

Email to:

WMReform@ofgem.gov.uk

22 November 2023

Dear Eleanor Warburton,

Response to Ofgem's Open letter on strategic transmission charging reform

Scottish Renewables is the voice of Scotland's renewable energy industry. The sectors we represent deliver investment, jobs and social benefits and reduce the carbon emissions which cause climate change. Our 340-plus members work across all renewable energy technologies, in Scotland, the UK, Europe and around the world. In representing them, we aim to lead and inform the debate on how the growth of renewable energy can help sustainably heat and power Scotland's homes and businesses.

Scottish Renewables welcomes the opportunity to respond to Ofgem's Open letter on strategic transmission charging reform. We also welcome the broad thinking of Ofgem in preparing this letter and applaud both the presentation of the key issues and the range of potential solutions under consideration.

Transmission charging is an important driver for achieving our 2035 and 2050 targets, however catastrophic increases in the recent Transmission Network Use of System (TNUoS) tariff projections by National Grid ESO for Scottish projects present clear risks for consumers, generators and our overall net-zero ambitions. The scale of the increase is unprecedented. As an indication, the charges in 2033/34 create a differential of c.£20/MWh between offshore wind in the north and south of GB, with similar values for other technologies. This would result in one of two possible outcomes:

- The investment case for renewables projects in Scotland becomes uneconomic, increased support through CfD is not forthcoming and decarbonisation of the electricity system by 2035 is not delivered.
- Increased support is provided through the CfD, but substantially increases the cost of all renewable generation and net-zero delivery.

Currently, TNUoS tariffs are not predictable and National Grid ESO insists they are provisional which makes it difficult for clean energy generators to forecast. As a result, industry cannot trust these projections which is fuelling uncertainty and discouraging vital investment.

TNUoS is not fit for purpose and Ofgem must launch a rapid, strategic review

We are calling for Ofgem to launch a rapid, strategic review of TNUoS methodology now, as opposed to the timelines set out in this open letter. This review must consider the scale, timing and cost of net-zero delivery and meet the Energy Act's requirement for Ofgem to consider support of net-zero.

It must ensure that the current transmission charging methodology is fit for purpose and will not present a barrier to achieving our net-zero targets. At a time when we need to increase renewable generation to meet UK targets, charging methodology should provide certainty and predictability of charges to increase investor confidence, particularly in the developments needed in the north of Scotland.

There are several important factors involved in supporting the UK's climate change commitments, and Scotland is a major player in helping the country reach these targets. However, if TNUoS is not reformed, there will be significant deterrents to development. For Scotland, TNUoS could be the biggest barrier to achieving our net-zero targets.

We believe that TNUoS, as a locational signal, is not as effective as planning, land availability, resource location, and connections availability. These factors provide much stronger signals for determining optimal locations. By strategically coordinating these elements, we can directly improve locational choices. Currently, the transmission system is being designed in a centrally coordinated way, which contradicts the TNUoS approach of providing an incremental marginal cost signal to all generation. This inconsistency is driving the need for fundamental reform to the transmission charging methodology.

As previously stated, the recent 10-year TNUoS forecast will 1) impose significant, unmanageable costs on existing generation which couldn't have realistically predicted or now respond to, and 2) raise CfD costs for new generation where location has been pre-determined and/or where the wind resource is the greatest. As a result, TNUoS is putting ScotWind projects at the back of the wind development queue, threatening the achievement of the 2035 and 2050 targets in addition to causing Scotland to miss supply chain opportunities.

Ofgem needs to step in now as these wider consequences are too profound to be left to the current TNUoS Task Force.

Developers and investors need a predictable signal for future TNUoS charges to incorporate into investment decisions and minimise the associated cost risk. The projections by National Grid ESO

are helpful, but reform is required to create an environment that delivers stability and certainty to investors.

Under the Review of Electricity Market Arrangements (REMA), TNUoS could be positively changed to address locational challenges incrementally, by encouraging more flexible demand in congested areas like Scotland by allowing negative demand charge.

Key principles

We would like to propose some key principles for TNUoS charging instead of specific solutions which the industry hasn't yet agreed upon.

1. Reform is needed with urgency.
2. TNUoS charging methodology must provide long-term certainty for capital intensive, new build generation.
3. The methodology should enable not hinder net-zero and should consider the ability of system users to retrospectively respond to locational signals.
4. Solutions must consider the impact on current operational assets.
5. If it is being used to send a locational signal, TNUoS should send a signal based on future strategic network plans and not the status quo.
6. Locational signals should not drive up CfD clearing prices, causing avoidable costs to consumers. According to Ocean Wind's report¹ from Aurora, the status quo could lead to consumer harm of over £5bn.
7. The charging methodology should deliver tariffs which are sustainably compliant with the €0-2.50/MWh allowable range and must be cognisant of interconnected markets.

We look forward to more development of the possible frameworks, including the outlined 'loss-based' or 'capacity-based' alternatives. We are not ruling these out at this stage.

In keeping with our involvement with the TNUoS Task Force and other industry bodies, Scottish Renewables would be keen to engage further with this agenda and would be happy to discuss our response in more detail.

Yours sincerely,

¹ [20230905 Aurora analysis of the consumer impact of TNUoS ISSUED.pdf](#)

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Background for Reform

1. Do you agree with the need to consider the future role and design of transmission charges in light of system changes and developing policy reforms? Which of these policy areas do you deem as more or less material?

We are firmly in agreement with the need to reform the transmission charging methodology and regime considering the wide-ranging changes that have impacted the transmission system since the current regime was established.

We agree that, on policy reforms, the two most material considerations are (i) REMA and (ii) the move towards strategic and spatial planning. REMA with its potential for introducing locational marginal pricing in some form, is going to be more material. CfD reform is also significant and needs to align with broader reforms and mitigate the impact of increasing transmission charges, inevitable if the current methodology is not changed, and likely under any future regime, if a net-zero system is to be achieved.

The development of spatial planning as proposed in the Winser report is also materially significant as it provides a basis for providing a strategic approach for the type and volume of generation that is needed to deliver a net-zero system. If this takes a balanced approach to all aspects of project development and risk, it could be much more efficient than relying on market forces to determine where and when generation and demand is developed.

For example, an offshore wind locational signal is primarily provided by the Crown Estate Scotland leasing rounds and other external factors such as seabed conditions, wind utilisation, etc. A charging signal based on expansion factor provides an unintended barrier to development as offshore wind will always be developed at the extremities of the existing grid network. The consequence is that the high charges developers face particularly in the north of Scotland can only be fed through into the CfD strike price and passed onto consumers.

We would add here that high charges are not only impacting on CfD price - but also other routes to market such as PPA's (which will need to be more expensive and therefore less attractive to off-takers - also fed through to the consumer via bills) but high TNUoS, as well as exponentially unforecastable increases undermine investor confidence in the UK - and in turn increase costs of capital as developers increase their risk margins.

This tension, if not resolved, will undermine the delivery of GB net-zero targets in the short and longer terms.

TNUoS has a significant impact on the clearing prices of CfD allocation rounds. According to modelling, Scottish projects will continue to influence the clearing price in future allocation rounds, resulting in unnecessary additional cost to consumers. Projects in the south of GB are awarded

CfDs at a strike price above what would be required to deliver these projects and this unnecessary uplift can cost up to £5bn to consumers. Furthermore, if we consider the latest 10-year forecast, the number of consumers affected by this harm will increase significantly.

It's also important to note that the UK is sending out mixed signals regarding wind energy. On one hand, the government has set targets and there are opportunities for seabed leasing. However, the pricing and unpredictability of the TNUoS in Scotland make it a high-risk area for building wind farms. The methodology for locational signals also indicates that it may not be the best place for investment.

2. Are there other reform programmes not considered here that are likely to have a material bearing on the future role and design of transmission charging?

As highlighted above, CfD reform is material to, and needs to be influenced by, transmission charging reform.

In addition, offshore network coordination will have a bearing, although we see this as broadly within the category of strategic and spatial planning. OFTO regime needs improvement and development to meet the net-zero challenge. For example, clarity on post tender revenue stream economics to mitigate the risk of early decommissioning of renewable generation. Other aspects of the OFTO regime are impacted by transmission charging and vice versa including, the generator commissioning clause, multi-purpose interconnectors and generation re-zoning. Charging reform needs to consider the interaction and impact with these elements.

Objectives of Transmission Charging

3. Do you see reasons to alter our current view not to design transmission charges to send dynamic operational signals for generation and demand in the longer-term?

Transmission charges (and the unpredictability) are currently sending a signal not to build and invest in Scotland. Transmission charges were designed historically to send a locational investment signal - when coal and gas could be located near to centres of demand. The signal they were sending then (and continue to send) is not to site generation at the extremities of the network, which is completely at odds with government policy and national need.

Trying to reform TNUoS methodology (which has been increasingly complex due to generation changing beyond all recognition from when it was designed) without addressing the fact that the underlying principles are no longer fit for purpose for net-zero will not result in the rapid change industry needs to be able to invest and deliver on targets set by the government.

Transmission charges need to be predictable to provide effective long term investment signals and therefore cannot also effectively anticipate real time operational conditions. They are already

unstable and create investment uncertainty, if they were to vary with operational timescales then it would be incredibly difficult to create an investment case. In this case, the CfD would be required to 'smooth them out' - therefore negating some of their effectiveness whilst leaving alternative routes to market at a significant disadvantage.

However, the operational benefits of co-locating demand and generation and other combinations of hybrid generation sites could be signalled by appropriate long run investment signals and is an opportunity for transmission charging reform to consider.

We believe that attempts to mix operational and investment signals with network charges risks double-counting and mixed-signalling; it would weaken the efficacy and usefulness of the investment signal element. Furthermore, it can distort related market signals – whether that be wholesale market, locational flexibility market, reformed BM, or other related system elements which include operational dispatch signalling.

4. In addition to those described above, what would be the other key characteristics of a future design, for the transmission charging framework, to enable its effective incorporation into investment decisions so as to achieve cost-effective net zero?

Locational signals in the existing transmission charging methodology are working in direct opposition to delivering and supporting net-zero due to the current expansion approach to cost reflectivity. Low-carbon targets require large offshore wind to deliver large volumes of renewable low-carbon energy. Inevitably, offshore wind will be located at the extremes of the existing transmission network exposed to the higher zonal charges that exist furthest away from the centres of demand. This is apparent in the north-south divide in cost exposure highlighted by the recent NGENSO 10-year TNUoS projections.

However, the need for transmission network upgrades is triggered by generation and demand connecting at all points on the existing distribution and transmission networks. Generation in particular offshore wind has a very limited ability to respond to the locational signals included within TNUoS. Reforms should focus on delivering locational signals to assets that can respond to them including storage and certain flexible demand. The decision to locate is dominated by where wind resource is most prevalent, where seabed rights are leased and compatible with the construction and operation of wind farms of scale. The cost of the transmission network upgrades is therefore levied inequitably on some generators compared to others. This is creating a shutdown signal for many sites with TNUoS levels rising to 65% of the levelised cost of energy and the upward pressure on CfD strike price. This also coincides with the allocation round 5 where the pot was reduced. Projects with more favourable TNUoS charges are still being impacted by supply chain and interest rate issues.

Framework for transmission charge design

5. Are there other key drivers that should be factored into the transmission charging framework? Which of these drivers do you see as most important?

We agree that the range of drivers identified by Ofgem and presented in Figure 1. is appropriate and comprehensive. We believe the choice from cost drivers within the 'what costs' options to be the most important.

The current expectation is that with the current regime, significant increases in transmission charges will materialise to meet net-zero network investment costs.

Additional drivers could be to value the carbon benefit of the generation type and the flexibility, or other operational benefit of the source, to meet network needs. For example, a hybrid site such as a traditional pump-storage site or hydrogen generation or BESS situated beside wind or solar generation. Demand sites that provide 'behind the meter' generation can be similarly assessed. The extent to which these sites can be managed to mitigate constraint costs could be given a value. Similar in importance is the question of TNUoS charges reflecting planned future network conditions.

Future design also needs to consider the impacts of a 'status quo' scenario where offshore wind clusters in the south-east and relatively few ScotWind sites are realised.

6. Do you have any views on which of these approaches would be more effective, considering the energy transition?

Appropriate valuation of constraints and system losses, optimising investment in and use of the network, and incentivising the development of low-carbon renewable generation are all essential to achieving a net-zero system. The transmission charging framework cannot do all these things but needs to be at least neutral if not positive in supporting these ambitions. It cannot do everything but should focus on predictable and equitable cost drivers, with long term resets appropriate to the benefits different User types bring to a net-zero system.

Developing alternatives to the expansion approach need to be identified. The proposals to consider network losses may create the same problem. Connecting at the periphery of the network may still be penalised due to higher losses although with the changing network flows this could be a more equitable approach. It is also worth noting that generation connecting to the extremities of the system is already penalised due to locational transmission loss multipliers (TLM's).

7. Do you agree that TNUoS charges should reflect planned future network conditions rather than actual network conditions?

Ofgem's proposal that use of system charges should aim to reflect the forecasted future planned network, rather than today's methodology of the current network can improve predictability, and therefore has merit in this respect. However, it is unclear yet as to whether introducing a deeper connection charge would be effective, but this could provide a more equitable spread of costs. The challenge for investors is not about volatility, it is the scale of the charges.

8. Do you agree that the frequency of reset should be longer than 'real-time', to ensure an effective investment signal can be sent?

To achieve predictability, longer term resets are much more beneficial. The potential for a longer term TNUoS contract so that charges faced by some categories of network users are stable for a period after connection could support this. OFTO's benefit from such an approach, and it should be considered for other users.

Starting with the logic presented in section 2 for the transmission charge being designed solely as an investment charge, it follows that users are expected to use this information on investment decision timeframes – months and years rather than anything close to real-time.

9. Have you any views on how trade-offs between predictability and cost-reflectivity in considerations of how frequently network charges should be reset should be managed?

See the response to the previous question.

Key questions for transmission charge design

10. Is there an enduring justification for paying credits to generators, specific to their siting location, through their transmission charges?

The current charging methodology makes such payment inevitable and highlights why it needs to change. The allocation of the cost of funding transmission network upgrades must provide a level playing field for investment in renewable energy that will deliver the GB net-zero targets. Under the existing regime, this is not happening.

The principle of cost reflectivity is not being achieved under the current methodology. The transmission network has changed radically from the "top down" flows from supply to demand with the advent of disaggregated and distributed generation sources. Energy flow is often from lower to higher voltages and frequently from south to north. Network upgrades that meet these new flows are not necessarily extending the network at its periphery but reinforcing its capacity throughout the network.

It is right to reconsider the paying of credits to generators. The current methodology, in principle, rewards each MW in a negative-charge zone for avoiding incremental network investment need,

to the same degree that each MW in a positive-charge zone is penalised for adding incremental investment need. This assumption of symmetry rarely holds – these are often different types of generators acting at different times, for example, southern peak-time generators often act in periods of low northern wind. The outcome is that network investment need is not avoided and therefore the scale of credit is not justified.

It is alarming that charging design pays thermal, carbon-intensive generators in the south - into the tens of millions. We believe that all users should pay towards the costs of operating and maintaining the network, in recognition of the benefits they gain from this access.

11. How should the distinct characteristics of storage assets be reflected in their treatment in network charging, to encourage optimal investment outcomes across the large storage development pipeline?

Storage should not be treated in the same way as other generation sources in terms of allocating network capacity. Consideration of its operational service and impact on the network needs to be incorporated into the methodology and charging regime, thereby releasing network capacity for other types of Users and reducing the connections queue.

Transmission network charges should be designed to avoid any distortion or undue deterrent for storage to fully participate in relevant markets/mechanisms for operational dispatch – whether wholesale, local flexibility, reformed BM or similar.

12. Within the range of storage assets, what distinctions should be taken into account in the charging approach?

The capability of a given storage asset to meet short term operational needs and service provisions for the network should be supported by the charging methodology. The development and operation of hybrid sites with mixed demand and generation sources including storage, which can provide multiple network services, should not be hindered. This isn't materially better than separate BESS/Gen/Demand which are metered separately but physically adjacent.

13. To what extent should transmission charges send locational signals to large demand users of the network?

Demand that can mitigate transmission investment for example by being sited near generation should receive positive charging signals compared to demand that triggers investment. Encouraging hybrid sites where demand and generation can be managed and net off should also be considered as benefiting from a charging signal.

The present methodology exposes users to signals that they cannot meaningfully respond to; this is detrimental to the consumer and to the achievement of government targets. Before the

investment decision, locational signals simply act to inflate the cost-of-energy/CfD prices/cost to the consumer of new generation projects. Post investment decision, large-scale generation cannot relocate and therefore the only effects of changing locational signals are either closure signals, value erosion or windfall gains. None of these are desirable.

14. What level of locational variation in charging is appropriate, for smaller demand users who are not generally expected to change siting decisions based on the signal?

Locational signals should only be given to users who can respond to the signal.

15. If there are significant increases in the costs recovered through the residual charge, should alternative charge designs be considered?

Transmission charges need to provide a level playing field for users based on appropriate cost reflectivity and the benefit they bring to the network and other users. Increases to the residual charge may well be appropriate in this context but need to be shared proportionately on a usage or capacity basis.

This needs some consideration in our opinion. Could the answer be to simply allow the transmission charge residual to increase?

Ofgem expects the residual to roughly double (total TNUoS pot increases from £4.5bn to £7bn by 2032). This is the price of mass electrification, the price of access to cheap clean energy. Customers will be net better off. The best way to pass out the increased total transmission charge is to share it out as equitably as possible (as per current residual).

The increased cost recovered through the residual charge may not necessarily be a bad thing - if it leads to the cost being recovered through a low cost capital route then it will ultimately be better for the consumer.

16. Should transmission network charges play a role in encouraging households and small businesses to make efficient investments in low carbon technologies?

There is no need to change the current allocation of transmission charge residual, which is a good deal, and in other areas (not transmission charging) there is a need to ensure operational signals reach these users.

17. How should charges for large generators and large demand users at different voltages account for the increasing proportion of distributed generation and the changing nature of network flows?

The transformation of the electricity system towards net-zero carbon has diluted the differentiation of transmission and distribution assets. Voltage does not play such a definitive role in identifying

how network assets are used and therefore charges are no longer appropriate to be calculated based on voltage alone. Similarly, investment in the network is triggered by users connecting at all voltages. Transmission and distribution investment costs can no longer be routinely allocated to users by their connection voltage. A proportionate, predictable, and affordable allocation of costs need to be developed.

18. Should there be greater alignment of charging obligations and methodologies for transmission- and distribution-connected assets, to encourage efficient connection voltage choices by generation and storage assets?

As per the previous response, the distinction between transmission and distribution assets is blurring in electrical terms due to the changing network flows that arise from the proliferation and disaggregation of generation. It is appropriate to align commercial terms to provide a level playing field for users to connect.

Despite the advances in distribution and transmission technology, there are still fundamental differences in the way they are designed and operated. As a result, distribution connected assets have deeper connection costs and do not have the same access rights as transmission assets. Therefore, they should not be subject to the same level of use of system charges. A level playing field must ensure that we apply proportionate rules and not the same rules to different types of projects. The scale of investment and duration of development of users connecting at distribution and transmission can vary enormously. Large transmission users need predictability of transmission charge whereas smaller lower voltage users may be able to respond and value different signals.

19. Should transmission charges be used to signal the relative costs of network congestion (i.e. internal constraints and cross-border congestion) in different areas?

Constraint costs arise from short term congestion on the network and are an essential and effective means to signal where transmission investment is most needed, as well as (while below the threshold for annuitised investment) providing an alternative to building an unaffordable unconstrained network. They need to be appropriately valued as part of a net-zero system. The ESO manages the network to mitigate constraints, and this can happen close to real time depending on multiple variables.

The future planned network developed under the spatial plan proposals should provide an optimum signal for the volume and type of generation required to connect to optimise operational constraints and network investment costs. Charging and market-based reforms need to be developed to signal alignment with the future network plan.

We agree that network constraints are a serious issue and there is a need for rapid growth in transmission investment, we do not agree that there is a case to reform access rights and move to constraint-based transmission charges. Effectively this would shift from long-run economic signal for investment to an approach that optimises current network capacity. Such a change requires a more fundamental change to the planning and design of the overall power system.

20. What are your views on the potential implications of market reform and system planning outcomes on the benefits of different long-term transmission charging options?

21. Should locational signals from transmission charges be adapted where cost-reflective charges conflict with other policy goals and electricity market signals?

Ofgem has correctly set out in their open letter that there are significant policy reviews and potential changes that will materially affect transmission charging and how it should be implemented. We welcome Ofgem's recognition of this and the publication of the open letter as a first signal of willingness to work with the sector to ensure the long term charging regime is fit for purpose.

As previously stated for Scotland, TNUoS may be the largest obstacle to achieving net-zero targets. However, we believe it is less effective as a locational signal compared to factors such as planning, land availability, resource location, and connections.

Strategic coordination of multiple factors can provide stronger signals for determining optimal locations. By improving locational choices through efficient coordination of these elements, we can directly benefit the overall system. However, the current centrally coordinated design of the transmission system contradicts the TNUoS approach of providing an incremental marginal cost signal to all generation. This inconsistency highlights the need for fundamental reform in the transmission charging methodology. The methodology should enable rather than hinder the transition to net-zero and should consider the ability of system users to respond appropriately to locational signals.