UK Energy Research Centre

Pot-Zero 2025 Update:

Reducing the Cost of Renewable Support to Consumers

UKERC Working Paper

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1. Executive Summary

This report provides an update of a 2022 UKERC Working Paper, which aimed to assess the potential consumer savings from converting the support mechanism for legacy low carbon generators currently supported under the Renewables Obligation (RO) scheme to a Contracts for Difference (CfDs) structure in line with newer renewables projects. The 2022 study was carried out in the context of very high energy prices following the energy crisis at that time. Whilst prices have subsided since their peak, they remain elevated compared to the previous decade. Based on recent market data and scenarios, this report finds that Pot-Zero could still deliver material consumer savings in the range of £2-8 billion per year during the late 2020s while maintaining investment confidence and aligning with the UK's decarbonisation objectives.

Wholesale electricity prices in the UK remain among the highest in Europe, due to global gas market volatility, while existing RO certificate (ROC) structures allow generators to receive full support payments alongside high market prices, resulting in excessive consumer costs. CfDs, in contrast, offer price stability for both consumers and generators, with generators paying back excess revenues when market prices exceed the agreed strike price.

The range of consumer savings is based on a range of alternative strike price scenarios (£30, £50, £80/MWh) and market price trajectories. The analysis suggests that the early implementation of Pot-Zero, starting in 2027, maximises potential savings and price stability while preventing windfall overpayments, because the plant supported under RO scheme will start to retire over time. The report concludes that Pot-Zero could represent a practical step to support affordability for consumers while maintaining progress towards a fully decarbonised electricity system by 2035.

2. Introduction

The UK is in a critical phase of its net zero transition, while facing persistently high electricity prices. Wholesale electricity prices surged during the gas price crisis of 2021–2023, peaking at levels four to five times higher than historical norms and driving up consumer bills across households and industry. Although wholesale prices have moderated, UK electricity costs remain relatively high by European standards, at around 20-30% more than the average for EU-14 countries.[1]

In 2022, UKERC published a report[2] which examined whether changing the contract structures for existing low carbon generators could help to reduce costs for consumers, while maintaining progress towards the UK's decarbonisation goals. That analysis estimated potential annual consumer savings of up to £22 billion -

equivalent to £300 per household per year -if most existing renewables and nuclear generation were moved onto Contracts for Difference (CfD) structures (under a so-called 'Pot-Zero' arrangement) rather than continuing to receive Renewable Obligation Certificates (ROCs) and unhedged wholesale market revenues.

The principle behind this proposal is that under CfDs, generators receive a fixed strike price for their electricity, paying back excess revenues when market prices exceed that level.[3] In contrast, ROCs were designed during a period of low wholesale prices, and allow generators to receive ROC support in addition to market revenues without returning excess profits when prices are high. This structure, while effective for market development in the past, now risks over-remuneration of renewable generation at the expense of consumers during periods of elevated wholesale prices.[4] The RO scheme provided 20-year contracts. The scheme finished in 2017, so the most recent contracts will expire in 2037. This report assesses the potential savings from switching from RO contracts to CfDs over this period.

Wholesale prices have stabilised below the peak of the crisis, but there is continued public and political pressure to lower consumer energy bills given their contribution to the cost of living crisis. There are also concerns that high electricity costs risk undermining the affordability of the net zero transition.[5]

This updated report revisits the Pot-Zero proposal using updated market data and scenario analysis to assess the potential for converting legacy ROC arrangements into CfD structures for existing low carbon generators. The aims of this study are:

- To quantify the consumer savings achievable from ROC-to-CfD conversions under updated market conditions and electricity price trajectories;
- To assess the impacts on generators, identifying potential incentives and risks associated with shifting from variable market-based revenues to fixed strike price contracts;
- To support policymakers with evidence on how to lower electricity costs while safeguarding investor confidence and ensuring continued decarbonisation momentum.

The report proceeds by outlining the technical and contractual differences between ROCs and CfDs, presenting a clear rationale for Pot-Zero. We then describe the detailed methodology used to estimate consumer savings and generator revenue impacts under different scenarios, followed by the results of this analysis, and concluding with implications for policy and market design.

3. The Case for Pot-Zero

The Pot-Zero proposal is grounded in the structural differences between Renewable Obligation Certificates (ROCs) and Contracts for Difference (CfDs) in how they remunerate low carbon generators and interact with wholesale electricity prices.

Under the Renewables Obligation (RO), operational since 2002, generators receive tradable certificates (ROCs) for every MWh generated, which suppliers must purchase to meet their obligations. Generators also earn revenues from selling their electricity at the prevailing wholesale price. This system was effective in stimulating the early growth of renewables during a period of low wholesale prices. However, it does not protect consumers when wholesale prices rise, as generators continue to receive full ROC payments alongside higher market prices, resulting in excessive consumer costs during price spikes. Generator revenues via the RO Scheme are illustrated schematically in Figure 1.

In contrast, Contracts for Difference (CfDs) provide price stability for both consumers and generators by guaranteeing a fixed strike price. When wholesale prices are below the strike price, the counterparty (LCCC) pays generators the difference; when wholesale prices exceed the strike price, generators pay back the surplus. Generator revenues via the CfD scheme are illustrated schematically in Figure 2. This means that consumers benefit from stable bills during high-price periods, while generators receive stable revenues.[6] This could be attractive to the owners of these existing RO-accredited renewables assets, especially if the CfD had a longer end-date on the contract, providing greater revenue certainty during the project tail when wholesale prices are likely to be most affected by price cannibalisation. Keeping these assets financially viable and running for longer could also have system-wide benefits in terms of the overall costs of meeting decarbonisation targets.

In order to realise these benefits, implementation of Pot-Zero will require:

- Agreeing strike prices attractive enough for generators to voluntarily switch, while ensuring material consumer savings;
- Establishing clear counterfactuals to assess additionality and prevent windfall gains;
- Mitigating tail risks for generators in the 2030s, where electricity price uncertainties could otherwise lead to premature plant retirements;
- Designing Pot-Zero as a time-limited offer, incentivising early uptake to maximise savings while ensuring alignment with the broader CfD framework and security of supply.

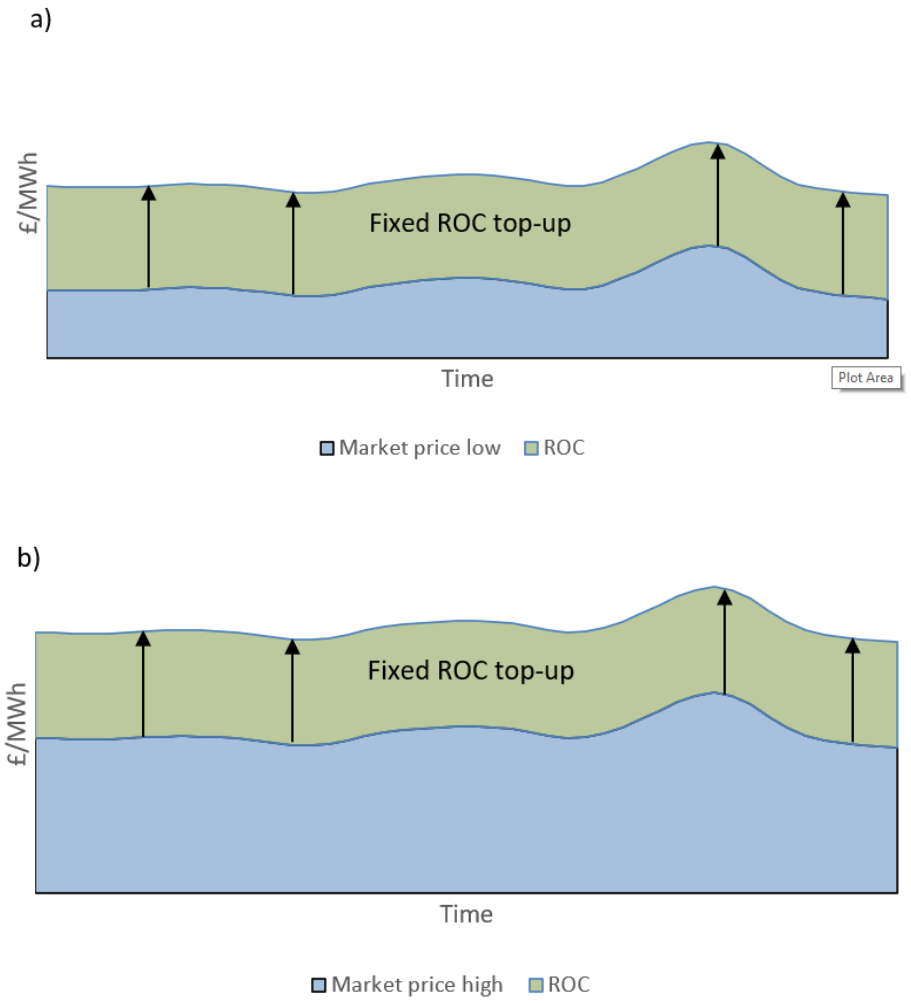

***Figure 1**: Illustration of generator revenues via the RO scheme under a) low market price and b) high market price conditions.*

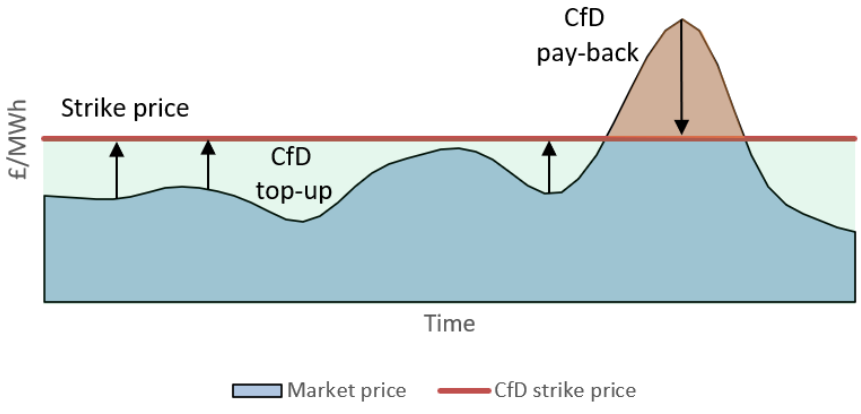

***Figure 2**: Illustration of generator revenues under the CfD scheme*

4. Methodology

This analysis is based on a calculation of the cumulative difference over time between the values of two contrasting revenue streams for low carbon electricity generation:

1. An RO-based revenue stream calculated from the sum of the value of RO certificates generated for each annual cohort of generators, plus the wholesale electricity price calculated under different gas price scenarios; and
2. A CfD-based revenue stream calculated under different strike price scenarios.

The technologies included in the analysis are offshore wind, onshore wind, solar PV, plus small amounts of biomass, though excluding DRAX, which has already negotiated a CfD contract from 2027 onwards. The assumptions behind the analysis are set out in Annex 1.

4.1 RO-based revenue calculation

The analysis starts by separating out the legacy renewable generation capacity into annual cohorts representing the years they were accredited for the RO (Table A1). This allows us to track how the capacity of plant remaining within the RO scheme declines over time as plant reach the end of the 20-year contract period. This is shown in Figure 3, which also shows how generation could continue beyond the 20-year contract period for the RO-accredited plants were to continue for the duration of their technical lifetime.

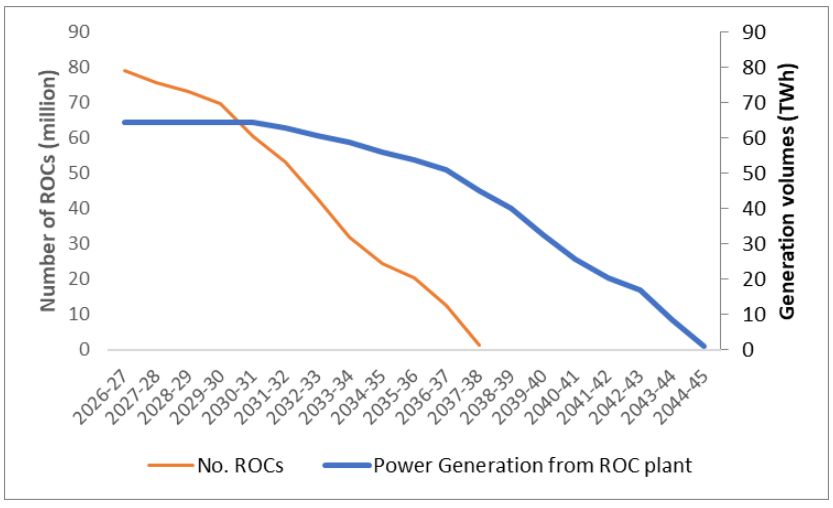

***Figure 3**: Number of renewables certificates produced and power generated from RO-accredited plant*

These figures take into account changes over time in the load factor (Table A3), and the number of RO certificates (ROCs) awarded per MWh generated (Table A2), to calculate the number of ROCs generated per year for each annual cohort. The number of ROCs generated is then multiplied by the 2024 ROC buy-out price of £64.7 per ROC[7] (reflecting costs in £2024 currency terms in this analysis) to provide

an estimate of future revenue for any given cohort. The RO is assumed to last for 20 years, so each cohort stops earning this revenue once it exceeds this period. Total system cost of the RO is then the sum across all cohorts that are still generating ROCs in any given future scenario year.

Revenue earned from wholesale markets is calculated as the number of MWh generated, multiplied by the annual average wholesale price (under two scenarios), which are adjusted by a capture price multiplier to reflect the fact that renewables often receive less than the average market price, due to the correlation of their output with other low marginal-cost generators. Annual revenues are cumulatively summed across the time horizon.

We calculate two wholesale electricity price scenarios. Both are based on the short-run marginal cost of gas-fired CCGT plant under the following assumptions:

- **Low scenario**. Carbon prices rise from current levels but are assumed to be capped at €80/tCO2 after 2030.[8] Gas prices are fixed at today's price of approximately 80p/therm. Price cannibalisation is assumed to deepen over time, reducing average market electricity prices by about 40% in 2030 and by 67% in 2040 compared to 2025.
- **High scenario**. Carbon prices are based on the NESO CP30 scenario, which rises to £147/tCO2 by 2030, and then we assume these stay flat thereafter. Gas prices are based on the NESO CP30 base case, and are assumed to stay flat at 100p/therm over the modelling horizon. Price cannibalisation of average market prices is assumed to remain unchanged from 2025 levels.

4.2 CfD-based revenue calculation

Under the CfD, generators are assumed to earn the CfD strike price (under a range of scenarios), multiplied by the volume of generation for each cohort. Generation is assumed to continue for the duration of their technical lifetime, after which these generators are assumed to retire and not earn further revenues from the CfD.

Strike price scenarios were set at £30, £50, and £80 per MWh. These were taken to be representative of the range of potential prices that could be achieved for a plant transferring from an RO contract to a CfD.

4.3 Estimating cost savings based on revenue difference

The total system cost savings estimates are based on the difference between the two RO revenue scenarios, compared to the three CfD revenue scenarios. This creates six cost savings scenarios.

In addition, we show an additional 'neutral' scenario which assumes that market revenues and CfD revenues are broadly balanced, such that the overall cost savings would just accrue from avoiding the RO payments.

5. Results

The updated analysis evaluates the consumer savings potential of converting ROC-accredited low carbon generation to Pot-Zero CfDs under updated market conditions and future price trajectories for the period 2027–2037. The modelling framework calculates cumulative consumer savings relative to a "ROCs only" baseline while maintaining generation volumes, system balancing assumptions, and policy consistency.

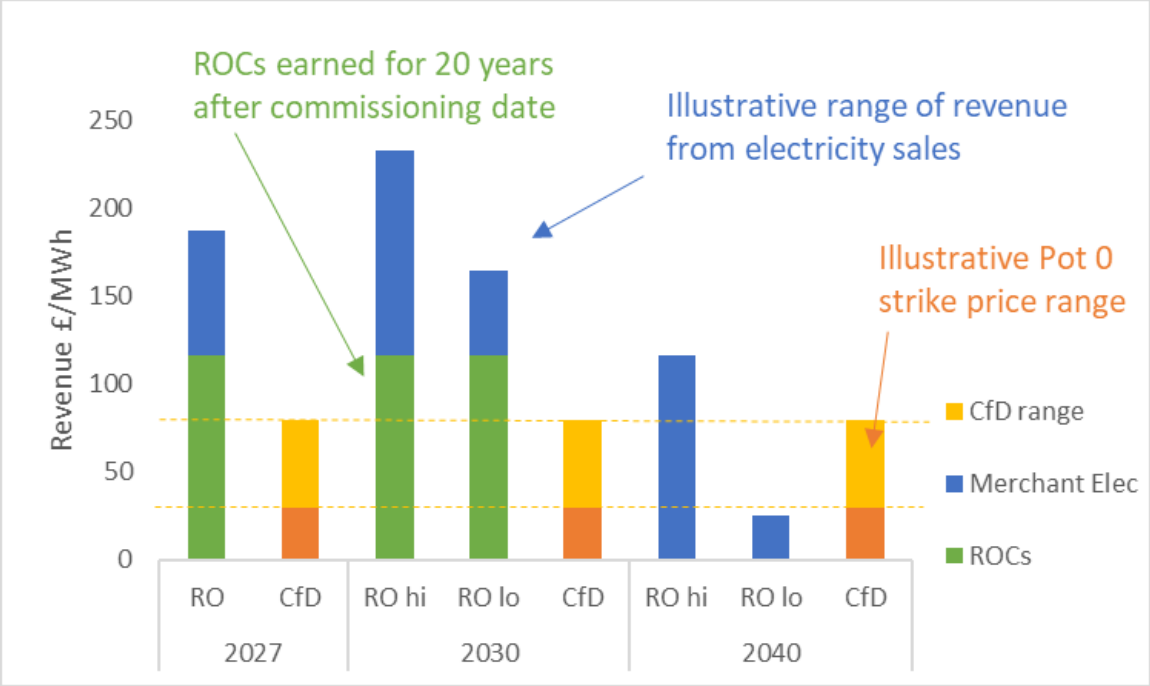

***Figure 4**: Illustrative revenue profiles for offshore wind under ROC + merchant revenues vs Pot-Zero CfD structures. The figure is illustrative of a plant that was commissioned in around 2015, which would cease to receive RO payments in 2035, but could continue to receive CfD payments for the duration of their technical lifetime into the early 2040s.*

This chart shows indicative revenue streams for an offshore wind plant accredited under the RO scheme, illustrating:

- **Fixed ROC revenues**, which continue until the ROC support ends (typically 2035 for a 2015-accredited plant).
- **Variable merchant revenues**, dependent on wholesale electricity price trajectories and price cannibalisation effects.
- **Pot-Zero CfD revenues**, modelled with indicative strike prices replacing both merchant revenues and ROC support, offering stable, predictable revenues for generators.

The chart shows that under high-price scenarios, ROC + merchant structures result in higher total generator revenues than under Pot-Zero CfDs, reflecting **potential**

consumer overpayments under current support structures. This illustrates that Pot-Zero CfDs can therefore capture excess revenues during periods of high wholesale prices, offering material consumer savings. Conversely, for the generator, there are benefits in terms of creating more certainty over revenues in the latter part of the technical lifetime of the plant. This may be optimal from a system cost and carbon reduction point of view as it could help to maintain the output of existing low carbon generation sources on the system.

By combining these savings across all technologies and across all annual cohorts, we can estimate the total potential system cost savings for each of the seven scenarios described in the methodology section. These results are shown in Figure 5.

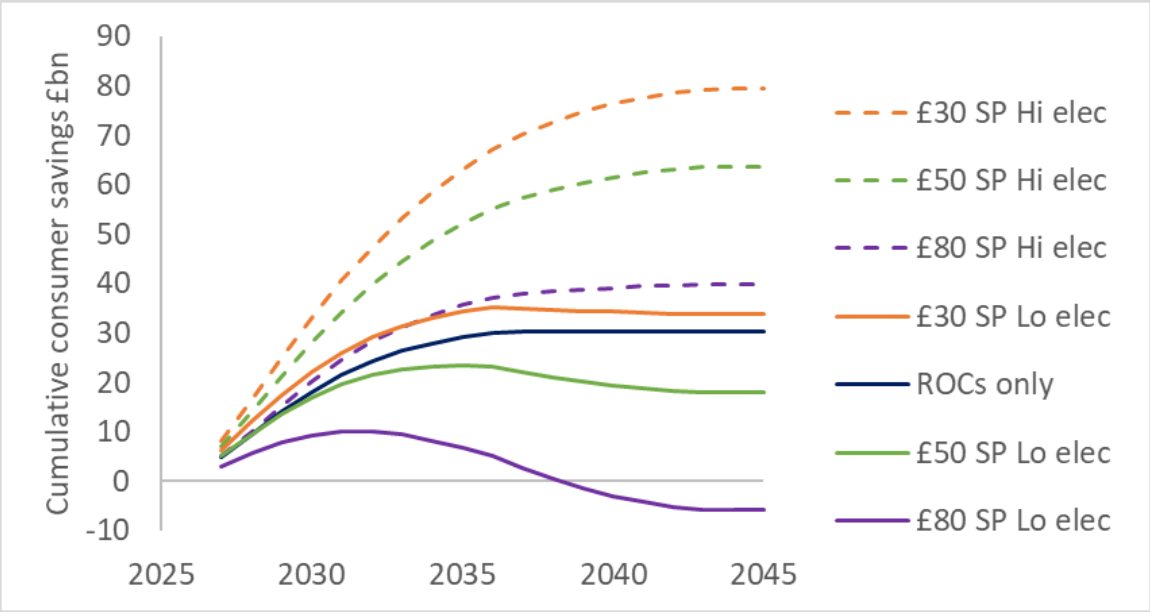

***Figure 5**: Estimated undiscounted cumulative consumer savings from Pot-Zero implementation, 2027–2045, under different price scenarios.*

This chart presents the cumulative undiscounted consumer savings achieved by replacing ROC and merchant revenues with Pot-Zero CfD payments for the entire RO-accredited generation fleet (excluding DRAX, which is under a separate CfD arrangement). It illustrates cumulative savings in the range £10-30 billion based on annualised consumer savings ranging from ~£2-8 billion per year up to 2030, depending on the price scenarios. As would be expected, the savings from switching to a CfD structure are highest when merchant electricity prices are high and the strike price is low. Conversely, the benefits of Pot-Zero are reduced when electricity prices are low and the strike price is high.

In the worst-case scenario shown in Figure 5 with low electricity prices and a £80/MWh strike price, the early gains for consumers into the early 2030s become eroded and potentially reversed later in the 2030s and into the 2040s. However, this representation is not necessarily a fair comparison of the costs and benefits of CfDs

relative to ROs since an RO-accredited plant faced with heavily cannibalised merchant-only revenues at the tail-end of the plant lifetime may choose not to operate at all, which would require capacity shortfalls to be met with new-build plant, which would likely require a higher price than was being paid under a Pot-Zero CfD.

6. Conclusion

This updated analysis suggests there could be a positive consumer and system case for implementing a Pot-Zero Contracts for Difference (CfDs) for existing low carbon generation currently supported under the Renewables Obligation (RO) scheme. The work suggests there may be a range of benefits to consider:

- **Material Savings Potential:** Pot-Zero CfDs could deliver **£2-8 billion in annual consumer savings** in the late 2020s, depending on electricity price and CfD strike price scenarios.
- **Price Stability:** Shifting from variable market-dependent revenues to fixed strike prices under Pot-Zero offers consumers and suppliers greater price predictability.
- **Generator Incentives:** The potential "tail risk" of price uncertainty in the 2030s provides an incentive for generators to accept Pot-Zero terms, trading lower near-term revenues for long-term stability.

While wholesale electricity prices have moderated since the crisis peak, leading to lower consumer savings than were estimated in the 2022 UKERC report, prices nevertheless remain high by historic standards, and the structural misalignment between ROC-based remuneration and the current price environment means consumers continue to pay higher support costs than necessary.

To maximise benefits, Pot-Zero should be implemented as a time-limited voluntary offer, targeting the full RO-accredited fleet (excluding existing CfD assets) with appropriately structured strike prices that ensure consumer savings while maintaining sufficient generator incentives. Early implementation (from 2027) would allow consumer benefits to be realised before ROC contracts naturally expire, while reducing the "tail risk" that could otherwise drive premature retirements.

7. Annex 1: Assumptions

	2004–05	2005–06	2006–07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Onshore wind	400	633	500	695	606	501	513	1267	1516	885	366	765	3019	848	104
Offshore wind	60	90	90	190	90	352	1063	645	891	1033	424	50	0	1383	154
Fuelled ex. Drax	0	0	0	127	13	23	268	33	116	41	122	83	141	107	34
Solar PV	0	0	0	1	2	6	0	6	284	1205	2496	1261	767	58	0
Landfill gas	80	91	66	25	24	27	31	0	9	0	7	0	1	0	0
Other	13	12	10	16	124	14	15	1	13	12	14	3	32	1	0

Table A1. Annual RO accredited capacity additions by technology (MW)

	2004–05	2005–06	2006–07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Onshore wind	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9
Offshore wind	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.8	1.8	1.8
Fuelled ex. Drax	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Solar PV	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.6	1.4	1.3	1.2	1.2	1.2
Landfill gas	1.0	1.0	1.0	1.0	1.0	0.3	0.3	0.3	0.3						
Other	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.85	0.85	0.85	0.85	0.85	0.85

Table A2. No. of ROCs per MWh by technology for each annual cohort

	2007–08	2018–19
Onshore wind	26.3%	26.3%
Offshore wind	33.7%	41.4%
Fuelled	55.9%	55.9%
Solar PV	10.9%	10.9%
Landfill gas	55.3%	55.3%
Other	39.0%	39.0%

Table A3. Load Factor assumptions (assuming linear interpolation for intervening years)

	2026-27	2030-31	2040-41
Offshore Wind	93%	80%	80%
Onshore Wind	93%	80%	80%
Solar PV	92%	68%	68%

Table A4. Capture price ratios by technology relative to average wholesale price. Figures for 2026 and 2030 are derived from reference price calculations for AR6.[9] These ratios are assumed to remain flat between 2030-2040, although cannibalisation of average market values is assumed to deepen over time under the low price scenario as described in the main text.

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