

Robert Hull  
Director - Transmission  
9 Millbank  
London  
SW1P 3GE

Dear Mr.Hull,

## **Connecting the Islands of Scotland**

### **1. Introduction**

1.1 With regard to the above paper, I wish to comment on the issue of ownership of transmission assets and how this can impact on value for money for the final customer, not only from the transmission assets, but also from engendering effective competition within the generation market. The following proposal is for a more holistic approach than that which has been in effect since privatisation, and it endeavours to include in the economic justification of 'need' as many as possible of the costs of running a secure and economically effective power system. The corollary of this is that the regulatory arrangements regarding 'ownership' of transmission connections by the generation developer should be such as to require the Generator to include all costs not included in the transmission justification in the generation economic assessment. The aim is to bring as many of the costs as possible into a competitive market, and to ensure that these costs fall to the account of the body that creates these costs and can, therefore, be the most effective at controlling them.

1.2 The proposal, therefore, covers not only directly the transmission asset costs, but also indirectly any extra system costs of providing 'reserve' in the 'balancing mechanism' to ensure Security of the System; and any extra costs of providing sufficient 'plant planning margin' to ensure the appropriate level of risk is achieved with regard to Security of Supply. These arrangements endeavour to ensure that that the customer gets value for money by addressing all the costs from Generation to Supply.

1.3 It also addresses an issue of Transmission governance by suggesting the separation of 'ownership' of transmission assets from the activities of system design, asset management, and system operation. This allows the 'ownership' of transmission assets to be open to competition.

1.4 As an addendum, the proposal suggests that the Regulator carries out and publishes an economic assessment to include all the costs to 'society'; that is to include the costs to the taxpayer as well as the customer through subsidies to ensure effective use of resources.

### **2. Depth of Connection Charging**

2.1 It was recognised at the time of privatisation that shallow connection charging was appropriate to encourage competition in Generation. At the time there were only four or five Generators, and the encouragement of more

Generators was a prime imperative. Perhaps, with the number of Generators now operating in the market, it is time for reconsideration.

2.2 Also at the time of privatisation, it was foreseen that new Generators would apply for connections that were relatively well distributed over the existing system, and that the system was fairly closely integrated. This indicated that whilst there would be an obvious difference in cost to Generators between ‘deep’ and ‘shallow’ connection charging, these differences would not be as great as those that now would be encountered by connecting large amounts of generation in the northern areas of GB. By looking at load flows in National Grid’s Seven Year Statements, and the number of applications for generator connection in the northern areas, it is fairly clear that current zonal charging with ‘shallow’ connection arrangements is unlikely to provide sufficient incentive to result in efficient allocation of transmission capital.

2.3 A more economically effective arrangement would be to have ‘very deep’ connection arrangements with the increments of transmission asset investment required at all boundaries in the GB transmission system attributed to the incremental Generator’s account. This would ensure that the incremental transmission asset costs were included in the Generator’s economic assessment. This is valuable for two reasons. First, it ensures there is no ‘double counting’ of subsidies. Without this approach it is possible for the Generator to include subsidies such as ROCs in his economic appraisal; and for the same subsidy to be utilised in the economic appraisal to establish the ‘need’ case for the transmission assets by including the value of ROCs within the ‘constraint costs’ in the cost/benefit analysis. Note that this could occur even if the potential Generator and the Transmission business are part of the same corporate body. Secondly, it ensures that all the required GB incremental transmission asset costs associated with a generation development are included in the cost/benefit analysis, and not just a particular reinforcement apparently closely associated with the generation development. Both these avoid over planting and extra cost to the customer. The corollary of ‘deeper’ connection charging is, of course, an amelioration of the differentials in the zonal Use of System charges.

2.4 It would be essential with this arrangement that the Generator retains rights over the transmission assets for which he has paid. He is the effective owner, and should retain the right to sell on all or any surplus capacity he has paid for to a future Generator, since he has taken on the risk of creating these assets. (There is further discussion on this and associated issues below at paragraph 3.3.)

### **3. Competition in ‘Ownership’ of Transmission Assets**

3.1 One of the shortcomings of the existing structure of Transmission is having the ‘ownership’ of assets within the same corporate body as system design. There is an obvious risk that, notwithstanding the ‘checks and balances’ put in place by the Regulator, the system designer will be tempted to over-plant the system in order to boost the size of the regulatory asset base. Separating ‘ownership’ from system design avoids this risk, and connections to the Scottish Islands presents an ideal starting point.

3.2 ‘Ownership’ of the assets is essentially a banking function – the owner borrows finance to purchase the assets and receives a return based on the ‘cost of

capital' allowed by the Regulator. It can, therefore, be separated from the other essential activities within the transmission area, viz. system design, asset management, and system operation. The asset management function would make the decisions regarding the requirements for plant maintenance, project management for new assets etc. which would be put out to competitive tender. The Generator could either borrow finance competitively and retain 'ownership' or place the 'ownership' itself in the competitive market. Thus only system design, asset management, and system operation would remain as a price regulated business. Because these three activities are so closely interrelated with regard to Security of the System, they should be held together under the one corporate body.

3.3 A generation developer, having purchased the right of ownership of assets associated with 'deep connection', could retain these rights, or sell them on in whole or in part. A second developer could either purchase a right to surplus capacity at one or more of the boundaries, or commission further capacity, thus introducing competition. System design would 'size' the required capacity, and the plant would be specified by asset management.

#### **4. Costs of Security of the System and Security of Supply**

4.1 When the greater proportion of generation plant connected to the system was thermal plant it was not unreasonable that these costs were simply distributed between all of the players since all plant had similar characteristics. Most types of renewable generation being contemplated for installation on (or off) the Scottish Islands have very different characteristics to thermal plant. These differences incur extra costs. In order to ensure efficient allocation of capital, it is necessary that these costs are included in one or other of the economic assessments.

4.2 With regard to Security of the System, the extra costs are incurred in an operational timescale and are associated with the provision of reserve (and possibly response). They are, therefore, revenue costs and should be for the account of the proposed generation developer who has control over them, and not simply added to the System Operator's account via the Balancing Mechanism to be shared out between all customers. These costs are not insignificant and National Grid currently estimates them at £3/MWh. However, this figure will increase rapidly as the proportion of renewables on the system increases (particularly if wind generation is prevalent).

4.3 With regard to Security of Supply, because of the intermittency of the prime source of energy involved (for example, wind) extra thermal generation plant is required along with the 'renewables' to reduce the risk of not having sufficient generating plant available at the time of maximum demand in the 'planning year'. Prior to privatisation this risk was 3 or 4 winters in 100 years (Minutes of The Electricity Council of July 1986 refer). The extra cash flow to provide this plant is incurred 'up front' and is in effect a capital cost. The Generator making the proposal should, therefore, either provide the plant himself or make payments during the operational life of the 'renewables' to compensate the providers of such plant. These payments would have to be covered by a bond or insurance arrangement. Again, these costs are not insignificant. As an example, these extra costs can be assessed from comparing two generation scenarios. Each

scenario meets an increment of load (at system load factor) with the amount of generation increased until the risk to Security of Supply is restored to the pre-increment level. The first scenario utilises CCGTs, say. The second scenario utilises wind generation plus sufficient OCGTs to reduce the risk to Security of Supply to the pre-increment level. The extra capital costs of the OCGTs would be for the account of the wind generator

4.4 Having a regulatory system that requires that both these costs fall to the account of the Generator making the proposal will ensure that the discipline to minimise these costs is in place, and that the Generator will take them into account in his economic assessment. The Regulator would be responsible for deciding the quantity of extra plant required to deliver the appropriate risk level.

## **5. Costs to Society**

5.1 There are now considerable subsidies and subventions available to Generators with renewable type plant. These are provided by the customers in the case of ROCs for example, and by the taxpayer in the case of capital grants for plant. Any subsidy or subvention will, of course, result in less than optimal allocation of resources, in particular, capital allocation. In order to ensure that decisions regarding the allocation and extent of subsidies are effective it is important that total cost to society for each development is in the public domain. Since the Regulator has a duty to ensure the efficient use of capital for the Transmission business, it is suggested that the Regulator carries out this task.

## **6. Conclusions**

6.0 It is proposed that the following arrangements be considered for Connecting the Islands of Scotland (with the view that the principles could be extended to cover the whole of GB)

6.1 A 'deep' connection charge arrangement should be adopted. This will not only ensure that all the incremental transmission costs will fall for the account of those that create them, but also ensure that 'double counting' of subsidies does not occur, and that all the incremental transmission costs are included in the cost/benefit analysis.

6.2 'Ownership' of transmission assets should be separated from the System Design function. This avoids the temptation to over plant the transmission system and introduces competition to 'ownership'.

6.3 The three functions of System Design, Asset Management, and System Operation who have a combined duty to ensure Security of the System should be together in the one corporate body thus ensuring that this area of Security of the System is effectively addressed.

6.4 Because of 'intermittency', most 'renewables' introduce extra costs to ensure Security of the System and Security of Supply over and above these incurred by conventional generation. The extra revenue costs of response and reserve should be for the account of the 'renewables' generator and not for the Balancing Mechanism. The extra capital costs to ensure adequate 'planning plant

margin' to contain the risk should also be for the account of the 'renewables generator. This places the costs with those best positioned to contain them.

6.5 As an addendum, the Regulator should carry out a total cost exercise for each development to demonstrate the total cost to society.

6.6 The above proposals are directed at reducing the costs to customers and maintaining the Standards of Security of Supply and the System by:-

- (i) placing as many activities as possible in competitive areas
- (ii) ensuring that all costs associated with a development are considered
- (iii) costs fall to the account of the body that causes them and can thus most effectively contain them

Colin Gibson C.Eng., FIEE, CCMI