of planning, stabilising policy and regulation, and creating a favourable corporation tax regime will improve the prospects for investment. Plan for no overall change in the number of manufacturing jobs, but their type to evolve to support the construction industry required by the energy sector.

### Work with us

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