



NET ZERO

Opportunities for the power sector

NATIONAL
INFRASTRUCTURE
COMMISSION

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Recommendations from the National Infrastructure Assessment

The Commission considers that the UK electricity system should be running on at least 50 per cent renewable generation by 2030, as part of the transition to a highly renewable electricity supply. To achieve this, the government should set out a pipeline of Contracts for Difference auctions to deliver the needed generation. Recent analysis for the Commission also highlights the potential for hydrogen technology in the power sector, which further supports the case for pursuing a highly renewable system.

The government's ambition to deploy 40 GW of offshore wind will go a long way to delivering at least 50 per cent renewable generation by 2030. This positive progress needs to continue. Delivering the Commission's recommendations would allow government to take the needed concrete action in the near term, whilst not closing down options for the future.

The Commission's recommendations deliver a 21st century power system

In the National Infrastructure Assessment the Commission recommended that government:

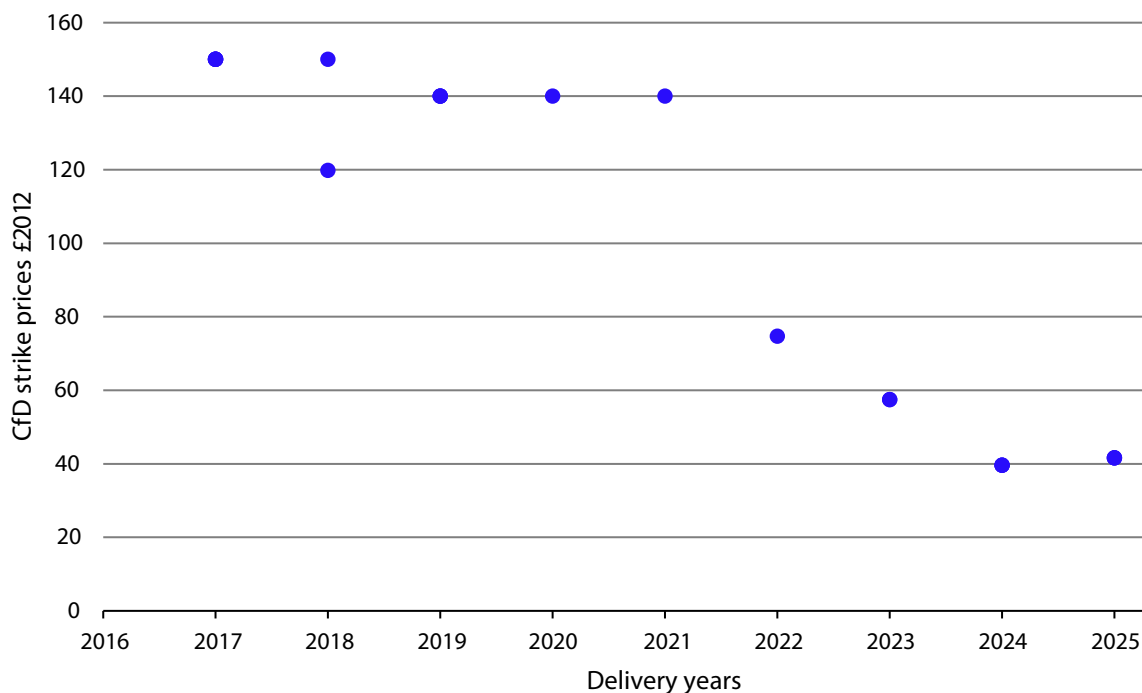
- set out a pipeline of pot 1 Contracts for Difference auctions, to deliver at least 50 per cent renewable generation by 2030, as part of the transition to a highly renewable generation mix
- move technologies that have recently become cost competitive, such as offshore wind, to pot 1 following the next Contracts for Difference auction in Spring 2019. Pot 1 should be used for the overwhelming majority of the increase in renewable capacity required
- publish indicative auction dates and budgets for the next decade by 2020
- over time take whole systems costs into account in Contracts for Difference auctions, as far as possible
- consider whether there is a case for a small-scale, pot 2 auction in the 2020s, if there are technologies which are serious contenders for future pot 1 auctions
- not agree support for more than one nuclear power station beyond Hinkley Point C, before 2025.

The considerations underpinning these recommendations are:

- **The analysis carried out for the Commission of future electricity system costs finds that systems with high penetrations of renewables are as cost effective as other systems** (Figure 1). This was true under the previous 2050 emissions target and it is still true with the new, more ambitious, net zero target. While there are uncertainties in any modelling, it is clear that ruling out the highest penetrations of renewables now would be counterproductive.
- **Renewable costs have consistently fallen faster than forecast.** The analysis summarised above uses informed and expert forecast of future technology costs, capturing a central view of how these costs could evolve. However, over the past decade renewables costs have consistently fallen faster than forecast. The latest Contracts for Difference auction once again demonstrated the rapid cost reductions in renewables (Figure 2), as the Commission suggested it might in its Assessment. Whilst this does not mean the Commission expects this to continue to happen, this presents an upside risk that renewables are even cheaper than currently expected. Other technologies that are key to low cost highly renewable systems, such as short term batteries, have also seen significant cost reductions over the past decade.⁸
- **In contrast, nuclear plants have not yet demonstrated consistent cost reduction.** Figure 3 shows the construction costs of nuclear power stations in various countries, by construction start date. With many decades of experience this data still shows no discernible trend in construction costs over time. This is true even for countries, such as France, that have built fleets of similarly designed reactors.
- **Emerging technologies, such as hydrogen, could further reduce the costs of highly renewable systems.** The Commission's latest analysis demonstrates that, if deployed, hydrogen, either generated from electrolyzers using curtailed generation or gas reforming with carbon capture and storage (CCS), has the potential to materially reduce the cost of highly renewable electricity mixes. In some scenarios costs are reduced by up to 30 per cent.
- **If bioenergy with carbon capture and storage (BECCS) is deployed in the power sector, it will likely displace other baseload technologies such as nuclear.** The Committee on Climate Change have set out that BECCS will likely be needed to generate negative emissions. If deployed in the power sector the Commission's analysis finds it will likely generate baseload and therefore displaces some nuclear capacity.
- **Keeping options open in a rapidly evolving sector is important and putting the UK on the pathway to a highly renewable system does just this.** Costs and operability of different technologies will continue to change rapidly, and the UK must be responsive to this. Policy decisions that lock the UK consumer into paying for large scale programmes with long construction times risk missing opportunities that may emerge. In contrast to other technologies renewables have short construction timelines. Therefore, if action is taken to put the UK power system on a highly renewable pathway, and evidence emerges that makes the case for alternative technologies, it will be possible to change course. The potential cost savings from hydrogen in the power sector is one example that underlines the importance of this.

- **New low carbon capacity is needed over the next decade and renewables can deliver this.** As the Commission argued in the first Assessment, due to current plant retirements, in the 2020s there will be a gap in electricity generating capacity, that needs to be filled.⁹ It must be the case that low carbon generation fills this gap. Given their short lead times, renewables are ideally placed to do this. With the exception of Hinkley Point C, nuclear power stations would likely only be able to deliver new capacity in the early 2030s. It therefore makes sense for government to take action to deploy renewables now.

Figure 2: Price reductions in offshore wind in the UK¹⁰



Note: Similar cost trajectories have been demonstrated for both onshore wind and solar. For example, *An analysis of the potential outcome of further 'Pot 1' CfD auction in GB estimated the price of onshore wind at around £45/MWh in £2012.*¹¹ However, this chart only covers prices agreed in signed Contracts for Difference in the UK. This trend is not just UK based, with cost reductions in onshore wind, offshore wind, and solar evidenced around the globe.¹²