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Policy, Risk and Investment in UK Offshore Wind Capacity

Authors: Serguey Maximov, UCL; Jamie Rickman, UCL; Rob Gross, Imperial College London; Nadia Ameli, UCL

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Key messages:

Data shows that the introduction of the CfD has significantly broadened the offshore wind investor base and supported market development.

The CfD revenue stabilisation mechanism has attracted more risk-averse investors such as banks, providing access to lower-cost sources of finance.

Policy adaptability to wider market and macroeconomic change is crucial for the continued growth of the offshore wind sector.

The role of policy and investment

The United Kingdom's ambitious commitment to achieving net-zero emissions requires a substantial increase in offshore wind capacity. With a target of 50 GW of offshore wind energy by 2030 set in the British Energy Security Strategy (BEIS, 2022), the role of finance and policy support in driving this growth is paramount.

In the last twenty years, the two major policy schemes driving the deployment of renewable generation in the UK have been the Renewable Obligation (RO) and Contracts-for-Difference (CfD), detailed further in Box 1. Despite both policies working by supporting the expected revenues of a project, their different design has provided distinct signals to investors.

In complex capital intensive endeavours such as offshore wind, project finance structures play a pivotal role in shaping the landscape for investors and developers. These structures typically involve a combination of debt and equity financing (D'Ambrosio, Marriott and Stewart, 2022). Debt providers, such as banks and some institutional investors, offer capital at lower interest rates but impose stringent covenants to mitigate risk. Equity investors, on the other hand, seek a higher expected return for taking on greater risk (WindEurope, 2020)[1]. This distinction in financing approaches directly impacts the cost of capital and the risk-return profiles that different investors seek. Hence, policy that beneficially influences revenue streams and their associated risk has the potential of attracting a wider pool of actors and diversifying investor composition (Steffen, 2018).

This briefing summarises empirical findings on how the different instruments applied in the UK to promote the growth of the renewable generation sector have influenced the involvement of different financiers and changed the nature of finance in the UK offshore wind market.

1 Recommended reading for more in-depth understanding on finance structure in wind projects.

Box 1

The Renewables Obligation (RO) policy was established in 2002 to provide subsidies for renewable technologies. It involved issuing certificates to generators based on their production and imposing obligations on suppliers to acquire a certain number of these certificates. This framework created a market for Renewable Obligation Certificates (ROCs), creating an additional revenue stream for renewable energy generators. Although the price of ROCs has remained relatively constant in recent years, at around £50-55/ROC, this revenue stream added uncertainty to generators, as the price of the ROC is set in a market, and suppliers have the option to pay a penalty instead of fulfilling their obligation by purchasing ROCs (UK Government, 2023b). Moreover, this policy did not affect the revenue risk arising from variable wholesale electricity prices. Hence, while successfully improving the business case of projects, it struggled to attract more risk averse investors, particularly debt providing financial institutions. In view of these considerations and others in the Energy Act of 2013 (UK Government, 2013), government explored other mechanisms for supporting investment in renewables, and eventually the RO closed to new applicants in 2017 (with grace periods lasting until 2018) and was replaced by the Contracts for Difference scheme (Ofgem, 2018).

CfD was introduced in 2014 as a policy mechanism to support low-carbon electricity generation in the United Kingdom. They operate by providing generators of renewable or low-carbon electricity with a guaranteed payment for the difference between the "strike price" (a price for electricity reflecting the long-run marginal cost) and the market price of electricity. These contracts create a financial incentive for the development of renewable energy projects and ensure a stable income stream for generators (UK Government, 2023a).

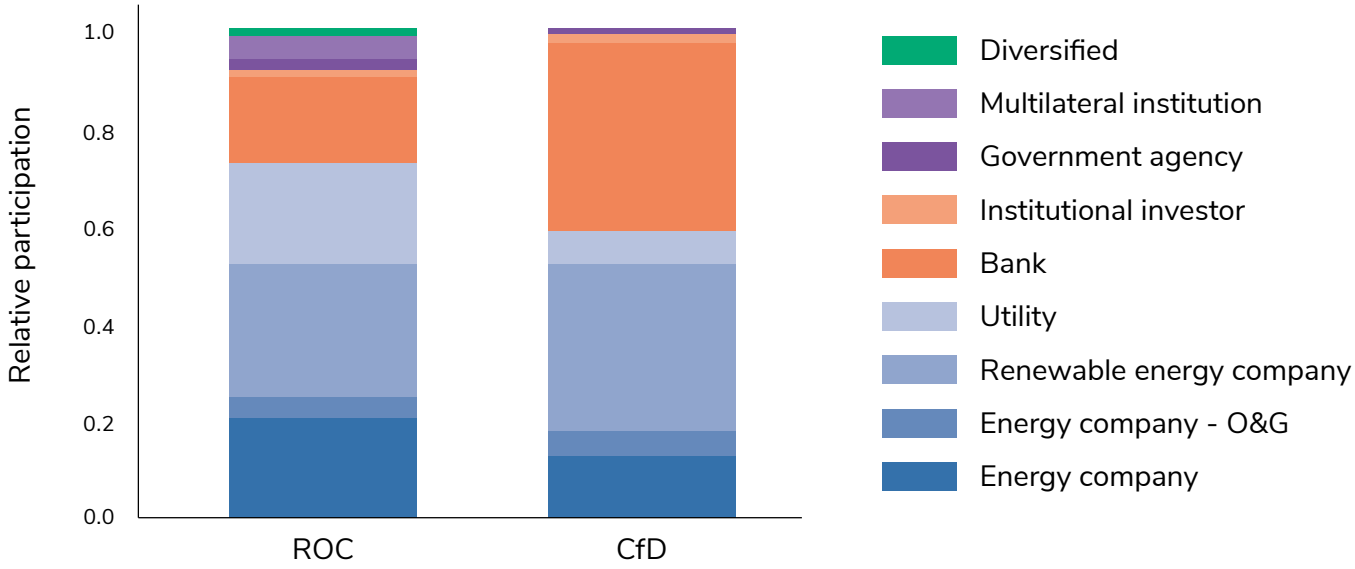
We have reviewed empirical evidence from 39 offshore wind projects in the UK with final investment decisions spanning from 2000 to 2023, amounting to a total capacity of 18 GW. For the analysis, we categorise investors into nine business categories:

- Energy Company, whose main business is electricity generation, regardless of the technology of use;
- Energy Company O&G, whose main business is oil and gas production or distribution;
- Renewable Energy Company, whose principal business is electricity generation focusing on clean technologies;
- Utility, whose core business is supplying electricity to final consumers;
- Diversified, private non-financial companies whose business is not related to energy;
- Government Agency;
- Multilateral Institution, these are multinational organisations such as the European Development Bank;
- Institutional Investor, non-bank financial companies such as private equity firms, insurance companies and investments funds;
- and Banks, for which the main business is lending capital.

Managing risk and attracting investment

The implementation of CfD has attracted a new pool of players that were not present under the previous policy regime. The total number of different investors doubled, with some categories, such as Multilateral Institutions and Governments Agencies, decreasing their involvement, while others, such as Banks and Renewable Energy Companies, surged (Figure 1). This is consistent with the findings for the German renewable energy market, where the use of project finance and the associated increase of involvement of financial institutions broadens the participation of sponsors, especially of those with smaller balance sheets (Steffen, 2018).

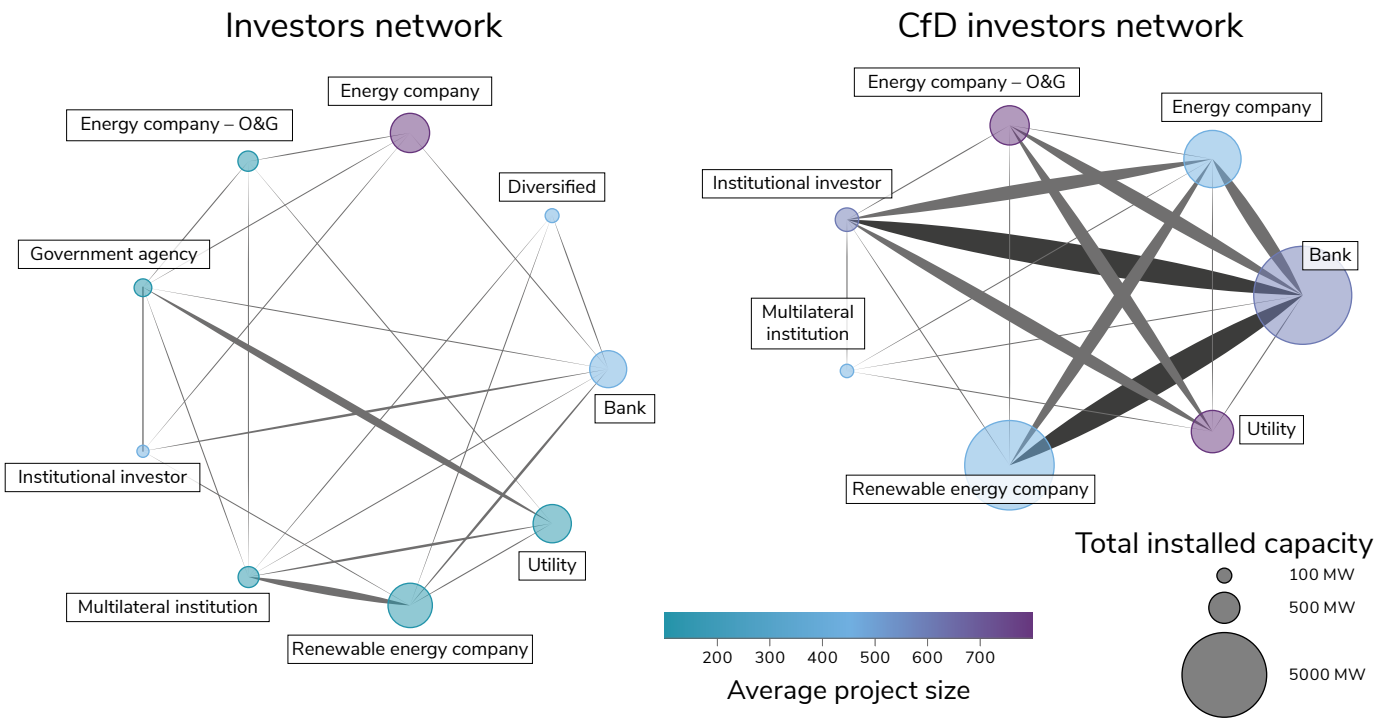
Figure 1: Relative participation of investor categories in financing offshore wind projects under different support policies



The advent of CfD produced a burst of bank interest in financing offshore projects, with banks representing two thirds of the new investors. The new appetite of banks to invest in offshore projects resulted in an increase in project finance funding, which passed from roughly one third to above half of the total investment. This shift favoured Renewable Energy Companies, which are typically smaller and have less access to corporate level finance compared to larger Energy Companies and vertically integrated Utilities. The changing dynamics of investors are visualised in Figure 2 by representing the interactions between different investor categories as a network of connections. This figure confirms that Renewable Energy Companies with the financial support of Banks have become primary drivers for the deployment of offshore wind during the CfD era. An era that has seen cost of capital decrease to close to 2% in 2021 for offshore wind in the UK (IRENA, 2023). However, due to the surge in Bank of England's base rate in response to rising inflation, this is currently not the case. With a base rate at 5.25% in late 2023 (Bank of England, 2023), it is to be expected commercial banks' interest rates to be above this value, although no specific post-2022 data has been published yet. The impact of this exogenous shock in the market has already been felt in Allocation Round 5 (AR5) of the CfD contracts, where no bids were presented for offshore wind deployment. The main reason for this outcome

has been the low administrative strike price set by the government amid the increase in costs for offshore wind developers driven by the hike in interest rates combined with widespread inflation pressuring costs in the supply chain (Quinn, 2023).

Figure 2: Investor category networks in offshore wind projects under different support policies

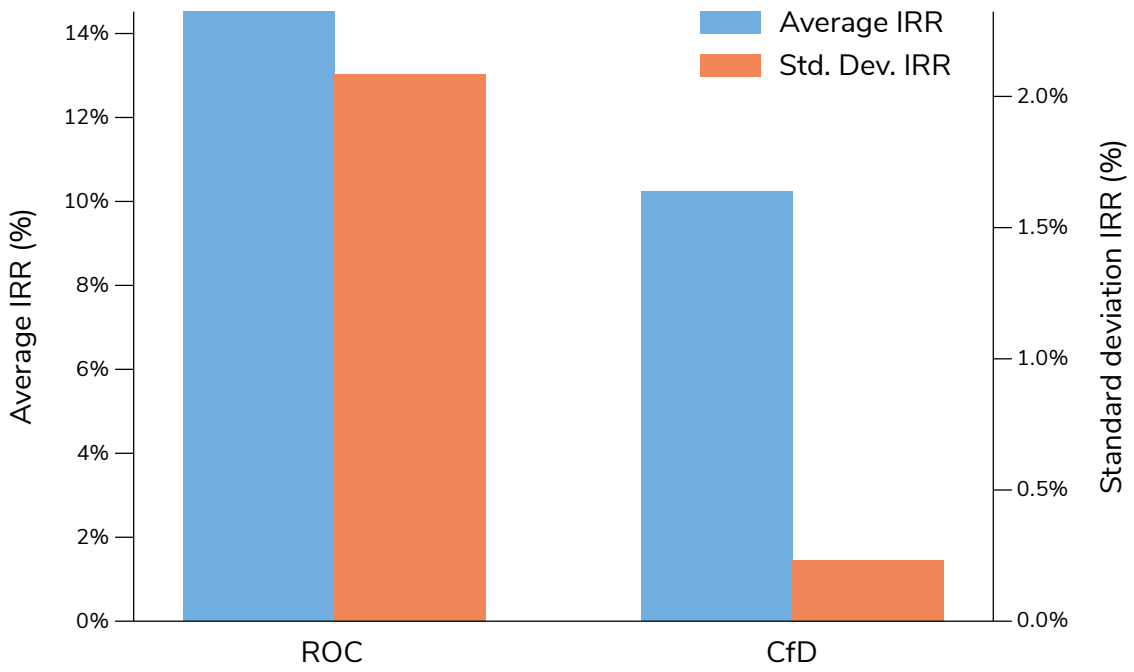


Note: Each category is represented by a node and the links between nodes represent investment interactions, with the width and shade of each connection proportional to the number of projects in which investors belonging to each category have partaken. The size of each node represents the total equivalent capacity each category has invested in, and the node's colour is the average size of the projects each category has invested in.

CfDs are designed to mitigate the revenue risk from variable electricity prices. Hence, CfD-backed projects have only risks arising from uncertain generation outputs and tail risks (the period after the contract expires). RO-supported projects are also exposed to uncertainties of future electricity prices during their entire operational lifetime and, to a lower extent, to uncertainties on the value and liquidity of the certificates. This means that even though projects supported by RO may achieve higher expected returns than those under CfD, these returns are much more volatile and present higher probabilities of underperforming, discouraging more risk averse investors (Figure 3).

Banks generally consider their risk concerns to be adequately addressed when repayments can be reliably made under conservatively estimated conditions (Gohdes, Simshauser and Wilson, 2023). Therefore, they prioritise ensuring that project cash flows can cover loan repayments — even when wind conditions or electricity prices deviate from projections — over maximising the project's return, as they will not receive any revenues additional to the debt service (Ciruelos Alonso, 2015). Consequently, they place higher value on projects with lower cashflow uncertainty.

Figure 3: Comparison of average internal rate of return (IRR) and its standard deviation under different policies



Note: Values calculated from BNEF project based investment cost data and stochastics cashflow modelling using expected electricity price and generation volume variability.

Although our analysis focuses on the value that CfD bring to investors, it is important to highlight that, unlike RO, CfD also have the potential of stabilising prices for consumers (Grubb, Drummond and Maximov, 2022) and limiting excess revenues for generators in periods of high electricity prices (Maximov et al., 2023), as was evidenced during the recent energy crisis. These relative advantages of CfD have led to proposals to move legacy RO-supported generators to CfD-like contracts (Gross, MacIver and Blyth, 2022).

Summary and recommendations

Our analysis reveals that CfD have attracted a diverse array of investors previously uninvolved in the sector. Notably, the investor base has widened to include more risk-averse investors, highlighting the broad appeal of CfD's revenue-stabilising mechanism. This increase in lower cost sources of finance, especially from Banks, has significantly impacted project financing, with financial institutions contributing over 40% of the total investment. This shift in investor composition providing easier access to cheaper finance is fundamental for the deployment of capital-intensive infrastructure. The introduction of CfD has thus contributed to the development of the offshore wind market as CfD-backed projects have created investment track records and boosted financial and technological learning.

However, not only specific support policies but also international macroeconomic stability affect the cost and deployment of renewable assets, as seen after the lack of bids in offshore wind projects in AR5. Even though this could have been foreseen and avoided (Maule et *al*., 2023), this should not be interpreted as a failure of CfD (or any other policy aimed at reducing investment risk), but of the specific design of CfD auction price cap not adapting fast enough to the reality of higher costs of capital and in the supply chain. Therefore, improving how policy design — in this case, the definition of the strike price cap— adapts to existing conditions is key to keep providing the support and signals that investors require for delivering the offshore capacity required by government's goals.

As we navigate the path to a sustainable, low-carbon future, policies that decrease revenue uncertainties continue to be important to UK and international energy strategy. By fostering an environment where financial institutions and diverse investors can thrive, we can increase investment and accelerate the progress towards an energy landscape aligned with a net-zero future.

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Authors

Serguey Maximov, UCL
Jamie Rickman, UCL
Rob Gross, Imperial College London
Nadia Ameli, UCL

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Contact

Email: UKERC@ucl.ac.uk
Website: www.ukerc.ac.uk
𝕏/: @UKERCHQ
: www.linkedin.com/company/uk-energy-research-centre

UK Energy Research Centre,
Central House, BSEER,
14 Upper Woburn Place,
London, WC1H 0NN
T: +44 (0)20 3108 7564
𝕏/: @UKERCHQ