

## Reactive Power Offshore and the Commercial Arrangements Consultation: response proforma

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<b>Respondent:</b>	John Gaffney Phone <i>01793 89 3983</i> E-Mail <a href="mailto:John.Gaffney@rwe.com">John.Gaffney@rwe.com</a>
<b>Company Name:</b>	RWE Npower plc, RWE Supply and Trading GmbH and <i>RWE Npower renewables</i>
<b>Do you agree with the findings of the comparison between the offshore and onshore generators?</b>	<p>We do not fully agree with the findings of the comparison between onshore and offshore generators. The paper asserts that there is no substantive difference between the two classes. However, this assumes that the cost of the technology located at an onshore interface point to meet the STC requirements is not materially higher than the cost of providing the capability from the offshore generator. This assumption should be investigated and validated.</p> <p>On a related issue, NGET's emerging interpretation of the STC/GC requirements, with respect to "continuous" voltage control, suggests that the provision of reactive capability onshore may be higher than originally anticipated by the industry – potentially to the extent that the default position of offshore generators operating at unity power factor may no longer be the most economic technical solution, i.e. the result of the original cost benefit analysis may no longer hold true.</p> <p>Finally, there are aspects of the STC and Grid Code that can potentially lead to difficulties with regard to offshore generators using inherent reactive capabilities of their plant to help (or fully) meet the requirements at the onshore interface point. This can lead to an offshore generator in effect paying twice for capital costs associated with reactive capability (i) once via TNUoS charges that recover onshore equipment costs and (ii) for the cost of stranded inherent capability offered by their generator(s). Whilst this issue (STC / Grid Code technical requirements) is not an explicit part of this consultation, it is a relevant issue. For example, if the original cost benefit analysis was found to be no longer valid, then a review of the STC / Grid Code requirements may be justified</p>

	<p>to ensure these technical standards do not unnecessarily stand in the way of economically efficient capability being provided by the offshore generator. Furthermore, there would appear to be potential for a conflict of interests for National Grid, in that there needs to be tripartite agreement between NGET, OFTO and Offshore generators in order for the latter to contribute to reactive obligations at the IP. Whilst there may be good technical reason for pursuing such an option, National Grid would have to pay for reactive provision from the offshore generator; whereas, under this consultation, they do not for reactive provision from the OFTO?</p> <p>We believe that these factors should be considered in relation to the comparison of onshore and offshore generators. We also consider that cable costs should be reconsidered. Firstly, it is worth re-emphasising that the cable cost saving is only a potential saving as the higher load may not necessitate a higher cable cross-section. This will be a very site specific issue, with the benefit either existing or not existing at all.</p> <p>On the assumption that the cable saving does exist, then there are still the issues highlighted above that have the potential to eradicate the cable cost saving and potentially reverse it. If the cost of onshore reactive compensation has been under-estimated in the original analysis then the cost benefit analysis should be revisited, looking again at reactive costs and cable cost together.</p> <p>For these reasons, we believe that there are merits in re-examining the original cost benefit analysis that led to the current arrangements.</p>
<p><b>Do you believe the commercial arrangements as described in the consultation are appropriate for the offshore regime?</b></p>	<p>No, we don't believe the commercial arrangements are appropriate. The provision of the capability <i>from the OFTO</i> should not be free to National Grid. We believe the service is in effect being provided <b>from the offshore generator</b> irrespective of the equipment location (offshore gen / OFTO), i.e. by virtue of the fact that the offshore generator is covering the capital cost. As such, the offshore generator should always benefit under DPM for provision of all reactive capability provided to satisfy the STC, alternatively the cost of the reactive compensation should be socialised and not recharged to the offshore generator via local TNUoS.</p> <p>We are also particularly concerned by the prospect of additional assets providing reactive power that may be despatched without being subject to the same marginal price as onshore generation assets providing the obligatory capability under default payment arrangements. This is likely to further undermine the market for reactive power such as it is and increases the potential for generators having to invest in assets with the prospect of not being able to recover their costs.</p>
<p><b>Do you believe alternative commercial arrangements</b></p>	<p>We believe that alternative arrangements as outlined in response to question 2 should be implemented.</p>

<p><b>should be considered? If yes please describe those alternative arrangements.</b></p>	
<p><b>Do you have any other comments?</b></p>	<p>We believe a fundamental issue is missing from this consultation, i.e. the question of whether (or not) the offshore generator should always receive payment under the DPM, for full STC reactive capability, irrespective of what percentage is provided by generator and OFTO.</p> <p>As clearly stated in the consultation the offshore generator's local TNUoS charges are used to recover the cost of the reactive equipment provided by the OFTO. Whilst offshore generators cover the capital cost; they do not benefit from payment via the DPM if the equipment is located with the OFTO. This is discriminatory when compared to an onshore generator who would fully recompensed under DPM, despite the service provided being the same in both case and both parties covering the capital costs.</p>

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<b>Respondent:</b>	<p><i>Mike Lee</i></p> <p><i>Mike.lee@transmissioncapital.com</i></p> <p><i>020 3178 7995</i></p>
<b>Company Name:</b>	<p><i>Transmission Capital Services</i></p> <p><i>(representing TC Robin Rigg OFTO – STC Party)</i></p>
<b>Do you agree with the findings of the comparison between the offshore and onshore generators?</b>	<p><i>In general we agree with the findings of the comparison between onshore and offshore generators. The arrangements appear to provide the correct incentives to make optimal design decisions between the provision of on and offshore reactive power.</i></p>
<b>Do you believe the commercial arrangements as described in the consultation are appropriate for the offshore regime?</b>	<p><i>The commercial arrangements for the generator, provide the correct incentives to choose between the on and offshore provision of reactive power. If the generator chooses for the OFTO to provide the reactive power requirements then the charging arrangements place the majority of this cost of the onshore reactive compensation on the generator through the local element of TNUoS. Additionally any savings in reduced cable capacity are also passed on through the local element of TNUoS. For the Transitional Projects, clearly the developer has all the information to make the optimal investment decisions, for an enduring OFTO build, then there will still be incentives on the generator to work with the OFTO to design an optimal solution, although quite how this would work in the tender stage is less clear. It has to be pointed out though, that as the offshore connection points become further from shore, the effectiveness of the offshore generation to control the reactive power flows at the onshore interface will become significantly reduced.</i></p> <p><i>In respect of the costs on the OFTO, we are comfortable</i></p>

*with the treatment of fixed operating costs. At the tender stage the OFTO bidders can forecast the likely fixed maintenance costs and build these into the proposed revenue stream.*

*We consider that variable operating costs are more problematic. At the bidding stage, the potential OFTO has to make some assumptions about the perceived operating regime of the onshore reactive power assets. Whilst it may be possible to determine the likely operating regime in the early years of operation, over time, the local system characteristics can change significantly and therefore the operating regime can also change. We believe the suggested variable maintenance costs are reasonable, although possibly lower than we would have expected. The risk to the OFTO comes from high loading or numbers of switchgear operations significantly exceeding design assumptions and the requirement for enhanced maintenance or more significantly, asset replacement within the fixed twenty year revenue stream. The form of regulation for an onshore TO is such early indications of increased costs or asset replacement costs can be factored into subsequent price controls, for an OFTO the revenue stream is fixed at licence grant and cannot be reviewed. We note that NGET has had significant issues with reliability of switchgear associated with mechanically switched reactive compensation and in some cases their asset lives have been significantly lower than would otherwise have been expected.*

*The consultation paper is correct to suggest that equipment primary losses are not charged to the OFTO or generator, but smeared across all consumers as system losses. In terms of secondary (auxiliary) system losses; then, where these are supplied from transmission system connected auxiliary transformers then these would also be treated as transmission system losses. It is more problematic for the OFTO, where auxiliary supplies are not derived from the transmission system but from metered supplies. (be it DNO or generator derived) For Static Var Compensator(SVC) installations, the auxiliary system losses can amount to several tens of thousands of pounds per annum and it is highly load dependent given that the majority of the auxiliary system power is associated with cooling systems. (such that the costs could vary by a factor of 10 as losses are a square law relationship to reactive output) The OFTO must make an assessment of this in the initial proposed tender revenue*

	<p><i>stream at bidding stage, it is quite possible that operating conditions change and this has an appreciable impact on the OFTO's revenue stream.</i></p> <p><i>Our worry is that NETSO in operating the OFTO assets, does not take a big picture view of the costs of reactive power production or is perversely incentivised to increase the OFTO's costs whilst minimising the perceived overall costs of reactive power and benefiting itself through the SO incentives.</i></p> <p><i>We also worry that NETSO could favour the use of OFTO reactive power assets in preference to its own TO reactive power assets, thereby saving on its own maintenance and operational costs.</i></p> <p><i>We do not agree with the assertion in scenario 2 (of the consultation paper) that NETSO should despatch the OFTO assets first as they are effectively free. They are only free as consumers and NETSO are not directly exposed to the system losses or variable operational costs; because of the method of charging for reactive power.</i></p>
<p><b>Do you believe alternative commercial arrangements should be considered? If yes please describe those alternative arrangementsr t.</b></p>	<p><i>We feel that in making operational decisions regarding reactive power provision, NETSO's actions should be informed by the true costs of provision of reactive power and not assume that provision by transmission connected equipment is free. We believe that this would also give greater benefit in terms of transparency between use of reactive power sources from different providers including different TOs.</i></p> <p><i>Furthermore, we believe that there are very significant benefits to consumers of reactive power production by TO assets (the reactive power savings of a typical OFTO reactive power installation (for a 150MW generation module) could amount to £250-500k pa when compared to provision at onshore generator rates.) Given these very significant benefits to consumers, (who are not exposed in any way to the variable costs of provision), it would not seem unreasonable that the OFTO shares some of variable operating cost risk with consumers through an appropriate tariff. There are a number of possible ways to do this:</i></p> <ol style="list-style-type: none"> <li><i>1) Through a £/MVA<sub>r</sub> tariff.</i></li> <li><i>2) Through a £/MVA<sub>r</sub> tariff, so designed as to only compensate the OFTO for additional costs over and</i></li> </ol>

	<p>above a specified number of MVARh either annually or per settlement period.</p> <p>3) <i>By pass through of additional costs over and above agreed levels, to be reflective of additional variable operating costs.</i></p> <p><i>We also note that in some cases that TOs can provide additional reactive capability over and above the <math>\pm 0.95</math> pf requirement of section K of the STC. As a TO making this available, reduces the costs of provision of reactive power elsewhere and perhaps more importantly the costs of onshore TO investment, we believe there should be an appropriate mechanism to incentivise the OFTO to make this available, particularly to offset the OFTO's otherwise avoided costs.</i></p> <p><i>We recognise that currently the sums associated with these variable costs are small in terms of overall industry costs, but to individual OFTOs operating in a very competitive environment they could be quite significant. The provision of complex commercial rules is possibly not justified (at this stage), and perhaps a more simple payment mechanism can be devised. Irrespective of the complexity of the payment mechanism, we strongly believe that the OFTO should be recompensed for the additional costs of providing to consumers, what is a very valuable and cost effective service.</i></p> <p><i>In conclusion, given that it would provide the correct incentives for all parties, our recommendation is that:</i></p> <ol style="list-style-type: none"> <li><i>1) there should be a £/MVARh payment based on the additional costs to the OFTO of incremental maintenance / asset replacement / auxiliary power; and</i></li> <li><i>2) a £/MVAR / annum availability payment for capacity in excess of STC requirements based on avoided costs to consumers.</i></li> </ol>
<p><b>Do you have any other comments?</b></p>	<p>No.</p>

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<b>Respondent:</b>	<i>Sarah Owen</i> <i>sarah.owen@centrica.co.uk</i>
<b>Company Name:</b>	<i>Centrica Energy</i>
<b>Do you agree with the findings of the comparison between the offshore and onshore generators?</b>	<i>We agree with the findings of the comparison between offshore and onshore generators, however, we are highly concerned about the impact these arrangements will have on the reactive power market.</i>  <i>We suggest that an OFTO that provides either in part or fully its reactive power obligation will be in direct competition with those generators around it. Regardless of whether these generators are onshore or offshore, they will have invested in providing a reactive power capability but will be less likely to be utilised ahead of an OFTO providing essentially free reactive power to National Grid.</i>
<b>Do you believe the commercial arrangements as described in the consultation are appropriate for the offshore regime?</b>	<i>The commercial arrangements laid down in the paper seem to be sensible although the above impact on reactive power providers should be investigated further.</i>
<b>Do you believe alternative commercial arrangements should be considered? If yes please describe those alternative arrangements.</b>	<i>We suggest that detailed processes and procedures should be developed to ensure the questions detailed below and any further considerations have been thought through in addition to the unfair competition impact to the reactive power providers (detailed above), to ensure no unintended consequences are introduced into this area.</i>
<b>Do you have any other comments?</b>	<i>We have further concerns on how these commercial arrangements will work in practice. We have some questions in this area and would appreciate some</i>



*industry discussion and agreement on the detail of working procedures:*

- 1. Agreeing the necessary MSAs/CSAs could be complex as potentially 3 (or more) parties are involved.*
- 2. If both the OFTO and the wind farm are instructed to provide reactive power, how will this be achieved and who will respond and control MVars to fulfil the instruction?*
- 3. How will metering of the reactive power be accomplished, this is especially important as the remuneration differs between the two parties?*
- 4. How will this work if there is more than one windfarm connected to an OFTO?*
- 5. What is the obligatory procedure if an OFTO connects to another OFTO?*
- 6. And reiterating the point made above, any OFTO set up to provide reactive power, will be utilised more by National Grid than any other (non OFTO) reactive power providers in the area. We feel this is unfair competition as the OFTO will not be paid for the use of the reactive power and the generator will have to provide reactive power capabilities but is unlikely to be utilised.*

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<b>Respondent:</b>	<i>Bob Reid</i>  <i>020 7121 3817 or 07803 146526</i>  <i>Bob.reid@bbcap.co.uk</i>
<b>Company Name:</b>	<i>Thanet OFTO Ltd</i>
<b>Do you agree with the findings of the comparison between the offshore and onshore generators?</b>	<i>We have no comment on this part of the consultation document.</i>
<b>Do you believe the commercial arrangements as described in the consultation are appropriate for the offshore regime?</b>	<i>We believe these arrangements are appropriate, as , from an OFTO's perspective, the effect is neutral.</i>
<b>Do you believe alternative commercial arrangements should be considered? If yes please describe those alternative arrangements.</b>	<i>We do not wish to propose alternative commercial arrangements</i>
<b>Do you have any other comments?</b>	<i>We would appreciate clarity in the final arrangements about the treatment of losses. Our preferred position is that all losses, including those associated with the SVC cooling plant, should be considered to be system losses. This would be logical since, as the OFTO does not receive any income related to usage of the SVC, they would be protected from the impact of additional operating costs when the SVC is dispatched at high load levels. (The OFTO is still liable for any additional maintenance costs, however the load-related element of these costs can be expected to be small.)</i>

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<b>Respondent:</b>	<i>Hannah McKinney</i>
<b>Company Name:</b>	<i>EDF ENERGY</i>
<b>Do you agree with the findings of the comparison between the offshore and onshore generators?</b>	<ul style="list-style-type: none"> <li>• In terms of capital costs offshore generators are not disadvantaged by the obligatory reactive power arrangements as they face the same obligations as onshore generators in the provision of reactive power capability. Fundamentally, reactive power capability obligations are based on generator capacity rather than whether it is provided onshore or offshore.</li> </ul> <p>In addition, it would seem that offshore Power Stations would be indifferent as to whether they install the required reactive power apparatus or negotiate with an OFTO to do so as the cash flows over the 20 year recovery period would be the same under either scenario.</p> <ul style="list-style-type: none"> <li>• Similarly to above, the same principle applies to operating fixed costs; the offshore generator might install their own reactive power apparatus and therefore be obliged to meet the costs of keeping it operational and available or the OFTO might pay the operating costs to maintain their apparatus which is then recouped via TNUoS.</li> <li>• Operating variable costs (maintenance) in the case where an offshore power generator does not provide the full reactive capability, and therefore the OFTO is the provider of the service, offshore generators would appear to be disadvantaged under this scenario as they are still exposed to the maintenance costs but do not receive the DPM.</li> </ul> <p>This could however, be addressed via a bilateral contract between the deemed OFTO and offshore generator to remove any likelihood of windfall losses or gains.</p>

<p><b>Do you believe the commercial arrangements as described in the consultation are appropriate for the offshore regime?</b></p>	<ul style="list-style-type: none"> <li>• The commercial arrangements described do provide sufficient and necessary flexibility to enable offshore generators to provide reactive power using the most efficient means available. For example, in some instances the offshore generator may choose to provide it themselves, or due to geographical difficulties it would be more efficient to allow the offshore generator to 'sub-contract' out the reactive capability service or a proportion thereof.</li> <li>• Further to this, it should be noted that these commercial arrangements appear to assume bilateral offshore radial networks. However, in the case of an integrated offshore network for example, it maybe more economic for the integrated OFTO to be the sole provider of reactive power. Under this scenario the OFTO would need to procure its own apparatus (e.g., install a single reactive power unit) to fulfil the reactive power capability obligations of every offshore generator connected to that particular network, rather than for individual units to be built separately as and when required. This would clearly give more weight to the option (No generator involvement) where the OFTO is the sole reactive power provider.</li> </ul>
<p>Do you believe alternative commercial arrangements should be considered? If yes please describe those alternative arrangements.</p>	<p>Please also see above.</p> <ul style="list-style-type: none"> <li>• In addition, EDF Energy believes the generator build option will be the preferred option for many offshore developers. Accordingly, it would appear that it will be the developer's choice (including those projects already built and connected to transmission). For example, the developer may choose to meet the requirements partly from offshore generation and partly from SVC's at the interface point. We believe that these pre-existing arrangements should be honoured when the OFTO takes over the assets and we ask what the governance would be to ensure this is the case.</li> </ul> <p>Without any safeguards in place the OFTO could subsequently increase the size of the SVC's to meet the full Grid Code obligation, recovering these costs via the local circuit element from the offshore generator and the rest through the residual element across the industry. This could have the adverse impact of effectively removing part of the offshore generators assets from the reactive market.</p>

<p>Do you have any other comments?</p>	<ul style="list-style-type: none"> <li>• In circumstances where there is no power station contribution, or as the paper says 'no agreement is reached between the offshore power station and the OFTO', the power station is required to maintain unity power factor at the Offshore Grid Entry Point.</li> </ul> <p>Where does this obligation arise (the Grid Code requires the offshore generator to have the capability to maintain zero transfer at the offshore Grid Entry Point) and what are the sanctions if this is not the case? If the offshore generator does not maintain nominally zero transfer this could lead to inefficiencies in the use of the OFTO SVC's.</p> <p><b>Note:</b> Our comments above reflect the context of the consultation paper which appears to imply that the unity power factor is required. However, it is not clear if this is required as a technical consequence or contractual requirement under the Grid Code. We therefore seek clarification on this particular point.</p> <ul style="list-style-type: none"> <li>• Our final point relates to the despatch mechanism, in particular Option 2 in the paper where there is already an onshore generator in proximity to the connection point to the offshore generator. In such circumstances if the OFTO provides all the offshore generator requirement through a SVC, then NG would expect to despatch reactive requirements via the OFTO as first choice as this is a 'free option' rather than despatching the onshore generator through the DPM.</li> </ul> <p>This would appear to be a distortion of the market mechanism for provision of reactive power and is contrary to the position of facilitating competition between providers. A similar situation exists with NG SVC assets that are connected to the transmission system; however we understand these are only used whilst there are no other possible service providers in the locality to control voltage profiles.</p>