



Frances Warburton
Partner - Energy Systems
Office of Gas and Electricity Markets
9 Millbank
London
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Dear Frances,

We welcome the opportunity to respond to your open letter on charging arrangements for embedded generation (EG).

Our objective at Origami Energy is to drive whole system efficiencies by increasing the utilisation of new and existing flexible assets, and help drive consumer bills down by deferring investment in large centralised infrastructure. There are currently few revenue streams that recognise the benefit of providing system flexibility outside of ancillary services, despite general industry consensus about the benefits of a smarter, more flexible system. One of the mechanisms that does recognise the benefit of system flexibility is embedded benefits (EB). Therefore, we have major concerns that this mechanism may be removed and/or not replaced with an appropriate mechanism that recognises the benefits provided by EG, storage and other providers of flexibility.

It appears that the embedded benefit review in recent times was announced by DECC in response to diesel generation creating a low bidding price in the Capacity Market (CM). This contributed to a lack of successful bids for large CCGT. If the intention is to reduce the attractiveness of higher-carbon solutions, such as embedded diesel, then any new mechanism should attempt to address this more sensibly than a removal for all technologies, for example, through a tiered level of embedded benefit rated according to carbon-intensity of fuel source/generation type. Removal of embedded benefits across the board is likely to significantly stall an emerging new lower carbon storage and flexibility market, to the detriment of UK economy and jobs. This would likely result in higher overall costs for consumers.

The current charging regime, transmission and distribution was designed for a centralised system. It was not designed for the flexible decentralised system that we are seeing rapidly develop, and which is highlighted to provide significant consumer benefits of up to £8bn per year by 2030 by the recent National Infrastructure Commission (NIC) report, 'Smart Power'¹. As noted in your open letter, there is a lot of ongoing work in industry alluding to the fact that charging is not fit for purpose. This includes the CDCM and EDCM reviews, National Grid's (NG) charging review, Ofgem/BEIS review of charging through the flexibility/smart work amongst others. There is a risk of unintended consequences if a

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https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/505218/IC_Energy_Report_web.pdf



change to embedded benefits is rushed in without considering the evidence from these other significant pieces of work. Specifically, there is a significant risk of moving away from a smarter, more flexible, lower-cost electricity system instead of towards it. Our recommendation is that as evidence comes in from these pieces of work, Ofgem reconsiders carrying out a Significant Code Review (SCR). This would cover transmission, distribution, use of system and connection charging, with the objective to remove distortions and level the playing field across the system. Although this would be a considerable undertaking, a full SCR is likely to result in the best outcome for consumers.

Please find our complete response below, and do let us know if you have any questions about our response or if we can contribute to your analysis for this or wider work, in any other way.

Yours faithfully,

Peter Bance
CEO
Origami Energy Limited



Your main concern – the TNUoS demand residual

We understand that the assumptions behind EBs were made at a time when EG made a rather insignificant proportion of our generated energy. We understand that there are some costs imposed on the system, as levels of EG have increased (now approximately 28GW connected²), that are not passed on to embedded generators at certain times of system stress e.g. negative impacts of solar PV generation at summer minimum demand periods. We also understand Ofgem's concerns of increasing TNUoS demand residual as peak demand reduces and I&C customers use innovative ways of avoiding peak charges. Diesel peaking plant may have distorted the result of the Capacity Market somewhat, as the embedded benefit available to them has enabled them to further reduce bid-in prices. However, leaving the capacity market aside, we do not agree that investment in smaller distribution connected generation creates an inefficient generation mix. It is likely that the majority of flexibility that the system requires, that Ofgem and BEIS are working to enable, will come from distribution connected assets. Outside of engine efficiencies, there are significant benefits in placing EG closer to demand centres, reducing losses and deferring the requirement for investment in distribution and transmission infrastructure (when optimally located and operated). Distributed generation also enables us to build a diverse portfolio of low carbon generation assets, removing the risk of investment in expensive centralised infrastructure and assets.

We think there are a lot of factors contributing to transmission connected generation exiting the market, not primarily associated with the embedded benefit/demand residual payment. These include renewable subsidy distortions, CM failure, drop and uncertainty in wholesale prices, drop in oil prices, uncertainty in other potential revenue streams and emission regulations shutting down high emitting plant as we decarbonise.

We agree that the results of the CM may be distorted as a result of inexpensive diesel peaking plant, and that the EB may be contributing to this. We do not think that the remedy is to remove the EB for all technologies and if it was changed it could be done by having tiered level of embedded benefit rate according to carbon-intensity of fuel source/generation. However, we do not think the EB is the central issue here. We think that to address the underlying problem, the CM and balancing mechanism should be adjusted to reflect carbon intensity of participants alongside long term UK emissions legislation.

We think that the current mechanism although not perfect, has enhanced innovation as it incentivises the market and organisations to develop technology to capture these benefits and benefit the system by reducing peak demand. Some behaviour may have negative impacts such as transmission connected users managing to avoid Triad but shift intense usage to other times. However, any change in mechanism should ensure an incentive remains to drive the market to innovate for system flexibility and peak demand reduction.

We are glad that you recognise the importance and benefits technologies such as CHP (and others like storage and smart technologies) offer to the system. We would appreciate a strong message from Ofgem that a mechanism to realise these benefits will be retained through any changes to the EB

² <http://www.energynetworks.org/assets/files/news/publications/Reports/TDI%20Report%20v1.0.pdf>



mechanism. This will bring some certainty to this area, as the current EB announcements are questioning the viability of a new innovative business models and technologies such as storage, designed to increase system flexibility. This is of utmost importance when the current energy policy intent is to remove barriers and unnecessary costs for flexibility providers e.g. getting fair network charging and removing unnecessary end user energy levies for storage, as it is treated as a typical generator.

It is encouraging that you will consider the locational element alongside your work on system flexibility. It is appropriate to consider these in the round with overall system and regulatory objectives.

We agree that the generation residual and BSUoS are less of a priority. However, on the BSUoS element, there are issues around different treatment and recovery between distribution and transmission connected generators and demand customers. Also when providing a system balancing service it does seem inefficient to be charged BSUoS. We agree that this should be looked at as part of your ongoing work on system flexibility.

Does EG provide any other benefit?

We agree with your analysis that there is additional benefit from EG in avoiding investment at importing GSPs, or costs if driving investment at exporting GSPs. We also note that there is a benefit in losses reduction offered by EG that was not mentioned in your open letter. We don't believe the 'locational transmission losses' pricing planned to be implemented following the CMA review, mentioned in your letter, will adequately reflect the benefits of EG versus transmission generation. Considering the cost of losses (i.e. c.7% of energy is lost in transmission/distribution), and lack of effective regulatory mechanisms to reduce these, the losses reduction benefit typically provided by EG and storage should be considered as part of your evidence.

Other benefits of EG that are currently not reflected in any other mechanism are the contribution to reduced loading on distribution networks that can serve to minimise asset duty, increase efficiencies and provide contributions to security of supply. The significant potential of EG to participate in flexibility schemes to help reduce overall peak demand and provide optionality and investment deferral should also not be overlooked. Whilst today, there are limited routes to market made available by network operators to recognise such benefits, it is our view that EG will increasingly provide a critical role in avoiding network investment and managing a smarter system. An abrupt change to the embedded benefits is likely to stall deployment of EG to the detriment of moving to a smarter and more flexible system.

There are wider societal benefits provided by EG, by enabling non-traditional business models and community energy schemes, some of which go towards reducing fuel poverty. There are also wider economic benefits of job and industry creation.



Initial thoughts on your approach

We do not agree that the best approach is to tackle EB separately through the code modification process. We think that the EB issue is part of much wider charging issues. A code modification approach would risk missing an opportunity to analyse and resolve charging issues holistically. Getting charging right is fundamental to enabling the correct pricing signals required to develop an efficient system.

In the letter you state a 'delay in implementation is likely to mean reduced consumer benefit'. However, this fails to consider anything wider than the basic cost of the residual payments. It does not consider the potential future benefits that an increased level of EG might be able to offer consumers in a smarter more flexible system, once other barriers to flexibility and storage are resolved, highlighted in recent papers on system flexibility. We believe a more rapid and agile approach to removing other barriers for flexibility and storage would be a more direct approach of mitigating the risk to increased costs for consumers, before the scale of any suggested distortion would become significant.

The code modification process (through the CUSC) would mainly get the attention of the large incumbents. This is evidenced from the two code modifications that you present in your letter from Scottish Power and EDF. These players will see this issue from a particular perspective, missing that of decentralised stakeholders and overall strategic policy objectives. The CMA backs this point up by raising concerns more generally about the code modification process in its recent Energy Market Investigation Report³. It states that:

"We have found that the current system of industry code governance limits innovation and pro-competitive change and causes the energy markets to fail to keep pace with relevant policy objectives."

Relying on industry to come forward with modifications to fix the EB issue is a risky approach. We believe strategic, consistent direction is required from Ofgem on whole system charging.

We think that the only way this can be done in a proportionate and appropriate way, considering the scale of the problem, is through an SCR.

The 'likely time involved' in an SCR is not in itself a valid reason to push through an incremental change that may have unintended consequences. It also does not appear to directly address the central concern, which appears to be distortion to the CM and an increasing residual demand bill.

If code modifications are taken as the route to change, or as an interim solution, we would recommend a grandfathering approach, whereby changes are not made for a subset of users or a subset of investments made by specific users. These users would specifically be for energy storage developments and investments. These assets are being deployed to offer a system benefit. The business case does not rely on subsidy like other forms of low carbon EG, but by stacking revenues and/or benefits. The embedded benefit is an important part of the business case and losing it threatens the viability of storage deployment. This is evidenced from the National Grid's recent Enhanced Frequency Response

³ <https://assets.publishing.service.gov.uk/media/5773de34e5274a0da3000113/final-report-energy-market-investigation.pdf>



announcement, where 6 companies chose to withdraw tender options from 10 sites following your letter on embedded benefits. This highlights the level of investor uncertainty the embedded benefits announcement has created, and the risk this creates for new flexible technologies.

Hindering storage deployment goes against Ofgem/BEIS objectives of saving customer's money by increasing system flexibility. We think that a grandfathering approach, ring fencing storage from being impacted by any changes to EB could be one approach to avoid unintended consequences to storage and system flexibility. However, we reiterate that our recommended approach is to consider all evidence and carry out a full SCR for network charging.

Potential distortions from other arrangements

It is not clear whether distribution connected generation paying DUoS is disadvantaged over transmission connected generators paying TNUoS. However, of note is our experience of connection charges for distribution increasing as network capacity headroom is taken up by EG. This is making it more challenging to make the investment case for distribution projects and get connected. We welcome Ofgem's work on Quicker more efficient connections (QMEC) in helping to get customers connected in response to these issues. Although positive steps are also being taken by DNOs towards flexible connections, designed to lower connection costs, EG does not receive any constraint payments, unlike its transmission connected counterparts. Transmission connection costs are primarily spread through ongoing use of system charges, not a bulk upfront payment as in distribution. Transmission connected generators are also able to secure long-term pricing commitment through CfDs, providing contractual certainty that is unavailable to storage and for other EG. Given these discrepancies, some the result of wider energy policy, one could argue that the playing field is currently weighted towards large transmission connected generators, not towards EG. However, it is difficult to conclude without a thorough benefits analysis. Therefore, we consider that all other charging arrangements and potential distortions between distribution and transmission connected generation should be considered in the round as part of an SCR on current network charging arrangements.

You point out that significant changes to EB may push more generation behind the meter or into private wires. A push to behind the meter generation may create issues for system transparency, operation and for the regulation of these assets. It could also cost more as the full benefit of these assets will likely not be available for the whole system. We encourage Ofgem to consider unintended consequences of making a significant change to the EB regime.

We welcome the opportunity to discuss anything raised in this letter further with you. We also look forward to continuing to work with you on wider issues in the forthcoming call for evidence from Ofgem and BEIS on a smarter/flexible system.