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Cap and floor regime: Initial Project Assessment for the NSN interconnector to Norway

EDF Energy is one of the UK's largest energy companies with activities throughout the energy chain. Our interests include nuclear, coal and gas-fired electricity generation, renewables, and energy supply to end users. We have over five million electricity and gas customer accounts in the UK, including residential and business users.

In summary:

- We support the development of the European internal market via interconnectors where it improves economic efficiency. In our view, incremental increases in interconnection with GB's closest neighbours are likely to be beneficial to economic efficiency and GB net welfare under a broader range of scenarios than large interconnection projects to distant markets.
- If an investment is to be supported by consumers via the cap and floor regime, the consumer benefit case must be clear. In the case of NSN, there are short-term benefits to consumers because of price differentials but the scenarios show a wide range of potential outcomes.
- The "developer-led" approach does not necessarily result in the most economic projects being developed. More economic interconnectors than NSN could be built but because they are not currently on the table, they are not considered. There is a risk that interconnectors to closer markets will come forward in time but consumers will be locked into potentially more expensive projects.
- It is important that interconnection does not cut across other Government policies. In particular, the UK Government has determined that it is right to put in place a carbon price support mechanism. The Cost Benefit Analysis (CBA) must, however, take into account differences in policies and regulations between interconnecting countries to ensure a level playing field between generators in GB and the connecting market.
- The NSN cable will be the longest subsea cable in the world, making this a complicated project with significant technical risk. This increases risk of stranding or at least higher floor payments. We would urge Ofgem to take a conservative approach in assessing the benefits.

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Our detailed responses are set out in the attachment to this letter. Should you wish to discuss any of the issues raised in our response or have any queries, please contact Mark Cox on 01452 658415, or me.

I confirm that this letter and its attachment may be published on Ofgem's website.

Yours sincerely,

Angela Piearce
Corporate Policy and Regulation Director

Attachment

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EDF Energy's response to your questions

Chapter Three

Q1. What are your views on the approach Pöyry has taken to modelling the impact of cross-border interconnector flows?

Pöyry's economic modelling calculates the 'social welfare' impacts of NSN using three scenarios (base case, low, and high) and two modelling approaches (first additional and marginal additional). They also test sensitivities to changes in renewable generation share, removal of carbon price support (CPS) in GB and decrease in gas prices. Their approach to evaluating the possible benefits of a new infrastructure investment appears thorough and well considered and is broadly aligned with our expectations. However, we consider that there are a number of areas where the modelling should be enhanced:

Market sensitivities:

When the merits of new interconnectors are being assessed further sensitivities should be undertaken to better assess any existing differences in policies and regulation between the connecting markets so as to further understand the fundamentals of the project and ensure consumer risk is understood.

For example, the UK has taken the decision to put in place a carbon price support mechanism to support investment in low carbon generation and the decarbonisation of the power sector. It would be wrong if the case for interconnection rested principally on differentials that are a result of Government action to price carbon. Pöyry has indeed conducted its assessment without the CPS in one of their sensitivities but the outcome is hardly discussed in Ofgem's consultation. What is evident from Pöyry's analysis is that net GB welfare benefit depends significantly on the CPS; without the CPS, the total net benefit to GB is only £91m, which is immaterial in the context of the range of plus/minus £1000m between high and low scenarios, and significantly less than the £309m used in the base case.

In addition to the CPS, interconnected generation does not pay transmission or balancing charges to access the GB network and indeed in many other Member States generators do not pay local transmission charges either. While it is not straightforward to estimate the cost differential, we estimate GB generators pay several £'s/MWh in transmission charges which is reflected in the GB wholesale price. Interconnected generators do not currently pay these charges. This has not been modelled as a sensitivity. As with the CPS, it would materially impact net GB welfare.

NSN's business model is primarily based on the arbitrage opportunity created by the significant wholesale price differential between Norway and GB. It is not clear from the consultation whether Pöyry's analysis has considered the impact of further interconnection to the Norwegian market. There is a risk that, as Norway is a relatively small market, the existing price differential between Norway and GB could be substantially reduced if other interconnectors are constructed to Norway. We understand an example is NordLink, the planned interconnector[1] between Germany and south-west Norway. There is a risk that prices in Norway will increase once NordLink is built, resulting in a smaller price differential between Norway and GB, which would reduce the benefits to GB consumers of NSN.

"Developer led":

It is worth noting that the "developer-led" approach does not necessarily result in the most economic projects being developed. The developer-led approach means that more economic interconnectors than NSN could be built but because they are not currently on the table, they are not considered. There is a risk that interconnectors to closer markets will come forward in time but consumers will be locked into potentially more expensive projects. We note that Pöyry was not asked to look at other projects beyond Ofgem's short-listed projects. So while NSN may appear viable in relation to these projects, alternative interconnector designs may provide the same benefits at lower cost or lower risk. Shorter subsea connections are likely to bring lower construction and operating risk.

Q2. Do you agree with the modelling results for NSN and our conclusion that NSN is likely to provide benefits to GB consumers?

Ofgem states that interconnectors have potentially significant benefits for consumers: lowering electricity bills by allowing access to cheaper generation, providing more efficient ways to deliver security of supply and supporting the decarbonisation of energy supplies. While we fully support this view, we challenge some of the assumptions used and conclusions drawn for NSN below.

Lowering electricity bills by allowing access to cheaper generation?

We agree that NSN is likely to provide benefits to GB consumers in the short-term owing to the wholesale price differential between GB and Norway but the longer-term benefits to consumers are less certain. The scenarios and sensitivities used by Pöyry demonstrate that there is a wide range between potentially more than £1000m gain or almost £1000m loss to welfare from NSN, with large distributional effects. As discussed above, we believe that there are further sensitivities that need to be considered to fully understand the possible outcomes.

[1] With a formal final investment decision expected imminently: http://www.tennet.eu/nl/news/article/tennet-ready-to-start-with-high-capacity-power-cable-between-germany-and-norway-nordlink.html

The NSN cable will be the longest subsea cable in the world, making this a complicated project with significant technical risk. In fact, Pöyry concludes that NSN has substantial downside risk because it is a large capacity, long distance interconnector which translates to high project costs. This increases risk of stranding or at least higher floor payments. In our view, incremental increases in interconnection with GB's closest neighbours will be preferable to high cost, long distance interconnectors.

Operational experience of the 580 km NorNed cable from Feda, Norway to Eemshaven, Netherlands, completed in May 2008 with 700 MW capacity, shows three major outages in its first six years of operation (excluding those related to transformer equipment), and highlights in particular how long repairs take for offshore cable faults compared with onshore[2]. The operational risks associated with long-distance interconnectors should not be underestimated and we would urge Ofgem to take a conservative approach in assessing the benefits.

We are aware that under the cap and floor regime, the floor will only apply if a minimum availability threshold of 80% (to be determined on a project by project basis) is met each year. But it appears availability below this level could still be awarded the floor if the developer could demonstrate that the lack of availability was beyond the project's control (which is not defined). We note Statnett's response to Ofgem's consultation on Project Nemo dated 3 Mary 2013, which states that any partner in an interconnector project to Norway must accept the Norwegian grid "as is", and Statnett would offer no financial compensation in cases of potential interconnector constraints due to grid issues. They go on to say that "it is imperative that Ofgem in any operational availability incentive recognises this situation, so that our partner is not penalised based on actions beyond its control." If transmission constraints are a known concern that could affect the flow of power into GB, we would argue that GB consumers should not be penalised or expected to take on this risk.

Providing more efficient ways to deliver security of supply?

More interconnection alone will not provide the UK Government or the EU with the ability to ensure security of supply or to control energy costs – and could expose consumers to high and volatile energy prices.

The table[3] below illustrates that the majority of GB's potential interconnector projects (outside of France, Belgium and Netherlands) would involve very long lines, with high capital costs and large losses of electrical power. As a comparator, the cost of a CCGT is

[2] 06-02-2009 to 24-02-2009 (onshore link); 01-02-2010 to 25-04-2010 (70 km offshore); and 18-04-2011 to 04-06-2011 (only 300m offshore) Source: http://www.tennet.eu/nl/grid-projects/interferences/interferences-archive.html

[3] Source: Interconnection costs assumption used by Redpoint / Baringa report "Impacts of further electricity interconnection on GB" for DECC November 2013

around £0.7m/MW, significantly less than an interconnector to Norway. Moreover, security of supply will not be delivered by itself; it requires TSO and political agreement.

Interconnector	Distance (km)	Cost (£m/MW)	Losses %
France (short)	70	0.45	2.03
Belgium	140	0.52	2.55
Ireland	170	0.55	2.78
Ireland (North)	170	0.55	2.78
France (long)	195	0.58	2.96
Netherlands	260	0.64	3.45
Germany	480	0.87	5.1
Norway (Scotland)	570	0.96	5.78
Denmark	600	1	6
Norway (England)	711	1.11	6.83
Spain	850	1.25	7.88
Sweden	900	1.31	8.25
Iceland	1200	1.62	10.5

While NSN is likely to contribute to GB security of supply, the assessment recognises that there will be large GB producer loss (£1.4 to 3.8bn NPV) but the implication of this significant loss is hardly discussed. NSN may displace expensive GB generators but it may also trigger further effects such as plant closure. Ofgem mentions a displacement of approximately 11.4TWh of thermal plant in GB (mainly gas) in 2020 which seems to include closure of new high-efficiency plants in addition to those nearing retirement age. The ultimate impact on GB consumers of these plant closures has not been assessed, and could significantly offset the reduction in wholesale price anticipated.

Ofgem also mentions that it assessed the expected impacts of the CM policy for interconnectors on NSN and found that it would displace expensive GB generation from the CM, potentially reducing CM clearing prices, and reduce GB producer surplus (i.e. generator profits). It is possible that this could lead generators to seek higher CM prices to compensate for reduced energy revenues; in this context, it should be noted that the level of the CM is likely to have a strong impact on decisions to build new generating plants or to close existing ones whereas it may have a much lesser impact on decisions to build or retain interconnectors supported by cap and floor arrangements. (Unlike generators, interconnectors are expected to be allowed to participate in the CM even if receiving other support e.g. through a "cap and floor" scheme.)

In terms of security of supply, the balance of advantage from an interconnector is likely to depend critically on the contribution it makes at times of potential "system stress", estimated for the purposes of the capacity market by the LREI (Long Run Expectation of Imports). It is quite likely that the interconnector's contribution at such times will be significant and so it will bring a benefit to GB security of supply.

However, there is a risk that the interconnector could have a detrimental impact on the efficient provision of security of supply if it reduces the energy revenues of GB generators, leading them to seek higher revenues from the capacity market but it does not then make a significant contribution at times of potential "system stress". This could happen as a result of, for example, grid constraints in Norway or the impact of further interconnection from Norway to other countries such as Germany.

Supporting the decarbonisation of energy supplies?

Importing large quantities of hydro power into GB no doubt leads to the decarbonisation of GB energy supplies, by displacing coal and gas generation in GB with hydro from Norway. However, the suppression of GB wholesale price as modelled is likely to increase the level of support needed for renewables, e.g. CfDs, to achieve the same level of MW installation. This will mean that to ensure GB meets its renewable commitments, the costs for GB consumers will rise. Therefore, a large part of the consumer benefit of lower prices is lost in higher low-carbon support payments and the additional tax revenue that must be raised elsewhere in the economy.

As before, we support the efficient allocation of resources across Europe to minimise costs to consumers and reduce carbon intensity but it is important that these wider implications are understood in the assessment for NSN and other projects.

Chapter Four

Q3. Do you have any comments on the system operation impacts of NSN?

Yes. The impact of NSN on the GB transmission system is considered in the consultation but the impacts on the Norwegian transmission system are not considered. While we appreciate that Ofgem is not responsible for the regulatory regime in Norway and GB consumers are not exposed to Norwegian transmission charges, we think it is important for the CBA to consider the entire picture. For example, if there are known transmission constraints in Norway that could affect the flow of power into GB, this would be relevant in the assessment of the benefits of the interconnector.

Q4. Do you have any views on the onshore connection information?

No.

Chapter Five

Q5. Have we appropriately assessed the qualitative impacts of NSN link?

We broadly agree with Ofgem's assessment against identified benefits of interconnection. In question 2 above, we challenged some of the assumptions used and conclusions drawn for NSN to ensure a more balanced view.

In terms of supporting the decarbonisation of energy supplies, Ofgem mentions that "a link between the two markets should allow for efficient sharing of renewables; for example, when wind output is high and demand is low, then GB can export energy to Norway". We note from Pöyry's analysis that the export to Norway will be minimal i.e. 1% in 2020 to only 13% even by 2040 in the Base Case.

In terms of the hard-to-monetise benefits, arguably they will apply to other interconnector projects and are not necessarily unique to NSN.

Q6. Are there any additional impacts of NSN link that we should consider qualitatively?

No.

Chapter Six

Q7. Do you have any comments on our assessment of NSN's chosen connection locations or cable routes?

Without the details, it is difficult for a third party to determine whether NSN's chosen connection location or cable routes provide the best value to consumers.

It is interesting to note, however, that NorthConnect, the competing interconnector to Norway, is expected to connect to Scotland rather than England. We assume, in their view, the shorter link to Scotland is more economical despite the extensive reinforcements needed to accommodate it. As highlighted above (re NorNed), operational risks associated with long-distance subsea cables also needs to be considered.

Chapter Seven

Q8. Do you have any comments on our assessment of NSN's project plan?

No.

Chapter Eight

Q9. Do you agree with our conclusions on the IPA for NSN?

No. We agree there are potentially significant benefits to NSN. However, the risks are significant too and the outcome may well be that GB consumers end up subsidising the project in the longer term. In our view, large interconnection projects to distant markets are more risky in the absence of a clearer indication of the trends in market fundamentals.

Chapter Nine

Q10. Do you have any comments on our application of the regime to NSN?

No.

Q11. Do you have any comments on our assessment of the development costs?

No. This is mainly because limited information has been disclosed in the consultation. For Project NEMO, there was much more transparency which made it possible to provide comments.

Q12. Do you have any comments on our initial assessment of technology choice or tendering strategy for the NSN interconnector?

No.

EDF Energy
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