



BRIEFING PAPER

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Support for low carbon power

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Summary

- The Government's primary mechanism for supporting new low carbon power infrastructure is known as the contract for difference (CfD) scheme.
- CfDs work by guaranteeing a set price for electricity – known as a strike price – that generators receive per unit of power output. As the wholesale price of electricity fluctuates, the generator is either paid a subsidy, or pays back, so that they always receive the value of the strike price. The cost, or benefit, is passed on to consumer bills.
- The technologies that have been able to compete for CfDs have been subject to policy changes. The Government has announced a consultation on changes to the CfD scheme, which would mean a wider mix of technologies, including onshore wind, will be able to compete for contracts.

Background – Electricity Market Reform

The energy policy of successive Governments has been designed in line with the “energy trilema” to:

- decarbonise electricity generation;
- ensure energy security; and
- minimise the cost of electricity to consumers.

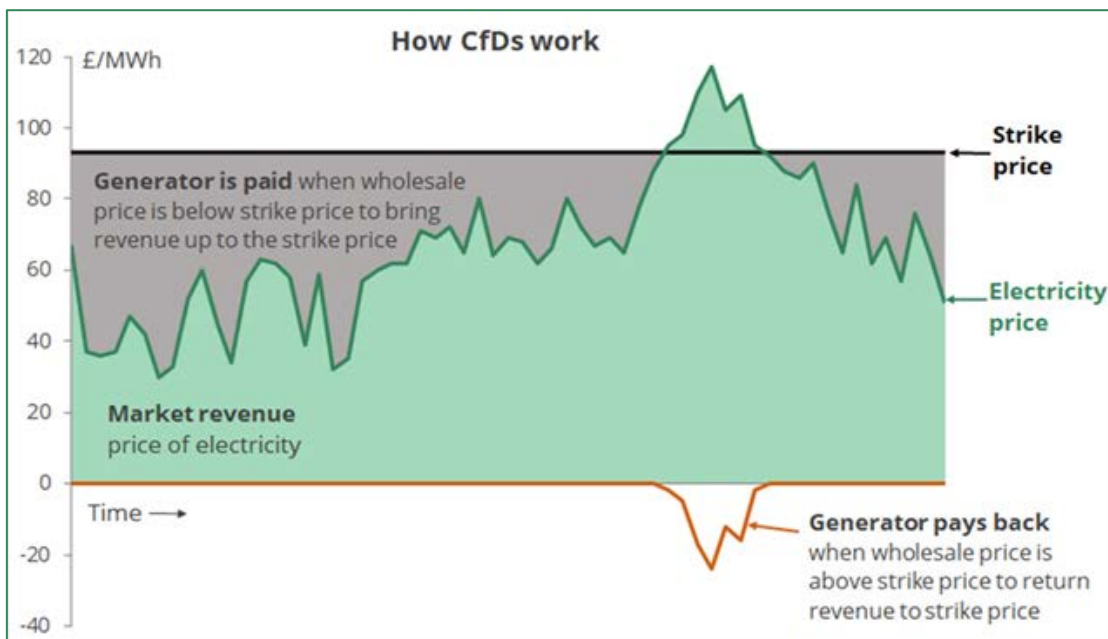
In 2010, the Coalition Government energy policy sought to address the trilema with a programme known as Electricity Market Reform (EMR), legislated through the [Energy Act 2013](#). EMR aimed to improve the relative attractiveness of the UK for investors in the electricity market by creating a long-term, stable and predictable electricity market, providing greater revenue certainty. The two main mechanisms of EMR are:

- A Capacity Market – to help ensure security of electricity supply. More information on the capacity market is available in the Library briefing paper on [Electricity Grids](#) (January 2019, section 3.3).
- Contracts for Difference (CfDs) – to provide support for new low carbon power. CfDs replaced the [Renewables Obligation](#) which closed to new generation in March 2017. CfDs are now the primary mechanism by which the Government supports new low carbon power developments.

Contracts for Difference

Large scale, low carbon power infrastructure is supported through Contracts for Difference (CfDs).¹ Introduced in 2010, CfDs work by fixing the prices received by low carbon generation over a number of years, reducing the risks developers face from a fluctuating wholesale power price, and ensuring that eligible technology receives a price for generated power that supports investment. The fixed price is known as the strike price.

A CfD is a private law contract between a low-carbon electricity generator and the [Low Carbon Contracts Company \(LCCC\)](#), a government-owned company. Under the CfDs, when the market price for electricity generated by a CfD Generator is below the strike price set out in the contract, payments are made by the LCCC to the CfD Generator to make up the difference. However, when the market price is above the strike price, the CfD Generator pays LCCC the difference. This is shown in the figure below.



Source: House of Commons Library

The payments, and repayments, paid and received by the LCCC for the CfD scheme are passed on to consumer electricity bills.

Allocating CfDs

CfDs are mostly decided at auctions, known as allocation rounds, to allow competition between technologies and help keep prices low. The Government sets a budget in advance, then sealed bids of strike prices submitted by developers are accepted sequentially from the lowest to the highest until the budget is exceeded. All developments of the same technology and delivery year (i.e. when construction is completed) that bid are paid the last submitted successful strike price bid; there are different prices for different technologies and delivery years. There is a non-delivery disincentive for developers unable to fulfil the contract they have been awarded, meaning they will not be able to compete in the next auction. To date, there have been three allocation rounds.

The Government are required by [regulations](#) to publish the budget in advance but are free to choose the amount:

¹ For information on Government support for small scale renewable power generation, see the Library briefing paper on [Support for small scale renewables](#).

- The first allocation round took place in 2014 with an [available budget](#) of £300 million per year (this was split with £65 million for Pot 1 technologies, and £235 million for Pot 2 technologies – see description of Pots below). In the [2016 Budget](#), the Cameron Government announced £730 million for further CfD auctions.
- The second allocation round took place in 2017 with a [total available budget](#) of £290 million (the auction was open to Pot 2 technologies only - see section below on 2015 Conservative Government changes). In the 2017 [Clean Growth Strategy](#), the May Government confirmed that the remaining unspent £557 million (of the previously announced £730 million) would be available for future auctions.
- The third allocation round took place in 2019 with a [total available budget](#) of £65 million (again the auction only included support for Pot 2 technologies).
- The [Government have said](#) that they plan to hold further auctions every other year from 2021 until the remainder of the £557 million budget has been used.

The Government were criticised for only allocating £65 million as a total budget for the 2019 auction. The environmental charity Greenpeace describe it as “bewildering” but other stakeholders said it could reflect the lower prices achieved in previous auctions (see graphs below).²

The Government also set administrative strike prices for each technology, which are an effective cap on how high the strike price can be. The Government also has the power to cap the capacity that certain technologies can win. The National Audit Office criticised the use of this cap for fuelled technologies (such as biomass) in the 2017 auction which resulted in smaller, more expensive developments winning contracts over cheaper, larger developments that would have exceeded the cap.³

In addition to auctions, CfDs can also be decided by bi-lateral negotiation, such as the CfD agreed for the Hinkley Point C nuclear power plant. All CfD budgets and strike prices are in 2012 values.

‘Pots’ of funding

The CfD funding is set out in ‘Pots’ which group the technologies that can compete:

- Pot 1 is ‘established technologies’ including Onshore wind (>5MW), Solar Photovoltaic (PV) (>5MW), Energy from Waste with combined heat and power (CHP), Hydro (>5MW and <50MW), Landfill Gas and Sewage Gas;
- Pot 2 is ‘less established technologies’ including Offshore Wind, Remote Island Wind (>5MW - added for 2019 auction), Advanced Conversion Technologies (ACT), Anaerobic Digestion, Dedicated Biomass with CHP, Wave, Tidal Stream, and Geothermal.

Results of previous auctions

The three CfD allocation rounds results (all CfD budgets are in 2012 values) are shown below:

- In the first allocation round in 2014 (which included Pot 1 and Pot 2 technologies) contracts were awarded to ACT (£114.39/MWh for 2018/19 delivery), energy from waste with CHP (£80 for 2018/19 delivery), offshore wind (£114.39 for 2018/19

² Matt Mace, [‘Genuinely bewildering’: BEIS to allocate £60 million for next CfD auction](#), *Edie*, 20 November 2018

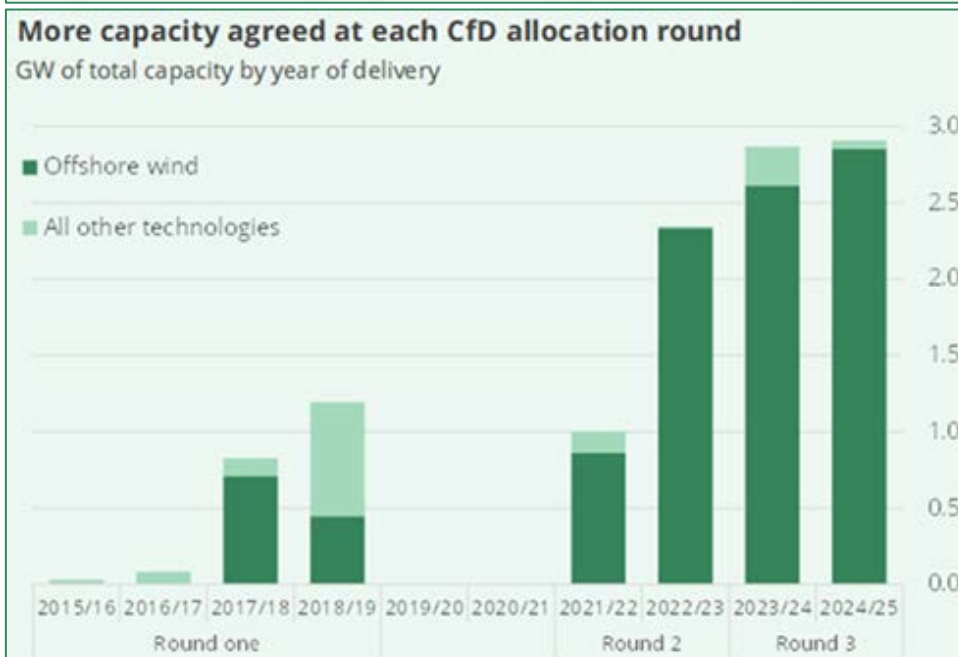
³ National Audit Office, [Investigation into the 2017 auction for low-carbon electricity generation contracts](#), 16 May 2018

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delivery), onshore wind (£82.50 for 2018/19 delivery), and solar PV (£79.23 for 2016/17 delivery). The full results are available [here](#).

- In the 2017 allocation round (for Pot 2 only) contracts were awarded to ACT, dedicated biomass with CHP, and offshore wind at £74.75/MWh for 2021/22 delivery. For 2022/23 delivery, ACT and wind secured contracts at £40 and £57.50 respectively for the two technologies. The full results are available [here](#).
- In the 2019 allocation round (Pot 2 only) the technologies that won contracts included offshore wind, remote island wind, and ACT with strike prices as low as £39.65 per MWh for 2023/24 delivery. The results are [available here](#).

The fall in strike prices for Pot 2 technologies, and the rise in the capacity of generation added at each round, are shown in the figures below. These show that despite the smaller budget, the most capacity was added in allocation round 3 due to lower prices. The recent auctions have been dominated by offshore wind; see Box 1 for information on comparing the strike prices for different technologies.



Source: House of Commons Library

Box 1: Comparing CfDs

The strike prices of £39.65/MWh secured by generators from the most recent (third) round are a significant reduction from the first round, and below the projected cost for wholesale electricity when the developments come online, leading some in the [industry to say](#) the projects are effectively subsidy free.

The costs for renewables secured in allocation rounds are also below the negotiated CfDs for nuclear: Hinkley Point C has a negotiated strike price of £92.50 per MWh which could fall to £89.50/MWh if another plant at Sizewell C is also built.

However, it is not possible to directly compare the costs of different energy technologies based solely on strike prices for several reasons, such as:

- The contract length for strike prices vary (i.e. 15 years for wind and 35 years for Hinkley);
- The total length of operation of the technologies vary (i.e. the proposed Swansea Bay tidal lagoon could generate for 120 years whereas Hinkley C is projected to generate for 60);
- The capacity (MW) and the load factor (how often it generates) of the technologies vary;
- The cost of integrating different technologies into the grid varies, i.e. in terms of grid connection costs, and system balancing.

To compare technology costs, the Government can use a method that takes into account the life-cycle of costs of a technology, known as the [levelized cost](#).

2015 Conservative Government changes

Following the 2015 election, the Cameron Government withdrew support for Pot 1 technologies such as onshore wind, and also made changes to the planning regime to give local people the final say on onshore windfarm proposals.⁴ This followed a [manifesto promise](#) which argued that onshore windfarms “often fail to win public support [and] are unable by themselves to provide the firm capacity that a stable energy system requires”.⁵

This decision had been criticised by the industry, who argued that the cheapest forms of renewable electricity were being blocked.⁶ According to the [Government's Public Attitudes tracker](#), public opinion of onshore wind had fluctuated between 64% and 70% support, and 11% and 13% opposed between 2012 and 2015, though these national views may not reflect more local feeling near a development.

Public support had been increasing since 2015, and reached a total of 79% when last checked in March 2019, compared to a total of 6% opposed. This correlated with growing concern about climate change⁷ and continuing support for renewables in general.⁸

Current proposals

In March 2020, the Government announced that the 2021 CfD allocation round will re-introduce Pot 1 to include onshore wind and solar, and also proposed including the novel technology of floating offshore wind:

The [2021] round will be open to renewable technologies including onshore wind and solar, with proposals to introduce floating offshore wind. This could see millions more homes powered by clean energy by the end of the decade, and a boost for the supply

⁴ More information is available in the Library briefing paper on [Planning for Onshore Wind](#), July 2016

⁵ For more information on balancing energy systems, see the Library paper on [Electricity grids](#), January 2019

⁶ Renewable UK, [Blocking onshore wind penalises consumers, warns new CCC report](#), 28 June 2018

⁷ From a total of 66% concerned in March 2015 to 80% in March 2019.

⁸ Support for renewables has fluctuated from the mid-70s to mid-80s% support between 2015 and 2019.

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chain, adding to the 20,600 jobs and the £628 million of exports each year already supported by the renewables industry.⁹

A [consultation on the proposed re-introduction of Pot 1](#) was published on 2 March 2020. The consultation confirms that from 2021, auctions will be open to established (Pot 1) and less-established (Pot 2) technologies, but asks whether the structure by which different technologies currently compete against each other within pots should be altered. The consultation suggests two alternative structures:

- Pot 1 and Pot 2 remain the same (including the technologies set out above), with floating offshore wind added to Pot 2, or
- Pot 1 and Pot 2 as above, except Pot 2 will no longer include offshore wind (non-floating) which will compete in a new Pot 3.

The Government say in the consultation that the Pot structure needs to optimise competition to keep the downward pressure on prices. On the one hand, separating offshore wind into a separate pot allows each pot to have technologies with similar characteristics (e.g. size, expected costs, regulatory issues, etc) which can allow more appropriate auction parameters (e.g. budget, delivery years, etc) to be set for each pot. This could increase competition to deliver better prices for consumers. On the other hand, reducing competition to offshore wind in a separate pot could risk less competition, due to fewer uncertainties for bidders.¹⁰

In addition to technical changes, the other proposed changes in the consultation include extending the CfD scheme delivery years until 2030, enhancing the low carbon supply chain, and providing for decommissioning offshore windfarms. The consultation is open to responses until 22 May.

Stakeholder comment

The consultation was widely welcomed by the renewables industry, who had been arguing for changes to the CfD scheme. Before the announcement of changes, while the CfD scheme was supported, there were broadly two key areas of concern:

- supporters of Pot 1 technologies such as onshore wind and solar had been critical that they could not receive support¹¹, and
- supporters of Pot 2 technologies which have not been successful in auctions, such as wave and tidal, had said they did not have a level playing field against the more established industries like offshore wind¹².

Industry trade bodies welcomed the proposed changes; for example Renewables UK, said in a [press release](#) the changes were important to meet the UK's statutory target for net-zero emissions by 2050:

The Government is pressing ahead with action to meet our net zero emissions target quickly and at lowest cost to consumers and businesses. Backing cheap renewables is a clear example of the practical action to tackle climate change that the public is demanding, and this will speed up the transition to a net zero economy. As one of the UK's cheapest power sources, new onshore wind projects will be a huge boost for jobs and investment in local economies across the UK.

⁹ HCWS139, [Energy Policy Update](#), 2 March 2020

¹⁰ Gov.uk, [Contracts for Difference \(CfD\): proposed amendments to the scheme 2020](#), 2 March 2020

¹¹ Renewable UK, [Blocking onshore wind penalises consumers, warns new CCC report](#), 28 June 2018

¹² David McPhee, [Wave and tidal 'effectively locked out' of energy market, marine boss claims](#), *Energy Voice*, 19 March 2019

Renewables UK also said there was a pipeline of “shovel-ready” onshore wind projects, which had secured the necessary consents that were ready to compete for contracts.

However, there was also criticism of the decision. An article in *The Telegraph*¹³ said the changes would be “costly” and referred to the costs of balancing the grid with new renewables (see Box 2).

Box 2: Cost of CfDs

The energy trilema, which was the basis for CfDs includes decarbonisation, but also affordability. The affordability of low carbon developments, relative to the wider costs of energy, is the subject of debate.

Critics of renewables say that the need for subsidy shows that they are expensive to build, but also that renewables are expensive for the electricity system due to the costs of balancing the supply and demand on the grid. This topic is covered in the Library briefing paper on [Electricity Grids](#) (January 2019). In summary, there are costs of balancing the grid with any technology, but the cost can be greater with intermittent technologies such as wind and solar, and includes constraint payments to turn the renewables off when supply is higher than demand. Estimates of system integration costs for intermittent renewables vary from £6 to £17/MWh and are expected to be higher with a greater proportion of renewables. Nuclear power has also been criticised for its high cost¹⁴ but has the opposite grid issue, in that it provides constant power that cannot flexibly respond to demand.

On the other hand, supporters of renewables say that the view that low carbon power is expensive is increasingly outdated. As the results of the auctions show, the cost of renewables has been falling and [some analysis](#) has suggested that the cost of building renewables is falling below the costs of building, or even operating, conventional fossil fuel power plants.¹⁵ The former Secretary of State for Business, Energy and Industrial Strategy, Greg Clark MP, said in a [2018 speech](#) that the energy trilema was coming to an end as “cheap power is now green power [...] it is no longer true that when it comes to electricity, you can only choose two of the three things that we really want: green, cheap and secure”.

The costs of CfDs are passed on to consumers through a levy on energy bills. This is common for many aspects of energy policy, with other schemes for small scale renewables and energy efficiency also passed on to bills. Concern about rising bills and the impacts of these costs led the May Government to introduce a [control on low carbon levies](#) in the 2017 Autumn Budget. This included a moratorium on new low carbon levies outside of existing commitments, including the then existing £557 million for CfD auctions.

Planning and onshore wind

As noted above, the Cameron Conservative Government stopped financial support for onshore wind but also introduced a specific planning consent process for onshore wind. This meant that local people were given the “final say” on windfarm applications and local planning authorities should only grant permission if a consultation had demonstrated the proposal had local backing. More information is available in the Library briefing paper on [Planning for Onshore Wind](#), July 2016.

The Government have said that they have no plans to revisit the existing planning framework in light of the changes to CfDs¹⁶. As such, while onshore wind will be able to compete for support, projects will still need to receive approval from local communities.

A Private Members Bill, introduced by Crossbencher Baroness Hayman in the House of Lords, aims to amend the current planning regime. The [Contracts for Difference and](#)

¹³ John Constable, [The Government's murky wind subsidies revival is a costly blunder](#), *The Telegraph*, (paywall) 4 March 2020

¹⁴ National Audit Office, [Hinkley Point C](#), 23 June 2017

¹⁵ Simon Evans, [Analysis: Record-low price for UK offshore wind cheaper than existing gas plants by 2023](#), Carbon Brief, 20 September 2019

¹⁶ PQ HL2547, [Wind Power: Planning Permission](#), 24 March 2020

[Onshore Wind Bill \[HL\] 2019-2021](#) was introduced on 30 January 2020 and would permit Local Planning Authorities to grant onshore wind applications for the purposes of meeting the UK's carbon budgets. The Bill also aims to ensure CfD auctions occur at least every two years until the UK's carbon budgets are on track to be met.

Other options for large scale low-carbon funding

For renewable developments which do not pursue or win CfDs at auctions, there are various options to proceed with construction.

- **Bilateral CfDs:** as mentioned above, some CfDs can be agreed outside of auctions, through bilateral negotiations between the developer and the Government. Nuclear power plant strike prices are agreed in this way at present and can be linked to wider development. For example the only nuclear power plant currently under construction, Hinkley Point C, has an agreed strike price of £92.50/MWh, but this will fall to £89.50/MWh if another plant at Sizewell C is also built (the funding support for nuclear power is currently under review, for more information see the Library Briefing paper on [New Nuclear Power](#)). Bilateral negotiations were also pursued for the proposed tidal lagoon at Swansea, though ultimately rejected by the Government over cost concerns (more information is available in the Library briefing paper on [Tidal Lagoons](#)).
- **No subsidy:** the cost of some renewable technologies has been falling to the extent that some stakeholders argue that they could be built "subsidy free". Although limited, some developments have proceeded without subsidy. The term is debated as most energy receives some support in the UK, such as capacity market contracts or easier grid connections. Further information about 'subsidy-free' renewables and what the term means is available from Carbon Brief (a policy blog) article on [Q&A: What does 'subsidy-free' renewables actually mean?](#)
- **Power Purchase Agreements:** One way that renewable developments without CfDs can proceed are with power purchase agreements. This is a long-term contract under which a business agrees to purchase electricity directly from a renewable energy developer. This provides the developer with similar certainty to a CfD though the contracts tend to be shorter. More information is available from the developer [RWE](#).
- **Capacity market:** contracts for the generation of power are also available from the Government's [capacity market](#). Also introduced as part of the Electricity Market Reform, the purpose is to secure capacity to cover any potential shortfall in demand during peak periods, by paying for the guarantee that a generation source could be called upon to supply power to the National Grid as and when required. Alternatively, a consumer can be paid to adjust their usage of power to allow National Grid to manage demand as well as supply in a process known as demand-side response. All technologies, not just renewables, which are not receiving other subsidies can participate. The prices are decided through competitive auctions.

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