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Dear Richard,

Natural Power Consultants Ltd. Response to the National Grid GB Transmission Charging: Final Methodologies Consultation

Natural Power Consultants (NPC) are consultants to the renewable energy industry. We are currently providing services on a range of renewable energy projects at all stages of the development process. We remain particularly active in the development of wind farm projects within Scotland. Several of our clients have projects in possession of current grid offers, and other developments are making approaches for grid offers pre and post BETTA implementation, in both the transmission and distribution networks.

We welcome the opportunity to comment on grid connection and transmission charging consultations and the effects these consultations will have on the Scottish renewable energy sector.

General Comments

Timetable driven application of the easiest solution for NGC

In business terms the application of virtually the current England and Wales TNUoS charging model in Scotland, without taking into account the previous business situation and historical differences in transmission voltage, could be viewed as a takeover of the Scottish network by the E&W network, rather than a merger into a GB network. NGC were instructed by BETTA to look at constructing a GB charging mechanism using the current E&W mechanism as a basis. They took the current system and applied it to Scotland, then challenged the GB industry to prove them wrong. This is neither inventive nor constructive and is completely different from using the E&W system as a starting point from which the GB system could be built. The Scottish and E&W systems are entirely different in design and historical application. NGC should have looked at both systems and designed a fair charging methodology for the new GB network from scratch. NPC believe that the decisions taken by NGC were timetable driven to meet the BETTA go live date. A substantial change to charging in E&W would have been a difficult change to make within the BETTA time frame proposed by Ofgem. The easy route for NGC was to apply the current mechanism to the UK market.

The result of the route NGC has chosen is that the majority of their existing customers in E&W are satisfied due to a reduction in charges. It is hardly surprising therefore that the majority of consultees in GB would support the current NGC proposals. NPC believe that it is this majority of E&W customers who have moved NGC from Scenario A (which is unfairly biased towards generation in the south) towards supporting Scenario B (Which is extremely unfairly biased towards generation in the south). The concerns of Scottish generators who stand to lose most from the proposals have been disregarded as a minority view.

Effect of the Threshold cap and Highlands & Islands rebate mechanisms

Powers are being reserved by the Secretary of state to make an order setting a threshold or discount for transmission tariffs for renewables in the Highlands and Islands of Scotland with revenue shortfalls being recovered by the GBSO through GB suppliers.

It is NPC's opinion that NGC should be producing a charging mechanism which does not require such powers to be used. Clearly under the scenarios being proposed these powers would be required to be implemented, if renewable generation in the Highlands and Islands continue to be developed. The very fact that these powers will be required shows that NGC have failed to create a fair GB charging methodology which creates a level playing field. NGC have missed an opportunity to create a framework in which all generation in all areas of GB can operate, without government favour.

NPC would welcome the use of these powers in support of renewables development in the Highlands and Islands but would rather have a charging mechanism in place which did not require the use of rebates. Furthermore the rebate system and levels of discount, if any, are unclear and rely on the government of the day to continue the rebates. As such they introduce a more significant political risk to project finance than would be the case with a single charging mechanism.

The Consultation Process leading up to BETTA

The BETTA consultation process has been flawed. By breaking up the BETTA process into different consultation documents issued at different times it has been very difficult for respondents to gain a clear view of the outcome. For example 'transmission access rights' and 'charging methodologies' consultations were issued on differing time scales. As a result of this a respondent may make one response to the earlier consultation based on assumptions on what the later consultation will contain. When the later consultation then changes dramatically, as has happened with charging methodologies, the respondent can not go back and change his earlier responses as the consultation has then closed.

Uncertainty for distribution connected generators

The current proposals introduce huge uncertainties to distribution connected generators. Where distribution connected generation spills onto the transmission network it is unclear how the costs associated with this will be accommodated. Whilst licence-exempt distributed generation will be exempt from generator TNUoS charges at BETTA go-live it is clearly the intent of NGC and Ofgem to reconsider the appropriate charging basis for such generators in the short-to-medium term. And yet nowhere in these consultations has the potential impact on licence exempt distributed generators been considered. The risks and uncertainties for developers of new distributed generation have been increased significantly as it is unclear as to what if any charges such generators could face and how they can gain firm access rights and financial compensation if constrained by NGC or the distribution network. This has created a significant barrier to entry and will reduce competition.

Prospects for future charges

NPC is also concerned that the proposed methodology may lead to further increases in northerly generator charges in subsequent years as developing and proposed new connections commission. We believe the lack of any attempt to quantify how the charges may evolve over time in line with connection applications represents a significant flaw in the consultation process.

Use of a 90/10 split

NPC is surprised to note that the move to a 90/10 split of transmission charges between demand and generation leads to higher generator charges in northerly zones than under the previous 73/27 split. NPC supports a revision of the split but urges NGC to move directly to convergence with the majority of European transmission system operators and to levy the entirety of transmission charges from demand customers.

Discrimination and uncompetitive practices within the proposed GB TCM

NPC would like to highlight the following issues which we believe make the application of either Scenario A or Scenario B uncompetitive and discriminatory to Scottish based generation companies.

The proposals given under Scenario A and particularly under Scenario B will have the following effect on the UK market.

1. Companies with a portfolio of generation assets located in the north and south of the GB network could benefit substantially from reduced TNUoS charging in England and Wales (E&W) offsetting the additional costs of generation in Scotland.

The arguments supporting the above statement are set out below:

- a. By doubling the length of the transmission system NGC have distorted the load model with the result that, as the transmission network increases in length the balance point moves disproportionately north. This distorted load model makes charges in the south decrease by too large a margin and charges in the north to increase by too large a margin. No test of reasonableness has been applied to the results of this untested expansion of NGC's charging model.
 - b. As a result existing generation in Scotland becomes less economic. Those companies with a portfolio of sites spread throughout the UK can absorb the higher charges for northerly sites through the reductions in charges for E&W sites.
 - c. Independent generators who have invested in renewable energy projects within Scotland, based on a previous charging methodology, are therefore through no fault of their own, unduly discriminated against by a substantial change in the charging methodology. A system which does not allow a stand alone project from an independent generator to be viable is flawed.
2. Generators operating successfully in what was previously an independent Scottish market will see the market change dramatically with the highest TNUoS charges ever imposed anywhere in GB being levied in some areas of Scotland, the highest of which is double¹ the current highest E&W tariff. The locational signal provided by some of these charges is disproportionate and unreasonable.
 3. The charges will prevent economic connection of renewable projects in Scotland to the GB transmission network and stifle competition in the electricity generation market in favour of existing conventional generation projects in E&W and future nuclear build.

The arguments supporting the above statement are detailed below;

- a. Scotland is where the best wind and wave resource is located. European studies have shown that 20% of Europe's wind and wave resource is in Scotland.
- b. Scotland is also the only part of the UK where the political will for renewable generation is backed up by successful planning applications and the potential construction of renewables projects at a large scale.
- c. The unduly high Scottish Tariffs will produce a barrier to entry into the GB electricity market for the most economical wind generation projects, located where the wind resource is greatest.
- d. In E&W the renewable resource is not as great and as a result the wind projects will be less competitive with other forms of generation.
- e. Recent history has shown that it is more difficult to obtain planning permission and build wind farm projects within England and Wales.
- f. If the planning culture in E&W does not change significantly and the government were to block further gas or coal power station construction with the aim of reducing carbon emissions this charging methodology will have prevented any competition in the market place.

¹ Comparison of TNUoS charges September 2004 with Scenario B shows charges in the Northern Highland zone would be 1.9 times the current highest E&W tariff in Northern zone

Errors in arguments supporting Scenario B as the preferred option

NPC would like to point out the following specific errors in the preferred option B outlined.

1. NGC conclude that it is appropriate to use a weighted average for the 132kV expansion factor, yet they do not apply the same logic to the 275kV factor. This has a serious and detrimental effect on the Scottish Generation Tariff over the E&W tariff as Scotland, due to the historical differences, has 50% of the GB 275kV system. Weighted averages should be applied to the 275kV system if the NGC proposals are to be even handed.
2. The “embedded benefit” of connecting at 132kV in E&W is currently calculated as the sum of G&D residual elements in the load model. Under current charges this calculation produces an £8.60 net benefit. £6.60 is then deducted for the costs of connecting distribution level leaving a £2 benefit. Under the new model if this logic is applied the net benefit of connecting at distribution 132kV in E&W is £8.40.
3. The model does not scale down uncontrollable generation (wind hydro etc.) in reflection of the variable generation element (for wind around 30%). Scaling should take place in recognition that these assets can only use the transmission network for this percentage of the licensed output on average over a year. This is particularly significant as elsewhere other generators are in place which will use the network during those periods when the uncontrollable generation is reduced. Since both generators are using the system and paying full charges NGC are effectively double charging. NPC notes that investment decisions by NGC do apply scaling factors that differentiate by type of generator and believes that it is inconsistent not to apply similar scaling factors in the charging mechanism.
4. NGC comment that the proposed charges could leave Scottish generators ‘broadly neutral’ taking account of present TNUoS, interconnector charges etc. This is not the case. The majority of Scottish generation is not exported to E&W, but is consumed within the GSP Group and is therefore not liable for interconnector charges. The majority of Scottish generation will be substantially worse off under both scenarios.

In the consultation document the basis of NGC’s argument for choosing Scenario B over Scenario A would seem to be;

“There is no evidence that the tariffs associated with Scenario B do not facilitate competition”.

NGC quote an independent study in support of this conclusion stating that in Scotland post BETTA and pre-BETTA transmission charges would be broadly neutral. NGC has not referenced or made available for comment this independent study, therefore in NPC’s opinion this reference should not be used in the consultation document. As such they do not present any evidence that the charges **will not** be disproportionate to the charges currently levied in Scotland.

Taking NGC’s statement “Scottish revenue raised through the charging mechanisms in Scotland will remain broadly neutral post BETTA”, where is the money being found to finance the reduction in E&W charges which can clearly be seen post BETTA in either Scenario A or B? If there are economies created by a GB system then these should be used to reduce charges in Scotland, as clearly it is the Scottish generator who has been paying too much in the past. Under the proposals Scottish generators will pay 100% of UK transmission costs with only 14% of UK generation. Given this evidence we fail to see how the proposed BETTA charges can be broadly neutral and would ask for a more detailed explanation from NGC.

NGC also state as evidence that Scenario B in particular will not effect competition;

“Significant tariff differentials exist in England and Wales and have not been perceived as a barrier to competition”

NPC would like to point out that the “significant tariff differentials” in the current system have a range of £17.5 between Peninsular in the South West and Dinorwig in the North². Under the Scenario B proposals the differential would be £31.14 between Northern Highland and Peninsula. This is a 78% increase in the differential. NPC fail to see how the experiences on competition under the current system can therefore be used to accurately conclude the effects on competition post BETTA for Scenario B, given the 78% increase in differentials.

Surely the very purpose of high tariff differentials is to discourage competition in generation between zones. The increased differentials will decrease the competition between zones further and particularly given Scenario B, disproportionately discourage competition between Scotland and the rest of the GB system.

The failure of NGC to provide any evidence from the current system to prove that competition has not been compromised is of concern. Proof that competition has not been compromised by the zone tariffs currently used could have been provided through evidence of the number of generators who have chosen to locate in the northern sections of the E&W network in comparison to other areas. Such evidence would help substantiate the premise that the existing charges do not prevent competition. NGC hold much of the evidence required to back their own conclusions, yet have not presented it in consultation. Instead they are asking the consultees to provide the evidence which will prove them wrong. We would ask NGC, being the experts in transmission networks within GB, to provide the evidence to users which will prove their conclusions to be correct, under the new arrangements.

² The Statement of use of system charges 13th September 2004

Example showing the effect of the Scenario B on a wind farm site in Northern Highland

NPC have approval for construction, on behalf of a major client, for a 64MW wind farm in the Northern Highland area. Connection agreements have been reached with Scottish and Southern and construction will commence shortly. Although this site is below the 100MW TNUoS charging limit it is worth using it as an example. The figures given are broadly indicative as the actual figures for this site can not be given in a public consultation response.

Zone Tariff	£20.54
kW of wind farm site	64000
Annual TNUoS Charge	£1,314,560

An indicative estimated capacity factor for this site based on wind resource analysis, and after all losses including downtime of 30% has been used in this example model

Estimated annual energy production from the site would therefore be 165 GWh

This results in a TNUoS cost to the generator of £7.97 / MWh

Example showing the effect of the Scenario B on a gas turbine site in Northern Highland

Assuming a gas turbine of the same MW capacity and an annual capacity factor of 85%

Zone Tariff	£20.54
kW of wind farm site	64000
Annual TNUoS Charge	£1,314,560

Capacity factor for this site 85%

Estimated annual energy production from the site would therefore be 476 GWh

This results in a TNUoS cost to the generator of £2.76 / MWh

Example showing the effect of Scenario B on demand supply competition

NPC would like to point out how the discrimination within the charging methodology could effect the ability of Scottish generators to meet local demand. Currently the majority of Scottish generators sell into the Scottish market as it is more economic to avoid interconnector charges. Likewise the majority of Scottish demand is sourced from contracts with Scottish generators. The Scenarios outlined in the consultation, particularly Scenario B with its £31.14 differential would produce a situation where it is dramatically cheaper for wind farm generators in Cornwall to supply power to Inverness than wind farm generators in Inverness.

We have already calculated transmission charges for wind farms in the Inverness area to be £7.97 / MWh. Applying the same figures to a wind farm in Cornwall assuming a 30% capacity factor for simplicity of calculation:

Zone Tariff	-£10.60
kW of wind farm site	64000
Annual TNUoS Charge	- £678,400

This results in a TNUoS cost to the generator of -£4.11 / MWh

As can be clearly seen from this example it is cheaper for a wind farm in Cornwall to Supply power to Inverness by a margin of £12.08 / MWh.

In reality the capacity factor for the wind farm in Cornwall could be expected to be slightly lower, but this would only have a marginal effect on the figures given the magnitude of the margin.

Conclusions on above calculations

The charging methodology as it stands is biased towards conventional generating plant (with the exception of negative charging zones where renewable generation benefits from the capacity factor). This is discrimination. In our example it can be clearly seen that wind farm projects in northern Scotland could expect to pay 3 times more per MWh in TNUoS charges than an average conventional generating plant in the same area. If regional charges are to be used as locational signals to generators these charges should not discriminate against types of generation. Clearly this is not the case in northern Scotland.

We have also demonstrated that the same wind farm located Inverness and Cornwall (assuming identical capacity factors) would have a massive £12.08 per MWh TNUoS payment difference.

The reasons for this discrepancy in the model are clear. The load model bases the TNUoS charges paid on the maximum peak output from any generating plant, regardless of the capacity factor. Unlike conventional generating plant wind farms cannot choose to run at full output in response to market signals.

NPC can see no good reason why scaling should not take place within the model for uncontrollable generation. The failure to apply scaling discriminates against renewable generation in the north. Our calculations show that charges are clearly not cost reflective. Therefore the charging methodology does not meet the Ofgem objective to balance the need for competition and cost reflective charging.

Conclusions

NPC fail to see how the post BETTA market in Scotland could be judged as broadly Neutral. We would judge Scottish generators paying 100% of GB transmission costs with only 14% of the generating plant to be completely unbalanced. Neither Scenario A nor Scenario B are particularly palatable and if implemented many developers would be forced to re-evaluate the financial prospects for projects currently at the planning stage. With TNUoS charges set to be 15% - 20% of revenue under these proposals. They are set to get even higher as other new generation in the same areas comes on line. These are significant risks which will jeopardise the prospects for obtaining finance. Furthermore the rebate mechanism will not encourage the required finance to build projects in the north of Scotland, even if the rebate is substantial enough to offset the unduly high TNUoS charges. The proposed renewables rebate is welcome, but we take this view as rebates granted at the discretion of the incumbent secretary of state are not bankable, due to the associated political uncertainty.

It is our belief that the choices made by NGT in recommending use of the England and Wales model are timetable driven to deliver a workable system in time for BETTA, which can be accepted by the majority of the GB users, these being in England and Wales. As such an easily implemented solution requiring minimum effort is being recommended, rather than an innovative solution which could take into account the differences in the Scottish Infrastructure and the need not to discriminate against renewables if we are to meet government targets. The lack of any recognition within the charging model that renewable generation differs from conventional generation in having a much lower capacity factor is discriminatory.

The uncertainty introduced for distribution connected generation and the failure to attempt to address this issue under BETTA is a failure of Ofgem. Ofgem have not painted the whole picture in the BETTA process and have left distribution connected generators guessing about what may happen and what charges may be levied by distribution networks in the future. This is no way to encourage investment or competition.

On behalf of Natural Power Consultants Ltd.

Scott Mackenzie BEng MIEE

Senior Technical Manager