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Consultation

Consultation on the Final Project Assessment of the NeuConnect interconnector to Germany

Publication date:	11 April 2022	**Contact:**	Aliabbas Bhamani, Vanessa Simpson
		Team:	Interconnectors
Response deadline:	23 May 2022	**Tel:**	020 3263 2795
		Email:	Aliabbas.Bhamani@ofgem.gov.uk

This consultation provides our minded to position on costs and technical aspects of the Final Project Assessment (FPA) of the NeuConnect interconnector ("NeuConnect") to Germany. We have also provided an update on the needs case for the project. We welcome views from all stakeholders on these areas.

This document outlines the scope, purpose and questions of the consultation and how you can get involved. Once the consultation is closed, we will consider all responses. We want to be transparent in our consultations. We will publish the non-confidential responses we receive alongside a decision on next steps on our website at **Ofgem.gov.uk/consultations**. If you want your response – in whole or in part – to be considered confidential, please tell us in your response and explain why. Please clearly mark the parts of your response that you consider to be confidential, and if possible, put the confidential material in separate appendices to your response.

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Executive summary

Electricity interconnectors can provide benefits to GB energy consumers. We[1] confirmed our cap and floor regime in 2014, to provide a clear and transparent regulatory approach for the development of new electricity interconnectors between GB and other countries. This aims to incentivise commercial investment in interconnectors where it stands to benefit consumers.

This consultation provides our minded-to position on the Final Project Assessment (FPA) of NeuConnect and our review of the needs case for the project. NeuConnect Britain Limited (NBL) is the developer of NeuConnect.

Background and scope

NeuConnect is a planned 1400 MW electricity interconnector between Isle of Grain, GB, and Wilhelmshaven, Germany. Our cap and floor regime applies to the GB portion of the project (50% share).

The cap and floor regime is the regulated route for electricity interconnector development in GB. There are three main assessment stages to the regime – Initial Project Assessment (IPA), FPA and Post Construction Review (PCR). We assessed the needs case for NeuConnect at IPA and decided in January 2018[2] to grant the project the regime in principle. Our IPA assessment showed expected net consumer benefits of circa £2.8 billion (2022 prices).[3]

This consultation seeks stakeholders' views on our position on NeuConnect's costs, technical characteristics and approach to revisiting the needs case of the project. As NeuConnect is project financed,[4] we will set the provisional cap and floor levels when the project reaches financial close in Q2 2022. In 2021, we published licence changes to implement project finance-related regime variations for NeuConnect.[5]

What our assessment shows

We set the cap and the floor levels based on building blocks of costs, tax and allowed return. The costs are capital expenditure (capex), operational expenditure (opex), asset replacement

[1] The terms "Ofgem" and "the Authority," "we" and "us" are used interchangeably in this document.
[2] Decision on the Initial Project Assessment of the GridLink, NeuConnect and NorthConnect interconnectors
[3] Cap and floor regime: Initial Project Assessment of the GridLink, NeuConnect and NorthConnect Interconnectors
[4] Decision on proposed changes to our interconnector cap and floor regime to enable project finance solutions
[5] New proposed special conditions for the electricity interconnector licence held by NeuConnect Interconnector Limited

capital expenditure (repex) and decommissioning expenditure (decommex). We refer to these costs as 'Provisional Costs' and have set out our views on these in this document.

NBL submitted its incurred and forecasted project costs to Ofgem in December 2021. It submitted an update to these costs in March 2022. We have assessed whether submitted costs are economic and efficient. We focus on capex and opex and consider that the majority of the project's firm costs are reasonable. The detail is set out in Chapter 3 of this document.

Our January 2018 decision on the IPA of NeuConnect is contingent upon specific IPA conditions. Two of these conditions are that costs do not materially rise from those submitted at the IPA stage and that the project should be delivered on time based on the expectation at IPA. NeuConnect's costs have increased materially against NBL's IPA forecasts and delivery has been delayed to March 2028.

As the regime policy specifies, when project costs have increased or the delivery date is delayed, we may choose to review the needs case for NeuConnect. This review will enable us to confirm whether the project continues to be in consumer interests and should keep the cap and floor regime. We have also invited NBL to provide updated cost-benefit analysis (CBA) reflecting the increased costs and new 2028 connection date. We have set out our approach on the review of the needs case for the project in Chapter 4 of this document.

We have reviewed the procurement process followed for the cable and converter station contracts and consider it was competitive and generally efficient. We have considered the disruptions experienced due to the COVID pandemic and resulting wider economic impacts. The Provisional Costs set out in this consultation include initial values for risks and uncertainties - they reflect an economic and efficient estimate for the extra costs NBL may incur.

We have completed our review of costs during the FPA stage and set out provisional values for opex, repex and decommex. We will review the provisional values at the PCR and update the provisional cap and floor levels to reflect our economic and efficient allowance for these costs.

We have provisionally set the GB share of NBL's development and capital costs at £986.8 million, a reduction of £82.8 million from the submitted £1,069.6 million.

We will confirm the financial parameters that will apply to NeuConnect after NBL's financial close. Our May 2020 regime variations decision[6] allows financial parameters to be set based on the date of Final Investment Decision (FID). We would know these parameters and NBL's final investment decision at financial close. These parameters (such as the actual cost of debt and gearing) are inputs for calculating the Actual Floor Level for NeuConnect. We will calculate the notional cap and floor Levels following our default regime process.

We have also decided to set a target of 94.37% for NeuConnect's availability incentive, based on our review of the project's technical design. The cap level can increase or decrease by up to 2% based on performance against this target. We will assess NBL's revenues against the cap and floor levels considering the interconnector's target availability.

Next Steps

We request stakeholders to respond with their views and evidence relating to our consultation questions. Responses to this consultation and continued stakeholder engagement over the coming months will help shape our decision on this FPA.

We are aware that certain costs can fluctuate from the point of publishing our FPA decision to NBL taking their FID. We will review the final contract costs to inform our decision on this consultation or at the PCR stage. Our decision will be subject to satisfaction that the final stages of the process (ie between our FPA decision and FID) have been run competitively. It will also be subject to the final contract costs not being significantly different to current expectations.

[6] Decision on proposed changes to our electricity interconnector cap and floor regime to enable project finance solutions

1. Introduction

What are we consulting on?

1.1. We are consulting on our minded to position on NeuConnect's FPA. We are seeking views on our assessment of NBL's proposed project costs and technical aspects. We also welcome views on the options we have set out for reviewing NeuConnect's needs case.

1.2. The following areas are in the scope of this consultation:

- Provisional views on devex and capex costs;
- Provisional views of uncertain capex costs;
- Provisional views of the project's post-construction costs;[7]
- Technical aspects, including review of the technical design and setting the project-specific target for the availability incentive; and
- Options we have set out for reviewing NeuConnect's needs case.

1.3. The following areas are not in the scope but are being worked on in parallel:

- Our upcoming decision on the financial parameters for NeuConnect at FID, and
- Our oversight of the debt raising process prior to FID.

1.4. The following areas will be assessed and decided on at the PCR stage:[8]

- Adjustments to the devex and capex costs presented in NBL's March submission to reflect specific changes during construction, and
- Adjustments to the post-construction costs presented in NBL's March submission.

1.5. We have not set out the preliminary cap and floor levels for NeuConnect in this document. We will calculate and publish them after financial close.

[7] By post-construction costs we mean costs associated with operational expenditure (opex), replacement expenditure (repex) and decommissioning expenditure (decommex).
[8] Further details on the specific cost areas that we will review at the PCR stage are included in Chapter 3 of this document.

Structure of this document

1.6. This consultation includes five main sections:

- **Chapter 2** gives an overview of the NeuConnect project and our cap and floor regime.
- **Chapter 3** provides an overview of our cost assessment, which includes an assessment of our proposed view on firm costs and on uncertain costs.
- **Chapter 4** sets out our views on NeuConnect's technical aspects - the technical design and our setting of the project-specific target for the availability incentive. We also address our review of the needs case for the project in this section.
- **Chapter 5** provides information on the annual reporting requirements, the scope and timing of our PCR stage and high-level principles on eligibility.
- **Appendix 1** provides the regime summary for NeuConnect, and **Appendix 2** provides the principles we will apply when reviewing risk-related eligibility at the PCR stage.

Related Publications

The regulation of future electricity interconnection: Proposal to roll out a cap and floor regime to near-term projects Published: May 2014

Decision to roll out a cap and floor regime to near-term electricity interconnectors Published: August 2014

Cap and floor regime: Initial Project Assessment of the GridLink, NeuConnect and NorthConnect Interconnectors Published: June 2017

Decision on the Initial Project Assessment of the GridLink, NeuConnect and NorthConnect interconnectors Published: January 2018

Cap and floor regime: Open letter on procedural changes to our Final Project Assessment stage Published: November 2017

Decision on changes to the electricity interconnector licence held by Greenlink Interconnector Limited (GIL) and the electricity interconnector licence held by NeuConnect Britain Limited (NBL) Published: June 2021

NeuConnect Britain Limited – Decision on a request for a later regime start date for the NeuConnect interconnector project Published: August 2021

NeuConnect Britain Limited – Decision on a request for a later regime start date for the NeuConnect interconnector project Published: March 2022

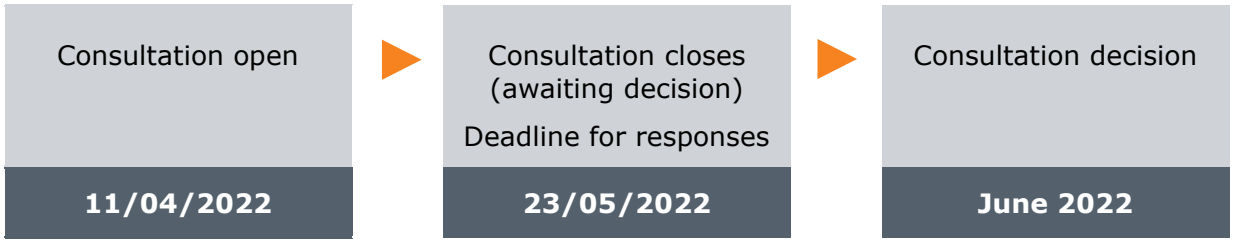
Consultation stages

1.7. Our consultation on NeuConnect's FPA will close on 23 May 2021.

1.8. Following the close of this consultation and subject to consideration of responses, we expect to make our final decisions on each of the elements as follows:

- Determination of NeuConnect's firm costs and our FPA position on uncertain costs.
- Determination of our FPA position on NeuConnect's technical characteristics.
- Finalising the target for the availability incentive which will apply to the project.
- Our review of limited aspects of NeuConnect's needs case.

Figure 1: Consultation stages



How to respond

1.9. We want to hear from anyone interested in this consultation. Please send your response to the person or team named on this document's front page.

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

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

Your response, data and confidentiality

1.12. You can ask us to keep your response, or parts of your response, confidential. We'll respect this, subject to obligations to disclose information, for example, under the Freedom of Information Act 2000, the Environmental Information Regulations 2004, statutory directions, court orders, government regulations or where you give us explicit permission to disclose. If you do want us to keep your response confidential, please clearly mark this on your response and explain why.

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

1.14. If the information you give in your response contains personal data under the UK GDPR and domestic legislation on data protection, the Gas and Electricity Markets Authority will be the data controller for the purposes of GDPR. Ofgem uses the information in responses in performing its statutory functions and in accordance with section 105 of the Utilities Act 2000. Please refer to our Privacy Notice on consultations, see Appendix 3.

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

General Feedback

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

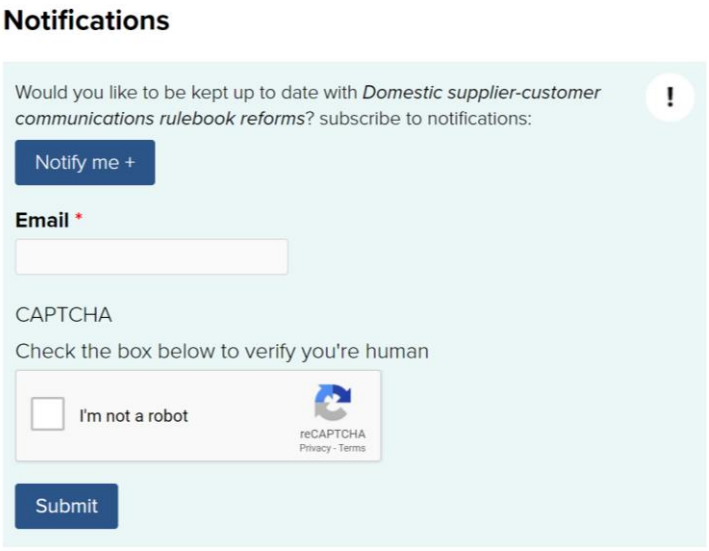
1. Do you have any comments about the overall process of this consultation?
2. Do you have any comments about its tone and content?
3. Was it easy to read and understand? Or could it have been better written?
4. Were its conclusions balanced?
5. Did it make reasoned recommendations for improvement?

6. Any further comments?

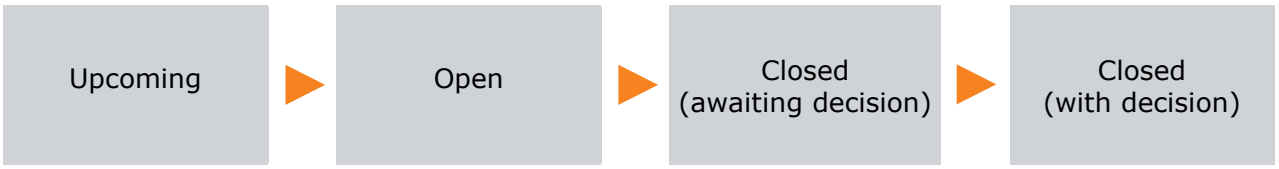
Please send any general feedback comments to stakeholders@ofgem.gov.uk

How to track the progress of the consultation

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



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



2. Background

Section Summary

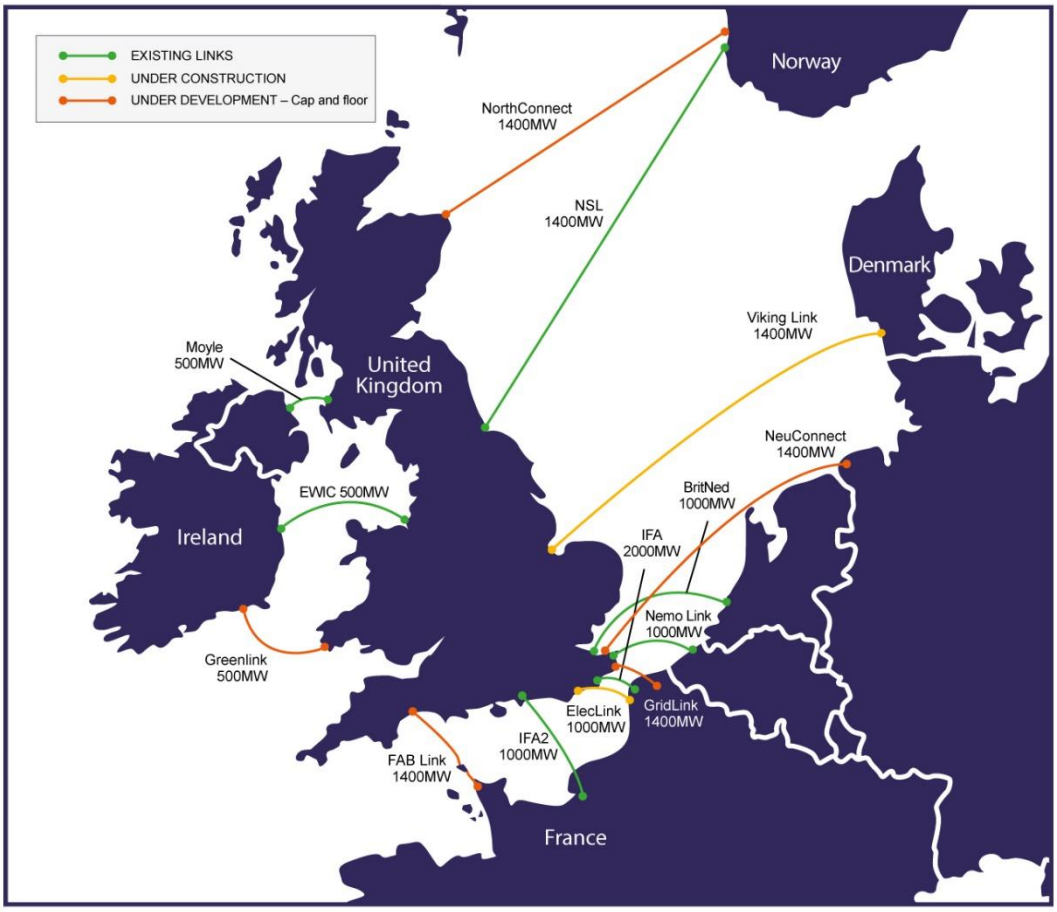
This section gives an overview of the NeuConnect project and our cap and floor regime.

Project Overview

2.1. NeuConnect is a planned 1400 MW electricity interconnector between Isle of Grain in England, Great Britain (GB), and Wilhelmshaven in Germany. In the UK, the connection to National Grid's existing network will be at Grain West substation. In Germany, the connection point to the existing network will be at Fedderwarden substation.

2.2. NeuConnect is shown alongside other operational and proposed projects in Figure 2 below:

Figure 2: Proposed and developed interconnectors



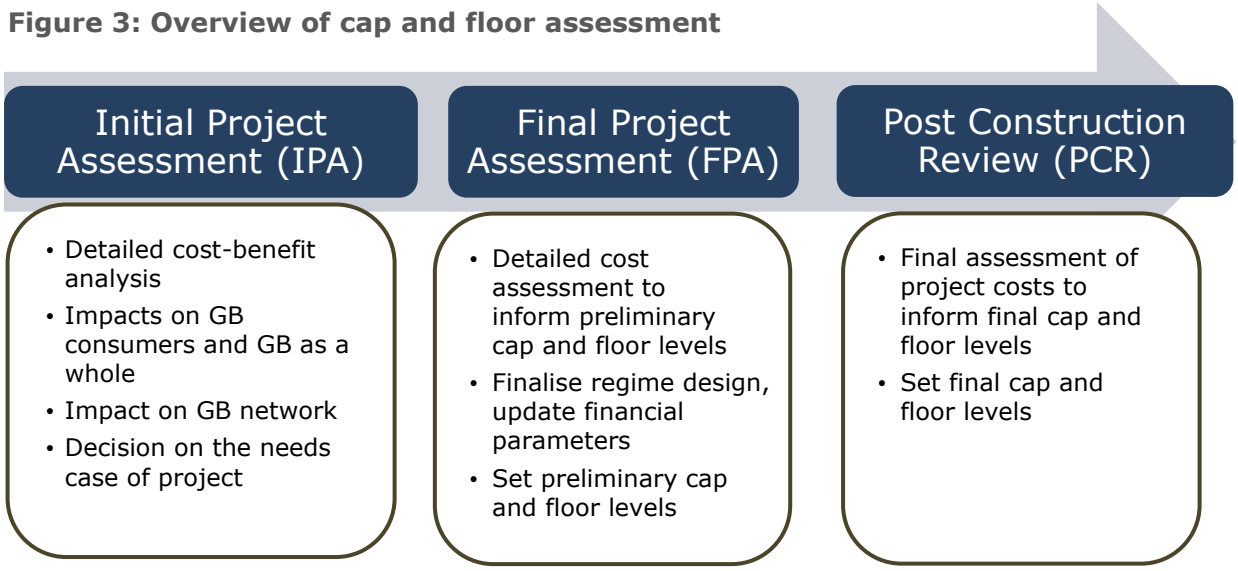
2.3. The project consortium includes Meridiam, Allianz Capital Partners, Kansai Electric Power and Greenage Power, with the project also supported by Frontier Power. Our cap and floor regime applies to the 50% GB portion of NeuConnect. The 50% which applies to the German side of the project is regulated by the German Federal Network Agency (BNetzA). More information on the cap and floor regime design for NeuConnect is provided in Appendix 1.

Our cap and floor regime

2.4. The cap and floor regime is the regulated route for interconnector development in GB. We developed the cap and floor regulatory model jointly with the Belgian regulator, CREG, for application to the Nemo Link interconnector. We then extended the cap and floor regime to other interconnectors in August 2014.[9]

2.5. The three stages to our regime assessment framework are shown in Figure 3 below.

Figure 3: Overview of cap and floor assessment



- The **IPA stage** is when we assess the needs case for new interconnector projects. This is mainly an economic assessment, considering the total costs and benefits of new interconnectors and assessing the likely impacts on consumers.
- At the **FPA stage** we confirm the grant of a cap and floor regime and assess the economic and efficient costs for developing, constructing, operating, maintaining, and

[9] We extended the cap and floor regime to near-term projects in August 2014, and then confirmed this as our enduring approach to interconnector regulation in March 2015 as part of our Integrated Transmission Planning and Regulation project conclusions.

decommissioning of the interconnector. We also develop a project-specific financial model, to set the preliminary cap and floor levels and incentives values.

- We confirm the cap and floor levels at the **PCR stage**, when we revisit aspects of our cost assessment that were not fixed at the FPA stage and assess the efficiency of certain costs incurred during construction.

2.6. We are not setting out our preliminary cap and floor levels for NeuConnect in this consultation document. Our May 2020 regime variations decision allows us to set the levels using the actual cost of debt and gearing achieved through a competitive finance raising process. NBL has been working on the debt raise process alongside its FPA submission. We expect the financing process to end at financial close and produce financial parameters (such as cost of debt and gearing) that will underpin the preliminary actual floor level. We will update the cap and floor financial model and publish the preliminary notional cap and floor levels based on the assessed FPA costs.

2.7. We assessed the needs case for NeuConnect as part of our second cap and floor application window (Window 2) and decided in January 2018 to grant the project a cap and floor regime in principle.[10] This was based on our assessment that the project is likely to not only benefit GB consumers but also GB as a whole when considering the CBA results and other qualitative factors. This decision was subject to a number of conditions, including the costs of the project not materially increasing from the IPA stage and the project meeting the backstop connection deadline of 31 December 2023.[11]

2.8. Following the updated FPA costs submission by NBL, we consider some of the IPA conditions have not been met. Costs have materially increased from the projection at the IPA stage. This has resulted in a review of limited aspects of the needs case of the project and our consideration of two potential approaches to inform our FPA decision. We have explained our approach to the needs case in Chapter 4 of this document.

[10] Decision on the Initial Project Assessment of the GridLink, NeuConnect and NorthConnect interconnectors
[11] The regime start date of all Window 2 projects is 1 January 2021 with a connection deadline of 31 December 2023. Any delay beyond 1 January 2021 will reduce the effective regime length by the length of the delay. Any delay beyond the connection deadline may mean revisiting our IPA analysis.

2.9. We published a procedural update to our assessment framework in November 2017.[12] This noted that we no longer intend to consult on our FPA, except in cases where information has significantly changed since our IPA. This would include situations where:

- project costs have materially increased,
- we think the expected impacts of the project have changed significantly,
- the project has requested variations to the default regime design that we are minded to approve,
- the project does not meet the conditions we attached to our IPA decision, or
- the project has otherwise changed significantly.

2.10. We have decided that NBL's FPA submission qualifies for consultation. This is because costs have increased since the IPA and the connection date has been delayed.

[12] Cap and floor regime: Open letter on procedural changes to our Final Project Assessment stage.

3. Cost Assessment

Section Summary

This section provides an overview of our cost assessment, which includes an assessment of firm costs and our initial views on uncertain costs.

Questions

Question 1: Do you agree with our proposed cost allowances?

Scope of our cost assessment

3.1. During the IPA, NBL submitted its estimates for the project costs, based on the information that was available to them at that time. We did not assess these costs in detail at the IPA stage. At the FPA stage, NBL has submitted more mature project costs and so we are able to carefully assess these costs for this consultation.

3.2. Since the cap and floor levels are largely based on the project costs, we assess these costs at the FPA stage to ensure that they are economic and efficient. We use the GB share of these costs (50%) to inform the cap and floor levels for the GB share of the project.

3.3. We note that our FPA assessment will only affect the notional cap and floor levels. A separate floor level (Actual Floor Level - AFL) will be set to ensure that NBL is able to meet its yearly debt obligations to lenders. The AFL does not allow recovery of equity investment in the project or a return on that investment.

Phased FPA process

3.4. On 2 October 2018, we published our FPA timing update letter for Window 1 (W1) projects.[13] We decided to conduct a phased FPA process for the NeuConnect project. This allowed the developer to submit information for our FPA in three stages. We have also followed this phased approach for the NeuConnect FPA to reflect NBL's procurement process.

[13] Cap and floor regime: An update on the timing of the Final Project Assessment (FPA) for 'Window 1' interconnector projects

3.5. To enable alignment with the timelines for NBL's financing process, NBL submitted an overview of the project including ownership structure and procurement strategy details in phase 1 (Stage 1) and supplemented this with capacity and performance technical details in phase 2 (Stage 2) of its FPA submission. We have updated our assessment of information submitted for Stage 1 and Stage 2 to reflect up to date information. This update is part of our Stage 3 assessment.

3.6. NBL submitted initial cost information in December 2021 to start the Stage 3 process and updated costs in March 2022. The updated costs represent the position following NBL's signing of the engineering, procurement and construction (EPC) contract for cables and the current view from advanced negotiations to sign EPC contracts for the converter stations.

3.7. During this assessment, we have reviewed elements of the project where costs are sufficiently mature. We have carefully reviewed devex, capex and some aspects of opex. Where cost elements are based on early estimates, we have done a high-level review at this stage and, provided that there were not any significant issues in relation to assumptions that had been made, we have provided placeholder values for these costs.

3.8. This consultation provides our provisional view on the placeholder values and firm project costs. We will publish our FPA decision after careful consideration of all consultation responses, setting out our final FPA view on the economic and efficient costs for NeuConnect.

3.9. We will conduct a final review of the project's costs at the PCR stage. We expect the vast majority of NBL's costs would be fixed at that time. Alongside our review of the eligible capex costs, we will assess NBL's post-construction costs in more detail at the PCR stage.[14]

Our view on NeuConnect's submitted costs

3.10. Table 1 and Table 2 provide our provisional view on the economic and efficient costs for the GB share of NeuConnect (50%).

[14] By post-construction costs we mean costs associated with operational expenditure (opex), replacement expenditure (repex) and decommissioning expenditure (decommex).

Table 1: Summary of devex and capex (2022 prices, GB share)[15]

Cost type		NBL IPA Submission	NBL FPA Submission	Ofgem FPA Provisional Allowance
Devex (£m)		12.5	104.3	31.4
Capex (£m)	*Main project costs*	681.4	931.2	921.3
	Risk		34.1	34.1
Total (£m)		**693.9**	**1,069.6**	**986.8**

Table 2: Summary of post-construction costs (2022 prices, GB share)

Cost type	NBL IPA Submission	NBL FPA Submission	Ofgem FPA Provisional Allowance
Operating costs (£m)	287.0	492.8	492.8
Replacement costs (£m)		10.7	10.7
Decommissioning costs (£m)		69.3	69.3
Total	**287.0**	**572.9**	**572.9**

3.11. NBL's FPA submission sets out its rationale for the devex costs incurred to date, and the projected devex and capex spend for the remainder of the project's development and its construction. The majority of these costs relate to EPC contracts NBL have signed, as well as EPC contracts NBL are in the final stages of awarding for the project. We present our review of these costs in the sections below, which cover the assessments of:

- devex costs,
- capex costs, and
- post-construction costs.

3.12. Table 3 provides a breakdown of the project's devex and capex costs, on a component basis, including our provisional FPA cost allowances.

[15] For all values in this document, due to rounding, the figures may not add up precisely to the totals indicated.

Table 3: Costs and proposed Ofgem adjustments (2022 prices, GB share)[16]

Cost type	Submitted cost (£m)	Provisional Adjustment (£m)	Provisional FPA value (£m)
Subsea cables	495.1	0.0	495.1
Land cables	36.1	0.0	36.1
Converter stations	324.8	-7.1	317.8
Substations	9.0	0.0	9.0
Other	170.4	-75.7	94.6
Risk	34.1	0.0	34.1
Total	**1,069.6**	**-82.8**	**986.8**

Assessment of devex costs

3.13. As presented in Table 1, NBL submitted £104.3m of costs associated with development expenditure as part of its FPA submission.[17] We consider devex to cover costs associated with items such as environmental and planning studies, engineering and design assessments, permit fees and resourcing costs that have been incurred prior to the project taking FID. The devex costs also include any eligible grants that have been awarded to the developer, such as the European Union's Connecting Europe Facility (CEF) grant.[18]

3.14. Due to the timing of our assessment, some of NBL's devex costs have already been incurred, and can be considered as fixed, whilst others remain as estimates. These estimated costs reflect the period between NBL's Stage 3 submission and its expected FID date.

3.15. We have reviewed the costs associated with both the fixed and estimated devex costs during this assessment. We are satisfied that the total costs associated with the project's fixed devex costs are economic and efficient, and we are minded to allow the total sum of £10.9m associated with these costs.

3.16. Out of the remaining £93.4m of NBL's estimates for the devex costs, we are also satisfied with and minded to allow £20.5m, provided that the actual incurred costs associated with these development works do not change significantly from this estimate.

[16] Due to rounding, the figures in this table may not add up precisely to the totals indicated.
[17] Unless otherwise stated, all costs referred to in this section reflect the GB share.
[18] Grants such as the CEF grant are presented as negative values within NBL's submission.

3.17. We are minded to disallow the remaining £72.8m of estimated devex costs. These are associated with originator success fees, additional fees payable to the original developer, sponsor development fees for existing shareholders as a development premium and a proportion of costs associated with the acquisition of converter station land. We consider that these costs are outside the scope of our default cap and floor regime costs allowance process and should therefore not be borne by consumers.

Assessment of capex costs

3.18. NBL submitted £965.4m of capex costs as part of its FPA submission. At this stage NBL have not yet incurred any capex costs, and therefore this value is based on NBL's estimates.

3.19. We are minded to provide a provisional allowance for the majority of these costs, based on our review and the maturity of the estimates provided to us in NBL's submission. However, for the non-firm costs that are based on initial estimates, we are minded to use the submitted costs as a placeholder value at this stage, and to revisit these cost areas during the project's PCR.

3.20. Our assessment of the capex costs considered the following elements:

- the suitability of the tender process of the project's main contract(s), and
- the efficiency of the estimated capex costs on an overall basis and by component.

3.21. We provide further details on our assessment, and how we came to our minded to position, below.

Firm capex costs

3.22. The vast majority of NeuConnect's capex costs can be attributed to the works associated with the project's main EPC contracts.

3.23. We have undertaken a detailed review of NBL's procurement process, which is in its final stages, and found it to be robust. We have also assessed the combination of outturn and expected costs of the contracts from the procurement process and found them to be higher than expected for a project of this size and complexity.

3.24. NBL has provided justification for the higher-than-expected outturn costs of its contracts including changes and new information on details of the project such as:

- increased cable length,
- longer construction period due to ground conditions,
- supply chain constraints,

- higher metal prices than originally estimated, and
- increased insurance costs due to constraints in the insurance market.

3.25. We have considered this evidence carefully and concluded that these costs are reasonable in the context of these constraints. Due to the maturity of the costs associated with these works, we refer to these as firm costs within this document.

3.26. We will look at the final contract costs following completion of all the procurement exercises. Subject to our satisfaction that the final stages of the process have been run competitively, and subject to the final contract costs not being significantly different to current expectations, we are minded to provide the full allowance for the outturn value for the awarded contract(s). This is currently estimated as £838.1m (GB share). This means that we will not re-assess the final signed contract(s) unless costs are significantly different.

3.27. The price schedules within NBL's EPC contract(s) include various staff and vessel rates the contractor(s) propose(s) to use, if Variation Orders (VOs) are required during the course of construction.[19] However, a number of these rates are yet to be finalised. We expect to see further details on these rates during the project's annual submissions.

3.28. NBL will need to demonstrate that any VOs and rates used to generate them are economic and efficient. We will assess VOs as they arise during the project's annual submissions and then make a final decision on these costs at the project's PCR.

Land Costs

3.29. The submitted land costs are a mixture of firm and non-firm costs. The project's GB converter station is located on the Isle of Grain in Kent. NBL was required by the owner of the converter station site to purchase land with an area of 836,768 m^2, which is in excess of the project's requirements. Our minded to position is to allow costs associated with the development of the converter station and associated infrastructure, as well as any land used for any uses which are legally required e.g. protected habitats. The area occupied by the converter station is 221,600 m^2 or 26% of the total site.

3.30. NBL explained that the purchased parcel of land contains an existing landfill site, which will require remediation and monitoring for the project's duration. This land was included as

[19] A VO is issued when there is an alteration to the scope of works within a construction contract. This may be in the form of an addition, substitution or omission from the original scope of works, and could bring either an increase or a decrease in costs.

part of the overall land purchase and will have a negative value on contract with the converter station site. Costs related with this remediation should not be borne by consumers and would not be included in the cap & floor values. NBL's share of this cost is £2.4m.

3.31. NBL's cost submission included a value of £10.4m for the entire land purchase/ acquisition costs, of which the GB share is £5.2m. Of this value, we are minded to disallow £3.8m for the land that exceeded the project's requirements.

Non-firm capex costs

3.32. Following our review, we are minded to disallow £4.1m and use a placeholder value for the remaining £117.3 of capex costs that we have deemed to be non-firm.

3.33. These costs related to three main areas:

- Developer project management,
- Developer insurance, and
- Risks.

3.34. We discuss our assessment of each of these, in turn, below.

Developer project management

3.35. This covers costs associated with NBL's own resourcing, as well as all relevant external contractors and advisers, during the project's construction phase.

3.36. We consider that, when compared to similar projects, NBL's developer project management costs appear reasonable. We also consider that the assumptions that sit behind these estimates are appropriate.

3.37. However, when combining the developer's project management costs with the contractor's project management costs, we consider that NBL's combined project management costs are towards the higher end of the range that we would expect for a project of this size.

3.38. We do not propose to adjust these combined project management costs at this stage. However, we will closely monitor them, along with any increases throughout the project's annual submissions and its PCR, to ensure that they are economic and efficient. Where the costs are not substantiated with robust justifications, we will propose cost adjustments at the PCR stage.

Developer insurance

3.39. This covers costs associated with the insurance coverage that NBL expect to place for the construction phase of the project, of which NBL's share is £44.2m.

3.40. NBL are yet to procure these insurance covers. Therefore, the costs included within its submission are estimates, based on communication with its insurance broker. We have reviewed the submitted information supporting the estimated costs for the insurance and acknowledge the current conditions within the interconnector insurance market.

3.41. NBL's share of the submitted cost for Delay in Start Up (DSU) insurance for the project is £4.1m. After reviewing this cost, we do not believe that this insurance provides a tangible benefit to consumers. We are minded to disallow this cost.

3.42. We acknowledge that this insurance could prove to be beneficial for NBL, in the event of a loss of projected revenue, but we do not believe it is a necessary cover for the project.

3.43. Our minded to position is that in the event that NBL do make a claim based on their DSU insurance, any revenue from this would not be considered part of the cap and floor and therefore any revenue from this source would not be considered against the cap and floor levels. We do not propose to revisit our assessment of the requirement for DSU insurance during our PCR.

3.44. Other than the costs associated with the project's DSU insurance, we do not propose to make any further adjustments to NBL's insurance costs for the project. However, as these costs are still early estimates, we will undertake an in-depth analysis of all insurance costs during the PCR stage.

Risks

3.45. NBL is forecasting to incur £34.1m of costs (GB share) as a result of a wide range of risks materialising during the construction phase. This includes, for example, costs for unforeseen environmental conditions on the converter sites or those due to unforeseen marine crossings.

3.46. We have assessed the risks included in NBL's FPA submission. Our minded to position is to include all risks that have been requested. We consider NBL's £34.1m funding request as an appropriate placeholder to cover NBL's share of the eligible risks for the project.

3.47. We will monitor the project's risk profile and materialised risk expenditure throughout the annual submissions. We will take a view on the materialised risks at the PCR stage, applying the principles for risk eligibility that are set out in Appendix 2.

3.48. Our £34.1m allowance is based on NBL's detailed analysis of its construction risks, and our view on these risks. We consider that the register provides realistic risk coverage for the selected delivery mode of a project of NeuConnect's size and complexity. We therefore do not expect the project's materialised risk expenditure to exceed this amount.

Assessment of post-construction costs

3.49. NBL submitted a total estimate of £572.9m (GB share) for the project's post-construction costs, which consisted of:[20]

- £492.8m for opex,
- £10.7m for repex, and
- £69.3m for decommex.

3.50. We have reviewed these costs and NBL's justification for them. However, as the project is still several years away from being operational, some of these costs are based on early estimates. Where this is the case, we have only undertaken a high-level review at this stage, to ensure that that the placeholder values that we will use for these are appropriate.

3.51. We do not propose to make adjustments to NBL's post-construction costs at this stage.

Firm post-construction costs

3.52. Through the procurement process previously mentioned in this section, NBL is also procuring service and maintenance contracts for the project's operational phase. The costs associated with these services are therefore of the same maturity as the capex costs associated with the EPC contract(s). These are for the service and maintenance of the project's converter stations and cables.

3.53. We will look at the final costs following completion of the procurement exercise. Subject to satisfaction that the final stages of the process (i.e. between now and the contract award) have been run competitively, and subject to the final costs for these services not being significantly different to current expectations, we are minded to provide the full

[20] All post-construction costs reported within this section, and within this document, are in real 2022 prices.

allowance for the outturn value for these services. This is currently estimated as £50.7m (GB share). This means that we will not re-assess the costs for these services unless outturn costs are significantly different.

Non-firm post-construction costs

3.54. Following our review of NBL's submission, we are minded to use a placeholder value of £522.2m for post-construction costs that we have deemed to be non-firm.

3.55. This placeholder covers costs associated with the following elements during the project's operational phase:

- Subsea cable surveys;
- Personnel, commercial and business services;
- Insurance;
- Property and route;
- Non-controllable opex;
- Repex; and
- Decommex.

3.56. We have reviewed the main assumptions and considerations that have informed these cost estimates at a high level and do not propose to make any adjustments to these costs at this stage. We propose to use a placeholder value of £522.2m for the project's non-firm post-construction costs.

3.57. We will undertake an in-depth review of these cost elements during the project's PCR where we expect these costs to be more mature. This will enable us to complete a thorough assessment of their eligibility and efficiency. However, we do not expect that these costs will increase significantly from these estimates.

4. Other Aspects of our Final Project Assessment

Section Summary

This section sets out our views on the technical aspects of the project, target for the availability incentive, and our approach to the project's needs case review as a result of costs increase and delays.

Questions

Question 1: Do you agree with our proposal to set an availability target of 94.37% for NeuConnect based on the updated report by GHD consultants?

Question 2: Do you have any views on the technical assessment carried out on NeuConnect?

Question 3: Do you agree with our view that, on balance of the information we have, Option 1 of our needs case review is in the interests of today and future GB consumers?

Question 4: Are there any extra steps that you think we should consider to inform our final decision on NeuConnect following this consultation?

Technical Assessment

4.1. At the FPA stage we undertake a high-level assessment of the project's engineering design. The aim of this assessment is to understand the final design NBL have adopted for NeuConnect and whether the design is in line with the industry practice and standards.

4.2. NeuConnect will have a conventional bipole configuration. This consists of two Direct Current (DC) cables with no metallic or ground electrode return path. The bipole design maximises the availability of the interconnector as it can operate as a monopole in case of the outage on one of the poles.

4.3. NBL have selected a voltage level of 525 kV for the project. We recognise this DC system voltage has become common amongst many existing interconnectors of this size. We have also assessed the reliability and availability assumptions for NeuConnect to set availability targets for the project.

4.4. Following our review of the project's technical design, we are satisfied that the technical choices made are efficient and in line with standard industry practice for this type of project.

Availability Incentive

4.5. The availability incentive is a mechanistic incentive which applies to all cap and floor interconnectors. The incentive aims to ensure that the developers maintain technical availability of the cable, even in periods when they could reasonably expect revenues to exceed the cap or fall below the floor.

4.6. The availability incentive gives a potential 2% upside and downside to maximum interconnector revenues at the cap. This is based on performance against a target level of availability. If developers outperform against the target by up to two percentage points, the cap level increases by the same amount. If developers underperform against the target by up to two percentage points, then the cap level reduces by the equivalent.

4.7. The specific availability target varies from project to project, depending on a number of technical factors such as project design and cable length.

4.8. We determine the availability target based on a Microsoft Excel-based model designed in 2013 by Sinclair Knight Merz (SKM) engineering consultants for our pilot cap and floor project. SKM recommended that the model should be updated where possible to reflect new information that becomes available to ensure that developments in Voltage Source Converter (VSC) and High-Voltage Direct Current (HVDC) cable technologies are captured.

4.9. This was materially updated by GHD (Gutteridge Haskins & Davey) consultants for the North Sea Link (NSL) FPA in 2016 and the IFA2 FPA in 2018. GHD's updates ensured that the model structure and source data continued to be fit for purpose. They also updated the model so that it could capture project-specific information.

4.10. For this FPA, GHD have updated the technical input assumptions to reflect the final design of NeuConnect. The model has been updated to reflect the latest HVDC reliability and availability data that has been recorded since the last time the model was updated, in 2020.

4.11. New information suggests that there has been a reduction in internal and external cable failure rates.[21] GHD have used this information to update the High-Voltage Alternating Current (HVAC) and HVDC cable availability technical parameters in the model.

[21] CIGRE Technical Brochure 815 "Update of Service experience of HV underground and submarine cables" (WG B1.57.2020)

4.12. Based on GHD's analysis and recommendation, we are minded to apply an availability incentive target of 94.37% for NeuConnect's cap and floor regime.

4.13. We have published the GHD summary report and updated availability model alongside this consultation. GHD's report contains details on updates to the availability model.

Why we are reviewing the needs case for NeuConnect

4.14. At our IPA stage, we attached conditions to our decision to approve the NeuConnect project for a cap and floor regime in principle. We have the discretion to review the needs case for a cap and floor project if the developer has not met its IPA conditions. NBL have not met some conditions we attached to our IPA decision for the project. The project costs have increased materially from the projection at the IPA stage and its delivery date has been delayed. We have decided that we therefore need to revisit aspects of the needs case.

4.15. At IPA, NBL estimated capex costs of £1.39 billion (GB and Germany), opex-decommex-repex costs of £0.57 billion (GB and Germany) and a delivery date of 2023. Today, capex has increased to £2 billion (43% increase) and opex-decommex-repex to £1.15 billion (100% increase) and the delivery date is now 2028. All values are in 2022 prices.

4.16. In addition, a 2020 analysis for Ofgem by consultants AFRY indicated that consumer benefits of two Window 1 projects facing delays (Greenlink and FAB Link) have reduced, and in some scenarios turned negative. We have also seen the electricity system change faster than we had assumed at the IPA stage, driven by more ambitious decarbonisation goals.

4.17. Current projections of our developing energy mix share similarities with Pöyry's 2017 high value scenario analysis for our NeuConnect IPA. That scenario suggested falling GB wholesale prices due to more renewables development in GB, and rising exports to Germany in the later years. This resulted in positive total GB welfare, which was a combination of benefits to producers from rising exports and the resulting negative effect on GB consumers from increased energy costs.

4.18. The National Grid Electricity System Operator (NG-ESO) Network Options Assessment for interconnectors (NOA-IC) report provides a similar view on future market developments. The most recent report suggests that *"the high levels of variable renewable generation like*

offshore wind that are an important component of meeting Net Zero often exceed demand and excess power is exported to the continent".[22]

Needs case review for NeuConnect

4.19. We have reviewed aspects of the needs case for NeuConnect to inform this consultation. We have decided to focus on NeuConnect's potential to maximise the value of GB and German renewables through efficient dispatch across both markets, particularly wind.

4.20. In addition, we will request NBL to provide updated socio-economic modelling (CBA) reflecting current project costs and connection date, and any additional independent analysis relevant to the overall needs case. We expect these to be provided during the consultation period and we will consider these submissions in our decision-making process.

GB consumer benefits

4.21. Our June 2017 IPA consultation indicated NeuConnect is likely to create £2.8 billion in consumer benefits.[23] These are primarily based on reductions in the GB wholesale market prices based on day-ahead trading across NeuConnect. These are measurable benefits which we note as ***Benefits A – benefits coming from a reduction in wholesale prices.***[24]

4.22. However, current evidence suggests that NeuConnect's ***Benefits A*** may have reduced or become negative for GB consumers – potentially caused by cost increases, delays and changes in the electricity systems. Higher Net Zero goals may have also led to faster changes in the energy mix than previously anticipated - the UK and Germany have now written into law higher Net Zero targets relative to policy targets in place at our IPA stage.

4.23. Our decision to award NeuConnect the cap and floor regime in principle at IPA was also based on an assessment of the long-term strategic value of the project in balancing intermittent renewables output and maximising the efficient use of renewables across GB and Germany. We note that the additional wholesale market value – based on trading intra-day in response to weather patterns or volatility in prices – is not captured in our previous day-ahead modelling. We would expect this to be an important benefit in balancing intermittency and maximising renewables output.

[22] Network Options for Interconnectors (January 2022)
[23] Our January 2018 decision confirmed our consultation position.
[24] Our May 2020 regime variations aimed to maximise timely delivery of these consumer benefits and noted a potential temporary transfer of extra risks to consumers as a result of the decision. All figures are in 2022 prices.

4.24. The European Network of Transmission System Operators for Electricity (ENTSO-E) Mid-term Adequacy Forecast 2020 highlighted Germany as one of the countries with the largest installed renewables capacities by 2030. Germany has higher shares of generation from renewables than GB which is expected to continue to increase.

4.25. Even where ***Benefits A*** may be reduced or negative, there are also reasons to consider that greater GB producer benefits (that NeuConnect may generate) could lead to a more efficient wider energy system overall which could benefit consumers indirectly.

4.26. The role of NeuConnect in enabling CO_2 reduction, renewables integration or providing flexibility and security of supply is more difficult to measure. However, we consider these factors are likely to form a larger proportion of the total impact of interconnectors in the future. In particular, we would note the value in enabling CO_2 reduction (by connecting two renewables-heavy systems to manage intermittency and maximising renewable output); the value in enabling a route to market for excess renewables output in periods where demand is lower than supply, reducing system constraints; and the security and diversity value of a first link to the German market. For simplicity, we note these extra benefits of interconnectors as ***Benefits B***. We discussed these in detail in our recent interconnector policy review decision.[25]

4.27. Given the changes noted above and the increasing role interconnectors could play in enabling renewables uptake, ***Benefits B*** from NeuConnect is likely higher now than we anticipated at the IPA stage. ***Benefits A*** is likely lower as prices in GB are now expected to be closer to prices in Germany or lower in the next decade – although, as discussed above, modelled value is based solely on day-ahead pricing and will not capture the wholesale market value from trading closer to real-time. However, we do not currently have a reliable way of combining ***Benefits A and B*** to provide a rounded view of the consumer impacts.

4.28. More importantly, the changes in the energy environment are continuing and unlikely to reduce in the foreseeable future driven by our Net Zero goals. Our benefits assessment methodology is evolving to ensure it remains fit for purpose and can address the complex impacts on the future energy system. Following our interconnector policy review, our current work to consider our assessment approaches in more detail ahead of our third cap and floor application window should provide more clarity on where consumers are gaining or losing from a whole GB system view.

[25] Interconnector Policy Review: Decision (December 2022)

Options we have considered to better understand the impacts of NeuConnect

4.29. Given the project's current status and the maturity of the financing and procurement processes, there are two options for reviewing the needs case for NeuConnect. We consider these two options as sequential rather than alternative. These are as follows:

- **Option 1 is to progress NeuConnect** under NBL's current timelines to connect by March 2028. As part of this, we are requesting NBL to provide an independent CBA reflecting current project costs and connection date. We will consider these, and any new evidence provided by stakeholders in responses to this consultation to make a decision.
- **Option 2 is to delay NeuConnect** until we have a new framework in place to reassess the project's needs case – we will use an updated welfare modelling framework we are currently developing to support our upcoming third cap and floor application window. This approach could lead to project delay of around a year.

4.30. **On balance of the information available to us, our preferred option is Option 1.** We consider that Option 1 is in the best interests of current and future GB consumers, and that delaying the project at this stage will likely increase costs and materially delay delivery. We are therefore progressing on the basis of Option 1 alongside this consultation – we expect further analysis to be provided during the consultation period.

4.31. Following our review of this analysis, we will confirm in our FPA decision whether we will continue with Option 1 (ie the project progresses as currently planned), or whether the evidence provided is insufficient and we would need to move to Option 2 at that stage.

4.32. We have discussed the pros and cons of the two options below in more detail.

Option 1

4.33. Our view is that Option 1 would keep costs down for consumers. Choosing Option 1 at this stage means NBL can preserve the delivery programme and price negotiated with the EPC contractors (if new evidence from this consultation and from NBL suggest NeuConnect is still likely to be in consumer interests).

4.34. This option aligns with our intent to open a third cap and floor application window which is based on our expectation that interconnectors will play increasing role as the UK's renewables capacity increases. We have provided our reasoning for more interconnectors in our interconnector policy review decision.

Risks linked with Option 1

4.35. New evidence from consultation and from NBL may indicate conflicting views on NeuConnect's needs case which might make a further consultation necessary. This may potentially risk the 2028 connection date and result in further cost increases. NBL may also decide to reconsider the project.

Option 2

4.36. Going with Option 2 would delay the project further from March 2028 to at least March 2029. The delay could be longer if it does not translate 1:1 to time-shifts that would be necessary across the overall project delivery arrangement – for example, if complex commercial processes such as financing agreements and EPC contract procurement would need to be restarted.

4.37. This delay period would allow us to complete our work on developing a new socio-economic modelling framework as part of our third cap and floor application window, and would allow us to apply this to NeuConnect, consult on our position and issue a decision. We would in parallel request the developer to provide extra analysis that reflects the current costs levels, delivery date and Net Zero targets to inform our final decision under Option 2.

4.38. As we noted in paragraphs 4.21 to 4.28, the evidence we have suggests NeuConnect is likely to generate marginal or negative GB consumer benefits (if we applied the same modelling framework that informed our needs case revisit for the Greenlink and FAB Link projects).

4.39. In our December 2021 interconnector policy review decision, we indicated the need for changes to our current modelling framework to better reflect the changing needs case for interconnectors. We do not consider it is in consumer interests to delay NeuConnect until we have a new framework to implement the full needs case review, considering the growing evidence that more GB interconnectors are likely to be in the interest of consumers and the GB energy system as a whole.[26] We concluded in our interconnector policy review that there is likely to be value in further projects beyond the 15.9GW we have already approved, which

[26] The 2022 NOA-IC report by NG-ESO indicates that *"a total interconnection capacity in the range of 18.2 GW to 29.5 GW between GB and EU markets by 2041 will provide the maximum benefit for GB consumers"*. The total GB capacity of 15.9GW, if all W1 and W2 projects are delivered, is less than the total capacity suggested in the report.

includes NeuConnect. Delaying NeuConnect at this stage would also reduce the likelihood of government's ambition of 18GW of interconnection by 2030 being met.

4.40. We are currently working with consultants and NG-ESO to develop a new CBA framework for interconnectors to inform our cap and floor regime Window 3 process. This work will not be completed in time to meet NeuConnect's financial close which NBL has informed us is critical to deliver the project by 2028. We have provided our view on the delivery timeline in our March 2022 pre-operational force majeure decision for NeuConnect.[27]

Risks linked with Option 2

4.41. Financial agreements with lenders (to raise about £2 billion in debt for the project) are at an advanced stage. This may have to be delayed and/or renegotiated if we were to delay the project. Financial close (expected in Q2 2022) and signed EPC contract(s) may also need to be delayed and/or renegotiated. Both processes are at a very advanced stage and further delay would have a material impact on project deliverability.

4.42. NBL signed some EPC contract(s) in March 2022, which may require renegotiation if the 2028 delivery time is pushed back further. NBL have informed us that they expect to start construction in July this year. To do that, they have to enter into financing agreements in Q2 to enable them to issue a notice to proceed ("NTP") to their EPC contractors in July.

4.43. Overall, a delay to current timelines may lead to increased costs and could lead NBL to reconsider the project. The additional costs of pushing that delivery date beyond 2028 are unclear given present supply chain constraints also noted by NBL, but are likely to be high.

4.44. We have considered the following evidence:

- **Costs increase:** NBL have explained that a change in grid connection location in GB led to an increase in cable length. NBL have also noted that a longer construction period is now being expected (due to ground conditions at the new location). Supply chain constraints and higher metal and insurance prices have also contributed to the project's cost increase. We have considered these costs carefully as part of our FPA process and consider they are reasonable given the evidence.
- **Delays:** NBL have submitted two requests for a delay to the Regime Start Date (RSD). We considered both requests carefully and agreed to a new RSD to reflect delays faced by

[27] Decision on a request for a later regime start date for the NeuConnect (March 2022)

NBL in delivering the project. Both requests were based on events the project has experienced which NBL considered to be beyond its reasonable control, and which have obstructed progress in some key areas. We agreed that a number of these factors were beyond NBL's control and therefore that some delays were unavoidable. More detail is provided in our RSD decisions for NeuConnect.

- **IPA consumer welfare estimates:** Both the 2020 AFRY modelling, and 2022 NG-ESO's modelling, suggests that the effect of Net Zero policy will be to lower long-term structural price differentials between GB and Germany over the next decade. This is because both countries are expected to have more renewable generation by 2030.[28] In some cases, both analyses suggest GB prices might even be lower longer term. As noted above, we will reconsider how we estimate consumer benefits in any future assessment framework as our current framework mainly looks at benefits generated from a reduction in GB wholesale prices at the day-ahead stage. Wholesale market and balancing value nearer to real-time, and the role of interconnection in enabling CO_2 reduction, renewables integration, flexibility and security of supply remains more difficult to measure.

Risk mitigation

4.45. We have considered below key risks if we were to confirm the cap and floor regime for NeuConnect and how such risks could be mitigated.

4.46. The NOA-IC report recommends interconnection to Germany, at a later date than 2028, in only one scenario (Leading the Way) of the four Future Energy Scenarios (FES). This may suggest that interconnection to Germany, in the remaining three FES, is likely to create lower total socio-economic welfare when compared to alternative locations and dates that would represent an optimal path for interconnector build-out. It may also suggest that projects to Germany are likely to create socio-economic welfare but to a lesser degree than the optimal path recommended.[29] We will consider this result in more detail to inform our decision on the NeuConnect needs case review.

4.47. We also note that the AFRY report for Ofgem in 2020 showed that interconnectors to Northwest Europe would likely reduce GB consumer benefits. The report noted that potential

[28] The 2021 ERAA publication forecast almost all countries considered in the study to increase the proportion of renewables in their resource capacity mix while reducing the proportion of non-renewables. The study is a pan-European monitoring assessment of power system resource adequacy of up to 10 years ahead: link to the report

[29] We note that the NOA-IC looks for what would be the optimal path in the FES rather than consider specific project characteristics. The analysis aims to maximise the socio-economic welfare less capex less attributable constraint costs value. Link to NOA-IC methodology: Network Options Assessment Methodology (nationalgrideso.com).

new projects may likely create positive socio-economic welfare overall under a High and Net Zero scenarios with or without Balancing Services Use of System charge (BSUoS) scenarios.

4.48. If we confirm the needs case for NeuConnect, GB consumers may pay higher electricity prices as cheap GB wind power is exported to Germany most of the time rather than importing to reduce prices for GB consumers. But we can also see some benefits to current and future consumers potentially through lower CfD cost which could reduce the overall consumer costs, and through market trading in near-term timeframes that would better capture the volatility value inherent in intermittency.

4.49. It is also possible under a worst-case scenario, although unlikely, that consumers may have to step in to pay lenders about £1.77 billion[30] if NeuConnect is unable to earn any revenues from its commercial operations for reasons outside the control of NBL. We note that our regime variations decision for NeuConnect has now better aligned NBL's incentives with those of consumers. Our decision does not allow NBL to recover its equity investment or any returns on it at the floor level set to cover repayment of the £1.77 billion.

4.50. We have observed that delivering new interconnectors (both cap and floor and exempt projects), when most countries are pursuing Net Zero policies, have proven to be complex, uncertain, and dependent on many competing factors. We will have to consider how to better handle projects we have approved if future events outside the control of developers result in a change to the benefits context that informed our IPA decision on the project.

[30] NBL estimates its potential yearly debt obligations to lenders of about £70.8 million. Under the regime, consumers will step in to repay this yearly amount over 25 years, if the project is delivered successfully.

5. Annual Reporting and our Post Construction Review

Section Summary

This section provides information on the annual reporting requirements, the scope and timing of our PCR stage and high-level principles on eligibility.

Questions

Question 1: Do you agree with our proposed approach to the post-construction review?

Question 2: Do you have any other views on the post-construction review for NeuConnect?

Annual reporting

5.1. NBL will be required to submit annual reports during the construction phase, including cost variations from those set at the FPA. NBL will be required to submit detailed financial information and explanations of any changes annually.

5.2. NBL will need to maintain high quality financial records, according to the requirements set out by Ofgem,[31] and to provide evidence of expenditure during construction. As a minimum NBL will need to:

- Ensure a clear paper trail of expenditure for all items submitted as part of the annual reporting. For example, NBL needs to differentiate clearly between expenditure on the original contract and any variations to it. If we are unable to distinguish the expenditure, we may assume it is expenditure for items already assessed at the FPA and therefore not eligible for further review.
- Provide evidence for all expenditure, such that a forensic audit can be carried out by Ofgem if required. Items which cannot be evidenced (e.g. no invoice and proof of payment) may be disallowed by Ofgem entirely.

[31] Our Cap and Floor Regulatory Instructions and Guidance (RIGs), published as Schedule 5A to our Nemo Link PCR decision, sets out these requirements.

5.3. All changes in cost (including risk-related costs and VOs) will need to be transparently documented, against the scope of works and expectations at the FPA, so that they can be assessed separately from FPA items. In addition, the link between these cost changes and NBL's proposed FPA risk allowance should be noted within the annual submissions. These costs will need to be evidenced and documented in the same reporting year in which they occurred.

5.4. If any risk-related cost variance is deemed eligible, only efficient costs will then be allowed. We expect NBL's decisions taken in response to such risk-related factors to be evidence-based and the developer to be responsible for proving that decisions taken in response to these factors were efficient. Appendix 2 provides further information on risk-related eligibility at the PCR.

Scope of the Post Construction Review

5.5. This FPA consultation proposes our minded to position on the economic and efficient costs to feed into the cap and floor levels. For many reasons the outturn costs may be different. The PCR will adjust the FPA's preliminary cap and floor levels for costs we deem to be eligible and efficient.

5.6. The result of the PCR will be an update to the cap and floor levels in NBL's interconnector licence, which will represent the final cap and floor values for the duration of NeuConnect's cap and floor regime (subject to discretionary opex and decommex reopeners).

5.7. At the FPA stage we have approved a nominal interest during construction (IDC) component based on the submitted profile of capex spend over the period of construction. The actual IDC entitlement will be updated at the PCR stage based on the total value of actual allowed expenditure and when it is spent.

5.8. We may choose to conduct a forensic analysis of NeuConnect's costs, or any eligible cost variations, to ensure the traceability and substantiation of the cost submission. This analysis can be used to help establish the final PCR values for the project, including any adjustments to values stated within this document.

5.9. More information on our consideration of risk-related expenditure at the PCR stage is included in Appendix 2.

Timing of the Post Construction Review

5.10. We intend to start the PCR process:

a) The earlier of either:[32]

i. a date on which between 85% and 95% of development and capital expenditure, excluding IDC (and any snagging retention) has been committed to the development and construction of the Licensee's interconnector; and

ii. The Full Commissioning Date; or

b) Such date as may be agreed in writing by us.

5.11. If some risks materialise shortly after PCR submission by NBL, we may allow inclusion of these costs into the PCR up to a certain cut-off point. This cut-off point will be specified as part of the PCR guidance that we will issue to NBL to ensure that there is no unreasonable delay to the PCR process.

5.12. If NBL have reasonable grounds to believe that some of the remaining construction works might be exposed to certain risks after this point, we intend to provide them with an ex-ante allowance for managing these risks, which would be granted as part of the PCR and would not be reopened.

5.13. If the PCR process doesn't conclude within the first year of operation, we may choose to disallow NBL any within-period revenue assessments until the PCR is completed and final cap and floor values are established.

[32] This wording is still under consultation as part of our Statutory consultation on our proposal to insert new special conditions into the electricity interconnector licences held by NeuConnect Interconnector Limited and NeuConnect Britain Limited to implement the cap and floor regime

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Appendix 1

Regime Summary for NeuConnect

In this appendix we provide a summary of the key cap and floor regime features that will apply for NeuConnect. Financial parameters not provided will be estimated following FID using the FID date as reference date. We will calculate and publish these after FID together with the preliminary cap and floor levels that will apply for NeuConnect.

The final regime design will be confirmed via a decision by the Authority post consultation.

Table 1: Key regime features

Feature	Default regime	NBL regime variations
Regime duration and regime start date (RSD)	• The regime duration is 25 years. • The cap level will come into effect automatically on the RSD. • The floor level will come into effect following a successful completion of a proving period and will be retrospectively applied from the date when the successful proving period started. • Except for delays caused by force majeure events, we will start the 25-year cap and floor period from the earlier of the actual commissioning date or 31 March 2028. This means that if non-FM delays cause the connection date to be delayed beyond 31 March 2028, the regime start date will still be 31 March 2028. • We will grant interest during construction (IDC) and additional incurred costs associated with delays if NBL can demonstrate they were efficiently incurred. Our final view on the application of IDC to the project's spend will be confirmed at the PCR stage.	• No change – same as default regime
Amount of project covered by the	• The GB cap and floor regime broadly covers 50% of the project's costs – with minor deviations set out below – and will cover 50% of the total	• No change – same as default regime

regime	revenues earned by the interconnector. • The detailed costs that inform our cap and floor levels are: 50% of NBL's development costs; 50% of the total costs of cable, converters, site preparation (at both GB and Germany); 100% of GB-specific separate costs; and 0% of Germany-specific separate costs.	

Interconnector revenues	• All sources of interconnector revenue, including from selling capacity, capacity market payments and provision of ancillary services will be taken into account for assessment against the cap and floor levels.
	• Receipts that substitute revenue will also be included, for example:
	  • business interruption insurance, and
	  • constraint payments.
	• Certain 'market related costs', defined as firmness, error accounting costs and trip contract costs, will be netted off revenues before comparison against the cap and floor levels (which gives the 'assessed revenue').
		• No change – same as default regime

Assessment period (assessing whether interconnector revenues are above the cap or below the floor)	• Each assessment period is five years. This means that the interconnector's 'assessed revenue' will be compared to the cap and floor levels on a net present value (NPV) neutral basis, every five years. • Each five-year assessment period shall be considered in isolation, with no carry-overs between assessment periods. • Where the interconnector's revenue is below the floor or above the cap (on a cumulative NPV-neutral basis) during an assessment period, the developer may request a 'within-period adjustment' on the grounds of: ○ financeability; or	• Each assessment period is one year. This means NeuConnect's 'assessed revenue' will be compared to the cap and floor levels on a net present value (NPV) neutral basis, every year. • The discount rate applied for the NPV-neutrality calculations (the operational discount rate) will be the Bank of England's Sterling Overnight Index Average (SONIA) rate applicable for the period under consideration plus a margin to be determined at financial close (based on a competitive

	○ pre-empting a material end of period adjustment. • Such a request can cover from year 1 up to year 4 of any five-year assessment period but must reflect whole years only (not partial years). • Ofgem cannot request a within-period adjustment (i.e. only the developer can trigger a within-period adjustment). • Any within period adjustment will be subject to a true-up on a NPV neutral basis at the end of the relevant assessment period. • The discount rate applied for the NPV-neutrality calculations (the operational discount rate) will be the notional operational discount rate (ODR), calculated as the simple arithmetic average of the floor return rate and the cap return rate.	debt raising process and with the approval of the Authority).
Regulatory reporting	• Developers will be required to report annually during the operational phase on revenues, availability and costs. • Developers will also be required to report during construction-on-construction progress and costs. • This reporting must be in line with the 'regulatory instructions and guidance' (RIGs) issued by Ofgem.	• No change – same as default regime.
Cap and floor Payments	• Cap and floor payments will be made between the developer and NG-ESO as the system operator and will be recovered/distributed via the prevailing transmission charging arrangements.	• No change – Same as default regime.

Table 2: Cap and floor levels

Principles for setting the cap and floor levels	Default Regime	NBL Regime variations
Building Blocks Approach	• The cap and the floor levels are built from building blocks of development costs, capital costs, operating and maintenance costs, decommissioning costs, tax and allowed return. • The cost related building blocks (capital costs, operations, maintenance and decommissioning) as well as the tax and return building blocks are confirmed at FPA and/or PCR stages. • The cap and floor levels will be profiled so that they are flat over time in real terms.	A Notional or Market approach is possible: • Notional approach: No change – same as default regime (but replacing the default benchmark with 'iBoxx GBP Non-financials BBB 10+', with everything else remaining the same as in the default regime). • Market approach: The cap level is built in the same way as under the default approach; the floor level equals actual debt servicing costs, including interest payments and principal repayment, as well as provision for a reasonable debt service cover ratio and/or reserve and tail requirements, plus the yearly operational costs incurred during those years in which debt is serviced.
Cap and floor levels are indexed by RPI	• Cap and floor levels are indexed by RPI using the CHAW index.	• No change – same as default regime.
Currency	• Cap and floor levels are expressed in Pound Sterling.	• No change – same as default regime.
Availability incentive and Minimum Availability.	• The target availability level for NeuConnect is 94.37% • The cap level will be adjusted annually by up to +/- 2% if interconnector availability exceeds or falls short of a target availability level. This means that availability above (or below) the target level will result in a one-for-one percentage increase (or	• Same as default with the following exception: consumers will top up revenues to the floor (in the form of a temporary loan to NBL) to enable debt servicing if NBL is unable to meet the 80% minimum availability target. NBL will have to repay consumers (from future revenues) on a Net Present Value (NPV-neutral) basis for

	decrease) in the cap level, up to +/- 2%. • Developers will lose automatic eligibility for floor payments for each single year if availability is below 80% in that year. • Ofgem will retain the discretion to reinstate eligibility for floor payments if the outage that caused availability to fall below 80% was caused by an 'exceptional event' (i.e. force majeure).	consumer payments received in years where availability is below 80% (before any distribution or payment to equity providers). Borrowing by NBL's shareholder or equivalent that may seem like a workaround the restrictions on equity distributions or dividends payment will not be allowed. • Outstanding temporary loans from consumers to NBL (over the regime duration) would not be allowed to exceed a maximum of four times the annual floor level.

Table 3: Financial parameters for NeuConnect

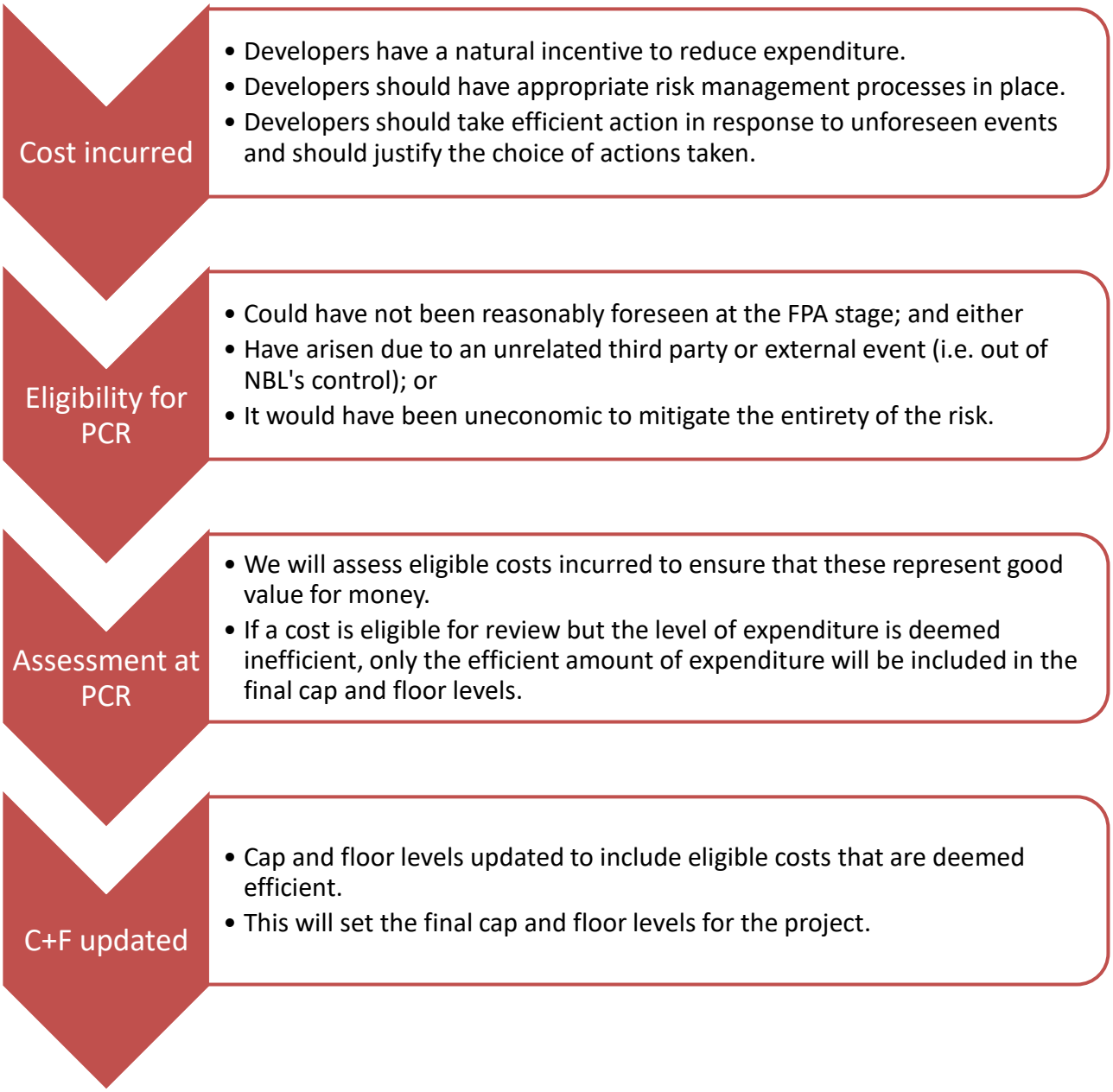
Financial Parameters	Default regime	NBL regime variations
Returns at the floor	• The allowed notional return rate at the floor (real-RPI) will be applied to 100% of RAV. • This notional return is calculated using the 20-day trailing average to the FID date of the average yield on two iBoxx GBP Non-Financial indices of bonds with 10+ years to maturity, with credit rating of A and BBB. • Inflation used to deflate nominal iBoxx yields from nominal to real-RPI is 10-year breakeven inflation (reflecting the difference between nominal and real yields), as published by the Bank of England.	A Notional or Market approach is possible: • Notional approach: no change – same as default regime (but replace the default benchmark with iBoxx GBP Non-financials BBB 10+, with everything else remaining the same as in the default regime). • Market approach: return at the floor is based on actual debt financing achieved, its cost and actual gearing, including provision for a reasonable debt service cover ratio and/or reserve and tail requirements, with Ofgem to oversee the competitive funding process.
Returns at the cap	• The allowed notional return rate at the cap (real-RPI) will be applied to 100% of RAV. • This is calculated using capital asset pricing model (CAPM) and	• No change – same as default regime.

	comprises the following elements: ○ Equity beta: 1.25 ○ Risk free rate: 1.6% ○ Total market return: latest DMS average of UK equity returns since 1900 available at FID date ○ UK RPI formula-effect adjustment: 0.4%	
Interest during construction (IDC)	• The IDC is set based on our regime policy for W2 projects. The same IDC is set for all W2 projects taking FID in each particular year. If NBL takes FID in 2022, our IDC for 2022 will apply to the project.	• Actual debt financing achieved, its cost and actual gearing.
Tax	• Corporation tax rate and write-down allowances used for the purposes of calculating cap and floor values are the UK tax rates as published by HM Treasury.	• No change – same as default regime.
Transaction costs	• The financial transaction costs are calculated as a percentage of the opening RAV. The allowances are 2.5% for debt transaction costs and 5% for equity transaction costs. • The final allowance (in £) will reflect the final RAV at the PCR stage.	• Notional approach: no change – same as default regime. • Market approach: determined through market competition.

Appendix 2

Risk related eligibility at the PCR

This appendix provides an overview of the principles we will apply when considering risk-related expenditure at our PCR stage. Risk-related expenditure is allowable within the PCR where the risk is foreseeable, but it would have been uneconomic to mitigate the entirety of it. We present the risk eligibility review process in the diagram below.



Examples of risks

We recognise that interconnectors are large projects, complex assets and that they often face unique construction risks on a case-by-case basis. This is why we have not sought to include a definitive list of risks that will or will not be eligible for assessment at the PCR stage. Not all projects will face the same risks, and some projects may encounter risk-related expenditure that neither the project developers nor we could have foreseen.

The section below lists some specific risks where we would expect related expenditure to be eligible, considered on case-by-case basis for eligibility or ineligible for assessment at the PCR stage. These lists are non-exhaustive, and it will be the responsibility of developers to prove that risk-related expenditure meets our eligibility principles in the PCR submission.

Examples of risks that we would expect to be eligible for our PCR assessment:

- Soil conditions are significantly different to those indicated by the developer's relevant survey(s) or studies,[33] and therefore additional rock placement or ploughing/burial equipment is required.
- TSOs at either end change the connection arrangements or requirements, which leads to new design requirements and/or delays.
- Grid reinforcement works by TSOs are delayed.
- A significant number of unexploded ordnances are discovered that were not detected by the developer's initial studies or surveys.[30]

Examples of risks that we would consider on a case-by-case basis for eligibility under the PCR assessment:

- Weather conditions (cable) – harsh weather conditions offshore beyond statistical expectations for that time of year.
- Weather conditions (converter) – site conditions mean that construction is delayed beyond what could have reasonably been expected. This can cover excessive wind, flooding, snow, avalanche etc.
- Contractors or related parties fail to deliver on their contract expectations/obligations.

[33] Assuming that the initial surveys or studies were conducted in line with industry good practice and therefore should have been deemed reliable. The onus is on project developers to ensure that their strategy in relation to studies and surveys is appropriate. We would expect the developer to have negotiated suitable rates in advance such that they are not a distressed buyer of services.

- Knock-on effects from contractor delivery of other major projects cause delays/additional costs.

For both of the above examples, to be considered for inclusion in the PCR, we would expect the following circumstances to apply:

- The additional incurred costs are in excess of contractual damages received.
- The developer had adequate risk monitoring processes in place and took timely action to mitigate incurred cost.
- It would have been uneconomic to insure against the scale of the contractor failure.

Examples of risks that we would expect to be ineligible for our PCR assessment:

- Performance of the project organisation leads to delays or additional costs.
- The cable or converter design is unsatisfactory, leading to additional costs or delays.
- Cable or converters are damaged during transport (unless this is due to third party actions or weather events beyond usual expectations).
- Cable laying vessels break down or are not available as scheduled.
- Cable is damaged during manufacturing.
- Cable damage during installation due to inappropriate practices / or use of equipment.

Our PCR assessment of eligible risk expenditure

We recognise that there is a strong incentive on developers to efficiently manage and minimise costs within the construction phase, and that this incentive extends to unexpected costs. However, we still think it is necessary to assess the costs incurred in dealing with unexpected events. This is to ensure that the costs have been efficiently incurred and represent good value for consumers. We will look to ensure that proper process was undertaken, that risk-related expenditure is well-documented, and that costs incurred were not excessive for that type of action.

In addition, our dialogue with project developers throughout the construction stage as part of our annual reporting process should provide developers with an opportunity to ensure that costs (including in relation to risk events) are updated regularly and that sufficient supporting evidence is provided to us. Whilst we will not make any final decisions on cost variations (including risk-related expenditure) prior to the PCR stage, we expect developers to provide us with justification as the project progresses. If we notice large variances from the planned expenditure, we may ask for further evidence during this annual process. We would also ask for further evidence and justification if the PCR submission differs from the iterative updates received as part of the annual reporting process.

Appendix 3

Privacy Notice on Consultations

Personal data

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

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

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

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

2. Why we are collecting your personal data

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

3. Our legal basis for processing your personal data

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

4. With whom we will be sharing your personal data

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

6. Your rights

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

- know how we use your personal data
- access your personal data
- have personal data corrected if it is inaccurate or incomplete
- ask us to delete personal data when we no longer need it

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

7. Your personal data will not be sent overseas (Note that this cannot be claimed if using Survey Monkey for the consultation as their servers are in the US. In that case use "the Data you provide directly will be stored by Survey Monkey on their servers in the United States. We have taken all necessary precautions to ensure that your rights in term of data protection will not be compromised by this".

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

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

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