

Offshore Transmission Owners (OFTOs)

The OFTO regime at 15: Head winds, or a solid platform?



Introduction



It's hard to believe that the first Offshore Transmission Owner licence was granted 15 years ago (2009) to the Robin Rigg OFTO. The market has rapidly matured from those early days. The regulator Ofgem has since held nine tender rounds, representing £12 billion of investment, and our analysis suggests at least a further £16 billion of investment will be needed in the medium term to fund further OFTO developments.

'OFTO' refers to the owners of the offshore transmission assets that connect the UK's offshore wind farms with onshore grid infrastructure. Bidders wishing to acquire the assets participate in a competitive tender and the successful bidder is awarded an OFTO licence with a 25-year availability-based income stream, reminiscent of the now defunct private finance initiative (PFI). In return for maintaining and operating the assets, the OFTO enjoys a long-term, single-digit equity return, or can flip the assets after a few years for some upside.

The regulator Ofgem, who set up the regime, has recreated a classic infrastructure tender lifecycle, to which institutional investors have responded with enthusiasm. The OFTO regime has expanded the pool of capital available and is widely viewed as having been successful, achieving a low (but sustainable) cost of capital.

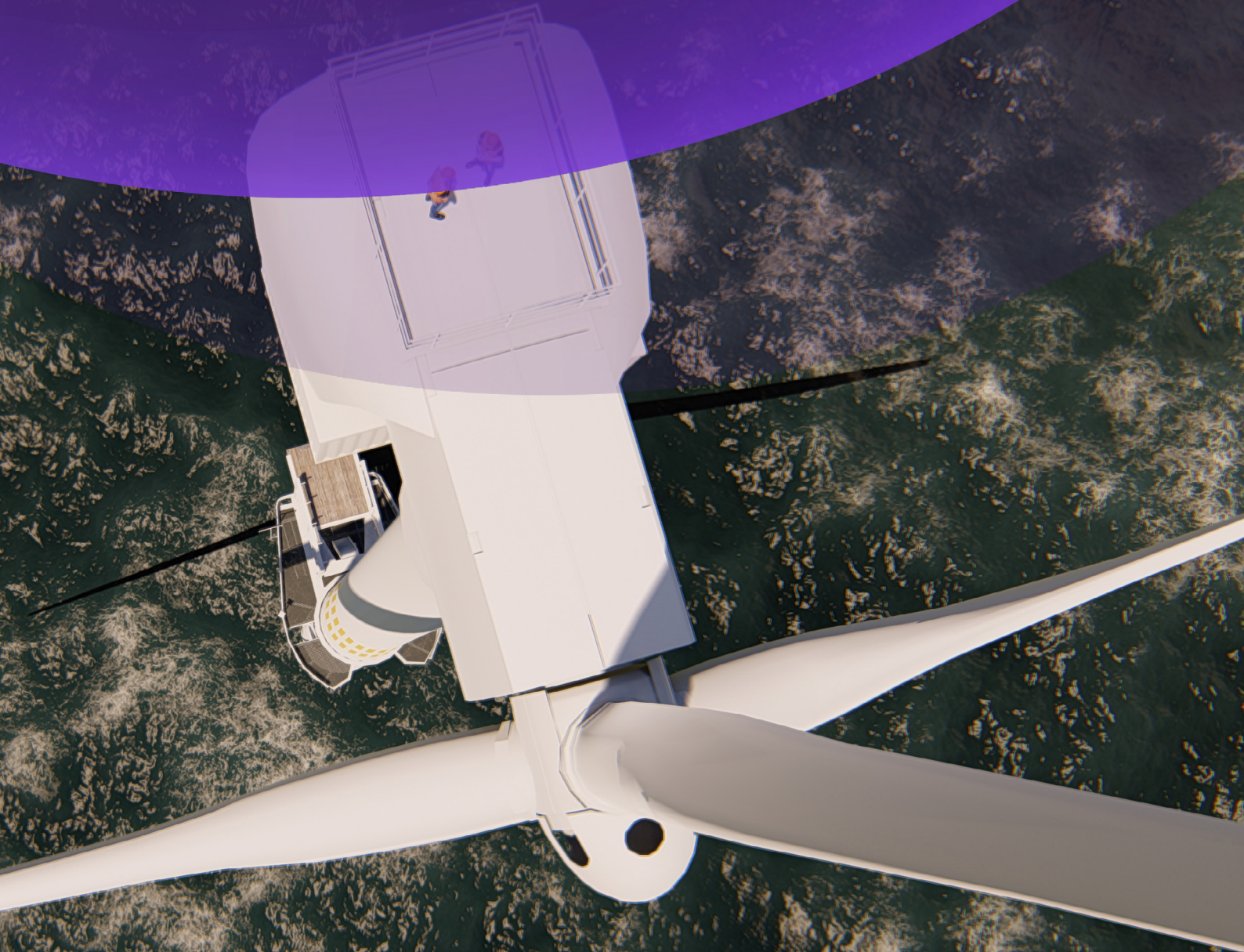
Twenty-eight OFTO licences have been awarded, held by nine different parties, as of 2023. New investors continue to enter the market, demonstrating the regime's enduring ability to attract international capital.

The UK's offshore renewables sector is growing in size and complexity. The Government's ambition is for a total of 55GW of installed offshore wind capacity by 2030. To deliver that capacity, attract investors, and maintain a sustainable cost of capital, the approach to delivering and operating offshore transmission assets will have to evolve.

Current transmission assets are point-to-point connections, with siloed project planning, and are developed and financed during construction by the offshore wind developer. Other OFTO delivery models will need to be explored that are more suited to a market that's expected to triple in size over the next decade. The sector is just beginning down this journey, for example Ofgem's recent approval of two Offshore Hybrid Asset pilot projects (November 2024).

The existing OFTO regime certainly serves as a solid platform for future growth. This paper explores some of the trends and challenges facing the OFTO regime as it prepares for the next 15 years.

Overview of the OFTO regime



The OFTO regime is the regulatory funding model to support investment in the electricity transmission assets that connect offshore wind generation facilities to the onshore electricity grid.

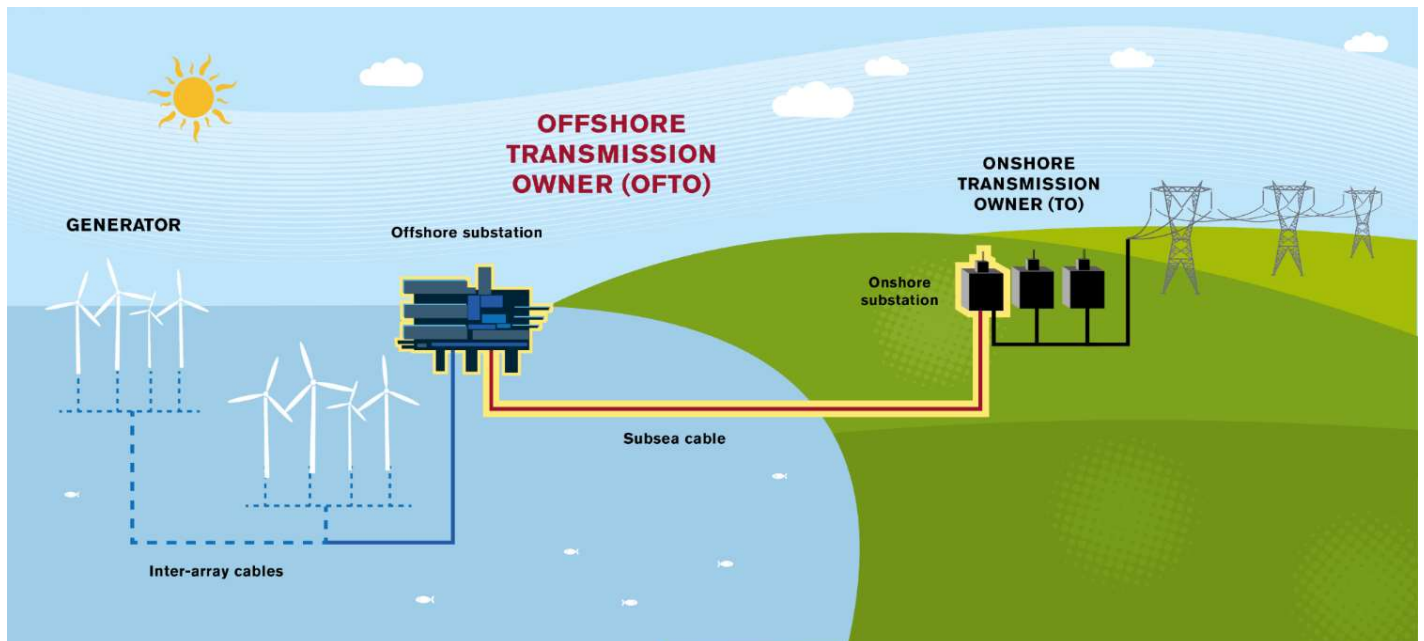


Figure 1 - Offshore Transmission Assets

Source: Ofgem

The GB energy sector regulator, Ofgem, developed the OFTO regime to introduce competition and attract capital into transmission asset ownership. Owners of transmission assets must be separate from the owners of generation assets (“unbundled”) in accordance with UK and EU law. Ofgem runs competitive tenders to appoint a party to own and operate the transmission assets and the successful bidder is granted an OFTO licence. The wind farm developer has to transfer the transmission assets to an OFTO within 18 months (the Initial Generator Clause) or risk falling foul of the UK’s ownership unbundling rules for transmission and generation assets.

The winning bidder acquires the assets from the offshore wind farm developer, post-construction, for a pre-agreed transfer value, which it must finance with debt and equity from its investor pool. The new OFTO then must operate and maintain the assets for the licence period, in exchange for an availability-based revenue stream (with performance incentives and penalties), known as the tender revenue stream (TRS).

During the competitive tender, Ofgem assesses bidders to ensure they have the technical ability to operate offshore transmission assets and typically the bidder who has the lowest TRS is successful, provided they’re also technically proficient. Given current OFTO assets are all relatively similar in their technical specification and operational requirements, cost of capital is a key differentiator in determining the winning bidder’s TRS and ultimate success.



To date, transmission assets have been developed in tandem with the generation assets by offshore wind developers. This is referred to by Ofgem as the ‘generator build’ or ‘developer build’ model. Under current rules it’s the choice of the offshore wind developer as to who develops the assets. Up to now developers have opted for the developer build model as offshore wind developers have been uncomfortable transferring responsibility for the transmission assets to another party; in the future, transmission assets could be developed directly by the OFTO (the ‘OFTO build’ model). Offshore wind developers prefer to develop the assets themselves rather than risk placing reliance on an OFTO to meet construction milestones or quality standards. The revenue risks to the generator that could result from offshore transmission asset unavailability are not easily transferred to an OFTO.

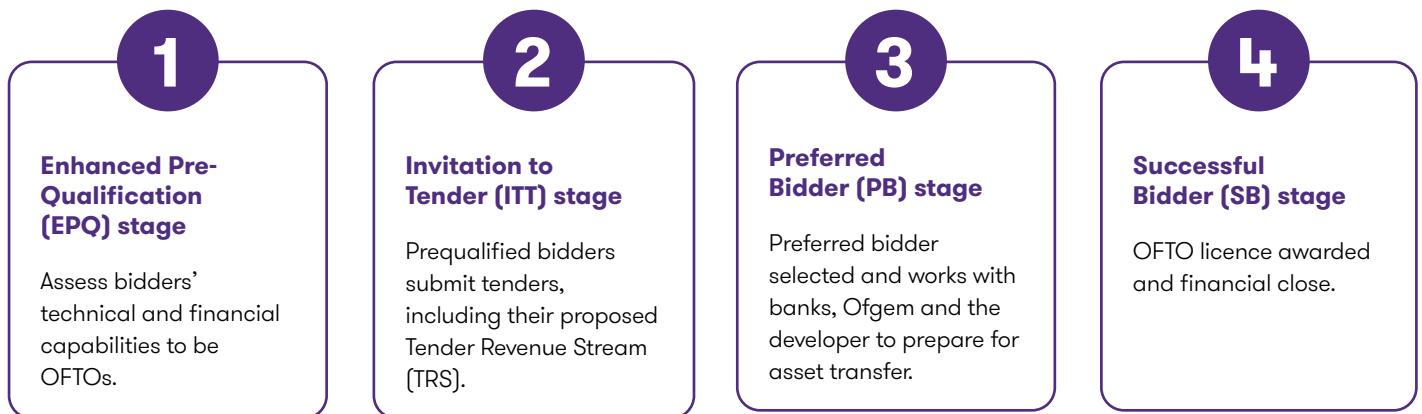
As investors have amassed experience acquiring and operating assets, the pool of capital has widened and the cost of capital has fallen. In 2012 the National Audit Office quoted the post-tax nominal equity return for Tender Round 1 (TR1) as between 9-11% (levered). In 2018, consultants CEPA quoted the equity return for TR2 and TR3 to be 8-9%. For TR4 and TR5 it was lower still (based on Grant Thornton market intelligence). In terms of debt, bidders have increasingly tapped capital markets, utilising project bonds and credit enhancement products, with gradually increasing gearing and tenor.

Ofgem has been working with industry to explore opportunities for OFTO build projects, given this would offer opportunities for investors looking to take on construction risk, and may lead to a more efficient cost of capital across the entire offshore wind project lifecycle. Market intelligence suggests there’s appetite in the sector for these opportunities if brought to market under the right framework.

OFTO revenues are funded by transmission network charges. This is favourable to investors as the funds are levied by the electricity system operator (an investment grade entity) and are held behind a regulatory ring fence. The charges are socialised so are not reliant on the creditworthiness of any particular entity. The charges paid by the generation developer largely cover OFTO revenues, but any difference is covered by other system users.

The OFTO model is distinct from other energy sector funding models such as the Contracts for Difference (CfD) scheme for renewable energy, and from Regulated Asset Base (RAB) models for regulated utilities. The risk profile is similar to RAB frameworks in that investors are protected from volume risk and the cost is socialised to system users. However, the model is more akin to availability-based PFI schemes where the operator earns an agreed bid revenue in return for providing the service. The OFTO licence doesn’t guarantee a regulated return on investment, and is not in perpetuity.

The OFTO competitive tender process



One EPQ per tender round



Multiple transactions per tender round



Figure 2 – OFTO competitive tender stages

OFTO tender rounds consist of four stages.

The EPQ stage may commence during or before construction of the offshore transmission assets and may include pre-qualification for multiple assets or tender rounds, depending on how Ofgem structures the tender. The ITT, PB and SB stages occur during the generator commissioning clause period, the (approximately) 18 months following construction completion. During this period, the offshore wind developer will commission the assets and is allowed to operate the assets while the OFTO tender round concludes.

These stages apply under a developer build model. Later in this paper we consider how these might evolve under an OFTO build approach, where the incoming investor is also responsible for construction of the assets.

The investment proposition



The OFTO regime has proven attractive to institutional and strategic investors. Tenders are typically highly competitive, which has spurred innovations in financing and operations and maintenance (O&M) strategies, and ultimately led to lower costs for consumers through lower energy bills.

The regime has several elements that are attractive to long-term investors in core infrastructure, outlined below. Similar to availability-based PFI contracts, it has utility-like characteristics such as protection from low-volume risk and passthrough of specified cost items. However, the regime is different from other licensed energy utilities in that it isn't delivered through a Regulated Asset Base (RAB) approach and isn't subject to period price control reviews.

- 1 **Long-term stable returns:** OFTO licences grant a 25-year inflation-linked¹ revenue stream (earlier licences were granted for 20 years). The revenue counterparty is the National Electricity System Operator (NESO), a regulated company which collects network charges and maintains an investment grade credit rating.
- 2 **Regulatory confidence:** The regime is designed, regulated and administered by Ofgem, and is considered a broadly apolitical area of policy, which political parties have not sought to alter. The granting of a long-term licence from an independent regulator gives comfort to investors.
- 3 **No construction risk:** Offshore transmission assets have historically been constructed by developers, significantly reducing the complexity and risk for OFTOs. Investors perform necessary technical due diligence during Ofgem's tender round processes to determine the health of the assets.
- 4 **Operational risk:** Despite some early OFTOs encountering technical challenges in the maintenance of their assets, offshore transmission assets are considered high-value with relatively low operational risk, and the regime limits the OFTO investor's exposure to events outside of their control.
- 5 **Limited counterparty risk:** The OFTO tender revenue stream is availability-based and not linked to the output or technical success of the associated offshore wind generation facility.
- 6 **Performance incentives:** OFTO investors can generate returns upside if they can outperform the target availability of their transmission assets which is set at 98% for the upcoming Tender Round 11. Revenues can also reduce as a result of outages, but this is capped at 10% of base revenues in any given year, limiting downside and supporting bankability.
- 7 **Refinancing gain share:** Refinancing gains post-financial close are shared 50:50 between investors and consumers.

1 The rate of indexation is biddable, i.e. bidders can choose the percentage of their revenues that are linked to inflation, using the Consumer Price Index (H). In practice most bidders choose to index 100% of their revenues.

Investment volumes to date

Over Tender Rounds 1 to 10 the regime is estimated to deliver over £12 billion of investment. Figure 3 shows the size of each tender round and the average project size. Tender rounds have included a different number of projects and hence some are larger than others. However, the size of projects in each tender round has risen gradually and is expected to continue increasing as offshore wind projects continue to scale up.

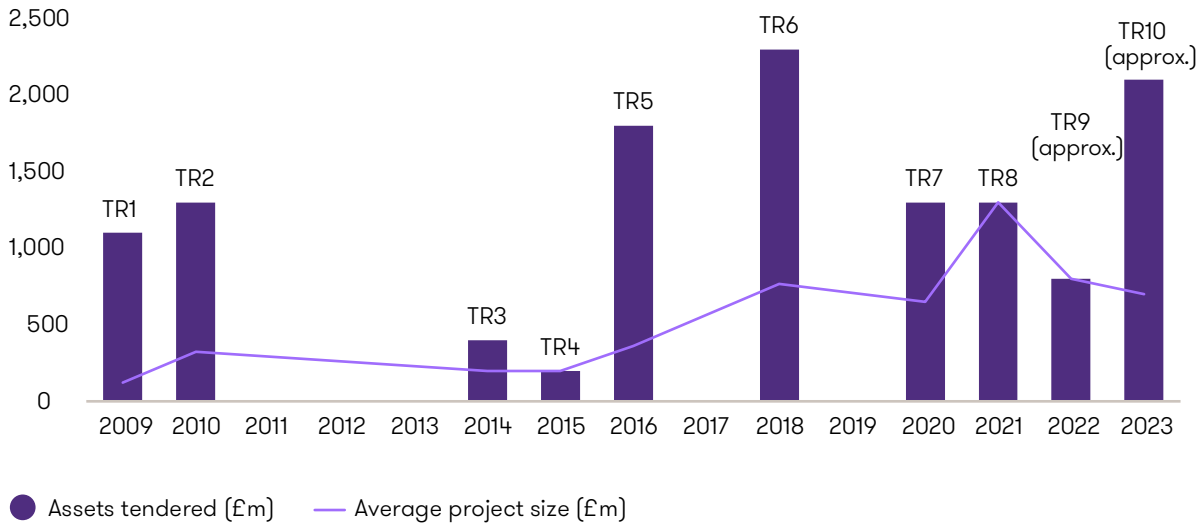


Figure 3: OFTO Tender Round Asset Values (£ million)

Source: Grant Thornton analysis of Ofgem data

Key market participants

Investors in the offshore transmission market vary from institutional investors to strategic utility firms and infrastructure funds. The investor landscape includes a combination of UK and global capital. Although market consolidation in recent years has reduced the number of individual OFTOs, this isn't necessarily a negative outcome as an important part of the investment proposition is the ability to exit investments and consolidate assets into portfolios to achieve operational efficiencies. When refinancing takes place, the consumer shares in any upside.

Key investors and their percentage ownership of the UK's offshore transmission assets are summarised in the chart below. Transmission Capital Partners is a joint venture consisting of Amber Infrastructure Group and Transmission Investment. Diamond Transmission is a consortium led by Mitsubishi with other partners depending on the project.

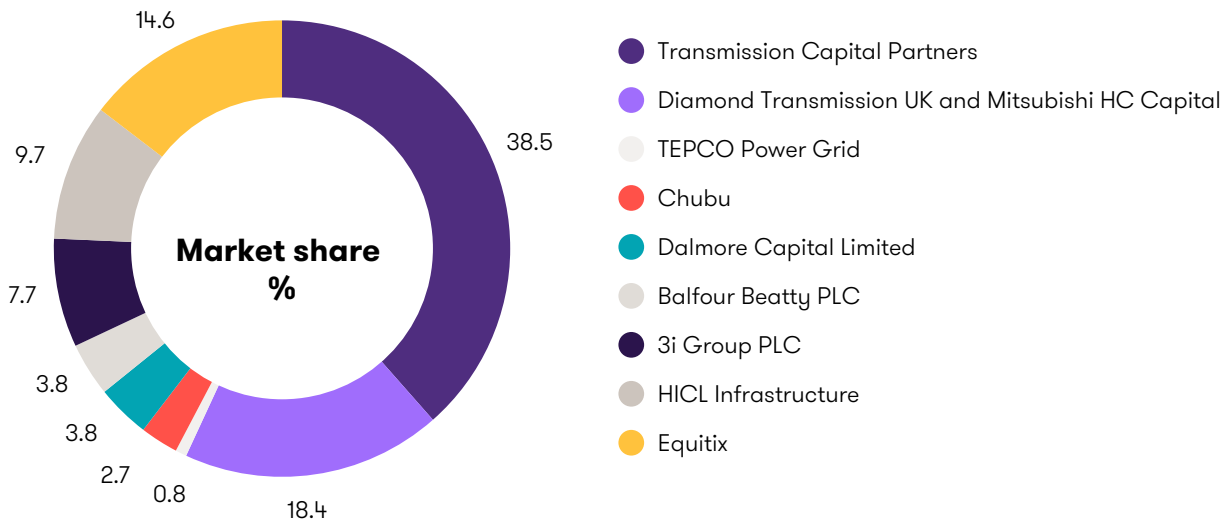


Figure 4 - offshore transmission asset market share percentage

Source The Crown Estate's Offshore Wind Report 2023²

² https://www.datocms-assets.com/136653/1720789954-11964_offshorewindreport_2023_final300424.pdf

Winds of change

How is the regime adapting?



Potential challenges loom for the OFTO regime as the offshore renewables market continues to evolve. But these challenges also allow scope to expand and adapt the regime, create new types of assets and further reduce costs to consumers.

Scale of investment required

The scale of future investment is expected to grow significantly, driven by the increasing scale of offshore wind, which will deliver the “heavy lifting” for our net zero targets. This will require deeper pools of capital to finance asset acquisitions and, potentially, construction.

Our analysis suggests 28GW of offshore wind capacity is under development or in planning (excluding developments <100MW or already captured in Ofgem tenders). Assuming capital costs for transmission assets of £600K/MW (2019 prices)³, capital investments totalling more than £16billion will be required in the medium term⁴. This is likely to represent a lower bound of the required investment as data from the for Energy Security & Net Zero (DESNZ) does not capture all projects including those in early stage development and supply chain constraints have increased the cost of delivering transmission assets beyond the quoted 2019 price levels.

Securing this investment may have been straightforward if projects continued to be simple point-to-point assets, with acquisition from the offshore wind developer after construction. However, grid constraints and growth of the offshore wind sector mean the delivery of offshore transmission assets will have to adapt. For example, development of assets will have to become more coordinated, and both Ofgem and the Government are increasingly eager to explore opportunities for shared assets or multipurpose projects. These changes should generate new investment opportunities and attract new pools of capital in the long term, but they will also create complexity in the short term, and require significant policy and regulatory development.

Offshore wind developer concerns

It's well-known that offshore wind developers consider the OFTO regime to treat them unfairly⁵. Developers have argued the regulatory approach negatively impacts their return on investment and commercial model.

Deal timing: Developers claim the 18-month transmission asset transfer deadline post-construction puts pressure on them during their negotiations with Ofgem and the preferred OFTO bidder. Developers risk incurring penalties if they don't transfer their transmission assets before the developer generation clause expires. This means they may have to give concessions to the incoming OFTO during the due diligence phase to secure deal finalisation within set deadlines.

Transfer value: The transfer value of the offshore transmission assets is set by Ofgem, who undertake a cost assessment to ensure that the spend incurred by a developer on the transmission assets was ‘economic and efficient’. It is common for some costs to be removed from the transfer value leading to the developer losing money on the OFTO transaction. Developers claim this is unfair, as the Contract for Difference (CfD) auctions in which they participate already incentivise cost efficiency in the delivery of their offshore transmission assets.

Risk allocation: If the transmission assets experience outages post-transfer, there's no compensation mechanism between the OFTO and the offshore wind developer. A developer could incur uncapped losses, while the OFTO's losses are capped each year. Insurance products can be purchased by developers to cover losses but this increases their cost base and may mean they're either not able to be competitive in CfD auctions or otherwise don't make their required return on investment. Other European countries have compensation mechanisms for developers where their connection to the grid is interrupted. This will likely become a more salient issue as the complexity of offshore transmission networks increases in the future.

DESNZ launched a consultation⁶ on the OFTO regime in November 2023. At the time of writing, responses have not yet been published, but these issues are likely to feature based on our developer engagement.

3 <https://guidetoanoffshorewindfarm.com/wind-farm-costs>

4 DESNZ data does not include expected commissioning dates but our high-level assessment assumes these projects would mostly begin construction within the next 10 years.

5 <https://uk.rwe.com/-/media/RWE/RWE-UK/downloads/press/statements/reforming-the-offshore-transmission-regime.pdf>

6 <https://www.gov.uk/government/calls-for-evidence/offshore-transmission-owner-ofto-regime#full-publication-update-history>

Operational challenges: cable defects

Early OFTO projects experienced higher-than-expected outages and equipment defects⁷. Some of these events were attributed to cable manufacturing, others to installation, for example, seabed drift.

While these challenges aren't due to the design of the OFTO regime, the regulator and industry have responded to ensure the sector continues to function as needed. For example, Ofgem held consultations regarding the relevant clauses in the OFTO licence (the Income Adjusting Events clause), to test whether they remained fit for purpose⁸. This included engagement with the insurance industry and with offshore wind developers and OFTO investors.

Ofgem has stated that the offshore transmission regime isn't designed to fully insulate OFTO investors from all operational or equipment risks, such as latent defects. The formal policy position is that incoming OFTO investors should be willing to accept such risks since they're reasonably foreseeable and commercial arrangements can be put in place to manage them. However, Ofgem also recognises that the higher-than-expected number of faults or defects had effectively made some assets uninsurable. It has stated that asking OFTO investors to accept these risks wouldn't be in consumer interest because it could lead to a significant increase in tender revenue streams (bidders would have to assume contingent provisions to fund uninsurable defects).

Ofgem has therefore allowed some additional costs associated with unexpected repairs to be passed through via the Income Adjusting Event clause. Following its policy review, it decided to retain the Income Adjusting Event clause to provide this protection, and also established a high bar for OFTOs to demonstrate where a defect or event was outside their control. From Tender Round 5 onwards, Ofgem also required bidders to include an Operational All Risk insurance policy with the highest level of protection (known as LEG3). Ofgem has also encouraged offshore wind developers to provide extended warranties to OFTO bidders (a minimum of five years), though it can't mandate this.

Grid constraints: integrated offshore network planning

There is increasing concern among the public, the Government and Ofgem regarding UK transmission network constraints, and the impact of increasing offshore wind development on the grid. The amount of investment needed to overcome these constraints and deliver the Government's offshore wind targets will be significant, and areas such as Northeast England have experienced ongoing disruption and congestion due to the lack of coordination in offshore development.

In the early years of the offshore wind sector, it was economical and cost-effective for generation assets to connect to the onshore grid via point-to-point (radial) connections. That has remained the case until now. Going forward this approach may be both economically inefficient and practically undeliverable, because new standalone projects may be unable to gain an acceptable grid connection offer and would join a connections queue that is increasingly oversubscribed.

Ofgem and NESO have identified that costs to consumers are likely to rise if each new offshore wind development is connected to the grid via a standalone connection. Local communities and natural habitats would also be adversely impacted by a continued proliferation of point-to-point offshore transmission assets.

To address these risks, NESO has developed a Holistic Network Design (HND) policy for future offshore transmission assets. The HND (and subsequent follow-up exercise) aims to connect offshore wind developments with close proximities together via shared offshore and onshore transmission infrastructure.

Where transmission assets are to be shared by multiple offshore wind developers, Ofgem proposes that OFTOs should build those assets via the OFTO build model. OFTO investments arising from such projects would therefore be significantly different in risk profile from opportunities brought to market to date under the developer build model. Figure 5 below sets out some of the opportunities and challenges this presents.

⁷ <https://www.infrastructureinvestor.com/ofto-outages-more-frequent-than-thought/>

⁸ https://www.ofgem.gov.uk/sites/default/files/docs/2018/11/iae_response_-_final_0.pdf

Opportunities

- Lower cost to consumers and economies of scale for developers
- Fewer new connections; reduced impact on onshore grid
- New investment propositions generated – broader pool of capital
- Potentially increased resilience if offshore generators have more than one connection to the onshore grid
- Lower impact on local communities and environment
- Potential for streamlined consenting processes

Challenges

- Risk profile of OFTO investment (and offshore wind investment) would change significantly relative to current model. Cost of capital would likely increase, at least in short term
- Increased number of dependencies between multiple offshore wind developers and OFTOs. Offshore wind developers in particular may suffer if shared assets are not completed on schedule
- Significant uncertainty regarding procurement approaches and risk-sharing approach for shared OFTO assets

Figure 5 - Opportunities and challenges of increased offshore coordination

Ofgem and NESO have run several consultations to try to address the challenges regarding shared transmission assets. Ofgem is due to publish the results received from its most recent consultation⁹ on this topic soon. We expect to see the following themes emerge with regard to shared assets or OFTO build projects:

- Offshore wind developers continue to be responsible for design and consenting of assets while OFTOs are responsible for financing and construction. Offshore wind developers will likely demand that OFTO bidders continue to be rigorously assessed at tender stage to ensure they're technically and financially capable of delivering the assets.
- Complexity would remain regarding which party should be responsible for procurement of equipment and service providers for the offshore transmission assets. Transmission assets (particularly HVDC cables) currently have long lead times and constrained supply chains; it may be more effective for the offshore wind developers to lead on procurement given they will have a better view of project timelines. However, OFTOs may wish to have some say regarding the materials and suppliers given the associated maintenance risks may be transferred to them in operation.
- Ofgem will have to consider how the risk of delivery or commissioning of the transmission assets is shared. Developers would likely argue that it should be the OFTO's responsibility to ensure timely delivery and compensate the offshore wind developer if commissioning is delayed. However, depending on the delivery model, the OFTO may argue that it isn't sufficiently able to manage the risk if planning, development and procurement is led by the developer.
- OFTOs may argue for protections in their licence, for example due to latent defects, cost increases or other operational issues, if they're not given sufficient control over the design of the assets and procurement of equipment and service providers. This wouldn't be significantly different to the current regime, but the developer will not provide the same warranties if another party (the OFTO) is responsible for installation of the assets.

Ofgem has also been developing arrangements for Offshore Hybrid Assets (OHAs), projects which would combine the transmission assets for offshore wind with subsea interconnectors. In November 2024, Ofgem approved two proposed projects, LionLink and Nautilus, to receive a pilot OHA regulatory treatment. These projects are essentially cross-border interconnector cables, developed by National Grid, which allow for connection to offshore windfarms in the North Sea via offshore converter stations or "energy islands". These projects will be treated similarly to other electricity interconnector projects and will receive a modified version of Ofgem's Cap & Floor funding framework. Ofgem hopes these pilot OHA projects will lay the ground for a "meshed" North Sea offshore grid, allowing increased coordination and more efficient development processes.

Legacy offshore transmission assets

A significant number of early OFTO projects are due to expire from 2027, as they reach the end of the initial 20-year licence period and Ofgem is exploring how to treat such assets. It wouldn't be economically efficient to decommission most of these projects as both the transmission and generation assets have a significantly longer economic life span than the initial licence period.

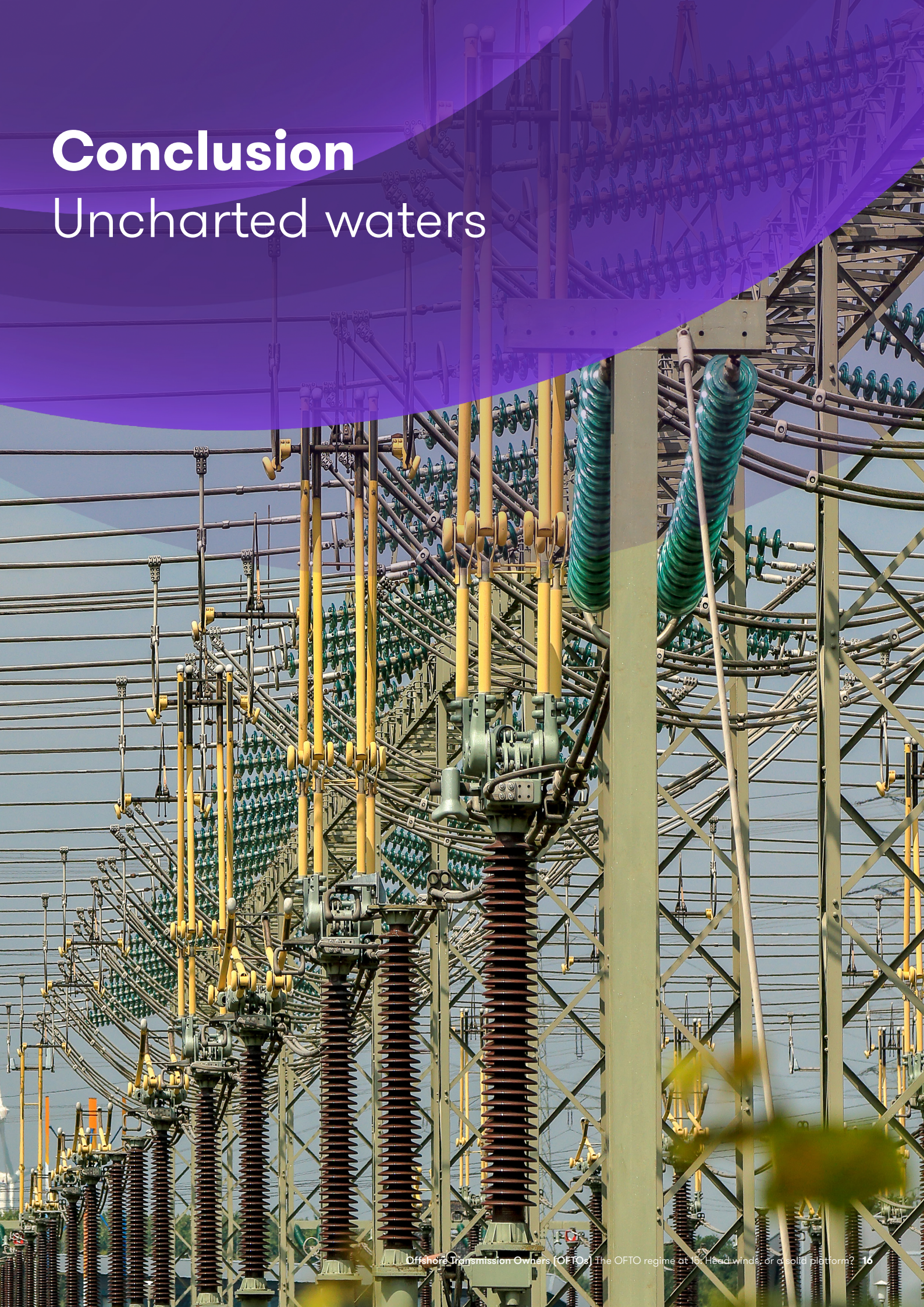
Ofgem has published initial positions¹⁰ regarding how it will "maximise the operational life of transmission and generation assets where it is economic and efficient to do so". The most likely options are to either directly award a licence extension to the existing OFTOs, or to hold a further competitive tender for extension of the OFTO licence. Ofgem will have to set out its approach in the near future as the procurement activities surrounding a re-tendering of the licence could take several years to develop.

⁹ <https://www.ofgem.gov.uk/sites/default/files/2024-04/Consultation%20on%20OFTO%20Build%20Model.pdf>

¹⁰ <https://www.ofgem.gov.uk/sites/default/files/2024-01/EoTRS%20Decision%2C%2024%20January%202024.pdf>

Conclusion

Uncharted waters



The OFTO regime has been a success, simultaneously attracting significant investment while also reducing costs to consumers. The sector is attractive to international infrastructure investors and the assets continue to be highly sought after in competitive tender rounds.

Ofgem and project developers have so far had an easy ride: tendering point-to-point assets after their construction has been relatively straightforward (notwithstanding the various complexities and challenges detailed above). This model will need to adapt as the offshore renewables sector grows in scale and complexity.

Most likely, the OFTO regime will undergo gradual evolution rather than revolution. Ofgem should work with industry and developers to bring forward an initial OFTO build opportunity or shared connection project. This will require significant collaboration and political capital, but investors are supportive of these initiatives and many existing OFTOs and new market entrants would be willing to invest under the right model. Ofgem's approval of two pilot Offshore Hybrid Assets is a promising sign of the regulator's commitment to this process, but we are only at the beginning of this journey.

The OFTO framework is a solid platform on which more novel and commercially complex projects can be launched. Expanding beyond the comfort of the current developer-led, point-to-point connection model won't be easy. The existing models will need to be evaluated with the future in mind, from the procurement approach to licence conditions, to cost of capital, to planning and development. Doing so will put the UK on a surer footing to achieve its stretching delivery ambitions for 55GW of offshore wind capacity by 2030.

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