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ESO Response to Ofgem's Open Letter on Strategic Transmission Charging Reform

Dear Eleanor,

Thank you for the opportunity to respond to your open letter on Strategic Transmission Charging Reform. This response is on behalf of Electricity System Operator (ESO) and is not confidential.

Who we are

As the ESO for Great Britain, we are at the heart of the energy system, balancing electricity supply and demand second by second.

Our mission, as the UK moves towards its 2050 net zero target, is to drive the transformation to a fully decarbonised electricity system by 2035, one which is reliable, affordable, and fair for all. We play a central role in driving Great Britain's path to net zero and use our unique perspective and independent position to facilitate network and market-based solutions to the challenges posed by the trilemma.

Our transformation to a Future System Operator (FSO) is set to build on the ESO's position at the heart of the energy industry, acting as an enabler for greater industry collaboration and alignment. This will unlock value for current and future consumers through more effective strategic planning, management, and coordination across the whole energy system.

Our key points

We welcome the opportunity to consider broader transmission charging reform in the wider energy policy reform context, taking into account the ongoing Review of Electricity Market Arrangement (REMA) consultation, changes to strategic network planning and the Distribution Use of System (DUoS) charging Significant Code Review (SCR). This will also build on the work already being undertaken from the Transmission Network Use of System (TNUoS) Taskforce.

Given that there are outstanding questions on the direction of REMA, and the interaction with the emerging Strategic Spatial Energy Plan (SSEP) and Centralised Strategic Network Plan (CSNP), we think that the principles and questions posed within this response would be better considered when there is further clarity on these related policies, noting that they are not mutually exclusive. These outstanding questions are fundamental in determining the policy direction of network charging and design, and without a clear policy direction, it is challenging to fully answer the questions posed in this letter.

The ESO agrees with the view expressed in the letter that signals sent through TNUoS should solely seek to influence the investment decisions of system users and not real-time operation. A key conclusion from Phase 3 of the ESO Net Zero Market Reform programme was that dynamic real-time locational signals must be embedded within wholesale prices, rather than network charges, to ensure the efficient dispatch of assets critical to meeting net zero, especially those with two-way flows.

We disagree with some points of principle framing the questions within the letter and we believe further scrutiny of these assumptions behind the principles is required before they are established as a sound basis for subsequent decision-making. Consistency in these fundamental principles across both the REMA work

programme and transmission charging reform is critical to ensure coherence of locational signals in the overall market arrangements.

We would also welcome Ofgem's view on how locational signals arising from market reform, network charging and network planning could interact. Market driven and centralised planning approaches have different benefits and limitations and the way they work together needs to be considered and developed carefully. We look forward to exploring this further with Ofgem and industry, building on current discussions with Ofgem and the Department of Energy Security and Net Zero.

Our detailed response to your questions is appended to this letter.

We look forward to engaging with you further as this reform continues to be worked through. Should you require further information on any of the points raised in our response please contact Rachel McLeod at rachel.mcleod@nationalgrideso.com in the first instance. Our response is not confidential.

Yours sincerely

Claire Dykta

Head of Markets

Appendix 1 – Open Letter Question Responses

Background for Reform

Question: 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 agree that there is a need to consider the future role and design of transmission charges to ensure they are fit for purpose and help to drive net zero. The increase in renewables, both offshore and onshore, embedded generation, storage and the scale of investment needed to deliver net zero cost effectively and in a timely manner, means that consideration of broader reform is timely.

Alignment with REMA and the REMA consultation is crucial. We must work with industry to ensure that the future role and design of transmission charging has all parties, but particularly the consumer in mind. This is a huge opportunity to comprehensively review how transmission charging works to drive net zero. Any fundamental changes to transmission charges must be aligned with REMA decision making as the consultation is exploring where in the holistic market design locational market signals should be placed.

Our position in REMA is that dynamic locational pricing is needed in operational timescales to support effective coordination of supply and demand, and in particular, to drive efficient scheduling and dispatch decisions. Locational signals sent via static network charges cannot facilitate effective operational decision-making. As set out in our Net Zero Market Reform Phase 3 report, locational wholesale pricing is required to align the behaviour of assets with system needs, especially those with two-way flows such as interconnectors and storage, which will represent a far greater proportion of total capacity by 2035 and beyond.

Ultimately the most material interacting policy areas are those which profoundly impact the role of locational market signals in general, regardless of whether these are present in the wholesale market and/or network charging and it is important that we as an industry look at this opportunity with critical thinking, listening to all voices not just those that are the most vocal.

As well as considering the role and design of transmission charging in the context of market reforms such as REMA, there also needs to be alignment with wider policy reforms such as the introduction of Centralised Strategic Network Plan (CSNP) and Strategic Spatial Energy Plan (SSEP). Both strategic plans could create and affect locational signals, which need to interact effectively with the market and network charging signals.

Question: 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?

There is reference within the open letter to the importance of the TNUoS Taskforce and that this delivers short to medium term change for TNUoS. The Taskforce is gaining real impetus on the depth and breadth of topics progressed by members and progress updates have been provided including a timeline for future works and next steps. However, clarity is required to understand how the Taskforce dovetails into the Strategic Transmission Reform as there is a risk of duplication of, or wasted, effort. Our understanding is that the Taskforce is focused on more immediate term reforms, whilst the open letter is looking at a longer term timeframe. It would be useful to set out how this interaction is understood by Ofgem so as not to implement changes now that may be reversed or not needed in the future.

Within a later section of the open letter, page 14 titled 'Allocation of Transmission Owner (TO) Investment costs to different charge type', there is a discussion on how deeper connection charges could potentially work and it would be interesting to see how this aligns with Ofgem's view on TO asset reinforcement/replacement costs at shared or sole user sites (TNUoS/Connection Charging). This is of particular interest following the Roadknight Taylor letter[1] regarding distribution connections and Super Grid Transformer (SGT) reinforcements which also looks at TNUoS charging.

[1] https://roadnighttaylor.co.uk/wp-content/uploads/2023/09/Open-letter-to-Ofgem-regarding-distortion-in-charging-for-supergrid-transformer-reinforcement.pdf

As per the previous question it is essential that we align policy and reform packages, and the SSEP and CSNP are examples of reform packages that are material in these discussions and not highlighted specifically within the open letter. The recent Electricity Network Commissioner report recommended the creation of a SSEP, and enhancements to the CSNP, to accelerate transmission investment and the Prime Minister confirmed its introduction in September. Further thought and discussion is required to understand how the spatial recommendations of the SSEP interact with locational market and network charging signals to provide longer-term investment signals for supply, demand and networks.

We are working closely with the Department and your colleagues in Ofgem to agree the scope, status, governance and timelines of the SSEP, and its interaction with the CSNP. We will continue to work through these questions and engage with key stakeholders as proposals develop.

Another consideration relates to our GB Connections Reform Programme. There needs to be consideration on how any strategic charging reform would interact with the strategically reformed connections process that is currently being developed (also noting the forthcoming Connections Action Plan) and we would welcome engagement with Ofgem on this. There is already potential overlap of the connections reform programme with other reform programs, such as REMA, which depending on the outcome could show a need in the future for a more targeted review of transmission access rights and the links of those transmission access rights to network charging. It is therefore important that these are kept under review while the outcomes of such broader reform programs, like REMA, become clearer in the future. This is particularly important in relation to the potential for greater anticipatory investment being included within connections related network design in future.

Given that there are a number of reform packages across industry, it is essential that we, as an industry take a holistic approach to ensure that all interactions are well understood to enable drive to net zero.

Objectives of Transmission Charging

Question: 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?

We agree with the view that dynamic operational signals should not be sent via transmission charges. Transmission charging is meant to recover the costs of building and maintaining the network and are designed to send signals for investment (siting) decisions. If these signals are replaced or include operational signals for real-time dispatch, it will not achieve the intended purpose. It is unclear how short-term constraint costs/signals could be directly incorporated into TNUoS and still have an accurate tariff setting process that is predictable.

It is also important to recognise the difference between short run marginal costs and long run marginal costs, particularly given the persistent pattern around network constraints. TNUoS contains a tariff element reflecting long run marginal costs of network capacities, while short run marginal costs of network capacity, revealed via locational wholesale prices, are partly attributed to siting decisions made by investors when applying for grid connection. In an efficient system, TNUoS would send forward-looking locational signals (as well as the basic function of network cost recovery), and locational wholesale prices would send real-time operational signals to unlock users' potential of creating network capacities (for example through operating storage units). They are not mutually exclusive and TNUoS can still have a location element, but locational wholesale pricing would better identify short run marginal costs.

Therefore, we believe short term constraint-based signals must arise through REMA and locational wholesale pricing. As previously stated and set out in our Net Zero Market Reform Phase 3 report, locational wholesale pricing is required to align the behaviour of assets with system needs, especially those with two-way flows such as interconnectors and storage, which will represent a far greater proportion of total capacity by 2035 and beyond.

Question: 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?

When considering a future design framework, to enable effective incorporation into investment decisions, an effective and efficient governance process is critical if we wish to achieve a cost-effective solution and reach net zero by current targeted dates. As identified, there is a huge amount of change in the industry with several reforms that overlap and to ensure they develop in a holistic and co-ordinated manner, we need to consider the involvement of industry from a governance perspective. At present, any party can propose a modification at any time, and this can slow down the progress of changes. In addition, there is a distinct lack of control and ownership over the long-term strategic direction of the codes, and by extension of the charging methodologies. The current structure of governance adds uncertainty and can lead to further complicating what are already complex charging arrangements. This complexity is a barrier to new entrants. We highlighted this as part of our response to the Call for Input on Energy Code Reform in January 2023 [2], considering examples where commercial organisations across industry have fundamentally different objectives which leads to a lack of alignment on how the charging methodologies are strategically developed. We believe it is important we continue having conversations as part of the Energy Code Reform programme alongside reforms such as this to ensure any fundamental changes are managed alongside an efficient governance process.

It is important that any future design, which focuses on the drive to net zero, is also aligned with the key principles of transmission charging. Although not directly linked to this question we would like to call out two objectives proposed in the letter that we believe are open to misinterpretation under the current wording. These are on page 12 of the document and state that other characteristics of an effective investment signal include;

1) Sufficient predictability that they can efficiently be incorporated into investment decisions.
2) Signals are sent to groups of assets that have a reasonable ability to respond to them.

On the first point, the important factor with respect to underpinning investment decisions is not predictability in isolation, but the extent to which this can be mitigated via hedging, whether physical or financial. Unpredictability that stems from uncertainty in fundamental economic drivers impacting network costs is cost-reflective and market participants are better placed to manage this risk than consumers. If market participants were to be artificially shielded from this uncertainty the result would be increased costs to consumers. The solution needs to empower them to manage it. The financial and physical hedging opportunities unlocked by locational wholesale pricing would empower market participants to manage this uncertainty.

On the second point, market participants have a number of actions available to respond to locational signals, including geographical portfolio diversification, vertical integration, co-location, Power Purchase Agreements etc, or indeed choosing not to build the asset at all. The asymmetry in locational risk between supply and demand currently makes some of these options less effective. However, rather than exposing consumers to locational risk by insulating generators from them, the solution should be to improve the ability of participants to respond. Locational wholesale pricing would greatly improve the ability of all market actors to respond to locational signals.

Framework for Transmission Charge Design

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

Another key driver that is not covered in the letter, should be making the transmission charging framework less complicated and more accessible, without compromising cost-reflectivity. This will reduce barriers to entry and increase innovation, which will deliver value for consumers and drive net zero. The charging framework should be under a strategic direction so that code modifications can be aligned (or so that code modifications that don't align with the strategic direction can be de-prioritised) to use industry time efficiently and effectively.

[2] https://www.nationalgrideso.com/document/275981/download

The key drivers listed within the open letter are mutually exclusive and can have significant impacts individually. Therefore, we believe they cannot be ranked in importance.

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

The approach overall should be as coherent as possible; the more fragmented and complex the framework, the more risk there is that it is not future proof and will not enable net zero.

Regarding treatment of different users, it is important that we have overarching principles that are standardised across the framework to ensure guiding principles are clearly aligned. The more fragmented the approach, the more risk there is that market distortions appear, as market participants may adjust behaviour to take advantage of these differing treatments.

Another approach is that no locational signals are sent but this could lead to the assumption that it would create a flat wider TNUoS which would not be appropriate or useful but could be considered in changes such as REMA. We can however reiterate that a strong locational signal is beneficial for long term optimisation of the users siting and network build. This could or could not come from transmission charges.

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

Currently, TNUoS tariffs are calculated ex ante, based on the (planned) next year's network condition. This is compatible with one of the design principles of TNUoS, which is to send forward-looking locational signals that reflect long-run marginal costs of building and maintaining the network. We consider this question is about "by how far ahead" the planned future network conditions should be reflected in the year ahead TNUoS tariffs. For example, if an undersea HVDC cable is to be completed by 2029, we consider the question is - should the 2025 TNUoS tariffs be affected by the 2029 cable. The answer to this is one of policy and is ultimately dependent on the signal that you wish to send.

We welcome Ofgem's thoughts on how far ahead inclusion of the planned network is being considered. For example, there will be significant difference between 2 and 5 years because of the typical milestones and spending profile for transmission projects. Ofgem could explore whether an explicit link can be made between when certain milestones are met for the network build programme, and when the network tariff is incorporated into the forward plan. Similar measures have been proposed as part of the ESO 5-point plan to manage the connection queue.

This letter is timely, and we see this as a huge opportunity to form a fuller position with support from Ofgem and the Department to fully analyse and review the impacts of different policy positions and what this means for network charging.

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

We agree with the view that frequency of reset should be longer than "real-time" to ensure effective investment signals are sent. TNUoS should not send out operational signals via dynamic charging and therefore we agree that real time frequency reset of charges should be ruled out as an option.

Question: 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?

We recognise that there are potential trade-offs between predictability and cost-reflectivity. There should be tariffs set every year which provide a cost-reflective signal to network users about their locational choice.

There is a huge amount of change occurring in the electricity system as we evolve towards net zero and therefore it feels appropriate to strike that balance between certainty and accuracy. This is why we currently believe that tariffs should be recalculated annually to maintain reasonable accuracy in the input assumptions whilst also providing reasonable cost-reflectivity. Any deviation to charges from cost-reflective levels either through multi-year charging periods or longer-term TNUoS contracts would introduce inefficiencies. Not only would it transfer location risk from generators to consumers, but it would also reduce allocative efficiency via a

cross-subsidy between different assets paying different tariffs for the same network access which would not facilitate effective competition.

It is worth noting that this answer builds on from the question above in that it is a matter of policy.

Key Questions for Transmission Charge Design

Investment signals to generation

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

Yes, there is an enduring justification for credits to generators to reflect the benefits that these generators offer to the transmission system. Generators located closer to the demand centres reduce overall network costs and therefore validates the use of credits. This is a fundamental component to the charging methodology that highlights the benefits of locating where demand is highest. It is important that we recognise the differentials between generation tariffs and the use of the generator cap, and that ultimately a signal is sent to ensure generators ideally locate closer to demand.

Investment signals to storage

Question: 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?

As users of the network, storage assets should not be exempt from paying network charges. Current transmission charging is ill-suited to deliver efficient locational signals to assets with two-way flows due to inconsistencies and asymmetry between supply and demand, as previously mentioned. This highlights the importance of a need for locational wholesale pricing. Locational wholesale pricing will seek to strengthen locational signals that act to incentivise storage assets on siting decisions and locate closer to demand in order to reduce network charges. This will allow alignment of their behaviour with the needs of the transmission system.

We also recognise that the potential output from SSEP will look at proposed locations for demand, generation, and storage. This is something to consider but ultimately to help facilitate this output, there is a need to accurately assess investment signals which can be strengthened through locational wholesale pricing.

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

We do not think that there should be distinctions made on asset type when assessing the charging approach. If different asset types are subject to different locational signals on the basis of asset type alone, rather than any real difference in locational value, this does not represent a level playing field. This would inevitably lead to one asset type being over-rewarded and others under-rewarded, highlighting how any distinctions on asset type when charging would not facilitate effective competition and would lead to inefficient market outcomes.

Investment signals to demand

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

Large demand users should be able to use locational signals in conjunction with locational pricing to make informed decisions on where to site on the network, and on how to operate their assets. They should be incentivised to make cost reflective decisions on siting and operations to enable market efficiency. We believe that all demand users should be given the opportunity to respond to locational wholesale prices to improve overall market efficiency.

Question: 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?

As mentioned in the previous question, locational signals play a crucial role in encouraging efficient use of the network by demand users of all sizes, including that of smaller demand users. Although smaller demand users are unable to use these signals to make changes in siting decisions, these signals can be used to encourage efficient behaviour. Retailers are able to respond to these signals by portfolio diversification and/or vertical integration and therefore it is important to make that distinction between retailers' ability to currently respond and smaller demand users inability to currently respond.

As in our response to REMA consultation, we support locational pricing which enables dynamic locational and operational signals. Dynamic locational signals can be seen to empower households to harness low cost, low carbon electricity when it is available through retailers, which can minimise curtailment of renewables. These dynamic signals can incentivise households to shift demand to off-peak periods which can aid in a reduction of heating costs, especially those that are without access to the gas network.

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

The Transmission Demand Residual (TDR) charges are there to recover network costs with the current TDR arrangements in place since April 2023. It could therefore be premature to suggest further amendments to this considering the recency of this implementation.

On a broader scope, charges are currently impacted by the EU Retained Law, also known as The Limiting Regulation, whereby annual average transmission charges paid by producers in Great Britain (GB) must fall within a range of €0-2.50/MWh subject to some exclusions. There is an opportunity to reassess the appropriateness of this charge to the current and evolving GB transmission system.

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

Whilst we recognise the need to encourage households and small businesses to make efficient investments in low carbon technologies, under the current charging regime, you are inherently limited in how much you can encourage investment at that granular level due to the inability to send those temporal and locational signals. There is a need for more granularity in locational and temporal signals to prompt development of innovative retail offerings to enable consumers to have more control over how they use energy, hence the need for LWP. Exposure to these signals (with proper hedging mechanism in place) can allow development of demand flexibility contribution. When households and small businesses are exposed to locational wholesale prices, consumers will be incentivised to respond to temporal and locational signals while suppliers can tailor their products to benefit consumers.

Investment signals at different connection voltages

Question: 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?

Transmission capacity needs can be driven by large users and/or the aggregated effect of small users, and all users should pay for their use of the system. Charges need to be more consistent in terms of liability and materiality regardless of different voltage.

Question: 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?

We agree that greater alignment of charging obligations and methodologies for transmission and distribution connected assets would support making it easier to understand and access. There are concerns when it comes to the distributed charging mechanism; as a Transmission user with a Bilateral Connection Agreement, a DNO has the option to choose annualised or capital contribution connection asset charging in their

Agreements. Our concern is then what the distribution charging mechanism is for those distributed users who initially triggered those transmission works, and how they offset those charges to the DNO. Our question is whether this is fair, equitable and enables the development of Distribution connected projects. We would welcome input from Ofgem on their view of this.

Distribution networks are becoming more active and bi-directional. In addition, modern electricity systems recognise the importance of ancillary services (compulsory for some parties while optional for others), which link all energy providers and users (large or small) together, via the same electromagnetic field across transmission and distribution networks. Designing and operating the whole network in an efficient way is a highly complex task, and network charging methodologies need to strike a balance between conflicting requirements like transparency, simplicity, predictability, cost-reflectiveness and proportionality. It is increasingly challenging to design network charges which meet all the above requirements. To the extent that sending an effective locational signal at transmission level also resolves constraints at distribution level, locational wholesale pricing could potentially align locational signals between voltage levels. (This argument of course depends on the extent to which different types of demand are exposed to varying locational prices).

Transmission access rights and constraint costs

Question: Should transmission charges be used to signal the relative costs of network congestion (ie internal constraints and cross-border congestion) in different areas?

Transmission charges by nature will only reflect (if not purely for cost-recovery) long-run costs of network capacity, while short-run cost of network capacity (aka cost of constraints) can only be accurately reflected in the market spot price - e.g. nodal or zonal pricing. Over a period of time, a persistent and structural constraint pattern will manifest itself through spot prices, leading to the relevant network reinforcements being considered, and TNUoS tariffs will reflect the network reinforcement cost, if the need case to build is strong.

Constraints are an operational issue and cost, and as previously mentioned we agree that TNUoS should not be used as an operational signal. However, TNUoS can be used to provide an investment signal to locate (site) and this investment signal should reflect the costs associated with reinforcing the network which could alleviate congestion.

Implications of different market and policy reforms for Transmission charging

Question: 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?

There is significant ongoing reform across the electricity and energy industry including market and planning reforms. All these reforms lead to different signals to market parties, and therefore, all signals need to work in conjunction with TNUoS to achieve overall outcomes that are beneficial for the consumer considering security of supply, fair cost and net zero. It is difficult to assess the impact of specific charging options without further clarity on the outcome of these market and planning reforms as previously highlighted.

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

The internalisation of system costs into investment decisions is critical to ensure that policy goals are achieved, albeit recognising that cost reflective charges could change the makeup of investment. There should always be consideration of the impact and overall value to consumers and to the decisions made on their behalf. The decarbonisation of the system is a key goal which hinges on the ability to export low carbon generation to be transported to where it is consumed, and anything that artificially reduces locational signals to incentivise greater low carbon capacity, will only increase renewables curtailment. Additionally, encouraging capacity to be built in constrained locations will work against the decarbonisation ambition and as previously mentioned, socialising those constraint costs is not the way forward.

If some assets were to be made immune from the locational aspect of TNUoS charges then this would result in the system externalities being ignored in investment decisions, resulting in sub-optimal asset siting, and increasing costs for consumers.