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Impact Assessment

Proposed changes to our electricity interconnector cap and floor regime to enable project finance solutions

Division:	Systems and Networks	**Type of measure:**	Variations to our cap and floor regime for two projects to enable project finance solutions
Team:	Interconnectors	**Type of IA:**	Qualified under Section 5A UA 2000
Associated documents:	1) Draft impact assessment 2) Decision on changes to our electricity interconnector cap and floor regime to enable project finance solutions	**Contact for enquiries:**	Okon.enyenihi@ofgem.gov.uk
Coverage:	Partial coverage of policy decisions in the associated documents		

Introduction

Purpose

This is an Impact Assessment carried out within the meaning of section 5A of the Utilities Act 2000. We have a statutory duty either to carry out an Impact Assessment or to publish a statement saying why we are not doing one. This duty applies to proposals that we consider "important" within the meaning of the legislation.

Our assessment focuses on consumer impacts of making four key variations to Ofgem's interconnector cap and floor regime. Two developers have requested these variations to accommodate project finance solutions.

This assessment is an updated version of our earlier assessment published alongside our October 2019 consultation.[1] We refer to the earlier assessment as our draft impact assessment. In this document, we have updated our draft impact assessment to take into account consultation responses from stakeholders.

Summary: Intervention and Options

What is the problem under consideration? Why is Ofgem intervention necessary?

We[2] regulate electricity interconnector development in GB under the cap and floor regime and have approved nine cap and floor projects in this way. As part of the regime policy, developers may request changes[3] to how we apply aspects of the default regime and show that applying these changes for their projects is in the interest of GB consumers.

Greenlink Interconnector Limited (Greenlink) and NeuConnect Britain Limited (NeuConnect) have requested changes to some aspects of the default regime. They claim that without these changes, it would be difficult to raise required financing and deliver projects on time.

We have to assess the requests and accept or reject them without undermining our regime principles. These principles aim to preserve a fair consumer-developer risk-reward balance and to keep a level playing field across all cap and floor projects.

What is the assessment scope?

The scope of this assessment is slightly broader than the scope of our draft impact assessment. It covers, in addition, impacts on consumers of applying **one of the requested changes (broadening the definition of Force Majeure)** to four cap and floor projects that have already raised financing. This modification allows our assessment to capture consumer impacts better when other projects benefit from any of the changes.

We limited the scope of our draft impact assessment primarily to the impacts of two projects led by the developers who requested the changes. We also considered long-term impacts of three additional projects that will need to raise financing under the regime in the future. In this assessment, we also assess the impacts of applying by design a change in Force Majeure meaning (one of the requested changes) for all cap and floor projects.

What are the policy objectives and intended effects, including the impact on Ofgem's Strategic Outcomes?

[1] Consultation on proposed changes to our electricity interconnector cap and floor regime to enable project finance solutions (October 2019): https://www.ofgem.gov.uk/system/files/docs/2019/10/regime_variation_condoc_-_031019_1.pdf
[2] The terms "the Authority", "Ofgem" and "we" are used interchangeably. The Authority is the Gas and Electricity Markets Authority. Ofgem is the Office of the Gas and Electricity Markets Authority.
[3] We refer to these changes as regime variations.

The objective of the policy is to ensure that the cap and floor regime is fit for a range of financing solutions. We consider that enabling a range of financing solutions is, in principle, good for consumers as it could promote competition, innovation and efficiency in the interconnector market.

Consumers benefit when there is interconnection to markets with cheaper electricity. Consumers also benefit when interconnectors enable the integration of renewables, and increase the diversity and availability of supply sources. These outcomes align with Ofgem's principal statutory objective – to protect the interests of both current and future consumers.

What are the policy options that have been considered, including any alternatives to regulation? Please justify the preferred option (further details in Evidence Base).

We have considered the below five key changes:

- **Variation 1**: To reduce the default five-year revenue assessment period to one year.
- **Variation 2**: To require consumers to top up revenues earned by interconnectors in the market to the consumer supported revenue floor level when necessary to repay lenders. Interconnectors will repay consumers from future revenues above the floor to ensure any additional floor payments compared to the default regime are reimbursed to the extent possible (in NPV neutral terms). In the default regime, consumers will not top up revenues if interconnector availability is below 80% in a given year.
- **Variation 3**: To broaden the default definition of force majeure to cover more events.
- **Variation 4**: To set floor revenues based on financial parameters (actual cost of debt and gearing) achieved in a competitive market process as well as Interest During Construction (IDC) calculations. These are set notionally in the default regime.
- **Variation 5**: To maintain the 25-year regime length (if shown to be in the interest of consumers, or the operational date has been delayed beyond developers' control).

In our draft impact assessment, we considered Variations 1, 2, 3 and 4 under four policy options set out below to reach our consultation position:

- Option 1: Do nothing (counterfactual)
- Option 2: Accept Variation 1
- Option 3: Accept Variations 1, 2 and 3 (our consultation position)
- Option 4: Accept Variations 1, 2, 3 and 4 **(our final position).**

We rejected Variation 5 in our initial assessment. We found insufficient evidence that the regime did not already address concerns raised under Variation 5. We also did not see enough evidence that this change would be a requirement from lenders to finance projects.

We rejected Variation 4 based on our draft impact assessment and approved Variations 1, 2 and 3 (Option 3).[4] Our draft impact assessment indicated that Option 3 had slightly higher average expected consumer benefits relative to Option 4. The average expected consumer benefit was lower under Option 2 relative to Options 3 and 4. We focus on Options 3 and 4 in this assessment and do not revisit Option 2.

Based on the information available to us and the assessment methodology we have followed**, we now consider that Option 4 should present a better outcome for consumers.** This option should make the regime attractive to a wider group of lenders and equity providers relative to our counterfactual and Option 3. It should also enable consumers to realise the potential benefit of additional interconnection in a timely manner compared to our counterfactual or Option 3.

Under Option 4, the two projects are expected to deliver consumer benefits of £569million to £910million[5] relative to our counterfactual. **When we limit the worst-case downside of Option 4** (following our proposed approach to implementing Variation 4), this reduces the risk exposure for consumers. Under this scenario, the **expected consumer benefits under Option 4 could be in the range of £717million to £1,006million**.

Preferred option - Monetised Impacts (£m)

Business Impact Target Qualifying Provision	Non-qualifying
Business Impact Target (EANDCB)	Not applicable

[4] Other requests that we dropped in our consultation were not common across projects and therefore not deemed to be as important from the view of an efficient developer. We have maintained our position not to consider those requests in detail. We considered some minor requests (such as the scope of our Post Construction Review (PCR) assessment) as matters on which we would need to provide further clarity and have done so in our decision published together with this impact assessment.

[5] All expected consumer benefit figures are expressed in Net Present Value (NPV) terms.

Expected Net Benefit to GB consumers These NPV figures represent consumer impacts of the Greenlink and NeuConnect projects under Option 4 (our preferred option). They also capture the partial impacts of applying Variation 3 for projects that have now raised financing. These NPV figures represent long-term consumer impacts (under Option 4) of three additional projects that may seek project finance solutions in the future. These figures also capture the partial impacts of applying Variation 3 for projects that have now raised financing. The NPV figures are calculated based on assumptions about the probabilities of projects being cancelled, delayed or delivered on time. Whilst we have made our best efforts to use evidence and feedback from stakeholders and potential lenders to inform these assumptions, this approach remains uncertain.	£569million to £910million (Average of £739million) £2,627million to £4,130million (Average of £3,379million)
Wider Benefits/Costs for Society	Not quantified (See below)

Explain how the Net Benefit was monetised, NPV or other

We have calculated net consumer benefits based on Pöyry's near-term interconnector Cost-Benefit Analysis (CBA) which informed our Initial Project Assessment (IPA) decision for projects.[6] We adjust the Pöyry estimates to reflect a potential increase in costs to consumers caused by applying the requested changes for individual projects. We also consider the potential costs of project delays if we reject the changes. We model how a generic developer may respond depending on what changes we accept or reject (based on probability range estimates). The net position is our expected consumer benefits relative to our counterfactual. We have provided an overview of our methodology in paragraph 3.25.

The Pöyry analysis is an NPV estimate of consumer benefits calculated over the regime length (25 years) using a discount rate of 3.5% and a base year of 2019 for the Greenlink and 2021 for the NeuConnect projects. We have updated the NPV base year for all projects to 2022 and presented all figures in 2018/19 price base using the GDP deflator from HMT.

[6] The IPA stage is when we assess the needs case for projects and grant a cap and floor regime in principle. The Pöyry CBA is an economic assessment that takes into account the total costs and expected benefits of developing new projects under the default regime. We have provided an overview of the CBA assessment in paragraph 3.25.

Wider Benefits/Costs for Society

We have not quantified the wider impacts and unintended consequences of our policy options. We have discussed this qualitatively in Chapter 4 in line with Ofgem's Impact Assessment Guidance.[7] We have also discussed the impact of our preferred option on vulnerable consumers, the environment, cap and floor projects and our administrative and resources costs.

Preferred option - Hard to Monetise Impacts

Describe any hard to monetise impacts, including mid-term strategic and long-term sustainability factors following Ofgem impact assessment guidance

The net impacts of Option 4 on Ofgem's strategic and long-term sustainability goals is difficult to model given their complexity and long-term nature. Further detail on these goals is provided in our Impact Assessment Guidance, Ofgem's 2019-23 strategic narrative and Ofgem's decarbonisation plan.

Our 2019-23 strategic narrative sets out that consumers and stakeholders should expect us to enable competition and innovation, which drive down prices for consumers.[8] We expect Option 4 would enable more competition in the financing of interconnectors which could lead to a lower cost of financing over time – a positive outcome for consumers. We also expect Option 4 would allow consumers to realise the benefits of further interconnection sooner and a more diverse range of connected markets, both of which will increase wholesale market competition.

Our decarbonisation plan sets out the actions we will take over the next 18 months to help make low-cost decarbonisation a reality. Option 4 should enable developers to build more interconnectors sooner, compared to the counterfactual. Interconnection provides flexibility options in hours of high renewable generation, instead of curtailment (which is positive for consumers). Interconnectors can import from low-carbon markets, reducing total system emissions; however, they could also import electricity from markets with higher emissions (which would be negative for decarbonisation).

Longer-term sustainability considerations (e.g. out to 2050) include playing a key role in the transition to the low carbon economy and wider sustainability goals. Option 4 could lock out potential cheaper alternative technologies in the future by crowding out financing for these technologies. Ofgem's resources could also be disproportionately focused on regulating interconnectors at the expense of competing technologies. This would be a negative outcome for consumers.

[7] Ofgem's Impact Assessment Guidance (Oct 2016): https://www.ofgem.gov.uk/publications-and-updates/impact-assessment-guidance
[8] Our strategic narrative for 2019 – 23 (Jul 2019): https://www.ofgem.gov.uk/publications-and-updates/ofgem-strategic-narrative-2019-23

Key assumptions, sensitivities and risks

The impacts associated with our policy option are difficult to quantify. We have made the following assumptions to be able to quantify some important aspects:

Assumptions – We assume the following:

- Our expectations about energy market access and electricity trading rules at the time of our IPA decision on projects remain broadly unchanged.
- The results of the analysis completed by Pöyry in 2014 (for Window 1 projects, e.g. Greenlink) and 2017 (for Window 2 projects, e.g. NeuConnect) are still broadly valid. [9] [10] Based on these assumptions, we have therefore not updated estimates of GB consumer benefits expected from these projects.
- Developers will respond to our policy options as we have modelled. When developers successfully raise the required financing, they will progress their projects in a timely manner. We do not consider wider factors that could cause delays or cancellations.

Sensitivities and scenarios – We do the following:

- Consider three cost scenarios (high, central and low) as described in Section 3 but focus on the central scenario for our updated assessment. Potential extra costs to consumers of applying the changes are driven by our assumptions under the central cost scenario as set out in Table 2, Section 3.
- Model developers' responses to Options 3 and 4 by making assumptions about how applying each option could change the probability of different outcomes occurring, such as the delivery of projects on time or cancellation. We provide probability ranges, rather than point estimates, to capture uncertainties.
- Test the Pöyry estimates by reviewing the assumptions underpinning them and factors driving interconnector value; and reduce the Pöyry consumer benefit estimates to see how this would change our results under each option. This extra analysis enables us to understand the impact of the Pöyry CBA analyses on our impact assessment results.

Risks – We note that the following key factors could change the result of our assessment:

- Major changes in market arrangements after the UK's exit from the European Union. We consider that our analysis is robust to reasonable changes in market access and trading rules in the future relative to our assumptions. We have based our analysis on conservative revenue scenarios – the Pöyry marginal interconnector value case and have considered only limited revenue sources for the interconnectors. We consider only revenues from trade in response to wholesale market price differentials. We have not

[9] A Pöyry report for Ofgem (Dec 2014): https://www.ofgem.gov.uk/sites/default/files/docs/2015/03/791_ic_cba_independentreport_final.pdf
[10] A Pöyry report for Ofgem (Jan 2017): https://www.ofgem.gov.uk/system/files/docs/2018/01/near-term_interconnector_cost_and_benefit_analysis_-_independent_report_.pdf

considered other sources of revenues such as from the provision of ancillary services or from the capacity markets.

- Not assessing the impact of economic damage or other issues caused by the coronavirus pandemic. Significant changes in financing arrangements between developers and lenders as a result of the pandemic could impact financing costs and project delivery timelines. Higher financing costs or project delays have a negative consumer impact.
- Major changes in factors driving interconnector value, such as changes in our expected interconnector build profile; competition from other technologies to displace interconnectors; and government policy in GB and connecting countries.
- Using feedback from our consultation[11] to inform our estimates of probability ranges. Estimating the risks of delays or cancellation of projects is inherently difficult because there is limited evidence on which to base our estimates. This means that the actual impacts on consumers could fall outside the ranges that our result suggests.

Will the policy be reviewed? Not for the two projects we are currently assessing.	**If applicable, set review date:** N/A

Is this proposal in scope of the Public Sector Equality Duty?	No

Summary table for options

Table 1 below provides an overview of expected consumer impacts generated by the Greenlink and NeuConnect projects across the options considered in this assessment.

Table 1: Net consumer impacts of Greenlink and NeuConnect projects

Summary of options	Non-quantified impacts	Net impact (relative to the counterfactual)	Key considerations
Option 1: Reject the variations	• Wider impacts of project delays or suspension if we do nothing. • Hard to monetise impacts as set out on Page 6 of this document.	**This is our counterfactual**	• High risk of project delays or suspension if we do nothing. • Lower expected benefits based on our assessment.
Option 2: Accept Variation 1		**Following our consultation, we are no longer considering**	• Low prospect of broadening the financing options open to projects. • Lower expected benefits relative to Options 3 and 4.

[11] More information on feedback from our consultation is provided in Chapter 3.

		Option 2 in this assessment.	
<u>Option 3:</u> Accept Variations 1, 2 and 3	• Wider impacts on vulnerable consumers and on other factors that consumers may care about such as environment. • Hard-to-monetise impacts.	£640million to £802million	• Extra costs to consumers and uncertainty about these costs. • Revenue floor level protection to enable debt financing. • Lower risk of project suspension or cancellation relative to Options 1 and 2.
<u>Option 4:</u> Accept Variations 1, 2, 3 and 4		**£569million to £910million**	• Similar considerations as above and in addition, allows further scope for equity providers to manage risk more efficiently. • Lower risk of project suspension or cancellation relative to Option 3.

Limiting the worst-case downside of Variation 4 (following our implementation approach) changes the risk exposure for consumers. **The average expected net impact under Option 4 could be up to 17% higher, rising from £739million to £861million (Option 4$_{(adjusted)}$).**

We have provided more details on our implementation approach and net consumer impacts in Section 4. Net consumer impacts under Options 3 and 4 (and 4$_{(adjusted)}$) are set out in Chart 2.

Contents

1. Context

This chapter describes the context for this impact assessment and the policy objective Ofgem is seeking to achieve.

Background

1.1. Ofgem's priority is to protect the interests of existing and future energy consumers. We work to promote value for money, security of supply and sustainability for consumers. We do this in a number of ways including the regulation of electricity interconnectors through our cap and floor regime.

1.2. Electricity interconnectors are physical links which allow electricity to flow across borders. They have potentially significant benefits for consumers: lowering electricity bills by allowing access to cheaper generation, providing efficient ways to deliver security of supply and supporting the decarbonisation of energy supplies.

1.3. The cap and floor regime has been successful in attracting nine new interconnector projects. Four of these are led by National Grid Ventures (NGV) in GB and are under construction or operational. Five are led by different developers and are expected to be financed on a standalone basis using project finance.

1.4. More information on cap and floor projects and our default regime is set out in Section 2 of our October 2019 consultation published alongside our draft impact assessment.

Problem under consideration and rationale for action

1.5. As part of our policy, developers are able to request changes to how we apply aspects of the default cap and floor regime. Developers also have to show that applying these changes for their projects is in the interest of GB consumers.

1.6. Greenlink and NeuConnect requested changes to some aspects of the default regime in 2019. They claimed that these changes are necessary to be able to raise required financing (using non-recourse project finance solutions) and to deliver their respective projects on time.

1.7. We have to assess the requests and accept or reject them without undermining the regime principles. These principles preserve a fair consumer-developer risk-reward balance and keep a level playing field across all cap and floor projects.

1.8. Based on our initial assessment, we were minded to accept three of the five key requested changes. Detail of this initial assessment and our assumptions is set out in our draft impact assessment published for consultation in October 2019.[12]

1.9. We have updated some of these assumptions slightly based on stakeholder responses to our consultation. The updates we have made will limit extra costs to consumers and ensure that we maintain a comparable risk-reward balance with projects that have been able to raise financing under the default regime.

1.10. Following these minor changes, we have updated the draft impact assessment to improve our estimates of consumer benefits. More detail on the updates and its impact on our consumer benefits estimates is set out in Section 5 (Table 10).

Cap and floor regime variation objectives

1.11. The objective of our regime variations policy is to ensure that the default regime is fit for a range of financing solutions.[13] We consider that enabling a range of financing solutions is, in principle, good for consumers as it could promote competition in the interconnector market. This should bring more projects online sooner and therefore benefit consumers more than would otherwise be the case.

1.12. We aim to identify and accept only the minimum changes that are necessary to allow the projects to progress immediately. This approach should mitigate the potential risk of transferring more value than is necessary from consumers to developers.

Document structure and content

1.13. The rest of this document sets out our assessment of expected consumer impacts under Options 3 and 4 relative to our counterfactual. These two options had higher expected consumer benefits (in our draft impact assessment) compared to Option 2.

1.14. We have not considered Option 2 further in this assessment but have maintained the same ordering to allow for easy read-through from our draft impact assessment to this assessment.

1.15. Details on the chapters are set out below:

- **Chapter 2** sets out our policy options and likely outcomes that we have considered, as well as the associated risks with these options and outcomes.

[12] Draft Impact Assessment (Oct 2019): https://www.ofgem.gov.uk/system/files/docs/2019/10/20191003_regime_variation_ia_final_0_0.pdf

[13] Enabling a range of financing solutions under the cap and floor regime (Dec 2015): https://www.ofgem.gov.uk/publications-and-updates/enabling-range-financing-solutions-under-cap-and-floor-regime

- **Chapter 3** provides an overview of updates to our draft impact assessment framework and scope. It also explains our updated impact assessment framework and analytical approach.
- **Chapter 4** presents our quantitative analysis of the options, alongside long-term impacts and wider impacts.
- **Chapter 5** sets out the summary of our preferred option and our assessment of risks and uncertainties, as well as overview of our implementation plan.
- **Chapter 6** describes the next steps, and our monitoring, evaluation and feedback plans.

2. Policy options and likely outcomes

This chapter describes the policy options that we have considered, associated risks and how developers may respond to these options.

Rationale for options and selection

2.1. Policy options are different ways we could consider the requested changes to be able to achieve our policy goals. We discuss the key requested changes briefly below:[14]

- **Variation 1:** Developers have requested an annual assessment process to align with annual debt repayment obligations that they expect. Annual assessment of interconnector revenues against the revenue floor level will ensure that developers are able to access any consumer payments annually when this is necessary. Under the default regime, the revenue assessment process takes place every five years.
- **Variation 2:** Developers have requested that consumers should top up revenues to the floor, even if the 80% minimum availability target is not met, to enable debt servicing. They proposed to repay consumers (from future revenues) on an NPV-neutral basis. Currently consumers top up revenues to the floor in any year to ensure that notional debt can be repaid. In return, developers must ensure that the interconnector capacity is available at least 80% of the time in any given year. If this minimum threshold is not met, consumers will not top up revenues to the floor level in that year.
- **Variation 3:** Developers have requested that we should broaden the definition of force majeure to cover three events **(strike, lockout, other industrial disturbance)** and a wider range of other events as set out in their respective consultation responses. Currently the default force majeure clause excludes these three events and additional events that developers have requested.
- **Variation 4:** Developers have requested that the floor level and IDC allowance should be calculated based on actual cost of debt and gearing resulting from a competitive debt raising process overseen by Ofgem. Currently these parameters are calculated on a notional basis.
- **Variation 5:** Developers have requested that Ofgem should maintain the default 25-year regime length where projects are late for reasons beyond their control, or whenever a delay is shown to be in the interest of GB consumers.[15]

[14] As noted in our summary section, the developers requested more changes than these five. On balance of evidence, we consider that these were the key ones related to our policy objective.
[15] We consider that the default regime already addresses the key concerns raised under Variation 5.

Under the default regime, Ofgem will reduce the 25-year regime length to reflect the length of delays or a late operational start date unless delays qualify for the currently available pre-operational force majeure relief.

2.2. To assess or reject the developers' requests, we discussed them with the wider project finance community to seek views both before and during our 2019 consultation. We also reviewed additional evidence available to us which indicated that the regime is at present suitable for balance sheet financing solutions.[16]

2.3. Based on our initial assessment and consultation, we were able to focus on two groupings (options) of variations: one that aims to achieve the minimum actual cost of debt possible (Option 3) and another that aims, in addition, to increase the likelihood of delivering projects on time (Option 4). More explanation follows below.

Selection of options

2.4. The two options identified in paragraph 2.3 above are the ones most likely to achieve our policy objectives. These two options had the highest expected consumer benefits in our draft impact assessment.

2.5. To avoid confusion, we have not updated our groupings of variations under our policy options or our labelling of the options. This should ensure an easier read-across from our draft impact assessment to this updated assessment.

2.6. In this assessment, we have considered Variations 1, 2, 3 and 4 under two policy options as set out below with Option 1 as our policy counterfactual:

- Option 1: Do nothing and continue with default regime unchanged;
- Option 3: Accept Variations 1, 2 and 3 (our consultation position; offers a better chance of developers achieving lower debt financing cost relative to the default);
- Option 4: Accept Variations 1, 2, 3 and 4 **(our final position; in addition to enabling lower financing cost, increases likelihood of project delivery).**

2.7. We have not revisited Option 2 which we considered in our draft impact assessment. We found no evidence from our consultation that Option 2 would achieve our policy objectives - expected consumer benefits were lowest under Option 2.

2.8. To define these options, we have:

- assumed that Greenlink and NeuConnect would face similar borrowing conditions and that lenders would focus on the security of floor revenues which the default regime provides as well as on the prospect of market revenues generated by individual projects;

- grouped the variations into groups as set out above under Options 3 and 4; and

[16] NGV have developed four projects (Nemo Link, NSL, IFA2 and Viking Link) without changes to the default regime.

- for long-term impacts, we assumed that Greenlink and NeuConnect are representative developers and that future variation requests would be reasonably similar to the current set.

Options

2.9. Based on the rationale above, we have limited the options for this impact assessment to three: rejecting or accepting Variations 1, 2, 3 and 4, and one intermediate option (which we consider might enable developers to achieve a lower debt financing cost relative to the default regime).

2.10. More detail on the three policy options are set out below:

- **Option 1 – Counterfactual:** This represents the 'status quo'. Developers are expected to progress projects under the default regime without variations.

- **Option 3 - Accept Variations 1, 2 and 3**: Consultation responses broadly suggest that the revenue floor is firm under Option 3. This is necessary to ensure that the lowest actual cost of debt can be achieved. Under Option 3, we would assess revenues annually. In addition, consumers would also top up revenues to the floor for interconnectors when they have missed our 80% standards for minimum availability and recoup these payments in future years in NPV neutral terms. We would limit the amount of outstanding top up to a maximum of four times the annual floor level over the entire length of the regime. We would also broaden the default force majeure definition to cover three extra events (strike, lockout, other industrial disturbance) as described in our decision which is published alongside this impact assessment.

- **Option 4 - Accept Variations 1, 2, 3 and 4:** In addition to Option 3, we would give the two developers the two approaches below to choose from:

    - Approach 1: We could continue using a notional cost of debt approach to set the revenue floor. However, we will replace the default regime notional cost of debt benchmark with a slightly adjusted benchmark that might reflect the risk profile better of investing in standalone project financed interconnectors.

    - Approach 2: We could set the revenue floor based on a competitive market process (which is the developers' request for Variation 4). However, if the floor based on this approach is higher than the floor based on Approach 1 above, consumers must be reimbursed the difference (to the extent possible) from future revenues above the floor before developers can recover their equity investment or dividends.

2.11. We consider that our approach above provides a sensible risk balance between consumers and developers. It limits the extra cost of Variation 4 (to consumers via higher floor) to the difference between the default and the new benchmark for these two projects. It also provides developers with the flexibility to manage risk if the actual cost of debt (they are able to achieve) is higher than the support under Approach 1.

Rationale for outcomes

2.12. To be able to assess consumer impacts, we have to consider how developers would react to our policy options and the likely outcomes.

2.13. We make a similar set of assumptions to those that we made earlier (when selecting our policy options). We focus on outcomes that are the most likely based on our evaluation of evidence available to us. Both developers have indicated that they would suspend or reconsider their projects if Variations 1, 2, 3 and 4 are not accepted. We have assumed notional developers, and therefore that each project would react in a similar way. In addition, we have assumed that developers would progress projects according to default timelines if they were able to raise financing.

2.14. Our assessment suggests that developers may respond to our decision by suspending or cancelling projects if they are unable to secure required financing. Developers may decide to progress the projects on balance sheet by partnering with other firms. They could also decide to keep moving ahead with the projects using the project finance route with or without delays.

2.15. We have ignored some intermediate outcomes (which may be possible if we relax our assumptions) to further simplify the analysis. One of these intermediate outcomes is where project size determines a developer's ability to raise financing or lenders' willingness to provide required debt financing for the project to go ahead.

Outcomes

2.16. We expect developers to respond to our decision in a number of ways which we have limited to the following for simplicity. These are the same outcomes we discussed in our draft impact assessment:

- **Outcome A - None of the projects would be built:** Developers are unable to raise required financing leading to suspension or cancellation of projects.
- **Outcome B – Projects are delayed and then progressed using balance sheet financing:** Developers are unable to progress via project finance route, but manage to bring projects ahead using balance sheet financing after delays.
- **Outcome C – Projects are delayed and then progressed using project finance solutions:** Developers would continue to progress projects and are able to raise financing under project finance route. However, projects may suffer delays if the variations are not attractive enough to all equity providers.
- **Outcome D – Projects are progressed using project finance as expected:** Developers are able to raise required financing and deliver projects on time.

2.17. Our assessment focuses on consumer impacts considering the above outcomes. We have estimated potential ranges for probabilities related to the four outcomes based on feedback from our consultation. Further detail on our methodology is set out under 'Determining the likelihood of outcomes' in Chapter 3. We note that an alternative to our probability approach may be to use experienced judgement. However, this is unavailable at this time as no GB interconnector has been financed using the project finance route.

3. Analytical approach to our impact assessment

This chapter explains the purpose and scope of this impact assessment and our analytical approach. This includes how we estimate monetised impacts and how we assess the hard-to-monetise impacts that we have considered.

Overview of updates to our draft impact assessment framework and scope

3.1. We have updated our impact assessment framework and scope to take into account consultation responses from stakeholders. The three key updates are set out below:

- We have increased our probability estimates for project cancellation under Option 3 relative to Option 4. We have allowed more balance sheet developers' involvement at the expense of project finance developers under both options.
- We have updated how we calculate the cost of Variation 2 (now estimated as a revolving loan facility that consumers provide to developers with developers being unable to repay). We now estimate the cost of Variation 4 as a direct change in default floor level as a result of Variation 4. This ensures that the cost of Variation 4 for individual projects is not moderated by the project's revenue projection which may be different from actual revenues.
- We have expanded our application of Variation 3 and consequently our cost estimate to cover all cap and floor projects (including projects that have already raised financing).

3.2. Although we assume that consumers are never repaid any temporary loan they provide under Variation 2, we expect developers to repay these costs to consumers in the future if revenues are above the floor and before developers can recover their equity investment and dividends.

3.3. The change in our approach for calculating the cost of Variation 4 takes into account a consultation response which suggested to use developers' respective revenue forecast instead of the Pöyry revenue forecast (which supported our IPA decision) as this was lower. We have now decided to follow a more conservative approach and have removed the moderating effect of revenues on cost of Variation 4.

3.4. The above update to our Variation 4 estimate enables our assessment to capture consumer exposure more accurately. It ensures that our cost estimate is robust to changes in revenues (if actual revenues are different from current estimates).

3.5. We have expanded the scope of our assessment to capture consumer impacts of applying a broader definition of force majeure for four additional projects that have been developed using balance sheet financing. This aims to maintain a level playing field across all cap and floor projects. More detail is provided in our decision.

3.6. We have also reviewed factors that drive interconnector value to better understand the strength of the Pöyry GB consumer benefits estimated a few years ago (in 2014

for Greenlink and 2017 for NeuConnect). This gives us more confidence around the benefits the projects are expected to generate.

3.7. The above changes underpin our assessment framework in this document. Table 10 in Section 5 provides the impact of these changes on our estimates of expected consumer benefits.

Our impact assessment scope

3.8. The scope of our assessment covers the impact on consumers from applying Variations 1, 2, 3 and 4 for the Greenlink and NeuConnect projects and three extra cap and floor projects that have yet to raise financing. It also covers the impact of applying only Variation 3 for the four cap and floor projects that have now successfully raised financing.

3.9. Our assessment framework covers groups that would be affected based on our decision to reject or accept the requested changes. We have identified these groups as GB consumers and all cap and floor project developers. We consider the impacts on non-cap and floor interconnector projects to be marginal and limited to competition impacts.

3.10. We have set out a proportionate assessment scope covering these groups and defined the potential impacts on them as follows:

- **GB consumers – accepting the changes would shift additional risks and costs to consumers:** our assessment aims to quantify aspects of these impacts to inform our decision.
- **Greenlink and NeuConnect - accepting the changes may reduce risks around raising required financing:** our assessment covers the likelihood of developers being able to raise required financing and be able to progress projects on time.
- **Three extra cap and floor projects - accepting the changes may benefit other cap and floor projects yet to raise required financing (subject to potential future assessment):** we have followed the same assessment approach for the Greenlink and NeuConnect projects.
- **Four cap and floor projects that have now successfully raised financing - accepting the changes may impact the balance of risks in the default regime for these projects:**[17] our assessment of the impacts on the

[17] These are mainly projects that have passed our default regime Final Project Assessment (FPA) stage. At the FPA stage, we confirm the grant of a cap and floor regime and set the provisional cap and floor levels. We assess the economic and efficient costs associated with developing, constructing, operating, maintaining and decommissioning of the licensee's interconnector.

developers is qualitative. However, we have quantified impacts on consumers where these four projects may benefit from specific regime changes.

3.11. Our assessment of impacts on the four groups set out above is provided in Chapter 4 under monetised impacts and wider impacts assessment.

Our impact assessment framework and analytical approach

3.12. We have quantified the expected net impacts of the Greenlink and NeuConnect projects in NPV terms (relative to our counterfactual). We have also estimated the long-term expected net impacts (also in NPV terms) of three extra projects that have yet to raise required financing to move forward.

Determining our counterfactual for assessing impacts

3.13. We consider that the relevant counterfactual for our assessment would be the continuation of the default regime for the projects (i.e. to reject the changes requested). This is Option 1 in both our draft and final impact assessments.

3.14. Making this assumption about the counterfactual enables us to measure the impacts of the other options relative to what otherwise would have happened. It also allows us to compare impacts associated with Options 3 and 4 (and Option 2, which we have not considered further following our draft impact assessment).

Determining our preferred option

3.15. We have selected our preferred option based on the overarching principle of improving outcomes for GB consumers.

3.16. We are interested in the overall expected net benefits to consumers based on our quantitative and qualitative assessments. More detail is presented in our monetised impacts and hard to monetise impacts sections of Chapter 4.

3.17. The key risks to consumers associated with Options 3 and 4 and our counterfactual are the following:

- **Option 1:** All the requested changes are rejected under this option. Consumers face the risk of projects not going ahead on time or cancellation. Project delay or cancellation means consumers would not realise some or all of the benefits of new projects. This would be the case if developers were unable to raise required financing to move projects forward on time or find a buyer for their projects. It is also unlikely that new projects could replace the current ones within the same delivery timeframe.

- **Option 3:** When an interconnector is unable to meet the required 80% minimum availability threshold, consumers would top up revenues when necessary (in the form of temporary loans to interconnectors) to ensure full repayment of financing loans to lenders. However, developers would repay the temporary loans to consumers from future revenues above the floor. Consumers face the risk of non-repayment of these temporary loans if future revenues are never above the floor. To protect consumers, we have implemented a cap on maximum top-up loan outstanding at any time. In addition, broadening the definition of force

majeure may expose consumers to further costs, as more consumer payments are likely in such a scenario. Extra payments from consumers are even more likely when we implement the amended force majeure clause for all cap and floor projects (as we have proposed to do). To protect consumers, we have limited the amended force majeure definition to align closely with the scope of relief provided under the initial regime licence consultation for Nemo Link. Developers see the shift in risks to consumers under Option 3 as insufficient and have indicated in consultation responses unwillingness or inability to progress their projects.

- **Option 4:** Changes made under this option ensure that developers can repay lenders and in addition, equity can better manage risk around the cost of debt achieved in the market versus our cost of debt benchmark. Under this option, the risk sharing between consumers and developers shifts further in favour of developers as consumers now pay a higher floor based on iBoxx BBB rather than an A/BBB blend. Consumers also face the risk (at least temporarily until they are repaid in the future) of the actual cost of debt realised in the market being higher than our notional cost of debt benchmark. In addition, developers may prefer the revenue floor to be based on iBoxx BBB if the market cost of debt turns out to be lower than iBoxx BBB. Whilst this may appear to be a negative outcome for consumers, we consider that the overall impacts on consumers would be positive in the long run. We would be able to make decisions on any potential future regime variation requests considering the evidence on actual cost of debt achieved by the two developers.

3.18. We have set out in Chapter 5 under *'Risks and uncertainties'* more ways to address the key risks mentioned above in paragraph 3.17.

Feedback from consultation

3.19. The responses to our consultation indicate strong support for our minded-to position to accept Variations 1, 2 and 3. However, 65% of the respondents disagreed with our consultation position to reject Variation 4, and the remaining 35% were neutral or in support of our position.

3.20. Lenders broadly agreed that our consultation position (Option 3) offers better incentive for them to provide debt finance to developers relative to the default regime. In addition, lenders indicated that they would review their willingness to lend if developers' incentive is unreasonably reduced relative to the risk the developers face, or if optimal project financing structures are limited by the risks the developers face. This may be the case in a scenario where developers are suddenly faced with a high risk of actual cost of debt mismatch relative to the default iBoxx cost of debt benchmark. Lenders also agreed with our consultation position to the extent that poor implementation of Variation 4 would make consumers worse off.

3.21. Other responses supported doing the minimum that is needed for good projects to progress. They supported a limited version of Variation 4 as we are now proposing.

3.22. A minority of stakeholders suggested we should reject Variations 2 and 3. They considered the default regime as already too generous for developers. Some responses highlighted the need to maintain a regulatory level playing field which

would not discriminate against projects funded on balance sheet; and to maintain a fair risk-reward balance between developers and consumers.

3.23. As detailed in Paragraph 3.1, we have updated our draft impact assessment framework to take into account these consultation responses.

Calculation of monetised impacts

3.24. We have calculated monetised impacts in line with Ofgem's Impact Assessment Guidance. Our calculation aims to identify the policy option that offers best value for money to consumers.

3.25. We have followed the key steps below to calculate monetised impacts:

1) **Estimating consumer benefits of each project:** We rely on NPV benefits estimates from Pöyry's near-term interconnector cost-benefit analysis which informed our IPA decision for each project. We note that the Pöyry estimates do not take into account the costs of variations, system operator costs or benefits and the costs of network reinforcement. We have updated the Pöyry estimates to reflect additional costs provided by National Grid ESO covering system impacts (including one-off reinforcement works, ancillary service benefits and constraint costs for individual projects). The net GB consumer welfare estimates we have used are the same as the aggregated estimates for each project published in our Window 1 and Window 2 IPA consultations.

- **Pöyry CBA modelling methodology:** Pöyry assesses the impact of interconnectors on consumers by comparing the NPV (using a 3.5% discount rate over the 25 year regime period) of consumer welfare[18] in the scenario without the assessed interconnector (the Pöyry 'counterfactual') and with the assessed interconnector (the Pöyry 'target case'). Consumer benefits come primarily from changes in the costs due to wholesale electricity price changes caused by the introduction of a new interconnector. In addition, any payments to or from consumers under the cap and floor regime also represent a net change in consumer welfare. The modelling follows two approaches covering a 'first additional' approach which looks at the NPV of impact that the project will have on its own; and a 'marginal additional' approach which looks at how sensitive each project is to the other interconnector projects competing to connect at the same time to capture the interactions between the projects. The marginal approach is selected to inform our decision. A detailed methodology for

[18] Consumer welfare is the sum of changes to the following: wholesale electricity price; low carbon support regime; new interconnector cap and floor payments; other interconnector cap and floor payments.

calculating social welfare impacts of the projects is presented in Annex A of the Pöyry reports.[19] [20]

Uncertainty: To test the strength of the Pöyry results, we have reviewed the assumptions underpinning them and factors driving interconnector value. We then reduce the Pöyry estimates to see how this would change our results under Options 3 and 4. We apply the reduction in the form of a breakeven analysis as set out in Table 11, Section 5 of this document.

2) **Estimating costs of requested variations:** We compare the cap and floor levels[21] where requested changes have been accepted to levels under the default regime without them. The sum of the difference between the two (over the regime duration) is the cost to consumers as a result of the change. In the case of Variation 2, we estimate its costs as the maximum loan cap that consumers will be required to provide under Variation 2.

   - Uncertainty: In our draft impact assessment, we assumed three scenarios of low, central and high costs to capture uncertainties around cost estimates. In our updated assessment, we have not revisited the low and high scenarios. In addition, we cap the cost of applying the changes (under Variations 2 and 4) where we consider these costs unreasonable relative to evidence.

3) **Estimating cost of delays:** We estimate the cost of delay as the consumer benefits lost for the years the project is late. In addition, we assess the change in net payment position under the default regime (25 years) versus a shorter regime reflecting the delay period (23 years assumed). We crosscheck our estimates with the results of the sensitivity estimates around project connection dates in the Pöyry 2017 report.[22] Our Window 2 IPA consultation document provides consumer impacts of project delays.[23]

   - Uncertainty: Our analysis of cost of delays was carried out under three scenarios of low, central and high costs in our draft impact assessment. We assumed delay periods of 1 year (low case), 2 years (central case) and 3 years (high case) where the length of the regime is not extended to accommodate the delay. Under this assumption, the project duration is 24

[19] Near-term interconnector CBA - Independent report (Dec 2014 report for Window 1): https://www.ofgem.gov.uk/sites/default/files/docs/2015/03/791_ic_cba_independentreport_final.pdf
[20] Near-term interconnector cost-benefit analysis (CBA) - Independent report (Jan 2017 report for Window 2): https://www.ofgem.gov.uk/system/files/docs/2018/01/near-term_interconnector_cost_and_benefit_analysis_-_independent_report_.pdf
[21] Applied changes impact cap and floor levels when they lead to an increase in RAV or an increase in the return rate applied to RAV to determine the cap and floor levels.
[22] We note that the Pöyry estimates showed that a Window 1 project delay (for example Greenlink) might lead to improvements in benefits generated by a Window 2 project (such as NeuConnect).
[23] Cap and floor regime: Initial Project Assessment of the GridLink, NeuConnect and NorthConnect Interconnectors:https://www.ofgem.gov.uk/system/files/docs/2017/06/ofgem_window2_ipaconsultation_june_2017.pdf

years under the low case scenario, 23 years under the central case scenario and 22 years under the high case scenario. To understand how delays affect consumer benefits, we estimate how the different policy options increase the probability that the projects are completed successfully. We note that we have not revisited the low and high case scenarios in our updated impact assessment.

4) **Estimating the cost of outcomes as set out in Chapter 2:** We estimate the cost of each outcome as the sum of costs of the changes accepted under that option plus the loss of benefits to consumers coming from project delays. This estimate is carried out under two probability scenarios (Scenarios 1 and 2). More detail is provided under *'Determining the likelihood of outcomes'.*

5) **Evaluating the expected benefits under each option:** Expected benefits are evaluated across the probability ranges to obtain lower and upper bound figures based on the following formula:

- Impact under Outcome = Pöyry CBA estimate*(adjusted to reflect GB ESO costs)* – (variation cost + delay cost)
- Expected value under each option = A**p*(A) + B**p*(B) +C**p*(C)+ D**p*(D)
  i. where A, B, C and D correspond to impacts under the four possible outcomes as set out in Chapter 2; and
  ii. *p* is the probability of uncertainty around A, B, C and D (which are driven by developers' and finance providers' reaction to our policy options, keeping everything else fixed).

3.26. These calculations may be subject to a broader uncertainty range making our impacts estimates indicative of what may be the actual impacts. Section 5 provides more detail on risks and uncertainties and ways that we propose to manage them.

Cost of variations calculation

3.27. **Cost of variations:** This is the first calculation step in our assessment. The cost of each variation is calculated as set out below:

I. *For Variation 2:*

- **We determine the temporary revenue top-up loan cap that consumers could provide:** we select the revised revenue floor level from applying Variation 4 (as this floor level is set based on market parameters to meet project finance requirements). We then set the loan cap as a multiple of the annual floor level. The repayment risk (representing the full amount) to consumers of this top-up loan is the cost of Variation 2.

II. *For Variations 3 and 4:*

- **We determine variations impact on floor level**: we apply each variation separately to the default cap and floor financial model in order to determine the revised revenue floor level. The sum of the difference between the default and revised floors (over the regime duration) is the cost of each variation.

3.28. Table 2 below provides more details on our assumptions and the scenarios supporting our costs of variations estimates. Variation 1 is not listed in Table 2 as we consider the direct cost of Variation 1 to be negligible. We have selected the central case to underpin our impact assessment.

Table 2: Scenarios for costs of variations estimates

Variation	Low cost	Central cost	High cost	Limitations
Variation 2	Assumes consumers will top up revenue to the floor with developers paying back in NPV neutral terms; maximum outstanding loan exposure is capped at 200% of annual revenue floor.	Assumes consumers will top up revenue to the floor with developers paying back in NPV neutral terms; maximum outstanding loan exposure is capped at 400% of annual revenue floor.	Assumes consumers will top up revenue to the floor with developers paying back in NPV neutral terms; maximum outstanding loan exposure is capped at 600% of annual revenue floor.	• Timing, size and rate of faults might under- or over-estimate the likelihood and impact of such events. • Assumes revenues would not exceed the floor, therefore loan from consumers not repaid.
Variation 3	Lack of variation leads to lenders requesting funds to be held in a reserve facility the size of 50% of annual floor payment. Cost of this variation is the cost of keeping the reserve facility.	Lack of variation leads to lenders requesting funds to be held in a reserve facility the size of 100% of annual floor payment. Cost of this variation is the cost of keeping the reserve facility.	Lack of variation leads to lenders requesting funds to be held in a reserve facility the size of 150% of annual floor payment. Cost of this variation is the cost of keeping the reserve facility.	• Our estimate is based on modelling assumptions provided in developers' submissions. • Reserve size might under- or over-estimate actual requirement.
Variation 4	125bps (1.25%) margin over our notional iBoxx index; 70/30 gearing; and 1.2x DSCR.[24] Cost of variation is the change in the floor levels over the regime length.	175bps margin over our notional iBoxx index; 80/20 gearing; and 1.2x DSCR. Cost of variation is the change in the floor levels over the regime length.	225bps margin over our notional iBoxx index; 90/10 gearing; and 1.2x DSCR. Cost of variation is the change in the floor levels over the regime length.	• Limited evidence is available given lack of precedent - some evidence from developers' submissions. • Our costing assumes revenues would always be below the floor, representing the worst case for consumers.

[24] In our assessment, Debt Service Coverage Ratio (DSCR) states the annual revenue floor level as an approximate multiple of debt obligations that developers have to meet within one year.

Determining the likelihood of outcomes

3.29. The probability estimates used in our draft impact assessment for the four outcome scenarios are provided below in Table 3:

Table 3: Draft impact assessment probability estimates attached to outcomes

Outcomes (probability, %)	Option 1 (Counterfactual)	Option 2 (V_1)	Option 3 ($V_{1,2,3}$)	Option 4 ($V_{1,2,3,4}$)
Outcome A	70-30	55-25	25-0	25-0
Outcome B	30-10	20-5	20-5	20-0
Outcome C	0-40	20-40	30-15	20-10
Outcome D	0-20	5-30	25-80	35-90

3.30. We have updated the estimates in Table 3 above following consultation to reflect responses from stakeholders. Our updated estimates are provided below in Table 4.

Table 4: Updated probability estimates attached to Outcomes A, B, C and D

Outcomes (probability, %)	Option 1 (Counterfactual)	Option 2 (now dropped)	Option 3 ($V_{1,2,3}$)	Option 4 ($V_{1,2,3,4}$)
Outcome A	70-30	55-25	**30-0**	**20-0**
Outcome B	**30-20**	20-5	**45-10**	**25-15**
Outcome C	0-40	20-40	**0-20**	**10-0**
Outcome D	**0-10**	5-30	**25-70**	**45-85**

3.31. To capture the uncertainty attached to each outcome, we have modelled the probability of Outcomes A, B, C and D presented above following the steps set out below:

- We expect the widest probability ranges to occur in the more extreme outcomes, e.g. Outcome A under Option 1, where we reject all variations; and Outcome D, under Options 3 and 4, where more variations are approved – i.e. projects are either cancelled or all go ahead on time;
- We set a lower and upper bound for the probability ranges; and
- We test the probability ranges to ensure that they are consistent (for example: in at least one of the scenarios, cost of delays should decrease from Option 3 through 4 whilst cost of variations should increase).

3.32. Under Option 1, developers see the risk of not being able to raise project finance as very high, which implies a low probability of Outcomes C and D, both of which require project finance. It is possible that the projects are sold to new developers that do not require project financing, such as balance sheet developers. However, this is uncertain and will be dependent on these parties having an interest in doing so and being willing to work with current developers on mutually acceptable economic terms.

3.33. In Option 3, our assessment is that the probability of the projects going ahead using project finance increases. Variations 2 and 3 are now included, thus addressing the key issues of availability risk and force majeure, and as a result the risk of developers not being able to obtain project financing diminishes materially. Hence, there is a

material increase in the probability of Outcome D, where developers are able to raise project financing on the envisaged timetable.

3.34. In Option 4, Variation 4 is also included. This adjusts the regime to take into account lending terms that developers are able to achieve with lenders. Our assessment is that Variations 1, 2 and 3 already provide certainty over project cash flows (albeit the level of cashflows depends on the default iBoxx cost of debt level at the time of financial close). However, the amount of debt raised will depend on the difference between the actual cost of debt realised in the market by developers and the iBoxx value. There is a risk for some projects that insufficient debt is available to make them viable under the project finance route, although they could potentially be viable for balance sheet investors. Therefore, in our assessment of Option 4, we see a higher probability for Outcome D and a corresponding decrease in the need for the current developer to try to find a balance sheet partner or suspend their project.

3.35. The analysis we have provided above is broadly consistent with stakeholder views from consultation. We note that developers and lenders' responses would depend on the precise final arrangements used when implementing the variations.

Hard to monetise impacts

3.36. We have carried out a qualitative assessment of hard-to-monetise impacts of the options under consideration. Our assessment focuses on the following factors:

- Direct impacts:
  - positive investor confidence which may enable competition and innovation in the development and financing of interconnectors and drive down prices for consumers; and
  - reduced consumer benefits if costs are higher than our estimates and/or if our decision makes it less likely for developers to seek the balance sheet route which is delivering projects without extra costs to consumers.
- Indirect impacts:
  - Potential adverse impacts on GB producers (beyond those that the Pöyry welfare analysis has accounted for); and
  - Because these variations make interconnectors more likely to happen, they would give more flexibility options in hours of high renewable generation, instead of curtailment (positive) and a potential import from markets with higher emissions (negative).

3.37. To understand how our decision may affect these factors, we consider the optionality of our decision as well as any learning and capacity-related benefits that may occur in the future because of it. We also consider whether the options would 'lock-in' or 'lock-out' a separate interconnector development regime or technology solutions.

Assumptions

3.38. In estimating the cost of variations we have made three key assumptions as set out below and discussed the risks associated with them:

i. We have not updated the Pöyry CBA analysis for the projects. We have also not assessed project cost estimates provided by developers to confirm whether they are economic and efficient.[25]

ii. Our assumptions on the availability of the interconnector may suggest that we are overestimating or underestimating the cost of Variation 2. We have assumed that the cost to consumers of interconnector unavailability will not exceed four times the annual floor payment (over the 25-year regime length) and that consumers would not be able to recover this cost from developers. This cap is benchmarked to the construction time for interconnectors plus a small allowance for delays.

iii. We have assumed that a reserve facility that is equivalent in amount to a 1-year floor payment would be adequate to address revenue shortfalls resulting from force majeure events not recognised by Ofgem. We have also assumed that lenders would accept this arrangement as adequate. If lenders would not accept this provision, projects may face more delays or not progress meaning consumers may face higher costs than we have estimated.

3.39. In estimating the cost of project delays we have made two key assumptions as set out below and discussed the risks associated with them:

i. We have assumed a two-year delay in the connection date of interconnectors under our central scenario and used the NPV benefits estimates provided in the Pöyry independent report (after making adjustments to reflect GB ESO costs). A two year delay, when added to the one year automatic delay allowed (for Window 2 projects), is the maximum delay allowed before we may update our needs case analysis for each project. Any significant change in any of these factors would impact our assessment result.

ii. We have taken a conservative view by assuming that a delay in a Window 1 project does not automatically lead to improvements in the benefit estimates of a Window 2 project. We consider that a full CBA and sensitivity analysis (around connection dates and interactions between projects) as set out in the Pöyry studies would be necessary to improve our estimates of cost of delays.

3.40. In estimating the expected consumer impacts of Options 3 and 4, we have assumed that the two developers are similar and that the size of the projects or the differences in regulatory arrangements in the markets that the projects are proposed to link would not have an impact on how the developers respond under the options.

3.41. In addition, the probabilities attached to each response outcome represent our view based on the evidence available to us. If the actual response from developers were to be different, this would change our estimates.

[25] We assess project cost at the FPA stage, which both projects have yet to complete.

4. Impacts

This chapter presents our quantitative analysis of the impacts of our policy options on consumers. It also considers the wider impacts of the options on consumers.

Summary of quantified consumer impacts

Costs of variations and delays

4.1. Table 5 below provides a summary of potential costs of Variations 1, 2, 3 and 4 for both the Greenlink and NeuConnect projects and three additional cap and floor projects that we assume, for the purposes of this analysis, may request similar regime variations in the future.

Table 5: Cost of variations for projects yet to raise required financing

Variations (NPV £m, 2018/19)	**Greenlink and NeuConnect**	**Three additional projects** (Long-term cost)	**All five projects**
	Central	Central	Central
Variation 1	**0**	0	0
Variation 2	**232**	539	771
Variation 3[26]	**22**	50	72
Variation 4	**192**	449	642
Total	**446**	1,039	1,484
Variation 4(adjusted)	**18**	45	63
Total(adjusted)[27]	**272**	634	906

4.2. We grouped the variations into two combinations of potential changes under Options 3 and 4 as we explained in Section 3.

4.3. Table 6 below sets out the cost of delay estimates under Options 3 and 4. Cost of delays under our central case assumes a two-year delay. We calculate the consumer benefits lost for the two years the project is delayed. In addition, we assess the

[26] The cost of Variation 3 as presented captures the extra cost of implementing a change in force majeure definition to four balance sheet projects that have already raised financing. We have assigned the cost proportionately to the five projects we expect would use project finance solutions.
[27] Total(adjusted) is calculated as the sum of (Variation 2 + Variation 3 + Variation 4(adjusted)). Variation 4(adjusted) assumes that the actual cost of debt is the same as the iBoxx BBB yield; and Variation 4 is based on our central case assumption for actual cost of debt (iBoxx A/BBB + 175bps margin).

change in net payment position under the default regime versus a shorter regime reflecting delays.[28]

Table 6: Cost of delays under our central case

NPV £m, 2018/19	Greenlink and NeuConnect		Three other projects	
	Option 3 ($V_{1,2,3}$)	Option 4 ($V_{1,2,3,4}$)	Option 3 ($V_{1,2,3}$)	Option 4 ($V_{1,2,3,4}$)
Cost of delays	531	531	1,966	1,966
Expected cost of delays	159 - 239	80 - 186	431 - 646	215 - 502

4.4. The cost of delays are the same under the options before we apply our assumptions around probability of delays. The expected cost of delays is the result of this calculation as set out in Table 6 above.

Consumer impacts of the Greenlink and NeuConnect projects

4.5. Our assessment of consumer impacts of Options 3 and 4 relative to our counterfactual follows the steps provided in paragraph 3.25.

4.6. Consumer impact is calculated as the expected net benefits under each option following the formula set out below:

- Expected benefits (Impact) = A**p*(A) + B**p*(B) +C**p*(C)+ D**p*(D)

  Where:

  I. A, B, C and D are calculated as follow:
  - Pöyry benefits adjusted to reflect factors such as underlying cap and floor parameters and cost of onshore transmission reinforcements needed to accommodate the project[29] minus (-) (cost of variations + cost of delay); and

  II. *p*(A, B, C and D) is as set out in Table 4 in Chapter 3.

4.7. Table 7 below sets out the calculation steps for expected consumer impacts.

[28] As a crosscheck, Pöyry's estimate of consumer impact of a 3-year delay to the three Window 2 projects are £659M, £623M, £593M (all in 2018/19 prices) - Cap and floor regime: Initial Project Assessment of the GridLink, NeuConnect and NorthConnect Interconnectors: https://www.ofgem.gov.uk/system/files/docs/2017/06/ofgem_window2_ipaconsultation_june_2017.pdf

[29] As set out in our Window 2 IPA consultation under 'summary of welfare impacts' for each project: https://www.ofgem.gov.uk/system/files/docs/2017/06/ofgem_window2_ipaconsultation_june_2017.pdf

Table 7: Calculation of consumer impacts of options relative to our counterfactual

Description	Parameter	Calculation
Benefits if projects go ahead	P	Adjusted Pöyry CBA estimate expressed in 2018/19 price base
Benefits if projects do not go ahead	Q	Zero
Cost if projects go ahead (cost of variations)	R	As set out above (Table 5)
Cost if projects are delayed	S	As set out above (Table 6)
Cost if projects do not go ahead	T	Zero
Probability range attached to each of four outcomes ('unable to raise project finance and do not go ahead'; 'delay but later built on balance sheet'; ' delay but later built under project finance'; and 'go ahead on time using project finance')	*p*(x)	As set out in Section 3 (Table 4)
Benefit under each outcome	V	[*p*(P) * P]
Cost under each outcome	W	[*p*(R) * R] + [*p*(S) * S]
Expected value under each option	X	V - W
Expected value of each option relative to counterfactual (impacts)	Y	X - Z[30]

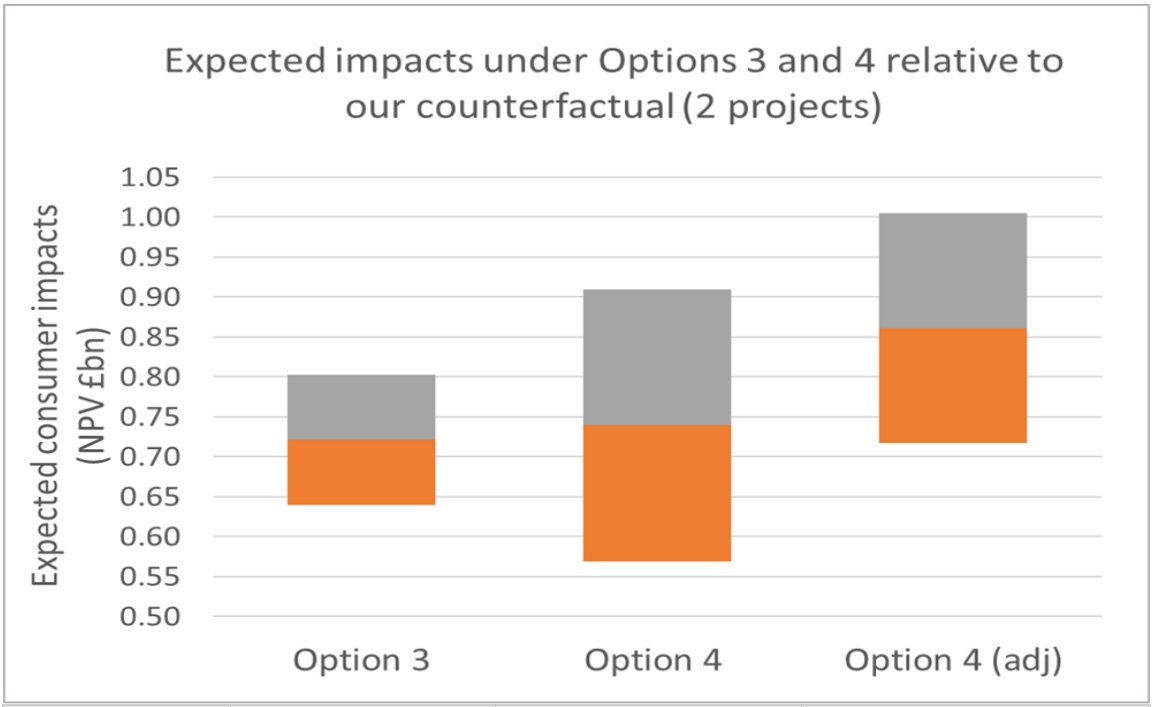
4.8. The results of our analysis are presented in Chart 2 below. We have provided uncertainty and midpoint estimates for expected consumer benefits under Options 3 and 4 relative to our counterfactual.

4.9. Under Option 4, the Greenlink and NeuConnect projects are expected to deliver **consumer benefits in the range of £569million to £910million** relative to our counterfactual. When we limit the worst-case downside of Option 4 (following our approach to implementing Variation 4 as set out below in paragraph 4.11), this reduces the risk exposure for consumers. Under this scenario (which we refer to as Option 4(adjusted), the **expected consumer benefits could be in the range of £717million to £1,006million**.

4.10. The Option 4(adjusted) value presents the expected consumer benefits if the cost of Variation 4 (for the two projects) is limited to around £18million. We expect this result from applying Variation 4 as set out below under 'Approach 1' in paragraph 4.11. The result under Option 4 is supported by our central case assumptions for the cost of Variation 4 as set out in Table 2 in Section 3 of this document.

[30] Z: expected value under the counterfactual

Chart 2: Expected range of net consumer impacts for the Greenlink and NeuConnect projects



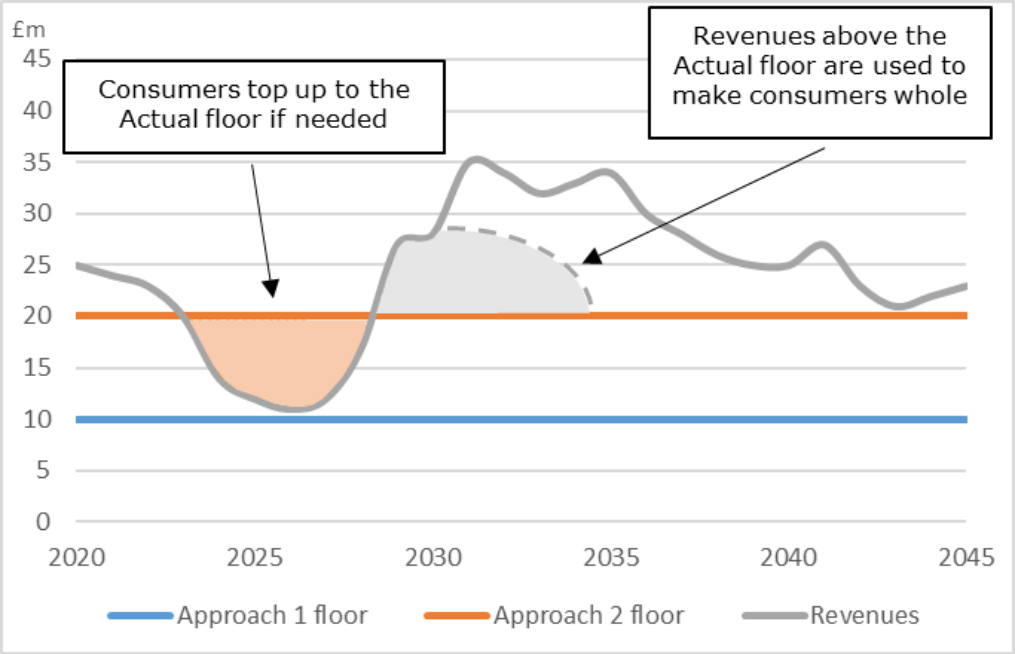
NPV £m, 2018/19	**Option 3** (Variations 1, 2 and 3)	**Option 4** (Variations 1, 2, 3 and 4)	**Option 4 (adjusted)** (Variations 1, 2, 3 and 4 adj)
Higher end expected benefits	802	910	1006
Lower end expected benefits	640	569	717
Average expected benefits	**721**	**739**	**861**

4.11. To implement Variation 4, we propose giving developers the opportunity to choose between the following approaches:

- *Approach 1:* Ofgem could set revenue floor based on a notional approach but replace the default regime benchmark with a new benchmark (iBoxx BBB 10+ years) to reflect the risk profile of standalone non-corporate interconnectors. This approach ensures that extra risk to consumers is limited to the difference between the default floor based on iBoxx A/BBB and the new floor based on iBoxx BBB.

- *Approach 2:* Ofgem could set the revenue floor based on a competitive market financing process (which is the developers' request for Variation 4). However, **if the floor based on Approach 2 is higher than the floor under Approach 1, developers will pay back (as much as possible) any floor payments above the floor level in Approach 1 before they can recover their equity investment and dividends.** This should ensure that consumers are restored to the position they would have been under Approach 1. An illustration of Approach 2 is set out below in Chart 3.

Chart 3: Illustration of Approach 2 for implementing Variation 4



4.12. We note that implementing Approach 1 for the two projects could add a total of about £18million to the floor levels relative to the default regime over the 25-year regime length. This estimate is based on the difference in interest rates (about 0.15% more as at our reference date) that lenders require to lend to iBoxx BBB versus a blend of A/BBB rated companies. The cost could rise to £62million if the difference is 0.5%.

Consumer impacts of three additional cap and floor projects

4.13. We have also estimated monetised **long-term impacts** of Option 4. These long-term impacts are as a result of three additional projects that have yet to raise financing. These projects may come forward with similar requests to support their financing plans. Whilst our current impact assessment and decision do not extend beyond Greenlink and NeuConnect, we have included these impacts here to represent the possible long-term consumer impacts if similar decisions were to be taken in future.

4.14. Table 8 below provides a summary of the results. For the three additional projects, we estimate long-term net consumer impacts in the range of £2,627million to £4,130million under Option 4 and £2,764million to £3,456million under Option 3.

Table 8: Expected net consumer impacts of Option 3 and 4 for three additional projects that may seek project financing solutions in the future

NPV £m, 2018	Three additional projects		Three additional projects + Greenlink and NeuConnect	
	Consumer benefits (lower end scenario)	Consumer benefits (higher end scenario)	Consumer benefits (lower end scenario)	Consumer benefits (higher end scenario)
Option 3	2,764	3,456	3,404	4,258
Option 4	2,627	4,130	3,196	5,040

Wider impacts

4.15. We have considered wider impacts qualitatively. In this part of our assessment, we aim to identify the potential knock-on effects of Option 4, our preferred option. We have identified and discussed some of these below:

- **Wider impacts on consumers:**
  - *80% minimum availability threshold reliability standard for interconnectors:* There is a chance that applying Variation 2 could reduce the incentive on developers to repair the interconnector promptly after an unexpected fault or outage. In addition, how we implement the variation could affect lenders' view of project risk and may lead to a higher cost of financing (if lenders assess the final arrangements to be inadequate). Both outcomes would be negative for consumers. A favourable view from lenders could also lead to a lower cost of financing than we have estimated.
  - *Force majeure:* consumers may be exposed to negative impacts if the extra events now added to our amended force majeure definition were to occur. The nature of these events and the associated costs to consumers (if they were to occur) are difficult to estimate meaningfully. It is also possible that the amended definition still does not enable projects to raise required financing at the lowest rate possible under the project finance route. This would also be a negative outcome for consumers.
  - *Setting the revenue floor based on a competitive market financing process:* The iBoxx BBB cost of debt benchmark (our Approach 1) may not fully reflect the risk of financing interconnectors. The impact on developers would be negative if the market cost of debt is higher than the iBoxx BBB benchmark. Conversely, consumers face the same risk if the market cost of debt is lower than iBoxx BBB but we go on to set the floor level based on iBoxx BBB. Project finance offers the potential for the cost of debt to be based on a competitive market process which should reveal lenders' views about the risk of financing interconnectors. This price discovery should be valuable information that can inform regulatory decisions for interconnectors. We consider this as a benefit for consumers.
- **Impacts on cap and floor projects that have raised financing:** We consider the impacts of Option 4 on this group as negligible. However, we have sought to address any potential negative impacts on this group by applying Variation 3 for them too. Variation 3 broadens the definition of force majeure which benefits both lenders and equity providers. We consider that our proposal to implement Variation 3 for all cap and floor projects would help to maintain a level playing field across projects. To do otherwise may tip the playing field in favour of projects following the project finance route relative to others that have followed the balance sheet route.
- **Impact on other cap and floor projects:** If implementing the variations results in widening the range of financing solutions available to Greenlink and NeuConnect, this could lead to a lower cost of debt over time for future projects. We note that the Greenlink and NeuConnect projects may experience different

impacts as a result of the variations. A smaller project may be more likely to go ahead (relative to a bigger project) if our preferred option is attractive to fewer lenders, because a smaller project may need to borrow less to go ahead. It is also possible that our preferred option works better for a bigger project. In a different scenario, lenders may judge a bigger project as more capable of managing risk and therefore be more willing to lend (even if they assess the variation package as less than adequate).

- **Impact on the investor community:** We expect investors to view our decision positively relative to the default regime. Our decision provides more security for the floor which ensures that interconnectors would earn a stable and predictable cashflows. It also provides developers with more flexibility to manage risk.

4.16. Other wider impacts we have considered cover impact on consumers in vulnerable situations; impact on the environment; and the impact on Ofgem's administration and resources costs.

- **Impact on consumers in vulnerable situations:** We have considered the impact of our preferred option on individuals who are disabled or chronically sick, of pensionable age, with low incomes, or residing in rural areas and other consumers in vulnerable situations. These consumers are impacted indirectly if our decision results in the interconnectors going ahead. Interconnectors would allow the import of lower priced electricity, thus lowering bills for all consumers. We note that interconnectors may also export to neighbouring markets when prices are higher in these markets. If GB interconnectors tend to import more when prices are lower in other markets, this would be good for consumers. We also consider that our decision will increase the chances of all consumers realising the additional benefits of interconnection – such as contributions to security of supply and decarbonisation – as highlighted in our IPA decision.

- **Impact on the environment:** We expect the environmental impact of Option 4 to be indirect as our decision aims to broaden the range of financing solutions available to developers. The direct environmental impact of interconnectors themselves is outside the scope of this impact assessment. This assessment would have been provided in our IPA decision for the projects.

- **Impact on Ofgem's administrative and resources costs:** Our preferred option may result in slightly higher administrative and resource costs for Ofgem compared to Option 3. Under Option 4, Ofgem would have to oversee developers' financing arrangements to ensure that developers raise debt under a competitive market process. We expect to be able to manage these extra costs adequately under our business as usual arrangements.

Hard to monetise impacts

4.17. We provide further assessment of impacts that are difficult to monetise meaningfully and very long-term, making them challenging to include within a monetised analysis.

4.18. Our assessment is a qualitative assessment of hard to monetise impacts of Option 4 as set out below in Table 9. We focus on impacts on Ofgem's mid-term strategic and

long-term sustainability aims as set out in our Impact Assessment Guidance, our 2019-23 strategic narrative and Ofgem's decarbonisation plan.

4.19. These impacts relate to increased likelihood of more interconnectors progressing to operation (because of project finance variations), rather than the impacts of the specific variations themselves.

Table 9: Hard to monetise impacts

Factor	Mid-term strategic	Long-term sustainability	
	Optionality: this involves the evaluation of specific, realistic options that may be enabled or prevented by our decision.	**Learning by doing:** considers that there can be potential savings in cost by one party going through a process and passing that learning onto others.	**Lock-in or lock-out of decarbonisation pathways:** covers how our decisions today can make certain desirable options in the future unachievable.
Positive investor confidence may enable competition and innovation in the development and financing of interconnectors, and could drive down prices for consumers.	Our regime variation policy allows for project specific decision. Therefore, this decision keeps other options open to help us accommodate future uncertainty or change in direction.	Broadening the range of financing could allow new investors to enter the market with innovative projects that may otherwise not be developed. This would help future projects and consumers in the long run.	It is difficult to assess the extent our future decision will be contingent on the decision we make today and our capacity to move away from the current options under consideration.
Reduced consumer benefits if variations crowd out projects being developed using default regime or if projects crowd out generators or other technologies.	Potential to make the project financing route (currently a more costly option for consumer) preferable to developers; impact on domestic generation and security of supply may be more than we have assessed.	N/A	Our decision should not lock out other types of financing that are already possible under the default regime. Impact on future decision should be limited as our decision is project specific.
Project delays and cancellation which could result if developers are not able to raise required financing to progress projects on time.	Regime variations aim to broaden the range of financing solutions available to developers and therefore provide more options to developers to raise required financing.	It is unclear to what extent our decision may lead to projects progressing on time. Our decision could increase private involvement in interconnector financing or open up new options.	A broader range of financing solutions would provide more options for developers to progress projects on time by using efficient financing solutions.
Potential adverse impacts on GB producers (beyond the level accounted for in Pöyry's analysis).	Interconnection could provide flexibility options in hours of high renewable generation, instead of curtailment; potential import from markets with lower emissions; and/or a potential import from markets with higher emissions.	N/A	Enabling more interconnection could indirectly lock out other potentially competing technology and flexibility solutions.

5. Summary of our preferred option

This chapter sets out the summary of our preferred option and our assessment of risks and uncertainties surrounding it. It also provides a summary of our implementation plan.

Our preferred option

5.1. Based on the balance of costs, benefits and risks as set out in this impact assessment, **we consider that Option 4 offers the best trade-off for consumers**. Our choice of Option 4 is in line with our overarching principle which aims to improve outcomes for consumers without transferring too much risk to them.

5.2. Our updated analysis shows **average expected GB consumer benefits of £739m under Option 4** over the duration of the cap and floor regime. This estimate is relative to our counterfactual where we reject all the variations and maintain the default regime.

5.3. Limiting the worst-case downside of Variation 4 (following our implementation approach above) changes the risk exposure for consumers. This means the **average expected consumer benefits under Option 4 could be up to about 17% higher, rising to £861m (as shown under Option 4$_{(adjusted)}$ in Chart 2)**.

5.4. Option 4 should make the regime more attractive to more lenders and equity providers. This should widen the range of financing solutions available to developers. We think this should allow projects to raise the required financing to progress in a timely manner. The timely progress of both projects should keep development and construction costs down and benefit consumers.

Expected consumer impacts estimated at consultation

5.5. In our draft impact assessment, the expected consumer benefits under Option 3 was in the range of £593million to £802million (average £698million) relative to our counterfactual. The expected consumer benefits under Option 4, ranged from £530million to £804million (average £667million), making Option 3 our preferred option at consultation.

5.6. The difference in the results in our draft and updated impact assessment can be explained by the key updates to our draft impact assessment as set in paragraph 3.1 of Section 3. We have also made the below two changes to our estimates of IDC and default cost of debt following consultation feedback:

- We have updated our approach to calculating IDC to align with our default regime Window 1 approach (Greenlink) and Window 2 approach (NeuConnect).
- We have also updated our notional cost of debt in line with default regime guidance. At consultation, we kept the developers' assumptions provided at variation requests submissions to ensure comparability of results.

5.7. We note that the changes we have made (as set out in paragraphs 3.1 and 5.6) are more conservative and have increased the total costs of Variations 2, 3 and 4 from £388million to £446million. **This total cost represents the likely maximum consumer cost based on our reasonable worst-case assumptions and may not be realised.**

5.8. We have provided more detail about the impact of these changes on our results in Table 10 below.

Table 10: Cost of variations and expected consumer benefits under our draft and final impact assessments (NPV, £m 2018)

	Draft Impact Assessment	Final Impact Assessment	Explanation
Cost of variations and delay (Greenlink and NeuConnect)			
Variation 2	275	232	Cost of this variation has reduced by about 16%. Benefits lost, as a result of unavailable capacity, was a big driver of this cost. This is now removed to avoid double counting (as highlighted in a consultation response). Cost of Variation 2 is now calculated as four times annual floor payment for each project and cannot be exceeded over the regime duration.
Variation 3	11	22	Cost of Variation 3 has gone up by 100% as a result of applying the modified force majeure definition for all nine cap and floor projects. Cost of four balance sheet projects has been reassigned (proportionately) to the five project-financed projects.
Variation 4	102	192	Cost of Variation 4 has increased (by about 88%) as a result of the net effect of three factors: 1) Updating our approach to calculating IDC and default cost of debt (decreasing effect); 2) Adding a 20% buffer to floor reflecting DSCR assumption of 1.2x (increasing effect); 3) Removing the moderating effect of revenues (increasing effect). In our draft impact assessment, if revenue forecasts were high enough to absorb any increase in floor due to Variation 4, we would not treat the floor increase as a cost. In our final impact assessment, we now look at absolute increase in floor level as a result of applying Variation 4.
Cost of delay	516	531	Slight increase in cost of delay as a result of changes to how we estimate the cost of variation 4. Cost of delay is driven by two factors: 1) benefits lost during the 2-year delay period assumed; and 2) net cap and floor payments over the 25-year regime period relative to a 23-year regime reflecting delay.

Expected consumer benefits (Greenlink and NeuConnect)				
Option 3	**Lower end**	593	640	Change in expected benefits under **Option 3** driven by a combination of factors: 1) Cost of variations as set out above (increasing effect on benefits under Option 3 as total cost of Variations 2 and 3 have gone down between draft and final impact assessments) 2) Cost of delay (decreasing effect) 3) Updates to our probability assumptions (decreasing effect).
	Higher end	802	802	
Option 4	**Lower end**	530	569	Change in expected benefits under **Option 4** driven by a combination of factors: 1) Cost of variations as set out above (decreasing effect as total cost of Variations 2, 3 and 4 have gone up between draft and final impact assessments) 2) Cost of delay (decreasing effect) 3) Updates to our probability assumptions (increasing effect).
	Higher end	804	910	
Expected consumer benefits (three additional interconnectors)				
Option 3	**Lower end**	2141	2764	Change in expected benefits under **Option 3** driven by the factors as set out above for Greenlink and NeuConnect. Additional driver includes the following: Capex and variation estimates for the three projects are now used in our final impact assessment relative to draft impact assessment where we used approximate figures (average ratio of cost of variations to consumer benefits based on our assessment of the Greenlink and NeuConnect projects).
	Higher end	3251	3456	
Option 4	**Lower end**	1991	2627	Change in expected benefits under **Option 4** driven by similar factors as set out above for Greenlink and NeuConnect and by using capex estimates for the three extra projects as discussed above under Option 3.
	Higher end	3303	4130	

5.9. We note that the results in this analysis are driven by the assumptions we have made with obvious limitations. We have discussed these assumptions in more detail in our direct response to issues raised in the consultation responses. This detail is set out in Appendix 3 of our decision published alongside this impact assessment.

Risks and uncertainties

5.10. The requests considered throughout this impact assessment are difficult to assess, meaning that some elements of the impacts can only be assessed qualitatively. Additionally, for those areas where we provide quantification, our analysis and the estimates are driven by the assumptions we have made and based on information and evidence currently available to us.

Risks

5.11. The main risk of approving the variations is that the risk allocation balance between developers, their contractors and consumers would change (likely in developers' favour). Whether this impact leads to an optimal balance overall is difficult to know at this time, because so far, no GB electricity interconnector has raised financing through project finance solutions.

5.12. We have considered whether our preferred option would be sufficient for developers to raise required financing to progress projects. Project delays or cancellations could result in considerable consumer impacts. Other factors (which we have not considered), such as potentially higher construction costs due to delays or sunk costs in the case of non-delivery could have negative impacts on consumers as well.

5.13. If the cost of variations were lower than as we have set out in Table 5, then there would be a greater risk that our approved variation package is considered insufficient and developers may be unable to progress projects. Conversely, if the cost were higher than our estimate, the case for Option 3 or our counterfactual would be stronger.

5.14. Another risk factor is the long-term consumer impacts if other cap and floor projects requested different sets of variations (relative to the set we have considered in this impact assessment). We consider this risk as being reasonably unlikely or marginal as these projects would be seeking to raise project financing from some of the lenders who responded to our consultation. Our policy would also allow us to consider future requests based on the same principle of improving outcomes for consumers.

5.15. We have carried out a qualitative analysis of the hard to monetise impacts of our preferred option. However, the scale of these impacts is difficult to establish. It is challenging to understand fully whether the balance of risks and benefits (taking into account monetised and hard to monetise benefits) is better under other options relative to our preferred option.

Uncertainties

5.16. Variations to the default cap and floor regime are likely to lead to a complex response by developers and lenders which is difficult to predict. Whilst this impact assessment is based on the evidence available to us, there is uncertainty regarding our methodology for estimating the cost of variations and cost of delays. It is also uncertain whether developers and lenders' response in practice will align with the probabilities that we have modelled (presented in Table 4).

5.17. To reflect some of these uncertainties, we based our expected benefit assessment on the central scenario with a further scenario analysis applied to this central scenario to capture how we think developers would respond to Options 3 and 4. To capture developers' responses, we have modelled probability ranges under two scenarios for four response outcomes (A, B, C and D) as set out in Section 3.

5.18. Our probability estimates reflect the following expected outcomes: A) without variations, developers may struggle to raise required financing and projects may not to go ahead; B) projects are likely to go ahead with delays using balance sheet financing; C) projects are likely to go ahead with delays under the project finance route; and D) projects are likely to go ahead on time under the project finance route.

The result of this scenario analysis on the expected NPV consumer benefits is presented in Chart 2.

5.19. Our view is based on the conclusions we have drawn from our own analysis, from discussions with developers and from consultation responses. We note that it is difficult to estimate such probabilities accurately and a potentially unlimited number of factors might come into play which are difficult to predict in advance.

5.20. In addition, our analysis is sensitive to many elements of the wider environment in which interconnector developers operate. For example, the market environment in which financing and insurance activities for force majeure events are carried out.

5.21. To reflect uncertainties around the costs of variations, we have considered how these costs may vary across scenarios. The scenarios are based on the assumptions discussed above and are aimed at assessing a reasonable range of outcomes for the costs of variations. More detail on the three scenarios is set out in Table 2, Section 3.

5.22. We have also reviewed factors that drive interconnector value to understand the reliability of the Pöyry GB consumer benefits estimated a couple of years ago (2014 for Greenlink and 2017 for NeuConnect). In addition, we have estimated the breakeven Pöyry GB consumer benefits that would make us indifferent between the different options and our counterfactual.

5.23. The breakeven result for the Pöyry GB consumer benefits is between £1.11billion and £1.79billion. This means that if the Pöyry estimate (plus adjustments we have made to it) were 24% to 53% lower than the figure we have used in this assessment (£2.36billion for the two projects), we would be indifferent across Options 3 and 4 relative to our counterfactual. We have provided a summary in Table 11 below.

Table 11: Breakeven analysis result

Consumer benefits, (£m, 2018/19 prices)	Option 3	% variaton from Poyry GB consumer benefits	Option 4	% variaton from Poyry GB consumer benefits	Option 4 (adjusted)	% variaton from Poyry GB consumer benefits
	V1,2,3		V1,2,3,4		V1,2,3,4 (adjusted)	
Higher end expected benefits	1,217	**48%**	1,225	**48%**	1,106	**53%**
Lower end expected benefits	1,723	**27%**	1,794	**24%**	1,646	**30%**

Implementation plan

5.24. The implementation plan for our preferred option would involve changing our default regime policy for the Greenlink and NeuConnect projects to reflect Variations 1, 2, 3 and 4. These changes would be set out in the special licence conditions issued to both projects.

5.25. We will work with both developers to update our default cap and floor financial models to support the implementation of Variations 1, 2, 3 and 4 for the two projects.

6. Next steps, monitoring, evaluation and feedback

This chapter describes the next steps and our monitoring, evaluation and feedback plans.

Next steps

6.1. We have issued our decision alongside this impact assessment. This should allow developers to progress discussions on financing arrangements with lenders and help them progress their projects to meet our default regime timelines.

Monitoring

6.2. We will continue engaging with stakeholders and developers in the months following our decision to ensure that the regime is fit for purpose. We recognise that our preferred option may impact both developers differently and lead to different responses from them. It would also have different impacts on other developers yet to raise financing for their projects or those that have already done so.

Evaluation and feedback

6.3. To find out how successful our preferred option has been, and to ensure we have a strong base of evidence for future policy development, where possible we will seek the following:

- determining whether our preferred option has contributed to broadening the range of financing solutions available to cap and floor interconnector developers and the extent of this impact;
- understanding the minimum changes that are required for projects to raise required financing; and
- understanding better the risks to consumers of each aspect of the regime variations and being able to estimate accurately these risks.

6.4. Given that our decision is important for consumers, developers and lenders, we will continue to engage with the relevant parties to understand the impact of the changes we have made on all cap and floor projects. This should allow us to act as necessary to ensure that we are able to achieve our policy objectives.