

Frances Warburton
Ofgem
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London, SW1P 3GE

Dear Frances,

RE: Ofgem's open letter on charging arrangements for embedded generation

RenewableUK represents 438 organisations involved in onshore and offshore wind, wave, and tidal industries. In 2015, these technologies generated 12% of the UK's electricity needs, representing 52% of the electricity generated by all renewable technologies during the year. Furthermore, the previous Department of Energy and Climate Change considered that the technologies which we represent will provide over 70% of renewable energy generation by 2020.

Many of our members deliver these benefits to UK consumers by owning and operating renewable energy sources which are connected to the Distribution Networks. As of 2015 there was a total of 13.2 GW of wind power installed in Great Britain¹. 7.8 GW of this is visible to National Grid² (Transmission connected generation and Embedded Generation holding a BEGA). We therefore estimate that in 2015 there was 5.4 GW of Embedded Wind connected to the Distribution Networks.

It is therefore concerning to us that Ofgem appears minded to remove the embedded benefits which are paid to sub-100MW distribution connected generation without first undertaking adequate analysis to examine the consequences of such an action. We are concerned by the fact that Ofgem is minded to seek solutions to the issues identified in the open letter of 29th July 2016 via the CUSC modification process, rather than by an assessment in the round of the problems facing the market structure.

Whilst Ofgem is clear that its concern is that the current regime of embedded benefits does not reflect the value of the benefits which embedded generation provides to the transmission network, it is also clear that the set of CUSC modifications from which Ofgem is minded to choose a solution to this issue are instead directed (implicitly in CMP 264 and explicitly in CMP 265) towards the correcting of perceived problems with the Capacity Market. In light of this, an inadequate level of evidence has been presented both in the Ofgem open letter and in the code modification process for CMP 264 and CMP 265 to either assess the likely impacts of the proposed changes or to quantify the improvements which such changes would be expected to make to the baseline. Because of the accelerated timetable granted to both these CUSC modifications, no new analysis has been possible,

¹ From RenewableUK's "UKWED" database

² This total is computed by adding together the volumes of wind listed on National Grid's TEC register (<http://www2.nationalgrid.com/UK/Services/Electricity-connections/Industry-products/TEC-Register/>) and Embedded Register (<http://www2.nationalgrid.com/UK/Services/Electricity-connections/Industry-products/Embedded-Generation-Register/>)

and, given the significant nature of the changes, this means that the evidence base is cannot be judged sufficient.

We understand that it is important that the charging arrangements do not create perverse incentives in the market. Our membership accepts that change to the current arrangements are necessary. However, if a properly considered analysis supports a case for change there are other routes which the Authority can take in order to resolve any identified distortions in the market, routes which are likely to lead to better and more equitable enduring solutions.

In light of this, we ask that Ofgem undertakes a holistic review of the charging arrangements relating to embedded generators. Only through such a process will Ofgem be able to address the many and varied aspects of how to fairly reward market participants for their contributions to reducing the impact on the Transmission Network.

If Ofgem does decide to take early action, ahead of a holistic review, to tackle concerns raised over the interactions between the embedded benefits regime and the Capacity Market, then it is essential that the actions taken do not damage the interests of renewable generators, who are not the target of the concerns.

We understand that the greatest concern to Ofgem is the set of distortions which result from the growing size of the residual component of the Demand TNUoS charge. When considering the impacts of the demand residual component of the TNUoS charge on either embedded generation or the wider market it is crucial that any argument in favour of or rejecting embedded benefits is directed towards the correct component of the Demand TNUoS charge. It is the case that there are four elements which must be independently assessed for their contribution to the increase in consumers' demand TNUoS charges. Firstly, there is the total revenue which National Grid is permitted to recover each year, which is agreed upon in advance through the RIIO-T1 process. Secondly, there is the way in which this fixed annual revenue is recovered from both transmission connected generation and from demand. The share recoverable from generation is limited by the €2.50/MWh cap imposed by EU Regulation 838/2010, which shifts a progressively larger share of the TNUoS revenue recovery burden on to consumers. Thirdly there is the shape of the demand TNUoS charging regime itself, which constitutes a locational and a residual component. Fourthly, and lastly, there is the *a posteriori* allocation of the Demand TNUoS charge to consumers, which may be affected equally by the actions of either embedded generators or by half-hourly metered consumers reducing their consumption during triad periods.

It is clear that the actions of embedded generators affect only the last of these four elements. The scale of the recovered TNUoS revenue depends upon National Grid's actions in developing and maintaining the Transmission Network infrastructure. EU legislation dictates the share of this revenue which must be recovered from demand consumers. The way in which the resulting allocated Demand TNUoS revenue is charged to consumers via the locational element and the residual element is not dictated by the actions of embedded generators connected at the distribution level. The only element affecting consumers, and therefore the only element impacting on Ofgem's chief concerns in this matter, is the fourth element: that of the disbursement of rewards to different actors for the reduction in net demand during triad periods.

If Ofgem's concern is that one element of the Demand TNUoS charge is growing too unwieldy then we suggest that Ofgem's focus should be on the third of the elements above, namely the construction

of the Demand TNUoS charging regime itself, rather than considering how this unwieldy sum should be allocated to different market players. If Ofgem is concerned that the rewards available to embedded generators via the fourth element are causing a market distortion, then we recommend a holistic review to examine the structure of the market, in order to identify where these distortions truly lie, and to identify both the associated and the concomitant market distortions.

Alternative CUSC modifications

A CUSC workgroup is currently considering two original CUSC modifications, CMP 264 and CMP265, as well as more than 40 alternative modification proposals made against this pair. In essence, all the proposals target the netting of embedded generation output against a suppliers' gross demand, preferring a principle of gross charging for embedded generation output over the current regime of net charging. All target in one way or another a perceived distortion to the outcome of the Capacity Market auction due to the effects of embedded benefits. All target various subsets of embedded generators with proposals for how they should receive various elements of the Demand TNUoS charge.

Rather than considering a set of modifications targeted at the symptoms of a market distortion, it would be preferable to target the root cause of these distortions. If Ofgem is concerned that the residual component of the Demand TNUoS charge is growing to unacceptable levels, then it is better to attend to the way in which the Demand TNUoS charge is applied to consumers rather than introducing temporary fixes to limit the effects. We also note that the profusion of alternative modifications around the original pair of urgent modifications, submitted from such a diverse range of parties, makes a strong case for a holistic approach to tackling the problems identified in the open letter. With so many parties so clearly concerned by the distorting effects that the current charging regime is having on the market, a holistic review of system charges is a much better option than a series of incremental alterations to the existing regime.

To implement the CUSC modifications CMP 264 and CMP 265 would be to set in motion a train of piecemeal changes to the existing charging regime. This would be administratively inefficient and expensive, costly to the end customer, and damaging to UK energy sector investor confidence. The elements of the current demand TNUoS charging arrangements which can be proved to be not cost reflective should be remedied with a comprehensive, holistic solution that leads to a set of long term cost reflective signals for market participants. The lead time for the implementation of any major shifts in charging methodology must balance the need to prevent any current distortions with the need to protect energy sector investor confidence. Continually eroding the appetite of investors to bring forward any new UK generation will ultimately be a threat to the security of supply of future customers.

Net charging and fair reward

The current regime for the calculation of a supplier's Demand TNUoS liability involves the netting off of output from embedded generation contracted to deliver to that supplier against the consumption of that supplier's customers at network peak demand. We do not see that Ofgem has demonstrated that this principle should be reversed.

Under the existing arrangements, the net effects of a unit of reduced demand by a consumer and the same unit of power delivered onto the distribution network from an embedded generator are

indistinguishable to the transmission network operator. The net effects of these different actions at the GSP level are identical and so should be rewarded in an identical manner.

We would ask that Ofgem examines fully the benefits provided to the transmission network by each type of unit connected to the distribution networks, both demand and generation. All similar system benefits should be rewarded similarly, and where there is a benefit it should be rewarded. We ask that Ofgem does not by its actions bring about asymmetries in treatment between parties which will result in future defects to the market.

We would also like to see commercial arrangements developed so that all market participants, those who connect at the distribution level or those who connect at the transmission level, can engage in the full range of markets. If Ofgem seeks a level playing field between transmission and distribution connected parties, then access to balancing markets should be looked at alongside a reassessment at a whole-system level of network charging arrangements. It is also important for Ofgem to consider the implications of what is deemed to be distribution connection in Scotland and what is deemed to be distribution connected in England and Wales if the fairness in treatment between transmission and distribution connected parties is to be sought.

Small but significant impacts on revenues of embedded wind

Embedded wind resources are variable sources of power, their output varying as wind patterns change. Whilst it is the case that National Grid has no direct control over any form of embedded generation not holding a BEGA (via either the Balancing Market or emergency instructions) it is however generally accepted and understood that *“National Grid can predict tomorrow’s wind power [delivery] more accurately than tomorrow’s electricity demand”*³. As far as day-ahead system security goes, having wind on the system presents National Grid with less of a problem than does changing patterns of consumption. If we use transmission-connected wind as a proxy for the behavior of embedded wind, then we estimate that wind more commonly over-generates against contracted volumes than it under-generates⁴.

It is highly improbable that embedded wind plant target an increase in their output solely in order to tap into the embedded benefit value of the demand residual TNUoS available at triad periods, as output volumes are weather related and not market related. It is the case, however, that delivery at triad periods is non-zero across the embedded wind fleet and that this output can reduce the demand metered at many GSPs, resulting in reduced flows demanded on the Transmission Network. Where this is the case, the benefit can and should be cost-reflectively recognised through the network charging arrangements.

Some RenewableUK members report that embedded benefits can typically account for of the order of 5% of their annual revenues⁵. This is a small but significant component of the income for developers, many of whom find it difficult to participate in the process which seeks to reduce the revenues, as they are not parties to the CUSC.

³ The Telegraph, 14th August 2016: <http://www.telegraph.co.uk/business/2016/08/14/britains-vast-national-gamble-on-wind-power-may-yet-pay-off/>

⁴ Analysis performed on imbalance positions from BM Reports data.

⁵ We point to the analysis undertaken by Vattenfall contained in their response to this open letter to support the claim that embedded benefits potentially account for up to 5% of revenues for embedded wind

To resolve this Ofgem should undertake a wide ranging and holistic review of the impacts which each component of the electricity system has on the electricity networks. With Government, National Grid, and Ofgem aligned on the need for greater flexibility on the network, it is clear that the volume of distribution connected generation will only grow in relation to the volume of transmission connected generation, and we urge Ofgem to tackle the root cause of ‘T vs D’ charging distortions by examining the structure of charging regimes themselves.

Embedded wind impacts on triad calculation

National Grid’s published historic demand data⁶ provide estimates for the volume of delivery of Embedded Wind in each settlement period. We can see from this particular data set, illustrated in Table 1 below⁷, that if the output from Embedded Wind is not taken into account, then triads would, more often than not, fall on different dates. Embedded wind therefore can and has contributed to reduction in peak demand. It can be seen in Table 1 that the netted total demand at each recalculated triad over the past five years would be greater were it not for the effects of embedded wind. For a third of the triads, the effect is substantial, being greater than 1GW. It can also be seen that the effect of embedded wind is progressively greater for the second and third triads each year, both in terms of peak volume and the scale of the temporal shift. Embedded Wind clearly contributes to the flattening of peaks, and to the net reduction of demand on the transmission network. Moreover, wind contributes invisibly to the reduction in peak demand. To look only at the final triad periods, assessed from net demand, is to miss the contributions of embedded wind against gross demand on days when the contributions of embedded wind flattened what would otherwise have been larger peaks in demand.

Clearly, as we have already stated, embedded wind generators are variable source of electricity, and cannot actively dispatch predefined volumes of power in order to target potential triad periods. However, from National Grid’s own data it is apparent that embedded wind does indeed contribute to the reduction in peak net demand and to the timings of triad periods, and should be commensurately rewarded for this service. RenewableUK believes that only a holistic review of how charging regimes are constructed and how the system operates at peak – indeed, how Ofgem foresees the system operating at peak – will deliver an equitable response which fairly rewards all parties for their actions.

	1st Triad		2nd Triad		3rd Triad	
	Shift (<i>days</i>)	Demand change (<i>MW</i>)	Shift (<i>days</i>)	Demand change (<i>MW</i>)	Shift (<i>days</i>)	Demand change (<i>MW</i>)
2011/12	0	401	33	695	-43	722
2012/13	0	317	0	227	-61	1,415
2013/14	-10	1,049	20	723	-13	1,260
2014/15	41	692	13	773	-60	1,844
2015/16	0	454	0	1,470	67	733

Table 1: This table illustrates the number of days which the Triad periods would have shifted had Embedded Wind not provided power at the Distribution Network level (Green if the Triad shifted forwards, red if it retreated back in the winter)

⁶ <http://www2.nationalgrid.com/UK/Industry-information/Electricity-transmission-operational-data/Data-Explorer/>

⁷ RenewableUK analysis

period). It also indicates the change in the size of the peak demand during triad periods between the netted Embedded Wind volume and non-netted Embedded Wind volume.

Summary

Renewable UK agrees with the need for embedded benefits to be reviewed and the importance of tackling any perverse incentives on the system. However in order to be dealt with efficiently we would ask that Ofgem considers the following issues in its work on embedded benefits and the demand residual TNUoS element:

- The financial impact on parties unable to contribute to decisions directly affecting their revenues
- The importance of a holistic review of network charging in order to make decisions on the future of the charging regime from a firm evidence base
- The contributions of embedded wind to the reduction of system demand peaks, and to the timings of triads
- Optional to address perceived defects in the Capacity Market within the framework of the Capacity Market itself, and not through other, tangential means
- The application of the principle of a fair reward for a fair service, to avoid the creation of asymmetries in the treatment of parties connected at the same grid level.

Yours Sincerely
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