



Regulation of Transmission Connecting Non-GB
Generation to the GB Electricity Transmission
System

A Response by EirGrid

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PART 1 – INTRODUCTION

EirGrid welcomes the opportunity to provide a response to the Ofgem consultation on the licensing framework and potential regulatory arrangements for transmission assets connecting generation from outside of Great Britain (GB) to the GB electricity transmission system. EirGrid is the licensed and certified TSO in Ireland and is charged with developing an economic and efficient transmission network in Ireland. EirGrid is also the owner of SONI, the certified TSO in Northern Ireland. EirGrid is also charged with exploring and developing opportunities for further interconnection between the Irish transmission system and those in neighbouring jurisdictions. For these reasons EirGrid has a particular interest in the arrangements for the connection of non-GB generation from either Ireland or Northern Ireland to the GB system, particularly along the western GB seaboard.

In January 2013 the Irish and UK governments signed a Memorandum of Understanding (MoU) on energy co-operation. This MoU forms the basis for Ireland and the UK to develop the technical, regulatory and financial framework to enable Ireland to export renewable generation to Britain. In signing this MoU the two Governments are operating under the provisions of the 2009 E.U. Renewable Energy Directive (2009/28/EC) (“the 2009 Directive”) which sets out the basis for what is referred to as ‘Joint Projects’ between Member States. The 2009 Directive provides a mechanism whereby renewable energy produced in one country can not only be exported to another but can also be counted towards meeting that other country’s national renewable energy target. Since the signing of the MoU, work has progressed steadily on the details of the renewable energy export project/s with input from all relevant stakeholders in Ireland and the UK, and an Inter-Government Agreement (IGA) is expected to be signed early in 2014. An offshore regime, which includes the waters between GB and Northern Ireland, is also actively being developed in Northern Ireland.

The issues raised in the Ofgem consultation are of crucial importance to any agreed renewable export project and there are a range of important technical, regulatory and financial issues that must be resolved before the framework for renewable energy exports can be realised. In designing a renewable export framework, however, it is important to note that each proposed model will be shaped to varying degrees by the existing legal and regulatory frameworks in GB, the relevant non-GB territory and the European Union.

These schemes are the first of their kind in Europe. They have the potential to make significant progress towards EU energy policy objectives including, competition, promotion of renewable energy, energy security, interconnection and reduction of costs to consumers and competitiveness of the EU. Given the relatively unique nature of the projects as proposed, a purposive approach must be applied. Such a purposive approach will seek to focus on the aims of the legislative frameworks as set out as opposed to the specific legislative arrangements in place. EirGrid is confident that suitable arrangements to enable the achievement of the above can be put in place.

EirGrid recognises that the Ofgem consultation relates to all non-GB connections; however for the purposes of EirGrid’s response we will focus on the implications for connections

between Ireland and Northern Ireland and GB, firstly, and primarily, because EirGrid's own statutory and licence responsibilities relate to the exercise of its functions in Ireland and Northern Ireland but also given the level of engagement and progress between Ireland and the UK in relation to the advancement of such arrangements. In all instances EirGrid is not espousing any view on the merits of such projects nor supporting their progression; rather it is simply that insofar as it is determined by governments, and by the developers themselves, that they should proceed that the points raised by EirGrid in this response should be carefully considered and taken into account in the development of the regulatory framework.

PART 2 – KEY MESSAGES FROM EIRGRID'S RESPONSE

1. It is EirGrid's view that a set of arrangements should be put in place which are:
 - a. Fair and equitable to both GB and non-GB generators;
 - b. Economic and efficient in terms of the maximisation of value and appropriate allocation of risk;
 - c. Consistent with and respect the European dimension to what is a cross-jurisdictional project, including closer integration of electricity markets.
2. Market-to-market interconnection will deliver significant benefits, enhancing competition and reducing electricity costs for Irish and GB consumers. It should therefore be delivered as part of the initial infrastructure build of any renewable export project. In the event that for whatever reasons it is determined that market-to-market interconnection should only follow later then clear regulatory, contractual and technical arrangements should be put in place at the outset to enable this.
3. The network infrastructure to connect renewable export projects to the GB system should be economically and efficiently developed and operated in terms of its Design, Construction, Use and Financing. A level of regulatory support consistent with existing GB offshore arrangements will represent one important part of this.
4. Any arrangements extending to cover the physical assets located in non-GB territory should be consistent with the legislative framework for the operation and development of grid infrastructure, including technical standards, oversight, permitting and route sterilisation in that territory. Any set of arrangements which is not consistent with this, and which does not provide benefits to, and respect the arrangements in, the non-GB jurisdiction risks not being capable of timely delivery.
5. Any renewable export project will require oversight and financial recourse extending beyond GB and GB territory. It will therefore be necessary to put in place joint regulatory arrangements between Ofgem and the National Regulatory Authority (NRA) of the non-GB Member State which extends much further than the general duty to co-operate. These arrangements should be codified in any Inter-Governmental Agreement.

6. Work which has been undertaken by EirGrid and NGET¹ (the GB NETSO) shows that there is considerable benefit through the co-ordinated design and development of the network infrastructure to connect Irish renewable export projects to the GB system. Indeed, EirGrid believes that the overall co-ordinated and efficiently developed network infrastructure solution is, in fact, more deliverable as opposed to less deliverable than the alternative.
7. EirGrid does not see any technical challenges which cannot be overcome within the necessary timeframes. Moreover, EirGrid does not see any obstacle which cannot be overcome from a licensing or regulatory viewpoint. This is particularly the case if the exemption provisions are employed appropriately and the project is considered, as we believe it must, within a European framework and in seeking to achieve in a purposive manner those objectives as set out in European policy rather than simply within the existing regulatory architecture in either GB or the non-GB territory.
8. EirGrid recognises such arrangements are not without their complexities. However, through the ‘compartmentalisation’² of both the various elements and usage of the network infrastructure and the appropriate employment of the building blocks which already exist within the regulatory framework, such complexities can be overcome and the benefits outlined above can be realised and delivered in the appropriate timeframe.

¹ This work has been outlined at the Ireland-UK Energy Trading Grid Group of which Ofgem is a member.

² The term and concept behind ‘compartmentalisation’ is further explored and developed in the response to Question 6.

PART 3 – RESPONSE TO SPECIFIC QUESTIONS RAISED BY OFGEM

Question 1: What are the key milestones for the delivery of non-GB generation and connections pre-2020? How does the decision on the regulation and licensing of non-GB connection fit into this timeline?

Table 1 provides a high-level summary of the key milestones that EirGrid believes need to be met if projects are to be delivered by 2020.

Key Milestone	EirGrid perceived latest completion date for delivery by 2020
Decisions on generation quantity, CfD arrangements and regulatory framework	Q2 2014
Irish Renewable Energy Export Policy and Development Framework finalised	Q3 2014
Planning permission achieved	Q3 2015
Procurement contracts for network and generation equipment awarded	Q1 2016

Table 1: Key milestones for delivery of Irish renewable generation export projects.

Renewable Energy Export Policy and Development Framework

In the case of non-GB connections from Ireland, the Irish Government is currently developing a Renewable Energy Export Policy and Development Framework for renewable export opportunities from Ireland, with particular focus on opportunities for large scale renewable energy generation projects to export to the UK. This policy and development framework is expected to be finalised in Q3 2014.

This is a significant milestone and will provide the strategic environmental and planning framework for Irish projects seeking to export renewable energy. Projects will need to be in a position to apply for planning permission shortly afterwards. This will necessitate that all relevant studies be completed by Q3 2014 including, *inter alia*, marine surveys and Environmental Impact Assessments (EIAs). The planning and consenting process is likely to take up to a year resulting in planning being awarded in Q3 2015.

Decisions on Regulation and Licensing

Decisions on the regulation and licensing of the grid infrastructure to connect Irish renewable export generation projects to GB need to be made soon if the projects are to be commissioned by 2020. In order for projects to progress towards financial close, decisions are also needed on the CfD arrangements that will apply (the structure of the subsidy and resultant financial flows, project eligibility and selection etc.) as well as the quantity of renewable generation to be procured.

It is important that clarity on these issues is provided by Q2 2014 as the technical studies, environmental surveys and consenting process carry very significant costs for project developers. Decisions on regulation and licensing, CfD arrangements and the quantity of generation to be procured may be a pre-requisite for investors making such substantial financial commitments.

Equipment Lead Times

Finally, there are only a small number of suppliers serving the HVDC equipment market and consequently there are substantial lead times for HVDC equipment and in particular for HVDC cables. As a result, it is envisaged that contracts for HVDC equipment would need to be awarded in Q1 2016 to allow sufficient time for manufacturing, construction and commissioning. This is assuming that a co-ordinated approach is taken to the development, which could potentially reduce the number of cables required to connect renewable generation to GB relative to an approach based solely on direct and exclusive connections.

Contracts for the renewable generation turbines and the AC transmission equipment would likely also need to be awarded in a similar timeframe to that of the HVDC equipment.

Conclusion

In summary, connecting renewable generation to GB by 2020, whether from Ireland, Northern Ireland or elsewhere, is challenging but achievable. However, it is important that decisions on the regulation and licensing of the grid infrastructure as well as the CfD arrangements are made soon in order to provide sufficient investment certainty for developers of both the generation projects, as well as the developers of the associated network infrastructure, to undertake the studies and works necessary to meet the various planning, and procurement milestones listed in Table 1.

Question 2: From the perspective of a non-GB project developer, how does the decision on the regulatory arrangements interact with Government decisions on renewable support (such as the award of a Contract for Difference (CfD))?

N/A

Question 3: Are there other factors that Ofgem should be aware of relating to the timing and development of non-GB connections?

EirGrid believes that the regulatory arrangements for the renewable export projects should seek to facilitate an overall co-ordinated approach to the development of network infrastructure including the AC generation collector network built in the non-GB territory as well as the HVDC connections transporting the renewable energy to Great Britain.

Such a co-ordinated approach would facilitate the development of an integrated multi-purpose optimised network, which would minimise costs to consumers, provide transmission redundancy to the renewable generators, minimise the environmental impact

of network development in both GB and the non-GB territory, capture the benefits from market-to-market trading, and help to achieve wider policy goals such as electricity market integration.

The optimum number of HVDC cables required will depend on the quantity of Irish renewable generation to be connected to GB. However, in general, a smaller number of larger links are preferable to a larger number of smaller links both from a cost and environmental perspective. For larger quantities of generation, a co-ordinated approach could reduce the number of HVDC links required relative to an approach based solely on independently developed direct and exclusive connections. Aside from the substantial cost savings, this would reduce the risk of delays in the procurement, manufacturing and installation of the HVDC cables.

Another significant challenge in the Irish case relates to the planning consent process in Ireland. The Irish planning authority, An Bord Pleanála, will be concerned about the cumulative impact of multiple individual project proposals and any impacts resulting from a lack of co-ordination between them. A co-ordinated approach to development, which minimises the associated network infrastructure in particular, may make it easier for planning authorities to assess projects and reduce the risk of delays. Many similar challenges also exist in Northern Ireland.

Question 4: Do you agree these are appropriate principles to take into account in relation to non-GB connections?

EirGrid agrees with Ofgem’s view that protecting the consumer, promoting efficient capital and operational network costs, promoting the coordinated development of the network assets and supporting investment in low carbon electricity generation are important principles that should underpin the development of the renewable export projects.

In order to minimise overall costs the arrangements should be as economic as possible and allocate risk to the party best able to manage the risk. This is likely to lead to a lower cost of capital and ultimately minimise costs to consumers who will ultimately bear the cost of the delivery of the infrastructure whatever the model for its financing and support. These issues will be explored further under Questions 14 and 15.

EirGrid notes the importance of ensuring that flexibility is retained in the regulatory arrangements and that whatever approach is adopted is one which can facilitate multiple uses.

Question 5: Are there other principles that we should also consider?

EirGrid considers it important to note the unique nature of these projects. The idea of ‘Joint Projects’ stems from the provisions of the 2009 Directive and an agreement of this kind has not been developed in the European Union to date. This project, therefore, poses new challenges for national regulatory authorities to consider, but it also provides new

opportunities to proffer innovative regulatory solutions, which, through the medium of an Inter-Government Agreement, may not be limited by the shape of existing regulatory arrangements in either GB or non-GB territory.

In this context, it is important that a purposive approach is taken to the existing legislative framework and that the arrangements are developed and considered through a European lens and within an overall European energy policy context that seeks to promote further interconnection and enhance market competition in the electricity sector.

Question 6: We invite views on our interpretation of the different asset definitions / boundaries and interpretation of the legislation provided in this chapter. What implications does this have for the regulatory options presented in the next chapter?

Asset Definitions/Boundaries

EirGrid agrees with the interpretation of the different asset boundaries as outlined in Chapter 3 of the consultation paper. In the Irish case, Ireland and GB have separate jurisdictional arrangements as regards regulation and licensing and therefore it is important that a cross-jurisdictional regulatory approach is taken when designing the regulatory framework and licensing arrangements for the 'Joint Projects' as a whole. EirGrid would note, however, that what is being proposed by both governments is not a typical market-to-market interconnector.

The consultation paper sets out three options for the regulatory treatment of non-GB connections, based around the concept of the transmission assets being part of an interconnector licence.

The interconnection definition by Ofgem will place certain European legal requirements on each project option, including on the use of revenues from the Interconnector usage, and in regard to Capacity Allocation and Congestion Management, Third Party Access etc.

Interpretation of Legislation

The interpretation of legislation outlined in Paragraphs 3.2, 3.3 and 3.4 of the consultation paper is in accordance with EirGrid's understanding of relevant UK legislation. Given this, an interconnector licence appears to be the appropriate licence for the cross-jurisdictional portion of the proposed asset configuration.

However, the GB licence for interconnectors was originally developed and put in place for only a single purpose – market-to-market interconnection – whereas it is clear that in the case of renewable export projects the assets will fulfil a variety of uses. The employment of exemptions, and indeed special conditions, must therefore be thought of in that context.

The European policy framework promotes the development of both traditional market-to-market interconnection and also provides for 'Joint Projects'. It would therefore be undesirable if either the European rules themselves or the licensing arrangements as apply in GB were to frustrate the delivery of a set of arrangements which would facilitate both of

these goals. Indeed, EirGrid would go further and state clearly that this should not be allowed to happen and that, where necessary, a purposive interpretation of the rules and arrangements must be taken which enables the fulfilment of the European objectives within the context of the European framework.

Implications on Regulatory Options

EirGrid's believes that it is important that flexibility is retained in the arrangements and that whatever approach is adopted is one which can facilitate the multiple uses that EirGrid has outlined above, and will further outline in its response to Question 11 below, which have the potential to deliver significant overall benefits.

To date GB (Ofgem) has adopted a particular approach to the development of interconnection; but as outlined above, what is envisaged here is not a 'typical' interconnector.

To date GB (Ofgem) has employed a particular approach to the development of Offshore Transmission through the OFTO regime; yet what is envisaged here is not 'typical' offshore.

To date GB (Ofgem) has employed a particular approach to the funding of GB reinforcements; yet what is being envisaged here – the siting of GB reinforcements on non-GB territory is not 'typical' in terms of its approach.³

Each of the existing regulatory regimes has established building blocks. EirGrid believes it is important that in developing the arrangements that these are not lost sight of. Moreover, EirGrid understands that while many of the particular regimes could not be applied wholesale or without amendment given the non-GB nature of elements of the arrangements, that nonetheless provision exists for the building blocks to be applied individually, in many instances to achieve the same effect.

EirGrid believes it is also important that non-GB generation is accorded fair and equitable treatment and not disadvantaged relative to GB generation. GB generation is accorded a level of regulatory underwriting and certainty in relation to the offshore transmission assets through the OFTO regime which has enabled such assets to be financed at lower cost; if non-GB generation were not to be accorded similar treatment then it would ultimately have to be reflected in a higher CfD payment arrangement.

EirGrid therefore believes that in developing a framework what matters is both geographic location (is the asset within GB territory, non-GB territory or cross jurisdictional?) and use of the assets concerned (are they facilitating renewable exports, market-to-market trading, or overall network support in either the GB or non-GB jurisdiction?). This is particularly the case given that the existing frameworks which pertain for each use in both GB and also in the non-GB territory, no one approach is necessarily fit for purpose for all uses in either jurisdiction.

³ EirGrid does note that some provision does exist in Europe for the compensation of the hosting of cross border flows through the Inter TSO compensation fund.

It is for this reason EirGrid believes that a ‘compartmentalised’ approach, whereby the various assets and uses can be ‘compartmentalised’ and a separate and potentially different approach be applied to each, could bring many advantages. In that manner it is possible to tailor the regulatory regime to apply appropriate incentives, as well as fairness and equity, to each element of the network infrastructure, building and drawing upon the existing frameworks as pertain in both GB and the non-GB Member State. A stylised diagram of the various assets, and uses, is presented below.

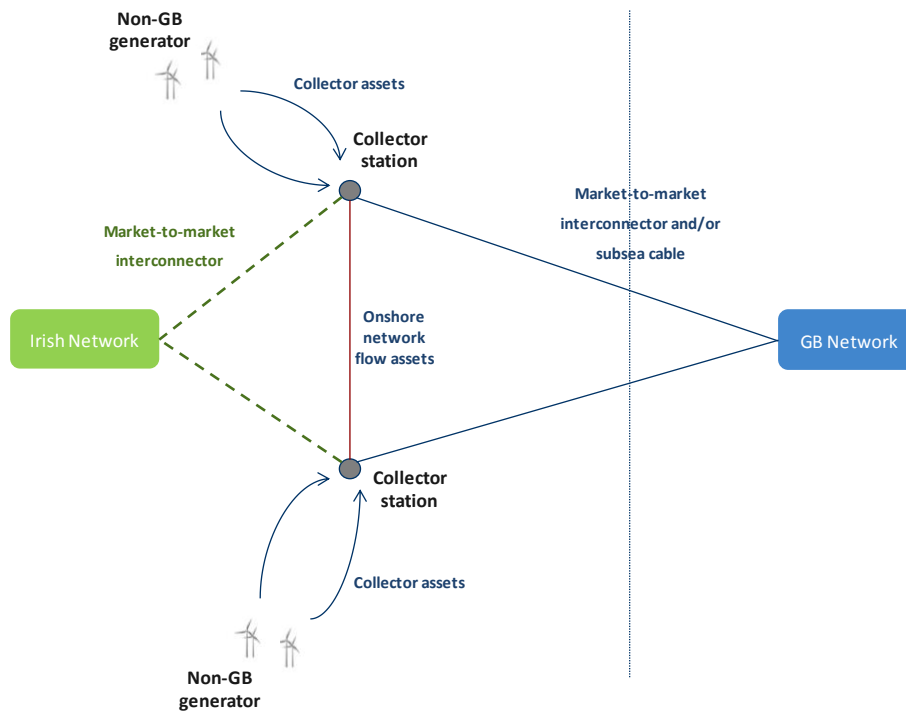


Figure 1: Stylised representation of ‘compartmentalisation’.

Through a ‘compartmentalised’ approach Ofgem can seek to respect, while at the same time adapt, its existing frameworks (recognising always that it is important that the bespoke nature of the particular arrangements and the European dimension are taken into account). Equally, such an approach could be designed to both respect and facilitate the non-GB arrangements which would clearly be necessary in the context of cross-jurisdictional projects such as these.

EirGrid recognises that ‘compartmentalisation’ could be seen by some to increase the number and complexity of interfaces. In reality, however, this need not, and would not, be the case. Through the putting in place of an appropriate set of institutional arrangements and an institutional framework which facilitates multi-purpose non-GB generation connection networks and in particular the ‘compartmentalised’ structure complexity would be reduced, not increased, and clarity for all parties enhanced.

This institutional framework would be embedded within the legal, regulatory and commercial arrangements including the Inter-Governmental Agreement reflecting the multi-purpose use of the assets and the expected size and cross-jurisdictional nature of the non-

GB connection projects. Through the set of institutional arrangements the appropriate mechanisms for user commitment, anticipatory investment, regulatory oversight, appropriate incentivisation and the allocation of both volume and stranding risk can be managed in a similar manner to that which currently pertains under existing regimes in both GB and non-GB territory.

Therefore, under a compartmentalised approach, all the benefits of the existing regimes which have been developed over many years and put in place for very good reasons can be realised. Contrast this with the Developer-led, fully merchant model where the cost of finance is higher (see Questions 14 and 15), anticipatory investment comes without a level of user commitment. The replication of a set of contractual arrangements to underpin multiple use under this approach would be extremely difficult.

EirGrid would welcome the opportunity to discuss the practical outworkings of a ‘compartmentalised’ approach further with Ofgem.

Question 7: We are interested in views from stakeholders on what impact alternative interpretations would have on potential projects? Please provide detail where possible.

EirGrid notes the importance of adopting an approach/regulatory regime that can facilitate multiple uses and has set out a possible ‘compartmentalisation’ framework in its response to Question 6.

Question 8: We seek input from stakeholders on how generation licensing for non-GB generation could ensure appropriate safeguards for the export of renewables to the GB transmission system?

As the purpose of the connection of non-GB generation to GB is to provide for the transfer of renewable power to GB from non-GB territory it would be important that the overall arrangements and licensing of non-GB generators provided the necessary verification to GB authorities that the power was being sourced from renewable sources of generation.

In respect of the grid infrastructure, it is EirGrid’s understanding that it is intended that the network infrastructure connecting non-GB renewable generation to the GB network would be required to be unbundled from the renewable generation and therefore it would be the TSO of this unbundled network who would have an interface with the main National Grid transmission system, and with Ofgem, and who would be required to co-operate with the GB NETSO in accordance with the general obligations pertaining on TSOs to co-operate under the European legislative arrangements.

The obligations to interface with the GB system would therefore come under the contractual and licensing arrangements around the interface between the operator of the cross-jurisdictional assets and the GB NETSO, as they do with any other interface between the GB system and a third party. As a result it would not be necessary that they extend to non-GB generation or indeed to any generation collector network infrastructure, which

would rather be required to interface with the operator of the cross jurisdictional network infrastructure.

These set of arrangements in terms of the ‘Relevant System Operator’ are further discussed in paragraphs 6.12 – 6.14 of the consultation paper. It is not clear therefore what additional arrangements over and above that connected to a separate transmission system would require. Of course, the arrangements would need to be underpinned by a set of joint regulatory arrangements and perhaps also an inter-NETSO agreement/relationship.

EirGrid welcomes the fact that Ofgem recognises (in paragraph 6.14) the importance of engaging with NRAs and NETSOs in other Member States. EirGrid would be happy to engage with both Ofgem and the GB NETSO on this.

Question 9: Are non-GB connections deliverable by 2020 via direct and exclusive connections?

As already outlined in the answer to Question 1, delivering connections by 2020 will be challenging. This will be the case regardless of whether the connections are direct and exclusive or multi-purpose.

One of the biggest challenges in either the case of Ireland or Northern Ireland will be the planning consent process – this should not be underestimated in terms of the time it may take to achieve full planning consent. A co-ordinated approach to development, which minimises the associated network infrastructure in particular, may make it easier for planning authorities to assess projects and reduce the risk of delays.

The technical challenges of designing, constructing and operating an AC fully cabled collector network, on the scale envisaged in Ireland, connected exclusively to a HVDC network should also not be underestimated.

Finally, clarity on the regulation and licensing of the grid infrastructure to connect Irish renewable export generation projects to GB as well as on the CfD arrangements that will apply is required for projects to connect by 2020 as outlined in our response to question 1. In the first instance, this is needed to provide developers with the investment certainty required for them to continue to commit capital to development studies and works. Longer term, it is important that the arrangements are such as to provide sufficient investor certainty to attract finance and enable projects to reach financial close.

Question 10: What are the technology challenges of delivering direct and exclusive connections? What are the technology challenges of delivering multi-purpose assets?

EirGrid contends that delivering multi-purpose assets does not present a greater technology challenge or risk relative to delivering direct and exclusive connections while providing for many significant benefits to be captured.

There will be technology challenges regardless of whether the connections are direct and exclusive or multi-purpose assets. Due to the distance between Ireland and Great Britain, connections will have to be built using DC technology. AC technology is prevalent worldwide and standard solutions can be developed for projects but the same cannot be said of DC technology. Every DC connection project demands a bespoke and innovative solution requiring project developers to take on elements of risk.

There are two types of DC technology – Line Commutated Conversion (LCC) and Voltage Source Conversion (VSC). For islanded wind generation networks such as those envisaged for the Irish renewable export generation projects, VSC is the only feasible HVDC technology as unlike LCC it does not require a strong AC network in order to operate.

HVDC VSC systems essentially consist of two main components – the cable and the VSC converter stations at both ends of the cable. The rating of VSC converter stations is limited by Integrated Gate Bipolar Technology (IGBT) capabilities, which are continually improving. The Ofgem-commissioned 2013 SKM report⁴ states that VSC converter stations can currently reach up to 1600A and are expected to reach 2000A (at voltages up to 600kV) by 2016, providing the potential to deliver a symmetric monopole or bipole solution that achieves a power rating in excess of 2.2GW. An order for a converter station with this higher rating has not been placed yet.

With regard to cables, two technology options exist – Mass Impregnated (MI) cables and Cross Linked Polyethylene (XLPE) cables. Achieving the high power ratings outlined above for a VSC project as a whole is likely to require the use of MI cable technology, which is a more mature technology than XLPE. For example, National Grid has procured $\pm 600\text{kV}$ 2.2GW MI cables on their Western Link project (expected to be in service in 2016). By comparison, XLPE cables are presently limited by a lower maximum operating voltage ($\pm 320\text{kV}$ - note that there is no service experience at this voltage), which limits the power rating to 1GW⁵.

It is clear then that HVDC technology (VSC converter stations with MI cables) is capable of providing the large capacity connections required to facilitate integrated connection solutions. An integrated solution would reduce overall project risk relative to a direct and exclusive connection solution by providing multiple paths to market resulting in greater transmission redundancy and resilience. An integrated network solution would also enable a larger amount of Irish renewable generation to connect to the Great Britain MITS in the period to 2020.

In terms of facilitating market-to-market trading, multi-terminal HVDC technology offers one feasible solution. This would involve using a single additional AC-DC converter station to connect into the Irish grid. The SKM report states that the first VSC single-vendor three-ended multi-terminal scheme is expected to be operational by 2014 (the South West Link connecting Barkeryd and Hurva in Sweden).

⁴ SKM report on “Review of Worldwide Voltage Source Converter (VSC) High Voltage Direct Current (HVDC) Technology Installations” (2013):

<https://www.ofgem.gov.uk/ofgem-publications/52726/skmreviewofvsvchvdc.pdf>

⁵ Ibid

Market-to-market trading is not dependent on multi-terminal technology however. Market-to-market trading could also easily be facilitated using existing mature back-to-back VSC technology, such as that used in the East-West Interconnector.

Question 11: What are the potential benefits and challenges of enabling flexibility for a non-GB connection to also be used for a) market-to-market trading; and b) GB network reinforcement? What are the implications for investment certainty?

Market-to-Market Trading

In February 2013, EirGrid and National Grid Electricity Transmission published a joint report⁶ that explored the benefits to Great British and Irish consumers that might be achieved by an integrated network solution that includes connections to the Irish transmission system, thus increasing power transfer capacity between Great Britain and Ireland and facilitating market-to-market trading.

A key finding of that report is that the additional cross-border integrated network capacity provided by such a connection would provide similar benefits as another Great Britain - Ireland interconnector, but at a fraction of the cost and without impacting on the development timeframes, costs, or the available network capacity for and access rights of renewable energy export projects.

The benefits of this additional cross-border capacity would include:

- Increased capacity for cross-border trade;
- Increased sharing of response and reserve;
- Reduction in the total generation capacity required to maintain security of supply;
- Reduction in overall capital costs and environmental impact;
- Future flexibility for network evolution and further integration.

For a single new 0.5 GW connection to the Irish transmission system, the studies estimated the annual benefits to be £60m (€75m) per annum.

The capital cost of the connection to the Irish transmission system depends on the connection technology employed. The preferred technology option has an estimated capital cost of £80m (€100m). By comparison, a stand-alone interconnector (similar to the recently commissioned East-West Interconnector) would cost in the region of £450m (€550m). In terms of cost-benefit, the preferred option for a single new 0.5 GW connection to the Irish transmission network has a payback on capital costs of less than two years with the benefits from market-to-market trading accruing for the remaining asset lifetime.

⁶ EirGrid-National Grid Joint Report on “Connecting Wind Generation in Ireland to the Transmission Systems of Great Britain and Ireland” (2013):
[http://www.eirgrid.com/media/ExportingRenewableEnergy-JointStudybyEirGridandNationalGrid\(Feb%202013\).pdf](http://www.eirgrid.com/media/ExportingRenewableEnergy-JointStudybyEirGridandNationalGrid(Feb%202013).pdf)

For these reasons, market-to-market interconnection should be delivered as part of the initial infrastructure build with benefits accruing to consumers on both islands. This would enable the benefits to be realised as early as possible. It would also have other additional benefits for example, putting in place the commercial contracts and arrangements from the outset will help to avoid any potential legal difficulties arising from changes to the contractual arrangements of parties at a later stage. Early clarity on these contractual arrangements would provide a greater level of investment certainty to the renewable export generation project developers and financiers.

Incorporating interconnection as part of the initial infrastructure build would require additional development works. However, EirGrid believes that it would be possible to schedule works so that these elements are not on the critical path and to include contingency plans that ensure that any delays to these elements would not delay the overall programme for connection of renewable generation to Great Britain.

GB Network Reinforcement

A co-ordinated approach to the connection of Irish renewable generation to GB could potentially provide benefits by avoiding or deferring reinforcements on the GB network. This would be dependent on the volume and location of Irish renewable generation capacity, the routing of grid infrastructure, and the connection points to the GB network.

There is an existing framework within the European architecture which seeks to promote the development of market-to-market interconnection; however it is the development of a framework for the siting of GB reinforcement on non-GB territory which is, the more novel and which would require the greatest additional outworking in terms of the arrangements and which would require the greatest level of co-operation between the bodies in the non-GB state.

Conclusion

EirGrid believes that where enabling flexibility for a non-GB connection to serve multiple purposes can provide benefits for consumers, as is outlined for market-to-market trading above, or indeed for GB network reinforcement as the case may be, then the regulatory framework should be developed in a manner that provides sufficient investment certainty to enable it to happen. This will ensure the delivery of mutual benefit to the non-GB territory, GB and developers and make certain that such overall benefit is maximised.

In our response to question 6 we set out how these challenges can be overcome through the adoption of a 'compartmentalised' approach underpinned by a set of institutional arrangements.

Question 12: Is the interconnector licence with exemptions(s), as currently available, a feasible option for non-GB connections? If not, what are the key challenges of applying this route to non-GB connections? How could these challenges be addressed?

EirGrid believes that an Interconnector model with exemptions approach might be feasible so long as the possible exemptions are used appropriately. There are many aspects to this approach, however, which can impact on the overall method of funding and cost of financing for the renewable export project that should be examined further.

It is important to note, however, that it can be difficult to obtain these exemptions as the EU Commissions' preference is for the development of regulated interconnectors. Thus, there are inherent complexities associated with the exemption route that increase the risks to the project.

In devising regulatory solutions to manage these challenges, it is important to reaffirm that an agreement of this kind has not been developed in the European Union to date. The idea of 'Joint Projects' stems from the provisions of the 2009 EU renewable energy Directive and poses new challenges for national regulatory authorities to consider, but it also provides new opportunities to proffer innovative regulatory solutions, which through the medium of an Inter-Government Agreement, may not be limited by the shape of existing regulatory arrangements in both Ireland and GB.

EirGrid has set out a framework of compartmentalisation in response to Question 6 under which these challenges can be addressed.

Question 13: Under this route would an exemption (under Article 17 of the Electricity Regulation) be required? If so, which provisions would you seek exemption from? How would your project be affected if exemptions could not be applied for?

In general EirGrid believes that assets should be defined by use and a compartmentalised approach be employed (see answer to question 6).

However, in the event that an interconnector licence with exemptions is applied in each of the options proposed it is likely that exemption/s under Article 17 of the Electricity Regulation (2009/714/EC) would be required.

It is likely that a range of exemptions from EU rules around the following will be required:

- Third Party Access rights (providing long term access rights for export projects);
- Unbundling;
- the Use of Revenue;
- Capacity Allocation; and
- Congestion Management

EirGrid is not familiar with all of the permissible approaches within the GB framework. Of course, ultimately it is not the GB framework alone which matters but also that within the

non-GB territory, with both frameworks working together to meet the overarching European policy objectives of closer market integration, whilst at the same time facilitating cross border renewable trading. Any approach proposed by Ofgem must therefore be assessed against the degree to which it is compatible with the framework in the non-GB territory and ultimately the European policy goals.

Question 14: Given that an application of the regulated Cap and Floor or fixed revenue model would take time to implement for non-GB connections, should these still be explored further?

Yes, application of the Cap and Floor and Fixed Revenue models should be explored further.

A framework for non-GB generation connection networks that is able to deliver an efficient allocation of risk between network users and investors, underpinned by clear regulatory principles, will help facilitate the financial deliverability of non-GB generation projects and lead to efficient financing costs of the associated network infrastructure.

We believe that a regulatory framework that allocates those risks to transmission asset owners which they are *able* and *best placed* to manage, whilst being underpinned by clear and established regulatory principles of revenue support for investment into network sectors, will best achieve this objective.

Regulatory backed revenue regimes which are typically applied to core regulated infrastructure assets – including onshore and offshore electricity transmission – have helped to ensure a cost of capital for price regulated utilities which is typically considered to be much lower than would be derived for a typical corporate.

Investors have developed confidence in stable regulatory frameworks which allow them to recover the capital they invest into the assets, with an appropriate (risk adjusted) return provided that agreed performance levels are met.

This is illustrated by the recent financing of Offshore Transmission Owner (OFTO) licensees following competitive tenders completed by Ofgem:

- The fixed revenue model, underpinned by consumer underwriting and a strong payment counterparty in the GB NETSO, has been received relatively favourably by investors and ratings agencies and has helped to overcome some of the novelty of the new market and OFTO project risks.
- This led the National Audit Office in the UK to conclude that the initial costs of debt and equity from initial OFTO projects had potentially led to favourable outcomes for consumers given the prevailing financing environment *and* that there was scope for improving financing costs of OFTO projects in the future.⁷

⁷ NAO (2012): 'Offshore electricity transmission: a new model for delivering infrastructure'

EirGrid sees no reason to believe similar regulatory principles and allocation of project risks as are applied to OFTOs, if applied to non-GB generation connection transmission networks, would not lead to similar outcomes in terms of:

- project financial deliverability; and
- the competitiveness of financing costs (when compared to returns typically required for investing in core regulated infrastructure sectors).

In contrast, the interconnector licence exempt approach which Ofgem discuss in its consultation paper, would expose investors to:

- the underlying performance of the non-GB generating assets as users of the transmission connection system; and therefore
- various stranding, payment and infrastructure usage risks that investors are typically not required to face under core regulatory regimes.

If such an approach were adopted, the impact is likely to be that non-GB generation connections are treated, from an investor perspective, as higher risk, with higher required returns, and as an asset class much closer to electricity generation and more “merchant” based infrastructure investment opportunities.

Ofgem has not articulated in its paper why it believes that these models would take more time to implement.

Question 15: If so, what are the main challenges and benefits of applying a regulated Cap and Floor or fixed revenue model to non-GB connections? How could these be addressed?

While all models under consideration have particular challenges, EirGrid would highlight the importance that the model chosen be designed in an economic and efficient manner.

The benefits of a level of consumer underwriting is a more appropriate allocation of risk which is diversified among consumers and which leads to a lower overall cost of financing. Whilst EirGrid has not sought to quantify such difference it could easily be of the order of 300bps which, given the scale of infrastructure envisaged in relation to non-GB connections is significant.

Moreover, as articulated in Question 14 above this would be consistent with the existing OFTO regime, which has been seen to deliver demonstrable benefits and would, if a similar fixed revenue regime was applied here ensure a level playing field for both GB and non-GB generation.

EirGrid recognises the arrangements are not without their complexities. However, EirGrid would refer back to its response to Question 6 wherein it referred to the concept of ‘compartmentalisation’ underpinned by a set of institutional arrangements, including regulatory arrangements, which would enable mechanisms to be designed which best meet

each of the respective uses. EirGrid believes that these arrangements, appropriately designed, would enable any particular challenges to be overcome.

Question 16: What is the appropriate mechanism for ensuring access to capacity for non-GB generation?

As part of the overall regulatory and commercial framework for the renewable export project, an appropriate mechanism that provides for long term access rights for the renewable projects exporting to the GB electricity market will be required (see question 13).

This mechanism will need to be compliant with EU legislative requirements where necessary (see Question 20 for further details).

Question 17: What are the implications of following the current connections process for non-GB connections? Should non-GB generators be treated differently to GB based generation? Should non-GB generators be treated differently to other interconnector users? If so, please provide your reasoning.

EirGrid has no comment on this question save for the general principle that non-GB generation should be accorded a fair and equitable set of arrangements as pertain to GB generation.

Question 18: How would the role of the interconnector operator need to adapt if a direct-connect asset was used for additional purposes – such as a) market-to-market interconnection; or b) GB network reinforcement? Should the GB or non-GB NETSO have a role in operating these assets? If yes, what role?

EirGrid sought to address these issues in its response to Question 8.

It is EirGrid's understanding that there would be a TSO (interconnector operator) certified by the NRAs in both jurisdictions, who would be responsible for the operation of the cross-jurisdictional assets regardless of whether there is market-to-market interconnection, and that this is in accordance with both the existing GB and European framework. This TSO would be required to co-operate with the GB NETSO in accordance with the general obligations pertaining on TSOs to co-operate under the European legislative arrangements. This could be further reinforced through a structured inter-NETSO agreement/relationship.

The arrangements must also be considered in the context of compatibility with those set out in Directive 2009/72/EC whereby full ownership unbundling is required and each TSO is responsible for the carrying out of the TSO tasks as set out in Article 12. Given this, EirGrid believes that the separation of operation and ownership of the interconnector asset would require further careful consideration and the requirements may best be facilitated through a set of contractual arrangements between the GB and non-GB NETSO as has existed for all other interconnectors to date.

EirGrid welcomes the fact that Ofgem recognises (in paragraph 6.14) the importance of engaging with NRAs and NETSOs in other Member States. Should Ofgem develop any more specific views in this regard, EirGrid would be happy to engage with it in relation to the arrangements as they would apply in the case of either Ireland or Northern Ireland.

Question 19: Can the existing charging/cost allocation approaches used onshore or for interconnection be applied to non-GB connections? If not why not and what alternatives are available?

EirGrid has no comment on this question.

Question 20: How can capacity allocation for direct and exclusive connections ensure consistency with European legislation and European Network Codes? How could this be achieved with the introduction of market-to-market connections?

In the case of a direct and exclusive connection, where no capacity is offered or is to be offered to market participants, and taking the Ofgem interpretation that the cable will be an interconnector under EU law, it is difficult to see how such an arrangement could be consistent with European Legislation or European Network Codes without exemptions.

European energy policy objectives are designed to promote closer market integration, whilst at the same time facilitating cross border renewable trading. EirGrid believes that a 'Joint Project' that provides for market-to-market interconnection would be more likely to secure the necessary exemptions.

Question 21: Are there other challenges we should be considering when looking at non-GB connections?

EirGrid has no comment on this question.