

Warwick Energy Limited

Comments on National Grid Consultation Document GB ECM-08

Scope

This document summarises Warwick Energy Limited's (Warwick's) initial comments to the National Grid Further Consultation Document entitled "Modification Proposal to the Transmission Network Use of System Charging Methodology to introduce charging arrangements associated with Offshore Transmission Networks".

The following sections deal with the National Grid revised proposals as set out in Section 6 of the October 2008 version of GB ECM-08. Warwick has not examined the Appendices in any detail – and assumes that the wording is simply a translation of the proposals set out elsewhere into formal code form.

Detailed Comments

Section 6 Proposed Modification

Warwick is concerned that the proposals are based on a steer from Ofgem as outlined in Section 5 of the Consultation document. The aim of this steer appears to be to minimise any non-locational element of the charges. This by definition removes one of the main justifications used by Ofgem in selling the entire OFTO regime to the industry in the first place. Warwick believes that Ofgem should revert to the underlying principles that the main part of substation costs should be treated as non-locational assets.

In support of this it is noted that the Government has set massive target for renewable offshore energy giving a clear signal that this is to the benefit of all users, and the country as a whole. Given the requirement to develop Offshore generation to meet wider energy needs, developers have no choice but to locate substation assets Offshore. As such the assets should be treated as non-locational and their costs socialised. This approach would also be consistent with the existing Onshore regime.

Warwick believes that the steer given to National Grid by Ofgem is clearly discriminatory against an entire class of users – and to the detriment of the country as a whole. In this case wider strategic goals should take preference.

On a wider note Warwick believes that there appears to be an increasing over-emphasis on locational signals within the regulatory regime. Aside from changes for OFTOs there are also the proposed locational DUoS charges. In general businesses often do not have a real choice about their location as there are many other over-riding issues to be considered; e.g. for demand customers availability of work force, suitable sites, transport links, location of customers etc.

There are equivalent factors for Offshore generation where key locational drivers include Crown Estates requirements, environmental considerations, subsea ground conditions, availability of cable routes, location of shipping lanes, MOD Radar etc. Set within this context the idea that a locational cost signal within the TNUoS charge will in reality alter location of new generation sites is somewhat naïve. In this respect Warwick is sympathetic to the recent paper from Scottish Government which expresses a similar view – albeit in that case the driver is specifically related to generation in Scotland.

Warwick also notes that there are major differences between Onshore charging zones – but historically areas such as “Peninsula” have not attracted major new projects despite the clear TNUoS signal from the associated negative charging zone. It is therefore questionable that there is any positive impact from locational signals in determining project location.

Warwick therefore supports the view that there should be a fundamental review of the entire charging structure – and supposed locational signals in particular. This would need to apply equally to Onshore and Offshore areas.

Section 6.1 Description of Proposed Modification

No comment

Section 6.1.1 Offshore Connection / Use of System Boundary

Warwick supports the offshore connection/ use of system boundary being at the Offshore Substation LV busbar. With reference to an offshore wind farm this will be at the outgoing LV feeder to individual turbine strings.

Section 6.1.2 Offshore Circuit Expansion Factors, Security Factors and Substation Tariffs

The proposed split between locational and non-locational elements is noted. No detail of the proposed STC process proposed to obtain a breakdown of OFTO costs is given. It is therefore not clear to Warwick how this process is to obtain the information in an open and transparent manner. The OFTO will have no motivation to split costs fairly since all monies are recoverable anyway (whether socialised or not). However the accuracy of the information will affect the contribution to overall OFTO costs met by the generator and demand customers alike – and hence affect fundamental project economics. Warwick would request further information on this part of the proposed process and how this concern is to be addressed.

Expansion Factors

In terms of locational elements the proposal is to include the offshore cables and reactive compensation equipment within the locational charges. Warwick understands that these costs will arise from the locational element of OFTO costs and effectively be 100% passed through to the generator.

The longer term future of Offshore transmission is likely to involve interconnection of projects – if the most economic network is to be developed. Indeed it may ultimately be beneficial to provide interconnection between different points on the Onshore transmission system. Such circuits would then become part of the MITS. It is clear that Offshore cable circuits should then be treated as part of infrastructure. There appears no means in the proposed charging regime of recognising this.

Given the most pressing need is to allow OFTO's to bid for transitional projects the above limitation is not critical in the immediate short term. However Warwick believes the effective limitation of the proposals to radial networks should be explicitly stated in the Charging Statements. Further work should also be carried to address this fundamental issue and the overall charging regime modified accordingly.

Warwick notes the point made by National Grid that Onshore generators are able to sell their reactive capability to the System Operator. If, as is currently proposed, the generator is required to fund the reactive capability then any commercial benefit to the OFTO should be recoverable by the generator. The difficulty with this is that the generator will not be in control of the reactive plant – and the OFTO will not gain any benefit from bidding its

reactive capability. This issue arises from the difference in basic ownership structure in comparison to the Onshore regime – and the remote location of the reactive compensation equipment from the connection point.

One possibility would be for the generator to be able to instruct the OFTO to provide reactive capability to the System Operator – all benefits from this could then be passed to the generator with some allowance for the OFTO's reasonable costs in complying with the generator instructions.

Warwick supports National Grid's view that further work is needed to address the issue of reactive provision to the System Operator – and suitable proposals are required before commencement of the first round of transitional project bids

Warwick also believes that the proposal to include the entire reactive compensation within the locational charges effectively discriminates against Offshore generators. This view has been expressed in response to the previous consultation but has not been taken into account within the latest proposals. This issue should be addressed or the decision to ignore these views clearly justified. The documentation does not appear to do this and further work is therefore needed in this area.

In particular there are a number of inconsistencies and difficulties in comparison with treatment of Onshore connections.

- For an Onshore system the Connection Conditions are defined at the Connection Point. By definition this will be local to the site at the entry point to the Onshore Transmission System;
- The Connection Conditions to be met for an Offshore system are defined at the OFTO boundary with the Onshore Network i.e. at a geographically remote location to which the generator is not directly connected;
- For an Offshore system the Connection Conditions at the Offshore Entry Point proposed are not clearly defined (note earlier responses from Warwick to Ofgem in the area of Quality of Supply issues);
- For a generator unit (based on a wind turbine of particular manufacture and type) the reactive compensation equipment for an Onshore project is required to compensate any deficiencies in machine characteristics to meet the Grid Code at the connection point; i.e. this excludes any effect of the passive transmission network extension to the Onshore Transmission System;
- However for an Offshore connection the reactive compensation equipment is required to correct for any deficiencies in the machine characteristics plus the effect of the passive network. This arises due to the difference in the definition of Connection Conditions;
- Based on Warwick's experience the passive network has a significant effect on the required compensation plant. For instance additional reactive compensation is required to correct for any passive network capacitance or reactance – i.e. the OFTO cables and transformers;
- A further effect is that during system voltage swings additional high speed response from SVC units is required to compensate for the rapid VAR swings resulting from changes in voltage on the passive network. This effect leads to the need to increase the size of any necessary SVC units and therefore a consequential increase in cost.

For the above reasons Warwick believes that including the entire reactive compensation system within locational charges is discriminatory against Offshore projects in comparison to Onshore projects. The basic reason for this is because the Offshore Generator is required to provide compensation to a point remote from the Connection Point whereas Onshore this is not the case. As such Warwick believes that at least some of the cost of

reactive compensation equipment (effectively the extra equipment/ increased ratings and cost associated with compensating for the passive network) should be included in non-locational charges and thence socialised with wider system users.

Given that the current proposed Offshore Connection Conditions are unclear (see earlier consultation responses) it is difficult to see how Offshore connections can be fairly shared between more than one connectee. This is especially true where generators are in different physical locations. In this case the compensation for the passive network components relevant to each connection cannot be a simple pro-rata of the overall requirement; e.g radial connection to 2 separate sites.

A further difficulty arises if the inherent generator characteristics differ between the projects. The proposed simple pro-rata approach of reactive compensation costs based TEC would not be equitable in such circumstances – since one project may actually require a disproportionate amount of the overall OFTO capability.

In the event that Offshore Connection Conditions are developed there is a risk that a perverse incentive to locate reactive compensation equipment Offshore will be created. In such a case the costs are likely to be greater than for reactive compensation Onshore due to the significant platform costs involved.

Security Factors

The new proposals in this area are noted.

Warwick agrees that some account should be taken of relative security of connections. However considering a 300MW generator the proposed security factor for the following networks is 1.0, whereas the networks clearly have different levels of security:

- a single 300MW cable connection;
- a network with two 150MW cables.

This seems contrary to principles applied Onshore – where networks with normal (secure) levels of redundancy have a security of factor of 1.8. This issue requires further examination and clarification.

In the case of cable costs it is not clear from the proposals how circuit and cable ratings will affect the charges. The proposed Offshore SQSS proposes zero redundancy in terms of circuit capacity for sites up to 1000MW. In practice it is likely that there will be some element of redundancy introduced as a result of multiple cable circuits. There should also be some mechanism by which a generator is not liable for recovery of any over-specification of circuits by the OFTO in anticipation of possible future connectees at the site. i.e. any such costs should be met by the OFTO not the connectee unless agreed otherwise in advance. The treatment of this issue should be clarified.

A further issue is that Ofgem may not deem redundancy within cable circuits as economically efficient. For example a 300MW project connected via 2 off 132kV cables rated at around 150MW each has by definition an element of redundancy which is in excess of the proposed Offshore SQSS. It is not clear whether such a system would be regarded as economically efficient by OFGEM. This risk particularly applies to transitional projects where design and installation is complete prior to take over by an OFTO. In such a case a generator may be left with an exceptional cost at transfer of the assets to the OFTO. However OFTO charges on an on-going basis would not reflect this. i.e. the OFTO benefits by gaining a more secure asset at below the market installation cost. There does not seem to be a mechanism to address this within the charging proposals. This again is an issue which in Warwick's view should be addressed in the Charging Methodology

Substation Tariffs

As noted elsewhere the revised proposals remove a major element of cost sharing between generators and demand customers. Warwick recognises that National Grid is proposing this change in response to signals from Ofgem. However since this cost sharing was a major factor in determining the overall regulatory structure making the proposed revision at this late stage is iniquitous. Warwick is therefore opposed to the proposals and believes that the entire Offshore substation costs should be treated as non-locational assets and socialised.

Warwick believes that both Offshore and Onshore substation costs should be included in non-locational charges. These costs will then be socialised which is consistent with practice for purely Onshore projects.

Warwick also reiterates the point that at least some of the cost of the reactive compensation equipment should be allocated to non-locational costs.

The proposal is that “typical” Onshore substation civil costs would be subtracted from offshore substation tariff. Warwick notes that no allowance appears to be made for elements such as land costs, landscaping and special situations e.g. in major cities.

In respect of Onshore users there is a clear cost difference between substations of air insulated (AIS) and gas insulated (GIS) designs. This difference is however not chargeable under the current Onshore regime.

Warwick believes the difference in cost between AIS and GIS is probably sufficient to justify a cost difference in any locational signal. However the choice between GIS and AIS will largely be due to available space in the immediate vicinity of the proposed connection point. As noted elsewhere since users and generators do not in reality have much choice over their location such a cost signal appears perverse in the context of overall economic development. As such Warwick does not believe that there should be a locational signal associated with a choice between GIS and AIS. Similar logic applies to the proposal for locational signal associated with Offshore platform costs. In this case developers really have no choice and the substation civil requirements (jacket and topsides) will be necessary given the Government driven pre-requisite of location Offshore.

Section 6.1.3 HVDC

Warwick believes that HVDC may play an important part in the widespread development of renewable capacity offshore. HVDC seems likely to be the main mechanism by which large windfarm developments at distance to the onshore grid will be best connected to the network either individually or, increasingly, using shared facilities. It is therefore critical that this area is given careful consideration in the charging arrangements.

Warwick notes that there are advantages in terms of reactive capability and fault levels to the wider system of installing HVDC links. The allocation of 100% of the converter costs to locational charges appears to make no allowance for such technical advantages. There is an argument for allocating some of the costs of converter stations to non-locational costs. This is particularly true since sharing of HVDC connections between a number of projects is likely to be more straightforward than for AC connections. Such sharing would lead to economies of scale and consequential benefits to all users.

It is disappointing that while National Grid has referred to the above comment in its latest consultation document there is no mechanism for providing a cost signal to recognise these benefits. There is therefore a risk that HVDC solutions, which could offer significant network benefits, will not be adopted due to perverse signals in favour of AC solutions.

Warwick believes that the charging arrangements for HVDC connections should be revisited.

Section 6.1.4 Embedded Transmission

Warwick believes that the underlying principle should be that DNO charges be a pass through cost to the OFTO. Since the Distribution system in this context is effectively an extension to the Onshore transmission system there should be no difference in the treatment of costs; i.e. the proposal should allow cost sharing of any wider reinforcement costs as occurs for the Onshore transmission system.

In respect of the proposal by National Grid, the use TEC to allocate DNO costs between generators does not appear equitable. The DNO costs will partly arise from project specific works, which are apportioned between connection charges and ongoing DGUoS charges. Hence it should be possible to pass through the exact costs and the relevant sums should be determined by the DNO - rather than the arbitrary TEC based pro-rata scheme proposed.

See under Section 6.2.4 below for further comment regarding Warwick's fundamental objection to the proposed 100% cost allocation against generators rather than these being socialised via the OFTO.

Section 6.2 Justification for Proposed Modification

No comment.

Section 6.2.1 Offshore Connection / Use of System Boundary

Warwick agrees that since the Offshore network should be charged for in line with Onshore principles there is no justification for including the radial network in a connection charge. It is however of concern that further connectees could significantly affect the charges to an existing connectee given OFGEM's proposal for 20% increase in capacity without re-tendering. This issue appears to need further consideration.

Section 6.2.2 Offshore Expansion Factors, Security Factors and Substation Tariffs

Warwick agrees with the principle of site specific expansion factors as noted previously. In addition Warwick believes that locational elements only should be reflected in the expansion factors.

In relation to reactive compensation National Grid's justification for charging the entire cost of the reactive capability ignores the issues already raised by Warwick; i.e. discrimination due to requirement of an Offshore generator to provide reactive compensation at a remote point on the network. In this respect the justification provided in the documentation appears inadequate. The issues raised by Warwick should therefore be addressed or the proposals modified appropriately.

The justification for the security factor ignores multiple circuits having an identical security factor to single circuits. Warwick believes this issue needs further consideration.

Warwick does not agree with the proposals for Offshore substation assets to be mainly locational. As noted elsewhere this represents a major shift in the economics of the proposals – and a fundamental change to the cost sharing principles originally proposed by Ofgem. Introduction of such a significant change at this late stage in developing the entire regulatory regime will hinder developments offshore. It is therefore contrary the stated Government aim to development of the Offshore generation industry.

As noted by National Grid in previous consultations there may be difficulty in ensuring a correct split of locational and non-locational costs. There is a lack of clarity and detail regarding the revised suggestion to do this via the STC rather than the tender process. Further clarification on this aspect of the proposals should be provided.

Section 6.2.3 HVDC

Warwick believes that in Round 3 the use of HVDC technology becomes a real possibility and necessity. Further interconnection of HVDC Offshore networks between different Onshore connection points offers a real prospect of reinforcement of the wider transmission system. The proposed regime allocates the entire HVDC cost to locational charges. This recognises neither the pure technical advantages (fault level, reactive control, dynamic capability), nor the potential strategic benefits. The proposed charging regime does not recognise any of these benefits and therefore creates a perverse incentive which favours AC solutions.

In view of the above Warwick believes a review of the treatment of HVDC for Offshore generation should be undertaken.

See also under 6.1.3 for further comments.

Section 6.2.4 Embedded Transmission

Regulatory Framework

The proposal is that all DNO costs should be passed through to the generator. This acts as a perverse incentive on generators to connect direct to the Onshore transmission system - since the Onshore transmission reinforcement costs are treated as infrastructure and therefore socialised. Hence the overall effect is to discourage generators from seeking potentially more cost effective solutions by connecting to DNO networks.

The obvious means to remove this perverse would be to treat the DNO network in a manner consistent with the transmission network; i.e. relevant DNO costs are socialised.

In order to ensure equitable treatment of Onshore embedded generators (or at least Large Embedded Generators – which are the most likely connectees to OFTO networks) then the Onshore regime would need to be changed as well.

The benefit of such a proposal would be to provide a clear economic signal to generators that connection close to the connected demand via DNO networks is likely to be more cost effective. From a network design and system losses perspective this is clearly true.

Warwick recognises that the above suggestions are more wide ranging than the scope of GB ECM-08. Nevertheless it appears important to address these concerns properly to avoid the proposed perverse incentive for OFTOs to only connect to the transmission system.

Warwick also notes that the overall regulatory proposals also favour direct connections to the transmission system – since there is no License obligation on NGET to consider the overall most economic connection – and thus actively seek DNO connections if appropriate. There is also no clear structured way of DNO connections being considered in the wider Ofgem proposals. This acts as a further disincentive to embedded OFTO networks developing.

Charging and Revenue Options

Warwick does not agree with the National Grid preferred proposal of Option 3 – i.e. charge generators DNO costs through a new type of Use of System charge.

In light of Warwick's comments above the preferred option should be Option 1. Selection of Option 3 creates a perverse incentive to connect to the transmission system.

Warwick notes the National Grid view that Option 1 is a perverse incentive for connection to DNO networks – however this is clearly not the case. In particular from an overall design perspective – and accounting for Government stated aims that there should be more local generation – connection of smaller schemes (with powers of hundreds of MW or below) to DNO networks is likely to be the preferred solution in most cases.

Warwick sees no reason to discriminate against embedded generators and believes a fundamental review of the treatment of Onshore generators is also required.

Other Issues Arising From Embedded Transmission

No comment.

Embedded Benefits

The proposal that all Offshore networks at 132kV be classified as transmission whereas similar Onshore networks may be treated as distribution is a bizarre consequence of the entire OFTO regime. It is perverse that offshore generators potentially are exposed to transmission charges that would not be levied on similar sized units connected to Onshore DNO 132kV systems.

Warwick believes that this problem is fundamental to the regulatory proposals and needs to be addressed by wider review of the regulatory framework.

Embedded Benefits Strawman

The proposal appears logical and consistent with Onshore practice. As such Warwick supports the principles outlined – although the means of implementation appears overly complex.

Warwick believes that the number of cases of this type of connection is likely to be relatively small; however the consequential changes to Codes outlined in the documentation appear relatively wide ranging.

In Warwick's view the most pragmatic approach would be to maintain the existing status of Offshore projects status falling into the "Embedded Benefits Strawman" category. The simplest way to do this would be to exclude them from the entire OFTO process. This could be done on the basis that the networks are sufficiently small (and already established or being established) that there is no real prospect of the OFTO process adding any value.

National Grid's View

Warwick notes that National Grid does not support the adoption of the "Embedded Benefits Strawman" approach. However the comparison offered to 132kV transmission system connected network in Scotland does not appear relevant. This is because the Scottish system is run as a transmission system due to the much smaller higher voltage networks available.

Section 6.2.4 Generation Zoning

No comment.

Section 6.3 Impact on Other Industry Documents

The additional STC process proposed to divide OFTO revenue into discrete elements is not clear.

For instance with respect to vessel costs how are these to be split between individual items? In addition how are fixed cost of vessels (capital etc) to be split from revenue and how can these be shared if different projects (potentially OFTOs) share facilities. The Offshore generator will also need vessels which may be shared with the OFTO. In this case how is this defined within the overall tender process and how are the costs then disaggregated between locational and non-locational elements?

Further work is required in this area – the extent to which the consultation process describes the STC process does not appear an adequate basis to modify the code itself.