

Decision

Interconnector Policy Review: Decision

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This document sets out our decisions and next steps for the review of our regulatory policy for interconnectors and the cap and floor regime.

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Foreword

To meet the net zero ambitions, the energy system is expected to undergo a number of profound changes. In the offshore space, we expect that a substantial amount of generation assets, and their connection cables, will be deployed off the GB coastline in line with the Government's ambition of deploying up to 40GW of offshore wind by 2030.

Our interconnector policy review is a key programme for Ofgem. We believe that interconnection will play an important role in the energy system of the future, and therefore continuing to improve and develop the regulatory framework, underpinning investments in these projects, is extremely important. We welcome the collaborative engagement of the huge number of stakeholders that have contributed to this work.

Following our review, in the near-term we plan to open a targeted cap and floor application window in mid-2022 to allow projects to come forward. This is in line with the Government ambition to deliver at least 18GW of interconnection capacity by 2030 as set out in the December 2020 Energy White Paper. As the energy system evolves and interconnector capacity increases, the role interconnectors play in the energy system is changing. We therefore want to ensure that our application framework brings forwards the right projects, in the right locations, at the right time for consumers when thinking about the GB energy system.

In the longer term we see benefit in regular and targeted investment windows for interconnectors, including multi-purpose interconnectors (MPIs), informed by analysis that is integrated within whole-system planning processes. It is therefore vital that we start taking a system wide approach in the planning of these assets, to ensure they are delivered where and when needed.

We believe MPIs are a key piece of the decarbonisation puzzle, and we are actively tackling some of the key barriers that have so far prevented these projects from being built. Therefore, we are pleased to announce that we will launch a dedicated cap and floor pilot scheme for near term MPI projects.

We look forward to continuing to work with developers and industry to regulate and enable the next generation of interconnector projects, which can play a vital role in helping transform our energy system and make an important contribution to achieving our net zero ambitions.

Akshay Kaul, Networks Director, Ofgem

December 2021

Executive summary

In August 2020, Ofgem launched a review of its regulatory policy and approach to new electricity interconnectors. This review supports our ambition to enable investment in low carbon infrastructure at a fair cost for GB consumers¹ as outlined in our Forward Work Programme and supports action 3 of the decarbonisation action plan to have more effective coordination in the delivery of low-cost offshore networks.²

The objectives of the review were two-fold: firstly, to establish whether there is a need for further GB interconnection capacity beyond those projects currently with regulatory approval; and secondly to consider Ofgem’s approach to the regulation of future GB interconnection.

This paper sets out our decisions against the objectives of the policy review and provides clarity for stakeholders on the next steps for GB interconnector regulation. This decision brings together key elements of the four workstreams³ of the interconnector policy review³ to set out our vision for GB interconnector regulation in the future, and the changes that we will make to the cap and floor regime for future projects. In doing so it takes into consideration a considerable amount of internal analysis, feedback through targeted stakeholder engagement, formal consultation, and a stakeholder workshop.

The key take-aways of the interconnector policy review are as follows:

- We will open our third cap and floor application window in mid-2022. This will be a locationally targeted window for interconnectors that are able to connect by 2030. We will also implement some changes to our cap and floor regime framework and design to ensure that it reflects the changing role of interconnectors in the energy system, it works equally for all market participants, and it continues to protect consumers’ interests.
- Alongside our third cap and floor application window for interconnectors, we will run a pilot cap and floor scheme for MPIs. We consider that MPIs could potentially deliver significant benefits and are also an important component for the delivery of

¹ [Forward work programme 2021/22 | Ofgem](#)

² [Ofgem’s Decarbonisation Action Plan | Ofgem](#)

³ Workstream 1: Review of the cap and floor regime to date, Workstream 2: Socio-economic modelling, Workstream 3: Review of the wider impacts of interconnection, and Workstream 4: Multiple Purpose Interconnectors

government objectives, such as 40GW of offshore wind by 2030. We, therefore, think it is important to ensure that there is a regulatory pathway to maintain momentum on the development of these assets.

- In the long term, we want interconnector planning to be integrated within strategic network planning, with regular outputs informing future investment windows. The tools and processes for strategic network planning are still being designed, and we will continue to work with the relevant teams within Ofgem, the Department for Business, Energy and Industrial Strategy (BEIS) and the Electricity System Operator (ESO) to ensure that interconnectors are factored into the development of future planning frameworks.

This document sets out in further detail our decisions on the interconnector policy review in relation to its objectives. It also sets out our plan for GB interconnector regulation in the future and provides clarity for stakeholders on the next steps in both the near and long term.

Following the publication of this document there will be an implementation period during which we will finalise and implement the details of the decisions set out. We have welcomed the extensive engagement with stakeholders throughout the interconnector policy review to date, and we look forward to continued engagement with stakeholders as we implement its outcomes.

1. Introduction

Context

1.1. Electricity interconnectors are the physical links that allow the transfer of electricity across borders. The cap and floor regime is the regulated route for electricity interconnector developers in Great Britain. We decided to roll out the cap and floor regulatory regime to new near-term electricity interconnectors in August 2014 to incentivise the delivery of further cross-border infrastructure.

1.2. Before the cap and floor regime was introduced, a limited number of electricity interconnectors had been either built or proposed: IFA (2GW) to France, Moyle (0.5GW) to Northern Ireland, BritNed (1GW) to the Netherlands, and the East West interconnector (0.5GW) to the Republic of Ireland. These interconnectors were mostly developed as standalone projects on a merchant basis.

1.3. We recognised that there was benefit in further interconnection and therefore a need to develop a regulated regime for electricity interconnectors to incentivise further development. We proposed a cap and floor regime initially for the Nemo Link interconnector (1GW) to Belgium in 2013⁴, and more broadly as an enduring regime in 2014.⁵

1.4. We have subsequently held two cap and floor application windows in 2014 and 2016 and have awarded a cap and floor regime in principle to nine interconnectors totalling 10.9GW in cross-border capacity. If all these projects go ahead, alongside existing interconnectors and approved projects under development on a merchant basis, GB interconnection capacity could increase to 15.9GW.

⁴ Cap and floor Regime for Regulated Electricity Interconnector Investment for application to project NEMO (2013): <https://www.ofgem.gov.uk/publications-and-updates/cap-and-floor-regime-regulated-electricityinterconnector-investment-application-project-nemo>

⁵ Decision to roll out a cap and floor regime to near-term electricity interconnectors (2014): <https://www.ofgem.gov.uk/publications-and-updates/decision-roll-out-cap-and-floor-regime-near-term-electricityinterconnectors>

1.5. In August 2020, we decided to review our regulatory policy and approach ahead of any further cap and floor application windows to ensure that both further interconnection and the regulatory framework for delivery remain in consumers’ best interests.⁶

1.6. We also undertook our review in the context of the Government’s net zero target for carbon emissions by 2050. In December 2020, BEIS published its Energy White Paper⁷ setting out how the UK will clean up its energy system to reach net zero. In the paper, BEIS committed to working with Ofgem, developers and European partners to realise at least 18GW of interconnector capacity by 2030. In addition, the 6th Carbon Budget highlights the role of interconnection in helping to facilitate a more flexible energy system to meet net zero targets.⁸

1.7. Since we launched our policy review in August 2020 and our four working paper consultations in Summer 2021, there have been developments in associated policy areas and further clarity on the UK’s approach to delivering net zero ambitions. In October, the Government published its net zero Strategy⁹ which sets out how the UK will meet its legislated goal of net zero emissions by 2050, including the delivery of a decarbonised power system by 2035. The commitments set out in the strategy provide weight to our messaging about the importance of understanding the full range of impacts of interconnection and ensuring that interconnectors are integrated within strategic network planning.

1.8. In our working paper consultations, we referred to a number of other relevant Ofgem and government projects; these have also progressed since our consultations. In July 2021, we launched a consultation on the changes intended to bring about greater coordination in the development of offshore energy networks under the Offshore Transmission Network Review (OTNR).¹⁰ The outcome of this consultation will have

⁶ Open letter: Notification to interested stakeholders of our interconnector policy review (2020): https://www.ofgem.gov.uk/system/files/docs/2020/08/open_letter_-_interconnector_policy_review.pdf

⁷ Energy white paper: Powering our net zero future: <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future>

⁸ Sixth Carbon Budget, Climate Change Committee: <https://www.theccc.org.uk/publication/sixth-carbon-budget/>

⁹ Net Zero Strategy: Build Back Greener: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf

¹⁰ Consultation on changes intended to bring about greater coordination in the development of offshore energy networks: <https://www.ofgem.gov.uk/publications/consultation-changes-intended-bring-about-greater-coordination-development-offshore-energy-networks>

implications on our next steps with respect to interconnector planning and MPIs. In November 2021, we published a consultation on the initial findings of our Electricity Transmission Network Planning Review (ETNPR), which looks at how to plan efficiently and progress strategic network investments in a holistic way. We will continue to work with colleagues in Ofgem, BEIS, and the ESO as these workstreams progress.

Scope of the review and this decision

1.9. The interconnector policy review was launched with an open letter to interested stakeholders in August 2020. The primary objective of the review was to establish whether there is a need for further GB interconnection capacity beyond those projects currently with regulatory approval. If so, the secondary objective of this review was to consider Ofgem’s approach to the regulation of future GB interconnection.

1.10. We decided to deliver this review through four workstreams (WS):

- WS1 – Review of the cap and floor regime to date
- WS2 – Socio-economic modelling
- WS3 – Review of the wider impacts of interconnection
- WS4 – Multiple Purpose Interconnectors (MPIs)

1.11. This document pulls together our work across each of the four policy workstreams. It reiterates the key messages that were presented in those workstreams and sets out how they relate to the stated objectives of the policy review. The document also sets out how we will respond to those key messages by providing clarity for stakeholders on the next steps for GB interconnector regulation in both the near- and long-term.

Related publications

1.12. Related publications for this decision are listed below:

[Open letter: Notification to interested stakeholders of our interconnector policy review | Ofgem](#) (Published: 12 August 2020)

[Interconnector policy review: Working paper for Workstream 1 – review of the cap and floor regime | Ofgem](#) (Published: 18 June 2021)

[Interconnector policy review: Working paper for Workstream 2 – socio-economic modelling | Ofgem](#) (Published: 18 June 2021)

[Interconnector policy review: Working paper for Workstream 3 - wider impacts of interconnection | Ofgem](#) (Published: 30 June 2021)

[Interconnector policy review: Working paper for Workstream 4 - multiple purpose interconnectors | Ofgem](#) (Published: 30 June 2021)

[Consultation on changes intended to bring about greater coordination in the development of offshore energy networks | Ofgem](#) (Published: 14 July 2021)

[Consultation on proposals for a Future System Operator role | Ofgem](#) (Published: 21 July 2021)

[Cap and Floor Regime Handbook | Ofgem](#) (Published: 17 September 2021)

[Consultation on the initial findings of our Electricity Transmission Network Planning Review | Ofgem](#) (Published: 5 November 2021)

Our decision-making process

1.13. As discussed in our August 2020 open letter, we decided to use a targeted engagement approach to the interconnector policy review in order to maximise value from stakeholder input. We invited interested stakeholders to notify us of their interest for each of the four policy review workstreams and subsequently engaged with them through the workstream groups and stakeholder forums. We noted interest from 67 participants, representing 45 organisations that included interconnectors developers, transmission

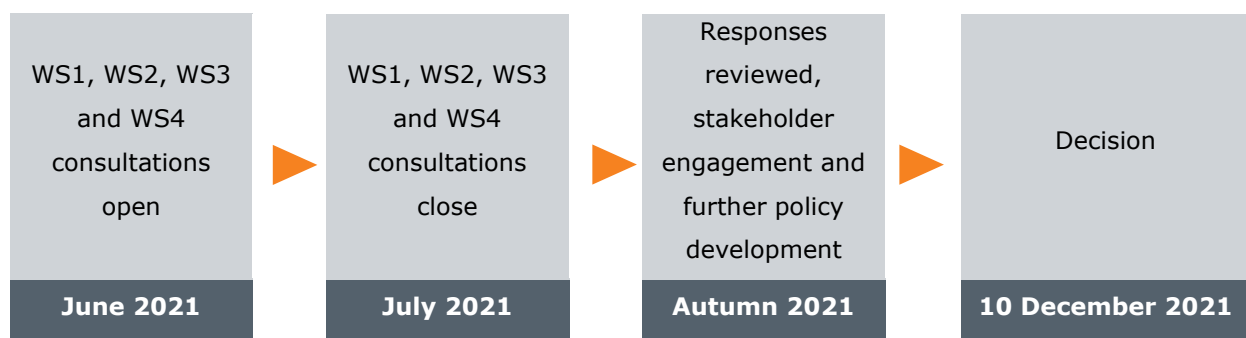
system operators, independent generators, potential lenders, industry advisors, financial and technical advisors, and trade bodies. Our targeted engagement took place between October 2020 and June 2021, and included calls for evidence, the sharing of ideas, and early feedback on analysis. The input from targeted stakeholder engagement was subsequently used to inform our positions at consultation stage.

1.14. We consulted on our minded-to positions for workstreams 1, 2, 3 and 4 in the summer of 2021. This enabled us to present our analysis, findings, and provisional recommendations from each workstream to industry for feedback and views. We received a good level of feedback across the workstreams with 53 responses submitted in total. We have taken those responses into consideration in this document and have summarised feedback in Section 5 of this document.

1.15. Our consultations covered most aspects of future interconnector regulation. However, we are mindful that they did not present a single picture for our preferred approach. In response to feedback on our initial proposals we have brought the various elements of the workstreams together into a coherent vision for GB interconnector regulation in the future. We tested this vision at a workshop on 4 November 2021 to which all stakeholders that noted interest in the interconnector policy review were invited and 61 external stakeholders attended. Whilst feedback was generally supportive, this workshop provided us with useful insight into areas of our approach that needed further clarity or improvement.

1.16. This document sets out a number of decisions on interconnection regulation in GB in the future, and details on the next steps Ofgem will undertake to implement those decisions following the review.

Figure 1: Decision-making stages



Your feedback

1.17. We believe that consultation is at the heart of good policy development. We are keen to receive your comments about this document. We'd also like to get your answers to these questions:

1. Do you have any comments about the overall quality of this document?
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. Are its conclusions balanced?
5. Did it make reasoned recommendations?
6. Any further comments?

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

2. Future of GB interconnector regulation

Section summary

In this section we set out our response to the key messages of the interconnector policy review, presenting our vision for GB interconnector regulation in both the near-term and long-term. We think that further interconnection is likely to be in the interest of consumers. Therefore, in the near-term we will open a new interconnector application window in mid-2022. This will be a targeted application window whereby we invite potential applicants to apply in those regions that we identify as most likely beneficial to consumers when considering deliverability, system impacts, and market signals. In the longer term we consider that more regular investment windows will enable us to respond effectively to these signals, with future interconnector planning integrated within broader strategic network planning.

Key messages of the interconnector policy review

2.1. Across our four interconnector policy review working paper consultations we presented several initial conclusions and recommendations for our approach to GB interconnector regulation in the future. The four key messages in those consultations were:

- **We think the cap and floor regime has been successful in delivering its objectives to date.** Specifically, it has incentivised the development of further GB electricity interconnection capacity that is in the interest of consumers. Prior to the cap and floor regime there were only 4GW of electricity interconnector capacity; a further 10.9GW of capacity is now either operational, under construction or in development with regulatory approval under the cap and floor regime. It has also attracted investment from new entrants and a range of financing solutions.
- **We think further interconnection is likely to be in consumers' interest.** This is based on both socio-economic market modelling presented in our workstream 2 consultation and a review of the wider impacts of interconnection presented in our workstream 3 consultation. This is also consistent with the Government's ambition for at least 18GW of interconnection by 2030. Our modelling suggests that the net welfare impact of future GB interconnection is likely to be positive. However, we expect a shift in the allocation of some welfare benefits from consumers to producers, and between GB and the

connecting countries. This is in response to the energy systems across Europe evolving to meet national and international energy policy objectives. We think that interconnectors have a potentially important role to play in directly delivering and shaping the energy system required to meet these objectives. The wider impacts of interconnectors in supporting these objectives should be integrated within the needs case assessment of future interconnector projects.

- **The principles of the cap and floor regime remain appropriate to incentivise further interconnector capacity development.** The hybrid design of the regime provides a balance between market-based commercial incentives and a regulated regime, ensuring projects can move forward whilst minimising risk to consumers and maximising incentives on developers. We also recognise the importance of regulatory certainty and continuity where appropriate and therefore consider that retaining the cap and floor regime supports the deliverability of future capacity. However, there are areas where we consider there to be a need for change to improve the effectiveness of the regime. We have proposed changes to the regime assessment framework to better reflect the changing needs case for future interconnection. We have also proposed changes to the regime design to make it simpler, more flexible, and consistent. These areas are set out in more detail in Section 3 of this document.
- **We think the cap and floor regime is, in principle, a suitable mechanism to support the development MPIs.** We recognise the potential benefits of MPI development and consider it important to enable their continued development in the near term. The conclusions of our Integrated Transmission Planning and Regulation (ITPR) project in 2015 were an important step forward in our regulation of MPIs, and we want to build on this by ensuring our regulatory framework is flexible enough to consider MPIs. We also note that the legal framework for MPIs is being assessed through the OTNR. Therefore, elements of this decision are subject to the outcomes of that review.

2.2. Stakeholder feedback across our four working paper consultations was generally supportive of these four key messages, although there were some counter views presented as we have set out in our Appendices in Section 5. We continue to think that these four messages apply and are supported by the evidence set out in our consultation papers.

Regulatory approach for future GB interconnectors

2.3. In our four workstream consultations we also presented several initial policy proposals. In some instances, those initial proposals referred to specific aspects of policy that we would explore further or sought stakeholder views on alternative options that we should consider. In general, stakeholders were supportive of our proposals and several additional recommendations were presented with supporting evidence. We present some specific proposals further throughout this document. A summary of stakeholder feedback across all four workstreams can be found in the Appendices listed in Section 5 of this document.

2.4. Our decision on our approach to GB interconnector regulation in the future is as follows:

- **In the near-term we will open our third cap and floor application window in mid-2022.** This will be a locationally-targeted window for interconnectors that are able to connect within the next decade, with particular emphasis on those that can contribute to government’s ambition for at least 18GW by 2030. Ofgem’s decision on the targeting of this window will be informed by future-facing analysis from the ESO on the system operability implications of further interconnection, alongside engagement with the relevant National Regulatory Authorities (NRAs) and our view of the potential connecting markets. We will enhance our needs case assessment to reflect stakeholder feedback on our approach to socio-economic modelling and ensure that the wider impacts of interconnection are assessed within our decision-making framework. We will also implement some changes to our cap and floor regime framework and design to ensure that it treats developers fairly, has the flexibility to maximise project deliverability and minimises undue delays, while ensuring that consumer interests are protected. We may consult with stakeholders on specific details of the regime if appropriate.
- **In the long term we want interconnector planning to be integrated within more strategic network planning processes, with regular outputs informing cyclical investment windows.** As more interconnectors connect and we approach an optimal level of interconnection, we expect future cyclical windows to be increasingly targeted to ensure that the right projects come forward in the right locations and at the right times to support the development of a net zero energy system and maximise consumer benefits. The tools and

processes for strategic network planning are still being designed, and we will continue to work with the relevant teams within Ofgem, BEIS and the ESO to ensure that interconnectors are factored into the development of future network planning frameworks.

Application windows

2.5. In the cap and floor regime to date, developers have been asked to submit their project proposals to Ofgem through pre-determined and time-limited application windows, along with sufficient information and analysis demonstrating that their projects are in GB consumers' interest. Application windows have been a key facilitator of the developer-led approach underpinning the regime, allowing developers to identify the location, size and timing of their proposed projects based on market price signals. This approach has also allowed us to compare and contrast projects on similar timeframes, and to take account of any interactions between projects in our initial project assessment.

What we consulted on

2.6. In our workstream 1 consultation we proposed to retain the use of pre-determined application windows but to review the historical window approach to ensure it remains fit for purpose. Specifically, we proposed a shift towards a more coordinated and system-wide approach to application windows, informed in part by the ESO. We also sought stakeholder feedback on four options for changes to our application window approach: (1) case-by-case applications, (2) windows with pre-determined capacity levels, (3) windows with pre-determined geographical scope, and (4) cyclical investment rounds.

2.7. Stakeholder feedback was mixed across these four proposals. There was some acknowledgment that greater coordination of application windows was the right direction to take to meet net zero objectives, citing interlinkages with other workstreams such as the OTNR. However, there was a concern about the role of the ESO, specifically the perception of creating an uneven playing field, over-prioritisation of system operability issues compared with other benefits of future projects, and contradiction with the principle of a developer-led regime. Some stakeholders noted that it was difficult to comment further without more detailed proposals on how this could be delivered in practice.

2.8. There was general support from stakeholders for option (1). Counterarguments to the use of application windows included a lack of predictability for developers, the creation of supply chain constraints, and the enforcement of an unrealistic one-size-fits-all

approach. Stakeholders generally disagreed with option (2) on pre-determining the capacity of future windows, but feedback was more mixed on option (3) regarding pre-determining the geographical scope of future windows. There was support for option (4) for a move towards cyclical windows in the future, mainly on the basis that it provided greater certainty for developers.

Our decision

2.9. We have taken on board stakeholder feedback, further assessed the options presented at consultation, and considered the applicability of our proposals on different timescales, including interlinkages with other workstreams across Ofgem, BEIS, and the ESO. We have decided the following with respect to our approach to future interconnector applications:

- **We will retain the use of application windows in the future.** We think this remains the right approach because it allows us to understand the interaction between projects, which we expect to become increasingly important. It also maintains the developer-led aspect of the cap and floor regime which stakeholders have told us is important. We acknowledge that some feedback suggested that application windows incentivise less mature projects to move forward earlier than would be optimal, however, it is not clear that alternative approaches would prevent this (and some options, such as first-come-first-served, may exacerbate it). In the near term, in recognition of the need for further interconnection and the pipeline of interested projects, we will open an interim Window 3 (W3) in mid-2022. Longer-term, once strategic network planning frameworks are in place, we plan to open more cyclical investment rounds. This will give more predictability ahead of time for developers and create more opportunities for projects to come forward.
- **We will target future windows to ensure that the right projects come forward in the right locations and at the right time.** We need the right tools and processes in place to help us understand where, when, and how much further interconnection we need on an incremental basis; we think more strategic network planning is the right way to do this. This will allow us to consider the system need for further interconnection through an integrated whole-system lens, enabling better informed judgement on when, where and how much interconnector capacity is needed in the future (and recognising that each of these factors is likely to evolve over time). In the near-term, whilst

those tools and processes are being developed, we will use a more bespoke approach to targeting our W3.

- **We will integrate interconnector planning into strategic network planning frameworks.** We envisage regular outputs from these processes informing how to target future cyclical application windows. By taking a whole-system approach this will enable us to respond to changing system needs as the energy system evolves to meet net zero objectives. We recognise that these tools and processes are still under consideration and development, so we are unable to provide further certainty on interconnector planning at this stage. We will continue to work with relevant teams in Ofgem, BEIS and the ESO as the various workstreams considering more strategic network planning progress.

Targeted application windows

2.10. We have decided to hold targeted future interconnector windows to ensure that the right projects come forward at the right time and in the right locations to maximise deliverability and consumer benefit. Stakeholders have emphasised the importance of maintaining a developer-led regime; the aim of targeting is not to materially limit this.

2.11. We recognise that the targeting of future cap and floor application windows is a new concept for stakeholders familiar with the cap and floor regime. This section sets out in more detail our reasoning for this, how it might be implemented in the near term, and how it might be implemented in the longer term.

2.12. Interconnector regulation in GB is currently developer-led. This means that developers propose where and when to build interconnectors based on market signals. This promotes competition and ensures projects that make commercial sense come forward. Whilst there is no central planning of interconnection, this approach is not fully market driven as Ofgem's role is to ensure that only the projects that are beneficial to consumers are awarded a regulatory regime, which also includes incentives for timely delivery. Furthermore, any interactions between projects are considered as part of the regulatory assessment – meaning the most beneficial projects are selected.

2.13. Historically there have been large price differentials between GB and connecting countries and limited interconnection capacity. This means that there has been a strong positive correlation between investment signals for developers (large price differentials mean increased revenues) and GB consumer benefits (when the GB price is higher,

interconnectors import cheap electricity and lower consumer bills). We could therefore be confident that benefits for developers and consumers were aligned.

2.14. However, the effect of interconnectors is to marginalise those structural market price differentials, so as interconnector capacity increases the marginal market benefit of each new interconnector decreases, and the benefit of existing interconnectors is reduced. Our modelling suggests that the effect of net zero energy policy will be to lower those structural price differentials over the next decade, and in some instances reverse them longer term. These two factors mean that we can no longer automatically assume a direct correlation between price signals and consumer welfare. Instead, the role that interconnectors play in the energy system is changing and our decision-making needs to reflect this.

2.15. This means that at some point we will reach an optimal level of interconnection in terms of consumer impact, at least when considering the welfare impacts driven by wholesale market prices. We have not performed bespoke analysis to determine an Ofgem view on what that level of optimal interconnection is. However, government's ambition for at least 18GW of capacity by 2030 and forecasts of optimal interconnection from the ESO's Networks Options Assessment (NOA) for interconnectors, as well as the level of interest from future developers, all imply we are not there yet. As we approach an optimal capacity, it is increasingly important to critically assess future projects to ensure that they are beneficial, and we therefore envisage future windows being increasingly targeted in scope (location, timing, capacity) to achieve this. We also recognise that the energy system is not static; as it evolves and the system needs change, so will the need for further interconnection. Our proposals enable us to respond to these changes.

2.16. We recognise that to deliver targeted application windows we need the right tools and processes in place. The current network development planning processes, particularly the NOA, have helped coordinate major investment in the transmission network and provided market signals to interconnector developers. However, the NOA and the NOA for Interconnectors have limitations due to the lack of an overarching strategic outlook that takes a GB-wide holistic view. An evolution to enable more strategic network planning is currently being considered through the OTNR, ETPNR and Future System Operator (FSO) programmes. We will continue to work with the relevant teams and organisations to ensure that interconnector regulatory needs are considered as future tools and processes are developed.

2.17. Whilst the tools and processes that can implement our vision for the long term are being developed, we plan to take a step in that direction in the near term. Our cap and floor W3 will therefore be an interim window to ensure there is a regulated route for those projects that can connect within the next decade, and in particular by 2030, in line with government’s policy ambition. This window will be targeted by geographical scope, which will be informed by:

- **Forward-looking analysis from the ESO on the system need for, and impacts of, new interconnection from a system operability perspective on a regional basis.** Stakeholders have told us that new interconnectors can deliver operability benefits but can also cause large system disturbances with resulting costs attributable to consumers through Balancing System Use of System (BSUoS) charges. As the energy system evolves to meet net zero targets, we need to ensure that the entire network is working efficiently, and we consider that using potential system impacts to inform the targeting of our near-term windows supports this.
- **Market signals on the need for further interconnection.** We recognise that developers are well placed to interpret these, so we will consider whether projects within a given region are likely to come forward in our third window. We will do this through continued stakeholder engagement and review of those projects with a connection agreement from the ESO. We will also consider the potential connecting markets and take an informed view on the complementarity of their energy system with GBs.
- **An understanding of potential project deliverability on each border through enhanced engagement with our neighbouring NRAs.** It is important that projects that come forward are deliverable over the timeframes set out in that window, and that means having a clear pathway to development in both connecting countries. We want to understand engagement with, and views of, connecting NRAs and TSOs as part of project applications. We will also work with our neighbouring NRAs ahead of, during, and throughout future cap and floor windows.

2.18. As we continue to work with the ESO and neighbouring NRAs on these topics and get a better understanding of the information we are able to gather to inform targeting, we will confirm with stakeholders how we plan to target W3. Should our assessment imply that there is limited value (on a system operability or project delivery basis) in

further connections in a particular region, we may choose to invite applicants who wish to connect to those regions to provide further justification beyond our analysis as to why we should still consider their projects for a cap and floor regime.

2.19. Longer term, our approach to targeting windows beyond W3 might differ from that set out above. We want application windows beyond W3 to be informed by regular outputs from strategic network planning to ensure that each window reflects the latest system needs when considering onshore and offshore developments. We expect that future windows might be increasingly targeted by parameters other than geographic scope, including timing and capacity, as existing interconnector capacity increases and we move towards an optimal level of interconnection.

2.20. Whilst the tools and processes of strategic network planning are still being developed, we are unable to provide further clarity on how interconnector planning will interact. We will continue to work with the relevant organisations and teams to ensure that interconnector regulatory needs are considered as those tools and processes are developed and continue to update interested stakeholders as required.

Role of the ESO

2.21. In our workstream 1 consultation we proposed an enhanced role for the ESO in future interconnector planning. There was concern amongst some stakeholders that this might reinforce the perception of an uneven playing field due to a perceived conflict of interest or strategic advantage for National Grid companies. One stakeholder also noted that no further processes are required as projects are already assessed by the ESO through the Connections and Infrastructure Options Note (CION) process, following which the project is provided with a connection agreement.

2.22. Our decision on the role of the ESO in future interconnector planning is that ahead of our W3 it will provide future-facing analysis on the system need for, and potential impact of, future interconnectors, from a system operability perspective, in different geographical regions. This analysis will be submitted to Ofgem to help inform our decision making on how we target W3. We will ensure that any such analysis is placed in the public domain and our consideration of it in deciding how to target W3 is transparent. The targeting of a W3 will remain an Ofgem decision and that decision will be informed by several factors. Furthermore, BEIS and Ofgem recently consulted on proposals for a fully independent FSO who would take on the ESO's existing functions as well as potentially taking on new responsibilities in planning the whole electricity system. We do not,

therefore, think this poses a risk of creating an uneven playing field nor providing advantage to any party.

2.23. We consider that this is the right approach as the ESO is uniquely placed to provide a view of the system operability impacts of interconnectors. Through targeted engagement ahead of our workstream consultations, stakeholders told us that in some instances interconnectors can cause material system operability challenges, the costs of which are passed through to consumers through use of network charges. Examples provided by stakeholders include exacerbation boundary constraints, frequency and voltage stability issues, and the management of ramping. This view is partially supported through the findings of the National Grid System Operability Framework (SOF) National Trends and Insights Report, which states that the impact of interconnectors on system operability is currently mixed. We explored the impact of interconnectors further in our workstream 3 consultation, and feedback was similarly mixed. In that consultation we also considered the role of the CION process and concluded that the process is instigated at the request of the developer and the output is primarily a lowest-cost connection point in the region that they propose to make landfall. It does not consider the impact of interconnection on system operability on a regional basis.

Multiple-purpose Interconnectors

2.24. An MPI is a project that combines cross-border interconnection with another purpose, such as the transmission of offshore generation. MPIs could play an important role in enabling the development of offshore renewables to meet our decarbonisation policy ambition and targets. As our seas become more crowded, ongoing efforts to better coordinate the development and delivery of offshore infrastructure has become more important. The potential for MPIs to reduce the number of transmission assets required to connect future offshore renewables, and consequently reduce investment costs and environmental and societal impacts, is becoming increasingly relevant.

2.25. We considered the regulatory aspects of Multiple Purpose Projects (MPPs, which could include MPIs) in our ITPR project, which concluded in March 2015. We signalled the importance of clarifying the regulatory approach for MPPs to encourage and enable investment in flexible, coordinated network solutions. The work undertaken through the interconnector policy review workstream 4 built upon these conclusions, and our engagement with industry to date, by looking at the potential of the cap and floor regime as a regulatory framework for MPIs.

2.26. More recently, the OTNR was launched in July 2020 to support government’s ambition of delivering 40GW of offshore wind by 2030, an important contributor towards net zero emissions by 2050. It recognised that MPIs could have an important role to play in supporting the OTNR objectives, and a dedicated workstream within the OTNR has been set up to explore MPIs in detail.

2.27. Whilst the interconnector policy review workstream 4 has reviewed the regulatory frameworks for MPIs, the OTNR is considering the legal framework which would underpin MPI assets. In July 2021, through the OTNR, we consulted on how to approach the classification, licensing, and ownership of MPIs within the current legal framework in GB to facilitate early MPI projects to begin operations before 2030. We also sought views on any barriers presented by market arrangements. In September, BEIS consulted on the merits of changing the legal framework to better facilitate MPIs in the future. We are continuing to engage closely with colleagues in Ofgem, BEIS and the ESO on these topics, and we expect to provide our OTNR decisions and next steps in 2022.

What we consulted on

2.28. In our workstream 4 consultation, we concluded that our ITPR decision no longer provides sufficient regulatory certainty to support the development of new MPIs. We also concluded that the cap and floor is, in principle, a suitable regime for MPIs in the future, whilst recognising other potential regimes may also be suitable. We sought stakeholder feedback on these initial conclusions and on our proposals to explore further other regulatory issues and barriers related to MPIs. These included areas such as market arrangements, legal definitions, unbundling requirements, regulated revenues, and anticipatory investment.

2.29. In general, stakeholder feedback agreed with our conclusions. Many respondents recognised the numerous potential benefits of MPIs and provided insight into how these could be assessed. Most respondents also agreed that further clarity was needed beyond the interconnector policy review to enable MPI development, and some called for a centrally led approach to MPI development linked into strategic network planning. There was a strong message from two stakeholders, however, to await the outcome of the OTNR before progressing further work on MPIs.

2.30. Most stakeholders agreed that the cap and floor regime is a potentially viable regulatory solution, although they acknowledged that other options should be considered to guarantee the regulatory flexibility needed to accommodate different MPI designs.

Alternative options suggested by stakeholders include a RIIO-style Regulated Asset Base (RAB) model, a revised cap and floor model, strategic wider works framework, onshore competition model, and a hybrid cap and floor model with Contracts for Difference (CfDs). On the potential regulatory barriers to MPIs, stakeholders provided useful insight but presented no major red flags. Beyond those potential barriers we sought feedback on, stakeholders also highlighted that CfD regulations, connection agreements, and technical codes may need further consideration.

Our decision

2.31. We have taken on board stakeholder feedback and performed some additional analysis on the applicability of specific elements of the cap and floor regime for MPIs. We have also continued to engage with the ongoing work through the OTNR on MPIs, and offshore coordination more generally. With respect to MPIs we have decided:

- **The cap and floor regime is, in principle, a suitable regime to apply to MPIs.** This is subject to there being an appropriate legal framework, which is being considered through the OTNR. Whilst further work needs to be done on the application of specific elements of the cap and floor regime, the additional analysis we have performed since consultation has not raised any material issues. We agree with stakeholders that there is a need for flexibility in our regulatory approach to accommodate different MPI models or configurations. We therefore want to continue to work with stakeholders to explore further potential regulatory options beyond the cap and floor regime to accommodate future MPI models.
- **We will open an MPI cap and floor pilot scheme to run in parallel to our cap and floor W3 for interconnectors in mid-2022.** We note that an appropriate legal framework is being considered through the OTNR. We believe that MPIs could deliver significant benefits and are important for the delivery of policy objectives such as the delivery of 40GW of offshore wind by 2030. We therefore think it is important to ensure that there is a regulatory pathway to maintain momentum on the development of these assets. We will provide further information for stakeholders on our approach to a pilot scheme in the first quarter of 2022. In the meantime, we are interested to hear from MPI developers who are willing to work with us to tackle barriers as we develop a cap and floor regime for MPIs.

2.32. We hope that these decisions will provide the signal required to maintain momentum on MPI development. The remainder of this section sets out in more detail our thinking around a pilot approach and how it will be implemented.

Suitability of the cap and floor regime to MPIs

2.33. Considering the growing interest in near-term development of MPIs in the North Sea region, we reviewed which regulatory options could be readily deployed while providing the right incentives and some degree of flexibility, in recognition of the complex and hybrid nature of MPIs.

2.34. We believe that cap and floor regime broadly meets these criteria. This regime maintains a significant degree of market exposure and merchant incentives for developers, encouraging them to invest only in commercially attractive projects whilst keeping costs down. This, in turn, minimises the risk that consumers will have to provide financial support to the developers (when compared to other potential models). At the same time, the presence of a guaranteed floor support limits the developers' exposure to the full potential downside, partially reducing the risk due to revenue volatility. Considering that MPIs will retain elements of cross-border trade of point-to-point interconnectors, we believe this fundamental design is well suited for MPIs too.

2.35. Importantly, we do not require legislative change to apply or modify the cap and floor regime to interconnector aspects of pilot MPI projects. Therefore, it could be introduced reasonably quickly to facilitate near-term investment by developers whose MPI project proposals are mature enough to participate in our MPI pilot scheme. The cap and floor regime has the potential to be applied flexibly and therefore is likely adaptable to the different models or configurations of MPIs that have been considered so far.

2.36. In contrast, a regime based on fixed regulated returns would not incentivise developers to bring forward beneficial projects, as they would not be exposed to the trade benefits they can provide. This would translate into potentially substantial risk for consumers, considering that price volatility, and the interaction of revenue streams between the different components of an MPI, is still unclear. Introducing new or adapted alternative regulatory models might also require legislative or framework changes, which could delay the development of near-term projects.

2.37. We also reviewed the overall cap and floor framework, and we concluded that it can be broadly applied to MPIs without substantial modifications. The assessment process

(pre-construction and during operations) is still fit for purpose, although we will need to consider modifications to the actual assessment framework to properly determine costs and benefits of an MPI. The key elements of the regime design can also be replicated, although some changes might be required to reflect the complexities of delivering first-of-a-kind projects. This could entail, for example, reviewing key regime timelines and conditions, as well as the parameters used to determine return rates at the cap and the floor.

Implementing an MPI cap and floor pilot scheme

2.38. We see an MPI cap and floor pilot scheme in 2022 as an important milestone to provide a signal to developers and maintain momentum amongst potential industry participants. We think a pilot is the right way forward for MPIs in the first instance, as it enables us to work through the details of a potential cap and floor regime with the pilot developer(s) and understand the interactions of the regime with the commercial and financial business models proposed. We recognise the value in bringing regulatory and industry expertise together to solve challenging issues and create solutions that deliver benefits. The cap and floor regime for interconnectors was developed using Nemo Link as a pilot project, which we consider a success, and we plan to take a similar approach to an MPI pilot project.

2.39. We recognise from stakeholder feedback that different MPI models might need different regulatory solutions, and that we need to be mindful of interactions with the OTNR and wider developments, such as market arrangements. We consider that a pilot scheme is the best way forward in response to both areas of feedback. Whilst we agree that different models might require different approaches, we expect there to be significant commonalities across regulatory approaches to different projects. This means that learning from pilot projects can be applied to potential future projects and to help inform the potential for an enduring regime. We expect a decision from the OTNR in Q1 2022 on the legal framework for MPIs. Whilst this decision is pending, we consider that progress that can be made through working closely with MPI developers towards a pilot solution is a valuable exercise. We will continue to work closely with OTNR colleagues to ensure that messaging is clear and consistent on both workstreams.

2.40. Whilst we are unable at this stage to provide firm details of how the MPI pilot scheme will be implemented, we can confirm the following:

- The MPI pilot scheme will run, as far as possible, in parallel with our W3 for point-to-point interconnectors. This means that we expect MPIs to follow the similar cap and floor framework to that for interconnectors, including: an eligibility assessment, and Initial Project Assessment (IPA), a Final Project Assessment (FPA) and a Post Construction Review (PCR).
- We recognise that MPI projects may not be as mature as some interconnectors and so eligibility criteria for MPIs may differ to those of interconnectors applying for a cap and floor regime. We have not yet decided how many MPIs to take forward as pilot projects, nor how we will select those projects at application stage.
- Whilst we want an MPI pilot and our W3 to run in parallel, we consider that the two tracks should be kept broadly separate. We do recognise that there are interactions between asset types, and therefore we expect to apply sensitivities during modelling exercises.

2.41. We recognise that stakeholders will require further details ahead of considering submitting a request for a MPI cap and floor pilot scheme. We will continue to explore further how we implement an MPI pilot scheme and will provide further details in Q1 2022.

3. A cap and floor regime for the future

Section summary

In this section we set out our response to the key message of the interconnector policy review that we think the cap and floor regime remains a suitable tool for regulating future interconnection, albeit with some changes to ensure that it remains fit for purpose whilst also protecting consumers. Specifically, we set out the case for the cap and floor regime and our decision on which areas of the regime should change.

Cap and floor regime for future interconnectors

3.1. In our workstream 1 consultation paper we summarised the principles and objectives of the cap and floor regime to date to bring forward timely, economic, and efficient investment in interconnection where that is in the interests of existing and future consumers.

3.2. The cap and floor regime aims to unlock investment by providing long-term downside protection at the floor to reduce investment risk, whilst providing benefits to the consumer at the cap in return for their exposure at the floor. The regime was also designed with the intent to be open to a wide range of investors, attracting new entrants and additional investment, and to ensure impartial and unbiased treatment between balance sheet finance and alternative financing solutions, and between existing and future developers.

3.3. As already set out in this decision paper, one of the key messages of the interconnector policy review is that the principles of the cap and floor regime remain appropriate to incentivise further interconnector capacity development. In response we have set out our intent to open a new cap and floor W3 in mid-2022, and to consider cyclical application windows integrated within strategic network planning in the longer term. However, there are areas where we consider a need for change to improve the design and effectiveness of the base regime, and to better reflect the changing needs case for future interconnection.

3.4. Through targeted stakeholder engagement ahead of consultation, we identified several areas for improvement in the cap and floor regime. In our workstream 1 consultation we subsequently proposed how we might implement those improvements

and sought stakeholders' input on possible solutions. This section sets out our decisions on those changes. These changes will apply only to future projects.

3.5. Throughout this section we have sought to provide stakeholders with as much clarity as possible on what a cap and floor regime for the future might look like. In some instances where we are unable to provide detail, we have set out the principles that we will apply as we consider the details further. Following the publication of this document there will be an implementation period wherein we will perform further analysis and stakeholder engagement to ensure that our cap and floor regime for the future works as effectively as possible. Further detail on next steps can be found in Section 4.

3.6. The remainder of this section goes through each of the areas of the regime that we considered for improvement and sets out our decision on each.

Assessing future interconnectors

3.7. This subsection focusses on the elements of the regime that apply to assessing the suitability of new interconnectors for a cap and floor regime. Specifically, it looks at changes to the eligibility criteria for new interconnectors applying for the regime and the needs case assessment framework used to determine whether applicant projects are in consumers' interests. Those projects that are awarded a cap and floor regime are underwritten by consumers at the floor. It is essential therefore that those projects be beneficial to consumers. To better serve that objective, our decisions in this subsection will ensure that we fully understand the deliverability of projects and take a holistic view of the impacts of new interconnectors.

Eligibility criteria

3.8. Before applying for a cap and floor it is important that applicant projects are of sufficient maturity to enable us to make an informed decision on their suitability for a regime in principle. In our cap and floor Window 1 (W1) and Window 2 (W2) we have therefore set out a number of high-level eligibility and maturity criteria that applicants must satisfy to be considered for a regime.

What we consulted on

3.9. At consultation stage, we proposed that we should review the eligibility under the new cap and floor regime and consider options to enhance the maturity threshold for

successful applications. Furthermore, we proposed that we should enhance due diligence at application stage, including through earlier and more proactive engagement with the connecting NRAs.

3.10. The majority of stakeholders supported reviewing the eligibility criteria and maturity threshold currently used. However, some respondents indicated that setting too high a threshold could potentially discourage projects from applying and lead to discrimination between Transmission System Operators (TSO) and non-TSO projects. Stakeholders also recommended to consider the interactions between a higher maturity threshold and the targeting of future windows, the combination of which could further discourage investments in new projects at a very early stage of development.

3.11. Few stakeholders also indicated that it may be difficult for developers to secure early support from the connecting NRAs, and suggested Ofgem would need to take the lead in supporting projects applying for the regime

3.12. The majority of stakeholders also supported our proposal to engage more proactively with connecting NRAs, highlighting how this would help in identifying potential conflicts between the two regulatory approval processes early on.

Our decision

3.13. After reviewing the IPA submission requirements for W1 and W2, and the feedback received so far, we recognise that there is a limited amount of additional information that developers can provide without risking incurring significant costs at an early stage of development. We also acknowledge that it may be difficult for developers to secure early support from the relevant authorities in the connecting country.

3.14. Nonetheless, going forward, we want to ensure that the projects selected and approved under the cap and floor regime are only those that are demonstrably realistic, viable and deliverable within the timelines proposed by developers within the limits of each application window.

3.15. Therefore, we have decided to:

- **Maintain the same categories of eligibility criteria used in previous application windows.** Stakeholder feedback and comparison with other GB and EU regimes suggest that these categories are appropriate.

- **Slightly increase the level of maturity that projects need to demonstrate when applying for the cap and floor regime.** We will do this by requesting developers to provide (i) more detailed evidence of positive engagement with the connecting NRA and the TSO, and (ii) more detailed financial information about the project and its sponsors.
- **Enhance the level of due diligence when assessing applications.** Having seen several interconnectors successfully progress through the cap and floor regime framework, and several others still progressing, we now have a better understanding of the timelines, costs, and challenges that projects might face, and the potential trade-offs between those. We want to draw upon this learnt expertise when assessing future project proposals.

3.16. These changes will help us consider the deliverability of potential future projects. Only those projects that provide us with a reasonable degree of certainty that there are no substantial obstacles preventing the project from being delivered within the timelines proposed will be selected at the IPA assessment stage. Those that do not provide such assurance will instead be invited to apply to the following investment window.

3.17. A detailed list of required submission information at IPA will be published when we announce the exact opening date of the next application window, and we will ensure stakeholders are kept up to date until then.

3.18. The following paragraphs describe in more detail the additional information that will be required in future application windows, including our approach to enhanced due diligence.

Evidence of positive engagement with connecting NRA and TSO

3.19. We will ask developers to provide evidence of positive engagement with the connecting NRA and TSO, demonstrating that the project does not face substantial obstacles to its development in the connecting country and that the regulatory and network planning processes are fully understood.

3.20. Supporting submissions from those bodies would help to clearly demonstrate positive and proactive engagement of the developers, however we appreciate that evidence of engagement can take other forms.

3.21. For example, developers would have to demonstrate that a clear route to market is available, or that the connecting NRA does not object to exploring introducing one. Similarly, developers would have to demonstrate that the connecting TSO is considering the project as part of its national network development plans, or that they have secured a connection agreement in the connecting country. Alternatively, developers would have to demonstrate the intended steps to do so.

Financial information

3.22. We will ask developers to provide information demonstrating that the project and its main sponsors have a solid and transparent financial structure, a credible financing strategy, and the required expertise to raise the capital needed to develop the project.

3.23. This could include, for example, letters of financial support from project sponsors, information on the financial structure of the project and of the project sponsors, intended financial flow, track record of past financial performance, track record of raising finance for similar projects, and other relevant information. This should cover the three main stages of the project – development, construction and operation – and should clearly set out the rationale for approaches taken.

Enhanced due diligence

3.24. We confirm our intention to enhance the level of scrutiny we exercise at the application stage to help us determine whether the proposed projects are realistic and deliverable, and that the evidence provided is sound. This includes increasing our proactive engagement with the relevant parties in the connecting countries at the application and assessment stages.

3.25. After assessing several projects in the past, we now hold a useful database of information that can be used to inform our future assessments. Therefore, enhanced scrutiny will include but not be limited to:

- reviewing and comparing project costs submitted at IPA;
- reviewing and comparing project plans and proposed technical design; and
- confirming the evidence provided demonstrating positive engagement to date with key parties in the connecting country.

Needs case assessment

3.26. The purpose of the IPA is to identify whether eligible cap and floor project applicants are likely in consumers' interests and should therefore be awarded a cap and floor regime in principle. Through our targeted engagement ahead of consultation, we sought stakeholder views on the range of impacts of interconnection and supporting evidence of how those impacts could be assessed. In our workstream 2 and 3 consultations we proposed which categories of interconnector impacts should be assessed, reviewed our approach to needs case assessments used in our W1 and W2 IPAs, and considered how others assess interconnector impacts. In this subsection we set out our decision on how we will approach interconnector needs case assessments in the future.

What we consulted on

3.27. In our workstream 2 consultation we shared the results of an independent electricity market modelling study performed by AFRY Management Consultants (AFRY), with the aim of understanding the need for further interconnectors based on the value of trade between day-ahead wholesale electricity markets. We concluded that we think there is likely value from a socio-economic welfare perspective for further interconnection but recognised that the distribution of benefits is likely to shift between consumers and producers, and between GB and the connecting country. These shifts result from a change in the net flow direction along modelled interconnectors from importing to exporting on day-ahead timeframes from around the early 2030s.

3.28. We also concluded that socio-economic modelling across a range of future scenarios remains an important tool for assessing the impact of future interconnectors. However, the approach to socio-economic modelling for interconnectors historically used by Ofgem also does not capture the full range of impacts of interconnection on the GB energy system and on consumers.

3.29. Stakeholders agreed that socio-economic modelling remains a valuable tool for assessing future interconnectors, and that it did not capture the full range of interconnector impacts – both benefits and costs. Stakeholders highlighted a number of limitations to the modelling approach we used, such as the fact that it does not consider intra-day volatility and therefore value generated by difference in weather patterns, and in some instances, they suggested alternative approaches. Some stakeholders also submitted their own market modelling studies that showed different results under

different scenarios. Those modelling studies submitted generally showed a more positive case for GB interconnection than that in AFRY's study.

3.30. In our workstream 3 consultation we reviewed the wider impacts of interconnection that were proposed to us through targeted stakeholder engagement. We also reviewed our approach to needs case assessments in our W1 and W2 IPAs, and how others assess interconnector impacts. In conclusion we recognised that the assessment framework used in the past did not fully capture the wider impacts, both costs and benefits, of interconnectors. We defined these wider impacts as (i) decarbonisation, (ii) flexibility, (iii) system operability and (iv) security of supply. We proposed that we should revisit our needs case assessment framework to be used in the future cap and floor regime to ensure that any future assessments take into full consideration a range of factors, including wider impacts, that could contribute to consumers' interests. We also sought stakeholder views on how we should approach future needs case assessment frameworks, in particular on the roles and responsibilities of Ofgem, the ESO, the developers, and public datasets.

3.31. In general, most stakeholders agreed with the impact categories we focused on at consultation stage, and with our proposal to better integrate their analysis in our assessment framework. However, there were differing views on whether interconnectors can actually deliver benefits under each impact category, the relevance and weight that each category should have in our needs case assessment, and the appropriate level of detail we should look at when assessing each category.

3.32. In general, stakeholders flagged the risk of double counting costs and benefits, and the inherent analytical challenges when trying to model certain impact categories over long timeframes. Some stakeholders suggested additional wider impact categories, including the effect of interconnection on competition in the wholesale market, with other technologies and through the capacity market.

3.33. We also received mixed feedback on whether we should use a developer, Ofgem or public data-led approach regarding our future needs case assessment framework. From the responses received it was, however, clear that we would need to guarantee transparency and consistency in the application of whichever framework is selected.

Our decision

3.34. There was clear interest from stakeholders in reviewing our needs case assessment framework to ensure it remains fit for purpose in future, and general support for our proposal to expand that framework to better consider the wider impacts of interconnection. We have therefore decided:

- **Socio-economic electricity market modelling remains a valuable tool for assessing the needs case for future interconnectors.** However, we acknowledge that any modelling exercise has limitations and necessarily makes simplifications, that should be taken into full consideration when making regulatory decisions. We will endeavour to incorporate suggestions from stakeholders, as far as possible, in future socio-economic modelling exercises.
- **The wider impacts of interconnectors should be better assessed and integrated within our future needs case assessment framework.** We consider that the role that interconnectors play in the energy system is changing and that wider impacts are likely to make up a proportionally larger part of the total impact of future projects. We will need to ensure that our needs case framework appropriately captures the full range of impacts. Specifically, we think that a future assessment framework should consider, alongside socio-economic modelling, the impact of interconnectors on system operability, decarbonisation, flexibility, and security of supply. We also agree with stakeholder feedback that we should further explore the impact of interconnectors on competition in the energy market.
- **We will work with advisors to design and publish a needs case assessment framework document for future interconnectors.** The document will set out methodologies for the assessment of different impact categories, decide on roles and responsibilities of different parties in delivering those methodologies, and outline how the outputs should inform our decision making. This approach will ensure that future decision making is fair, transparent, represents best practice and is fit for purpose when considering future impacts. We will continue to engage with stakeholders as this framework is developed through the implementation period.

Designing a future needs case assessment framework

3.35. We welcome the positive stakeholder feedback confirming our proposal to review our needs case assessment framework. We recognise that we need better tools to assess impacts of interconnectors. We want this framework to:

- Quantify, as far as possible, the impact of interconnection under each category. Where possible and appropriate, we also want to integrate those quantified indicators into a single value for easy comparison across projects. Where quantification is not possible, it will set out the parameters that we will consider in our assessment.
- Draw on best practice across industry and the public sector to present the most appropriate methodologies and data sources for the assessment of each impact category. We will also further explore whether the impact of interconnection on competition can be assessed.
- Identify the parties best placed to implement each methodology, and therefore the roles and responsibilities of different parties in the needs case assessment framework. This will specifically consider the roles of Ofgem, the ESO, the developers and independent advisors. This will help inform what we expect developers to submit when applying for a cap and floor regime in the future.
- Explain how the outputs of each methodology should be factored into decision making on the needs case for future interconnectors.

3.36. The output will be a methodology document, to be published ahead of the next application window, to be used at each assessment window in the future (and updated as required). This will provide clarity, transparency, and consistency in our assessment of future projects.

3.37. We recognise stakeholder feedback that there is a need for clarity on the framework as early as possible so that potential applicants can begin work on long lead items for submission, such as market modelling reports. We will ensure that stakeholder feedback submitted to date is taken into consideration when developing this framework and we will continue to engage with stakeholders throughout.

3.38. We are mindful that there is a perception that our past decisions have been made primarily based on consumer welfare as an output of socio-economic modelling. We are

keen to stress that we consider that consumer interest, the protection of which is Ofgem’s principal objective, is a function of all the impacts of interconnection.

3.39. Ofgem will run its assessment of interconnectors under W3 in mid-2022 based on this framework. We will still invite developers to present their own supportive evidence, alongside that set out in the framework, should they wish to do so. We would expect any differences in the analysis used by developers compared to those published in the methodology document to be fully explained. We recognise the challenge of modelling the future energy system, and we will take into consideration the evidence provided to support us in our decisions.

Timelines and incentives

3.40. The cap and floor regime includes provisions to incentivise developers to submit realistic project plans at the IPA stage and to deliver their projects in a timely manner. These provisions also ensure that consumers are protected from changes to the needs case of a project and from undue delays to the delivery of benefits.

3.41. The relevant provisions currently in place are:

- **Deadline for the FPA submission** - Developers have a set deadline from our IPA decisions to submit adequate information to trigger an FPA. If developers fail to reach FPA within a sensible timeframe, we may consider whether the needs case of the project still stands on a case-by-case basis.
- **Connection date** - This is the date by which developers commit to connect when applying to our application windows. In the case of material delays relative to this date, we may choose to reassess the needs case of a project to determine whether it is still in the interest of GB consumers.
- **Regime Start Date (RSD)** - The 25-year duration of the regime starts from the earlier of the actual commissioning date of the project or the expected completion date developers committed to. In the case of project delays, the effective length of the regime is reduced by the length of that delay. However, developers may request relief for delays caused by force majeure events.

What we consulted on

3.42. In our workstream 1 consultation paper, we proposed reviewing the current incentive mechanism, or considering alternative incentive mechanisms, to ensure the timely delivery of projects. We sought stakeholder views on our proposal and suggestions of modifications or alternatives.

3.43. Stakeholder feedback broadly agreed with our recommendation, although few respondents noted that the current incentive mechanisms in place were sufficiently punitive to ensure the timely delivery of projects. Suggestions submitted by respondents generally focused on the need for flexibility in recognition of the fact that not all projects are the same. There was also a request for an economically supported justification to reduce the regime duration of projects when they are delayed.

3.44. Respondents particularly noted the need for flexibility on the setting of the commissioning date and RSD-related provisions to allow time for developers to accommodate the occurrence of potential events beyond their control. They also noted that there is an intrinsic market incentive to deliver projects as quickly as possible so that revenues can be earned, hence any further punitive measures for delays might not be neither necessary nor effective. However, one stakeholder noted flexibility should not hinder the ability of new projects from entering the regime because there are other projects unlikely to achieve completion.

3.45. With respect to the timing of the different regime stages, respondents suggested sufficient time should be allowed between application for IPA and RSD and noted that the IPA stage review should be completed more promptly than in the past.

3.46. Finally, stakeholders reiterated their support for the introduction of a mechanism to provide relief for RSD delays, where those delays are caused by pre-operational force majeure events¹¹but requested more clarity and transparency from Ofgem.

Our decision

3.47. There is a clear call from stakeholders for further flexibility, simplicity and certainty when reviewing the mechanisms that ensure a timely delivery of projects. We recognise

¹¹ Cap and floor interconnectors: Decision on pre-operational force majeure arrangements - <https://www.ofgem.gov.uk/publications/cap-and-floor-interconnectors-decision-pre-operational-force-majeure-arrangements>

and agree with the importance of these high-level principles for the effective design of our regime.

3.48. It is important to note, however, that flexibility must come with consumer protection and should not detract from the importance of developer commitments at IPA stage to deliver within the parameters of the application windows. This becomes increasingly important as the level of interconnection moves towards an optimal level. Therefore, we believe that flexibility must be coupled with enhanced eligibility criteria and enhanced due diligence from Ofgem at IPA stage, as set out earlier in this document. It must also be coupled with the right incentives that encourage developers to operate within the parameters of the regime to which they have applied.

3.49. Based on the principles we have set out above, and after reviewing and analysing the alternative incentives suggested by stakeholders, we have decided the following:

- **We will no longer use a blanket connection date for all projects in an application window and will move towards setting project-specific connection dates.** This is in recognition that not all projects are the same and projects may have longer regulatory and permitting processes to follow in different countries, or with longer manufacturing or construction timelines for longer-distance projects. However, to protect consumers from changes to the needs case of a project, we will maintain a time limit by which projects will have to connect. This limit will be based on each project's connection date plus a predetermined period to accommodate potential delays occurred in the development phase. This predetermined period will be the same for all projects. We will undertake further analysis to determine the specific conditions on which we will work with projects to set their individual connection dates. We will also conduct further analysis to define the appropriate length of the predetermined period which will be used to set the time limit by which projects will have to connect.
- **We will aim to develop a new mechanism to maintain the length of the regime of 25 years and which will also maintain the risk-reward balance between consumers and developers.** We recognise that shortening of the regime duration causes uncertainty to project developers, may lead to higher floor levels and in some instances prevent consumers benefitting from shared revenues above the cap in the shortened period. Therefore, over our implementation period, we will carry out further analysis to help us establish a mechanism that

will equally provide certainty and flexibility to developers, incentivise them to deliver projects as planned, and protect consumers from undue delays.¹² Whilst we acknowledge that there are natural incentives on developers to deliver projects in a timely manner, we want to ensure consumers are protected from any additional risk they could face. We expect the design of the new mechanism to reflect these facts proportionally.

3.50. We will seek stakeholders' views on those details and how the mechanisms referred to above would interact with each other and with the existing pre-operational force majeure provisions before implementing them ahead of W3.

Regime design

3.51. The methodologies we use to set parameters and to calculate returns in the cap and floor regime are designed to reflect the risk-reward balance between consumers and developers, incentivise investment, and reflect the prevailing market conditions.

3.52. Through targeted stakeholder engagement ahead of consultation, stakeholders told us of a number of elements of our regime design that might need revisiting. In our workstream 1 consultation we subsequently presented proposals on which of those elements we would consider further. The following sections set out our decisions on those elements of the cap and floor regime design we will change in the future.

Determining the cap and floor levels: IDC, return rates and benchmarking

What we consulted on

3.53. In our WS1 consultation paper, we proposed a comprehensive review of the methodologies used to calculate IDC, cap and floor rates, and the current benchmark parameters. We also sought stakeholders' views on the methodologies to consider for further review and suggestions on our approach to these methodologies.

3.54. A number of stakeholders expressed support for the proposed review, without anyone directly disagreeing. Further, stakeholders supported Ofgem's intention to seek

¹² By undue delays we mean delays not approved under our pre-operational force majeure mechanism.

consistency across other regulatory regimes but only on certain generic parameters such as total market return and the risk-free rate. They noted any attempt to standardise methodologies across regimes needs to take into consideration the level of risk incurred by interconnector developers, which might be different from risk levels in other regimes.

Our decision

3.55. Based on the broad support received from stakeholders through our consultation, we have decided to confirm our intent of undertaking detailed analysis of the methodologies, rates and parameters mentioned above before the next investment round. Further details will be provided over the implementation period.

Corporation tax and capital allowance rates

What we consulted on

3.56. In our workstream 1 consultation paper, we recommended a review of potential changes to the cap and floor regime to reflect changes in corporation tax and capital allowance rates following FID and welcomed stakeholders' views on the scope and options for those potential changes.

3.57. Feedback received through our consultation was broadly supportive of this review. The most common theme across stakeholders' responses was the request for consistency across different regulatory regimes on who bears the risk of tax changes during the regime. One stakeholder suggested that the recalibration of cap and floor levels could form part of the regulatory audit for each interconnector on an annual or five-year basis, depending on the regime adopted by the project.

Our decision

3.58. Based on our analysis and consultation responses, we have decided to allow corporation tax and capital allowance rates to vary in the cap and floor Financial Models (CFFMs) to reflect the actual rates as set out by Her Majesty's Treasury (HMT). These will be updated at the time of each periodic revenue assessment, i.e., annually or every five years, depending on each project's regime conditions. We think the periodical review and adjustment of corporation tax and capital allowance rates for the calculation of the notional allowances will reflect real costs and allocate the risk of potential changes in tax rates symmetrically between consumers and developers.

3.59. We considered the alternative option of introducing a mechanism whereby developers could recover their actual tax payments to Her Majesty’s Revenue and Customs (HMRC). However, we concluded that this mechanism could potentially lead consumers to be exposed to a treatment of tax shield strategies which is not in their interest. We therefore decided not to pursue this option further.

3.60. It is important to note that some adjustments to the CFFM may be required to implement these changes. We will work over the implementation period on these adjustments and will provide further details in due course.

Other improvements to the regime

What we consulted on

3.61. In our workstream 2 consultation paper we presented some potential improvements to parts of the technical design of the cap and floor regime and invited stakeholders to comment on other potential regime improvements.

3.62. In addition to our proposals, one stakeholder highlighted the importance of future-proofing the cap and floor licence conditions as a response to the plans of the Office of National Statistics to move towards a more extensive use of the Consumer Price Index (CPI) and the discontinuation of the methodology historically used to calculate the Retail Price Index (RPI), which is currently used in the cap and floor regime.

3.63. One respondent also noted that over the period between FPA and financial close, some fluctuations in exchange rates may occur. However, there is currently no requirement for Ofgem to re-assess exchange rate assumptions used in setting cap and floor allowances after financial close, placing a significant exchange rate risk on a project promoter and finance providers.

3.64. Finally, some stakeholders suggested that to mitigate the uncertainty around operational costs (OPEX) at FPA, some events should be classified as non-controllable costs so that those can pass through into the cap and floor as a revenue adjustment. They suggested these types of events were outside of the control of project promoters.

Our decision

3.65. Based on our analysis, the recent recognition from HMT and the UK Statistics Authority¹³ of the shortcomings of the RPI, and stakeholders' feedback, we have decided to move away from the use of RPI in our future regime.

3.66. We acknowledge there will be financial implications for projects and investors depending on which index we select between CPI or CPIH¹⁴. We will further consider factors such as liquidity in the CPI and CPIH-linked debt and swap markets and the wider use of the two indices in the financial markets.

3.67. As per the treatment of risks linked to changes in costs as a result of fluctuations in changing exchange rates and commodity prices, we confirm that we expect hedging of all main contracts if it is economic and efficient to do so. However, a developer may choose not to hedge costs which are small in value. We will review such decisions on a case-by-case basis, and if we agree that it was not appropriate to hedge these costs and find that the developer acted in an economic and efficient manner, we will accept the costs at the sterling cost paid at the spot rate prevailing at the time of payment.¹⁵

3.68. We have also decided not to include any additional items in the non-controllable costs list of the future cap and floor regime as we did not find sufficient evidence of specific items which could be included. We note that most of the events mentioned by stakeholders were particularly broad which opposes the approach followed for the existing list of items, which are specific and tightly defined. However, recognising the different nature of each project and of the preferred financing solutions, developers may request a variation to the regime to allow for specific and well defined non-controllable operational costs to be included in the floor.

3.69. Finally, as set out earlier in this document, some stakeholders raised an issue in relation to the risk of circularity between FPA and FID. We intend to follow the same

¹³ A Response to the Consultation on the Reform to Retail Prices Index (RPI) Methodology - https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938008/RPI_Response_FINAL_VERSION_.pdf

¹⁴ The Consumer Prices Index including owner occupiers' housing costs

¹⁵ Further guidance on our current position on hedging can be found in our Electricity Interconnectors Cost Assessment Guidance Document published in March 2021: https://www.ofgem.gov.uk/sites/default/files/docs/2021/03/electricity_interconnectors_cost_assessment_guidance_march2021.pdf

approach described in our FPA decision for Greenlink,¹⁶ whereby we will confirm the financial parameters that will apply to the project after financial close.

A regime that works for a broad range of financing solutions

3.70. The cap and floor regime is intended to support a wide range of different financing options. Early feedback, however, suggested that some aspects of the regime might not be suitable for certain types of financing solutions. For this reason, we introduced a regime variations process to enable developers to request variations to the default regime where they could be justified.

What we consulted on

3.71. Through our targeted stakeholder engagement ahead of consultation, stakeholders told us that some challenges remain for project finance developers, specifically due to the added complexity of regime variations process alongside the default regime. Whilst feedback focussed on project finance solution, we consider that this feedback could also apply to other financing solutions. At consultation stage, we reiterated our commitment to ensure that any future regime works for all developers and invited stakeholders to provide suggestions on ways to ensure a level playing field for all types of financing solutions.

3.72. A significant number of stakeholders recommended that we retain the regime variations that were approved for Greenlink and NeuConnect in May 2020¹⁷, and to offer them to all developers, regardless of whether they have requested them or not. This would ensure a level playing field among project developers. More generally, feedback also suggested retaining the possibility for developers to request bespoke variations to the regime.

3.73. Few stakeholders reiterated pre-consultation feedback on the risk of circularity between FPA and FID, whereby costs and interest rates must be fixed at FPA in order to

¹⁶ Decision on the Final Project Assessment of the Greenlink interconnector to Ireland: <https://www.ofgem.gov.uk/sites/default/files/2021-09/Greenlink%20FPA%20decision1633004200399.pdf>

¹⁷The decision can be found at: <https://www.ofgem.gov.uk/publications/decision-proposed-changes-our-electricity-interconnector-cap-and-floor-regime-enable-project-finance-solutions>

set preliminary cap and floor levels. This is a potential issue as lenders are reluctant to fix those rates until the FPA process has been completed so that they have certainty on the project cost allowances covered at the floor.

3.74. Finally, one respondent highlighted the need to review the equity and debt return rates used to determine the cap and floor levels. They suggest that these should better reflect the higher revenue risk, and consequently financing costs, future interconnectors will face as more capacity is brought online, especially project financed projects.

Our decision

3.75. We reaffirm that the cap and floor regime should enable a range of different financing options. We have taken on board stakeholders' feedback and suggestions on how to deliver this and have decided the following:

- **We will include the variations approved in our May 2020 decision as default options within our future cap and floor regime.** This means that developers will no longer be required to submit a variation request to have those changes implemented. Developers will have the option to choose whether their project will be regulated under the standard mechanisms of the default regime or under the mechanisms approved in our May 2020 decision.
- **We will maintain the current regime variations process for specific changes to the regime that are not included as default options.** We want to ensure that the regime works for other sources of financing beyond those we have seen through our cap and floor W1 and W2. Therefore, we consider it appropriate to remain open to further regime variations where future developers can demonstrate they are necessary and in consumers' interest.

3.76. The remainder of this section provides further detail on each of these decisions. We will engage further with stakeholders on the implementation of these through the implementation period.

Default options within a future regime

3.77. There was strong support from stakeholders for us to maintain the variations agreed for Greenlink and NeuConnect for future projects. As these variations have been assessed by Ofgem in detail and proven to be required for certain sources of financing, we

agree that they should be readily available for future projects. This will provide certainty and limit the complexity of applying for a cap and floor regime for developers who choose to follow a similar financing solution.

3.78. Whilst the default regime will not include these options from the offset, developers will be able to request any or all of them. Developers will have to notify Ofgem at IPA stage which alternative options they require, and why, and reflect that choice in supporting documents for the needs case assessment. Developers will have to confirm their choice at FPA, or before Ofgem has issued a direction to activate Section G of the interconnector licence.

3.79. The following table summarises which default options developers will be able to choose from.

Table 1: Default regime and alternative options

	Default regime	Default options
Assessment period	Five years	One year
Minimum availability incentive	Developers will lose automatic eligibility for floor payments for each individual year if availability is below 80% in that year	Floor is maintained in years in which availability falls below 80%, with consumers providing a temporary loan capped at four times the floor level to enable developers to meet their obligations to lenders. Developers are required to repay ¹⁸ the temporary loan in full from future revenues above the floor level before they can recover their equity investment and any dividends.
Calculation of IDC, cap and floor level	Notional approach: calculations are based on notional cost of debt and gearing. Cost of debt is applied to 100% of RAV.	Market approach: calculations are set to match annual debt repayment obligations to lenders based on project-specific actual cost of debt and gearing. Cost of debt is applied on geared portions of the RAV only. Provision for a reasonable debt service cover ratio or reserve requirements is included in the actual floor. Ofgem has oversight of the debt raise process. If the overall additional consumers cost under the market approach is higher than under the notional approach,

¹⁸ Developers will be expected to do so over the duration of the regime, including any extension to it where necessary.

		developers are required to repay ¹⁹ consumers from future revenues before they can recover their equity investment and any dividends.
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3.80. It is important to highlight that the benchmark to calculate the notional cost of debt for project financed interconnectors as set in the May 2020 decision (i.e. Non-financial iBoxx BBB 10+ years) may not be maintained for the future regime. As mentioned at paragraph 3.55, we will undertake a review of the benchmark parameter used to determine IDC and the returns at the cap and at the notional floor to reflect an appropriate level of risk for future interconnectors.

3.81. We note that the changes to the definition of *Force Majeure* approved in May 2020 have been already integrated in the current cap and floor regime and will be maintained in the future. We also note our intention to maintain the length of the regime at 25 years as discussed in paragraph 3.49.

3.82. We believe that the changes listed in Table 1 represent an improvement to the default regime that can deliver significant benefits to consumers, while mitigating the potential additional risk consumers would take on. These changes address shared financing challenges that developers other than Greenlink and NeuConnect could face. We hope this decision help streamlining the process required in the past to have these changes implemented. Additionally, by offering these default options to all developers, we will maintain the level playing field while also providing the flexibility to developers to select what they think is the most efficient mechanism to support financing their projects.

3.83. We recognise that there may be financing solutions for which further specific regime variations might be required. We confirm that developers will continue to be able to submit requests for bespoke variations to the regime beyond those listed in Table 1 as per our guidance on this topic.²⁰

¹⁹ As above.

²⁰ For more information, please refer to our December 2015 open letter providing guidance on regime variations available at: https://www.ofgem.gov.uk/sites/default/files/docs/cap_and_floor_regime_variations_open_letter.pdf

4. Next steps

4.1. This document has set out a number of decisions on GB interconnector regulation following our interconnector policy review. These decisions cover both our intended approach for enabling future interconnectors to progress under a regulatory framework, and improvements to the cap and floor regime that will apply to future projects. Where possible, we have provided details on those decision but in some instances, further work is required.

4.2. Over the coming months we envisage the following next steps:

- **Following this decision, we will launch an implementation period.** During that period, we will finalise the details behind the decisions in this paper and implement those decisions to enable a future cap and floor regime. We will continue to engage with stakeholders throughout this stage to ensure that they have opportunity to comment on the details of the regime that might impact them. We may consult with stakeholders on specific details of the regime if appropriate.
- **Following the implementation period, we will publish full details of how the decisions in this paper will be implemented.** This will set out further detail on the process through which interconnectors and MPIs can apply for a regime and confirm what the cap and floor regime for the future will look like. This will provide all the details required for interconnector and MPI developers to make decisions on whether they wish to apply for a regulatory regime and will provide the necessary details for them to begin preparing for application rounds. We expect this to be published in spring 2022.
- **We will open a cap and floor application window for interconnectors and a cap and floor pilot scheme for MPIs in mid-2022.** The application rounds will remain open for three months to ensure applicants have time to adequately prepare and submit applications. To ensure expediency we will aim to begin progressing individual applications as they come in over that period. Once the window has closed, we will confirm which of the applicants are eligible and will begin the initial project assessment stage.

4.3. We recognise that stakeholders are looking for certainty on next steps as soon as possible, in particular those interconnectors and MPI developers seeking to apply for a cap

and floor regime. However, we need to balance speed with the need to ensure that the details of our approach and a future regime are fit for purpose and can incorporate the important changes highlighted by this review. Furthermore, we have valued stakeholder input to date and want to ensure that stakeholder continue to help shape the details and implementation of the decisions set out in this document. We think that the approach set out above achieves this balance.

Implementation period

4.4. Over the implementation period we will refine and clarify the details of the decisions set out in this document. We may consult with stakeholders on specific details of the regime if appropriate. Table 2 below sets out the next steps through the implementation period on each of the decisions we are taking following this review.

Table 2: Summary of next steps

Policy Area	Decision(s)	Next steps
Application windows: Near term	<p>We will open an interim W3 in mid-2022.</p> <p>W3 will be a location-targeted window for interconnectors that are able to connect within the next decade, with particular emphasis on those that can contribute to government’s ambition for at least 18GW by 2030.</p> <p>We will use a bespoke approach to targeting our W3 informed by future facing analysis from the ESO, alongside engagement with NRAs and our view of the potential connecting markets.</p>	<p>We will continue to work with the ESO on undertaking analysis on the system operability impact of interconnectors to inform our targeting of regions. We will keep stakeholders updated on this process.</p> <p>We will begin engaging with NRAs to understand the potential and regulatory processes for further interconnection in their jurisdictions.</p>
Application windows: Long term	<p>We will maintain the use of application windows in the future.</p> <p>We will target future windows to ensure that the right project come forward in the right locations and at the right time.</p> <p>We will integrate interconnector planning into strategic network planning frameworks.</p>	<p>We will continue to work with the relevant programmes (such as the OTNR, ETPNR and the role of the FSO) to ensure that interconnector regulatory needs are considered as strategic network planning frameworks are developed.</p>
MPIs	<p>The cap and floor regime is, in principle, a suitable regime to apply to MPIs,</p>	<p>We will continue to analyse the application of specific elements of the cap and floor regime to</p>

	<p>subject to there being an appropriate legal framework.</p> <p>We will open an MPI cap and floor pilot scheme to run in parallel to our cap and floor W3 for interconnectors in mid-2022.</p>	<p>MPIs. We will seek stakeholder input as this work progresses and other relevant work programmes conclude (e.g. OTNR).</p> <p>We will consider further on how the MPI pilot will be implemented, what eligibility criteria should be, and how we will select applicants.</p> <p>We will engage with MPI developers who would be willing to participate in a pilot scheme.</p>
Eligibility criteria	<p>We will maintain the same eligibility criteria used in previous application windows.</p> <p>We will also slightly increase the level of maturity projects need to meet when applying to the cap and floor regime.</p>	<p>We will define the exact list of additional information we expect to be submitted, as a minimum, to satisfy our eligibility criteria and maturity threshold.</p>
Needs case assessment	<p>Socio-economic electricity market modelling remains a valuable tool for assessing the needs case for future interconnectors.</p> <p>The wider impacts of interconnectors should be assessed and integrated within our future needs case assessment framework.</p> <p>We will work with advisors to design and publish a needs case assessment framework document for future interconnectors (Ofgem will run its assessment of interconnectors under W3 in mid-2022 based on this framework).</p>	<p>We will work with advisors to develop a new interconnector needs case assessment framework. This will clearly set out methodologies, roles and responsibilities, and submission requirements for our IPA stage.</p> <p>We will engage with stakeholders through workshops at key milestones in this workstream.</p> <p>We will share a finalised assessment framework document with interested stakeholder for comment ahead of publication.</p>
Regime timelines and incentives	<p>We will no longer use a blanket connection date for all projects in an application window and will move towards the setting of project-specific connection dates.</p> <p>We will aim to develop a new mechanism to maintain the length of the regime of 25 years and which will also maintain the risk-reward balance between consumers and developers.</p>	<p>We will review how the principles set out in this paper can be brought together by developing a mechanism that balances the risks taken by developers and consumers.</p> <p>We will hold workshops for stakeholders to comment on that regime framework ahead of publication.</p>
Regime design	<p>We confirm our intent of undertaking detailed analysis of the methodologies,</p>	<p>We will undertake further analysis of the methodologies, used to calculate IDC, return rates,</p>

	<p>used to calculate IDC, return rates, and the current benchmark parameters.</p> <p>We will allow corporation tax and capital allowance rates to vary in the CFFMs according to the actual rates as set out by HMT for each relevant assessment year.</p> <p>We will move away from the use of RPI in our future regime.</p>	<p>and the current benchmark parameters ahead of W3.</p> <p>We will work on adjustments to the CFFM required to allow for the corporation tax and capital allowance rates to variate.</p> <p>We will perform analysis on factors such as liquidity of CPI and CPIH in the debt market and its wider use in financial instruments.</p> <p>We will hold workshops to present our decisions on these aspects of regime design ahead of publication.</p>
<p>A regime that works for a broad range of financing solutions</p>	<p>We will include the variations approved in the May 2020 decision as default options within our future cap and floor regime.</p> <p>We will maintain the current regime variations process for specific changes to the regime that are not included as default options.</p>	<p>We will hold workshops with stakeholders to clarify our approach.</p>

5. Appendices

5.1. This section contains a summary of all the responses we received under each workstream of the interconnector policy review. We used this feedback to inform our thinking and the decisions presented in this document. When relevant, we addressed stakeholders’ feedback in the Appendices below.

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Appendix 1

Workstream 1 – Consultation questions and responses

5.1. Our consultation received 14 responses, with participants ranging from interconnector developers, a TSO, energy suppliers and generators to interest groups.

Question 1: Do you agree with the approach we have taken to workstream 1?

5.2. Stakeholders generally agreed with the approach taken and welcomed the opportunity to reflect on what has worked well under the regime and where opportunities for improvement lie.

5.3. One stakeholder flagged that our working paper stated that there were conflicting views from previous stakeholder engagement. However, no further information was provided by Ofgem about these views nor was there mention of the trends in these views. We confirm that these contrasting views have been reflected in this document or in this Appendix.

Question 2: Do you think we have missed any important strengths, weaknesses, opportunities, or threats when critically assessing the cap and floor regime?

5.4. Only three respondents thought we fully captured the strengths, weaknesses, opportunities and threats of the cap and floor regime. Six respondents provided comments, while four did not address the question. Comments provided by stakeholders were further incorporated in our original SWOT analysis, which served to inform the decisions set out in this document.

5.5. In terms of strengths, stakeholders stressed the value of a developer-led regime. This has enabled Ofgem to draw on the expertise and experience of a wide range of developers in identifying projects, fostering innovation and competition, and collecting helpful information on interconnector assets.

5.6. One respondent disagreed that the regime provides revenue certainty, as to date no interconnector project has completed a review period and there is still little clarity on the process and timing of how cap and floor payments will be made. The same stakeholder stated that the flexibility provided by the regime variation request process is a weakness as it demonstrates that the default regime is only capable of supporting

balance sheet financing. It was also noted that Ofgem could be more transparent and clearer compared to its past decisions and modelling studies. We acknowledge this feedback, however we still believe that allowing developers to ask for variation is a key feature that renders the regime adaptable and relatively future proof.

5.7. One developer flagged the risk of deviating from the regime principles of maintaining the risk-reward balance and a level-playing field for developers, through the approval and implementation of regime variations only for a limited range of developers.

5.8. One respondent also noted that the level of foresight on OPEX, required early on by the regime, is substantially high; including a mechanism to raise incurred costs that could not have been foreseen could help in managing this risk. We note that at the FPA stage we provide views on both firm and non-firm post-operational costs and there is an opportunity to reassess the OPEX after the regime has started. One respondent noted the need to improve the CBA by including a consideration of the merits of new interconnection against an appropriate baseline of existing projects. We have addressed this in our workstream 2 Appendix.

5.9. Finally, another respondent suggested to move all common elements of the regime to the standard licence conditions rather than have them in special licence conditions, as the current approach may lead to unjustified differences across projects. We considered this option while analysing the potential improvements to the regime so that it works for a broad range of financing solutions, however we decided not to take it further. Decisions on this topic and their rationale are set out in Section 3 of this document.

5.10. For what concerns opportunities, respondents recognised potential for learning from the delays that projects incurred in the past to review the eligibility criteria and update the interconnector capacities considered in our assessment reflecting those delays. One stakeholder also indicated that in the future the regime should fully reward interconnectors for their contribution to deliver wider system benefits. Other stakeholder noted it was important to incorporate the regime variations that were awarded to Greenlink and NeuConnect as permanent features of the regime. Finally, the regime was considered by one respondent as flexible enough to accommodate MPIs. Each of these elements raised by stakeholders have been considered in Section 3 of this document.

5.11. In terms of threats, stakeholders pointed at the continued uncertainty of Brexit and its impact on trading arrangements between the UK and the EU. Few

5.12. stakeholders argued that the regime may not be able to identify economically advantageous projects because of failing to correctly assess their impacts and benefits and for locking in consumer payments in the long term due to low revenues. Another stakeholder noted that Ofgem should also consider that there are other technologies that could now competitively deliver the objectives of the cap and floor regime.

Question 3: Do you agree with our conclusion that the cap and floor regime has met its objectives to date? Is there any other information you think we should take into consideration in our analysis?

5.13. Most respondents agreed with the fact that the cap and floor regime has met its objectives to date, particularly in terms of deployed IC capacity, whilst two left no comments.

5.14. However, one respondent stated that the initial objectives of the regime were relatively easy to achieve. Few stakeholders also noted that the regime has fallen short of bringing investment forward in a timely manner and that it has only partially enabled investment from a wide range of market participants for now. Finally, one respondent indicated that the regime could have also realised more benefits with a more coordinated approach from the ESO.

5.15. Whilst we agree with the fact that all newly built interconnector projects have been developed through balance sheet financing solutions, we note that two project financed projects have reached FPA stage. We also acknowledge that some of these projects have been delayed, however we disagree that these delays were caused by the design of the regime itself.

Question 4: Do you agree that the principles of the cap and floor regime remain fit for purpose and suitable to potentially incentivise further GB interconnection?

5.16. Most stakeholders agreed that the principles of the regime are still applicable in the short term. However, some respondents recognised that in the longer term these principles may not be suitable any longer. Stakeholders' views from this question informed our decisions on the regulatory approach for future interconnectors presented in Section 2 of this document.

5.17. Multiple respondents pointed out that not all the principles are fully fit for purpose. For instance, the coordination of regulatory treatment of developers between NRAs could be improved to ensure a level playing field among developers. There were also

contrasting views on whether a developer-led approach would be appropriate for the wider purpose of potentially incentivising further GB interconnection in the long term.

5.18. Finally, one stakeholder disagreed with the suitability of the regime and the need to incentivise further interconnectors due to their negative effect on wholesale prices, for consumers, existing ICs (cannibalisation effect), and generators (reduced profits) presented in the AFRY study. We note that AFRY's report did not suggest generators welfare would see a reduction, rather the results suggest this is likely to increase for some generators, especially in the period of high exports. We address this issue further in our workstream 2 Appendix.

Question 5: Do you agree with our initial proposals with respect to potential changes to the assessment framework of the cap and floor regime? Specifically:

- a) To consider a more coordinated and system-wide approach to application windows, potentially informed by a more proactive role for ESO. Do you have any views on the options presented for our approach to potential future application windows?**
- b) To review our eligibility criteria for any potential future regime, and to explore the potential to raise the maturity thresholds for applications.**
- c) To consider changes to the current incentives mechanisms to help ensure timely delivery of projects. Do you have any suggestions for modifications or alternatives?**

5.19. There was good response to this question with a large number of pertinent points which have been used to inform our decision-making. Feedback received for question 5.a was considered in our analysis for the decision on our regulatory approach for future interconnectors and application windows set out in Section 2 of this document. Stakeholders' responses to questions 5.b and 5.c fed into our analysis leading to our decision on assessing future interconnectors presented under Section 3 of this document.

5.20. Six respondents agreed with our proposal to consider a more coordinated and system wide approach to application windows, whilst five disagreed and one did not comment. Those who agreed saw the benefit of a more proactive role of the ESO that complements the efforts of developers to bring the best projects forward. They also agreed that interconnector and MPI development need to be considered within a more holistic and system-wide approach to improve strategic network planning and maximise efficiency on the system. Few respondents, however, did indicate the need for more details on the specific proposal, and more information on the new role of the ESO in general.

5.21. On the contrary, several stakeholders indicated that the new approach contradicts a very successful feature of the regime (i.e. its developer-led nature) and believed that moving away from it would have adverse impacts on innovation and competition in the sector. It was argued that developers are better placed to identify the best projects by being able to better access data and information, a broader range of expertise, and a wider pool of potential partner companies.

5.22. It was also suggested that the proposed shift could create conflicts of interest amongst National Grid businesses, deterring project finance developers from participating in the sector and affecting the transparency and legitimacy of the regime. Also, relying on the ESO for investment decisions would lead to prioritising system operability impacts in future project assessments over other elements, resulting in suboptimal choices of assets.

5.23. Few respondents also indicated that developers are quite reluctant to be subjected to a further new process and argued that the CION assessment and the NOA for interconnectors already provide Ofgem with enough information. On the contrary, other stakeholders argued that these assessments are not suitable for determining the viability of current and future interconnector projects.

5.24. Several respondents commented on the proposed alternative window design considered at the consultation stage. Five respondents would prefer moving to a case-by-case assessment process driven by the maturity of the projects. They suggest that this would also alleviate supply chain bottleneck issues. However, it was recognised that this approach would not allow Ofgem to select the most beneficial project among many.

5.25. Several respondents did not support the creation of targeted windows, arguing that such a design would not reflect the real development status of a project and that a centrally planned process would not be incentivising, or provide sufficient information to select interconnectors that maximise the benefit to the GB consumer. Such a solution would also be quite rigid and could lead to the risk that Ofgem and connecting NRAs are not aligned in terms of location and the level of interconnection capacity. Six respondents favoured the creation of more regular, cyclical windows, recognising this would increase predictability and flexibility for developers.

5.26. Seven respondents agreed with our proposal to review eligibility criteria and maturity threshold under the regime, although they warned against setting a too high threshold. We included this topic and the responses received in the eligibility criteria subsection in Section 3 of this document. Few stakeholders have also suggested to

introduce a scoring system to assess projects at application stage, and to keep track of their respective progress during the development stage. We will consider this proposal during the implementation period while design our needs case assessment framework for future interconnectors.

5.27. Finally, five stakeholders agreed with our proposal to consider changes to the incentive mechanism under the regime. We treated this topic and the responses received in the timelines and incentives subsection in Section 3 of this document.

5.28. Few stakeholders also welcomed the newly introduced force majeure mechanism to address delays during the development and construction period, however it was argued that this mechanism still does not remove uncertainty as the decision to recognise force majeure delays is taken towards the end of the development period and it is entirely at the discretion of Ofgem.

Question 6: Do you agree with our initial proposals with respect to potential improvement to parts of the technical design of the cap and floor regime?

5.29. Six respondents agreed, whilst six more left no comments on this question. We have reviewed these topics in Section 3 of this paper under the regime design subsection.

5.30. Most respondents commented that any change to the regime design should still reflect the difference in risk and rewards faced by developers. Numerous stakeholders highlighted the need to provide consistent policy on who bears the tax risk across regulatory regimes and that developers should bear a level of tax risk in line with that borne by RIIO licensees. Also, they suggested the introduction of tax reopening mechanisms under a new cap and floor regime.

5.31. One stakeholder suggested several improvements to the regime such as implementing all the variations we approved for the projects Greenlink and NeuConnect, to change the Income Adjusting Events mechanism and introduce new OPEX reopeners.

5.32. One respondent highlighted how one practical issue for project finance is the sequencing of IPA, FPA, debt raising oversight, the licence modification to insert special conditions and the PCR. This is because this sequencing leads to the licence modification coming after the FPA and after the financial close. We invite developers to continue engaging with us to understand how we can address these concerns.

Question 7: Do you have any suggestions for ways in which any potential future regime could work better for a broad range of developers?

5.33. Few respondents provided suggestions to ensure that the regime works better, also for project finance projects. These have already been discussed in Section 3 of this paper.

5.34. Besides the above topics, one respondent recommended to allow developers to have cash-flow during construction to allow early repayment of debt during the construction phase. The same stakeholder also suggested that all efficiently incurred and uncontrollable costs should be included at the floor.

Question 8: Are there any other potential regime improvements that we should explore that are not considered in this section?

5.35. Two stakeholders recommended to allow the split of costs and revenues of a project between countries to be adjusted on a case-by-case basis mindful that construction and operational costs in the UK are typically higher than in some neighbouring countries. We invite developers to engage with us to discuss such requirements if needed.

5.36. One stakeholder asked to consider the impact of Brexit given that support frameworks such as the PCI process and CEF grants no longer apply to interconnectors in the UK. It was suggested that Ofgem should take a leading role in the development of the new Project of Mutual Interest (PMI) framework and work with BEIS to find a replacement for CEF grant funding. We will work with BEIS to understand the potential for a UK support mechanism to satisfy PMI requirements, equivalent to the CEF grant funding, and whether such a mechanism could be implemented through the cap and floor regime.

5.37. A respondent was concerned about the regime being silent on how the period following the regime duration may be considered, as this limits the level of perceived residual value of an IC (with a usual life expectancy of 40 years) to investors, which leads them to only include the regime period for cashflow certainty. The same stakeholder highlighted that the current trial operations requirement exceeds that which is available by suppliers, creating unnecessary risks for developers.

5.38. We acknowledge the feedback received. Considerations on how to treat an interconnector asset after the end of the regime will be made in due time. We also

remain firmly convinced that the current 60 days test period is fundamental to guarantee that consumers underwrite high quality assets, and we believe developers and contractors are the parties best placed to manage that risk.

Question 9: Do you agree with our conclusions? Please provide supporting information if available.

5.39. Three stakeholders fully agreed with our conclusions, whilst five partially agreed and five more did not respond to this question.

5.40. One respondent was cautious about re-opening the regime for applicants given the costs that UK consumers have already underwritten through the regime and regulatory uncertainty post Brexit. The same respondent suggested to delay the process of new windows until more of the existing approved interconnectors are built and the intergovernmental regulatory framework is clearer. The basis of our decision to apply the cap and floor regime to future projects through further application windows is set out in Section 2 of the decision paper.

Question 10: Do you agree with our initial proposals? Please provide supporting information if available.

5.41. One respondent fully agreed with the initial proposals, whilst four partially agreed. The remaining stakeholders did not respond to this question.

5.42. There were mixed opinions regarding the proposed shift towards a more coordinated approach to windows, with stakeholders disagreeing on whether it was necessary and beneficial going forward. Few stakeholders recommended that any such change will require thorough consultation and involvement with the ESO, neighbouring TSOs, and the wider industry. Our views on the role of the ESO in relation to the application windows are presented in Section 2 of this document.

Question 11: Do you have any further feedback on our analysis, conclusions or proposals presented in this consultation document?

5.43. Several stakeholders suggested to simplify regime requirements, legal terms, and processes, with an emphasis on transparency, clarity on use of revenues requirements for IC owners and consistency in application of the future regime. We agree with the principles of further simplicity and transparency and consider that the decisions set out in the decision paper deliver this.

5.44. One stakeholder considered it particularly beneficial if the regime handbook would include more information on timing and required information for the IPA, FPA and PCR processes as well as the general financial model and up to date market related indices. This feedback will be considered in our process of continuous improvement of our regime handbook.

5.45. A different stakeholder was concerned that the proposal to extend the cap and floor approach has been predetermined by BEIS's White Paper, rather than actual analysis, and that more interconnectors may underplay the impact that alternative technologies could have. It was also flagged that by promoting further interconnection, Ofgem would indirectly create supply chain bottleneck issues that may delay offshore wind in Scotland. The basis of our decision to open a new investment round is discussed in Section 2 of this document.

5.46. Finally, one respondent stressed the need to ensure that any regime change is aligned with other relevant programmes, such as the OTNR.

Appendix 2

Workstream 2 – Consultation questions and responses

5.47. Fifteen stakeholders provided responses to our Workstream 2 consultation paper, including four generators, six developers, the ESO and four other respondents.

Question 1: Do you agree with the approach we have taken to workstream 2?

5.48. Four stakeholders agreed with our approach while three disagreed. The rest of the respondents did not provide any comment. Stakeholders' responses to this question were considered while developing our thinking on the future GB interconnector regulation. Details on this approach are set out in Section 2 of this document. We have also considered feedback from this question in our decision process on future needs case assessment which can be found in Section 3.

5.49. One developer disagreed with the need of an additional independent report considering the ESO is already required by Ofgem to produce the Network Options Assessment (NOA) analysis. They noted that if Ofgem consider that study to be insufficient to fulfil its objectives, then it should have addressed this prior approving the NOA methodology or procuring a new study.

5.50. One respondent critiqued the fact that the workstream 2 consultation paper did not report initial feedback from the call for evidence and that it repeated the same questions. Another respondent commented that the overall assumptions, methods, and modelling approach used by AFRY were inappropriate and lacked transparency.

Question 2: What are your views on the scenarios, assumptions, and methodology that AFRY has used to model notional future interconnectors and the impact of cross-border interconnector flows?

5.51. Eight stakeholders provided substantial comments to this question. In general, respondents raised concerns about the consistency of the scenarios used and highlighted the lack of evidence on the way data from different resources were brought together.

5.52. For what concerns the scenarios used in the study, two respondents highlighted that the timelines considered (up to 2040) in the study were too short and the extrapolation of assumptions for the following decade may have not considered important

changes in the energy system. Three respondents did not fully agree with the assumptions for weather patterns, carbon and other commodity prices, and the use of historical profiles to determine future demand. They also disagree with the downward evolution of GB electricity prices presented in the study because of the substantial deployment of renewable energy generation, and the treatment of biomass CCS. Whilst we recognise that some stakeholders disagree with certain aspects of our scenarios, we consider that the decision we made were appropriate for that exercise. Furthermore, we do consider that the scenario modelling was explained appropriately in AFRY's independent report. We will endeavour to continue to seek stakeholders' views during scenario development when assessing the needs case of interconnectors in future application windows.

5.53. Three stakeholders suggested it would have been helpful to consider a wider range of additional scenarios than those used. In particular, they suggested they should reflect declining costs of solar or nuclear energy, the likelihood of more rapid nuclear and coal capacity phase-out compared to renewable capacity deployment, or to reflect the availability of capacity in the connecting markets. One respondent also pointed that the scenarios were too optimistic in terms of achieving net zero, given the slow progress in the energy transition so far compared to the targets set by policymakers. The scenarios we used were based upon publicly available datasets that are widely consulted upon and known to stakeholders. We therefore consider that these represent a reasonable range of likely futures for the purpose of modelling.

5.54. In terms of the modelling approach used, six stakeholders provided comments. One developer indicated that the BID-3 model used by our consultants was not appropriate for the objectives of our analysis, being a linear deterministic model. Three respondents also disagreed with the stepwise approach based on IRR used to select the projects assessed through the CBA. One stakeholder argued that this meant the AFRY study was not a real socio-economic assessment and that the approach might have filtered out potentially viable and socio-economically beneficial projects based on assumptions of their commerciality. Whilst we recognise stakeholder concerns on the approach used in AFRY's modelling, we consider that this approach was appropriate when considering the objectives of the modelling exercise in the context of the ICPR objectives. As set out in our workstream 2 consultation paper this approach should not be considered as a needs case assessment for any interconnector.

5.55. Finally, one developer critiqued the fact that the modelling did not include an assessment of the wider impacts addressed in our workstream 3 consultation paper. Four

other respondents pointed that the modelling did not consider the opportunity costs of favouring investments in assets or technology other than interconnectors to maximise socio-economic welfare. The purpose of this modelling was not to integrate wider impacts into our modelling but rather to understand and seek stakeholder views on each of those elements individually, and to explore how they could be integrated in the future. We recognise the issue raised by stakeholders of the impact on competing technologies and will work with advisors to explore whether competition effects should be part of future needs case assessments.

5.56. For what concerns the assumptions used, one stakeholder stated that the interconnector baseline used was too limited and selected based on the wrong criteria. It also suggested that additional baselines should have been considered. Another stakeholder highlighted how some of the interconnection capacity additions required to maintain internal consistency were not considered as part of the CBA. We believe that the baseline we used in AFRY's modelling was objective and appropriate for this exercise. We will however review how baselines are set for future needs case assessments and whether sensitivities on the baseline are appropriate.

5.57. Four stakeholders highlighted the limited information provided by AFRY about the way in which the IRR was calculated. One respondent specifically criticised the theoretical limitations of using a flat IRR and the misinterpretation of reality it could lead to, as it may favour the selection of less-capital intensive projects and does not reflect different risk profiles between different projects. They suggested this may have led to inconsistent outcomes of the study. We would like to reiterate the position stated in our WS2 consultation that the IRR was an appropriate high-level indicator of commerciality when considering the scope of the WS2 modelling exercise. We recognise that using IRR has limitations and is not a full measure of commerciality.

5.58. For what concerns the modelling of revenues, several stakeholders noted the omission of ancillary services and capacity market revenues although acknowledged the difficulty to forecast them. It was also noted that the AFRY study assumed implicit trading arrangements between the UK and the EU, therefore potentially overestimating the socio-economic impacts of the UK no longer being part of EU's Internal Energy Market (IEM). We will explore how additional revenues can be integrated into future needs case assessments.

5.59. Stakeholders noted the increasing shift of value within electricity wholesale markets towards shorter time frame trading driven by the increasing penetration of RES and

higher volatility and suggested future assessments should focus on this timeframe. However, one respondent argued intraday revenue effects were likely to be limited due to the relative size of these markets compared to day-ahead, and historical observations of weaker price spreads (in implicit auctions) and lower prices for capacity (in explicit auctions) in intraday markets. We recognised in our WS2 that the modelling of revenues generated on shorter timeframes was a limitation. We will explore with consultants whether this can be better reflected in future needs case assessments.

Question 3: Do you agree with our view on the results of AFRY’s modelling? Do you agree that this modelling supports the needs case for further interconnection?

5.60. Responses to this question were mixed. One respondent openly agreed, four provided comments, and none disagreed with our view on the results of AFRY’s study. Some stakeholders highlighted that further information would be required to support the case for further interconnection, especially given the negative results for GB consumers welfare. One stakeholder noted that these negative effects in the short term would imply that there is no immediate need for new projects. We note that a key outcome of the interconnector policy review is that we should take a holistic view of impacts when considering the need for future interconnectors. This means that consumer interest is a function of more than just the outcomes of socio-economic market modelling.

5.61. Eight respondents agreed that the modelling supports the needs case for further interconnection, while five disagreed. The key feedback on modelling assumptions, approach and methodology have been reported earlier in this Appendix.

Question 4: Is there any further information or additional studies that you think should be factored into our analysis?

5.62. Very few stakeholders replied to this question. Some provided independent analysis supporting the case for additional interconnection. Another respondent stressed once again that an assessment of the wider impacts of interconnection defined in our workstream 3 consultation paper should have been integrated in our modelling study.

5.63. One respondent suggested to shift towards using actual weather data and performance of generation assets, rather than theoretical one, to improve the reliability of this type of modelling exercise. We will explore these improvements for future needs case modelling.

Question 5: Do you agree with our conclusions? If not please explain why and provide supporting information if available.

5.64. Six respondents agreed with our conclusions, although some raised concerns on the way in which Ofgem reached them. Only one respondent disagreed, pointing that the study demonstrates that further interconnection may not be in the interest of GB consumers. Six stakeholders did not provide any comments to this question. As already set out, a key outcome of the interconnector policy review is that we should take a holistic view of impacts when considering the need for future interconnectors. This means that consumer interest is a function of more than just the outcomes of socio-economic market modelling.

5.65. Several stakeholders noted that the AFRY study failed to consider many of the risks of the scenarios used not occurring in the future, and key sensitivities. They believed this should be corrected so that future modelling includes more robust and realistic set of credible scenarios and tested with sensitivities to understand how differences in those affect the findings. However, two respondents recognised that designing modelling assumptions and scenarios will continue to be a challenge and suggested that Ofgem provide guidance regarding the scenarios that market participants should consider ahead of future windows and ensure that a suitably wide range of scenarios is considered. We will review our approach to scenario and sensitivity modelling ahead of future needs case assessments.

5.66. Few stakeholders also asked Ofgem to clarify how this analysis will be considered vis-à-vis other future modelling, flagging risks of inconsistencies, and contrasting results. Further detail and clarity were also sought regarding issues such as the integration of wider impacts into socio-economic modelling, and whether developers will have to provide the relevant evidence at the IPA stage. As set out in the main body of this decision, we will be working with advisors to develop a transparent and holistic needs case framework for future interconnectors ahead of future application windows.

5.67. One respondent believed that the study underplayed the benefits of interconnectors, pointing that net zero cannot be achieved without additional capacity as other studies have shown. We note that our decision to open W3 was informed by several studies, including AFRY's report. More details on our views on how further interconnection can contribute to meeting the net zero targets are set out in Section 2 of this document.

Question 6: Do you have any further feedback on the work presented in this consultation document?

5.68. One stakeholder flagged that interconnectors are regarded as pseudo generation assets but are not subject to the same costs as other generators. It was suggested that they should not participate in the capacity market auctions as this is currently distorting the market. The participation of interconnectors in the capacity market is outside the scope of the interconnector policy review, however we will explore how competition effects can be integrated within future needs case assessments.

5.69. One respondent suggested to work closely with BEIS under the Smart Systems and Flexibility Plan 2021 and see whether their modelling could be used to assess future IC. We agree. The ESO confirmed its support to ensure that future socio-economic modelling of interconnection is of the very highest quality and is fit for purpose. We welcome this commitment, and we will ensure that we maximise the ESO's contribution to ensuring that future interconnector modelling is as robust as possible and provides valuable supporting analysis

Appendix 3

Workstream 3 – Consultation questions and responses

5.70. This consultation received 15 responses and participants ranged from interconnector developers, transmission system operators (TSOs), consultancies, interest groups, energy suppliers as well as an energy generator.

Question 1: Do you agree with the approach we have taken to workstream 3?

5.71. While there was general support for the approach taken to workstream 3, two respondents left no comments and six made suggestions for improvements. Several stakeholders noted that it was difficult to respond as the consultation was too high-level and gave only indications of further work rather than clear positions. Few stakeholders also required Ofgem to commit to detailing how wider impacts will be integrated into needs case assessments, the enhanced role of the ESO and project developers, and noted that further engagement would be needed before a decision by Ofgem. We hope that the information contained in this paper and the proposed next steps presented in Section 3 of this document satisfy these requests.

5.72. One respondent suggested that Ofgem tried to use wider impact categories to justify a pre-emptive conclusion on the need for more ICs that is counter to the AFRY report. We acknowledge these comments however we note the extended range of publicly available studies recognising the role of interconnectors in supporting the transition towards a decarbonised and flexible energy system. We also note that the AFRY report showed net positive welfare impact from new interconnection capacity.

Question 2: Do you agree with the potential wider impact categories we have focussed on? Are there any other areas we should consider?

5.73. Generally, respondents agreed with the categories presented. Stakeholders also suggested that we consider other wider impact areas such as the level of resilience provided by high voltage direct current systems, the local environmental impact of building new interconnectors both onshore and offshore, and competition. It was also suggested that we assess interconnectors' impact on balancing services, inertia, dynamic containment and the GB market liquidity. We will consider the above when developing the future assessment framework for interconnectors as set out in Section 3 of this document.

Question 3: Do you think the discussion presented in this document adequately represents the potential impact of interconnection within each category? If not, please explain and provide supporting evidence if possible.

5.74. Generally, stakeholders were supportive and agreed that the discussion presented in this document adequately represented the potential impacts of interconnection. Two respondents did not address this question and one stakeholder partly disagreed stating that there was an over-emphasis on the system operability impact. We will work with advisors over our implementation period to design a framework that assesses the range of impacts of future interconnectors. Section 3 sets out our decision on needs case assessment.

5.75. Another stakeholder indicated that our paper provided limited information and was lacking counterviews on the impact categories considered. We have provided a summary of these throughout this paper.

Question 4: Do you agree with our initial views with respect to each potential wider impact category? If not, please explain why.

5.76. There was consensus on the overall narrative of each wider impact category, however there were differing views on the detail and relevance of details outlined within each category.

5.77. In terms of decarbonisation, stakeholders generally agreed with our initial views, however several stressed that it is vital to have a robust methodology in place that correctly account for the carbon emissions of the electricity imported or exported through a new interconnector; not doing so would bear the potential for an overreliance on cheaper, although carbon intensive, electricity imports at the expense of GB renewables.

5.78. For what concerns the assessment of flexibility impacts, multiple respondents highlighted the risk of double counting with system operability impacts, and that we will need to clearly define what would be assessed under each category. One stakeholder also suggested to consider day-to-day flexibility, not just intra-day flexibility. On the other hand, one respondent believed we should not over-rely on this category as interconnectors have a positive effect on flexibility only under specific weather and market conditions. One respondent, reporting evidence from the ESO, argued that interconnection caused increased constraints in England, requiring more flexibility elsewhere to accommodate them.

5.79. In terms of system operability, several stakeholders noted the consultation was over-reliant on this category and suggested the use of alternative technologies to interconnectors that could provide the same benefits. Other respondents suggested that Ofgem under-represented the potential of interconnectors in delivering positive impacts and provided recommendations on how these assets could be better managed in the future. These included reviewing the ESO procurement processes for ancillary services such as Black Start, exploring zonal and nodal pricing, as well as removing commercial and regulatory barriers where needed.

5.80. Finally, in terms of security of supply, most generators who participated in our consultation provided consistent feedback stressing the negative impact of ICs participation in the capacity market and the risk of unreliability in the direction of IC flows during stress events. They also highlighted the risk of displacement of domestic generation, and the need to understand market conditions and risks in connecting countries that could spill over to the GB energy system. Other respondents, including interconnector developers, pointed at the positive impact interconnectors can have to address sudden system stress events.

5.81. Various stakeholders highlighted how interconnectors currently account for the largest losses on the system, however there were contrasting views on how we should account for the costs for reserves on the system required to manage them, and how the ESO should act to manage these reserves more efficiently.

5.82. One respondent noted that Ofgem did not highlight the potential benefits associated with the mandatory provision of Emergency Services to connected TSOs. They suggested that the benefit of these services could be assessed by the ESO and included in needs case assessment of a project. One stakeholder also recommended that Ofgem should assess the distortive impact on competition and on the capacity market at the IPA stage.

5.83. We acknowledge all the concerns and issues raised by respondents summarised above. We will endeavour to explore ways to address and integrate them in our future assessment framework. Our decision on the needs case assessment can be found in Section 3 of this document.

Question 5: Do you agree with our view on how wider impacts have been captured in past needs case assessments?

5.84. We received a limited number of responses directly answering this question. However, there was general agreement on our views. Some stakeholders noted that some wider impacts were not fully captured before, whilst another respondent further noted that the system operability analysis commissioned by Ofgem to National Grid Electricity Transmission (NGET) was not transparent enough. This feedback will be considered over our implementation period where we will design a new assessment framework for future interconnectors.

Question 6: How do you think we should approach future needs case assessments within the framework presented in this working paper? Are there any other options we should consider?

5.85. Respondents broadly agreed with the need to better assess wider impacts in the future, although there were mixed responses on the appropriate framework to use. Two stakeholders did not address this question. Responses received to this question informed our decision on the needs case assessment for future interconnectors set out in Section 3 of this document.

5.86. Few stakeholders flagged the complexities of modelling the wider impacts listed in our consultation over long periods of time, as well as the risk of double counting them. One stakeholder asked for more nuanced modelling and an assessment of the distortive effect of interconnectors on competition, whilst another recommended once again not to over-emphasise system operability impacts.

5.87. Developers usually preferred maintaining a developer-led approach, whilst other respondents preferred a more centrally led approach whereby Ofgem leads with the assistance of independent advisors. Both parties flagged the need to balance inputs and the role of the different parties involved in the assessment, including the ESO. Few respondents were also in favour of using the ENTSO-E framework, whilst one warned about the shortcomings of it.

5.88. Independent from the approach selected, most stakeholders recommended that Ofgem ensures the transparency and consistency of the new assessment framework, and that all interested stakeholders have the opportunity to participate in its development.

Question 7: Do you agree with our initial conclusions? If not, please concisely explain why and provide supporting information if available.

5.89. Generally, most interconnector developers agreed, whilst generators did not. The latter criticised our positive conclusions reached on the AFRY report set out in our workstream 2 consultation paper, despite negative AFRY modelling results. It was also argued that the analysis was not sufficiently robust to arrive at such conclusions. We note that most of the public and private studies submitted as evidence align with our conclusions.

Question 8: Do you agree with our initial proposals? If not, please concisely explain why and provide supporting information if available.

5.90. Six stakeholders broadly agreed with the initial proposals, whilst the rest submitted mixed responses. Those who commented noted that the proposals were not conclusive and that there is a need to consult on the details of the assessment framework for future interconnectors. One stakeholder also raised concerns on the role that ESO might take in the future and the risks in moving towards a more centralised approach in assessing interconnectors. One respondent was concerned that the new proposals may just lead to further delays in the delivery of projects. We acknowledge stakeholders' concerns and hope that this decision document provides further clarity on those.

Question 9: Do you have any further feedback on our analysis, conclusions or proposals presented in this consultation document?

5.91. Only few stakeholders responded to this question, asking for a speedier progression through the next steps. This would enable the stakeholders to form part of the 2030 and 2050 energy and climate objectives. One stakeholder supported the "opt-in" approach used under the OTNR to enhance coordination in the delivery of MPIs and suggested to implement it also for future point to point interconnectors. A summary of the intended next steps is presented in Section 4. We believe that the time allowed between the publication of this document and the next investment round is proportionate to the work needed to further engage with stakeholders and to address the items on that list.

Appendix 4

Workstream 4 – Consultation questions and responses

5.92. A total of 14 stakeholders submitted responses to our workstream 4 consultation paper, including project developers and their advisors, generators, investors and the ESO. Responses received through this consultation helped inform the decisions set out in Section 2 of this document on MPIs and will be used in our implementation period while we work on the next steps presented in Section 4.

Question 1: Do you agree with the approach we have taken to workstream 4?

5.93. Seven respondents agreed or broadly agreed with the approach taken under workstream 4. One respondent thought the call for evidence was too specific and suggested using wider and more interactive engagement sessions in the future.

5.94. One stakeholder openly disagreed, stating that it is too early for Ofgem to form a position on a regulatory framework for these projects before other work streams such as the OTNR are concluded and asked to delay any decision on the suitability of a regulatory framework for an MPI until then. Whilst we agree with the respondent that there are areas that still require further analysis and consideration, we believe there is value in progressing our thinking in parallel to delivering regulatory clarity in a timely manner.

Question 2: Do you think we have missed any important benefits that MPIs could deliver?

5.95. Almost all stakeholders agreed that we captured the most important benefits that MPI projects could deliver. Two stakeholders encouraged Ofgem to keep exploring additional benefits as new MPI models are developed.

5.96. Some stakeholders stressed the importance of assessing these benefits against the counterfactual, i.e. traditional radial connections to windfarms, when appraising MPIs. Another respondent indicated instead that given the additional complexities of assessing the benefits of MPIs, these assets should not be considered vis-à-vis traditional interconnectors. Whilst we recognise the different nature of MPIs, we believe there are also similarities with traditional interconnectors. We intend to work with interested developers to design an assessment framework that could adequately capture the costs and benefits of MPIs.

Question 3: Do you agree with our views on the conclusions of the ITPR?

5.97. Ten respondents agreed with our views that the ITPR does not provide sufficient certainty and clarity to bring forward MPIs. Three respondents openly agreed with our view that a shift towards a more system-wide and coordinated approach to identify new MPI projects may be preferable in the future.

5.98. Two stakeholders argued that a developer-led approach is still the most preferable approach to identifying the most beneficial projects while tapping into a wider pool of resources and expertise. They noted that this would also promote greater competition and innovation in the sector. It was also highlighted how a shift towards a more centralised approach with a more prominent ESO would represent a significant policy shift from the past, requiring the full legal separation between National Grid ESO and its sister companies before being implemented. We note the feedback received on the role of the ESO and we invite the interested stakeholders to engage with BEIS and Ofgem on the FSO programme.²¹

5.99. One stakeholder noted that Ofgem was not clear on whether the ITPR conclusion supporting a developer-led approach to develop regulatory terms for MPIs is fit for purpose. We confirm that we believe a purely developer-led approach to regulatory arrangements for MPIs is unlikely to be fit for purpose in the long term. We note that this is consistent with the conclusions of our workstream 1 and workstream 3 consultation papers, which proposed enhanced and more proactive network development planning to inform interconnector investment needs and assessments.

Question 4: Do you agree with our proposal to further explore the applicability of the cap and floor regime for the MPI projects currently under consideration? Please provide supporting information if available.

5.100. Eight stakeholders broadly agreed with our proposal, however some stressed that other regulatory models should not be ruled out. One respondent believed that the cap and floor regime can effectively de-risk investment in MPIs, although some changes to the original design and framework would be required.

²¹ For more information, please visit: <https://www.gov.uk/government/consultations/proposals-for-a-future-system-operator-role>

5.101. Three respondents agreed in principle but had some reservations. Two stakeholders stated that any decision on using the cap and floor regime for MPIs should follow the determination of the market arrangements that would apply to these assets and urged Ofgem to delay any decision until the conclusion of the OTNR programme. Other areas that would need to be considered carefully are the assessment of MPIs needs cases, the different development timelines of interconnectors and offshore generation assets, the need to ensure the most economical use of capacity across an MPI, and the determination of ownership of flows and corresponding accountability of the different parties using an MPI.

5.102. The third respondent doubted that a cap and floor could be made consistent with other regimes applicable to the different elements of an MPI. They suggested to consider the development of a single hybrid regime whereby the MPI capacity is identified and allocated dynamically to the interconnector or wind farm connection based on wind outputs, with the wind farm proportion of the overall cost funded through a Tender Revenue Stream (TRS) regime and the remainder through cap and floor regime.

5.103. One respondent remained sceptical about the applicability of a cap and floor regime beyond traditional interconnectors as this regime does not provide enough risk mitigation and financial stability for transmission infrastructure owners. Similarly, another respondent suggested that MPIs should not be considered under the same cap and floor framework used for traditional interconnectors, given the significant differences in technical design, functions, and more difficult appraisal.

5.104. We acknowledge the feedback received, although we disagree with the proposal to delay any decisions on MPIs until the OTNR programme is concluded. We believe there is still value in exploring the applicability of the regime and its principles with interested stakeholders, and learnings from this engagement will be valuable in the future when exploring alternative solutions.

Question 5: Do you agree with our proposal to also consider alternative regulatory models for MPI projects in the long term? What models should we consider? Please provide supporting information if available.

5.106. Most respondents agreed with our proposal and suggested we should maintain a flexible approach and consider a range of regulatory options to reflect the dynamic nature of MPIs. Few respondents, however, stressed the importance of striking a balance between developing a bespoke regime and the need for pragmatic timelines for delivering a decision to allow investments.

5.107. It was noted that remaining open to different models would also accommodate potential shifts towards a more centralised and coordinated approach to identifying MPIs in the future. Irrespective of the above, it was recognised that the chosen regime needs to be developed in conjunction with the ESO, transmission owners, offshore wind farm developers, interconnector developers or OFTOs as applicable.

5.108. One respondent believed that the best model would envisage a centrally led planning and development approach to identifying strategic projects and optimise the number of assets required. These projects should then be competitively tendered, with investment supported by offering a RAB-based or an annual-revenue-stream model linked to the availability of the asset.

5.109. We acknowledge the feedback received, which will be used for our thinking on a future enduring regime for MPIs.

Question 6: What other wider policy issues or aspects related to MPIs should we be aware of?

5.110. Several respondents stressed the importance of defining clear and efficient trading and market arrangements that can support regional cooperation. It was also highlighted that additional analysis is required to understand the implication on the operation of MPIs on Home Market (HM) arrangements compared to the Offshore Bidding Zones (OBZ) model. Few stakeholders noted the importance of close collaboration between the UK and the EU to avoid inconsistencies between jurisdictions.

5.111. Similarly, stakeholders indicated that grid and industry codes will have to be harmonised to ensure the correct market behaviour of the different generators connecting to an MPI. Feedback received suggested that connection arrangements, network

charging, and access rules would also require review to clarify the relationship between generators, owners and operators of MPIs, and to ensure a level playing field.

5.112. Few stakeholders indicated the need to define anticipatory investments (AI) for MPIs to incentivise project promoters to consider further development and oversizing of their assets to accommodate future MPIs. One stakeholder also pointed out that AI could cover the substantial collateral payments that developers need to make immediately to the ESO when signing connection agreements; they noted this would help de-risking investment in MPIs.

5.113. Some stakeholders also noted that it is important to define the activities that an MPI is permitted to carry out. This would in turn help with identifying the revenue streams generated by the asset and assessing them under the most appropriate regulatory regime. One respondent noted this would be key to build confidence among lenders.

5.114. Other areas stakeholders suggested we should consider are security of supply implications, unbundling requirements, access to flexibility markets, and the priority dispatch rules that would apply to the users of an MPI. Finally, one respondent stressed the need to ensure that any proposed new regulatory regime for MPIs must have a similar level of transparency and democratic accountability.

5.115. We acknowledge and agree with the feedback received. We note that some of these topics are currently under consideration through the OTNR programme.

Question 7: Do you agree with our initial conclusions? If not, please concisely explain why and provide supporting information if available.

5.116. Eight respondents broadly agreed with our conclusions, some of which made remarks on moving away from a developed-led approach, as already addressed in this Appendix.

Question 8: Do you agree with our initial proposals? If not, please concisely explain why and provide supporting information if available.

5.117. Seven respondents agreed or broadly agreed with our proposals, some of which stressed once more the need to carefully consider the correct market, commercial and regulatory arrangements for MPIs. Another respondent suggested Ofgem could remove

some of the barriers associated with the development of MPIs by appropriately specifying the market and commercial arrangements that should apply to MPIs.

5.118. Another two respondents highlighted the need for Ofgem to provide clear and firm timelines and intended milestones in our document to give developers and investors the certainty needed to progress projects. They also welcomed the opportunity to further engage in the regulatory process. We hope that the information shared in Section 4 of this document provide enough clarity on our intended next steps with regards to MPIs.

Question 9: Do you have any further feedback on our analysis, conclusions or proposals presented in this consultation document?

5.119. Two stakeholders stressed the importance of involving the ESO across all Ofgem programmes relevant to MPIs, and to consider interfaces with national TOs to ensure the development of a future offshore network that truly contributes to improving security of supply.

5.120. A third respondent encouraged Ofgem to work with European agencies and regulators to ensure alignment and coordination that reinstates market coupling for existing interconnectors as well as future MPIs. This respondent noted that a key barrier that should also be discussed is the current requirement to maximise capacity on cross-border assets.

5.121. Finally, it was suggested that we start considering what changes could be required in other regulatory regimes (e.g. CfDs) to facilitate our proposals.

5.122. We acknowledge the feedback received. This will inform our thinking on the future enduring regime for MPIs.