Consultation

Market Arrangements for Multi-Purpose Interconnectors

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We are consulting on market arrangements for Multi-Purpose Interconnectors (MPIs), in particular our views on the relative merits of both Home Market (HM) and Offshore Bidding Zone (OBZ) market configurations for these infrastructure projects. We welcome views from organisations and individuals with an interest in market arrangements for MPIs, as well as in cross-border trading arrangements and MPI development in general. We particularly welcome responses from MPI developers, offshore wind farms (OWFs) the GB system operator (NGESO), existing and future interconnectors, trade and other industry associations, wholesale electricity traders, power exchanges, consultancies, and European stakeholders (including, but not limited to, relevant ministries, regulatory authorities and system operators). We would also welcome responses from any other stakeholders and the public.

This document outlines the scope, purpose and questions of the consultation and how you can share your views. Once the consultation is closed, we will consider all responses. We will publish the non-confidential responses we receive alongside a decision on next steps on our website at ofgem.gov.uk/consultations. If you want your response – in whole or in part – to be considered confidential, please tell us in your response. Please clearly mark the parts of your response that you consider to be confidential, and if possible, put the confidential material in separate appendices to your response. Please note that your responses will be shared with the Department for Energy Security and Net Zero since this is a joint consultation.

Any enquiries related to the text of this publication should be sent to Ofgem at:

10 South Colonnade, Canary Wharf, London, E14 4PU.

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Contents

1. Introduction

Chapter summary

This chapter sets out the background to this consultation, including details on what Multi-Purpose Interconnectors (MPIs) are, what we are consulting on, as well as a summary of subsequent chapters in the document. Furthermore, we provide context on why this consultation is run jointly with the Department for Energy Security and Net Zero and what the scope of engagement with stakeholders has been, preceding this publication. Finally, we offer a collection of prior related publications and guide stakeholders on consultation stages and how they can respond.

What are we consulting on[1]?

The need for MPIs

1.1 In the Energy White Paper published on 14 December 2020, the Government set out a target of increasing offshore wind capacity to 40 GW by 2030, in order to accelerate the transition to net zero[2]. This target has since been increased to 50 GW by 2030, as detailed in the Energy Security Strategy published on 7 April 2023[3]. Offshore wind is necessary to reach our decarbonisation goals, and the development of offshore infrastructure and its integration into our energy system is a key priority for the Government.

1.2 The current radial, uncoordinated approach to offshore wind is a consequence of the system being designed when offshore wind was a nascent sector. As the scale of offshore development increases on the path to net zero, there is a need to improve coordination to deliver net zero commitments whilst avoiding unnecessary disruption to communities and natural environments.

1.3 In 2020, Ofgem and the Department for Energy Security and Net Zero launched the Offshore Transmission Network Review (OTNR)[4]. The aim of the OTNR was to

[1] This is a joint publication by the Office of Gas and Electricity Markets (Ofgem) and the Department for Energy Security and Net Zero. Ofgem is the Office of the Gas and Electricity Markets Authority (GEMA). The terms “Ofgem”, "the regulator" and “the Authority” are used interchangeably in this publication. As are the terms “The Department for Energy Security and Net Zero” and “The Government”. As this is a joint publication, the terms “we”, “us” and "our" are used interchangeably in this publication and reflect joint views and positions of Ofgem and the Department for Energy Security and Net Zero.

[2] https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future

[3] https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy

[4] https://www.gov.uk/government/groups/offshore-transmission-network-review

ensure that transmission connections for offshore wind generation are delivered in the most appropriate way.

1.4 Multi-Purpose Interconnectors (MPIs), which were considered as the part of the OTNR, are a novel asset class that enable coordination in the delivery of offshore networks by combining offshore transmission and interconnection activities in GB, with one or more offshore wind farms (OWFs) connected to the asset in GB jurisdiction[5].

Developing workable Market Arrangements for MPIs

1.5 Following the decisions of Ofgem's Interconnector Policy Review[6], Ofgem committed to opening an MPI pilot scheme running in parallel to Ofgem's third cap and floor window for point-to-point interconnectors[7]. The objective of the MPI pilot scheme (which has since been renamed the '*Offshore Hybrid Asset pilot scheme*') is to explore and deliver an appropriate regime (including regulatory regime design, assessment framework and standard licence conditions) to enable the development of offshore hybrid assets – including early MPIs and non-standard interconnectors. Lessons learnt through the pilot scheme will be used to update and adjust the framework for potential future offshore hybrid assets investment windows into an enduring regime.

1.6 As noted in Ofgem's update letter published on 7 December 2022, Ofgem established that delivering pilot projects under current market arrangements and existing legal frameworks was challenging[8]. To overcome these challenges and ensure the pilot projects succeed, we need to consider potential market arrangements now to ensure that there is a workable framework for MPIs (and non-standard interconnectors) by the time the pilot infrastructure is operational, by the target connection date of the end of 2032 (as per the requirements of the '*Offshore Hybrid Asset pilot scheme*').

1.7 The purpose of this consultation is to begin considering the market arrangements that should be in place for the pilot MPIs. It must be noted that the content of

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[5] Further explanation on the classification of MPIs and other offshore hybrid assets is contained in the consultation '*Policy Consultation on the Regulatory Framework for Offshore Hybrid Assets: Multi-Purpose Interconnectors and Non-Standard Interconnectors'* that is published simultaneously. Going forward, MPI is a term only applied to offshore hybrid assets that contain dual activities of offshore transmission and interconnection in GB jurisdiction.

[6] https://www.ofgem.gov.uk/publications/interconnector-policy-review-decision

[7] https://www.ofgem.gov.uk/publications/multi-purpose-interconnectors-pilot-regulatory-framework

[8] https://www.ofgem.gov.uk/publications/update-following-our-consultation-multi-purpose-interconnector-interim-framework

this consultation, and subsequent conclusions, could also bring valuable information for other offshore hybrid asset projects, namely non-standard interconnectors linking GB with other jurisdictions, in which these non-standard interconnectors are connected to OWFs.

1.8 Please note that this consultation is closely related to another Ofgem consultation ('*Policy Consultation on the Regulatory Framework for Offshore Hybrid Assets: Multi-Purpose Interconnectors and Non-Standard Interconnectors*'), on regulatory regime design for offshore hybrid assets, that is published simultaneously. Please refer to that consultation for issues on licensing, regulatory regime design and charging arrangements as these are policy areas within Ofgem's remit. Ideally, both consultations should be read together for a comprehensive picture of policy issues regarding MPIs and other offshore hybrid assets.

1.9 We will explore close links between bidding zone configuration and trading arrangements (i.e., how efficient capacity allocation can support each bidding zone model, and how the latter is interlinked with the former). This is closely linked with the development of new UK-EU cross-border trading arrangements, as discussed throughout this consultation paper. It must be highlighted that the implementation of new cross-border trading arrangements as per the Trade and Cooperation Agreement (TCA) is an entirely separate process involving the UK Government, the European Commission (EC), relevant Regulatory Authorities and Transmission System Operators (TSOs)[9]. It is therefore subject to different timescales and governance procedures.

1.10 Similarly, it also must be highlighted that the Review of Electricity Market Arrangements (REMA) is an entirely separate process led by the Government and is also subject to different timescales and governance procedures[10]. Whilst policy teams leading REMA and the work on market arrangements for MPIs will indeed be exploring the links between the two, that will not be the subject of this consultation.

1.11 We recognise that support schemes for OWFs may play a critical role under different market models, and we explore this further in this consultation. Please note that this policy area falls under the Department for Energy Security and Net Zero's policy remit – we expect relevant policy teams at the Department for

[9] https://www.gov.uk/government/publications/ukeu-and-eaec-trade-and-cooperation-agreement-ts-no82021

[10] https://www.gov.uk/government/news/uk-launches-biggest-electricity-market-reform-in-a-generation

Energy Security and Net Zero to provide policy guidance on this matter in due course, as noted in the relevant chapter of this document.

1.12 We continue to believe it is useful and important to continue the dialogue with industry exploring what market arrangements for MPIs represent the best possible outcome for consumers and what key considerations we need to make to ensure that pilot MPIs, and other pilot offshore hybrid assets, can be efficiently integrated into future market arrangements once projects become operational. This includes the fundamental question of whether a Home Market (HM) or an Offshore Bidding Zone (OBZ) should be the preferred market configuration for these infrastructure projects.

Summary of chapters

Setting the scene

1.13 This chapter starts by exploring envisaged benefits of MPIs for consumers, such as: enhanced security of supply and flexibility as well as benefits for accelerating decarbonisation. We then describe the fundamental concepts of cross-border trading arrangements, including both current and future market arrangements which are, or are envisaged to be, applicable between GB and connected countries, including both within the European Union (EU) and outside of the EU but within the Internal Energy Market (IEM), based on the agreement on the European Economic Area (EEA)[11]. This includes capacity allocation and calculation, explicit and implicit trading arrangements and different market timeframes as well as the concept of a bidding zone.

1.14 No questions are included in this chapter as it acts as a technical introduction that allows readers to familiarise with concepts related to cross-border market arrangements and serves as a background reading that swiftly segues into subsequent sections of this consultation document. Nevertheless, we welcome any comments from stakeholders on the content presented in this chapter.

Market Arrangements for MPIs

1.15 This is the core chapter of this consultation document. It firstly introduces the concepts of the HM and the OBZ and discusses the benefits and challenges of the two market set-ups. Subsequently, it examines market efficiency and benefits for

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[11] We talk specifically about GB and not the UK here as Northern Ireland is part of the Single Electricity Market (SEM), which is part of the IEM, and thus will follow EU processes in any UK-EU market arrangements.

consumers as well as integration of renewables under both models. This is followed by elaborations on the relationship between bidding zone configuration and cross-border trading arrangements. Finally, we ask questions on how trading arrangements across different market timeframes and bidding zone configurations might work.

1.16 Having considered benefits and challenges of both HM and OBZ configurations, on balance we believe that the OBZ has greater potential for realising market efficiencies, consumer benefits and integration of renewables. However, this is subject to interdependencies such as future cross-border trading arrangements – i.e., an implicit capacity allocation model needed to fully utilise benefits of OBZ – and support schemes in place to compensate for differences in expected revenues (explored in subsequent chapter).

Support schemes for OWFs under an OBZ model

1.17 This chapter explores ways of compensating OWFs for projected lower revenues earned under an OBZ set-up. This includes either redistributing congestion income from an MPI owner to the connected OWF or the potential of amending well-known support mechanisms for OWFs such as the Contracts for Difference (CfDs) scheme. This chapter is closely linked with the parallel Ofgem consultation on licensing, regulatory regime design and charging arrangements, as combinations of support schemes for OWFs and bidding zone configuration will impact some of the regulatory regime design options presented in that consultation.

1.18 It must be noted that any decision on amending/updating current support schemes for OWFs to accommodate OWFs connected to MPIs lies within the remit of the Department for Energy Security and Net Zero. The Government will continue to consider the question of eligibility for future allocation rounds beyond Allocation Round 6 (due to open in 2024). Further information will be provided in the Government response to its '*Considerations for future CfD rounds*' consultation, expected in spring/early summer 2023[12]. Nonetheless, your responses to questions in this chapter will be vital in contributing to ongoing policy development both in terms of regulatory regime design and potential future amendments to the CfD scheme.

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[12] https://www.gov.uk/government/consultations/considerations-for-future-contracts-for-difference-cfd-rounds

Operability and other issues

1.19 This section explores the HM and the OBZ configurations in the context of their interactions with system operability and curtailment. We recognise that these topics are currently being explored by National Grid Electricity System Operator (NGESO), the system operator in GB, therefore in this section we are presenting some preliminary and high-level thinking based on previous stakeholder engagement.

1.20 We will explore these issues, where appropriate, in subsequent engagements, but we are keen to hear your early views on operability of MPIs.

Context and related publications

Joint work of Ofgem and the Department for Energy Security and Net Zero

1.21 Before the end of the UK-EU transition period falling on 30 December 2020 (EU Exit)[13], in terms of cross-border market arrangements, Ofgem was mostly responsible for implementing Capacity Allocation and Congestion Management (CACM) Regulation and Forward Capacity Allocation (FCA) Regulation which defined cross-border market rules and trading arrangements[14]. Following EU Exit, provisions of these two EU regulations were revoked from the retained EU law which formed part of GB domestic law[15]. Ofgem then became reliant on licence conditions, and Access Rules in particular, when it came to regulating trade, and other related activities, over cross-border electricity interconnectors[16]. However, the end of 2020 saw a new period of UK-EU relations in the form of the Trade and

[13] We use the term "EU Exit" for the purposes of this document to mean 11.00 pm UK time on 30 December 2020. However, we note that this day and time is defined as "IP completion day" in section 39 of the European Union (Withdrawal Agreement) Act 2020. We further note that this date is known to our European stakeholders as 1 January 2021 (due to time zones difference).

[14] Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management. Link: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32015R1222

Commission Regulation (EU) 2016/1719 of 26 September 2016 establishing a guideline on forward capacity allocation. Link: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2016.259.01.0042.01.ENG

[15] The retained EU law is the new category of UK law created pursuant to sections 2 to 4 of the European Union (Withdrawal) Act 2018 (EUWA) at the end of the UK-EU transition period.

[16] Access Rules set out the terms and conditions for access to, and including use of, the interconnector and are required to be prepared by every interconnector licensee and approved by the Authority, as set out in Standard Licence Condition (SLC) 11A of Electricity Interconnector Licence. Link: https://epr.ofgem.gov.uk/Content/Documents/Electricity_Interconnector_Standard%20Licence%20Conditions%20Consolidated%20-%20Current%20Version.pdf

Cooperation Agreement (TCA), which set out various responsibilities for the Authority and the Government[17]. The TCA places different functions on Ofgem, the Department for Energy Security and Net Zero and Transmission System Operators (TSOs), in the context of the future cross-border market arrangements, creating complementary and cross-cutting functions for the regulator and the Government. Therefore, we believe that it follows that the regulator and the Government jointly develop the future cross-border market arrangements, including arrangements that would be applicable for MPIs.

1.22 Following previous consultations on the OTNR and MPIs as an entire workstream by Ofgem and the Department for Energy Security and Net Zero, in December 2022 Ofgem published a follow-up document to its April 2022 consultation[18]. In this document Ofgem outlined the desire to decouple the workstream on market arrangements from the broader OTNR and MPIs-related consultation and run this piece of policy work jointly with the Department for Energy Security and Net Zero. Subsequently, in January 2023 Ofgem and the Department for Energy Security and Net Zero published an open letter which confirmed this approach as the way forward and outlined our next proposed steps, including this consultation and the envisaged recommendation on market arrangements for MPIs which will follow this consultation[19].

Previous engagement, including via the MPI Framework Discussion Group

1.23 Previously our engagement relating to future market arrangements for MPIs was centred around former Ofgem and the Department for Energy Security and Net Zero consultations (please see the sub-section below, which contains links to relevant publications). This included responses received to our July 2021, September 2021 and April 2022 consultation documents.

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[17] Trade and Cooperation Agreement between the European Union and the European Atomic Energy Community, of the one part, and the United Kingdom of Great Britain and Northern Ireland, of the other part.

It was applied on a provisional basis from 30 December 2020 until it entered into force on 30 April 2021 at 11.00 pm UK time. We note that this date is known to our European stakeholders as 1 May 2021 (due to time zones difference).

Links: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:22021A0430(01) and https://www.gov.uk/government/publications/ukeu-and-eaec-trade-and-cooperation-agreement-ts-no82021

[18] April 2022 consultation: https://www.ofgem.gov.uk/publications/offshore-transmission-network-review-multi-purpose-interconnectors-minded-decision-interim-framework
December 2022 follow-up document: https://www.ofgem.gov.uk/publications/update-following-our-consultation-multi-purpose-interconnector-interim-framework

[19] https://www.ofgem.gov.uk/publications/open-letter-market-arrangements-multi-purpose-interconnectors

1.24 Following these various consultations and publications, the MPI Framework Discussion Group (MFDG) was subsequently established by Ofgem in late 2022, with the purpose of engaging with stakeholders to develop proposals for the commercial and regulatory frameworks that will apply to MPIs – that also included topics related closely to market arrangements for MPIs. The MFDG provides an opportunity to collaboratively discuss risks and opportunities, and a space to test thinking and gauge stakeholder views on various policy issues.

1.25 Throughout the collaboration and engagement with the Department for Energy Security and Net Zero, MPI developers, OWF developers and NGESO, amongst other valuable stakeholders, the work was split into four workstreams:

(1) Contracts for Difference (led by the Department for Energy Security and Net Zero);

(2) Licensing (led jointly by Ofgem and the Department for Energy Security and Net Zero);

(3) Regulatory regime, market arrangements and charging arrangements (led primarily by Ofgem, while market arrangements being led jointly by Ofgem and the Department for Energy Security and Net Zero); and

(4) Operability (led by NGESO, with inputs from Ofgem and the Department for Energy Security and Net Zero).

1.26 The first workshop on bidding zone configuration (which also covered parts of regulatory regime design) was held on 11 January 2023. This was followed by a second workshop on 7 February 2023, where cross-border trading arrangements were discussed (alongside with other aspects of regulatory regime design), with a final workshop, held on 1 March 2023, looking at considerations that may need to be given to support schemes to ensure a level playing field for the OWFs part of an MPI asset.

1.27 Moreover, Ofgem and the Department for Energy Security and Net Zero ran a summary workshop, presenting our current holistic policy development on market arrangements and regulatory regime design, during WindEurope's conference in Copenhagen in April 2023. Throughout our entire engagement process, we have been clear that at this early stage in the process there are many policy questions that require further consideration. This is why we welcome and value your inputs into this consultation and your continuous engagement.

1.28 Throughout this engagement, workshops and meetings, we have been continuously developing our policy positions. This consultation is building upon the discussions from these engagements. For the avoidance of doubt, where views of stakeholders are referenced or presented throughout this document, we mean any of the above engagements, workshops and interactions with stakeholders.

Related publications

1.29 All of the below publications contain some paragraphs and/or standalone sections on market arrangements for MPIs – this shows how the policy development has progressed in this matter over time. Related publications are listed in chronological order (i.e. listing the earliest publications first):

- Interconnector policy review: Working paper for Workstream 4 - multiple purpose interconnectors | Ofgem, June 2021
- Consultation on changes intended to bring about greater coordination in the development of offshore energy networks | Ofgem, July 2021
- Offshore Transmission Network Review: Enduring Regime and Multi-Purpose Interconnectors (publishing.service.gov.uk), September 2021
- Interconnector Policy Review - Decision | Ofgem, December 2021
- Update following our consultation on changes intended to bring about greater coordination in the development of offshore energy networks | Ofgem, January 2022
- Offshore Transmission Network Review: Multi-Purpose Interconnectors: government response (publishing.service.gov.uk), April 2022
- Offshore Transmission Network Review – Multi-Purpose Interconnectors: Minded-to Decision on interim framework | Ofgem, April 2022
- Update following our consultation on the Multi-Purpose Interconnector interim framework | Ofgem, December 2022
- Open letter on market arrangements for Multi-Purpose Interconnectors | Ofgem, January 2023

Consultation stages and how to respond

Consultation stages

1.30 This consultation will remain open for six weeks for written responses, as stated at the beginning of this document. This consultation was preceded by engagement with the industry via responses to previous publications (listed above) and targeted stakeholder engagement, including via the MFDG (as also mentioned above). Following this consultation, we envisage to publish a recommendation on market arrangements for MPIs.

1.31 Alongside this consultation, Ofgem is running a parallel consultation on licensing, regulatory regime design and charging arrangements for offshore hybrid assets (as indicated above). In terms of regulatory regime design, there will be further opportunities for engagement, including modelling workshops on Cost-Benefit Analysis scenarios and the Initial Project Assessment consultation to determine which projects will receive a regulatory regime in principle.

1.32 We envisage that, following this consultation, other targeted calls for inputs and/or further consultations on more detailed policy matters related directly to market arrangements for MPIs may be required. There also might be references and requests for views from stakeholders on market arrangements for MPIs in the context of matters directly or indirectly connected to these issues in other subsequent consultations supplied by either Ofgem or the Department for Energy and Net Zero (e.g. on licensing or support schemes for OWFs).

How to respond

1.33 We want to hear from anyone interested in this consultation. Please send your response to the person or team named on this document's front page (CBMA@ofgem.gov.uk).

1.34 We have asked for your feedback in each of the questions throughout. Please respond to each one as fully as you can.

1.35 We will publish non-confidential responses on our website at www.ofgem.gov.uk/consultations.

Your response, data and confidentiality

1.36 You can ask us to keep your response, or parts of your response, confidential. We will respect this, subject to obligations to disclose information, for example, under the Freedom of Information Act 2000, the Environmental Information Regulations

2004, statutory directions, court orders, government regulations or where you give us explicit permission to disclose. If you do want us to keep your response confidential, please clearly mark this on your response and explain why.

1.37 If you wish us to keep part of your response confidential, please clearly mark those parts of your response that you *do* wish to be kept confidential and those that you *do not* wish to be kept confidential. Please put the confidential material in a separate appendix to your response. If necessary, we will get in touch with you to discuss which parts of the information in your response should be kept confidential, and which can be published. We might ask for reasons why.

1.38 If the information you give in your response contains personal data under the General Data Protection Regulation (Regulation (EU) 2016/679) as retained in domestic law following the UK's withdrawal from the European Union ("UK GDPR"), the Gas and Electricity Markets Authority will be the data controller for the purposes of GDPR. Ofgem uses the information in responses in performing its statutory functions and in accordance with section 105 of the Utilities Act 2000. Please refer to our Privacy Notice on consultations, see Appendix 2.

1.39 If you wish to respond confidentially, we will keep your response itself confidential, but we will publish the number (but not the names) of confidential responses we receive. We will not link responses to respondents if we publish a summary of responses, and we will evaluate each response on its own merits without undermining your right to confidentiality.

1.40 Please note that your responses will be shared with the Department for Energy Security and Net Zero since this is a joint consultation.

General feedback

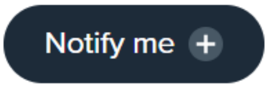
We believe that consultation is at the heart of good policy development. We welcome any comments about how we have run this consultation. We would also like to get your answers to these questions:

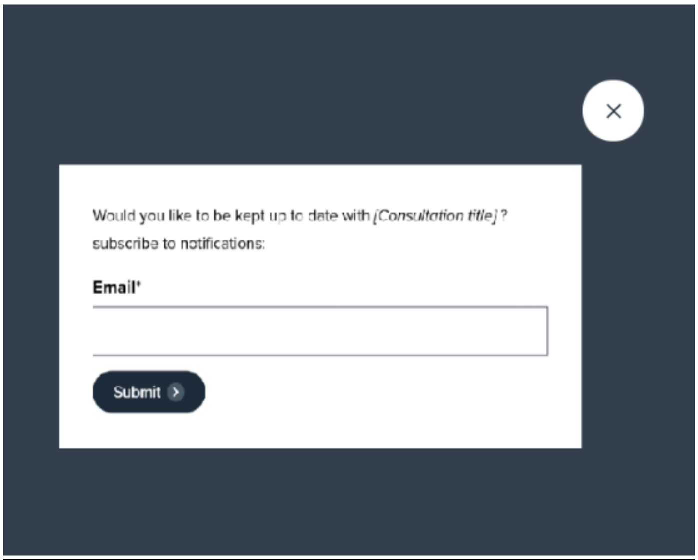
1. Do you have any comments about the overall process of this consultation?
2. Do you have any comments about its tone and content?
3. Was it easy to read and understand? Or could it have been better written?
4. Were its conclusions balanced?
5. Did it make reasoned recommendations for improvement?
6. Any further comments?

Please send any general feedback comments to stakeholders@ofgem.gov.uk.

How to track the progress of the consultation

You can track the progress of a consultation from upcoming to decision status using the 'notify me' function on a consultation page when published on our website: ofgem.gov.uk/consultations.





Once subscribed to the notifications for a particular consultation, you will receive an email to notify you when it has changed status. Our consultation stages are:

Upcoming > **Open** > **Closed** (awaiting decision) > **Closed** (with decision).

2. Setting the scene – introduction to MPIs and current and future cross-border market and trading arrangements

Chapter summary

This chapter starts by exploring the envisaged benefits of MPIs for consumers: enhanced security of supply and flexibility, as well as benefits for accelerating decarbonisation efforts. We then describe some fundamental concepts of cross-border trading arrangements, including both current and future market arrangements which are, or are envisaged to be, applicable between GB and connected countries. This includes capacity allocation and calculation, explicit and implicit trading arrangements, and different market timeframes as well as the concept of a bidding zone.

No questions are included in this chapter as it acts as a technical introduction that allows readers to familiarise with concepts related to cross-border market arrangements and serves as a background reading that swiftly segues to further sections of this consultation document. Detailed questions on bidding zone configuration and trading arrangements and operability are asked in subsequent chapters.

However, if you have any comments on the presented content, please do not hesitate to provide your views and observations.

Multi-Purpose Interconnectors

What are MPIs?

2.1 Multi-Purpose Interconnectors (MPIs) are a novel asset class combining offshore transmission with interconnection, with one or more offshore wind farms (OWFs) connected to the asset in GB, as defined in Clause 162 of the Energy Bill[20].

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[20] The MPI related provisions are contained in Clauses 162 to 167 in the version of this Bill dated 25 April 2023, as brought from the House of Lords to the House of Commons (Committee stage). Consequential amendments are contained in Schedules 13 and 15. The current version of the Energy Bill can be accessed under the following link: https://publications.parliament.uk/pa/bills/cbill/58-03/0295/220295.pdf

As of the date of publication of this consultation, the Energy Bill is at the Committee stage in the House of Commons. The final text of the Energy Bill, including the MPI related Clauses, may be amended during its passage through Parliament and is, therefore, subject to change.

The Bill was introduced to Parliament on 6 July 2022.

Benefits of MPIs for consumers: security of supply, flexibility and decarbonisation

Benefits of interconnectors

2.2 Traditional point-to-point interconnectors already deliver well-established benefits to consumers. They enable the trade of energy into and out of the GB market (with the EU and EEA), which provides consumers with reliable and flexible access to electricity. The benefits of this are:

- Lower costs for consumers by ensuring that GB has access to, and can benefit from, the lowest price electricity that is available across connected countries.
- Interconnectors provide system operators with the critical tools they need to balance rapid changes in supply and demand of electricity.
- Interconnectors allow renewable generation to be shared across energy systems of different countries, displacing carbon intensive generation and thus supporting decarbonisation efforts[21].
- The flexibility of interconnectors helps to address the challenges of difficulty of forecasting of renewable energy sources generation and control their outputs at any given time.

2.3 As described above, traditional point-to-point interconnectors already provide significant benefits for consumers and all these benefits will also apply to MPI assets. MPI assets also have specific benefits in the form of lower capital and operating costs, reduced community and spatial impacts, and more efficient integration of renewables.

Benefits of MPIs

2.4 MPIs can offer additional interconnection capacity at lower capital and operating costs through shared utilisation of transmission infrastructure. By coordinating interconnection and offshore wind generation, MPIs can reduce the total number of onshore and offshore substations and length of cabling required to reduce the total capital cost of installations and operating costs. NGESO's Offshore Coordination Project (Phase 1)[22] indicated that adopting an integrated approach

[21] According to FTI Consulting LLP, quoting National Grid Ventures, GB interconnectors saved 1.13 MTCo2 emissions in 2020. Link: https://www.fticonsulting.com/emea/~/media/Files/emea--files/insights/reports/2021/fev/electricity-interconnection.pdf

[22] https://www.nationalgrideso.com/news/final-phase-1-report-our-offshore-coordination-project

to offshore transmission from 2030, including the use of MPIs, could reduce lifetime transmission costs by around £3bn[23].

2.5 Coordinated infrastructure, including the use of MPIs, will also result in significantly lower environmental impacts, as well as reduced impacts on local and coastal communities. National Grid Ventures (following NGESO analysis) estimates that adopting MPIs could significantly reduce the number of landfall points and new electricity infrastructure assets overall, including onshore and offshore assets, cables and onshore landing points[24]. This significant reduction in infrastructure may aid in alleviating concerns amongst local communities around the cumulative impacts of offshore cables and onshore landing points near coastal locations.

2.6 Finally, as MPIs allow for connections to offshore wind generation, they will additionally benefit consumers by ensuring better integration of renewable wind energy into the grid. MPIs will allow for new routes for importing electricity whilst at the same time supporting the development of domestic renewable energy generation which can be exported when there is excess generation.

2.7 The challenge of delivering MPIs lies in the increased complexity created by coordination, including in terms of the need for a suitable regulatory and commercial framework brings together the two traditionally separate activities of interconnection and offshore wind transmission.

2.8 As such we consider overall that MPIs will have the following net benefits:

- socio-economic welfare gains;
- reduced cost of system operator actions;
- reduced curtailment of renewable energy sources;
- increased security of supply benefits;
- increased system flexibility benefits;
- environmental benefits of reduced infrastructure;
- reduced coastal impacts on communities; and
- decarbonisation benefits.

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[23] Similarly, a study of 10 potential European offshore hybrid projects considered by the consultancy Roland Berger GmbH found capex savings for projects ranged from €300m and €2500m (5-10% of total project costs) when compared to counterfactual scenarios using traditional interconnectors. Link: https://op.europa.eu/en/publication-detail/-/publication/59165f6d-802e-11e9-9f05-01aa75ed71a1

[24] Summary results from analysis on National Grid Ventures MPI pathfinder projects presented at UK Hybrid Project Forum on 10 March 2021. These stats are made on assumptions on the number of future MPIs. Links: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/972441/uk-hybrid-project-forum-march-2021.pdf and https://www.nationalgrideso.com/document/183031/download and https://www.nationalgrideso.com/document/182926/download

Cross-border market arrangements

2.9 It is likely that future trading arrangements for MPIs will be substantially based on existing features of cross-border market arrangements. Therefore, before elaborating on market arrangements for MPIs in subsequent chapters, we set out current and potential future cross-border trading arrangements and related fundamental concepts.

Capacity allocation and capacity calculation

Capacity allocation

2.10 Capacity allocation is a process where available capacity on a point-to-point interconnector (or 'cross zonal capacity') is allocated, i.e. sold to market participants, to allow the flow of electricity across borders. Capacity allocation can be either explicit or implicit and takes place over all timeframes: long-term, day-ahead and intraday.

Capacity calculation

2.11 Before capacity can be allocated to the market, the amount of capacity available must be calculated. This process takes into account available capacity on interconnectors accounting for system security needs in respective markets. Capacity calculation takes place across all timeframes.

Explicit and implicit trading (capacity allocation)

Explicit

2.12 Under explicit capacity allocation, the transmission capacity on an interconnector is auctioned to the market separately and independently from the trade of electrical energy. There is no central market coupling algorithm thus traders execute trades 'manually' based on own forecasting. Market participants need to choose specific interconnector and flow direction and acquire electricity separately.

2.13 Explicit auctions are less efficient as the two commodities, transmission capacity and electrical energy, are traded at two separate auctions, resulting in a lack of information about the prices of the other commodity. This lack of information can result in an inefficient use of interconnectors compared with implicit trading, with less price convergence and more frequent adverse flows.

Implicit

2.14 Under implicit capacity allocation, interconnector capacity and electrical power are allocated in the same process – i.e. the auctioning of transmission capacity is included implicitly in the auctions of electrical energy in the market as one product. A centralised algorithm calculates efficient cross-border flows by considering bids and offers submitted by market participants in connected markets and available capacity between coupled markets. Implicit trading ensures best capacity allocation and optimised cross-border flows.

2.15 It is worth noting, that there are two distinguishable forms of implicit capacity allocation – namely price and volume coupling.

- Price coupling is when a single algorithm determines simultaneous flows across interconnectors between connected markets and prices for those markets, based on bids/offers from each market and network capacities.
- Volume coupling is when an algorithm determines flows across interconnectors between underlying markets, based on bids/offers from each market and network capacities. However, price in each market is determined separately locally using the generated cross-border volumes.

Trading timeframes

2.16 There are generally three market timeframes relevant to cross-border trading: long-term, day-ahead and intraday.

2.17 In long-term timeframe, there are generally two types of capacity allocation methods (Long Term Transmission Rights – LTTRs) sold over different auctions (e.g., annual or monthly):

- Physical Transmission Rights (PTRs) – allow the rights holder the options to either nominate and flow energy via an interconnector (in a particular direction) or not nominate and thus receive financial compensation (i.e., a use-it-or-sell-it principle).

- Financial Transmission Rights (FTRs) – allow the rights holder to receive financial compensation. FTRs options entitle the holder to receive the positive market spread (e.g. the day-ahead market spread) in the direction of the FTR option.

2.18 The day-ahead timeframe can utilise either explicit capacity auctions or implicit capacity allocation.

2.19 In the intraday timeframe, trading is again either explicit or implicit (e.g. via multiple auctions or continuous trading).

Current arrangements for point-to-point interconnectors

2.20 Before EU Exit, day-ahead trading between GB and the Internal Energy Market (IEM) was done through implicit price coupling (Single Day Ahead Coupling – SDAC), with long-term and intraday arrangements varying across GB borders.

2.21 Currently, following EU Exit, cross-border trading is different on different borders, as outlined below.

- GB-Channel: PTRs in long-term capacity allocation and explicit allocation in both day-ahead and intraday timeframes;
- GB-Norway: implicit day-ahead price coupling without other timeframes currently available; and
- GB-SEM: implicit intraday price coupling realised via two coupled intraday auctions without other timeframes currently available.

Future cross-border market arrangements

Day-ahead timeframe (MRLVC)

2.22 Following EU Exit, the TCA governs the new relationship between the UK and the EU and contains provisions regarding cooperation on both offshore renewable energy and efficient electricity trade. Future cross-border trading arrangements between the UK and the EU are being developed, as required by the TCA, by the UK and EU TSOs and the day-ahead electricity trading model is envisaged to be based on the implicit trading concept of multi-region loose volume coupling (MRLVC). Once implemented, MRLVC will promote more efficient trading between GB and the EU.

2.23 In 2021, a joint UK and EU TSOs Cost-Benefit Analysis of MRLVC (MRLVC CBA) was developed[25]. The MRLVC CBA recognises that the development of MPIs will require trading arrangements which support efficient energy pricing and capacity utilisation. The MRLVC CBA explores different design options for implicit volume coupling, but in principle it is envisaged to broadly follow the following steps:

- Bids and offers are collected in GB and SDAC.

[25] https://consultations.entsoe.eu/markets/cost-benefit-analysis-of-multi-region-loose-volume/

- MRLVC algorithm determines flows between GB and connected markets, based on bids/offers from GB and directly connected markets, network capacities provided by the TSOs and forecasts of flows to/from zones directly connected to GB and other relevant zones within SDAC.
- Results of MRLVC algorithm are transferred back to local markets, i.e., GB and SDAC, and local prices within zones are determined, using MRLVC flows as inputs.

2.24 In February 2022, the Specialised Committee on Energy (SCE) requested further quantitative and qualitative analysis by the UK and EU TSOs on the back of MRLVC CBA[26]. The TSOs are now performing additional analysis and are expected to provide a report to the SCE in the summer 2023.

Intraday and long-term

2.25 The TCA gives the priority to development of arrangements in the day-ahead timeframe, and notes that the SCE shall keep under review the arrangements for all timeframes, and for balancing and intraday timeframes in particular, and may recommend that each Party requests its transmission system operators to prepare technical procedures in accordance with Article 317 to improve arrangements for a particular timeframe.

2.26 Through our sustained engagement with relevant developers, it is thought that these timeframes will also be of significant importance, not only for point-to-point interconnectors, but also to MPIs.

Bidding Zones

Bidding Zones – current status

2.27 Definition of bidding zones, as well as their key features and provisions can be found in Regulation 2019/943 on the internal market for electricity (the EU Electricity Regulation)[27] and Regulation 2015/1222 – Guideline on Capacity Allocation and Congestion Management (CACM Regulation)[28]. Here, we refer to

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[26] The SCE is a body established under the TCA which oversees the majority of the provisions agreed between the UK and the EU in the energy title (Title VIII) of the TCA, including implementation of MRLVC. The request for further analysis was expressed in Recommendation No 1/2023 of the SCE of 7 February 2023. Link: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22023D0425

[27] Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity (recast). Link: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019R0943

[28] Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management. Link: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32015R1222

these two regulations as they apply in the EU. The CACM Regulation has not been retained within our domestic retained EU law while the EU Electricity Regulation has been retained in materially amended form and is referred to in this document as the Retained Electricity Regulation.

2.28 The EU Electricity Regulation describes a bidding zone as "*the largest geographical area within which market participants are able to exchange energy without capacity allocation*"[29]. The CACM Regulation also states that "*bidding zones should be defined in a manner to ensure efficient congestion management and overall market efficiency*"[30].

2.29 Bidding zones are crucial to zonal market-based electricity trading. The majority of the current bidding zone configurations in Europe are largely derived from formerly national networks and consequently, are often based on national borders of the EU Member States. However, bidding zones in the IEM are not necessarily delineated by national borders (as in e.g. France, Belgium or the Netherlands), some bidding zones may be larger than national borders (e.g. Germany and Luxembourg and the Single Electricity Market (SEM) for the island of Ireland), and some countries (e.g. Italy, Denmark, Norway or Sweden) may have several bidding zones within their territory.

2.30 The borders of these bidding zones are physically coupled by interconnectors that allow for cross-zonal trade between bidding zones. Bidding zone borders can also be defined within an EU Member State, in which case the borders are determined by identifying lines connecting certain critical network elements. The EU Electricity Regulation requires that bidding zone borders must be based on long-term structural congestions in the transmission network and that bidding zones cannot contain such congestions[31]. Further the EU Electricity Regulation requires that the configuration of bidding zones in the EU is designed to maximise economic efficiency and cross-border trading opportunities while maintaining security of supply[32]. In addition, the relevant EU regulations envisage that bidding zones can be modified by splitting, merging or adjusting the bidding zone borders.

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[29] The same definition appears in our Retained Electricity Regulation (Article 2 (Definitions)).

[30] Recital 11 of the CACM Regulation (applicable in the EU but not retained in GB).

[31] Article 14 of the EU Electricity Regulation. This specific Article has not been retained as part of the Retained Electricity Regulation.

[32] Article 14 of the EU Electricity Regulation. This specific Article has not been retained as part of the Retained Electricity Regulation.

2.31 The EU Electricity Regulation and CACM Regulation together provide a comprehensive set of provisions for the review and potential re-configuration of bidding zones in the EU. The framework of the bidding zone review is set out primarily by Article 14 of the EU Electricity Regulation, and articles 32 and 33 of CACM Regulation. However, this requires the consensus of the TSOs, the EU Member States and relevant Regulatory Authorities in the Capacity Calculation Region on methods and proposals to amend the bidding zone configuration and the decision of the EU Member States.

2.32 Some of the above Articles of the EU Electricity Regulation are not part of retained EU law in GB, and ways of creating and defining new bidding zones, such as for example an OBZ, will have to be explored if this is the approach taken forward.

Bidding Zones – potential future developments

2.33 At present, GB is a single bidding zone and, since CACM Regulation is not part of the retained EU law in GB, there is currently no formal bidding zone review process. Nevertheless, in 2022 the Government launched the Review of Electricity Market Arrangements, which is considering reforms to the GB wholesale market, including the option of moving to either zonal or nodal pricing[33]. We note that in recent engagement, stakeholders expressed a view that market arrangements for MPIs should be considered alongside proposals for wider market reforms. We acknowledge interactions with the broader policy landscape and will continue to engage with relevant stakeholders and will monitor applicable developments.

[33] https://www.gov.uk/government/news/uk-launches-biggest-electricity-market-reform-in-a-generation

3. Market Arrangements for MPIs – Bidding Zone Configuration and trading arrangements

Chapter summary

This chapter begins by introducing the concepts of the HM and OBZ models and discusses benefits and challenges of the two different market configurations. It examines how market efficiency, benefits for consumers and integration of renewables may differ under each model and explores the relationship between bidding zone configuration and cross-border trading arrangements. Finally, we ask questions on how trading arrangements across different market timeframes and bidding zone configurations might work in practice.

Having considered benefits and challenges of both HM and OBZ configurations, on balance we believe that OBZ has greater potential for realising market efficiency and consumer benefits. However, this is subject to interdependencies with future cross-border trading arrangements – i.e., an implicit capacity allocation will be needed to realise the benefits of OBZ – as well as sufficient support schemes in place to compensate for differences in expected revenues (explored in the subsequent chapter).

Bidding Zone Configuration – Home Market and Offshore Bidding Zone

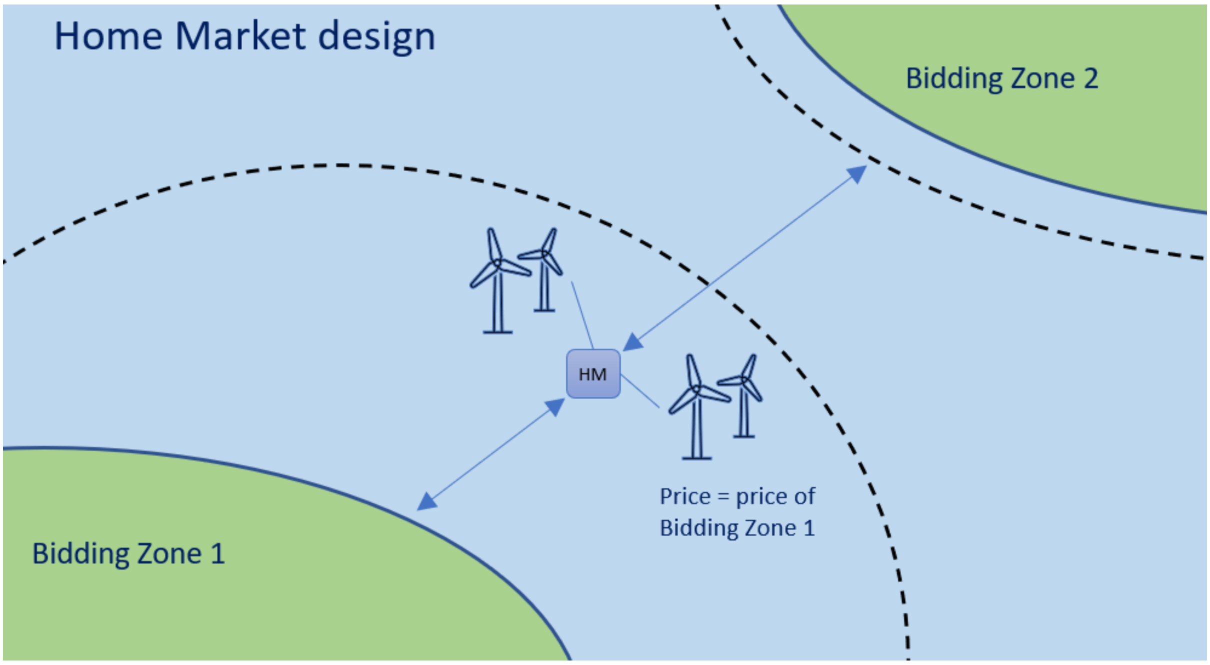
Introduction

3.1 MPI assets will deliver significant socio-economic, security of supply and decarbonisation benefits, and will contribute to the Government's ambitions on offshore wind and interconnection. However, a key question to answer is how best to use these assets when it comes to cross-border trade. There are two models which seek to answer this fundamental question: the Home Market (HM) model and the Offshore Bidding Zone (OBZ) model. We explore these two options below, including their differences, benefits and challenges.

How the HM model works

3.2 The HM model is effectively the status quo and is similar to the model used for current radial connections of OWFs to shore. OWFs connected to MPIs will be part of their domestic (or 'home') bidding zone (i.e. 'market'). It is envisaged that under the HM model, the OWF will have a priority access to the MPI cable over cross-border capacity – i.e. over flows to/from connecting jurisdiction. That priority access means that the OWF will always be guaranteed a proportion of capacity on the MPI cable to transport its generated output from the OWF to its domestic market. Because of the priority access and being considered as part of the 'home' bidding zone, the OWF will always bid into, and thus receive the price of, its domestic market, regardless of market forces and direction of flows.

Figure 1: HM configuration design.



Pros and Cons of the HM model

3.3 Priority access is a very desirable feature for OWFs, as having unconstrained access to the depth and liquidity of the onshore domestic market will provide investors with clarity of projected revenues. However, this priority access for the OWF would create challenges for the MPI, as explained further below.

3.4 The interconnector part of the MPI asset is likely to earn lower revenues under the HM scenario as less cross-border capacity will be available for it to sell to market participants (since a proportion of the MPI's capacity will automatically be allocated to the OWF).

3.5 Furthermore, a key challenge of the HM model is the increased need for corrections due to capacity allocation errors. Since some cable capacity will automatically be allocated to the OWF, any over-forecasts of the OWF's generation will lead to the MPI's capacity being unnecessarily constrained while under-forecasts will mean that the OWF needs to be constrained. In this way, forecasting errors may lead to an underutilisation of capacity or require costly remedial actions by the system operator, with costs ultimately falling on consumers. Priority access of the OWF to the cable may also mean reducing import capacity from connected markets, potentially leading to further curtailments.

3.6 In addition, it is possible that under the regulatory and legal framework applicable to MPIs, an MPI might not be able to offer priority access on its cable to the OWF connected to it and such an MPI may require an appropriate exemption from Ofgem and/or appropriate derogation from the Department for Energy Security and Net Zero to provide this priority access to the OWF under the HM model. These considerations are still subject to our ongoing analysis, but we would welcome any feedback that stakeholders would like to offer.

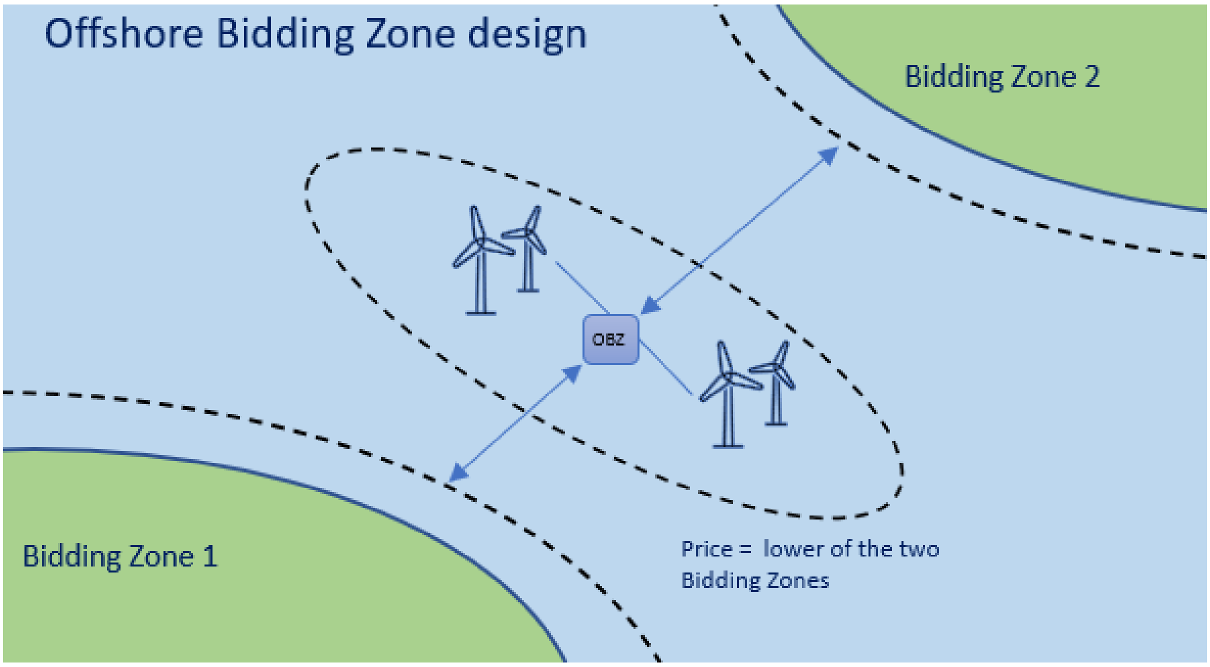
How the OBZ model works

3.7 Under the OBZ model, a separate bidding zone is created in relevant jurisdiction for the OWF(s) connected to a single MPI[34]. Instead of having the priority access to cable capacity, the OWF will compete with bids and offers from other market players in onshore bidding zones for access to the cable to all connecting markets. On the assumption that implicit trading arrangements are in place, a central algorithm will match those bids and offers and dispatch the OWF to optimise the overall use of the MPI asset.

3.8 As a result, it is expected that the OWF will usually receive the lowest price of the two onshore bidding zones to which it is connected. This is because the central algorithm will match the OWF with demand in the lower priced zone, allowing the capacity of the cable to export supply from that lower priced zone to connected higher price zone. This mitigates making forecast errors about how much cable capacity is needed to export OWF's generated electricity in one direction or another. In effect, the central algorithm will 'couple' the OWF with lowest price zone and 'net' the export of the OWF to that lower price zones off against exports in the opposite direction (to the extent possible given the capacity of the cable) to optimise overall benefits and ensure that the flow on the MPI is from the lower priced towards the higher priced zone.

[34] We refer to the currently proposed OBZ model and we note that this model may evolve in the future, potentially to include more connecting assets within a single OBZ.

Figure 2: OBZ configuration design.



Pros and Cons of the OBZ model

3.9 The OBZ model is likely to be more desirable for MPI developers due to greater opportunity to earn congestion income without cross-border capacity being 'automatically' displaced by the generation of the connected OWF.

3.10 Conversely, OWFs are likely to earn lower revenues because their wholesale revenue will converge to the lower price of the two onshore bidding zones. Additionally, support schemes such as the Contract for Difference (CfDs), as currently designed, will have a reference price of the OWF's domestic market (noting that the eligibility and participation of MPI-connected OWF assets within the CfD scheme is still under consideration), meaning that the CfD top-up will not be sufficient to attain the OWF strike price in some scenarios (this is explained in more detail in subsequent chapter).

3.11 The potential benefit of the OBZ is the utilisation of a central algorithm which can help to avoid the risk of over- or under-utilisation of the MPI assets. This is because the central algorithm will maximise the utilisation of the cable by efficiently dispatching the OWF and allowing the MPI asset to fully accommodate flows between the two markets. That should optimise overall welfare benefits for both connecting markets. However, this is on the assumption that implicit trading arrangements are in place. As per our understanding, this is because it is unlikely that the relevant market parties could, individually, maximise the use of MPIs in the way that a central algorithm can, and depending on the complexity of the

MPI, may be unable to identify and respond to different market price signals to determine the most efficient direction to trade across MPIs.

3.12 However, the challenge is that the existence and use of such central algorithm will most likely require a form of market coupling between GB and the EU. Thus, we believe that the value of OBZs can only fully be realised with implementation of new, efficient, electricity trading arrangements.

HM and OBZ in different jurisdictions

3.13 Given the above summary of both market models and their features, benefits and challenges, it is clear that preferences for specific configurations will differ according to each stakeholder. As a result of these differences, we will likely see a variety of market models across the UK and the EU, leading to a possibility of different market models on either end of an MPI asset. Implications of the existence of two different bidding zone configurations on either side of an MPI asset should be further explored – we invite stakeholders to provide any comments or views on this matter. We understand that the EC's guidance accompanying the EU's Offshore Renewable Energy Strategy[35] highlights the benefits of the OBZ approach in terms of compatibility with current EU electricity market rules and suggests that OBZ is a relatively more efficient solution[36]. The EC's guidance also indicates that the OBZ approach is the EC's preferred solution.

Aligning HM and OBZ models with the overall objectives of MPIs – market efficiency, consumer benefits and integration of renewables

3.14 In order to objectively determine the market configuration that will have the most desirable outcomes for efficient usage of MPI assets, it is important to consider the HM and OBZ models through the following lenses: market efficiency, consumer benefits and integration of renewables.

Example of inefficiencies in the HM model

3.15 In both the HM and OBZ models, generated wind can be deployed as both models are able to allocate that wind onto the MPI cable, whether because of the priority

[35] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020SC0273&from=EN

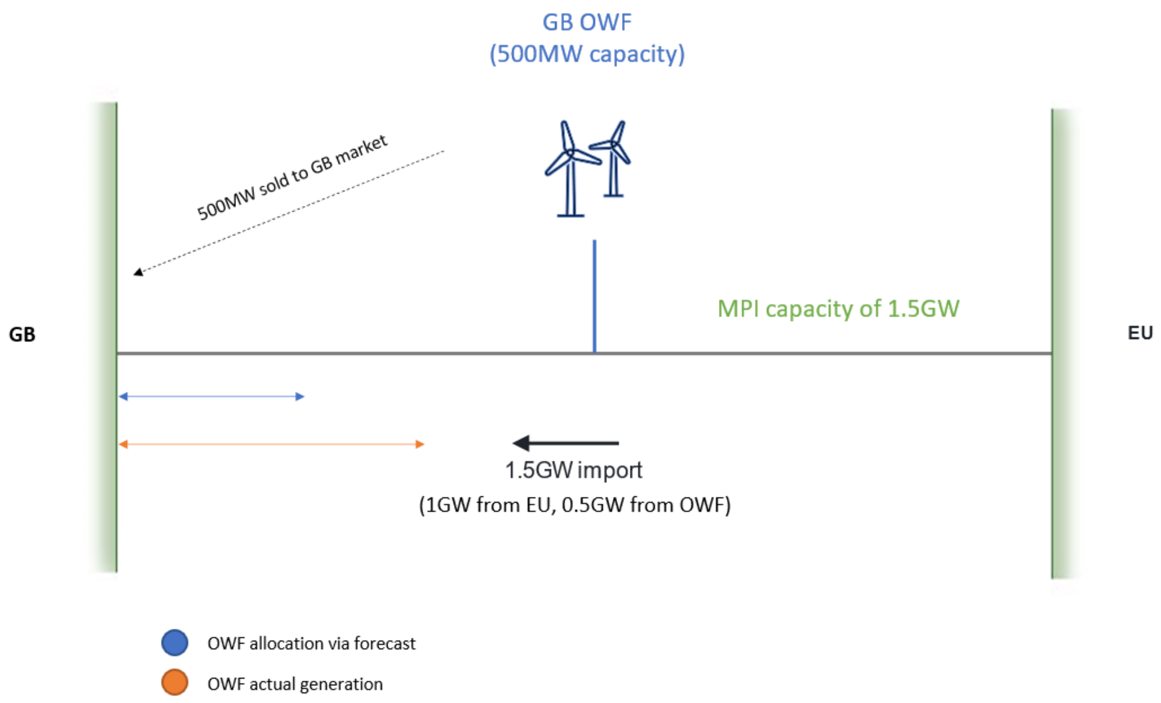
[36] For additional information and conceptual discussion on Home Market and Offshore Bidding Zones in the EU, please see the following EU's publications. Links: https://op.europa.eu/en/publication-detail/-/publication/28ff740c-25aa-11eb-9d7e-01aa75ed71a1/language-en and https://www.entsoe.eu/outlooks/offshore-development/ and https://www.ceer.eu/documents/104400/-/-/0ee9681b-fbc9-d367-9099-ad9b258088a7

access as per the HM, or via the central algorithm as per the OBZ. The difference then between these models is that whilst the HM is able to allocate generated wind to the cable, it does so at the expense of market forces.

3.16 As exampled in Figure 3 below, in a HM scenario at the day-ahead timeframe where the MPI cable (1.5 GW capacity) is importing from the EU, the OWF’s (500 MW capacity) access to its home market will need to be calculated via a capacity calculation process which will consider a forecast of how much the OWF will generate on the actual day of production. This will determine how much capacity will be released for cross-border trading and how much is reserved for the OWF’s access to the home market.

3.17 If the OWF forecasts that it will generate 300 MW on the day of production, corresponding capacity is allocated to the OWF on the MPI cable, leaving the rest of the line (1.2 GW) to be allocated to imported power. However, on the day of production, if that OWF is to generate more than its forecasted power, and generates 500 MW, it will still be allocated all 500 MW of generation onto the cable because of its priority access. This will lead to inefficient usage of the cable as pre-allocated power will now be pushed off creating issues surrounding charges and cost recovery, as well as curtailment of imported renewable generation and the need for remedial action.

Figure 3: HM importing scenario.



Summary of findings based on our engagement with stakeholders

3.18 We have considered both the HM and OBZ models through these lenses throughout our sustained engagement with industry within the MFDG, as well as via bilateral and multilateral conversations with developers, ministries, and regulatory authorities.

3.19 Following these engagements, initial conclusions suggest that the OBZ is the market model which will deliver better outcomes in these three aspects.

- Market efficiency: The OBZ model is better able to reflect the physical realities of all connected networks and MPI capacity, takes into account competition across the network, and co-optimises allocation via a central algorithm, ensuring efficient flows across the cable and network.
- Consumer benefits: In the HM model, cross-border capacity is given to the market accounting for the forecasted and reserved generation from the OWF. On the day of production, if generation exceeds forecasts, more power will flow from the OWF irrespective of what has already been allocated across the MPI. This then means that the system operator will be faced with a congestion management problem. The system operator will then have to curtail or export previously allocated power, as the OWF will have the priority access. This will result in remedial and imbalance costs, which ultimately will fall onto the consumer. The OBZ avoids these constraints but creates a revenue risk for the OWF (explained in the next chapter of this document).
- Integration of renewables: As the OBZ model is better able to reflect the realities of the entire network, flows will be more efficient in reducing the need for curtailment of connected OWFs. Such curtailment, possible under the HM, can also lead to more, perhaps fossil fuel-based, generation onshore to compensate for that curtailed OWFs, potentially resulting in higher emissions.

3.20 We wish to highlight that our reflections are based on qualitative analysis (as well as stakeholder engagement). As all GB MPI projects are novel, they are still subject to sensitivity and confidentiality, thus making it challenging and perhaps premature to perform robust quantitative analysis. We remind stakeholders that they are able to make their responses confidential should they choose to, particularly if they would like to present any quantitative evidence and/or data that might further help us with our considerations.

Bidding zone configuration linked with trading arrangements

3.21 While the above section sets out why OBZ may be the preferred bidding zone configuration, full benefits realisation is contingent upon wider trading arrangements between GB and continental Europe. While both implicit and explicit trading can technically be configured with either HM or OBZ, explicit arrangements risk being less efficient. To the extent GB retains explicit trading arrangements, there is a risk this undermines benefits of the OBZ model. We welcome stakeholder views on how these impacts explored preferences and priority of preferences.

Explicit and implicit trading with HM and OBZ

3.22 The MRLVC CBA notes that both implicit and explicit trading would be possible under both HM and OBZ. However, despite being technically possible, the MRLVC CBA deems explicit trading arrangements under both HM and OBZ solutions to be less efficient than implicit.

3.23 The MRLVC CBA notes that MRLVC should be better, and more efficient in realising benefits of MPIs under the OBZ model, than explicit allocation. This is because explicit trading shows greater difficulty associated with correctly anticipating optimal flows, (e.g. the uncertain volume of offshore generation) and may lead to a greater risk of underutilisation of the relevant asset(s) (i.e. the MPI and/or the OWF connected to it) and adverse flows.

3.24 In the HM scenario, the OWF’s access to the GB home market will need to be calculated via a capacity calculation process which will consider a forecast of how much power the OWF will generate on the day of production. This will determine how much capacity is released (and allocated) for cross-border trading and how much is reserved for the OWF’s access to the home market. In an OBZ model, capacity on the MPI cross-border cable is allocated in accordance with the trading arrangements that are in place.

Permutations of options

3.25 Through our engagement with the industry in the UK, the following table of bidding zone configurations and trading arrangements was established in the order of preference.

Figure 4: Table with bidding zone configurations and trading arrangements.

1. Implicit trading & OBZ	• This option was identified by stakeholders as the most efficient solution for MPIs. • It combines benefits of both implicit trading and OBZ configuration.
2. Implicit trading & HM	• This option contains benefits of implicit trading, but inefficiencies and challenges of HM configuration remain, influencing the overall design. • Stakeholders argued that if there is an implicit trading available, it will be better to move to OBZ to realise full efficiency and benefits of that configuration.
3. Explicit trading & HM	• This option was identified by stakeholders as a 'fallback arrangement' in the 'status quo' scenario where there is no implicit trading available. • Nevertheless, it was identified by stakeholders as slightly better than the last option but less efficient than the one above.
4. Explicit trading & OBZ	• This option was identified by stakeholders as the least efficient combination of bidding zone configuration and trading arrangements. • This is due to operational complexities and inefficiencies of explicit trading which can be exacerbated under the OBZ.

3.26 The overwhelming consensus among the stakeholders we have engaged in recent months is that Option 1, an OBZ supported by implicit trading, would be the optimal market model for MPI projects. The ranking presented in the table reflects our current thinking, and we believe it also reflects the broad consensus among the stakeholders. However, certain stakeholders argued that Option 4, an

OBZ paired with explicit trading, would be preferable to Options 2 and 3 (i.e., the two HM options). In their view, the negatives associated with the HM model in terms of increased need for constraint management, outweighed the likely inefficiencies (i.e., increased flows against price direction and underutilisation of capacity) arising from trading over an MPI on the explicit basis.

Questions:

Q1. Do you agree with the ranking of options (OBZ-implicit, HM-implicit, HM-explicit, OBZ-explicit) presented in the table?

Q2. Do you believe that some of the permutations are not workable and should be ruled out? Why?

Q3. Which of the four options is your preferred one, and why?

Summary of findings

3.27 In summary, our initial conclusions suggest that the OBZ model supported by efficient implicit trading arrangements would provide the best market model for MPIs in terms of market efficiency, benefits for consumers and integration of renewables.

3.28 During our engagement via the MFDG, most stakeholders agreed with this position, but as with other discussions around the HM and OBZ, they conditioned it on the existence of a complete package of suitable regulatory arrangements where benefits and costs are shared between involved parties and jurisdictions.

Questions:

Q4. Under implicit trading (loose volume coupling), which bidding zone configuration (HM or OBZ) best supports:

a) market efficiency?
b) consumer benefits?
c) integration of renewables?

Q5. Under explicit trading, which bidding zone configuration (HM or OBZ) best supports:

a) market efficiency?
b) consumer benefits?
c) integration of renewables?

Transition from HM to OBZ

3.29 Given links between bidding zone configuration and trading arrangements, and in the event that implicit cross-border trading arrangements are not yet developed when MPI assets go live, we have also considered whether a transition between HM-explicit and OBZ-implicit arrangements would be possible and/or desirable.

3.30 During our engagement via MFDG, it was noted by stakeholders that transition between the two proposed market arrangements for MPIs would have different effects on involved parties and is generally not desirable.

3.31 Similar concerns were raised in feedback provided following Ofgem's April 2022 consultation. Stakeholders expressed concerns in relation to transitioning part way through the operation of an asset and the need to have certainty of regulatory regime throughout the asset life. They expressed concern that it would be difficult to amend CfD contracts (noting that this view assumed that a project was receiving CfD support), and it would create uncertainty for developers on their revenues and long-term outlooks. One respondent mentioned that a change from the HM to the OBZ model would fundamentally change the risk-reward balance for both the MPI operator and the OWF connected to such MPI asset.

3.32 We recognise these concerns but given future cross-border trading arrangements are subject to a different process, we should be open-minded on potential fallback arrangements. Therefore, we are interested in your views on the below questions.

Questions:

Q6. Do you think that a transition from HM to OBZ is possible and/or desirable?

Q7. What conditions must be met so that a transition from explicit-HM to implicit-OBZ configuration would be viable for developers?

Q8. How does this relate to other areas such as regulatory regime design or charging arrangements?

Capacity allocation and capacity calculation for MPIs under different trading timeframes

3.33 We want to hear stakeholder views on how MPIs with connected OWFs could work in practice in terms of the day-to-day operations in different market timeframes and under different bidding zone configurations and under different trading arrangements. In other words, it would be useful to understand how stakeholders see the 'trading cycle' for MPIs in both the HM and the OBZ configurations.

3.34 We acknowledge that the future cross-border trading arrangements are not yet fully developed, nevertheless we see benefits in starting to think conceptually about capacity allocation and calculation issues (and also how existing capacity allocation and calculation mechanisms might need to adapt to accommodate MPIs with connected OWFs).

Day-ahead

3.35 Capacity calculation process usually takes place in D-2 timeframe and is followed by capacity allocation in D-1, when available capacity is allocated by either explicit auctions, or is made available for a market coupling operator, e.g. a Power Exchange, to be implicitly auctioned.

3.36 We understand that in the HM-explicit arrangements, capacity calculation process will need to account for a reserved capacity for an OWF based on D-2 wind forecasts. Then, the remaining capacity, accounting for any restrictions for system security, will be allocated for cross-border trade via explicit auction held by the MPI operator. We are currently unclear on whether the OWF might need to bid into capacity auctions in day-ahead stage (or only in intraday to refine their positions) or on what basis the capacity will be 'reserved' in practice.

3.37 On the other hand, we understand that in an OBZ-implicit configuration, capacity calculation will be performed, taking into account any restrictions for system security, as it is done today. However, the capacity allocation process will be performed via a market coupling operator and optimised, including flows volumes and directions, using algorithms. In this case, OWFs will be treated as any other market participant and will be bidding into day-ahead wholesale markets, and the whole capacity on the line will be allocated via cross-border trading arrangements.

Intraday and long-term

3.38 We believe that intraday market will be important in terms of correcting positions of market participants, especially given the nature of wind generation which is difficult to forecast accurately. This will also improve the efficiency of the use of the interconnector cable part of an MPI asset. Although development of intraday cross-border market arrangements is required by the TCA, the day-ahead is currently the priority. Nevertheless, we believe that it is appropriate to begin discussions on what trading arrangements will facilitate best outcomes in terms of market efficiency, benefits for consumers and integration of renewables. We are interested to understand whether explicit auctions in intraday (under both HM and OBZ configurations) will facilitate these corrections of market participants positions (including for OWFs).

3.39 Long-term capacity allocation is important hedging tool for market participants today. This can be done by auctioning either PTRs or FTRs. We are interested to understand your views on which of the tools will be most valued by market participants and what that might mean for OWFs connected to MPIs (under both HM and OBZ scenarios).

Questions:

Q9. How do you envisage long-term, day-ahead and intraday trading arrangements working for MPIs under both HM-explicit and OBZ-implicit scenarios? Can explicit capacity allocation work with OBZ configuration, if yes how?

Q10. What are your views on using either PTRs or FTRs in the long-term timeframe? Will OWFs have an active role in long-term capacity allocation?

Q11. Which timeframe is the most vital/relevant for MPIs and why?

Q12. Are there any improvements to commonly understood trading models (explicit trading or implicit price or volume coupling) that can be made to better facilitate efficient market arrangements for MPIs?

4. Support schemes for OWFs under OBZ market model

Chapter summary

This chapter explores ways of compensating OWFs for projected lower revenues earned under an OBZ set-up. This includes either redistributing congestion income from an MPI owner to the connected OWF or amending well-known support mechanisms for OWFs such as the Contracts for Difference (CfDs) scheme. This chapter is closely linked with the parallel Ofgem consultation on licensing, regulatory regime design and charging arrangements as a combination of support schemes for OWFs and bidding zone configuration will impact some of the regulatory regime design options presented in that consultation.

Any decision to amend/update current support schemes for OWFs to accommodate OWFs connected to MPIs (and to accommodate OBZ set-up) lies with the Department for Energy Security and Net Zero. Stakeholder involvement and responses to questions in this chapter will be vital in progressing policy development both in terms of regulatory regime design and potential future amendments to the CfD scheme.

Contracts for Difference (CfDs)

Traditional CfDs

4.1 The CfD scheme is the Government's current mechanism for supporting low-carbon electricity generation in GB. CfDs are 15-year private law contracts between low-carbon electricity generators and the Low Carbon Contracts Company, a government-owned company that is operationally independent. CfDs provide income stabilisation for the generator (thereby making projects more attractive to investors and lenders), but also provide protection to the consumer when electricity prices are high.

4.2 CfDs were introduced to support deployment of renewable technologies through competitive auctions. CfD contracts guarantee a price for the electricity generated. This price is called the 'strike price'. The generator sells power in the market but also receives a 'top-up' payment to a pre-agreed 'strike price' as a result of a competitive process. When the wholesale market price is below the 'strike price', a top up is paid. The CfD does not pay for the electricity itself, but just pays the difference. When the reference price exceeds the strike price, the generator pays back the difference.

CfDs: Considerations for market arrangements for MPIs

4.3 Access to CfDs has been raised as a significant consideration for OWFs connecting to an MPI, as OWF developers have stated that uncertainty over CfD access is a key blocker to progressing with MPI coordination.

4.4 There are two key challenges regarding CfD access and market arrangements for MPIs. The first relates to eligibility for MPI-OFW projects and the second surrounds loss of revenue for the OFW in an OBZ scenario[37].

4.5 Currently, MPI-OWFs are not eligible to apply for a CfD. This question of eligibility was posed to stakeholders in the Government's recent consultation ('*Considerations for* future *CfD rounds)*' where views were sought on whether MPI-OWFs should be eligible to apply for a CfD, and what changes would be needed to allow participation in the scheme[38]. Much of the stakeholder feedback from this consultation was positive on the future role of MPIs in the CfD. Nonetheless we note that there are a number of considerations and challenges involved with participation of MPI-OWF projects in the CfD [and not all of these were explored in as much detail as this consultation]. Further information and details will be provided by the Department for Energy Security and Net Zero in its response to their CfD consultation, which is expected to be published in spring/early summer 2023.

4.6 As mentioned above, CfD contracts guarantee OWFs a price for the electricity they generate. This price is called the 'strike price' and is set through a competitive allocation process. For intermittent renewable generators, such as OWFs, the strike price is linked to the GB day-ahead wholesale market price, this is known as the 'reference price'.

4.7 In a HM model, assuming eligibility for MPI-OWFs assets, the CfD contract would function as per the status quo for radial OWF projects (Figures 5 and 6). This is due to priority access which ensures that GB OWFs are able to access the GB wholesale market, and subsequently trade at the GB wholesale market price.

4.8 In an OBZ model, OWFs receive the lowest price of the two bidding zones they are coupled with (see the previous chapter for more details on why this is the case). In an exporting scenario (i.e., when cross-border flow over an MPI is in the direction from GB to connected jurisdiction and power from the OWF is aligned

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[37] A Multi-Purpose Interconnector Offshore Wind Farm (MPI-OWF), refers to a wind farm that connects directly to an MPI.

[38] https://www.gov.uk/government/consultations/considerations-for-future-contracts-for-difference-cfd-rounds

with that flow), this still means that, assuming eligibility, the CfD scheme/a CfD contract will still function as per the status quo as GB will be the lower of the two prices. OWFs will therefore have a GB reference price resulting in them achieving the same strike price as radial OWFs (Figure 7).

4.9 However, this is not the case in an importing scenario (i.e., when cross-border flow over an MPI is in the direction towards GB from connected jurisdiction and power from the OWF is aligned with that flow) as the lower price of the two bidding zones will be the EU market price. This is the second key challenge regarding CfD access and market arrangements for MPIs. As the lower priced bidding zone is the price that OWFs will receive, this is their reference price for the CfD resulting in a revenue gap (compared to OWFs operating in the GB home market) even with a CfD top-up (that would be based on the GB market price) as their strike price will not be achieved (Figure 8).

Figure 5: HM scenario – exporting.

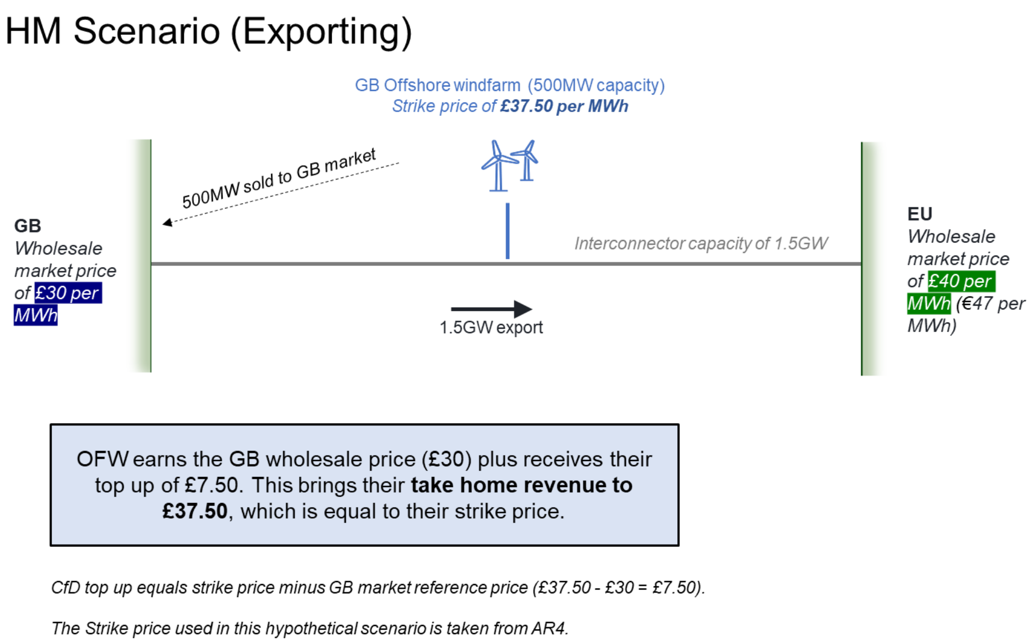


Figure 6: HM scenario – importing.

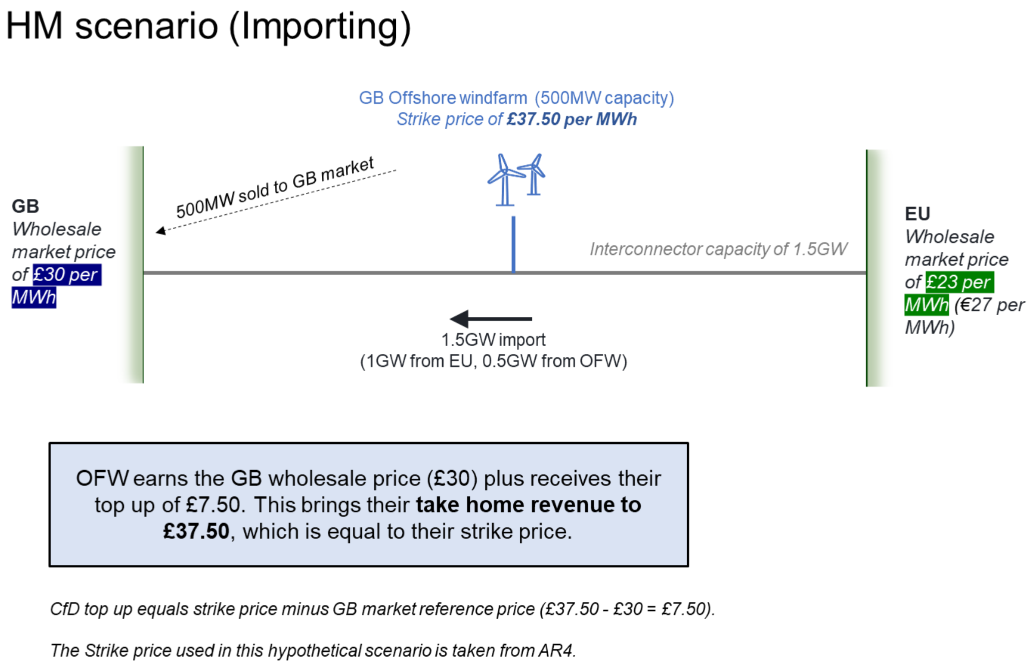


Figure 7: OBZ scenario – exporting.

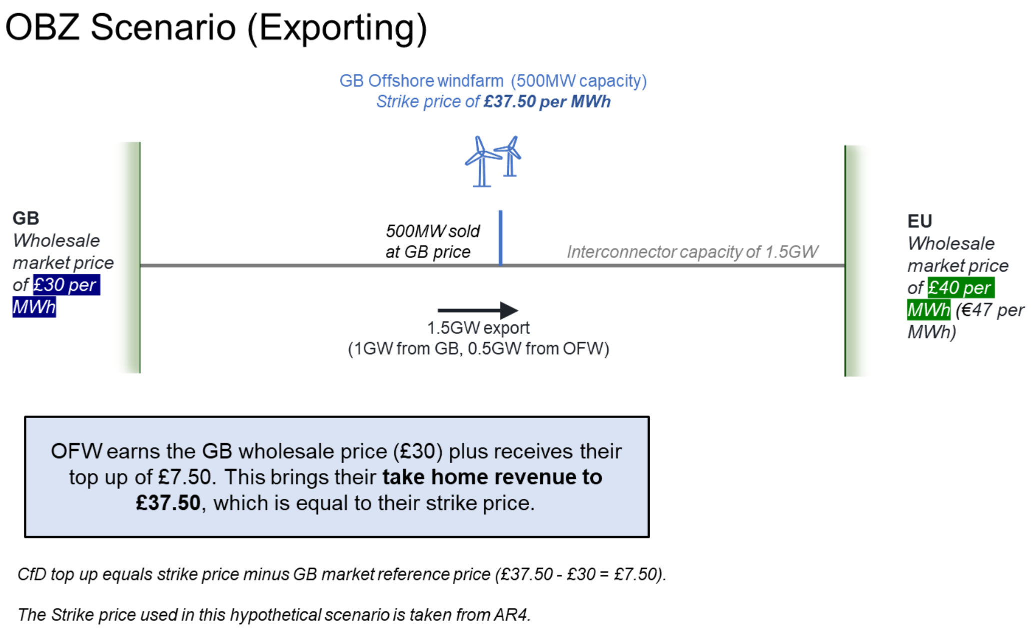
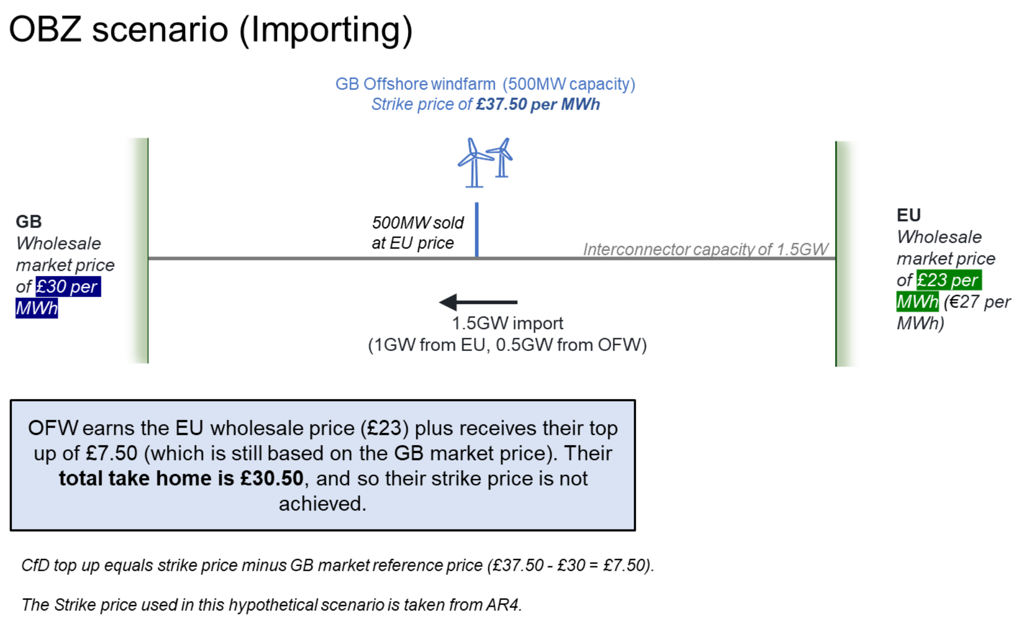


Figure 8: OBZ scenario – importing.



CfDs: Next Steps

4.10 The Government is supportive of coordination and recognises that projects are exploring ambitious solutions to achieve a more coordinated approach. The Government is keen that the CfD scheme works to support coordination and we acknowledge the positive sentiment from stakeholder engagement surrounding the inclusion of OWFs connected to MPIs in the CfD scheme. The Government will continue to consider the question of eligibility for future allocation rounds beyond Allocation Round 6 (due to open in 2024), noting some of the key considerations, including the revenue issues in an OBZ scenario. Further information will be provided in the Government response to its *'Considerations for future CfD rounds'* consultation, expected in spring/early summer 2023.

Congestion income redistribution

4.11 An alternative to CfDs, as a measure to compensate OWFs for lower revenues under the OBZ, is redistribution of congestion income between the MPI operator and the OWF.

Congestion income

4.12 Congestion between two bidding zones arises when the demand for transmission of electricity exceeds the physical capacity of transmission lines. As the difference in supply and demand in the two bidding zones cannot be evened out, the two markets clear at different prices. Congestion income is thus the revenue earned by traditional point-to-point interconnectors as they capture the spread between the two markets.

4.13 Congestion income accrues as market forces drive energy flows from less to more expensive market areas/bidding zones. Under implicit trading arrangements, in day-ahead and intraday trading timeframes, the amount earned by IC TSOs is equal to the price difference between the two markets (i.e. the price spread) multiplied by allocated capacity.

4.14 Under explicit trading arrangements, however, IC TSOs revenues come from auctioning the capacity on the interconnector itself. It is also worth noting that additional revenue is available from auctioning PTRs or FTRs in long-term auctions.

Ex-ante and ex-post redistribution

4.15 We are aware that in the EU, there has been consideration of compensating OWFs for lower prices received under an OBZ by redistributing congestion income from TSOs to OWFs. There appears to be two ways of doing this: ex-ante (via pre-allocating FTRs) and ex-post (via redistributing congestion income based on actual generation and price difference between HM and OBZ). The latter approach is also explored in GB under the concept of Wind Adjusted Financial Transmission Rights (WAFTRs)[39].

4.16 Ex-ante approaches aim to redistribute the congestion income to OWFs through preferential (or potentially free) allocation of FTRs to the OWF by the MPI operator (e.g. via auctions or direct allocation of a portion of FTRs).

4.17 During our engagement via the MFDG, stakeholders challenged this arrangement due to uncertainty over the timings of allocations, and how the volume of FTRs would be determined and allocated. Some stakeholders also noted that under this arrangement OWFs might be incentivised to participate in LTTRs market, and further noted that if FTRs are awarded to OWFs, then this could reduce long-term hedging opportunities available for other market participants.

4.18 In response to EC's initial analysis of this option, European Network of Transmission System Operators for Electricity (ENTSO-E) explained that in their view ex-ante allocation of FTRs under preferential conditions would violate FCA

[39] A WAFTR compensates OWFs for the relative disadvantage of operating in an OBZ by providing them with the revenue equivalent to the HM model. Under this model, an OWF would receive the congestion revenue from the MPI cable equal to its generation output, and only do so when congestion revenue has accrued on the cable connecting the OWF to the GB shore.

Regulation, that LTTRs could either over- or under-compensate OWFs, that it will be difficult to determine exact volumes of FTRs to allocate and that length of pay-out might be a point of concern (FTRs are usually auctioned one year ahead, while OWFs require long-term revenue stability)[40].

4.19 Ex-post approaches aim to redistribute congestion income directly to OWFs through re-allocation of the portion of congestion income equal to the difference between OWFs revenues in OBZ compared to HM configuration, based on actual generation. This is envisaged to be applied on top of a traditional CfD mechanism.

4.20 During our engagement via the MFDG, stakeholders highlighted that congestion income is earned in market timeframes that precede the actual generation output (i.e. day-ahead and intraday), thus there may be a substantial difference between the actual volume of generation of an OWF (used to determine congestion income re-allocation to the OWF) and congestion earned by an MPI operator. Stakeholders also raised a potential issue of currency exchange risk and discrepancy (OWFs receiving traditional CfDs in GBP, while congestion income being calculated in EUR). However, this might also be the case in other support schemes examined.

4.21 In response to EC's initial analysis of this approach, ENTSO-E challenged it as well by saying that "*reallocating congestion income would potentially be based on arbitrary and non-market-based principles*". ENTSO-E quoted Article 19 (see below) of EU Electricity Regulation and Article 59 of Electricity Directive 2019/944 (no cross-subsidisation between transmission and other electricity activities), saying that this approach will not be compatible with these provisions[41].

4.22 Furthermore, it is worth noting that similar challenges exist under our domestic legal framework for the potential introduction of congestion income redistribution (also identified by e.g. ENTSO-E's paper). Article 19 of the Retained Electricity Regulation restricts the use of congestion revenue from interconnectors for specific uses, and these restrictions also apply in the EU Member States[42]. We note that on 14 March 2023, the EC published a proposal to reform the EU

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[40] ENTSO-E Position Paper on Offshore Development: Assessing Selected Financial Support Options for Renewable Generation

[41] EU Electricity Regulation: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0943
Electricity Directive: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L0944

[42] The existing wording of Article 19 (Congestion income) of the EU Electricity Regulation. Link: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32019R0943.

electricity market design[43], including Article 19, to allow interconnectors to share congestion revenue with OWFs, in cases where the OWF operating in an OBZ would be curtailed[44]. The EC's proposed changes to Article 19 are to be discussed and agreed by the European Parliament and the Council. Therefore, the final extent of amendments to Article 19 is currently uncertain, and we cannot confirm these amendments would enable congestion revenue sharing solutions such as those mentioned above to take place.

4.23 Since both of the above approaches were challenged, e.g. by ENTSO-E as mentioned above, it is our understanding that the current EC's preference is to use two-way CfDs or Purchase Power Agreements (PPAs) as a default support mechanisms for OWFs, while still proposing to use congestion income to compensate OWFs for curtailment (so-called Transmission Access Guarantees – TAGs).

Questions:

Q13. Do you agree that OWFs should be compensated for a loss of revenue in OBZ compared to HM? Where should this come from? Should it come from the congestion revenue from the MPI cable derived from cross-border trade?

Q14. How could the existing CfD scheme be changed to support OWFs connected to MPIs, especially considering OBZ market model? How would you envisage this scheme to work?

Q15. Are there any other alternative approaches that we have not considered that would better incentivise an OWF to connect to an MPI?

Q16. How do charging arrangements relate to the considerations on support schemes for MPIs, especially under the OBZ scenario?

[43] https://ec.europa.eu/commission/presscorner/detail/en/IP_23_1591

[44] The proposed legislative changes to Article 19 are contained in Article 1(8)(b) of the proposal for a Regulation of the European Parliament and of the Council amending Regulations (EU) 2019/943 and (EU) 2019/942 as well as Directives (EU) 2018/2001 and (EU) 2019/944 to improve the Union's electricity market design, COM(2023) 148 final. Link: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52023PC0148

5. Operability and other issues

Chapter summary

This chapter explores interactions of the HM and OBZ configurations in the context of system operability and curtailment. We recognise that these topics are currently being explored by National Grid Electrical System Operator (NGESO), the system operator in GB, therefore in this chapter we are presenting some preliminary and high-level thinking based on engagement via the MFDG.

We will explore these issues, where appropriate, in subsequent engagements, but we are keen to hear your early views on operability of MPIs.

Operability and curtailment

5.1 NGESO has been working to understand which options for cross-border balancing and system operability and curtailment and compensation for MPIs are feasible and economically efficient. We will continue to closely monitor this work.

Operability in the context of HM and OBZ

5.2 The innovative nature of MPI projects will require changes to how assets are managed and will impact on system operability. On a governance level, it may be possible to utilise many existing governance arrangements, with some amendments. Likewise on a technical level, conditions imposed by industry codes may also need to be reviewed.

5.3 The system operator will need to adapt to a shift in OWFs being connected to DC networks via offshore platforms and accommodate the two separate activities that potentially require two sets of operational and balancing arrangements. Parties may need to develop more complex contractual arrangements that depart from the current model used for interconnectors.

5.4 We believe that the full impact on system operability will depend on which market arrangements we proceed with. For example, under the HM model, OWFs would need priority access meaning that forecast output will need to be considered within the capacity calculation process and have to be accounted for by system operator. Stakeholder feedback on this issue was mixed, and we are therefore seeking to understand further effects/interactions of the HM and the OBZ models on operability.

5.5 Challenges linked to MPIs extend beyond capacity allocation and calculation: the final design will need to consider imbalance settlements, balancing activities and the provision of ancillary services. We understand that trying to combine these actions for the two separate activities may result in some deviation from existing contractual and delivery arrangements. There are currently two proposals on how to tackle contractual (and thus technical) arrangements – i.e., the system operator having a relationship with both the MPI operator and the OWF via the MPI operator or having independent relationships with both parties.

5.6 For example, by keeping the two elements independent for operating purposes, retaining separate commercial and operational relationships, OWFs could potentially continue to be separate units under the balancing mechanism, be separately metered and provide balancing services direct to system operator. In such a scenario, the system operator would utilise the services it has with the generator to amend output, with DC network control systems of the interconnector component configured to adapt to such instructions. To amend cross-border flows on the MPI, the system operator would engage with the MPI operator, similar to how it currently does with existing point-to-point interconnectors. On the other hand, by having contractual agreements only with the MPI operator, the system operator could perhaps manage the OWF outputs via the MPI operator who in turn would have appropriate contractual agreements with the OWF.

Curtailment and compensation

5.7 A further complication to the operability of MPIs arises from curtailment and related compensation payments. Existing point-to-point interconnectors can be optimised for system security reasons via various tools and associated codes/methodologies.

5.8 However, in the case of an MPI and an OWF connected to it, there are two separate activities, i.e. one carried out by the OWF (generation) and one carried out by the MPI operator (transmission/interconnection). For this reason, when taking into account the dual activity of an MPI it has to be considered how the system operator restricts the capacity of the MPI asset, for the system security reasons, where it would, in turn, have an impact on the output of the OWF connected to this MPI. It might require the transfer of compensation through to the OWF for the restrictions placed on it, which may in turn have interactions with existing balancing mechanism/ancillary services compensation mechanisms. This also links with considerations in the previous sub-section of this chapter – i.e., the system operator having a relationship with both the MPI operator and the OWF via the MPI operator or having independent relationships with both parties.

Questions:

Q17. Does the chapter on operability capture the key topics that should be included when considering the impact of market arrangement models on system operability? Are there other important implications that need to be considered?

Q18. Do you have any views on how curtailment and compensation might work under both HM and OBZ configurations?

Q19. Do you have any comments on how balancing might work under both HM and OBZ models?

Q20. What are your views on contractual agreements that will need to be established between the system operator, MPI operator and an OWF? Do they differ depending on HM or OBZ configuration?

6. Next Steps

6.1 This consultation will remain open for six weeks for written responses. Following the closure of the consultation, we will review your responses.

6.2 Thereafter, we are aiming to publish a policy recommendation, primarily on the direction of travel in terms of favouring HM or OBZ.

6.3 We expect that further detailed work will be required once this critical question is answered.

6.4 We will continue to engage with the industry via the MFDG and other forums and will closely monitor developments in related policy areas.

Appendix 1 – List of all questions

Questions:

Q1. Do you agree with the ranking of options (OBZ-implicit, HM-implicit, HM-explicit, OBZ-explicit) presented in the table?

Q2. Do you believe that some of the permutations not workable and should be ruled out? Why?

Q3. Which of the four options is preferred, and why?

Q4. Under implicit trading (loose volume coupling), which bidding zone configuration (HM or OBZ) best supports:

a) market efficiency?

b) consumer benefits?

c) integration of renewables?

Q5. Under explicit trading, which bidding zone configuration (HM or OBZ) best supports:

a) market efficiency?

b) consumer benefits?

c) integration of renewables?

Q6. Do you think that a transition from HM to OBZ is possible and/or desirable?

Q7. What conditions must be met so that a transition from explicit-HM to implicit-OBZ configuration would be viable for developers?

Q8. How does this relate to other areas such as regime design or charging arrangements?

Q9. How do you envisage long-term, day-ahead and intraday trading arrangements working for MPIs under both HM-explicit and OBZ-implicit scenarios? Can explicit capacity allocation work with OBZ configuration, if yes how?

Q10. What are your views on using either PTRs or FTRs in the long-term timeframe? Will OWFs have an active role in long-term capacity allocation?

Q11. Which timeframe is the most vital/relevant for MPIs and why?

Questions (continued):

Q12. Are there any improvements to commonly understood trading models (explicit trading or implicit price or volume coupling) that can be made to better facilitate efficient market arrangements for MPIs?

Q13. Do you agree that OWFs should be compensated for a loss of revenue in OBZ compared to HM? Where should this come from? Should it come from the congestion revenue from the MPI cable derived from cross-border trade?

Q14. How could the existing CfD scheme be changed to support OWFs connected to MPIs, especially considering OBZ market model? How would you envisage this scheme to work?

Q15. Are there any other alternative approaches that we have not considered that would better incentivise an OWF to connect to an MPI?

Q16. How do charging arrangements relate to the considerations on support schemes for MPIs, especially under the OBZ scenario?

Q17. Does the chapter on operability capture the key topics that should be included when considering the impact of market arrangement models on system operability? Are there other important implications that need to be considered?

Q18. Do you have any views on how curtailment and compensation might work under both HM and OBZ configurations?

Q19. Do you have any comments on how balancing might work under both HM and OBZ models?

Q20. What are your views on contractual agreements that will need to be established between the system operator, MPI operator and an OWF? Do they differ depending on HM or OBZ configuration?

Appendix 2 – Privacy notice on consultation

Personal data

The following explains your rights and gives you the information you are entitled to under the General Data Protection Regulation (GDPR).

Note that this section only refers to your personal data (your name address and anything that could be used to identify you personally) not the content of your response to the consultation.

1. The identity of the controller and contact details of our Data Protection Officer.

The Gas and Electricity Markets Authority is the controller, (for ease of reference, "Ofgem"). The Data Protection Officer can be contacted at dpo@ofgem.gov.uk

2. Why we are collecting your personal data.

Your personal data is being collected as an essential part of the consultation process, so that we can contact you regarding your response and for statistical purposes. We may also use it to contact you about related matters.

3. Our legal basis for processing your personal data.

As a public authority, the GDPR makes provision for Ofgem to process personal data as necessary for the effective performance of a task carried out in the public interest. i.e. a consultation.

4. With whom we will be sharing your personal data.

All or some of your personal data will be shared with the Department for Energy Security and Net Zero since it is a joint consultation.

5. For how long we will keep your personal data, or criteria used to determine the retention period.

Your personal data will be held for 3-5 years after the consultation is closed.

6. Your rights.

The data we are collecting is your personal data, and you have considerable say over what happens to it. You have the right to:

- know how we use your personal data,
- access your personal data,
- have personal data corrected if it is inaccurate or incomplete,
- ask us to delete personal data when we no longer need it,
- ask us to restrict how we process your data,
- get your data from us and re-use it across other services,

- object to certain ways we use your data,
- be safeguarded against risks where decisions based on your data are taken entirely automatically,
- tell us if we can share your information with 3rd parties,
- tell us your preferred frequency, content and format of our communications with you, and
- to lodge a complaint with the independent Information Commissioner (ICO) if you think we are not handling your data fairly or in accordance with the law. You can contact the ICO at https://ico.org.uk/, or via telephone at 0303 123 1113.

7. Your personal data will not be sent overseas.

8. Your personal data will not be used for any automated decision making.

9. Your personal data will be stored in a secure government IT system.

10. More information.

For more information on how Ofgem processes your data, click on the link to our "Ofgem privacy policy promise".