ESB Generation & Trading Response:

Policy for Electricity Interconnectors: Assessment Criteria for Electricity Interconnection Applications
(CRU/18/131)

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1. INTRODUCTION

ESB GWM welcomes the opportunity to respond to the consultation “Policy for Electricity Interconnectors-Assessment Criteria for Electricity Interconnection Applications Consultation Paper (CRU/18/131). ESB is of the view that interconnection in Ireland to date has been positive. It has provided a link to a much larger market, it has helped to reduce curtailment of wind generation and it has brought a further competitive element to the all-island market.

Interconnection in general has the ability to contribute towards the three principal objectives of energy policy-affordability, decarbonisation and energy security and the proposed additional interconnectors need to be considered under each of these three strands. However, these strands may not cover the full impact of increasing interconnection. It is necessary to consider the “whole of system impact” of interconnection, quantifying the overall impact to the Irish energy market. The overall welfare benefit must be considered by capturing all the costs and benefits of the proposed interconnector. This requires an understanding of how the operation and manageability of the entire energy electricity and gas system changes as we add further interconnector capacity. For example, interconnection generally displaces domestic thermal generation, which provides important benefits for managing system stability and security of supply.

CRU needs to carefully consider how interconnectors can be relied upon to deliver security of supply during future stress events and, accordingly, adopt an approach to de-rating that accounts for some of the risks identified in this response. The energy system is rapidly evolving, both here and in the rest of Europe. In particular, increased reliance on renewables exacerbates the impact of low-wind periods across Europe. As such, credible future scenarios involving faster-than-anticipated renewables build-out and higher interconnection between countries could compromise security of supply in Ireland due to the consequences for power demand over interconnectors during periods when low renewable output (e.g. on a calm, very cold, dark winter evenings) and high system demand coincide in interconnected systems. The DCCAE Consultation Paper signalled that CRU may consider security of supply alternatives to interconnection when considering new interconnection proposals. ESB agrees with this and further suggests that it is included as part of any new interconnector project assessment. Prudence is urged in selection of derating factors for an interconnector, in particular when making comparisons with alternative options for investment for security of supply that it may displace.

While increased interconnection with other markets may help reduce wholesale prices, where arbitrage opportunities present themselves, the benefits of an additional interconnector need to be evaluated against the total cost of supporting the new interconnector including EU supports, cap-and-floor pay-outs, system balancing, procurement of additional and ancillary services increases, onshore reinforcement costs required to connect the interconnector to the transmission system and wider works costs, where they are identified as directly attributable to the proposed interconnector, for frequency control and voltage support.

ESB supports an independent economic and technical assessment along the lines proposed in this consultation document to ensure tangible and quantifiable benefits and costs to electricity and gas consumers are identified, particularly if the Irish consumer is underwriting some of the risk in a regulated funding model. Weighting factors used need to be transparent and consistently used for all interconnector assessments.

ESB’s view is that the regulatory approach selected by CRU should be that which protect the interests of existing and future Irish consumers and retains a level playing field for all investors in the generation and ancillary services markets.
2. OVERALL ASSESSMENT FRAMEWORK

ESB would welcome clarity around the high level assessment framework, timelines and processes, in particular for projects where the cost and/or risk will be borne by the end consumer such as under a ‘cap and floor’ or fully regulated regime. To supplement the comprehensive list of technical, economic and regulatory criteria proposed by CRU in the consultation paper for use in assessment of projects, elucidation is needed around eligibility criteria, the application process and nature of formal assessments to be completed at the key stages of the project (initiation, planning, execution, performance & monitoring, closure and operation). Reporting obligations of the developers throughout the project should also be clarified.

2.1 Interaction with other project proposals

An application window is the approach used by Ofgem for interconnectors and has the advantage of allowing assessment of multiple project submissions in parallel and consideration of the interactions between them. This facilitates a decision on whether all, some or none of the projects are in the interests of consumers. In contrast, the approach in Ireland is ‘case-by-case’ where developers choose when to come forward, allowing flexibility and resulting in regulatory treatment built into their project plans on an individual basis. In any event, ESB considers that there is merit in comparing projects, as the “needs case” for interconnectors can be in competition. This would allow the CRU to take a view on whether all projects coming forward in a given period are in Irish consumers’ interest – and if not, which of the projects would jointly offer consumer benefits.

2.2 Submission of information

The onus should be on developers to provide a high quality and complete submissions to ensure the assessments can be independently carried out by the CRU.

2.3 Eligibility criteria

Any framework for applications from interconnector developers will benefit from a minimum eligibility threshold for projects. This will ensure only projects come forward that are sufficiently mature such that they are looking to make significant investment decisions soon, and will have a sufficiently developed needs case to support an effective assessment process. At a minimum this should include detailed and realistic project plans, a connection agreement (or application in process), and a high quality, complete project submission. The DCCAE in their recently published ‘National Policy Statement on Electricity Interconnection’ acknowledged that grid capacity is a scarce resource, the necessity to discourage capacity-hoarding, and the consequent importance of project promoters being able to demonstrate their resources, capacity, capability, funding and recovery options to successfully deliver a proposed interconnector.

3. ASSESSMENT CRITERIA

The CRU proposal to independently appraise interconnector projects technically and economically is welcome, in particular the intention to avoid a disproportionate burden for Irish consumers. ESB endorses the comprehensive technical, economic and regulatory criteria as proposed in section 4 of the consultation document. It is imperative that the long term interest of Irish consumers is regarded in any assessment. The proposal to publish and consult separately on each electricity interconnection application is welcome, however, clarification is sought on whether this proposed public consultation is in relation to the initial project assessment only or whether there will be public consultations at later stages in the project, e.g., pre and post construction.\(^2\)

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\(^1\) Bilateral between CRU and developer or by public consultation.

\(^2\) A three stage process used in GB- Initial Project Assessment, Final Project Assessment and Post Construction Review
There is no direction signalled on the weighting that will be applied to each criteria in evaluating the project. Weightings selected should be transparent and consistently applied for each interconnector proposal submitted to the CRU.

3.1 Technical Criteria

3.1.1 Sub-synchronous resonance issues

The possible issues arising for generators near the proposed connection point in relation to sub-synchronous resonance (SSR) must also be given due attention. Turbine-generator shaft failure and electrical instability at oscillation frequencies lower than the normal system frequency can result from SSR.

3.1.2 Impact on system operation and technical requirements

The CRU has noted the possible impact of a large interconnector project on system RoCoF limits and system reserve requirements and the need to capture such effects in any assessment. In any event, the Irish system is a relatively small system and the benefits accruing to a larger neighbouring system of interconnection with Ireland may not all be transferrable to the Irish system, given the disproportionate impact of any new market participant in excess of 500MW on the Irish system compared to neighbouring European systems.

3.2 Economic criteria

It is important that Ireland optimises the level of interconnection in the best, long-term interest of the Irish energy consumer. The optimal level for Ireland may fall short of the 15% interconnection targeted by the EU. If, following a detailed cost benefit analysis, it is apparent that the overall benefits do not outweigh the overall costs, then the development of the project would not be consistent with European energy policy and alternative investments need to be investigated to achieve more cost effective ways of contributing to the three pillars of Ireland’s energy policy – sustainability, security of supply and competitiveness.

3.2.1 Security of supply benefits [6.1]

The expected contribution of an interconnector to Ireland’s energy security will be determined by its derating factor. Calculation of an appropriate de-rating factor for an interconnector is challenging. Severe system stress events occur only infrequently – perhaps once every few years – hence rendering it problematic to accurately predict future interconnector reliability. Furthermore, while there is some data on performance of interconnectors in Europe during critical system events, there is no data on the historical performance of interconnectors connected to Ireland during genuine system stress events. The challenges of forecasting, combined with a lack of historical data on which to base de-rating factors, provides ample cause for a cautious approach, especially given the speed at which both technology and policy is changing in Europe.

While stress events impacting Ireland, GB and western Europe, such as cold weather and low wind speed, cannot be predicted with certainty, the mere possibility of their existence makes the estimation of interconnector derating factors very difficult with an associated level of risk that is not the case for domestic generation.

Policy developments in systems directly and indirectly interconnected to the Irish electricity system can potentially undermine the economic assumptions on which interconnector derating factors are based. Participation of interconnectors in Capacity Markets may result in interconnectors “over-committed” in two different markets. Furthermore, differences in capacity market penalty regimes have the potential to distort interconnector behaviour during correlated stress events.
Getting de-rating factors right is critical to ensuring interconnectors make a positive contribution to security of supply. When uncertainty is high, a prudent approach, given the likelihood of error, would suggest a level of reliance slightly below expectation. A simple, but powerful, enhancement on the current de-rating methodology would be to better account for the fact that interconnectors have the potential to make a negative contribution to security of supply during a stress event. Aurora Energy Research have suggested that the maximum range of possible de-rating is from -100% to 100%, compared to dispatchable assets which can only have a de-rating of 0% or more.

Increasing interconnector capacity from the present level will tend to reduce all interconnector de-rating factors (as interconnection capacity increases and the saturation effect begins to manifest resulting in each GW of incremental capacity being worth less than the previous GW). Thus, there will be a growing need to consider the interactions between derating factors among current and proposed interconnectors. [6.2]

3.2.2 Environmental impacts [6.1]

The impact on total carbon emissions in Ireland needs to be analysed as part of an interconnector assessment, in particular when there is a difference in the carbon prices in the interconnected systems. While interconnection may facilitate greater penetration of renewables, it may also result in “carbon leakage” if carbon policies in the interconnected systems are not aligned [6.3].

As noted in ESB’s response to CRU’s earlier consultation on interconnector policy, the impact of different support scheme structures between interconnected jurisdictions need to be fully understood and taken into consideration. The question of how to adequately recognise the benefit and consequences (both indirect and indirect) of the export of zero marginal cost energy to another jurisdiction that has been funded by the Irish electricity consumer through the Public Service Obligation levy needs to be addressed.

3.2.3 Interaction of provision of system service in two energy markets

Consideration needs to be given to the possibility of double accounting of interconnector income from energy and system services markets in assessing cap and floor payments. The double counting is on the basis it becomes a financial insurance type of equation for the investor but it is dependent on there being zero correlation between the two interconnected markets in terms of events and therefore prices, i.e., the gamble is on the interconnector not being needed at the same time by both systems. While, in general, for system services events are not correlated, if events coincide in each system, the interconnector cannot physically provide reserve to both.

3.2.4 Ancillary Services

HVDC interconnectors based on VSC technology are capable of providing Black Start. The benefit to Irish system will be location dependent and this should be evaluated in relation to a proposed interconnector.

Interconnectors using the right technology could contribute to providing reactive power services to the Irish transmission system. The location and technology of a proposed interconnector connection should be assessed in relation to the potential to utilise its reactive power capability to reduce the need to procure reactive services from other sources. A quantitative analysis should be done to compare provision of the service by the proposed interconnector versus conventional means.

Any impact on the stability of the Irish system, given its low inertia compared to that of potential interconnected systems, of FFR provision from a proposed interconnector merits detailed investigation.
3.3 Regulatory criteria

There are alternative regulatory options\(^3\) that would facilitate investment in interconnection and the consultation document avoids detail on these options. ESB’s view is that the regulatory approach selected by the CRU should be that which protect the interests of existing and future Irish consumers and retains a level playing field for all investors in the generation and ancillary services markets.

The CRU’s proposed inclusion of the assessment of expected impacts on regulated prices is welcome. If interconnector capacity leads to retirement of domestic generators, then the TUoS costs will be recovered over a smaller base resulting in higher charges for remaining generators.

The CRU needs to ensure that interconnectors compete on an equal footing with other technologies both in Ireland and in interconnected systems. An interconnector receives / will receive a number of benefits and subsidies not available to domestic generators, including EU subsidies, if it has PCI status and exemptions from TUoS. There are further benefits if there is some of the investment risk is underwritten by the consumer. The reduction in investment risk, and consequently the cost of capital for new investors, is a benefit not available to generators in Ireland who face merchant risk. Also, with the protection of a model such as ‘cap and floor’, an interconnector is indifferent to the clearing price of a capacity auction and can bid a low price, with the moral hazard of leaving the consumer to make whole the asset through subsidy rather than market prices, thereby reducing the clearing price for other participants and possibly providing premature exit signals for domestic generation. This, combined with reduction in incentives for new domestic generators due to low capacity price, may result in adverse issues for longer term energy security and a suboptimal level of interconnection for Ireland overall.

4. TSO’S CONFLICT OF INTEREST

ESB welcome CRU’s commitment to ensure that there is ring-fencing between Eirgrid’s work as a project promoter for the Celtic interconnector and its discharge of functions under its TSO licence.

5. CONCLUSION

ESB is supportive of the assessment criteria set out by the CRU to evaluate interconnection projects. Our view is that a transparent and independently verified economic, technical and regulatory appraisal of any proposed interconnector is essential to ensure the best interest of the Irish energy consumer. ESB is available to discuss any aspect of this submission further.

\(^3\) Developer led without consumer underwriting; Developer led with ‘cap and floor’; Developer led with fixed regulated return; Centrally identified ‘cap and floor’; Centrally identified with fixed regulated return
6. REFERENCES

6.1 “Energy Security in an interconnected Europe”, Aurora Energy Research, May 2018
