

Decision on the cap and floor regime for the GB-Belgium interconnector project Nemo

Final decision

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Overview:

This is our final decision on the design of the cap and floor regulatory regime for project Nemo – the proposed electricity interconnector between Great Britain and Belgium. This concludes our consultation process for Nemo and finalises our work on the cap and floor regime design. This regime will now be applied to project Nemo.

Context

Nemo is the project name for the development of a 1GW electricity interconnector between Zeebrugge in Belgium and Richborough, Kent in Great Britain (GB). The project developers are National Grid Nemo Link Ltd (a subsidiary of National Grid Plc, the GB transmission system operator (TSO)) and Elia (the Belgian TSO). Together they will jointly own and operate the interconnector.

We have developed the cap and floor regime for the Nemo interconnector over the past three years with the Belgian energy regulator – Commission de Régulation de l'Électricité et du Gaz (CREG). We have consulted formally on our proposed methodology and design (March 2013), the proposed methodology for interest during construction for Nemo (October 2013), Impact Assessment (December 2013) and cost assessment (April 2014). We have also engaged bilaterally with the project developers and CREG. This document sets out our final decision to award the cap and floor regime to Nemo, concluding this consultation process.

In May 2014, we published a minded-to consultation on the regulation of future electricity interconnector projects. Following this, in August 2014 we published our decision to roll out the cap and floor regulatory regime to new near-term electricity interconnectors. We received five applications from interconnector developers and we are currently assessing these projects.

Together with this decision for the Nemo interconnector, the cap and floor roll-out provides a framework for GB interconnector investment. Improving cross-border electricity infrastructure is fundamental to achieving GB and European energy goals, including the internal energy market.

Associated documents

[Decision to roll out a cap and floor regime to near-term electricity interconnectors](#)

Published: August 2014

[The regulation of future electricity interconnection: Proposal to roll out a cap and floor regime to near-term projects](#)

Published: May 2014

[Cost assessment consultation for the proposed GB-Belgium interconnector, Nemo](#)

Published: April 2014

[Cap and Floor Regime for application to project Nemo: Impact Assessment](#)

Published: December 2013

[Offshore electricity transmission and interconnector policy: minded-to position on interest during construction \(IDC\)](#)

Published: October 2013

[Cap and Floor Regime for Regulated Electricity Interconnector Investment for application to project Nemo](#)

Published: March 2013

[Preliminary conclusions on the regulatory regime for project Nemo and future subsea electricity interconnector investment](#)

Published: December 2011

[Cap and floor regime for regulation of project Nemo and future subsea interconnectors](#)

Published: June 2011

[Open Letter on next steps from Ofgem's consultation on electricity interconnector policy](#)

Published: September 2010

[Electricity Interconnector Policy Consultation](#)

Published: January 2010

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Executive Summary

Electricity interconnectors can significantly benefit existing and future consumers. Our objective is to make sure that economic and efficient interconnection is delivered in a timely manner. Nemo is expected to be the first interconnector built under the cap and floor regulatory regime which we have developed with the Belgian energy regulator, CREG.

The regime

The cap and floor regulatory regime sets a framework for GB interconnector investment. This developer-led approach balances incentivising investment through a market-based approach, with appropriate risks and rewards for the project developers are appropriate.

The regime is designed to limit the downside of the investment by providing regulated revenue at the floor. Here, the developers will receive a top-up from GB and Belgian consumers if revenue falls below a predefined level. Consumers are protected through the cap, which ensures that high returns are passed back to network users in GB and Belgium. Following consultation on the details of this regime, we have now applied the regime to the GB-Belgium interconnector Nemo.

The cap and floor are constructed using a 'building block' approach. These building blocks include our assessment of efficient construction costs, a return on capital and an assessment of operating expenditure. For Nemo, we have calculated the cap and floor levels based on the final regime design and our assessment of costs to date. This generates an annual floor level of £50.4m and an annual cap level of £80m (2013/14 prices). These will be subject to final adjustments following our final assessment of costs after construction.

Impacts

We looked at the impacts of applying the cap and floor regime to Nemo as part of our Impact Assessment. We expect that over the lifetime of the project, Nemo will provide social welfare benefits resulting from trade between the GB and Belgian markets. We also anticipate wider positive impacts (such as a small increase in competition and enhanced security of supply) that will benefit consumers, in addition to those captured by trade benefits. The cap and floor regime is designed such that a project only goes ahead if revenues are expected to exceed the floor. The revenue projections presented by the developers suggest that consumer top-ups to the floor are unlikely.

Next steps

Our decision to apply the cap and floor to Nemo, along with the final regime design, has been agreed with CREG. CREG consulted on its decision in November 2014 and has now submitted its decision to the Belgian Parliament. We expect the Nemo developers to take their final investment decision in early 2015 with the interconnector in operation by the end of the decade.

This marks the end of the regime development for Nemo. We will now make the necessary changes to GB interconnector and transmission licences to reflect our decision. We will work with the developers and consult formally on these changes.

1. Introduction, background and next steps

Chapter Summary: This decision finalises a number of consultations on the cap and floor regime design for Nemo. These are summarised below along with the background to our decision.

This document

1.1. This document sets out Ofgem's¹ decision to award a cap and floor regulatory regime to project Nemo, concluding our work on the Nemo cap and floor regime design. This decision finalises a number of areas of the Nemo cap and floor regime following extensive consultation over the past few years.

1.2. First, this document sets out our final decision on the cap and floor regime design for Nemo. We consulted on the detail of the regime design in March 2013. The regime design is now finalised for Nemo.

1.3. Second, following our April 2014 consultation on the Nemo cost assessment, this document also incorporates our updated decision on efficient project costs for Nemo. Using this information, we set out in this document the cap and floor levels that will be set for the length of the regime in real GBP terms. We also set out the process we will follow to update limited aspects of the regime as part of the final cost adjustments closer to project operation – such as project operational costs and necessary adjustments to the capital costs.

1.4. Third, this consultation sets out our decision on the approach to Interest During Construction (IDC) for Nemo. This follows our consultation (on both interconnection and offshore transmission) in October 2013.

1.5. Finally, this document finalises our view of the impacts of project Nemo. This follows consultation on our draft Impact Assessment from February 2013. The amendments to our Impact Assessment are set out in Appendix 3.

¹ Ofgem is the Office of the Gas and Electricity Markets, which supports the Gas and Electricity Markets Authority, the regulator of the gas and electricity industries in Great Britain. The terms "Ofgem", "we" and "the Authority" are used interchangeably in this document.

Background

1.6. Interconnectors are the physical links which allow the transfer of electricity across borders.

1.7. Electricity interconnection can have many benefits:

- improving competition by creating larger effective markets, thereby making electricity market prices more efficient
- making supply more secure by increasing access to generation in periods of system or energy shortage
- making generation dispatch more efficient by providing access to the most efficient units over a larger area. This can also help to reduce the greenhouse gas emissions
- improving integration between variable generation and demand (for example, wind and solar renewable energy generation) by harnessing the diversity between output in different locations and improving access to the balancing services and other production flexibility needed to maintain security and quality of supply.

1.8. In GB, electricity interconnection can be brought forward under the exempt or regulated route.

1.9. Under the exempt route, interconnector developers identify opportunities to connect markets and to earn revenues from parties using the interconnector. Developers investing under this route apply for an exemption from aspects of European legislation to manage the risks of investment on this basis.

1.10. In 2010 we consulted on options for investing in regulated interconnectors in GB. We identified a clear need for a way to develop interconnectors in GB that would encourage appropriate and necessary investment.

1.11. In 2011 we consulted on the principles of the cap and floor approach for regulated interconnector investment in GB. This consultation highlighted a preference, taking into account views from stakeholders, for a cap and floor regulatory regime.

1.12. In March 2013 we consulted on the detailed regime design and methodology for setting the cap and floor for the Nemo interconnector. We followed this with the impact assessment consultation in December 2013.

1.13. Finally, in April 2014 we published a short consultation on the initial cost assessment for project Nemo. Following this consultation we have undertaken additional analysis to update our cost assessment for Nemo which has been used to set the cap and floor (this will be updated later and further detail is provided below).

Next steps

1.14. The regime design for Nemo is a joint regulatory regime between Ofgem and CREG that has been agreed following numerous consultations. CREG have now consulted on the tariff methodology for Nemo which will finalise the regime in Belgium.²

1.15. Ofgem is currently drafting the licence changes that will bring this decision into effect in GB. This will involve additions/changes to the Nemo interconnector licence and National Grid Electricity Transmission's (NGET) licence. We expect to issue an informal consultation on these licence changes in early 2015, ahead of the statutory consultation.

² CREG's consultation is on their website at this link: <http://www.creg.be/fr/opinione.html>

2. Regime overview for Nemo

Chapter Summary: This chapter provides an overview of the cap and floor regime design for project Nemo.

High level regime design

2.1. The cap and floor regime is a cost-based regime that will be set for 25 years. We will set the levels of the cap and floor ex-ante and they will remain fixed for the duration of the regime. This is so that investors have certainty about the regulatory framework applied to the project.

2.2. Once the interconnector becomes operational, the cap and floor regime will start. Every five years we will assess interconnector revenues (net of any market related costs³) over the period against the cap and floor levels to determine if the cap or floor is triggered.⁴ Any revenue earned above the cap would be returned to the National Electricity Transmission System Operator (NETSO) in GB and Belgium on a 50/50 basis. The NETSOs would then reduce the network charges for network users in both countries. If revenue falls below the floor then the interconnector owners would be compensated by the NETSO. They will recover the costs through network charges. National Grid performs the NETSO role in GB and Elia, the Belgian TSO, in Belgium.

2.3. Each five-year period will be considered separately. Cap and floor adjustments in one period will not affect the adjustments for future periods, and total revenue earned in one period will not be taken into account in future periods.

High level regime design	
Regime length	25 years
Cap and floor levels	Levels are set at the start of the regime and remain fixed in real terms for 25 years from the start of operation. Based on applying mechanistic parameters to efficient costs: a cost of debt benchmark will be applied to costs to give the floor, and an equity return benchmark to give the cap.

³ Market related costs are explained in full in paragraph 4.17.

⁴ Interconnector owners generate revenue (congestion revenue) by auctioning interconnector capacity. As long as there is a price difference between the two interconnected markets, there will be demand for the capacity and a revenue stream will be generated.

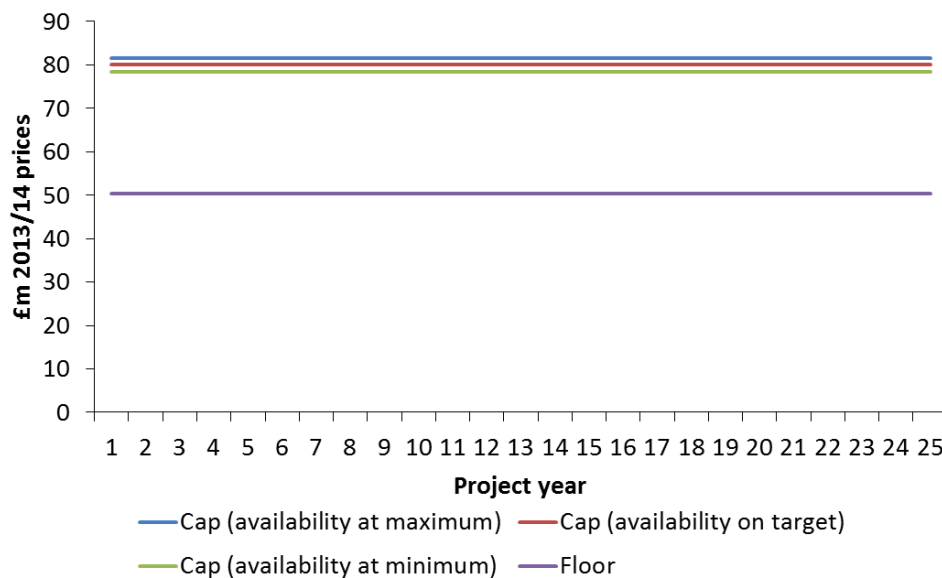
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Assessment period (assessing whether IC revenues are above/below the cap/floor)	Every five years, with within-period adjustments if needed and justified by the developer. Within-period adjustments will let developers recover revenue during the assessment period if revenue is below the floor (or above the cap) but will still be subject to true-up at the end of the five-year assessment period. ⁵
Mechanism	If revenue is between the cap and floor, no adjustment is made. Revenue above the cap is returned to consumers and any shortfall of revenue below the floor requires payment from network users (via network charges).

The cap and floor levels for Nemo

2.4. For Nemo we now have sufficient information to set the cap and floor levels. The floor is £50.4m and the cap is £80m per year (2013/14 prices) – these levels are shown in figure 2.1 below.⁶ These levels are set based on the regime design and latest project cost information specified in this decision document. These levels will be updated when final project costs are known and will then be set for the length of the regime.

Figure 2.1: Cap and floor levels for project Nemo



⁵ At the end of the five year assessment period we will look at whether the cap and floor have been breached and calculate whether payments to or from Nemo should take place.

⁶ Note that these levels include non-assessed values for risk, insurance and opex. These will be subject to assessment in 2018/2019 as explained in this decision. There will also be minor change to the levels as we update the relevant indices at financial close.

Summary of regime design

2.5. The design of the cap and floor regime is built up of three main themes: costs, revenues and returns. Our decisions across these areas are summarised below.

Cost-related decisions	
Additions to the RAV used in the annuitisation	<p>Approved capital expenditure (capex) will be remunerated through annuitised depreciation and return allowances generated from a Regulatory Asset Value (RAV). This process results in a flat profile of the cap and floor.</p> <p>There will be a review of some capex elements before construction, and a final capex adjustment to look at changes in costs and remaining cost items not yet assessed.</p> <p>Other costs also feed into the cap and floor through the RAV annuitisation process. Development costs and spares are added to the RAV. IDC on the RAV balance before the start of operations is added in each pre-operational year, and financial transaction costs (the costs of raising finance) are added to the RAV in the first year of operation.</p>
Interest During Construction	IDC will be treated as a cost incurred in the construction period which is capitalised and feeds into the cap and floor levels.
Operating costs (opex)	An ex-ante assessment of opex will be undertaken ahead of operation – and this will be set for the length of the regime with a possible re-assessment after 10 years. For non-controllable costs, we will set a baseline allowance as part of the opex assessment. Where these costs change during the regime due to external factors, we will make an assessment and where appropriate, pass-through the difference to Nemo.
Tax	Tax will be annuitised and included in the cap and floor levels to give a flat profile during the regime. It is based on UK tax arrangements for the purposes of this decision but will be updated to include both UK and Belgian tax arrangements ahead of financial close. There is no tax-trigger mechanism for tax changes (ie the tax will be set for the length of the regime).
Financial transaction costs (ie costs of raising finance)	An allowance of 2.5% on notional gearing (ie proportion of debt used to finance the project) for debt transaction costs and 5% on notional equity (ie proportion of equity used to finance the project). Here we assume 50% notional gearing during operation with the gearing assumption from the IDC calculation used during construction.

2.6. Interconnector congestion revenue will be assessed against the cap and floor every five years during the regime. Revenue-related aspects of the regime design are summarised below.

Revenue-related decisions	
Profile	The cap and floor will be flat in real terms over the 25 years. The separate cap and floor returns will be used to calculate the annuities for the cap and floor levels.
Indexation	50% linked to UK RPI, 50% linked to exchange rate-adjusted Belgian CPI inflation.
Assessment periods	Five years, on a discrete basis (each five-year period is considered in isolation). At the end of the five-year period, cumulative revenue will be assessed against the cap and floor.
Within-period adjustments	There is the possibility for payment within the assessment period. This payment is subject to a joint NRAs ⁷ decision based on justification from the project developer (and providing revenue is below the floor/above the cap). It will be considered on a cumulative basis. ⁸ If at the end of the assessment period the cap and floor are not breached, then they would need to be returned on an NPV-neutral basis. ⁹
Interconnector availability (cap and floor)	An adjustment of +/-2% of cap revenue is available against a target availability of 97%. Developers will lose automatic eligibility for floor payments for each individual year if availability is below an 80% threshold.
Financial assistance & refinancing	Any grants should be netted off the investment value incorporated into the cap and floor levels. Refinancing gains and/or losses will be retained by the developers.
Income adjusting events	Costs relating to income adjusting events will be passed through regardless of whether revenue is at the cap or floor, subject to justification by the developers and subject to the costs exceeding the threshold of 5% of the annual floor revenue. Changes to tax treatment are excluded. Income adjusting events shall be broadly defined as in the offshore transmission owner (OFTO) regime (with relevant amendments to reflect that interconnectors are not signatories to the System Operator – Transmission Owner Code (STC)). ¹⁰

2.7. A return on investment is provided at both the cap and floor. The return benchmarks are separate for the cap and floor returns to reflect the different risks at the cap and floor. As revenue will not be generated until the project is operational, interest is capitalised during the construction period and included in the RAV.

⁷ "NRA" stands for National Regulatory Authority and means Ofgem or CREG. "NRAs" stands for National Regulatory Authorities and means Ofgem and CREG.

⁸ We will consider the financing requirement up to the year in question from the start of the relevant five year assessment period.

⁹ We will ensure that the timing of payments is taken into account, both within and at the end of the assessment period.

¹⁰ See paragraph 4.54 for full details.

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Approach to returns	
Floor benchmark	Based on a cost of debt benchmark of A/BBB (iBoxx) applied to 100% of the RAV. There is a 50/50 weighting of GB/Belgium debt costs.
Cap benchmark	<p>This will be based on the Capital Asset Pricing Model (CAPM). We will use the risk-free rate and equity risk premium as determined by our current methodology. The equity beta used is based on our assessment of risk at the cap (we consider this to be similar to the risk faced by an independent generator¹¹).</p> <p>For the Nemo GB calculations we will use a risk-free rate of 1.6%, an equity beta of 1.25 with the equity risk premium as determined by Ofgem's current methodology.¹²</p> <p>There will be a 50/50 weighting of GB/Belgium parameters.</p>
Interest During Construction methodology	This will be based on the approach to IDC as consulted on in October 2013 (calculations will be updated). Two uplifts are applied to compensate for project development risk (0.54%) and construction related cost assessment process uncertainty (0.91%). This results in IDC of 5.76% (real vanilla).

¹¹ We have based this assessment on the re-gearred equity beta of Drax as an independent generator.

¹² For Nemo, we will use a GB equity risk premium of 5.2%. The Belgian risk-free rate used is 2.2% and the Belgian equity risk premium of 3.5%.

3. Setting the cap and floor for Nemo

Chapter summary: We have updated our view of efficient costs for Nemo for the current stage of the Nemo procurement process. We have used these costs to generate the cap and floor levels for Nemo.

3.1. Under the cap and floor regime, assessed efficient costs are used as an input to set the cap and floor levels. This chapter summarises the updated cost information we have received from Nemo through consultation. We explain the cost assessment approach we have taken to date and the costs items that will be assessed later on in the process. This includes our approach to the final opex assessment and final capex adjustment. We then set out our updated view on efficient costs for Nemo. This cost information has been used to set the cap and floor levels for Nemo.

Updated cost information

3.2. In April 2014 we consulted on the efficient costs for project Nemo. This assessment was based on an independent report from BPI consultants, which concluded in November 2013. We received 9 responses to this consultation of which 3 are confidential.¹³ Through the consultation we also received confidential updated cost information from the Nemo developers.

3.3. This cost information provides additional justification for a number of cost items and in particular the progress of the ongoing procurement exercise for the major capital components. We have taken this information into account in this updated assessment. This level of justification and detail was not available at the time of our previous assessment and consultation. This has resulted in an increase in the levels of costs that we consider efficient at this stage. We have explained this updated assessment below along with the changes we have made to the Nemo cost assessment process following consultation. Much of the information that we have assessed is confidential and commercially sensitive. We have presented our high level analysis in this document.

Cost assessment approach for Nemo

3.4. Following our April 2014 consultation we have decided to amend our approach to the Nemo cost assessment. In particular, we consider it appropriate to provide the project developers with certainty on some costs now, rather than waiting for the final assessment post-construction. We have therefore updated our assessment of the project costs only where sufficient cost information is available at this stage to ensure we can make an informed decision – for example for development costs

¹³ We have summarised the responses to this consultation in Appendix 2. Non-confidential responses will be available on our website shortly.

already incurred and HVDC contract costs. For other costs that have either not yet been incurred, such as opex, or where uncertainty still exists, such as risk and insurance allowances, we will undertake a full assessment ahead of operation.¹⁴ These items do not form part of this assessment.

3.5. Setting a proportion of costs now provides more certainty for the project developers on the costs that will be incorporated into the cap and floor and reduces the scope of the final assessments. The final assessment for project Nemo will be split into two sections – the final opex assessment and final capex adjustment. We intend to run these assessments at the same time.

Final opex assessment

3.6. As proposed in our April 2014 consultation, we will set opex before Nemo starts commercial operation. We will undertake a detailed assessment of planned opex which will be set for the length of the regime. We expect to undertake this assessment at the same time as assessment of the final capex adjustments. The ex-ante opex assessment will be based on benchmarks of the cost of operating comparable interconnector projects in Europe. In order to ensure transparency, only verifiable information will be taken into account by the NRAs in the assessment.

3.7. Following the consultation, we have decided to incorporate a discretionary opex re-assessment 10 years into the regime. We expect this assessment to consider whether the original estimates are appropriate for the remainder of the regime. This will include situations where costs are both higher and lower than anticipated in the ex-ante assessment and can be initiated by Ofgem or the project developers. The full details of this re-assessment will be set out in the Nemo licence which we will consult on in early 2015.

Final capex adjustments

3.8. As set out in our April 2014 consultation, we intend to undertake the final capex adjustment when project construction is 95 per cent complete. The Nemo developers should inform Ofgem 6 months ahead of this stage of construction.

3.9. At this stage, we will also require the Nemo developers to identify any events during construction that changed the scope of the required works. Where these events are justified, were mitigated efficiently, and are outside of the control of the developers, for example unfavourable sea bed conditions, we will take these into account in the final capex adjustment. At this stage we will also assess the competitiveness of the final stages of the tender process and any changes to the final contract costs where these differ from the costs already considered as part of this assessment.

¹⁴ We will also assess commissioning costs and remediation costs at that stage.

3.10. Finally, as part of the final capex adjustment, we will ask the Nemo developers to re-submit a spend profile for the construction phase of the project. This profile is required to ensure that the Nemo financial model is set accurately and will allow a final calculation of IDC that should be incorporated into the regime.¹⁵ At this stage the cap and floor levels will be set for the length of the regime. We expect this to take place in 2018/2019.

Current cost estimates for Nemo

3.11. We asked our consultants, BPI, to assess the updated project cost information provided by the project developers and update the assessment of efficient costs.¹⁶ As this assessment has included information from the current live tender process (Nemo developers are still engaged in commercial negotiations with contractors) we have not included sensitive information in this document to ensure the competitiveness of the tender process.

3.12. Using this information, we have updated our view of the efficient costs for Nemo. The table below provides a breakdown of the reductions made to Nemo's costs.

Table 3.1: Ofgem's updated cost assessment for Nemo

Assessment*	Cost category	Cost reduction
Pre-construction	HVDC contract**	-1%
	Project costs	-43%
	Mid-life replacement	-64%
	Decommissioning	-66%
	Development	2%
	Misc costs	0%
	Subtotal	-8%
Post-construction	Opex	0%
	Insurance	0%
	Risk	0%
	Commissioning	0%
	Remediation	0%
	Subtotal	0%
	Total	-4%

*Our pre-construction assessment is set out in this document. Our post-construction assessment will take place in 2018/19 and will include the final opex assessment and final capex adjustment.

**The reduction here is a result of differences in exchange rate assumptions.

¹⁵ We note that the methodology for calculating IDC will not change following this decision. Any change to overall IDC will be driven by the timing of expenditure during construction.

¹⁶ BPI undertook a cost assessment report for the NRAs that informed the April 2014 consultation position. This position was updated in summer 2014 to reflect the additional information available.

3.13. Overall, our proposed efficient costs for Nemo at this stage, taking into account all costs (those assessed and not assessed at this stage) results in a total project cost of €1,238m.¹⁷ This is 4 per cent lower than Nemo's estimate. This total cost has been used to generate the cap and floor levels for this decision.

3.14. Following our April 2014 consultation, we do not intend to change our assessment that Voltage-Sourced Converter (VSC) technology is the efficient choice for Nemo. The analysis undertaken by BPI as set out in this document therefore assumes VSC technology as the efficient technology choice.

HVDC contract

3.15. The procurement process for the major capital components for Nemo is still ongoing. We have undertaken a broad assessment of the Nemo developers' approach to procurement and find that the process and outturn contract value appear reasonable. Based on the commercial pressures on Nemo through procurement, we expect the contract costs to be efficient. We find that the current expected costs are within our benchmark range expected for this type of project.

3.16. As part of the final capex adjustment exercise post-construction (expected in 2018/19), we will look at the final contract costs following completion of the tender exercise. Subject to satisfaction that the final stages of the process (ie between now and the contract award)¹⁸ have been run competitively, and subject to the final contract costs not being significantly different to current expectations, we intend to use the final pre-construction agreed contract price as the efficient project costs for Nemo. This means that we will not re-assess the contract unless costs are significantly different.

Project (management) costs

3.17. BPI's analysis suggested that Nemo's project cost estimates were high with little justification in some areas. BPI undertook a bottom-up assessment of reasonable costs for this type of project. We have also compared recent projects and public studies to arrive at our own view for project management costs. This is 43 per cent lower than the Nemo estimate.

Mid-life replacement

3.18. Nemo requested funding for replacements during the regulatory regime for control and protection, and auxiliary power systems. BPI disagreed that the assets, being constructed to a 40-year lifetime specification, will need replacing at the mid-

¹⁷ This is £1,049m using the exchange rate of 1.18.

¹⁸ As part of our post-construction assessment, we will ask Nemo to submit information on the outcome of the tender process. This should include information, as directed by Ofgem, on the process taken and the outturn value of the contract.

operational period (ie around 16 years as proposed by Nemo). BPI agrees, however, that the IT systems are likely to need replacing, and has made an allowance for this. Overall, this is a 64 per cent reduction from the Nemo estimate.

Decommissioning

3.19. Nemo requested a decommissioning allowance for the onshore converters and the subsea cables at the end of the asset life. BPI has recommended an efficient allowance for decommissioning of the onshore works (including the HVDC converter stations). BPI suggested that removing the subsea cable making up 66 per cent of Nemo's proposed decommissioning costs, may have more severe environmental impacts than leaving the cable on the sea-bed. This is aligned with existing legislation which states that the competent authorities at the time of decommissioning will decide if the assets should be removed in full. As the current legislation is not definitive that the removal of the subsea cable at the end of the asset life will be the right course of action, we therefore only allow the onshore costs at this stage.

3.20. To reflect this uncertainty in future legislation, we will treat decommissioning costs as non-controllable in the regime (further detail is set out in paragraph 4.14). As such, the assessment undertaken here is final unless there is a change to legislation that requires a different approach at the time of decommissioning. Should future legislation require the subsea cable to be removed at the end of the asset life, we will assess the efficient costs of this action (subject to a cost submission and justification from Nemo) and provide an allowance to Nemo.

Other costs

3.21. The Miscellaneous cost category includes trading system costs, land purchase costs and miscellaneous costs. This total allowance requested by Nemo as part of our latest assessment is significantly less than previous Nemo estimates as costs that were treated as miscellaneous have now been allocated to actual cost items. BPI's assessment confirms that the costs proposed and assumptions made by Nemo here are appropriate based on the latest information. No reductions have been made.

3.22. For development costs, Nemo provided a detailed breakdown of the costs incurred through development. This information is additional to that available at the time of the previous assessment by BPI. This information provides further detail on incurred spend and represents a significant reduction compared to the previous assessment. We find these costs well justified and no reductions have been made.

Opex

3.23. For opex, we have used the indicative estimates provided by the Nemo developers. We will conduct a full efficiency assessment of opex as part of the final opex assessment. We use Nemo's estimates as purely indicative for the purposes of

this decision. Following our assessment, the final allowance for opex may be different to that included in the cap and floor calculation in this document.

3.24. We recognise that these opex estimates in particular are significantly higher than those presented in our April 2014 cost assessment consultation – we note that this does not imply acceptance of this higher level. As the project moves closer to operation, we expect that a much greater level of detail will be made available to Ofgem, including full justification and benchmarking with comparable projects. This will inform our full opex assessment post-construction.

Risk and insurance

3.25. At this stage of the cost assessment process, we have not undertaken a full assessment of project risk or insurance costs. For interconnectors under the cap and floor regime, there is not the same link between expenditure and revenue as there is for other regulated transmission assets. Revenue is determined by the market valuation of capacity therefore the developer returns are maximised by minimising costs. Our analysis undertaken as part of our Impact Assessment suggests that Nemo's revenue will be above the floor during operation.

3.26. We consider that there are appropriate incentives on the developers to mitigate risks that arise during construction. We consider it appropriate to look at risks post-construction to remove uncertainty developers are facing at this stage. We will only adjust the allowed costs where the developers have acted efficiently, taken reasonable mitigation actions and could not have reasonably foreseen the event (or if the risk is already included within the main contract).

3.27. We will therefore conduct a full assessment of the insurance costs and allocation of project risk as part of the final capex adjustment. At that stage we expect to have sufficient information to assess the cost impacts of any events that occur during construction. We will also require full information on the allocation of risk between Nemo and its contractors and expect this to be set out in the agreed HVDC contract. For insurance costs, due to the uncertainties in the insurance market and prices for this type of project, we consider it appropriate to base our assessment on actual costs rather than uncertain estimates.

3.28. For the purposes of this decision, we have used the project developers' expected risk and insurance allowances to calculate the cap and floor levels. We note that these values are indicative only at this stage and have not been assessed. Following our assessment, the final allowances for risk and insurance may be different to those included in the cap and floor calculation in this document.

Commissioning power

3.29. Nemo has requested an allowance for commissioning power, estimated based on the costs of the power required to test (for commissioning) the HVDC cable and converter stations. Our view is that this power would be purchased from one

market, and sold into the other. This would expose Nemo only to the price differential, rather than total cost. Whilst there is a risk of non-delivery of power during testing, Nemo have not fully acknowledged, or been able to estimate the net impact from, selling power back to the markets.

3.30. We expect the final HVDC contract to provide further clarity on the commissioning costs that are not included in the contract scope. Given this, and the uncertainties that make this cost area hard to assess at this stage, we will assess this cost in full as part of the final capex adjustment. Whilst the commissioning costs won't be incurred until construction is complete, at the time of the 95 per cent capex adjustment assessment stage we expect the developers to have sufficient information to allow us to make our assessment.

3.31. For the purposes of this decision, we have used the project developers' expected commissioning costs to calculate the cap and floor levels. We note that this value is indicative only at this stage. Following our assessment, the final allowance for commissioning may be different to that included in the cap and floor calculation in this document.

Remediation costs


3.32. Remediation costs did not form part of our previous cost assessment. Nemo have indicated that some remediation work may be required at the converter sites at Richborough and Zeebrugge. Nemo have provided an estimate of these costs. We will assess the cost of remediation as part of the final capex adjustment. At that stage we will know the full scope of the HVDC contract, including the remediation works included, and will be able to undertake a full assessment of the costs Nemo face.

3.33. For the purposes of this decision, we have used the project developers' expected remediation costs to calculate the cap and floor levels. We note that this value is indicative only at this stage and has not been assessed. Following our assessment, the final allowance for remediation may be different to that included in the cap and floor calculation in this document.

Regime financial parameters

3.34. The following chapter sets out the final decision on the policy design of the cap and floor regime for Nemo. This includes a number of financial parameters that are used to calculate the cap and floor levels. As part of this decision we are deciding on a number of these parameters for Nemo, including aspects of IDC and project returns.

3.35. For the calculation of the real cap and floor levels, the only parameters that we will leave open at this stage are the cost of debt indices and related inflation figures used at the floor and as part of the IDC calculation. Here we will use the relevant value from the iBoxx index (as explained in the next chapter) for the date of



Decision on the cap and floor regime for the GB-Belgium interconnector project Nemo

the final investment decision (financial close).¹⁹ This will ensure that the cost of debt used in the financial model reflects the actual market costs observed at the time debt is raised. We set out in paragraph 4.24 and Appendix 1 that the tax rate applied at the cap and floor will also be updated at financial close – this is to incorporate a blended UK and Belgian rate.

3.36. The project developers should inform the NRAs when they intend to reach final investment decision (financial close).

¹⁹ As set out in chapter 5, we will use a 20-day average of the iBoxx A and BBB indices of non-financial corporate debt with ten or more years to maturity.

4. Regime design: final detailed positions

Chapter summary: We provide a detailed explanation of the Nemo regime design. This is split into 3 sections – cost-related design parameters, revenue-related design parameters and incentives.

4.1. This chapter provides further detail on the regime design for Nemo. Appendix 2 provides background to our decision, the position set out in our March 2013 consultation and a summary of consultation responses. Unless otherwise stated, we have maintained our position and rationale as set out in the March 2013 consultation. We have explained areas where our position has changed.

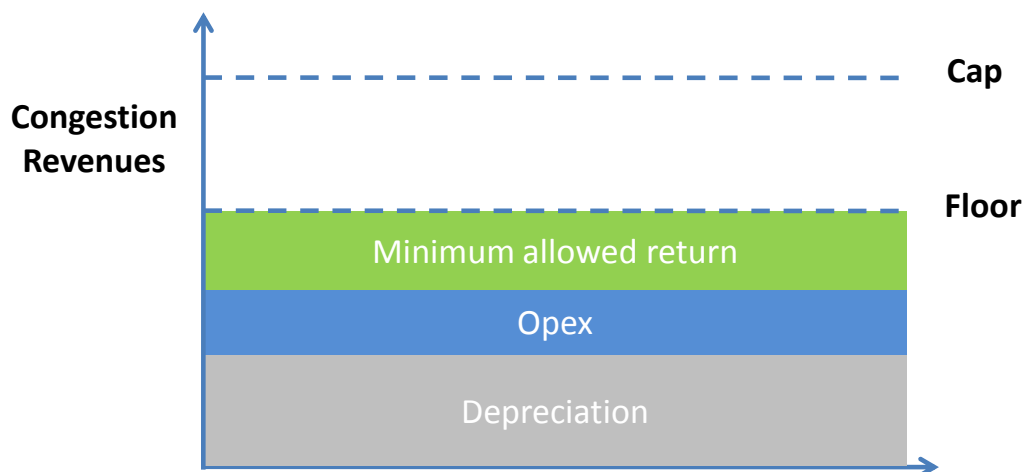
Cost-related design parameters

4.2. In March 2013 we proposed to set the cap and floor levels based on costs using a RAV-based model. We will follow this approach for the regime for Nemo. The cap and floor levels will be built up based on the following inputs, which are also explained in Figure 4.1:

- Depreciation of the capital, to allow return of capital invested
- Financing costs, to allow a return on capital invested
- Operating expenditure.

4.3. In practice, this will be an annuitised RAV model building up allowances in a similar way to a conventional RAV approach. We consider cost components added to this as 'RAV additions'. The RAV in the cap and floor regime is however annuitised to generate the cap and floor levels which are constant in real terms.

Figure 4.1: High-level components of the cap and floor



4.4. The following areas are covered in this section:

- Components of the cap and floor (RAV additions)
- Interest during construction (IDC)
- Operating expenditure (opex) and market-related costs
- Taxation
- Transaction costs.

Components of the cap and floor

4.5. The cap and floor regime is designed on a RAV-based model. Alongside capex, the following variables will also be incorporated in the RAV and will generate depreciation and return allowances during the operational period:

- Replacement capex
- Development costs
- Spares
- Modelled IDC
- Transaction costs.

4.6. In the March 2013 consultation, we did not make it explicit that development costs and spares were included. These costs will be incorporated into the RAV in the same way as capex. The NRAs must be satisfied that spares have not been counted twice in the opex allowance and that unused spares are taken off the decommissioning cost at the end of the project. This is dealt with through the cost assessment.

4.7. Table 4.2 below shows the items added to the RAV, indicating whether they will be added to the RAV during the pre-operational (construction) period or during the operational period. During the pre-operational period, there is no potential to receive income through the regime, so any IDC generated pre-operation is capitalised. It is only once operation starts that this can be recovered through depreciation and return.

Table 4.2: Additions to the RAV used in the annuity calculation

Pre-operational RAV addition	Operational RAV addition
Capex	Transaction costs (in first year of operations)
Development costs	Replacement capex
Spares	
IDC	

4.8. RAV additions will be modelled on an annual basis. In this chapter, we explain the calculation of the cap and floor levels. The regime will be based on a reporting year starting on the day on which commercial operation starts. This may result in the

years of the regime being based on periods that do not align with financial years, calendar years or even start on the first day of a month. Cost reporting and assessment will be performed in such a way that they can be adjusted to reflect changes in the date on which the regime years start. The reporting requirements and calculation of revenue against the cap and floor levels during the regime will be aligned with wider charging and reporting requirements in the interconnector licence.

4.9. The RAV is modelled in a way that will ensure that there is no terminal value for the asset at the end of the operational period. Including a depreciation term therefore allows for the return of capital invested both at the floor and at the cap. Pre-annuitisation, depreciation during the operational period will be modelled on a straight-line basis over the remaining life of the project such that all additions are fully recovered in real terms by the end of the project life.²⁰

Interest during construction

4.10. IDC is used to account for the delay between when costs are incurred in the construction phase and when the developer is remunerated for these (ie the commercial operation of the link). Following consultation on IDC at the end of 2013²¹, our view remains that there is a cost of financing the construction of the interconnection which is not taken into account in the capex review.

4.11. We will treat IDC as a cost incurred in the construction process. This cost will be reflected in the cap and floor, modelled annually (in line with the treatment of other components of the cap and floor levels).

4.12. The pre-operational RAV, which is the base on which IDC is earned, will be calculated using the approved RAV additions following the capex review. This will be re-assessed following the final capex adjustments. It is a function of the level of pre-operational expenditure and of timing, with compounding of IDC for expenditure occurring in earlier years. To ensure that there are no incentives to delay expenditure and that IDC does not reflect delays within the control of the developer, the final capex adjustment will consider the timing of expenditure, not just its level.

²⁰ A modification to the way in which the return calculation will be made means that the cap and floor levels are insensitive to the exact depreciation profile chosen. This feature occurs because the rate of return used to calculate returns at the cap (floor) and the discount rate used to calculate the annuity at the cap (floor) are now aligned, and the return calculation is now on a NPV-neutral basis as in RIIO models. These allow the timing of depreciation to be NPV-neutral (when assessed using the respective cap or floor rate of return as the discount rate) regardless of when they occur. Therefore the depreciation profile has no impact on the cap and floor levels.

²¹ Our consultation on IDC for Nemo can be found on our website here: [Offshore electricity transmission and interconnector policy: minded-to position on interest during construction \(IDC\)](#)

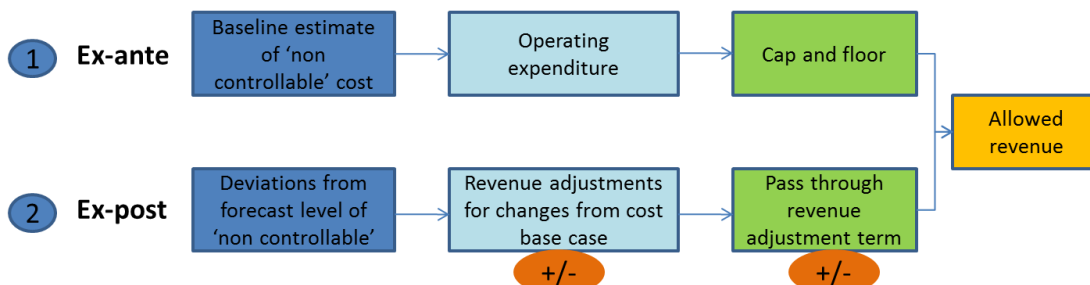
Operating expenditure and market-related costs

4.13. We will assess three distinct categories of risk-sharing for operating expenditure:

- Non-controllable costs will be subject to a full pass-through. This means that these costs will form part of the cap and floor but the developers will not be exposed to deviations in these costs. They will be passed on to network users directly through network charges.
- Market-related costs will be subject to a partial pass-through. These will not be included in the cap and floor levels and will be taken off total revenue before assessing against the cap and floor.
- Other opex (such as the general operating costs of running the interconnector) will be subject to an ex-ante cost assessment – these costs will feed directly into the cap and floor.

4.14. The baseline estimate of **non-controllable costs** will be determined ex-ante and included as operating expenditure in the cap and floor. Our approach to non-controllable costs is based on the 'Allowed Pass-through Items' as defined in the OFTO licence.²² Deviations from the baseline allowance – whether positive or negative and where the reason for justification is recognised in the licence – will be passed through to network users (provided the operator has used all necessary measures to mitigate these). Where pass-through costs are justified, these will be accumulated during the assessment period and recovered at the end of the five-year assessment period. These adjustments will occur regardless of whether revenues are between the cap and floor or not as shown in Figure 4.3 below.

Figure 4.3: Treatment of 'non-controllable' costs in a cap and floor regime



²² The assumptions behind this baseline cost estimate may change due to legislation changes or requirements by the relevant authorities (eg The Crown Estate and the Marine Management Office in GB). In this case, the increase/decrease in the economic and efficient costs is passed through outside the cap and floor, ie it is a non-controllable cost. Otherwise, developers are exposed to the full cost upside/downside. An example of this term in an existing OFTO licence can be found on the Electronic Public Register [here](#).

4.15. The following costs will be included as non-controllable costs:

- Crown Estate Lease costs/fees
- Property rates/taxes
- Licence fees
- Grid costs or network rates
- Costs relating to the Marine and Coastal Act 2009
- Decommissioning costs.²³

4.16. In the event that the 'revenue adjustment for changes from cost base case' term is positive, the developer must show that it has done all it could to limit the increase for each cost item with a positive deviation (outturn > baseline).

4.17. Costs defined as **market-related** will be subject to a partial pass-through. Under this approach, we refer to gross congestion revenue as the actual revenue earned by the project developer before market-related costs are taken into account. Net congestion revenue is the gross congestion revenue minus the market-related costs. It is this net revenue figure that will be assessed against cap and floor levels.

4.18. In practice, this means that developers will be subject to risk from such costs only in the event that revenue is between the cap and floor, and would no longer be subject to risk once revenue falls below the floor or rises above the cap.

4.19. Consider an example, where the floor allowance is £5m per year. If the interconnector earns £10m in revenue and pays £1m in market-related costs, its net revenue is £9m and it is not eligible for any regulated payment. If however, the interconnector earns only £5m in revenue and pays £1m in market-related costs, then its net revenue of £4m would be below the floor. It would therefore be eligible for a floor payment of £1m.

4.20. We will treat firmness as a market-related cost, partially exposing developers to this cost.²⁴ In addition, error accounting cost and trip contract costs will be treated as market-related and deducted from gross congestion revenue.²⁵

²³ Decommissioning costs are those relating to sufficiently removing (or other actions) assets at the end of the operational life in line with current legislation. We note that decommissioning costs should be considered net of any scrap value of the assets.

²⁴ Firmness costs are the costs of compensating parties who have purchased interconnector capacity that cannot be provided.

²⁵ Under current UK electricity trading arrangements, for implicit auctions only, Nemo would act as the Interconnector Error Accountant (IEA) for the link and as such would settle any energy imbalance due to scheduling errors and unplanned outages. The cost of these actions will be treated as non-controllable. Trip contract costs are an example of firmness mitigation costs. This could be in the form of a contract with a third party to deliver/off-take power in the market at either side of the interconnector in situations where the link is down.

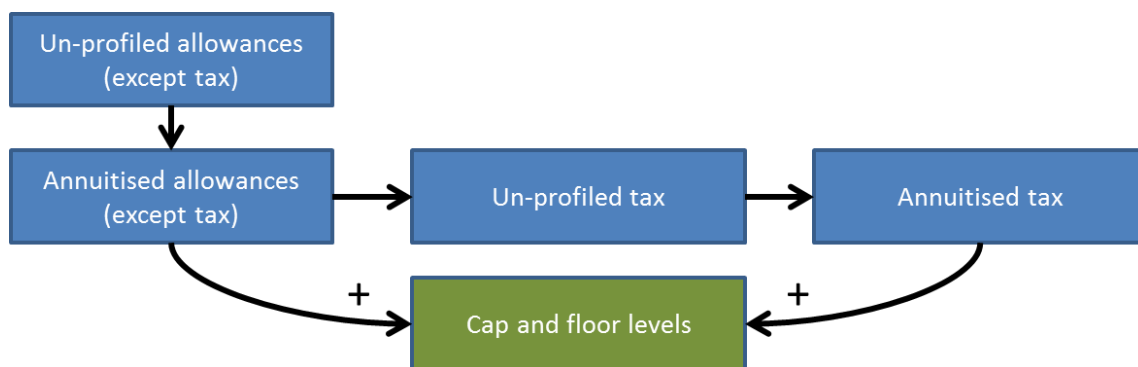
4.21. Opex that is defined as neither non-controllable nor market-related would attract no special treatment. For Nemo, these costs will be finalised 12 months before the start of operation. Once the opex forecasts are finalised, deviations from the forecast level (positive or negative) are at the developer's risk. However, we will include the option to review opex after ten years as a limited reopener.

Taxation

4.22. We will treat Nemo as a standalone entity for the calculation of tax at the cap and floor. We will calculate tax at both the cap and at the floor in the same way, as if they were calculated for two separate entities.

4.23. An un-profiled tax allowance will be calculated based on annuitised revenues excluding tax. This un-profiled allowance will then be annuitised itself to give the cap and floor levels indexed and applied in practice.²⁶ This process is illustrated in Figure 4.4.

Figure 4.4: Tax and annuitisation



4.24. The way we will calculate tax at financial close is 50 per cent weighting on UK and 50 per cent weighting on Belgian tax regime. All tax parameters and allocation of costs to tax treatments will be set at financial close (at the same time the cost of debt index is updated) based on changes announced in HM Treasury Budget Statements that have not yet passed into law. Once set, the values will remain fixed for the remainder of the regime.

4.25. We note that for the purposes of this decision, we have calculated the tax allowance for the cap and floor 100 per cent weighted on the UK tax regime. This is

²⁶ We do not, for example, feed the annuitised tax allowance back into a further tax calculation. We consider a single iteration of this process to be consistent with the simple approach adopted for this regime.

a simplifying assumption for this publication and will be updated ahead of financial close with the appropriate blended rate for GB and Belgium.²⁷

4.26. Further detail on our decision relating to tax treatment is in Appendix 1. This includes discussion of capital allowances, tax allowance calculations and tax treatment of costs.

Transaction costs

4.27. We will provide an allowance for debt and equity transaction costs. We will add the transaction cost allowance during the first year of the operational period, rather than adding it to its opening value in order to ensure it is fully compensated through depreciation and return.

4.28. We will provide an allowance of 2.5 per cent on notional gearing (ie proportion of debt used to finance the project) for debt transaction costs and 5 per cent on notional equity (ie proportion of equity used to finance the project). Here we assume 50 per cent notional gearing during operation with the gearing assumption from the IDC calculation used during construction. Further detail on our approach to transaction costs is in Appendix 1.

Revenue-related design decisions

4.29. Revenue-related design features are those that determine how the costs are translated into the cap and floor levels and how deviations from those levels are treated. The revenue-related design features addressed in this section are:

- Assessed revenue
- Profile of the cap and floor
- Indexation
- Assessment periods
- Within-period adjustments
- Recovery of adjustments.

Assessed revenue

4.30. We will assess interconnector revenue to determine whether the cap and floor have been breached.²⁸ Additional revenue streams, earned by Nemo during the

²⁷ The reason for this is that the Belgian authorities are currently undertaking a piece of work to calculate the appropriate equivalent tax rate in Belgium. We expect this to be completed by the time the developers take their investment decision. It will then be incorporated into the financial model.

²⁸ Revenues will be assessed in real GBP terms. Reporting, calculation and further details of the real GBP revenues will be set in the interconnector licence.

regime length, will also be included in the revenue that is assessed against the cap and floor. For example, these could include, but are not limited to:

- Revenue earned under the Electricity Market Reform capacity market in GB
- Revenue earned through the provision of ancillary services.²⁹

4.31. The former reflects the possibility that, as well as earning congestion revenue as a direct result of the price differential between markets, in the future interconnector owners may be compensated for making capacity available (regardless of whether it is used). This is a valid source of revenue for compensating interconnector investment, and should be considered alongside congestion revenue.

4.32. Similarly, an interconnector developer might be able to provide ancillary services to TSOs. In particular, a key advantage of the VSC technology is the ability to provide voltage support, black start and balancing possibilities. Revenue generated from such services will also be treated in the same way as congestion revenue for the purposes of the cap and floor assessment.

Profile of the cap and floor

4.33. The cap and floor will be flat in real terms at the time of awarding and will be based on an annuity. Since March 2013 we have updated our view on the rates used to calculate the annuities and on the price base of the revenues.

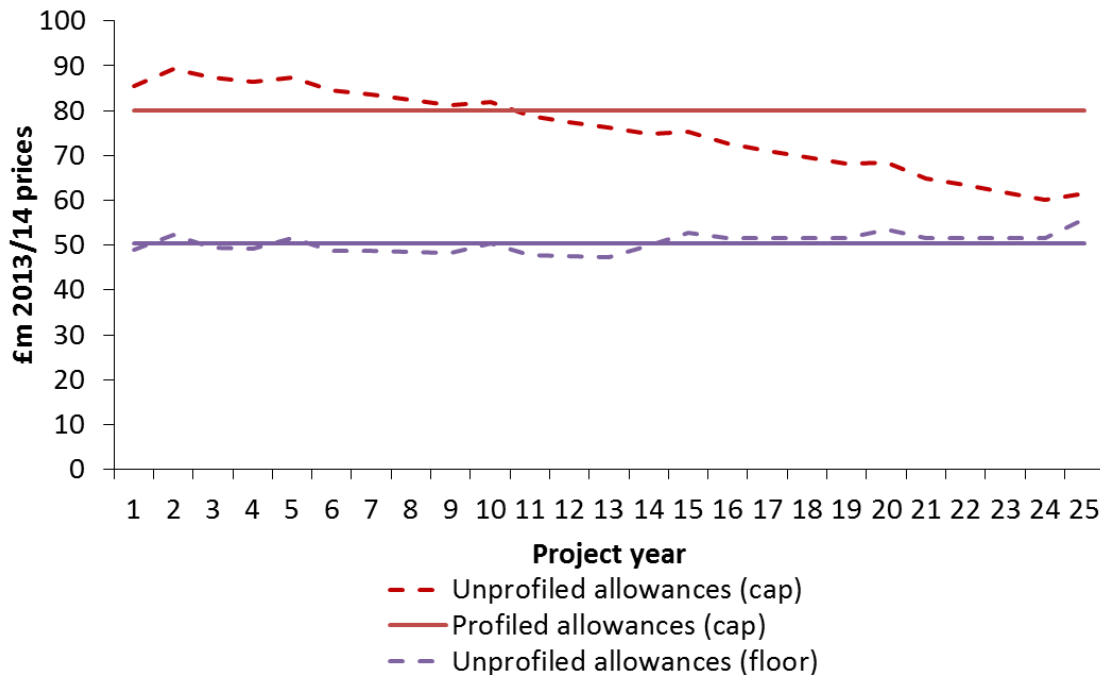
4.34. We seek to maintain market incentives within the regulatory framework. The flat profile that will be adopted represents a neutral position for forecast revenues. We consider that this is appropriate given that congestion revenues are variable from year to year and unpredictable.

4.35. The constant profile will be achieved by calculating separate annuities at the cap and at the floor. This will be based on the net present value of un-profiled allowances common to each approach (eg RAV depreciation and opex) but also returns and tax, which will differ at the cap and the floor. Further information on the annuitisation of the tax allowance is provided above and in Appendix 1.

4.36. The cap and floor annuities will be evaluated respectively using the cap return and the floor return. This ensures consistency between the rate of return provided on the RAV and the calculation of the annuity. Figure 4.5 below presents the impact of profiling on allowances based on the current assessment of costs set out in this document.

²⁹ This could include services to support system operation such as frequency control, black start capability, or balancing services.

Figure 4.5: Profiling impact on cap and floor levels



4.37. Given the international nature of the interconnection project, the regime will protect the real value of cap and floor for the GBP and EUR shares of the cap and floor.

Indexation

4.38. The cap and floor levels will be set in real GBP. The cap and floor levels will be 50 per cent indexed to UK inflation and 50 per cent indexed to Belgian inflation, adjusted for exchange rate movements. To implement this, the cap and floor annuities expressed in real GBP 2013/14 prices will be multiplied by an index factor to express them in nominal prices for each year.

Assessment periods

4.39. The cap and floor assessment period for Nemo will be every five years. In the year following each five-year assessment period, the present value of realised congestion revenues during the assessment period will be assessed and compared to the present value of the cap and floor. These present value calculations will be performed using the operational discount rate, defined as the mid-point between the cap return and the floor return.

4.40. The present value of any within-period adjustments allowed during the assessment period (as discussed below) will also be assessed using the operational

discount rate. This value will be netted-off from any present value excess above the cap or shortfall below the floor.³⁰

4.41. Any floor payment will be subject to achieving a minimum level of availability – ie the link must be operational for a minimum amount of time in each year. In the case that Nemo is not eligible for the floor, revenues below the floor in that year cannot be used to justify the need for a within-period or end-of-period floor adjustment. But if Nemo receives revenues above the floor in that year, the excess above the floor will be used in the normal way to assess within-period and end-of-period floor adjustments. This ensures that Nemo does not have an incentive to reduce availability to increase the likelihood of floor payments in the rest of the period.

Within-period adjustments

4.42. We will allow Nemo to apply for adjustments within each five-year assessment period. This option will only be available in circumstances where Nemo's revenues are below the floor or above the cap and can demonstrate to the NRAs that an adjustment is required.

4.43. There are two principal reasons for allowing within-period adjustments:

- (i) Financeability
- (ii) Pre-emption of potentially large end-of-period adjustments.

4.44. The financeability motivation primarily applies at the floor and is rooted in the aim to provide a regime that is finance solution-invariant – ie does not preclude or promote a certain financing structure. The NPV-neutral approach should make a developer indifferent to the timing of revenue adjustments. We are aware that some non-recourse financing structures are vulnerable to financeability problems when there are delays between shortfalls in revenue and the corresponding adjustment.

4.45. Pre-empting large end-of-period adjustments can be helpful both from the perspective of volatility for developer/network operator, and for avoiding the need to adjust cash payments to maintain NPV neutrality. The regime will be less distortionary if transfer volatility is minimised. This applies equally to adjustments above the cap as below the floor. We have therefore decided to accommodate early repayment above the cap as well.

4.46. Any request by Nemo for such an adjustment will be subject to joint approval by the NRAs and an NPV-neutral claw-back at the end of the period.³¹ If Nemo

³⁰ This will preserve the NPV value of the five-year cap and floor levels and avoid double compensation in situations where a within-period adjustment has been granted but revenue for the whole assessment period remain within the cap and floor.

³¹ The NPV neutral claw-back will use the operational discount rate.

receives a within-period floor adjustment, it would need to pay it back in full, adjusted for the time value of money if their five-year revenues, excluding adjustments, were within the cap and floor. This will encourage Nemo to only use these adjustments when they are needed.

4.47. The maximum size of cap and floor adjustments available to Nemo will be based on the cumulative assessment of revenues (net of previous within-period adjustments) against the cap and floor. Nemo will be able to apply for a within-period adjustment up to 100 per cent of the NPV cumulative shortfall below the floor (or equally pay back excess above the cap) in each year until the end of each period when the full end-of-period adjustment is undertaken.

4.48. Assessing the within-period adjustments will be subject to the same availability conditions and incentives as applied to the end-of-period adjustments.

Recovery of adjustments

4.49. Adjustments and payments under the cap and floor regime will be split 50/50 between Belgium and GB based on prevailing exchange rates.

4.50. All adjustments³² will be made at the earliest possible opportunity following the verification and joint NRAs approval of values provided by Nemo. Given the time needed to verify and process values provided by the developer, we recognise that it may not be possible for these to feed into the subsequent charging year for the NETSO and may be delayed. The default lead time between the end of a period or year, and any adjustments arising from it will be two full calendar years.³³

4.51. This approach allows the timing of the cap and floor regime to fit with the arrangements for recovering adjustments from or paying them to consumers through the NETSOs. This should reduce the cost of capital, and hence the floor that consumers are underwriting. The approach is consistent with onshore and offshore transmission regimes across Europe.

4.52. Nemo will perform an annual calculation of its performance against the annual cap and floor levels in order to determine whether any amount would be payable to or receivable from the TSOs. These annual calculations will be reviewed, aggregated and reconciled in total at the end of each five year period in order to determine the amount to be settled with the relevant TSOs. These amounts will be settled between

³² Within-period adjustments, end-of-period adjustments, income adjusting events and adjustments for pass-through costs.

³³ The present value of 'recoverable' adjustments, calculated under the assumption of a two year lag, will be preserved in real GBP terms by neutralising any difference (including differences less than a full calendar year) from the two year delay using the operational discount rate.

Nemo and the relevant TSO(s) after each five year period in accordance with the settlement process that will be set out in the licence.

4.53. Half of the value of each allowed adjustment will be recovered through the GB TSO and half through the Belgian TSO. We recognise that time lags may differ between Belgium and GB or may need to adapt to different charging methodologies over the life of the project. The value of any adjustment for each country will be adjusted for the timing differences accordingly.

Income adjusting events

4.54. We will include an income adjusting event term in the cap and floor regime. Our only change to the March 2013 proposals is to clarify that we will not include tax changes as an income adjusting event.

4.55. The criteria for identifying the income adjusting event will be based on the GB offshore transmission licence which is set out below (we note however that interconnectors are not signatories to the STC).

It must be:

- (i) an event of circumstance constituting force majeure under the System Operator – Transmission Owner Code (STC); or*
- (ii) an event or circumstance resulting from an amendment to the STC not allowed for when allowed transmission owner revenues of the licensee were determined for the relevant year t ; or*
- (iii) an event or circumstance other than listed above which, in the opinion of the NRAs is an income adjusting event and is approved by them.³⁴*

4.56. As there is a high regulatory burden associated with investigating income adjusting events, the threshold for the cost associated with the claim is set at 5 per cent of the annual floor in real terms.

4.57. Just as with non-controllable costs, only the economic and efficient spend will be passed through, which may be less than the increase sought by the developer. The NRAs think that the likelihood of an income adjusting event is rare and do not expect any to occur within the duration of the cap and floor regime.

³⁴ This is taken from the OFTO licence, Amended Standard Condition E12-J3: Restriction of Transmission Revenue: Allowed Pass-through Items Formula for the Income Adjusting Event Revenue Adjustment. An example of this can be found on the Electronic Public Register: <https://epr.ofgem.gov.uk/Document>

Treatment of financial assistance and refinancing gains

4.58. We propose to net-off any grants Nemo receives from the RAV. It would not be right for consumers to underwrite floor revenues on a proportion of the RAV that had already been financed in full at no cost to Nemo. Nemo must inform the NRAs if any grants area received.

4.59. We also propose to allow Nemo to retain the gains/losses of refinancing. The intention in developing the cap and floor regime has always been to remain as neutral as possible to the developer's choice of financing structure. Nemo will remain exposed to risk throughout the interconnector operational life. Any refinancing – for example, to introduce a greater amount of debt into the project – would carry risks for investors. We think that it is appropriate to allow Nemo to decide how best to manage those risks.³⁵

Incentives

Availability incentive

4.60. At the cap we will implement a symmetric financial incentive. Each year, actual availability will be compared to the target level. Availability above the target will result in a one-for-one percentage increase in the level of revenue at the cap. Availability below the target will result in a one-for-one decrease in the level of revenue at the cap. The maximum upside and downside (increase in revenue or decrease in revenue) as a result of the availability incentive will be limited to 2 per cent.

4.61. We consulted in 2013 on a target availability range for Nemo from 97.1 per cent to 97.8 per cent, incorporating targets for Scheduled Energy Unavailability (SEU) and Forced Energy Unavailability (FEU).³⁶

4.62. We acknowledge that the SEU target figure was based on HVDC converters and that there are other components to consider, which together make up the converter stations. So we propose to set the SEU figure at 1.0 per cent (up from 0.55 per cent). Combined with the FEU target of 1.95 per cent this gives a target availability figure for Nemo of 97 per cent.

4.63. In addition to the availability incentive at the cap, the floor will depend on a minimum level of link availability. In each individual year, the right to receive

³⁵ This presents a contrast to the situation for offshore transmission licensees. Under the offshore regime, gains from refinancing are shared between investors and consumers. However, there is a difference between the two regimes. Offshore projects can be refinanced after the vast majority of the project risk has been resolved. Since there is no equivalent reduction in risk for an interconnector developer, we consider our approach appropriate.

³⁶ This range is based on the results set out in section 9.3 and 10.2 of SKM's report.

payments from consumers at the floor will be conditional on achieving a minimum of 80 per cent reported availability, assessed on the same basis as for the availability incentive at the cap. If availability falls below this level, Nemo may retain its right to payments at the floor in that year if it provides a written statement to the NRAs explaining what it did to make the interconnector available to minimise the effect and duration of unavailability.³⁷ This will then be subject to a decision by the NRAs. This process will be set out in Nemo's licence.

4.64. We will assess availability annually to ensure that Nemo has incentives to maintain availability throughout each year of the assessment period.

³⁷ In the case that the developer is not eligible for the floor, revenues below the floor in that year cannot be used to justify the need for a within-period or end-of-period floor adjustment. However, should they receive revenues above the floor in that year, the excess above the floor will be used in the normal manner for the assessment of within-period and end-of-period floor adjustments. This ensures that the developer does not have an incentive to reduce availability in order to increase the likelihood of floor payments in the rest of the period.

5. Approach to returns

Chapter summary: A return on capital is calculated at both the cap and floor. The way we have set these returns is outlined in this chapter.

5.1. In this chapter we translate the regime design above into the relevant return parameters for Nemo. For the return for Nemo we have:

- Based the cap and floor returns on separate benchmarks, rather than attempting to work from a single central figure
- Adopted a mechanistic approach in order to keep the regime simple
- Adopted an approach that acknowledges that the interconnector will make investments and be exposed to risk in two jurisdictions
- Set the majority of parameters as part of this decision.³⁸

5.2. This section shows how we will set the benchmark rate of return for: the floor, the cap, and the discount rates to be used to re-profile revenues and payments.

Floor benchmark

5.3. We will apply the cost of debt benchmark to 100 per cent of the RAV. This has two main implications. First, this can accommodate a range of financing structures. Second, equity investors may also be able to earn a (small) positive return even at the floor. The floor provides for a guaranteed level of revenue, subject to meeting acceptable availability levels. In our view the scale of this return results in appropriate incentives for development. Further, this approach leaves investors (and in particular equity investors) exposed to the following risks:

- If availability falls below the required threshold for a given year (and this is not due to factors outside the developer's control), then the developer will not be eligible for that year's floor (as set out under the minimum availability threshold explained earlier).
- If outturn costs (including opex, capex or financing costs) are different from forecasts and within the developer's control, then this will directly change (reduce or increase) the returns available to equity investors.
- If the interconnector developer's actual financial structure or timing of annual revenues differs from the notional calculations at the cap and floor, then its actual tax obligations could be different from those modelled.

³⁸ We will set a limited number of parameters at financial close.

5.4. The right floor level is one that allows for financing of interconnector projects while also providing the right incentives during operation and allowing market incentives for interconnection. We consider that the proposed approach achieves these aims.

5.5. We have now confirmed the within-period adjustment mechanism (as described in the section on revenue-related design decisions). The interconnector developer is eligible for payments up to and including the level of the floor for each year within an assessment period. This provides some certainty, and should allow an efficient developer to raise debt at a lower cost than if within-period adjustments were not available. We have decided to use the average of an A and BBB cost of debt index to determine the cost of debt to be used at the floor.

5.6. We propose to align our choice of index with that used to set onshore price control allowances. We will base parameter estimates on the relevant iBoxx index of non-financial debt with ten or more years to maturity. We will calculate a 20-day trailing average. This will give an accurate, up-to-date view of debt costs with some of the day-to-day volatility smoothed out.

5.7. The indices to be used are nominal indices, and will need to be deflated to arrive at a real cost of debt. We have made a small change to our approach to accounting for the rate of inflation for our calculation for Belgium. We indicated in March 2013 that we would use the ECB inflation target of 2 per cent. However, this is an upper bound rather than a central target, and recent experience in Belgium has shown evidence of a lower rate. In consultation with CREG, the forward-looking rate of inflation that we will use is 1.8 per cent. The UK index will be deflated based on daily Bank of England breakeven inflation data.

5.8. For Nemo, the floor will be updated at financial close to reflect current data. Based on data as of October 2014 used for this publication, the floor would provide a real return of 0.93 per cent.

Table 5.1: Details of floor benchmark for Nemo

Aspect	UK	Belgium
Calculation technique	20-day simple trailing average (to be set at financial close)	
Index	GBP Non-Financials of 10+ years to maturity; credit ratings of A/BBB	EUR Non-Financials of 10+ years to maturity; credit ratings of A/BBB
Source	iBoxx	iBoxx
Inflation	10-year breakeven data published by the Bank of England: 2.9% (to be set at financial close) ³⁹	ECB and Belgian proposed rate: 1.8%

Cap benchmark

5.9. For the cap benchmark we will apply a cost of equity to 100 per cent of the RAV and will base our returns benchmark on a CAPM approach, taking a long-term perspective on each parameter. As part of this calculation we have reflected recent developments and analysis of Ofgem’s approach to GB parameters.⁴⁰

5.10. For the cap, we consider that the evidence available is sufficient to set our estimates for the risk-free rate and equity beta parameters. We estimate the long-term real risk-free rate to be 1.6 per cent for the UK and 2.2 per cent for Belgium. We will use a value of 1.25 for the equity beta. For the Nemo decision we will use the GB equity risk premium of 5.2 per cent and the Belgian equity risk premium of 3.5 per cent. The rationale for this is below.

5.11. In the cap calculation, we have firstly updated our approach to reflect the impact of the structural change in RPI. This effect has led to an enduring increase of around 0.4 per cent per annum in the RPI. This introduces a distortion to indices and parameters that rely on or are influenced by RPI. We have sought to correct this distortion.

5.12. Second, we consider the risk-free rate and the total, long-term equity market return are more objectively observable parameters than the equity market premium.⁴¹ As a result, our approach is to define the equity market premium as the residual between the total market return and the risk-free rate, rather than an

³⁹ Individual daily values are used to deflate the nominal cost of debt value, the value presented here is the average of the 20 daily values used.

⁴⁰ These are discussed more fully in our decision letter on Ofgem’s methodology for assessing the equity market return for the purpose of setting RIIO-ED1 price controls. These issues will be subject to further exploration over the long-term. This letter is on our website here: <https://www.ofgem.gov.uk/ofgem-publications/86366/decisiononequitymarketreturnmethodology.pdf>

⁴¹ Total equity market returns can also be considered more stable over time.

independent parameter to be estimated directly. We have sought to ensure the methodology used for the cap and floor regime is consistent with this approach.

5.13. We estimate the risk-free rate and equity risk premium using a long-term estimate drawing on recent regulatory settlements. The resulting UK rate of 1.6 per cent for the risk-free rate is based on recent UK regulatory settlements on the cost of equity, adjusted downward by 0.4 per cent for structural change in RPI. For Belgium, we have used the policy of the Belgian Regulator, CREG: 1.8 per cent.

5.14. Our approach to assessing equity market returns for GB onshore price controls has incorporated a further adjustment to put more weight on current market conditions. This is in light of the recent approach taken by the Competition Commission⁴² in its provisional determination for Northern Ireland Electricity (NIE) published on 12 November 2013. For onshore price controls, where the objective is to determine the cost of equity over an eight-year time horizon, we think it is right to place weight on contemporaneous evidence as well as longer-term trends. For Nemo, our objective is different. We must set a benchmark rate of return for a period that is not projected to start until later this decade and will last for 25 years. In this context, we consider it is more appropriate to focus on long-term evidence.

5.15. We use Drax as a benchmark for setting returns at the cap. It is important that the returns available at the cap match the nature and extent of risks. At the margin, those risks for a developer operating at the cap can be considered similar to those faced by a generator. This also recognises that the floor provides some downside protection for developer revenues. We have previously indicated that we would seek to characterise those risks through applying Drax's asset beta, re-gearred to 50 per cent.

5.16. Given changes in Drax's business mix, and in particular its pursuit of a strategy that increasingly incorporates biomass generation, it is unlikely that we would try to reflect future movements in its asset beta. Such movements are more likely to represent statistical noise or changes in business mix than underlying changes in the risk of generation, which is the benchmark we seek. We have therefore fixed the equity beta we are using for Nemo at 1.25, reflecting the level of Drax's re-levered equity beta over recent years.

⁴²On 1 April 2014, the Competition Commission was abolished and its functions transferred to the Competition and Markets Authority.

Table 5.2: Details of cap benchmark for Nemo

Aspect	UK	Belgium
Calculation technique	CAPM	
Risk-free rate	Long-term real risk-free rate used in recent regulatory settlements adjusted for RPI formula effect: 1.6%	Long-term estimate of the real yield on long-term Belgian OLO (linear bonds) adjusted for inflation of 1.8%: 2.2%
Equity beta	Set at 1.25	
Equity risk premium	5.2%	3.5%

Project discount rates

5.17. There are a number of instances where payments or allowances in the cap and floor regime for Nemo will need to be re-profiled over time. These include:

- Annuitising cap and floor levels to ensure that they are constant in real terms
- Aggregating revenue and the cap and floor levels within each assessment period (in a way that is NPV-neutral) in order to assess revenue against the cap and floor
- Accounting for the delay between when a cap or floor payment is due and when it is paid.

5.18. We annuitised the cap and floor levels using the cap and floor rates of return, respectively. This will align the returns at each level and the discount rate used to calculate the annuity. This will result in a more consistent interpretation of the cap and floor as annuities. Aligning the rates this way will neutralise the choice of depreciation profile of the RAV, so that there is no need to model short-lived asset depreciation profiles and replacement capex.

5.19. For all other aspects of the regime we will discount using the midpoint rate of return to represent the operational cost of capital. We propose to set the midpoint rate of return based on equal weightings of the cost of debt used to set floor returns and the cost of equity used to set the cap.

Methodology for setting IDC

5.20. For Nemo we will use an IDC of 5.76 per cent. This is made up of an IDC cost of debt calculation and separate IDC cost of equity calculations for GB and Belgium. The final IDC will be updated at financial close to reflect changes in the debt index used in the calculation. All other parameters will be fixed as part of this decision as explained below.

5.21. We consulted in October 2013 on the appropriate approach to IDC for Nemo. In our consultation we proposed two uplifts to IDC for Nemo to reflect the specific nature of interconnector investment. Following consultation we continue to consider that Nemo faces a greater degree of asymmetric development and cost assessment risk than comparable infrastructure projects. So we will apply the two uplifts as set out in our IDC consultation. These include uplifts for additional construction risk (0.91 per cent) and for additional project development risk (0.54 per cent). We will review this for future projects. The rationale for such uplifts should weaken over time as the regulatory approach and cost assessment process for interconnector assets becomes clearer. The IDC benchmarks at the cap and floor are below.⁴³

5.22. In line with the calculation of floor returns, the IDC cost of debt will be updated at financial close as shown in Table 5.3. We consider that the evidence available is sufficient to set our estimates for the cost of equity components of IDC as show in Table 5.4. We have also set the IDC notional gearing at 33.41 per cent based on an updated view of the calculations underlying the Grant Thornton Report, and the equity beta at 1.04.⁴⁴ We have taken this decision given the stable nature of these variables, and the additional certainty this provides for the Nemo investors.

5.23. To ensure consistency with other aspects of the Nemo decision, for the IDC calculation we will use the same 1.8 per cent assumption for expected Belgian inflation as we apply for the cap and floor calculations.

Table 5.3: Details of IDC cost of debt

Aspect	UK	Belgium
Calculation technique	20-day simple trailing average	
Index	GBP Non-Financials of 10+ years to maturity; credit ratings of A/BBB	EUR Non-Financials of 10+ years to maturity; credit ratings of A/BBB
Source	iBoxx	iBoxx
Inflation	10-year breakeven data published by the Bank of England: 2.90% (to be set at financial close) ⁴⁵	ECB and Belgian proposed rate: 1.8%
Value	1.25% (real cost of debt to be updated at financial close)	0.61% (real cost of debt to be updated at financial close)

⁴³ To calculate IDC, the two benchmarks are combined using a notional gearing assumption based on the average gearing of companies used in the sample for the beta calculation.

⁴⁴ The Grant Thornton report is on our website here: https://www.ofgem.gov.uk/sites/default/files/docs/2013/10/grant_thornton_review_of_interest_during_construction_stage2.pdf

⁴⁵ Individual daily values are used to deflate the nominal cost of debt values, the value presented here is the average of the 20 daily values used.

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Table 5.4: Details of IDC cost of equity

Aspect	UK	Belgium
Calculation technique	CAPM	
Risk-free rate	0.74% 10-year average of yields on long-term ILGs	1.75% 10-year average of the yield on long-term Belgian OLO (linear bonds) adjusted for inflation of 1.8%
Equity beta	Two-year asset beta of traditional energy companies ⁴⁶ , weighted by market capitalisation. Calculated based on approach advised by Grant Thornton. This gives a value of 1.04 that we have now locked-down.	
Equity risk premium	Fixed at 4.60% based on the latest Belgium value of the arithmetic mean risk premium over bonds from Dimson, Marsh and Staunton (DMS), which is published in the Credit Suisse Global Investment Returns Sourcebook, for the data series starting in 1900.	

⁴⁶ Centrica, SSE, E.ON and RWE.

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Appendix 1 – Detailed information on taxation, transaction costs and indexation

Taxation

1.1. The Nemo cap and floor regime incorporates a tax allowance at the cap and at the floor. The tax allowance calculation at the cap is based on achieving cap returns in every year of the regime. The tax allowance calculation at the floor is based on achieving floor returns in every year of the regime. These represent high and low tax scenarios within the bounds of the cap and floor. We will not attempt to replicate tax based on the developer's realised returns over time.

1.2. For the purposes of this decision, Ofgem has used the UK tax rate only to set the tax allowance at the cap and floor. We note that this is indicative at this stage as the rate is likely to be different for the final setting of the cap and floor following the process set out below.

1.3. A first step will be for each NRA to estimate for each country the effective tax rate if all profits were taxed in that single country and a second step would be to use the simple average of those rates within the model. The UK tax rate will be the expected rate of corporation tax, 20 per cent (as published by MH Revenue and Customs).⁴⁷ The appropriate rate in Belgium will be calculated by CREG. This rate will be communicated to the Nemo developers. The final tax rate (based on both the UK and Belgian rates) will be incorporated into the Nemo financial model at final investment decision (financial close).

1.4. The tax calculation is simple relative to the approach used by Ofgem for the RIIO onshore price controls. We have calculated a single capital allowance pool and assume a single tax treatment for each category of expenditure. We have modelled tax losses and include the tax deductibility of interest. We treat business rates as non-controllable operating costs. Table A3.2 below summarises the tax treatment of costs in the Nemo cap and floor regime.

1.5. The allocations shown in Table A3.2 will be updated at financial close based on any changes in the UK tax legislation or HM Treasury Budget statements made in the intervening period between now and financial close. The corporation tax rate and writing-down allowance rate will be reviewed in the same manner. Once set, the values will remain fixed for the remainder of the project life. There will be no tax trigger mechanism nor will tax be eligible for consideration under the income adjusting events clause of the regime. We would however make an exception to this in the case that there were a tax developed to target high returns on subsea

⁴⁷ The Finance Bill 2013 provided for a reduction of the UK main rate of Corporation Tax to 20 per cent from 1st April 2015.

electricity interconnectors, in which case we would seek to neutralise the impact of the tax.

Table A3.2: Indicative tax treatment of costs⁴⁸

Cost	Long-life pool	Revenue expense	Non-qualifying
Capex	Yes	-	-
Replacement capex	Yes	-	-
Controllable opex	-	Yes	-
Non-controllable opex (baseline)	-	Yes	-
Decommissioning (baseline)	-	-	Yes
Development costs	-	-	Yes
Spares	-	-	Yes
IDC	-	-	Yes
Cap and floor returns	-	-	Yes
Equity transaction costs	-	-	Yes
Debt transaction costs	-	Yes	-

1.6. In order to maintain the flat profile of the cap and floor, the tax allowance (calculated based on annuitised allowances except tax) will itself be annuitised and added to the other allowances.

1.7. The approach outlined above is consistent with the principles of the cap and floor regime, providing a reasonable allowance to the developers to cover their tax liability.

Transaction costs

1.8. Following our March 2013 consultation, we have not changed our position that we will provide an allowance for debt and equity transaction costs. However, we will add the transaction cost allowance during the first year of the operational period, rather than adding it to its opening value in order to ensure it is fully compensated through depreciation and return.⁴⁹

⁴⁸ Only 'baseline' ex ante decommissioning and non-controllable opex allowances feed into the tax allowance. Ex-post differences from these levels do not feed into the tax allowance for the cap and floor.

⁴⁹ In order to ensure full remuneration of a value through the RAV, it should be added during the year, rather than transferred in at the start of a period.

1.9. We will calculate the allowance based on the opening RAV at the start of the operational period.

1.10. The allowance will comprise an element to remunerate the cost of debt. This will be calculated based on a share of the opening RAV value defined as the greater of the notional gearing assumption assumed for the pre-operational period and the notional gearing assumption assumed for the operational period. As proposed in March 2013, an allowance of 2.5 per cent of that notional debt will be provided in the regime. This allowance covers all fees including any swap fees.

1.11. The allowance will also comprise an element to remunerate equity transaction costs. The proportion of equity used for this calculation will be the greater of the notional equity assumed for the pre-operational period and for the operational period.

1.12. The pre-operational notional equity level is the notional equity portion assumed in the calculation of IDC. This means some of the equity issued during the construction phase is either in the form of a short-term shareholder loan from the parent company or redeemed at the start of the operational period.

1.13. Based on the assumptions above, the total amount of debt and equity receiving transaction costs would be greater than the opening RAV value. This is because it is assumed that the pre-operational period will be funded with a greater amount of equity than the operational period. At the start of the operational period, it is assumed that additional debt is raised to achieve the assumed operational gearing level. As proposed in March 2013, an allowance of 5.0 per cent of that notional equity will be provided.

Indexation

1.14. Further detail on the approach to indexation is set out below.

$$\text{Nominal Cap}_t = \text{Real Cap Annuity} \times \text{Index factor}_t$$

$$\text{Nominal Floor}_t = \text{Real Floor Annuity} \times \text{Index factor}_t$$

1.15. The index factor will be the same for the cap and the floor and will be calculated as shown in the following equation.

$$\text{Index factor}_t = 0.5 \times \left(\frac{\text{UK RPI index}_t}{\text{UK RPI index}_{2013/14}} \right) + 0.5 \times \frac{\left(\frac{\text{Belgium CPI index}_t}{\text{Belgium CPI index}_{2013/14}} \right)}{\left(\frac{\text{GBP}_t/\text{EUR}_t}{\text{GBP}_{2013/14}/\text{EUR}_{2013/14}} \right)}$$

1.16. This approach reflects an equal split of costs between Belgium and the UK in real terms from the perspective of consumers in each country. While the actual costs may not be distributed in this manner, it reflects the split of 50:50 obligations on consumers in each country and that adjustments arising from the regime will be split equally between the countries. The approach applied will index the tariffs to fix half of the opening tariff in real GBP terms from the point of view of GB consumers. It will also fix half of the opening tariff in real EUR terms from the point of view of Belgian consumers. This should largely insulate consumers in each country from exchange rate risk.

1.17. One key effect that this adjustment incorporates is the potential for offsetting movements in the exchange rate when inflation rates diverge. Complete offsetting of these effects would occur where the concept of 'relative purchasing power parity' holds, in which case indexation would be equivalent to full UK inflation indexation. The approach would also allow for the case where there are no exchange rate changes over time despite different inflation rates, in which case indexation could be equivalent to an average of the inflation rates in the two countries. Given the long-term nature of the cap and floor, we consider it appropriate to allow for such macroeconomic effects to occur within this regime.

1.18. As discussed in chapter 4, in relation to the indices used to implement this approach, at the outset of the regime we will assume that relative purchasing power parity will hold. This will result in a flat real GBP cap and floor profile. However, if relative purchasing power parity does not hold over time, this will result in changes to the cap and floor expressed in GBP terms and divergence from a strictly flat profile expressed in GBP. Nonetheless, we consider this to be consistent with the decision to have a flat cap and floor profile, as this will help the cap and floor to be flat in real terms from the perspective of both UK and Belgian consumers, not just one country.

Appendix 2 – March 2013 proposals and summary of consultation responses

1.1. This Appendix summarises the policy positions from the March 2013 consultation and the responses to this consultation. These responses have informed our final decision as set out in this document.

1.2. We have also summarised the responses to the October 2013 IDC consultation and the April 2014 Cost Assessment consultation.

Components of the cap and floor

Summary of 2013 consultation proposals

1.3. We proposed to use an ex-post capex assessment for Nemo to determine the opening RAV. All capex will be fully depreciated over the length of the regime. We proposed to set an allowance for replacement capex up front, which would feed into the cap and floor levels. We also proposed that IDC and transaction costs would be added to the RAV.

Summary of responses

1.4. Respondents to the consultation presented their views on the appropriateness of moving to an ex-ante incentive-based treatment of capex for projects following Nemo.

1.5. Among those who responded, all commented on the suitability of moving towards an ex-ante capex incentive for future interconnector projects. Energy companies and interconnector developers noted that as more projects are built using the same technology proposed for Nemo, which has previously not been deployed at this scale, more robust estimates of building an interconnector may be attainable. This may allow a move towards an ex-ante incentive based treatment of capex for future projects.

1.6. One interconnector developer suggested that Ofgem should review the equipment supply and construction contracts at financial close (final investment decision) and carry out an ex-ante capex assessment at this point. They suggested that Ofgem analyses the construction and contract information obtained in the offshore electricity transmission tender process to facilitate benchmarking. They believe this process would reduce regulatory risk for developers at financial close. This view was supported by a TSO, who felt that an ex-ante incentive would provide a stronger incentive on timeliness and efficiency in the construction phase. They also expressed concern with commercially sensitive information around suppliers' costs being shared for the ex-post capex review.

1.7. One energy company warned that generalised capex incentives are not likely to be a simple matter for case by case projects. They suggested that each project should be dealt with individually, given the likely developments in technology.

Approach to Interest during construction

Summary of 2013 consultation proposals

1.8. In March 2013, we proposed to set a return (IDC) that developers will earn on economically and efficiently incurred spend incurred during the construction phase of the project. Based on a qualitative assessment of the relative level of risks faced by developers in constructing transmission assets for interconnection and offshore wind, our initial view was that the required return by an efficient interconnector developer may need to be higher.

1.9. Proposals made on the approach to calculate IDC, including views from the October 2013 IDC consultation, and on the resulting level of the allowance are discussed in chapters 4 and 5.

Summary of responses

1.10. Two interconnector developers supported our proposed approach to setting IDC. One energy company endorsed our proposed methodology and advocated that the methodology ensured a fair and balanced outcome for investors and consumers.

1.11. One interconnector developer felt that the IDC methodology should incorporate an appropriate allowance for development costs within the methodology for calculating IDC to reflect the particular risk associated with development costs.

1.12. One interconnector developer commented that they did not expect a significant difference between the operational cost of capital and cost of financing during construction. This was because under the proposed ex-post capex review all economic and efficient spend was passed through into the opening cap and floor levels.

1.13. Amongst energy companies, respondents held diverging views on the appropriate rate of IDC. One energy company felt that under an ex-post capex review, IDC can be considered as an almost risk-free return and could be equal to the minimum return calculated at the floor. Conversely, another energy company supported CEPA's inclusion of ~20 per cent risk of unrewarded costs (RoUC) term in the IDC calculation due to inefficient or uneconomic capex being disallowed in the offshore transmission regime.

Operating expenditure (opex) and market-related costs

Summary of 2013 consultation proposals

1.14. In March 2013, we proposed to treat operating expenditure differently depending upon how it is categorised. For most opex, we proposed to use a two stage assessment process. In the first phase, NRAs would take a high level view of opex to form part of the provisional cap and floor levels (this would however be non-binding). Subsequently, up to 12 months prior to the scheduled operational date of the link, the NRAs would re-assess opex forecasts submitted by developers and determine an ex-ante opex allowance to be applied for the duration of the regime.

1.15. There were two exceptions to this approach. First, we proposed to treat firmness costs as market related costs. In practice, this means they would be net-off from gross congestion revenues before revenue is assessed against the cap and floor levels. Second, we proposed to pass through non-controllable opex using a revenue adjustment term.

Summary of responses

1.16. Several interconnector developers and energy companies commented that exposure to market related costs incentivises developers to maximise link availability. One energy company remarked that the requirement to provide firm forward products, which may result from the European network codes, should provide a good incentive to maintain link availability as developers have to comply with the network codes. They felt firm products will be more valuable to network users and provide more earnings for interconnector owners.

Taxation

Summary of 2013 consultation proposals

1.17. In March 2013, we proposed that we would set a separate tax allowance at the cap and at the floor to reflect the different levels of taxable profits associated with revenue being at the cap and floor respectively, and to be consistent with the use of vanilla values (such as those used in the GB onshore price control) to set the cap and floor levels.

1.18. In the supporting illustrative model, we indicated that the tax regime applied would be a 50:50 weighting of the UK and Belgian tax regimes.

1.19. No specific responses were made regarding the tax allowance during the consultation process. However, the Nemo developers engaged with Ofgem to provide input regarding its envisaged corporate structure and the resulting tax implications.

Transaction costs

Summary of 2013 consultation proposals

1.20. In March 2013, we proposed to provide an allowance for debt and equity transaction costs expressed as a percentage of the opening RAV. This value would be added to the opening RAV which will then be annuitised to set the cap and floor levels. No comments were received in relation to transaction costs.

Income adjusting events

Summary of 2013 consultation proposals

1.21. In March 2013, we proposed the inclusion of income adjusting events in the regime to reduce the potential large liability for interconnectors for unexpected events. Income adjusting events would cover the change in cost items not included in the revenue adjustment for changes from the cost base case, with a threshold for the cost associated with the claim as 5 per cent of the floor in real terms for the year in which the cost was incurred. Adjustments arising from this term would be made outside the cap and floor in the same manner as the non-controllable costs.

1.22. We did not receive any comments on the proposals to include income adjusting events in the cap and floor regime.

Assessed revenue

Summary of 2013 consultation proposals

1.23. In March 2013, we proposed to assess interconnector congestion revenue. No consultations responses were received in relation to what should be included in assessed revenue.

Profile of the cap and floor

Summary of 2013 consultation proposals

5.24. In March 2013, we proposed that the cap and floor would be 'flat' in real terms and that this would be achieved by setting the levels based on an annuity of the allowances available to the developer. No consultation responses were received regarding the profile of the cap and floor.

Assessment periods

Summary of 2013 consultation proposals

1.24. In March 2013, we proposed that congestion revenue would be assessed against the level of the cap and floor every five years. Cap and floor adjustments in

one period would not affect the allowances for future periods, and outturn revenue earned in one period would not be taken into account in future periods.

Summary of responses

1.25. Respondents were split between those advocating five-year assessments and those favouring annual assessments. Respondents favouring annual assessments were primarily project finance investors. They highlighted that five year periodic assessments may not allow us to meet our objective of the regime being finance solution-invariant. They favoured either annual assessments or periodic assessments with a strong financeability provision to provide the certainty needed to raise debt finance.

Within-period adjustments

Summary of 2013 consultation proposals

1.26. We noted in the March 2013 document that a lack of guaranteed revenue within a five year assessment period meant that developers would have to finance themselves through provision of an equity buffer. We further noted that this could result in a higher cost of capital – which would require consumers to underwrite a higher floor – and might also preclude access to certain sources of finance. As such, we proposed to consider a within-period adjustment if warranted to support financeability.

Summary of responses

1.27. Respondents to the consultation held differing views on the need for a financeability test within-period under five year assessment periods and the trigger for causing the movement of funds if there was such a test.

1.28. As noted above, project finance investors generally favoured either annual assessments or periodic assessments with a strong financeability test provision. Other interconnector developers and TSOs were broadly in favour of five year assessment periods with provision for a financeability test within period. Energy companies that commented on this question advocated five year assessment periods with no within-period financeability test.

1.29. One interconnector developer advocated cumulative annual assessments over a five year period and a strong mechanistic financeability test if five year assessment periods were retained. Several interconnector developers and one TSO highlighted the need for clarity on how the financeability test would be conducted for the investment decision.

1.30. One energy company cautioned that whilst a financeability test may protect against very negative events within period, it could encourage inefficient gearing arrangements which would require higher floor returns to ensure debt covenants are met. They proposed the trigger for the test should be relatively strict. This view was supported by an interconnector developer who advocated that the trigger should be

below the cumulative level of the floor and restricted to conditions that are beyond those which could have been reasonably foreseen by the developer. Another energy company went further and argued that if there is a business case for the interconnector project, a financeability test within period should not be required.

Recovery of adjustments

Summary of 2013 consultation proposals

1.31. In March 2013, we indicated that the recovery of adjustments arising from income adjusting events would be made at the next available opportunity, which in practice could involve a two year time delay from the income adjusting event happening. End-of-period adjustments were modelled to be recovered with a two year delay. We did not receive any responses in this area.

Availability incentive

Summary of 2013 consultation proposals

1.32. In March 2013, we proposed an availability incentive with a symmetric financial incentive linked to the cap, with the aim of addressing potential perverse incentives relating to interconnector availability that may arise at the cap.

1.33. We proposed a one percentage point change in the level of the cap for each percentage point deviation in link availability from the target level, subject to a maximum upside/downside of two percentage points. Target availability will be set based on a model produced by Sinclair Knight Merz (SKM) consultants, which is published alongside our March 2013 document. A supporting report by SKM is also published.⁵⁰

1.34. We also proposed to make the floor payment conditional on availability being at or above a pre-defined minimum threshold, in a manner similar to OFTO licences.

1.35. We proposed that availability would be measured over the five year assessment periods but that availability is to be reported on an annual basis.

Summary of responses

1.36. Respondents agreed with our proposed approach for setting target availability on a mechanistic, project by project basis and the application of the financial incentive at the cap and a minimum availability threshold at the floor. Most respondents agreed that the proposed availability incentive would be effective for incentivising high interconnector availability.

⁵⁰ The report and model are available on our website here:
<https://www.ofgem.gov.uk/publications-and-updates/cap-and-floor-regime-regulated-electricity-interconnector-investment-application-project-nemo>

1.37. Some respondents suggested that other factors may need to be taken into account when setting target availability, in particular external constraints imposed on the link by the system operator.

1.38. Interconnector developers and one TSO provided additional comments on the availability incentive in the following areas:

- Measuring 'actual' availability: One interconnector developer supported a project specific assessment for availability but sought further clarity on the definition of target availability (technical and market availability). They suggested that neither target nor actual availability should include the impact of market-driven or potential external factors beyond the control of the link operator. Another interconnector developer and a TSO supported this view.
- Dataset used to set 'target' availability: One interconnector developer felt that the dataset used in the model should be continuously updated. Another interconnector developer felt that the proposed target for Nemo diverged from observed availability data for existing high voltage direct current (HVDC) interconnectors.

Treatment of financial assistance and refinancing gains

Summary of 2013 consultation proposals

1.39. We proposed to net-off any grants received for the project from the RAV of the project and allow developers to retain the benefits of refinancing. We did not receive any consultation responses in this area.

Floor benchmark

Summary of 2013 consultation proposals

1.40. We proposed to apply a relevant cost of debt benchmark to 100 per cent of the RAV. This cost of debt would be based on a 20-day trailing average of an index of BBB debt with 10+ years' maturity. It would be based on a 50 per cent weighting of a GB cost of debt index and a 50 per cent weighting of a Belgian cost of debt index.

Summary of responses

1.41. One TSO supported our proposal that an efficient developer should be allowed to recover its costs and service its debt obligations (be 'financeable') at the floor. They noted they would have views on minimum equity and/or liquidity and maximum allowable gearing if they were entering into a project with a partner and these views may differ to Ofgem's notional gearing assumption.

1.42. One interconnector developer commented that further detail on the particular benchmarks and parameters that will be chosen in Belgium would be helpful.

Cap benchmark

Summary of 2013 consultation proposals

1.43. We proposed to apply a relevant cost of equity to 100 per cent of the RAV. This cost of equity would be based on an approach rooted in the CAPM.

1.44. This approach requires estimates for three parameters: the risk-free rate; the equity risk premium; and the equity beta. We proposed to take a long-term perspective on the first two, weighting our estimate equally based on evidence from GB and Belgium. We proposed to use a beta estimate for Drax as a relevant comparator.

Summary of responses

1.45. One interconnector developer commented on the proposed methodology used to set the cap and floor on returns. They believed that the methodology used to set the cap may need to take into account two additional considerations.

- First, using the cost of equity for a generation plant caps developer return at a level less than or equal to those received by a generator (whose average returns will include contributions from returns above as well as below their average value). Under our proposed methodology, the cost of equity is being applied on the whole asset base not just the non-gear proportion.
- Second, they queried the use of Drax as the generation comparator. They suspected that there are number of other factors which are relevant to Drax's observable beta which are not relevant to interconnector investment appraisals but did not provide any alternatives. They also felt that the presence of the floor and the floor on returns does not reduce the level of risk at the cap.

Project discount rates

Summary of 2013 consultation proposals

1.46. We proposed to use an operational cost of capital for the purposes of re-profiling allowances and ensuring NPV neutrality during the operational phase. This was set using a 50 per cent weighting of each of the floor and cap rates of return.

Summary of responses

1.47. One interconnector developer noted that under an operation cost of capital that is determined by a 50:50 weighting of cap and floor returns, the cap and floor will be symmetric around the project cost of capital if the cap and floor are set appropriately. They cautioned that with separate cost of capital calculations for the cap and floor there was a risk of an unduly low prospective average project return.

Methodology for setting IDC (including October 2013 IDC consultation)

Summary of 2013 consultation proposals

1.48. In our March 2013 consultation, we proposed that, based on our assessment of the relative level of risks faced by developers in constructing transmission assets for interconnection and offshore wind, the required return by an efficient interconnector developer may need to be higher than that for offshore.

1.49. We subsequently issued a consultation on the IDC approach to be used for interconnector development and offshore wind in October 2013. In this consultation we proposed an overall approach based on the Weighted Average Cost of Capital (WACC), with a CAPM for calculating the return on the equity component. When applying the CAPM, we proposed to use market data for companies that share characteristics with companies constructing interconnectors, to derive values for risk, equity and gearing that are appropriate to the sector. This group of comparators includes integrated energy companies.

1.50. We proposed to include two additional uplifts for Nemo to the basic rate to compensate developers for asymmetric risks. These uplifts reflected:

- Asymmetric development risk – ie the risk that some projects might be aborted during the development phase; and
- Asymmetric construction risk – ie risk that costs would be disallowed under the cost assessment process after they had been incurred.

Summary of responses

1.51. There were limited responses to the October 2013 consultation in relation to the approach to IDC for Nemo (beyond those received in relation to the March 2013 Nemo consultation).

1.52. All respondents agreed that the use of CAPM and WACC are appropriate but some highlighted the importance of inputting appropriate parameters. The majority of respondents had concerns over some of the existing parameters, such as the cost of debt or the risk-free rate.

1.53. Respondents were generally supportive of our proposals for Nemo. All respondents agreed that IDC should be fixed at FID. Three respondents commented on different aspects of application: one suggested that a review every two years would be more appropriate than an annual review; one suggested that project-specific rates of IDC should be introduced and another suggested having a different cap on IDC for the development and construction phases. One respondent disagreed with our policy of adjusting the cap on IDC for projects that are currently accruing IDC.

Cost assessment consultation April 2014

Summary of responses

1.54. We received 9 responses to the April 2014 cost assessment consultation. Non-confidential responses are on our website.

1.55. The majority of respondents commented that the assessed costs were significantly lower than expected therefore costs were underestimated by BPI and Ofgem. One respondent broadly agreed with the assessment but noted that some costs, after reductions, did seem low.

1.56. A number of respondents challenged the timing of the cost assessment, suggesting that whilst a detailed assessment was appropriate, it had been conducted too early in the process. A number of respondents disagreed with an assessment that is designed to minimise costs, suggesting that there are already incentives on the developers to reduce costs.

1.57. Respondents commented that benchmarks for HVDC technology are hard to come by and some questioned whether the reliance on benchmarks was an appropriate approach for this cost assessment. The majority of respondents suggested an approach that took more account of the project specific elements of the project.

1.58. There was broad agreement that the choice of technology for Nemo (VSC) was appropriate. One respondent suggested that they could not provide a view without seeing the full information used to make our decision. One respondent suggested that the true value of VSC technology was not reflected in the consultation. Another questioned why a project developer should have to justify the technology choice.

1.59. A number of respondent suggested that opex was underestimated or were surprised at the scale of the opex reductions. One respondent suggested that setting opex for 25 years with no re-opener was not appropriate.

Appendix 3 – Updated Impact Assessment

Introduction

1.60. The consultation on our initial Impact Assessment (IA) closed on 13 February 2014. We had 6 responses. The respondents are listed in Table A3.1 below.

Table A3.1: IA consultation responses

Name	Category
Diamond Transmission Corporation (confidential response)	Interconnector developer
DONG Energy	Interconnector developer; energy company
EDF Energy	Energy company
National Grid Business Development	Nemo developer
National Grid Electricity Transmission	Transmission System Operator
Transmission Investment	Interconnector and OFTO developer

1.61. This appendix assesses the themes highlighted by respondents in turn and sets out our updated position.

1.62. This appendix is our updated IA. This should be read as an addition to the December 2013 consultation. We consider that the material in the December IA remains appropriate.

Discussion of responses by theme

Stranding risk and our approach to future cap and floor regime reviews

1.63. Three respondents requested more information on the proposal to review the cap and floor if revenues are consistently at the floor. One of these respondents also requested clarity on how exceptional or force majeure events would be treated under the regime, drawing comparison with the licence provisions under the OFTO regime for offshore transmission.

1.64. The floor provides a guaranteed return level which de-risks interconnector investment. The floor payment is subject to meeting a minimum availability threshold.

1.65. We will not include a reopener for policy or regulatory changes, such as further detail becoming available on the level of funding via any capacity market payments or changes in the GB carbon price floor. We consider that the floor provides sufficient insulation from such risks and therefore protects developers from such changes.

1.66. There are two safeguards for developers in the regime:

- Where the developer considers an income adjusting event has occurred they have the opportunity to raise this with us to request additional funding. This process will be set out in the licence and will be addressed outside the cap and floor mechanism.
- Similarly, we have implemented a minimum availability threshold at the floor. We will consider events that are beyond developers' control when assessing availability against this minimum threshold. Where we think that availability below this threshold was for reasons beyond the control of the developers, the top-up to the floor will be provided.

Validity of modelling

1.67. One respondent noted that the modelling used in the IA, undertaken by the Brattle Group and provided by the Nemo developers, should be updated. This respondent suggested that the modelling may not accurately represent the risk to consumers of having to pay for the floor on a consistent basis as a result of reduced revenues.

1.68. We agree with the respondent that the modelling provided by the Brattle Group is now dated. However, we still consider it to be useful in giving an indication of the revenues generated by the interconnector (and subsequent likelihood of consumers having to underwrite the floor) and of the consumer welfare benefits that are likely as a result of the interconnector being in operation.

1.69. The likelihood of consumers having to make payments at the floor is based on the amount of revenue generated by Nemo, and so will be a product of two factors: the amount of electricity traded over the interconnector and the value of these trades. As a result of market conditions and policy changes, we consider that the likelihood of the interconnector making less money than the level of the floor has reduced since the Brattle Group's study was undertaken. This is in part due to additional policy mechanisms such as the carbon price floor, which reinforces the existing price differential between the GB market and other markets and was not reflected in the Brattle Group's study.

1.70. Modelling work undertaken for DECC by Redpoint supports this view and that set out in our draft IA, and shows that Nemo is likely to contribute to a net welfare increase for GB (under a number of interconnector configurations and scenarios).⁵¹ This analysis suggests that the floor is unlikely to be triggered. This is shown to be the case even if a number of other interconnectors come online. Further least-regrets analysis undertaken in the Redpoint report concludes that *'incremental increases*

⁵¹ This analysis can be found on DECC's website here:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/266307/DECC_Impacts_of_further_electricity_interconnection_for_GB_Redpoint_Report_Final.pdf

with GB's closest neighbours are likely to be beneficial to GB under a broad range of circumstances ... in the medium term, some interconnection to France, Ireland, Belgium and Norway is unlikely to lead to regret'.

1.71. There are two additional reasons why we have not undertaken additional analysis:

- Given the rate of change in energy markets, and the assumption-driven nature of interconnector modelling, we do not think it would be prudent or efficient to commission further modelling to inform our decision for Nemo.
- Further modelling would delay the Nemo project at the time when the need for increased interconnector capacity is widely recognised by the government, energy regulators, industry stakeholders and European Union institutions. This may also create uncertainty in the market (which could hinder the progression of forthcoming projects or could increase the risk profile and therefore costs of such projects). Both these outcomes would be to the detriment of GB consumers.

Risk of displacing current generation

1.72. One respondent suggested that the completion of Nemo is likely to displace coal and gas in the GB generation mix, reducing the revenues for these plants and thereby potentially having a detrimental impact on GB security of supply.

1.73. We note the government is implementing the Capacity Market in order to directly remunerate the security of supply benefit that existing (and new) plants can offer, which aims to offer a source of revenue to plants that may otherwise have been mothballed or shut down.

1.74. Work is also ongoing to establish new balancing services, for which the SO will be responsible. National Grid recently consulted on the products and services that it is seeking to include in its contracts with system users.⁵² It is likely that these new services may generate contractual revenues for plants which can offer responsive and flexible balancing services.

1.75. In principle we highlighted in the IA that GB consumers may benefit as a result of electricity generated by a more efficient plant operating in continental Europe and being imported at a lower price than electricity generated at a less efficient plant in GB. This was identified as a key consumer benefit of the interconnector – allowing demand to be met in the most efficient manner.

⁵² More information is available on National Grid's website here: <http://www.nationalgrid.com/uk/electricity/additionalmeasures>

1.76. In practice we agree that this is likely to displace inefficient generation in GB and that Nemo may therefore impact on revenues of some coal and gas plants with higher running and production costs. We expect that any impact of the displacement of these plants on GB security of supply will be offset by the introduction of the Capacity Market and new balancing services.

1.77. We conclude that we do not consider the potential displacement of existing generation as a result of Nemo to have a material detrimental impact.

Considering alternative options (such as new flexible generation and emerging technologies)

1.78. Two respondents suggested that we have not sufficiently assessed Nemo against other technologies, such as alternative interconnectors, new flexible generation, demand side response (DSR) and electricity storage. Conversely, one respondent suggested that Nemo can make savings compared to the cost of these alternative measures and that we should take account of these potential costs.

1.79. Whilst we recognise that other interconnector projects are likely to come forward, and that there is scope for other technologies to perform similar functions, we do not consider it appropriate to measure the impacts of Nemo against other potential technologies. Nemo is a mature project at the investment stage, for which we have been developing a regulatory regime since 2011. We expect that Nemo will be operational in 2019. We think it would be difficult and unrealistic to consider this against some technologies, such as DSR and grid-scale electricity storage, that may be some years from full maturity. As a result, the assessment of interconnection against other technologies has been beyond the scope of the IA.

1.80. We do not have any regulatory tools that would bring alternative technologies to fruition and consider that it would not be in the interests of consumers to compare a viable and mature project to other options that may or may not come forward under a range of different circumstances.

1.81. It is widely accepted that additional interconnection will realise benefits for GB. As the most mature interconnector project we consider that Nemo going ahead will result in benefits to GB. This also reflects our March 2013 decision to progress Nemo separately to other interconnector projects. Our framework for regulation of future interconnector projects allows for the comparison of interconnector projects and allows us to determine whether there are benefits in some or all of them going ahead.

1.82. In conclusion, we do not think it would be in the interests of GB consumers to delay Nemo in order to enable comparisons with, or assessment against, other technologies or projects that may or may not be realised at some point in the future.

Impacts of Nemo on the GB network

1.83. One respondent suggested that we should further set out the onshore transmission costs resulting from Nemo, and how these impact on consumer bills. They also suggest further discussion of the benefits of VSC over Line Commutated Converter (LCC) technology.

1.84. We have assessed the impact of technology choice as part of our April 2014 cost assessment consultation. Our minded-to position for the cost assessment consultation was that the choice of VSC technology was justified, including when considering the cost of onshore reinforcements. Following consultation and assessment of responses, we have confirmed this decision in chapter 3 of this document.

Regulation of other interconnector projects

1.85. A number of respondents suggested that uncertainty about regulatory treatment for projects other than Nemo could delay investment in interconnection, with potential detrimental impacts on GB.

1.86. Although this issue was beyond of the scope of the Nemo IA, we recognise the concerns of respondents. We consulted on our proposals for regulation of near-term electricity interconnectors in May 2014 and have since published our decision to extend the cap and floor regime developed for Nemo to other near-term electricity interconnectors.⁵³ Our proposals for regulation of longer-term interconnectors were also discussed in our ITPR document published in September 2014.⁵⁴

⁵³ Our decision letter is available on our website here:
<https://www.ofgem.gov.uk/publications-and-updates/decision-roll-out-cap-and-floor-regime-near-term-electricity-interconnectors>

⁵⁴ Our ITPR draft conclusions is available on our website here:
<https://www.ofgem.gov.uk/electricity/transmission-networks/integrated-transmission-planning-and-regulation>