Impact on competition and social welfare of the proposed ElecLink interconnector between Great Britain and France

Summary of report for Ofgem and La CRE

Non-confidential version

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Executive Summary

Introduction

This report analyses the request of ElecLink for a regulatory derogation from EU and national regulation. ElecLink proposes to build a 1000MW HVDC interconnector between the French and Great Britain electricity systems.

The conditions for derogation are set out in paragraphs 1(a) to (f) of Article 17 of The Regulation No (EC) 714/2009. Our focus is on three of the main criteria:

(b) the investment must enhance competition in electricity supply;

(c) the level of risk attached to the investment is such that the investment would not take place unless an exemption is granted;

(f) the exemption must not be to the detriment of competition or the effective functioning of the internal market in electricity, or the efficient functioning of the regulated system to which the interconnector is linked.

In addition, the impacts in terms of social welfare have been duly considered.

ElecLink business plan includes non-recourse project finance, and so they wish to secure a large portion of their revenues via sale of long-term contracts, for which they would require the derogation.

We thus analyse in this report the criteria for the derogation in terms of the following. We first analyse the competition impacts of the proposed interconnector. Next, we analyse the revenue projections of the business plans proposed by ElecLink. We then analyse the welfare implications of the proposed interconnector. We next analyse the estimated impacts on existing and future interconnectors. We then provide a discussion of the appropriateness of the proposed long-term contract sales for regulation, competition, and the internal market. Finally, we provide a more detailed discussion of the many assumptions associated with the financial and market models provided to us by ElecLink in terms of upside and downside risks of the assumptions. Lastly, conclusions and recommendations are made.

Competition

We analyse the competition impacts of the proposed interconnector using the residual supply index (RSI). The competition analysis of ElecLink and their advisors RedPoint used an analysis of capacity market shares and the HHI. Finding EdF has a dominant position in generation in France, ElecLink proposed that EdF's share of the interconnector capacity into France should be no more than 50%.

Our analysis indicates that the HHI is usually not a good indicator of competition in electricity generation markets, in line with the detailed evidence of the 2007 study of London Economics for the DG Competition. We analyse competition effects instead using the RSI.

The focus of our analysis is on EdF. EdF is by far the largest generation company in France, and is significantly the largest generation company in Great Britain. EdF also has a presence in other related markets, such as supply. No other player has a market share greater than 25% in either market.

We used the modelling outputs of supply and demand in the northwest Europe system, and specifically the French and Great Britain systems from the Ventyx model. We calculated the RSI using the standard formulas and adjusted these for the added interconnector capacity and the share of the interconnector capacity allocated to the largest company. We calculated the RSI for import and export and all-hours situations and estimated the number of hours for each situation where the RSI would be less than the standard screening rule of 110. We also considered when the average RSI over the selected hours was increasing (increasing indicates less market power). Finally, we also included a brief qualitative analysis of the potential impacts of the interconnector on the incentives to use market power. The summary results of the analysis are found in the table below.

Table 1: Summmary of RSI results

Flow direction	Prices	EdF Market Power in France	EdF Market Power in Great Britain	Significant ability and incentive to raise price in either country	% Share *Interconnector* for EdF indicated
France→Great Britain	$P_{gb} - P_{fr} > 0$	Y	Y	Y	~40%
Great Britain→France	$P_{fr} - P_{gb} > 0$	Y	N	Y	~20%
Both ways	NA	Y	Y	Y	~20-40

Source: LE

Based on the analysis and our judgment, we recommend that EdF's total allowed share of the total interconnector capacity be limited to between 20 and 40% in either direction. This includes both long-term and short-term capacity. If market shares and the market landscape were to change significantly over time, then the regulatory authorities (RA's) might wish to re-visit these calculations.

We also considered whether the sale of long-term (LT) contracts could interact with other features of the market. In general, we do not believe that LT contracts are inconsistent with the functioning of the market or market competition, as LT contracts (annual and monthly) are already envisaged as consistent with the European Target Model (ETM). It is, however, conceivable that LT contracts could create a barrier to entry in the long run.

However, we do not believe the LT contracts will create a significant barrier to entry because: a) the counterfactual is 'no ElecLink interconnector'; b) the minimum efficient size of a new generator is typically about 200MW and there will be 200MW of short-term capacity available; c) the new European Target Model (ETM) will ensure that players need only transact in the energy markets, and will not need physical transmission rights; d) secondary markets, use-it-or-sell-it (UIOSI) rules, and other interconnectors will be available.

Revenue and Risk

We next analysed the revenue forecasts of ElecLink from their financial model and also considered the market modelling information from RedPoint.

The analysis was focused on the risk criterion, whether the project would be so risky so as not to go ahead without the derogation. Our approach was fundamentally two-fold: 1) we studied the key revenue and project finance assumptions of ElecLink; 2) we stress-tested standard financial ratios in terms of financeability rules such as the Interest Cover (IC) ratio and the Annual Debt Service Cover Ratio (ADSCR).

A first assumption is that the project needs project finance. Our analysis did not focus on this *per se,* but the need to generate/guarantee a large portion of the revenues up-front before financing (and thus the need for LT contracts and the derogation) is fully dependent on the need for project financing. Our analysis confirmed the need for project finance, as a variety of factors, including the amount of debt required relative to existing parent-company gearing levels, confirm this.

The next key assumption of the ElecLink financial analysis is the actual price per MWh that the capacity would be expected to generate. In terms of ElecLink's assumed price for capacity, we believe there is a risk that ElecLink's estimates may significantly underestimate the revenues that the project will achieve. The current existing prices on IFA for annual capacity 2014 are available. We calculated the average annual bi-directional 2014 contract price for all annual 2014 IFA capacity auctions. The results indicated a bi-directional price of long term capacity without a discount of the long-term fixed liability of €13.46/MWh. This analysis indicates that the ElecLink financial model revenue estimates may underestimate revenues significantly.

We further considered the average prices from ElecLink's advisors, RedPoint, market study. They modelled and forecasted prices in France and Great Britain with and without ElecLink, and the price differentials with ElecLink indicate the estimate of the congestion rents forecasted for the interconnector. We received the prices in France and Great Britain from the model on request. We note that we did not receive detailed estimates of hourly market prices and flows, and so the average price differential does not fully reflect the flows, although with the vast majority of flows France→Great Britain (circa 90%), the average price will be *less than but close to* the weighted average price. Using these prices, our analysis still indicates ElecLink's financial model prices are lower.

We also analysed the discount for LT contracts. We used two methods which were admittedly simplified analyses. First, we can consider a generic investment that gives an annual payment of €100 per year where this payment does not increase with inflation and compare this with an investment that pays €100 per year in today's prices – i.e. the yearly payments increase to precisely match inflation using a discount rate of 2% gives: PV=€1,952. The investment that pays every year €100 in today's terms (i.e., grows with inflation) has a value of 25x100=2500.

In terms of our example above, the purchaser of the capacity contract with capacity prices fixed in nominal terms for 25 years is as if paying €1,952 for a stream of revenues which in expectation is worth €2500. So it is as if buying at about a 22% discount.

We next analysed their financial model in terms of financial ratios, especially interest cover (IC) and annual debt service cover ratio (ADSCR). These ratios are general rules of thumb, but

according to these rules, both ratios should generally range from 1.3 to 2.0, with ratios at or below the lower end indicating 'distress', and at or above the higher end indicating 'health'. We note that ElecLink's own assumption for ADSCR falls within the range and, thus is in line with the above rules. Our method was to assume that short-term (ST) contract revenues fall to zero as a 'worst case' stress test, and then see what the LT contract cover would imply in terms of these ratios. It is our experience that lenders would conduct a similar type analysis. We then reduced the percentage of LT contract cover to study whether the project could sustain a lower amount of contract cover and still be financeable.

We conducted the stress tests for two main scenarios: 1) using ElecLink's revenue projections, 2) using ElecLink's revenue projections, but increasing the LT revenues by the percentage difference between ElecLink's LT price and the 2014 IFA annual price discounted by the same percentage as used by ElecLink.

The results of the stress tests are as follows. Using ElecLink's revenues, in terms of IC, the project is healthy in terms of interest cover, but achieves a low interest cover ratio (although within the range from the rules of thumb) with 80% LT contract cover and no short-term revenues in the early years of the project. In terms of ADSCR, the minimum projected value also indicates that the project is healthy according to the standard rules. Thus, using ElecLink's revenue assumptions and the standard rules, the project would require circa 80% LT contract cover using this analysis.

Using alternatively the higher 2014 annual IFA price revenue implications, the stress tests indicate that the project could remain above the lower threshold levels of IC and ADSCR with circa 50-55% LT contract cover and no short-term revenues.

Another element we were asked to analyse is the range of gearing that the project could achieve. In our experience, gearing levels of significantly over 50% are high but normal for such projects, but project financed investments can sometimes achieve gearing of 70-80%. We would propose, however, that gearing levels higher than those assumed in the ElecLink financial model might be excessive, as the project is already indicating lower ratios for IC and ADSCR. In the early the project years IC is low, and some years achieve a low ADSCR under the no short-term revenues stress test with 80% LT contract cover and ElecLink's current assumptions on gearing. Thus, it would seem gearing levels of higher than their current model-assumed gearing could put either project viability or financeability at risk, even assuming 80% LT contract cover.

The conclusions and recommendations on revenue and risk are that the revenue model of ElecLink entails a significant risk of underestimating the revenues, and thus overestimating the percentage LT contract cover required for the derogation. With higher revenues in line with current IFA prices, the project may be able to achieve project financing with LT contract cover of around 50-55%. Given the uncertainty around the level of funds which the market will actually allow ElecLink to raise at financing, a way forward would be to base the derogation on the revenues required to achieve project financing, rather than the percentage of capacity allowed to be sold under LT contracts.

Welfare

We next analyse the welfare impact of ElecLink. The method used was to estimate the consumer surplus and producer surplus impacts in each of France and Great Britain, and net overall surplus using the price, cost and flow predictions from Ventyx's modelling of the with and without ElecLink

cases. ElecLink's advisors RedPoint carried out a similar analysis. We compare our results with RedPoint's. The summary of the results is found below.

Our results differ from RedPoint's by a large factor (circa x5) in magnitude but in terms of qualitative results, they are similar:

- Producers gain in France and lose in Great Britain; the net effect on producers is positive
- Consumers lose in France and gain in Great Britain; the net effect on consumers is negative
- Production costs go down in aggregate because of efficiencies and reduced wind curtailment, and changes in net export among all NWE interconnected countries
- The overall welfare effect is positive: the net positive producer surplus effect more than compensates for net negative consumer surplus changes

The modelling and welfare results indicate that the welfare impacts are highly sensitive to the estimated price impacts. These are subject to the modelling assumptions and models themselves. We have qualitatively analysed the models and assumptions and we believe a key difference is how the two models estimate mark-ups. In the RedPoint model, mark-ups are assumed to be a function of the capacity margin, which is not changing with ElecLink, thus indicating a small impact for ElecLink. In the Ventyx model, mark-ups are assumed to be added to marginal plant for peak hours to recover, start, stop and other no-load heat costs. Thus the total cost to be recovered by mark-up in Ventyx's model is not changing, which must be recovered in fewer mid-merit hours. The result, we suspect, is that the mark-up methodological differences between the RedPoint and Ventyx models are driving significant estimated price impacts from ElecLink (we did not receive details of the mark-ups or mark-up function on request from RedPoint).

Given the significant sensitivity of the magnitude of the welfare results to the models and modelling assumptions, we were asked by the regulatory authorities to provide a final assessment of the welfare impacts and whether the 'true' values could be much lower than the RedPoint results. We believe that the following qualitative conclusions can be drawn with some confidence. First, the largest element of the consumer surplus and producer surplus changes cancels out (in any similar model): consumers lose to producers where the price increases (France) and producers lose to consumers where the price falls (Great Britain). An additional effect results from moving production to where it is cheaper. In this case, producers in France will increase output to export to Great Britain and Great Britain producers will correspondingly lower their output. As such, the net effect will almost always be positive as the price effects on non-traded production cancel out between consumers and producers but overall production efficiencies are achieved due to additional trade between the two areas. In the latter years of the project, this efficiency gain includes reducing wind generation curtailments especially in Great Britain.

As for the magnitude of these effects, the larger the interconnector's impact on price the greater the trade and production efficiency effects are likely to be. This is already a very low value and of a magnitude that could be considered smaller than the statistical accuracy of the model forecasts. The impact on price will be a function of the steepness of the supply curve (the short run marginal cost curve plus mark-ups). The supply curve has a minimum slope of zero. The likely risk is that the supply curve steepens and that a variety of factors, including wind generation and added interconnection, would move France up the supply curve causing stronger price effects and larger net gains for France. Thus, qualitatively, it is our judgement that the welfare impacts estimated by RedPoint are already quite small.

Revenue impact on existing and future interconnectors

The average annual impact on revenues of the other interconnectors, discounted and calculated to 2038 is estimated by LE using the Ventyx modelling outputs to be -€43m, or -18%.

Our analysis is that the impacts will be larger than those estimated by RedPoint. The same rationales driving the price and modelling differences are expected to be largely driving these differences. With such small impacts, it is, in our view, unlikely that RedPoint have underestimated the impacts.

Our conclusion is that there will be reductions in the value of congestion rents to other interconnectors. These values are calculated as the differences in the modelled prices of congestion rents. With ETM and market coupling, and implicit auctions, this should be the appropriate modelling approach. There is a significant and large variation in the estimated impacts which is a function of the modelling differences. We do not believe there is a large risk that RedPoint have underestimated the impacts, however.

Assumptions

Overall, a large number of assumptions are used in the models and modelling.

There appears to be on the balance an upside risk for the project revenues, meaning that, on balance, ElecLink may overestimate the degree of contract cover needed. Such overestimation may reflect a conservative approach to ensure financeability and overall viability of the project, however.

The modelling results indicate that there are large sensitivities of the models used to predict congestion rents based on the models and assumptions. We believe that, overall, the assumptions of RedPoint versus Ventyx on uplift, or the degree of mark-up, is a significant factor in explaining the differences, but it is difficult to fully ascertain the impacts without a more detailed study.