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To interested parties

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Electricity Network Access and Forward-Looking Charging Review: Open Letter on our shortlisted policy options

Our Electricity network access and forward-looking charges Significant Code Review (SCR) is an important part of our programme of reforms to the energy system. Through this programme we want to enable competition and innovation, decarbonisation at lowest cost and to protect consumers in the transition to a smarter, more flexible and low carbon energy system.

We launched the review in December 2018. To date we have identified and assessed a long list of options to address the issues with the current arrangements that we identified in our launch statement.[1] We have set out three principles to guide our options assessment:

1. Arrangements support efficient use and development of system capacity. A key part of the assessment against this criteria will be the extent to which the arrangements support decarbonisation at least cost to consumers, as discussed above

2. Arrangements reflect the needs of consumers as appropriate for an essential service

3. Any changes are practical and proportionate

This letter sets out the options we are taking forward for detailed assessment. It should be read in conjunction with the two working papers that we published last year, where we

[1] https://www.ofgem.gov.uk/system/files/docs/2018/12/scr_launch_statement.pdf

outlined the concepts in detail.[2] The annexes to this letter provide an explanation of our reasoning for excluding some options at this stage. Our working papers provide more in depth discussion about the issues we are seeking to address and of the merits of the potential options we are shortlisting. We have previously shared, through the Challenge Group and the Charging Futures Forum, the options we have been considering and our initial views of their respective pros and cons.

Our approach to assessment of reform options under this review

We will base our proposals on our view of which reform options will deliver the objective of the project in accordance with our statutory duties[3] and the principles we have set out for this review. We will consult on our views prior to making any decisions. Our decisions will be consistent with our Principal Objective, which requires us to protect the interests of current and future consumers, and with our duties to have regard to the achievement of sustainable development. A key part of this will be assessing the extent to which the options support decarbonising the energy system at lowest cost to consumers, which is one of our main priorities over the coming years.[4]

To date, we have undertaken largely qualitative assessment of the longlist of options against our guiding principles. This has been informed by a range of evidence and input from stakeholders and other analysis, including evidence on network cost drivers and other input on options development from network companies under our Delivery Group. We have undertaken surveys and interviews with wider stakeholders, and had substantial input through our Challenge Group and interactive sessions at the Charging Futures Forum. We have also reviewed available academic literature, consulted our Academic Panel and international case studies.

Going forward, we have commissioned CEPA-TNEI to undertake modelling to assess the potential quantitative impacts of the shortlisted options. However, we consider that there are inherent uncertainties in accuracy associated with forecasting the impact of options in quantitative terms. We therefore expect to place a high emphasis on our principles-led assessment in our decision-making, and will undertake further in depth qualitative assessment of the shortlisted options. The quantitative assessment will act to support this.

Our shortlisted policy options

Table 1 sets out the options we are taking forward for detailed assessment. We have assessed these options against the current arrangements, and although we have not

[2] https://www.ofgem.gov.uk/publications-and-updates/access-and-forward-looking-charges-significant-code-review-winter-2019-working-paper and https://www.ofgem.gov.uk/publications-and-updates/access-and-forward-looking-charges-significant-code-review-summer-2019-working-paper
[3] See https://www.ofgem.gov.uk/publications-and-updates/our-powers-and-duties
[4] https://www.ofgem.gov.uk/publications-and-updates/ofgem-strategic-narrative-2019-23

explicitly shortlisted maintaining the status quo below, we could decide no change is needed in some areas. Table 1 also sets out options that we are not taking forward at this stage. The annexes provide further information on why we do not think these options merit being taken forward, based on assessment against our guiding principles.

Our practicality and proportionality principle was a factor in ruling out some options. We note that we expect that access and charging arrangements will continue to need to evolve beyond the changes we introduce through this review. Some of these options will likely become more practicable in time – for example as network monitoring and data become more advanced – and so could merit further consideration in future.

Table 1: Summary of options being taken forward

Option area	Shortlisted reforms	Not shortlisting
Improving the definition and choice of access rights *(see Annex 1 for further details)*	• Improved definition and choice of access for larger users: – Improved options for curtailable access rights (non-firm) – Introducing option for time-profiled access rights – Ability to share access between users in the same local area – Clarifying distribution users' access rights to the transmission network	• Some sub-options for choice of access for larger users – see annex • Defining and introducing choice of access for small users
Potential reforms to the upfront charges for connecting to the distribution networks *(see Annex 2 for further details)*	• Reducing the contribution to reinforcement costs that distribution users pay through connection charges (a "shallower" connection charging boundary) • Removing the contribution to reinforcement costs that distribution users pay through connection charges (a "shallow" connection charging boundary)	• Some sub-options for a shallower/shallow connection charging boundary – see annex

Option area	Shortlisted reforms	Not shortlisting
	• Allowing alternative payment terms for connection charges e.g. to allow payment over time (including while maintaining the current "shallowish" boundary) • Introducing liabilities and securities arrangements	
Distribution Use of System (DUoS) charges *(see Annex 3 for further details)*		
Methodology for the network cost models used to set charges	• Charges based on forecasts of where incremental reinforcement is needed to the Extra High Voltage (EHV) network • An "Ultra long-run"[5] cost model, which could be applied at all voltage levels, or just to costs on the High Voltage (HV) and Low Voltage (LV) networks • Supplementing an ultra-long-run model with discounts based on an indicator of spare capacity on EHV networks • Charges/credits calculated based on users' estimated contribution to upstream network costs, and where practical, dominant flows	• Short-run marginal cost model • Charges based on forecasts of incremental reinforcement needed to the High Voltage (HV) and Low Voltage (LV) networks • Supplementing an ultra-long-run model with discounts based on an indicator of spare capacity on HV/LV networks • Amending the network models to assess users' contribution to downstream network flows as well as upstream flows
Extent of locational granularity	• Split DNO areas into more granular "zones" for charging purposes, based on primary substations, or groupings of primaries. Locational variation could be through:	• Other options for greater locational granularity, including: – Charges varying by secondary substations – Varying charges by primary

[5] This is where future network costs are estimated based on the premise the network will either need to expand and/or have existing assets replaced at some point in the future.

Option area	Shortlisted reforms	Not shortlisting
	– How costs vary for the EHV networks in different areas – Adjusting charges/credits according to whether dominant network flows are caused by demand or generation • Having different time bands for time-of-use charges to reflect locational variation in network peak times • Options to reduce volatility in charges for users connected at EHV, for example by moving from nodal to zonal charges	substations according to estimates of varying cost for the HV/LV network below each primary substation – Varying charges by primary substations according to estimates of varying spare capacity for the HV/LV network below each primary substation
Design of DUoS charges, i.e. the basis on which users are charged	• Charges based on more accurate time of use bands, e.g. seasonal • Charges based on agreed capacity rights Hybrid options of the two	• Charges based on users' maximum actual entry/exit capacity during certain periods ("actual capacity" charges) • Dynamic charging or rebates, with high charge or rebate periods based on real-time network conditions ("real-time", or "critical peak" charges)
Transmission Network Use of System (TNUoS) charges *(see Annex 4 for further details)*		
Methodology underpinning the flows on the network model used to set charges	• Options to change the reference node used to cost power flows in the model. We are still considering whether this merits in depth assessment.	
Better locational signals through TNUoS charges – embedded	• Options to have distribution-connected generation pay similar, or identical locational transmission	

Option area	Shortlisted reforms	Not shortlisting
generation	charges to larger generators	
Design of TNUoS demand charges, i.e. the basis on which users are charged	• Charges based on more accurate time of use bands, e.g. seasonal • Charges based on agreed capacity rights • Hybrid options of the two	• Charges based on users' maximum actual entry/exit capacity during certain periods • Dynamic charging or rebates, with high charges or rebates based on real-time network conditions

Small Users[6]

We are considering the extent to which the options above for charging reforms should apply to all network users, or whether there should be adaptations or specific protections for domestic and small business consumers to mitigate any adverse impacts.

As outlined in Table 1, we are not shortlisting the option of defining small users' access rights. We will assess how the options for charging reform could affect small users, and will have particular regard to the potential for unacceptable impacts for consumers in vulnerable situations. We continue to consider a range of options to address any such concerns, including adaptations to our charging options or retail market provisions.

Next steps

As discussed above, we are now undertaking detailed development and assessment of our shortlisted options. We intend to publish our consultation on our draft impact assessment and minded to decision in the autumn. Stakeholders will have the opportunity to discuss our shortlisting and CEPA/TNEI's approach to modelling at the Charging Futures Forum on 12 March.[7] There will be further opportunity for stakeholders to engage with us, and the detail of our review via our Challenge Group and Charging Futures ahead of our consultation. Additionally, stakeholders are welcome to send any comments on our shortlisting to futurechargingandaccess@ofgem.gov.uk by 6 April 2020.

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Deputy Director, Electricity Access & Charging

[6] We use 'Small Users' to refer to households and non-domestic users that do not have an agreement for their maximum capacity usage.
[7] http://chargingfutures.com/sign-up/sign-up-and-future-events/

Annex 1 – definition and choice of access rights

We are reviewing whether there is a case for better defining users' access to the networks, and giving them greater choice over the nature of this access.[8] Table 1 of this Open Letter details the options we are, and are not shortlisting. This Annex provides our rationale for not taking forward certain options. The options we considered under Access Rights fall into the below categories:

Better definition and choice of larger users' access rights

- Improvements to the choices that larger users have in how they access both distribution and transmission networks
- Whether distribution-connected users' should have more explicitly defined access to the transmission network
- Whether shared access options would be beneficial to certain users, and to the overall efficiency of the network
- Improvements to the choices that larger users have in how they access both distribution and transmission networks

Definition and choice of small users' access rights

Following the analysis set out in our working paper and undertaken subsequently, we have decided to not shortlist a number of options based on our current view of their deliverability and desirability. The following Table outlines our specific reasons for not shortlisting certain options at this time:

Option	Reasons for not shortlisting
Financially firm access and "connect and manage" at distribution level	• Drawing on how financially firm access and connect and manage works at transmission level, we consider that introducing it distribution level would require the development of agreed planning and security standards. These standards currently do not exist at distribution. It is not practical to develop and implement such standards within the implementation timeframes of this review (2023). • We have not identified clear evidence that introducing financially firm access with connect and manage at distribution would support more efficient use of the system. There are already options

	available for distribution-connected users that want to be compensated for a curtailment. Distribution users with a "standard connection" have a high level of firmness and are generally only curtailed due to maintenance issues. Beyond this, if DNO wants to curtail one of these users, then the DNO must pay the user through a flexibility contract. Users wanting a quicker or cheaper connection than available through a standard connection can choose flexible connection options, and we are considering options to improve the attractiveness of these. Note we determined that connect and manage at distribution level was out of scope of this review in our launch statement.
Wider shared access	• Given the existing use of network diversity assumptions by DNOs, we have not identified clear evidence that sharing access over a wider area (that is, access shared by users who are not immediately proximate, geographically or electrically) could lead to more efficient use and development of the system. • We have identified significant practical issues and challenges associated with sharing access over a wider area. For example, defining "exchange rates" for sharing access across different network areas and practical issues associated with different suppliers sharing access.
Entirely standardised, or entirely bespoke access options for larger users	• An entirely bespoke approach would create excessive administrative costs and would not be practical or proportionate. • They take up of flexible access rights could also be impacted under both an entirely bespoke and entirely standardised approach, reducing the extent to which it supports greater system efficiency. Under a bespoke approach, it could be harder for users to understand and compare options. Under an entirely standardised approach, there would be a risk that they cannot be tailored to adequately meet users' needs.

For distribution-connected sites, we continue to assess options for explicitly defined access to the transmission network, which will work in conjunction with options we are considering for TNUoS charge design.

At this stage we are deciding not to shortlist one of the sub-options for how to take this forward. We do not think the option of requiring distribution-connected users to agree access directly with the ESO would be practical or proportionate. This would create

substantial additional administration for the ESO and additional complexity for users. We think the other options – such as clarifying that users' agreed access to distribution networks also equates to their agreed transmission access – would be more proportionate.

Definition and choice of small users' access rights

We do not yet have clear evidence that better definition and choice of access for small users would support use that is more efficient and development of system capacity, including an absence of trials evidence. This is in contrast to a number of trials that suggest considerable consumer response to time of use charges.

- We are concerned that, due to a lack of understanding about their access requirements, some consumers could end up with inappropriate access levels that do not meet their essential needs.
- This option would have significant practicality challenges. DNOs or suppliers would need to agree access levels with millions of consumers and it would need a substantial programme of consumer engagement.

Annex 2 – distribution connection charging

We are reviewing whether there is a case for changing the extent to which upfront charges for connecting the distribution networks should recover the cost of any network reinforcement. Table 1 of this Open Letter details the options we are, and are not shortlisting. This Annex provides our rationale for not taking forward certain options. The options we considered under the Connection Boundary work fall into the below categories:

- how much connecting users should contribute to the cost of any reinforcement required through their connection charge (the "**depth**" of the connection charge)
- whether connecting users should be able to **adopt alternative payment terms** (e.g. to pay their connection charge over time)
- Whether, under any of the above changes, there should be **"liabilities and securities"** arrangements to reduce the risk to wider consumers of the connecting user not paying charges over time or of stranded assets if a connection does not proceed.

We intend to assess in detail all of the high-level options for different depths of connection charge. Our second working paper set out a number of sub-options within these high-level options that we are not taking forward. Our reasoning for this is set out below.

High-level option area	Sub-options we are not shortlisting
Move to a "shallower" connection charges, with reduced charges for reinforcement	• **Introduce a cap on the extent of reinforcement costs that can be recovered through connection charges** This option would reduce connection charges only for those connections involving high cost reinforcement. We do not think this would be justified as it the cap would be, at least in part, arbitrary and could increase system costs by reducing the signal to connect to cheaper areas of the network. There is a risk of potential unintended consequences for competition in connections.
Move to a "shallow" connection charge, with no charges for reinforcement	• **Introduce a standard connection charge** This option would involve a generic charge for those connecting to reflect the average cost of connection, rather than charging for the specific cost of extending the network to the point of connection. We do not think this would be justified as a standard charge may not, in all cases, be cost-reflective, and could increase system costs by reducing the

High-level option area	Sub-options we are not shortlisting
	signal to connect to cheaper areas of the network. It would also likely adverse impact on competition in connections. • **Recover some extension asset costs through use of system charges** While this option could align more with the approach to transmission connections, it would involve substantial changes to DUoS as there would be a need to consider DUoS "local circuit" charges to ensure that extension asset costs are not socialised across wider users. We do not consider this practical or proportionate.

Annex 3 – Distribution Use of System charge options for both the design of the charges, and the model used to set them

We are undertaking a comprehensive review of DUoS charges. We have structured this as follows:

- **Better locational signals**
  - Considering improvements to the network cost models used to calculate forward-looking DUoS charges
  - Considering the extent of locational granularity in DUoS charges
- **DUoS charge design** – this is how the network cost estimates for different areas are translated into charges, such as whether are they based on agreed capacity or usage at certain times.

Our first working paper set out the long list of options we have been considering and our initial pros and cons. Please refer to that paper for further explanation of these options. Following the analysis set out in our working paper and undertaken subsequently, we have decided to not shortlist a number of options based on our current view of their deliverability and desirability. The following Table outlines our specific reasons for not shortlisting certain options at this time:

Methodology for the network cost models used to set charges

Option	Reasons for not shortlisting
Short-run marginal cost (SRMC) model	• This approach would require significantly greater network data than is currently available and would also place a significant administrative burden on the DNOs. We do not consider this to be practical and proportionate. • Even with improved network data, we do not think this option would support more efficient outcomes. We think it would be extremely difficult for DNOs to set charges to accurately reflect the short-run marginal cost of using the network. Charges could also be extremely difficult for users to predict. We think an SRMC approach can only be efficiently created through a market-based approach, which is out of scope of this review.
Charges based on forecasts of	• The DNOs do not currently have sufficient network data to implement an incremental cost model for these customers.

Option	Reasons for not shortlisting
incremental reinforcement needed to the High Voltage (HV) and Low Voltage (LV) networks	• We are continuing to investigate the effectiveness of the current approach to forecasting incremental reinforcement of the EHV networks to calculate the charges of those connected at EHV. We do have concerns that the approach does not provide a sufficiently stable and predictable signal to effectively influence the behaviour of users. • Given these concerns about a forecast-based incremental cost model and the significant amount of time and cost required to enable a similar model to be implemented at HV and LV, we think it would not be proportionate to pursue this approach at this stage.
Amending the network models to assess users' contribution to downstream network flows as well as upstream flows	• While the current model only considers' users contribution to upstream costs, our analysis suggests this can still lead to efficient outcomes as users' who add to or can help offset downstream flows still get a relative charging signal that reflects this. • We think changing the approach may not lead to as efficient signals. If charges and credits were available in relation to upstream and downstream costs it would lead to a "double signal" to users through charge avoidance and credit eligibility (i.e. a user's choice of location could help them avoid a charge, but also result in them receiving a credit). This could be addressed through no longer paying credits to users who offset network costs, but this would make it hard for those users to access the value they provide the network. • In addition, this approach would require power flow modelling (in order to identify the direction and drivers of flows) and development of a new cost model. This would be a substantial practical challenge and does not seem proportionate, given the risk of distortive signals under a charges and credits option.

Following feedback to our working paper and further internal analysis, we have decided to shortlist an option in this area that was not covered in our first working paper. We are including the option of adopting an ultra-long-run cost model combined with a spare capacity indicator, so that there could be charging discounts where there is significant spare capacity. We think this option could have merit in providing for a more transparent and predictable charge than is possible under an incremental model, while also being able to reflect where reinforcement is unlikely to be needed in the medium-term due to the level of spare capacity in the existing network. We are considering this option to apply to EHV

costs. Based on evidence provided by the DNOs, we have concluded that it will not be possible to be sufficiently accurate in calculating spare capacity discounts for HV or LV costs at this time.

Extent of locational granularity

Option	Reasons for not shortlisting
Charges varying by secondary substations	• The evidence we have collected from DNOs indicates that there is not currently sufficiently accurate network data to calculate charges on a more granular basis than at the primary substation level. Although they are all working to roll out greater monitoring, we do not expect there to be sufficient monitoring in place during the timeframes of this review. • In addition, we have several concerns with implementing even greater locational granularity: – There are likely to be distributional impacts and boundary issues, when moving from a more averaged approach, which we are not convinced are justifiable for small users. – It does not seem proportionate to require the DNOs to calculate charges on a more granular basis, due to the administrative burden and cost involved for DNOs and supplier billing systems. For example, if charges were calculated on a secondary substation basis, there would be hundreds of thousands of charges.
Varying charges by primary substations according to estimates of varying cost for the HV/LV network below each primary substation	• Evidence from DNOs suggests it might be possible to estimate the cost of the existing asset mix under each primary substation, though this would involve costs to develop the data. • Our assessment is that the potential efficiency benefits are unlikely to warrant the cost due to the high risk that varying charges according to these estimates would not accurately reflect prospective future costs in each area. • This option could create significant distributional impacts, with higher charges for those in historically high cost areas, that would be unlikely to be justifiable if there is not sufficient confidence that they can help bring down future costs.

Option	Reasons for not shortlisting
Varying charges by primary substations according to estimates of varying spare capacity for the HV/LV network below each primary substation	• Discounting charges in areas where there is significant spare capacity on the HV and LV networks could bring efficiency benefits, by encouraging users to locate where there is spare capacity and avoiding incentives to reduce network flows where there are no concerns about network congestion. However, this approach would involve establishing an indicator of the average spare capacity across the network assets underneath a primary substation and so it would be less accurate if there are significant differences in spare capacity across different assets. • In addition, we do not think network data is currently sufficiently accurate to allow this approach for the HV and LV networks. While we expect DNOs to invest in additional monitoring capabilities over time we do not think this option would be feasible with the implementation timeframes of this review (2023).

DUoS charge design

Option	Reasons for not shortlisting
Static – Actual Capacity (charging against users' actual kW load in one HH period)	• This option is very similar to Volumetric Time of Use, as it uses consumers' actual load during specific times. We have seen no evidence that it would elicit a greater degree of response than a Volumetric ToU approach; • As the levels of response to an Actual Capacity option are not known, we cannot be confident that the scale of the changes needed to industry systems and processes would be proportionate to the benefits provided by an Actual Capacity approach over and above a Volumetric Time of Use option.
Dynamic – Real Time Pricing	• Real-time pricing signals are effectively short-run marginal cost charges, as discussed under the network cost model section above. We do not think this option is practical and proportionate within this review's implementation timeframes given the scale of network data needed, and also have concerns about its efficiency given the difficulty in accurately setting real-time charges.

Option	Reasons for not shortlisting
Dynamic – Critical Peak Pricing	• An ex ante approach to Critical Peak Pricing would require similar network data to that needed for Real-Time pricing options, so that the correct signals can be passed through to the correct network users based on the congestion levels on the assets to which they are connected; • Consumers who cannot shift their load would face high charges, potentially affecting those in fuel poverty/vulnerable situations; • Particularly under an ex ante approach, there is a risk that demand reduction occurs during the high charge periods but other periods could also still see very high flows, therefore not supporting reduced network investment. • In an ex post approach to Critical Peak Pricing, the peak periods would be defined after the event, meaning that users could respond only to the broad signal, that is, the signal that peaks are generally between, for example, 4pm and 7pm. In this case, we are not confident that Critical Peak Pricing on an ex post basis would be materially different in practice to a Volumetric Time of Use approach;
Dynamic – Critical Peak Rebates	• Similarly to Critical Peak Pricing, a Rebate option would require the full network connectivity to be well understood which we do not believe is feasible by 2023; • The main difference between a Critical Peak Rebate and Critical Peak Pricing is that under a Rebate option, rather than facing high charges at peak, suppliers would face a credit if their customers' loads were lower during the relevant period(s). In practice, this requires a baseline usage level to be established, which is likely to be highly complex. We do not think this would be justified as there is no clear merit to a rebate option. This is particularly because our charging regime applies charges to suppliers rather than users directly, so the supplier could still offer rebates to their customers if they consider this could help them reduce their costs of supply.

Annex 4 – Transmission Network Use of System (TNUoS) charges

We are undertaking a more focused review of forward-looking TNUoS charges. We have structured this as follows:

- TNUoS charge design for demand customers

TNUoS charge design for demand customers

Option	Reasons for not shortlisting
Dynamic – ex ante Critical Peak Pricing	• This option does not reflect the year-round costs driven by demand, and could overlap with, or provide conflicting signals to the flexibility markets that are already well established for transmission network operation; • Consumers who cannot effectively shift load would potentially face very high charges, which would materially affect those in fuel poverty or who are otherwise vulnerable; • The significant changes required to industry systems and processes, especially those of the ESO may not be proportionate to the benefits driven by the approach.

At the moment we are not removing any options for distributed-generation charging or the treatment of the demand-weighted distributed reference node from our current shortlist.

While we cannot currently rule out any options for the treatment of the reference node, we are still reviewing the extent to which changes to it would be beneficial to consumers. We have not yet seen strong evidence that the reference node being demand-weighted is in itself distortive, or that changing it to a generation-weighted node would improve forward-looking signals for network users.

We will be holding a workshop on 19th March 2020 to discuss our assessment of the reference node options – to register please email futurechargingandaccess@ofgem.gov.uk. Subject to feedback from that workshop, it is possible that we may conclude that the reference node options should not be taken forward for detailed assessment.