NIE NETWORKS RESPONSE TO:

A REVIEW OF THE CONNECTIONS POLICY FRAMEWORK IN NORTHERN IRELAND

September 2023

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INTRODUCTION

Northern Ireland Electricity Networks (NIE Networks) is the owner of the electricity transmission and distribution networks in Northern Ireland (NI), transporting electricity to 910,000 customers including homes, businesses and farms. NIE Networks is regulated by the Utility Regulator for Northern Ireland.

NIE Networks welcomes the opportunity to respond to this important Call for Evidence (CfE) on a Review of the Connection Policy Framework in Northern Ireland. An effective connections framework in NI is crucial to connecting any new generation and demand. Efficient economic facilitation of connections is essential to achieve the 2030 decarbonisation, renewable electricity, heat and transport targets and ambitions, encourage economic growth in NI and will have a positive impact on fuel poverty.

The NIE Networks Statement of Charges[1] for Connection to the Northern Ireland Electricity Networks distribution system (the SoCC) sets out the current distribution connection charging methodology in NI. NIE Networks' connections policies are designed to comply with our licence arrangements and relevant legislation, but are supported through industry consultation rather than regulatory approval.

The connections framework in NI (legislation, licence and policy) should:

- Provide objective and transparent terms and conditions for connections.
- Enable projects that best align with overarching UK government policy direction and NI Assembly strategic view on climate action, and deliver sustainable low-carbon solutions with well-regulated markets and networks.
- Be mindful of and not negatively impact the effectiveness of all-island electricity market auctions.
- Ensure NI is not out of step with neighbouring jurisdictions, discouraging investment and economic growth.
- Maintain the momentum in the NI renewable industry to maximise chances of meeting the 2030 targets.

NIE Networks acknowledges this CfE as a signal from the UR and DfE that they are aware of, and ready to address the issues currently faced by customers wishing to connect in NI. NIE Networks has been advocating for a review of the distribution connections charging methodology and the current degree of socialisation since 2019 including conducting a review of distribution connections charging in other jurisdictions, the submission of a paper to the UR in January 2022 supporting a review of distribution connections charging and a follow up project with an external consultant to understand the impact on a customer bill of moving to a shallower charging regime. The need for distribution connection charging reform has also been highlighted by NIE Networks via our Networks for Net Zero report and briefing paper to the Economy Committee and Infrastructure Committee in 2020[2]. We are aware that these submissions have been made alongside significant representations from Industry stakeholders who share our concerns.

Through the response to the questions stated in the CfE, NIE Networks is aiming to provide solutions to connections issues that are in the best interests of all NI consumers, including vulnerable customers, while also facilitating NI to meet its ambitious renewable electricity, heat and transport targets.

[1] https://www.nienetworks.co.uk/statementofcharges

[2] External Engagement | Northern Ireland Electricity Networks (nienetworks.co.uk)

BACKGROUND

NIE Networks is a member of the Energy Networks Association (ENA) and engages regularly through this forum and with stakeholders in NI to review distribution connections policy and update policies where it is possible to do so. The overarching aim is to facilitate the connection of further demand and generation to the NI distribution network, whilst maintaining the safety, stability, security and affordability of the whole system.

The bullet points below provide a brief summary of recent changes and consultations, which NIE Networks expect will facilitate faster and more cost-effective connections:

- Introduction of non-firm transmission access for generators >5MW connected to the distribution network.
- After Diversity Maximum Demand (ADMD) consultation, which considers the impact of low carbon technologies (LCT) on the electrical demand of households.
- Cluster methodology consultation to enable the connection of customer demand, network demand and storage into cluster substations.
- Removal of the requirement for firm transmission access and consideration of the operation limit for generators <5MW connected to the distribution system, facilitating export connections for these generators.
- Proposal to remove the 120% over-install limit for single technology and hybrid co-located generators.
- Call for Evidence on the potential for NIE Networks to introduce the concept of flexible connections for distribution connections.

Distribution Connection Charging

NIE Networks acknowledges the call for evidence (CfE) is open-ended, however specific focus is given to distribution connections charging.

Connection costs paid by the customer connecting to the distribution network in Northern Ireland are much higher than in Great Britain (GB) or the Republic of Ireland (ROI). This is something that NIE Networks see as a barrier to meeting 2030 NI Energy Strategy targets and ambitions. Overall distribution connection costs in NI are comparable to those in GB and ROI; however, the way in which the overall costs are attributed to the connecting customer and the wider customer base are different. For customers connecting to the distribution network in NI, total connection costs are chargeable to the customer (including connection assets and reinforcement required at the connection voltage and one voltage level up). However, in other jurisdictions the reinforcement costs are socialised across the wider customer base and are not chargeable to the connecting customer or only a portion is chargeable.

A shift to a shallower connection charging methodology (with a greater proportion of connection costs being socialised) would facilitate the increased adoption of renewable generation as well as LCTs such as heat pumps and EV charging infrastructure. NIE Networks has experienced connections, particularly of LCT's, that have been abandoned due to high costs. An appropriate charging methodology is essential to facilitate the achievement of all aspects of the new Energy Strategy and Climate Change Act whilst having the appropriate consumer protection in place.

Any move away from NI's current connection framework must be in the best interests of all NI consumers, including vulnerable customers. A shallower charging approach would help facilitate a nondiscriminatory, fair and just energy transition, by breaking down cost barriers for the connection of LCT's. With existing and future planned changes to policy and legislation, many consumers will no longer have a choice on whether or not to adopt LCTs.

Moving to a shallower charging regime could contribute to improving the competitiveness of Northern Ireland as a place to do business. Adoption of a shallower connection charging methodology in Northern Ireland could be supported by learning and experienced gained in GB, which moved to an even shallower charging approach on the 1st April 2023.

NIE Networks Distribution Charging Methodology

NIE Networks divides customers into two main categories for determining chargeability:

1. **Authorised Generators**
   NIE Networks has adopted two different approaches for connecting Authorised Generators to the distribution system:
   - Connection of the generator(s) on an individual basis – The costs of the Connection Assets[3] (inclusive of new assets and Reinforcement at the Point of Connection (POC) voltage or one voltage level above) are fully chargeable to the customer. With these connections being commercial connections, they do not receive any rebates in the event a future customer utilises the Connection Assets for their connection.
   - Connection of the generator(s) through a 110kV/33kV Cluster Substation – The charge for a generator to connect into a Cluster Substation is based on the proportion of the cost of the Cluster (based on Required Capacity) plus the full cost of their unique Connection Assets. Any future connections to the cluster will also be charged a proportion of the cost of the Shared Assets.

2. **Not an Authorised Generator** (e.g. Domestic and Commercial Load Connections)
   Customers are fully charged for installing new Connection Assets and any Reinforcement required to facilitate the new connection or increased load connecting to the distribution system. Where existing Connection Assets (constructed within a 5-year period for a domestic connection) are to be shared for a new connection(s), the costs of the Shared Assets are apportioned between each party.

   Where new Connection Assets are to be shared with others who are connecting simultaneously, the costs of the shared assets will be apportioned based on Required Capacity between the connecting parties.

For a housing development of 12 or more individually serviced domestic premises, the customer is charged a standard connection charge where they accept a full works option (NIE Networks to complete both non-contestable and contestable works).

For low carbon technologies (LCTs) connecting to an existing supply, NIE Networks, through RP6 price control allowances, will fully fund any Reinforcement required provided the following criteria are applied:

[3] Connection Asset is defined by NIE Networks as those assets required to connect the customer's assets to the Distribution System, including, as appropriate, civil works, electrical lines, electrical plant, meters, telemetry and data processing equipment; those assets required to reinforce the Distribution System which are at the connection voltage level and one voltage level above; and in the case of a customer connecting at 33kV, those assets required to reinforce the Transmission System at 110kV which are installed to enable the transfer of the customer's Maximum Export Capacity or Maximum Import Capacity, disregarding electricity flows caused by any other customer.

1. The existing MIC for the premises is not exceeded with the LCT connection
2. The connecting LCT complies with relevant harmonic and flicker standards
3. The connecting LCT does not require more stringent network characteristics than existing design standards

Where the connection does not comply with the above criteria, the cost for any reinforcement work is fully chargeable to the customer.

NIE Networks Connections Interaction with SONI

Certain connections to the distribution network may require assessment by SONI to ensure that the transmission system infrastructure is sufficient for supplying the new or increased load/generation. NIE Networks' current charging methodology is fully chargeable for any new Connection Assets and Reinforcement at the connection point and one voltage level above (those assets required to reinforce the Transmission System at 110kV which are installed to enable the transfer of the customer's Maximum Export Capacity or Maximum Import Capacity, disregarding electricity flows caused by any other customer). Where the connection is made via a Cluster Substation, the unique connection asset is fully chargeable and the cost of the shared 110kV infrastructure is apportioned up to the Designated Generation Cluster Infrastructure Connection Capacity[4]. Beyond the Designated Generation Cluster Infrastructure Connection Capacity, assets required to reinforce the Transmission System at 110kV which are installed to enable the transfer of the customer's Maximum Export Capacity or Maximum Import Capacity, including electricity flows caused by any other customer are fully chargeable. The cluster methodology nonetheless highlights the precedent in NI for socialisation of elements of connection costs. Appendix 2 of the SoCC sets out the full methodology for the connection of generation sites within a defined area to a cluster substation (the 'cluster methodology').

For customers seeking to connect directly to the transmission system, any associated reinforcement required on the transmission system to facilitate the connection is fully chargeable to the customer. However, SONI's current charging methodology ignores all other power flows when assessing the impact of the new connection on the existing network. With the design assessment looking only at the new user's power flow, it is rare that any reinforcement is chargeable on the transmission system.

Strategic Direction in GB

The Charging Futures Programme in GB, chaired by Ofgem, set up an Access and Forward-Looking Task Force to review and recommend new arrangements in strategic charging topics. Analysis showed that the total amount paid towards network reinforcement by the connecting customer was a small percentage of total distribution network reinforcement and an even smaller percentage of total distribution expenditure (which was around £3bn in 2018 and 2019). This shows that while the reinforcement recovered by individual connection charges can be prohibitive at times to the connecting customer, it is a small component of the overall network costs.

Other important points highlighted by Ofgem following consultation with industry included:

- Main reason given by respondents to Ofgem for projects not proceeding as planned was the level of upfront cost
- Misalignment between distribution and transmission could lead to sub-optimal connections
- Network planning and design was largely driven by individual connection requests

[4] Designated Generation Cluster Infrastructure Connection Capacity is defined by NIE Networks as the electricity capacity expressed in MVA of the Designated Generator Cluster Infrastructure.

- DNOs raised concerns that previous charging methodologies made it difficult for them to use flexible sources to manage reinforcement for new connections
- Flexible connections have been successful in allowing customers to connect prior to the capacity being released through reinforcement

Ofgem instructed GB DNOs that as of 1st April 2023, distribution connection charges in GB would become shallower than was previously the case. Distribution connection charges in GB as of the 1st April 2023 are outlined in the following bullet points:

- Connections serving demand of electricity, no reinforcement costs will be charged to the connecting customer.
- Connections serving generation, only a proportion of reinforcement costs at the connection voltage will be charged to the connecting customer. No reinforcement costs at voltage levels above the connection voltage are charged to the connecting customer.
- The new GB charging regime includes safeguards to protect the customer base from extreme high cost connections so that more expensive connections, such as those required by large businesses or industry, would not be paid for by the wider customer base. Through setting a 'high-cost project threshold' (HCPT), high costs are captured and the wider customer base is protected from large, out-lying connection costs. In these instances, the connecting customer is required to contribute more to the costs of reinforcement plus all of the costs for the new extension assets. The HCPT in GB is currently set at £200/kW for generation connections and £1720/kVA for demand connections.

RESPONSE TO CALL FOR EVIDENCE QUESTIONS

Q1. What are the risks and opportunities in relation to the development of micro grids and what issues do these raise for the connections framework in NI?

Under the current distribution connection charging methodology, NIE Networks as Distribution Network Operator (DNO) would be required to treat the development of micro grids the same way as any other connection, whereby the customer applies for connection with a Maximum Import Capacity (MIC) or Maximum Export Capacity (MEC), studies are completed to determine if the network can accommodate the connection, and if so then the Least Cost Technically Acceptable (LCTA) connection is provided in a connection offer.

If changes were made to distribution connections charging, and if flexible distribution connections were introduced, there would be more opportunities for the development of micro grids. NIE Networks would have more flexibility to accommodate the connection of micro grids especially in areas of the networks where there is limited available capacity. NIE Networks recently issued a CfE on flexible connections which closed on Friday the 25th August. NIE Networks will analyse responses received to the CfE and continue to explore the possibility of introducing flexible connection opportunities in NI.

Since 2020, NIE Networks has issued c.400 connection offers for zero export installations, of which c.200 have been accepted. NIE Networks also recently consulted on removing the Over Install limit for generation connections; which will allow customers to determine their Total Installed Capacity (TIC), whereas previously customers were limited to either zero export, full export or an export which allowed the TIC to be no greater than 120% of the MEC. A decision paper on the removal of the Over Install limit is due to be published in September 2023. These examples highlight that NIE Networks seeks to be a facilitator of new and innovative connections, either by introducing changes to policy or advocating for changes to be made. This is aligned with NIE Networks' commitment to understand and meet the needs of customers.

The paragraphs 1.25 to 1.32 of the CfE mention prosumers extensively. A shallower charging regime would facilitate more customers (including vulnerable customers) in becoming prosumers, as it would reduce the upfront connection costs by lowering network reinforcement costs for the connecting customer. At present, debilitating upfront connection costs are a major blocker to the uptake of Low Carbon Technologies (LCT's) and renewables, reducing customers' ability to become prosumers.

Without changes to the current distribution connection charging regime many customers will not be able to afford the connections costs to install LCT's due to the level of network reinforcement required. NIE Networks are finding significant volumes of customers are choosing to install off-grid solutions or putting additional 'hidden' generation on the Direct Current (DC) side with a rectifier in place so that it is not parallel to the network. Although these provide a solution to the customer it is likely to reduce the quality of their supply and increase nuisance tripping due to reduced requirements that are in place for parallel connections, as set out in the Distribution Code. These requirements are in place to help manage supply quality during faults and to balance generation and demand to ensure system security, therefore they are of the upmost importance.

These installations will also result at times in lower demand profiles however NIE Networks will still be required to provide any contracted MEC/MIC at times where the DC solution can not provide their site requirements (due to the intermittent nature of renewable generation). Generation connections, even zero export generation connections, are operating in parallel with the network, therefore a connection agreement is required, and NIE Networks will still

assess the network impact from that connection for example for fault level.

Currently, more than 70% of NIE Networks' regulated distribution allowance is recovered from Distribution Use of System (DUoS) charges based on the volume of electricity transported across the distribution network. Large uptake of micro grids will therefore require tariff reform to ensure network costs are fairly recovered from prosumers and passive customers. Any change to the distribution connections charging methodology will have a knock-on impact on the socialisation of network costs via network tariffs, hence there is a need to consider this impact along with the impact on connection charges. The UR has indicated it plans to consider the tariff reform (network charges) separately however it is worth mentioning that this reform could address some of the issues identified within the CfE. For example, NIE Networks could increase the proportion of network charges recovered by fixed as opposed to volume based DUoS charges, hence providing a fairer recovery from prosumers - this approach has been adopted in GB via their DUoS "residual charges".[5]

A key enabler for prosumers in NI is the roll out of smart meters and smart tariffs to encourage prosumer behaviour in a manner that supports grid stability and maximises the usage/storage of available renewable generation. It is also worth highlighting the difficulties around monitoring and renewables reporting created by the introduction of microgrids and it is important the UR and DfE consider this.

Q2. Do you agree with our guiding principles? Please expand your answer.

NIE Networks agrees with the principles that are laid out in the Call for Evidence and would also like to suggest some further guiding principles.

It is clear that a move to shallower distribution connection charging would assist in facilitating targets set out as part of the NI Energy Strategy and Climate Change Act by increasing the uptake of LCTs and renewable generation through lower upfront connection costs. It is also worth highlighting that a change to distribution connection charging would increase the competitiveness of NI as a place to do business. NIE Networks is receiving feedback from our stakeholders that high connection costs as a result of the current charging regime is discouraging medium and large businesses from investing in NI, causing investment to be redirected to other regions. The emergence and development of the green economy across the UK and further afield is a primary example of this movement. When marked in direct comparison with our closest neighbours, both GB and the ROI may be seen as more attractive areas to invest in, with lower connection costs for the connecting customer and a simpler route to significant market penetration.

Therefore, a guiding principle of this call for evidence should include benefits to the green economy across the whole of NI as part of Stormont's Levelling Up[6] and 10X economy[7] strategies. As NI strives to decarbonise sectors such as heating and transport, it is essential that barriers such as high connection costs are removed and instead shared across the entire population. This could provide several additional benefits such as encouraging green growth and inward investment; creating employment in existing sectors as well as stimulating a new sustainable green economy across the whole of NI.

Large renewable developers and EV charge point operators (CPOs) are currently making, and plan to make, significant investments in these domains in order to meet the requirements of NI's energy needs. The regions with favourable government policies and the

[5] https://www.ofgem.gov.uk/publications/targeted-charging-review-decision-and-impact-assessment

[6] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1095544/Executive_Summary.pdf

[7] https://www.economy-ni.gov.uk/publications/10x-economy-economic-vision-decade-innovation

potential for higher returns will attract more investments and as a result, gain the additional benefits of job creation, infrastructure development, and a more sustainable future.

The current deep distribution connection charging methodology in NI is acting as a barrier to such investments because of high distribution connection costs in comparison to other regions such as GB. This is reflected in recent statistics[8] on EV sales and chargers. Between 2012 and 2020, EV sales registration grew by 52% on average in NI compared to 88% across the whole of UK. The stock of chargers in NI is also materially below the rest of the UK. Public charging devices per 100,000 of the population are lower in NI (23) than any other UK region, and well below the UK average of 66[9]. To date, many enquiries made to NIE Networks from installers of rapid chargers for EVs have been abandoned as a result of the high cost of connection. By way of example, NIE Networks' analysis**Error! Bookmark not defined.** shows one such enquiry for which the applicant was quoted c. £178,000 to connect to the 11kV network in NI. By comparison, the same application would have an equivalent connection cost of c. £63,000 under the current GB charging regime. The applicant did not proceed with the investment.

In order to meet the 80% RES-E targets of the Climate Change Act, it is widely anticipated that large-scale generation may have to be incentivised through some form of contract for difference (CfD), which was recently consulted on as part of DfE's Renewable Energy Support Scheme consultation[10]. The CfD mechanism currently exists in GB. A shallower charging regime for NI would be more aligned with other jurisdictions which would create a level playing field for businesses to invest in any region in advance of any government schemes to encourage RES-E or LCT's. The absence of shallower charging in Northern Ireland would result in the distribution connection cost for renewable energy developers being much higher than in the rest of the UK, and would most likely discourage investment in NI. This would be catastrophic in pursuit of meeting the Climate Change Act target of 80% RES-E by 2030 and reduce the effectiveness of any similar renewable energy support scheme introduced in NI.

Ultimately under the current distribution connection charging regime, issues like those outlined above will become exacerbated as many NI consumers are required to install LCTs as part of new building regulations, legislation like the ban on new petrol and diesel car sales from 2030, and requirements for businesses to decarbonise. This will mean that the high cost connections will no longer be an "option" for those who want to become engaged in the climate emergency, instead it will be forced upon them. If connection costs are exceedingly high for the connecting customer they will be left in very difficult situations with the need to decarbonise pitted directly against high cost connections.

NIE Networks RP7 business[11] plan looks at the investment to cover increased growth in LCTs however it did not include costs that are chargeable under the existing charging regime as they are considered separately. RP7 network reinforcement is discussed further in response to Question 9.

Q3. Do you agree with our proposed scope in relation to this connection review, this includes: Are there other issues which you consider we should take into account? If so, please explain why. Are there any connection areas we should remove from the scope of our review? If so, please explain why.

[8] https://www.gov.uk/government/statistics/electric-vehicle-charging-device-statistics-october-2021

[9] https://www.gov.uk/government/statistics/electric-vehicle-charging-device-statistics-july-2023/electric-vehicle-charging-device-statistics-july-2023

[10] https://www.economy-ni.gov.uk/consultations/design-considerations-renewable-electricity-support-scheme-northern-ireland

[11] https://www.nienetworks.co.uk/rp7-business-plan

NIE Networks welcomes this Call for Evidence as a signal from the UR and DfE that they are aware of, and ready to, address the issues currently faced by customers wishing to connect in NI. NIE Networks have been advocating for a review of the distribution connection charging regime and the current degree of socialisation since 2019 including conducting a review of distribution connections charging in other jurisdictions, the submission of a paper to the UR in January 2022 supporting a review of distribution connections charging and a follow up project with an external consultant to understand the impact on a customer bill of moving to a shallower charging regime. These submissions have been combined with continuous lobbying of the issues to all of NIE Network's key stakeholders.

NIE Networks have major concerns that the implications of the 'do nothing' approach presented in the Call for Evidence are not being correctly outlined. Since it has been included in the document, NIE Networks wishes to clarify what 'do nothing' may mean in reality.

The idea that a "do nothing approach" will have "zero impact" is incorrect and needs to be considered and explored fully if it is to be considered as an alternative approach. The connection costs and ongoing costs of a generator connecting in NI will have major impacts on the bidding behaviours of that generator in the Single Electricity Market (SEM) (and other markets available to it e.g. DS3 System Services and Flex) in order to recover costs. If a 'do nothing' approach is chosen, higher connection costs for the connecting customer will be reflected in higher bidding costs in markets in order to recover investment made by developers to connect the renewable generation. This in turn, will lead to electricity suppliers paying a higher price for electricity. These costs then need to be recovered by the suppliers and are eventually passed on to a customer's bill. The overall result of the "do nothing" approach is therefore an increase in customer bills. It is disappointing that these market economics have not been outlined in the CfE document as at present the 'do nothing' approach is set out implying zero impact.

Electricity market economics are particularly important now that EU legislation has removed priority dispatch for newly connected or modified RES-E, and newly connected or modified RES-E in NI will be competing for market position with newly connected or modified RES-E in ROI (when SEM systems have been updated to enable this). Therefore, any differences in upfront connection costs paid by the connecting customer in NI versus ROI will result in business decisions driving investment away from NI. Similarly, high cost demand connections will result in connections being abandoned, – NIE Networks are already seeing this - or costs of goods and services being offered by these connected customers increasing to cover initial investment.

It is crucial to point out that the 'do nothing' approach will result in NI generators having higher bid prices in order to recover connections costs, in turn driving investment away from NI. This will result in devastating outcomes for NI in relation to installing the renewable capacity required to meet the Climate Change Act targets and mean NI falls further behind both of our nearest neighbours while also creating a drain of various resources including skilled employment. NIE Networks does not support the "do nothing approach", and would urge for extensive analysis of this approach. The assumption/suggestion that this approach will have "zero impact" on costs to the end consumer and the ability for NI to achieve the 2030 RES-E targets is false.

The legal, financial and international relations risks of NI not achieving 2030 and/or 2050 RES-E targets should also form part of the analysis of any proposed "do nothing" approach.

NIE Networks have provided a list of connection areas that should be included in the scope of this review in the response to Questions 14 and 15.

Q4. Do you consider the current 'partially deep' connection boundary in NI appropriate? Please explain your rationale further and provide evidence.

NIE Networks does not consider the current deep connection boundary in NI to be appropriate. The reasons for this are outlined throughout this full response and include the following:

- Connection costs (distribution) paid by the connecting customer in NI are much higher than in GB or ROI. This is something that NIE Networks see as a barrier to meeting 2030 NI Energy Strategy targets, and are therefore advocating for a review of distribution connection charging.
- Current distribution network charging doesn't lend itself to a 'touch the network once' strategy, as set out in NIE Networks RP7 business plan, to be effectively deployed to network reinforcement which is driven by new/increased distribution connections. The current approach dictates that a customer is charged for the specific section of network which needs upgraded to facilitate their capacity. If this were to become a socialised cost it would allow the work to be viewed much more holistically in relation to asset replacement works / network refurbishment / wider LCT growth / demand & generation growth on the same part of the network from other stakeholders, and investment delivered efficiently across the price control period. It would also enable the use of flexible and smart solutions to defer network reinforcement which is not currently an option as there is only one opportunity to charge a customer for a solution which will last for the lifetime of the connection.
- Analysis completed by NIE Networks forecasts that the impact of socialised costs using shallower connection charging methodologies on an average domestic customer's bill in 2030 is expected to be less than £3 per year[11]. This is explored further in response to question 9.
- A shift to a shallower distribution connection charging methodology would facilitate the adoption of renewable generation as well as LCTs such as heat pumps and EV charging infrastructure. NIE Networks has experienced connections, particularly of LCT's, that have been abandoned due to high costs. As a typical example of this, NIE Networks recently received a connection application for a supply to a new build low carbon property that requested an enhanced supply to accommodate low carbon technologies. The cost of supply to accommodate this connection was c. £22,000 which was cost prohibitive to the domestic customer. They were forced, through financial pressures, to abandon their low carbon ambitions and request a lesser supply which resulted in the connection costing c. £5,000. These connection principles go against what customers would expect in light of current government legislative focus.
- NIE Networks' customer feedback to date have expressed that such high upfront connections charges in NI are a barrier to uptake of LCTs. That may be one of the reasons why NI is still lagging behind in heat pump adoption, with 65% of people still using oil for heating, compared to 1-2% in the rest of the UK, although there are other contributing factors e.g. the availability of the gas network in GB.
- Any move away from NI's current connection framework must be in the best interests of all NI consumers, including vulnerable customers. A shallower charging approach would help facilitate a non-discriminatory, fair and just energy transition, by breaking down cost barriers for the connection of LCT's. With existing and future planned changes to policy and legislation, many consumers will no longer have a choice on whether or not to adopt LCTs and so costs will need to be fair to all customers. With costs shared across such a large group of customers, the impact on customer bills would be under £3 per year for an average domestic customer[12], but would ensure a fair approach and non-discriminatory access for everyone. As NI moves towards a

[12] This value is the estimated impact in the RP7 period if NI adopt the GB shallow approach

zero-carbon future, it is important that those customers who move first to adopt renewable and low carbon energy and transport solutions, are not unfairly burdened by paying the majority share of reinforcement costs.

- In addition to domestic customers, larger customers such as housing developers will be motivated to include LCTs within their domestic developments, while commercial customers wanting to connect commercial scale LCTs and public EV charging stations are also expected to increase in the future. The available capacity decreases as more generation and demand, including LCTs, are connected to the distribution network. This increases the likelihood that a connection will necessitate significant network reinforcement, with associated costs, resulting in a high connection costs for customers under the existing deep charging regime. This high cost will act as a barrier to the adoption of LCTs and hence meeting the overall 2030 and 2050 carbon reduction legal requirements.
- Under the current charging regime, there are large discrepancies in distribution connection costs between rural and urban customers depending on the level of network reinforcement required. According to NIE Networks' quotation data from 2018 to 2021, rural domestic customers accounted for 94.5% of total single domestic connection applications, while urban domestic customers accounted for only 5.5% of single domestic connection applications. However, the average connection charge for a single domestic rural dwelling is around £5,700, and for a single domestic urban dwelling is around £1,866. The current deep distribution connection charging regime appears to discriminate against rural based connecting customers, with higher quote values and therefore less acceptance for that customer sector. Moving to higher ADMD's, as consulted on recently by NIE Networks[13], to accommodate LCTs, will exacerbate this gap further as higher demand will require greater volumes of network reinforcement.
- Moving to a shallower distribution charging regime could contribute to improving the competitiveness of NI as a place to do business by creating a level playing field with other jurisdictions. This has been presented in response to various other questions but includes considerations around renewable energy support schemes and market economics.
- Although some progress has been made in connecting renewable generation (an additional 115MW connected since 2019), the rate of change has not been sufficient to meet targets set by the Climate Change Act given current planning timelines for new infrastructure, lead time of equipment and build time. Limited progress has been made on electricity consumption from renewable sources since the beginning of the decade which leaves NI just over 6 years to find an additional 40% of electricity consumption from renewable generation. This signals that urgency is required, and a shallower distribution charging methodology would encourage renewable generation to connect by lowering up front connection costs paid by the connecting customer.
- Adoption of a shallower distribution connection charging methodology in NI could be supported by learning and experienced gained in GB, who moved to a shallow charging approach on the 1st April 2023.
- The new charging regime could also include safeguards so that more expensive connections, such as those required by large businesses or industry, would not be paid for by the wider customer base. Through setting a 'high-cost project threshold' (HCPT), high costs are captured and the wider customer base is protected from large, out-lying connection costs. In these instances, the connecting customer will continue to be required to contribute more to the costs of reinforcement plus all of the costs for the new extension assets.
- The analysis shown in Appendix 1 demonstrates how a different connection charging methodology e.g. the previous GB methodology (it went even more shallow on 1st April 2023) and the ROI methodology, would result in significantly lower connection

[13] https://www.nienetworks.co.uk/design-demand-consultation

costs for the connecting customer. It is important to note that when Ofgem were carrying out their most recent analysis of distribution connection charging in GB, they noted that the previous methodology (pre-1st April 2023), which was already shallowish, was going to be a blocker to achieving RES-E and LCT targets, as well as delaying the uptake of EVs.

- One of the major disadvantages of the current charging regime is higher grid connection costs for first movers i.e. customers who move first to install renewables or LCT's in a certain area. These customers are charged all of the required network reinforcement costs directly, resulting in network capacity being created and paid for by a single customer although they may only require a proportion of the new capacity created. This means customers may be encouraged to wait to install LCT's and renewables as they will not be required to pay for any network reinforcement when the capacity has already been made available and charged to the first customer who triggers the need for reinforcement. The result of this is a stand off between parties connecting to the same part of the network, and a reluctance to move towards renewables and LCT's.

Q5. Do you consider a shallow connection boundary to be appropriate in the NI context? Please explain your rationale further and provide evidence.
If so, which of the following connection types should have a shallow connection boundary; -Demand only -Generation only -Demand and Generation
-An alternate connection type (for example Domestic/Non-Domestic connections
NIE Networks has chosen to respond to Questions 5 and 6 together. See below.

Q6. Do you consider a shallow-ish boundary to be appropriate in the NI context? Please explain your rationale further and provide evidence.
If so, which of the following connection types should have a shallow-ish connection boundary;
NIE Networks has been advocating for a change to distribution connection charging, and this continues to be the position. NIE Networks would welcome the opportunity to work with the UR and the DfE to design and implement a new distribution connection charging methodology that is in the best interests of all NI consumers, including vulnerable customers, while also facilitating NI to meet its ambitious climate change targets.

NIE Networks strongly advocates for a charging policy that is shallower than our current deep charging policy. Through our engagement with UR and DfE on this matter to date, we have not gone so far as to propose an exact policy, but we have shared extensive analysis of specific customers who have been impacted (commercial and residential) negatively i.e. chosen not to expand a business in NI, or been forced to install conventional oil/gas heating at a new build home instead of a heat-pump, due to high connection costs.

In response to the Energy Strategy consultation[14] NIE Network's stated:
Through our analysis of connections charging in neighbouring jurisdictions and the connections charging history in NI, we consider alternative connections charging arrangements could include:
• *Apportionment based on capacity required by connecting customer;*
• *Standard connection costs for different categories of generation;*
• *Shallow charging boundary;*
• *Reintroduction of a connection's subsidy*

In response to this question NIE Networks wishes to discuss the potential changes that could be implemented to the existing NIE Networks SoCC to reduce the upfront costs for the

[14] https://www.nienetworks.co.uk/documents/future-networks/dfe-response-jul21.aspx

connecting customer. The choice of connection charging method can profoundly affect the economic viability of a new connection for the connecting customer and hence play an important role in the adoption of renewable generation and LCTs. Significant research completed by NIE Networks has looked to understand how different charging scenarios might work in practice in NI, more of which is detailed below.

It should be noted there are many charging methods available and in use throughout Europe, such as in ROI which employs 'shallowish' charging where the costs are based on a percentage subsidy. However, the modelling completed by NIE Networks focused on GB charging arrangements including both the previous 'shallowish' and current 'shallow' approaches. The rationale for modelling the GB existing and proposed charging arrangements was that they align most with the situation in NI.

- **Northern Ireland Existing:** For both demand and generation connections, all reinforcement costs at the same voltage level and one voltage level above that of the connection voltage are charged to the customer. This is referred to as "deep" charging.
- **GB Previous:** For both demand and generation connections, reinforcement costs at the same voltage level and one voltage level above that of the connection voltage are shared between the customer and DNO according to the cost apportionment methodology described in Appendix 1. However, for generation connections, reinforcement costs in excess of the high-cost project threshold (HCPT) of £200/kW are charged to customer.
- **GB Current: (in place since 1st April 2023)** For demand connections, the customer will not be charged for any reinforcement cost within the HCPT. All costs will be recovered through DUoS. For generation connections, reinforcement costs at the connecting voltage level will be shared between the customer and DNO in accordance with the cost apportionment methodology, while costs at one voltage level above the connection voltage will be borne by the DNO and recovered through DUoS charges. The HCPT of £200/kW for generation remains and there is also a HCPT for demand connections of £1720/kVA

It is important to point out that prior to moving to a shallow charging approach, GB spent many years with a shallowish charging approach. This meant that the distribution network in GB has been updated gradually, with reinforcement costs shared, with both the connecting customer and the entire customer base contributing in proportion to the connection size. It may be prudent to consider that a shallowish charging approach would reduce the impact on socialised costs overall versus a fully shallow charging approach. If NI moves directly from deep to fully shallow in a single step it may result in an avalanche of connections and reinforcement works which would cause NIE Networks ability to deliver the volume of work to be put under significant pressure, while also bringing an initial spike in network reinforcement costs to be socialised.

There are many choices to be made when developing a new connection charging policy (e.g. charging boundary, proportional costs or percentage subsidy, rebates from 2nd comer to 1st comer, high cost cap, methods of socialisation, impact of more efficient network development), all of which will have an impact on how much cost is socialised, and to whom and for how long. It is important that all these choices are carefully considered in terms of the benefits and impacts, to develop a non-discriminatory charging policy that is best suited to NI in the context of vulnerable customers, RES-E targets, SEM etc. How connection costs are socialised may also be considered i.e. the approach taken for the recovery of the 40% subsidy previously applied to customers <1MW which was removed in 2012. With regards

to demand and generation, NIE Networks would suggest consideration be given to the level of locational signal given to both, similar to considerations Ofgem made in their Access SCR.

One further element that may be considered to provide balance to vulnerable customers could be achieved by asking or requiring large generation or demand customers to contribute towards a vulnerable customer scheme.

Q7. Do you believe that moving to a more shallow connection boundary in NI will deliver NI renewable targets that otherwise would not be met? Please provide evidence to demonstrate your answer.

NIE Networks strongly believes that moving to a shallower connection boundary in NI will give Northern Ireland the best chance to deliver renewable targets that would not otherwise be met.

NIE Networks RP7 Business Plan projects that a total of 3.9GW of renewable generation will be required to be connected to the network to meet the target of 80% renewables by 2030. That would see an additional 2.1GW of renewables connected to the grid, on top of the c.1.8GW currently connected. Of the forecasted amount, approximately 1.85GW is predicted to be large scale generation, including offshore wind. The remainder is forecasted to be made up of small-scale and microgeneration.

NIE Networks notes that current figures published by SONI[15] show that for 2023 (up to May) the electricity consumption from renewable generation was 38% for NI. This means there has been limited progress made since the beginning of the decade in advancing the levels of electricity consumption from renewable energy sources. The current figure leaves NI just over 6 years to find an additional 40% of electricity consumption from renewable generation in order to meet the 80% target set out in the Climate Change Act NI. This signals that urgency is required and although operating the system with high levels of non-synchronous generation creates separate challenges, it is important that high volumes of renewable generation connections are facilitated in NI. A shallower connection boundary and an efficient connections process would play an important role in ensuring this.

As increased levels of generation and demand are connected to distribution networks, the available capacity reduces. This leads to an increase in the likelihood that a connection will require significant network reinforcement, with associated costs. These significant costs may act as a barrier for customers to connect renewable generation and LCTs to the distribution network, putting the commitments of renewable electricity generation covering 80% of electricity consumption in the Climate Change Act (NI) 2022 at risk. Shallower connection charging would enable these targets to be met within the target timeframe by reducing the individual connection cost of renewable generation.

The absence of shallower charging in NI would result in the connection cost for renewable energy developers being much higher than in the rest of the UK, which would most likely discourage investment in NI, as already laid out in response to question 2. This would be catastrophic in pursuit of meeting the Climate Change Act target of 80% RES-E by 2030.

At a larger scale, the connection of grid-scale renewable generation will not only put downward pressure on wholesale electricity costs but also remove the national reliance on imported fossil fuels, which are currently used to supply the conventional power stations across NI. The importance of this has been highlighted in recent times through the uncertainty created by the war in Ukraine and the volatility this has created in oil and natural gas prices.

[15] https://www.soni.ltd.uk/media/documents/System-and-Renewable-Data-Summary-Report-July-2023.xlsx

To protect all customers, including vulnerable customers, the reliance on imported fossil fuels should be minimised. The recent high energy costs were not a reflection of poorly designed electricity markets locally or across Europe, instead a reflection of how global instability and a lack of resources can lead to high commodity prices. Therefore, to protect all the electricity customers in NI, facilitating the connection of generation that is not reliant on imported fuels is essential. NI should not allow the short-term issues to take our focus off the longer-term goals. If anything, the recent high prices show us what will happen when the imported fossil fuels become less abundant and as a result the costs are inflated to reflect the scarcity.

Q8. Please provide evidence on the potential impacts on energy affordability in NI if reinforcement costs were socialised further? What would the impact on energy affordability be in NI if household bills were to increase per annum by:

- **1-3%**
- **4-7%**
- **7-10%**

The domestic retail electricity bill based on PowerNI's prices (effective from July 2023) is £1,015.06 (incl vat at 5%). This assumes the average customer consumes 3,200kWh per year (consumption quoted by UR in their tariff papers). Using this information, the increases outlined correlate to:

Percentage Increase	Lower Percentile		Higher Percentile
1-3%	£ 10.15	to	£ 30.45
4-7%	£ 40.60	to	£ 71.05
7-10%	£ 71.05	to	£ 101.51

To provide some context and in an effort to quantify what moving to a shallower distribution connection charging regime might look like, as opposed to highlighting general percentage increases, it is vitally important to outline the piece of work NIE Networks completed with an external consultant to model the impact of socialised reinforcement costs on a customer bill if NI were to move to a shallower distribution charging regime. This project included modelling new demand and generation connections out to 2030 using forecasts developed as part of the RP7 business plan submission and calculating the amount of network reinforcement required to facilitate those connections. The total reinforcement costs were then apportioned based on the charging scenarios to find the amount of reinforcement that would be socialised.

The results of this analysis showed that for an average domestic customer in NI, the socialisation of reinforcement costs under the previous GB charging methodology (shallowish) amounted to approximately £2 extra per annum in 2030 and under the current GB (shallow) charging methodology amounted to approximately £3 extra per customer per annum in 2030.

When converted to a percentage increase, and compared with an average household electricity bill per annum, this amounted to a percentage increase on each customer's bill of below 1% for both the previous GB charging (shallowish) methodology and the current GB (shallow) charging methodology.

With any forecasting piece of work there are certain assumptions that need to be made. As such, even allowing for a significant degree of variance in the forecasted cost impact on customer bills calculated within the report, the overarching conclusion was that for less than £5 extra per year on the average domestic customer's bill, a whole new set of possibilities are opened up to allow NI to meet the 2030 carbon reduction and RES-E targets and allow

all customers, including vulnerable customers, to be able to integrate renewable generation, heat pumps or EV charging into their homes and businesses without the fear of debilitating upfront connection costs or overburdening existing customer bills.

Some additional analysis was carried out during this project to investigate the cost impact on domestic customers' bills from variance in the forecasted quantum of reinforcement that would be liable for socialisation. This analysis looked to calculate the impact on a domestic customer's bill due to differing amounts of forecasted reinforcement.

With that in mind, the analysis looked to find what amount of additional yearly socialised reinforcement would add £1 yearly to a domestic customers bill. This value was found to be approximately £4 million per year. Therefore, every additional £4 million per year in socialised reinforcement costs would equate to a £1 increase on the average domestic customers bill per year. These values are intended for illustrative purposes in this section, in order to give a scale as to how much increasing socialised reinforcement costs could affect a domestic customer's bill. The values were calculated under the shallowish charging approach (i.e. GB previous). As discussed previously, there are many design decisions to be made when developing a new distribution connection methodology, all of which will impact the level of socialised cost.

As a method of cross checking as part of the project, the average socialised cost per year under the two different charging scenarios were in line with what would be reasonably expected when compared with GB DNOs who have similar customer numbers and networks. "National Grid Electricity Distribution (NGED, formerly WPD) - South Wales" and "Scottish and Southern Energy Networks (SSEN) - North Scotland" are the two closest GB DNO areas to NIE Networks in terms of customer numbers and network topography. When calculated for Northern Ireland, the 'shallowish' average socialised cost per year was forecast to be approximately £9 million, which was in line when compared with submissions made by the NGED and SSEN submissions for the Yearly Ex Ante Connections allowance under the previous GB charging regime. Likewise, when calculated for NI, the 'shallow" average socialised cost per year was forecast to be approximately £11 million, which can be compared with submissions made for the Yearly Ex Ante Connections allowance under the proposed Access SCR charging regime[16].

The customer base is expected to grow in the coming years and the forecasted customer base was considered while calculating the impact on each customer's bill. In addition to the growth in customer numbers, there is projected to be a growth in customer consumption, driven by the anticipated increase of electrification in the heat and transport sectors. As outlined in the RP7 Business Plan, it is expected that electricity consumption will increase by c27% on average by the end of RP7 compared to the annual average consumption at the end of RP6 (this is in total not per customer). The anticipated growth in electricity sales may put downward pressure on network prices as the overall costs will be spread over more units.

It's important to note that NIE Networks acknowledges that any increase to a customer's bill, while projected to be small, given the current economic landscape is difficult to accept. However as stated in response to Q3, a "do nothing" approach does not correlate to no changes to customer bills. Costs for connection are recovered by developers through market prices and eventually passed onto customers. There will be also be a cost for NI in losing investment and not meeting renewable and LCT target's, which may result in fines. An example of this is the Zero-emission Vehicle (ZEV) mandate which requires manufacturers to sell an ever-increasing percentage of zero-emission machines such as electric cars, or face paying significant fines. These costs are likely to be eventually passed to customers for

[16] https://www.ofgem.gov.uk/publications/riio-ed2-final-determinations

business cost recovery purposes.

Q9. Can NIE Networks differentiate between RP6 allowances, RP7 business plan connection requests and how these differentiate and have been factored into the analysis that has been done on potential reinforcement connection costs analysis NIE Networks have completed?

Network reinforcement, particularly on the secondary network, can be driven by a variety of mechanisms such as those noted in the RP7 Business Plan, as part of maintaining the network within NIE Networks' Licence obligations. The other main source of network reinforcement is driven by specific customer applications from NIE Network's connections business, where under the current deep charging regime, the customer is liable for the full cost of all necessary upgrades at their connecting voltage and the voltage level above.

Throughout the modelling and analysis phases of the project to calculate the bill impact of moving to a shallower charging regime (discussed in response to Q8), reducing the risk of double counting network reinforcement from these two sources was a key consideration. In terms of double counting, the main risk was the inclusion of chargeable reinforcement to the connecting customer within the forecast for new connections when in reality this area may have already been reinforced through network investment programs. In order to address this risk, the same tool was used for this project as the one utilised by NIE Networks for the RP7 submissions. The tool used was developed and refined by UK DNOs through the Energy Network Association (ENA), and was a parametric model that considered typical distribution circuits, aligned with a series of NIE Networks' rural and urban scenarios.

By modelling the forecasted increases in demand and generation on LV, 6.6kV and 11kV circuits through the tool and applying a number of calculated assumptions, the project considered the RP7 network investment plans first and then overlaid the new and increased connections loads on top of this. The difference (or delta) in reinforcement costs between the baseline completion of the model and the new connections completion of the model was then calculated to leave only the new connections reinforcement costs. This significantly reduced the risk of double counting network reinforcement, i.e. the risk that the network had already been reinforced due to some other network project or load growth and then counted again as reinforcement required due to new connections.

This form of modelling is considered to be accepted industry best practice however as it looks towards the future it is set up with inputs that include forecasts and various assumptions. While best efforts were made to use the most appropriate forecasts and correct assumptions, as with any form of forecasting, there will always remain a degree of uncertainty. Ultimately the outcomes of the project to forecast reinforcement costs and the associated impact on customer bills if those costs were socialised, retained an element of hypothesis and further generic analysis including comparison with similar sized GB DNO's was completed, as outlined in response to question 8.

By moving to a shallower distribution connection charging regime, the whole process of designing a customer's new or increased load connection could move to a significantly more holistic approach. Rather than each individual connection design being considered in relative isolation with the total burden (and hence cost) of reinforcement being levied on the connecting customer, sections of network could be upgraded and reinforced considering the wider whole system cost, delivering optimal long term customer cost efficiencies and minimising customer disruption. In some instances, this may mean overall deferral of reinforcement, in other occasions it may actually mean reinforcing ahead of the imminent need, but overall availing of the inherent financial savings through improved greater efficiency of considering the wider picture. This aligns with NIE Networks principle of 'touching the network once', as outlined in the NIE Networks RP7 submission. This means that when traditional network investment is the appropriate solution NIE Networks will aim to

install assets which are fit for purpose out to at least 2050.

Within the current (deep) charging regime, it would still be very challenging to fully co-ordinate a suite of network development programs with individual connections applications as the latter occur on such an *ad hoc* basis and often under different timescales. By moving to a shallower charging regime, it would offer an intrinsic benefit of enabling a more holistic, synergetic approach to network development across the country. Page 14 of our RP7 Business Plan Summary[17] gives a good summary on this issue:
Reinforcement costs associated with new or increased connections at the connecting voltage and the next voltage up are not included in the RP7 Business Plan; these costs are fully chargeable to the connecting customer based on the current connection charging methodology. Reinforcement costs two voltages up from the connecting voltage are included within the RP7 Business Plan as this reinforcement is not chargeable to connecting customers based on the current connection charging methodology.

In essence where a customer is retrofitting LCTs within their existing MIC, particularly at domestic level, then the required network investment to manage this is funded through the price control. Where they require increased capacity then this is currently chargeable (up to next voltage level), and not included in the price control. A shallower regime would socialise the necessary reinforcement and would require additional funding as quantified by the project outlined above.

It is worth highlighting how uncertainty surrounding the move to a new charging regime (under Access SCR) and its interaction with price controls has been accommodated as part of Ofgem's RIIO-ED2[18] in GB. Ofgem recognised that in moving to shallower charging approaches through the Access SCR there would be an increase in DNOs' costs as work is funded through the price control that would otherwise have been borne by the connection customer. The Access SCR therefore introduced significant uncertainty in DNOs' forecasting of the investment needed in RIIO-ED2. Ofgem's view was that due to the uncertainty associated with the impact of the Access SCR, providing ex ante funding that was broadly equivalent to the first two years of DNOs forecast impact of the Access SCR (£356.7m across all DNOs) would be best for consumers.

The reasoning behind this was that it would ensure DNOs are funded in the immediate term, with an ability to request further allowances through the re-opener's in January 2025 and January 2027, whilst not committing consumers to higher costs than may be necessary. By putting the re-opener two years into the future, Ofgem were allowing for this uncertainty to be addressed at a time when better information is available about the impact of Access SCR on consumer behaviour and licensee's costs.

Q10. Do you think that a developer led or plan led is the best approach for the future development of connections in NI? Please explain your answer.

The current developer led approach was effective in enabling NI to meet the 2020 RES-E targets. However, at that time the availability of network capacity was not so scarce. Therefore, the need for network reinforcement (and therefore the connection cost) was not as prominent and prohibitive.

The introduction of distribution clusters was instrumental in connecting large amounts of grid scale renewable generation ahead of 2020, and since. The development of these clusters takes a pragmatic approach to developing distribution and transmission infrastructure ahead of definite need. The expansion of this methodology to other distribution and transmission developments should be considered in the context of the need for timely grid connection and

[17] https://www.nienetworks.co.uk/documents/future_plans/rp7-business-plan-summary-april-2023.aspx
[18] https://www.ofgem.gov.uk/publications/riio-ed2-final-determinations

reinforcement. With just 6 ½ years remaining to connect over 1GW of onshore renewables it is likely there is a need some sort of plan e.g. planning cluster substations at distribution or transmission level, or a "cluster like" approach to network reinforcement projects.

There are many benefits of a plan led approach, however careful consideration of the design of the plan is needed. The plan led approach would need to enable developers to access the connections market in NI regularly enough to ensure a steady throughput of connections, generation and demand, whilst enabling the system operators to develop the network(s) and any network reinforcement based on reliable, accurate information.

A plan led approach, along with showings areas where planning may be easier could mean more chance of meeting 2030 targets, noting the potential for uneven access due to need for different technologies to locate in geographic areas to suit their needs.

This is currently being discussed in particular for offshore connections, the current developer led approach based on speculative applications is inefficient and will; A) potentially lead to inefficient network design on this case by case basis B) cost more overall C) take longer to deliver overall and D) uses the same resources who would otherwise be engaged to look at a more holistic approach to network development to reduce issues outlined in A, B & C.

Q11. Do you think the current 3- month timeframe for SONI and NIE Networks to issue a connection offer is appropriate? Please explain your answer.

It is NIE Networks view that the current 3-month timeframe to issue a connection offer is outdated and requires review and change. Connection applications are becoming increasingly complex due to the nature of the connections being proposed e.g. co-location of generation and demand, the introduction of new technologies and complex control and protection schemes and the desire for connection applicants to get as much usage out of existing/new connections. There is evidence that these timeframes are no longer suitable, due to the interactions NIE Networks has had with the UR and applicants to extend the 3-month timescale on many occasions.

NIE Networks acknowledges that applicants will want a level of certainty around the expected timescales for the delivery of a connection offer, and is willing to work with UR, DfE and the wider industry to develop more suitable timescales or method of providing that certainty. Likewise, the impact on existing NIE Networks policies around milestones etc. may need to be reviewed and changed.

The batch type approach used in ROI (ECP-1[19] and ECP-2[20]) provided a level of certainty around when the applicants could expect to receive a connection offer, as there was a deadline for the system operators (SOs) to issue all offers. But also enable the SOs to consider the applications in a holistic manner rather than on an individual, first come first serve basis.

The connection queue, particularly for demand, can become congested with speculative applications e.g. variations of size of connection at the same connection point, in order for applicants to understand the impact of reinforcement costs on their project. The introduction of legislative backing for connection application fees (also known as assessment and design fees) would go a long way to discouraging multiple applications that result in the offer timelines being longer.

Other approaches may be suitable for smaller scale projects e.g. standard costing approach or menu pricing, in order to shorten timeframes to issue connections offers.

[19] Microsoft Word - ECP-1 decision - FINAL - 27.03.2018 (divio-media.com)

[20] CRU20060-ECP-2-Decision.pdf (divio-media.com)

Any consideration of timescales for provision of a connection offer, should be considered alongside the queueing principles i.e. developer led or plan led.

Q12. If our legislation facilitated it, should obtaining planning permission be a pre-requisite in order to receive a grid connection? Please explain your answer.
To date, all previous engagement that NIE Networks has carried out with industry, has indicated that industry is in favour of this. Benefits include certainty of development, reduced capacity hoarding on a congested network, certainty around need for network planning and reinforcements etc.

However, with only 6 ½ years to connect over 1GW of on-shore renewable generation, this approach might not allow us to meet 2030 due to long lead times and planning timelines (for OHL and substations) and outages to facilitate final connections.

Noting the long planning timelines associated with the development of renewable generation projects and the associated grid connection and wider grid reinforcement, careful consideration should be given to the impact of any reform. A balanced approach to ensuring certainty of development alongside reducing capacity hoarding is essential. NIE Networks attempts to achieve this balance through connection milestones, however a legislative solution would be much more robust and more desirable.

In order to achieve this balance, the relevant legislation could be updated to facilitate the prioritisation of connections with planning permission or projects that have been designated as strategically important, possibly in the context of likelihood to connect in a timeframe to help achieve the 2030 RES-E targets.

Note that the equivalent consideration is also being made with regard to offshore generation connections ahead of the SEA for NI.

Q13. If our legislation facilitated it, do respondents consider any other issues associated with the current queue process? Or that a different approach to managing the connection queue, would result in quicker connections? If so, what would that be? Are there any lessons to be learned from other jurisdictions?
As previously noted, in order to achieve a balance between certainty of development and connection and reducing capacity hoarding, NIE Networks introduced milestones into generation connection offers i.e. Planning Approval Milestone, Longstop Milestone and Utilisation Milestone. The milestones were introduced following engagement and consultation with industry, as part of the overall response to manage the change in connections following the UR final determination on the dispute referenced in the CfE. The Planning Milestone requires applicants seeking new or modified MEC to provide a copy of their planning permission or relevant consents no later than 120 days from the date of the Terms Letter.

The current first-come first-served queuing principle, which is applied independently at distribution and transmission, allocates capacity based on the date of competent application and does not consider the local or wider system needs. Current queuing principles also do not take account of projects that would be strategically important e.g. in terms of achieving 2030 RES-E targets or addressing a scarcity on the system. This also impacts how a connecting customer would be charged under the current distribution connection charging methodology, as it is possible that the first comer triggers the need for a network reinforcement that is wholly chargeable to them, resulting in the second comer being able to use any unused capacity created through this reinforcement at no cost.

Neighbouring jurisdictions have different approaches to queue management e.g. ECP-2 in

ROI, which takes a batch approach to processing connection applications at transmission and distribution. With defined windows for applications to be submitted, clear criteria for which applications will be accepted and a defined window for when connection offers will be issued.

A process similar to this in Northern Ireland may be possible within the existing legislation, which currently prohibits undue discrimination. If the system operators were instructed to discriminate on the grounds of a set of criteria e.g. likelihood to connect ahead of 2030 (in order to contribute to achieving targets), this could be deemed as due discrimination.

The connection queue, particularly for demand, can become congested with speculative applications e.g. variations of size of connection at the same connection point, in order for applicants to understand the impact of reinforcement costs on their project. The introduction of legislative backing for connection application fees (also known as assessment and design fees) would go a long way to discouraging multiple applications that result in the offer timelines being longer.

Other approaches may be suitable for smaller scale projects e.g. standard costing approach or menu pricing, in order to shorten timeframes to issue connections offers.

Q14. Do you have any other information relevant to the subject matter of this Call for Evidence that you think we should consider?

NIE Networks would refer the UR and DfE to all materials previously supplied on the topics discussed in the response to this CfE. If any further clarification is needed on any points raised within this response, or the documents previously provided, NIE Networks is happy to engage further.

The following discrepancies have been noted in relation to DUoS and TUoS charging:

- Paragraph 1.2 - the 40% subsidy on connection costs previously applied in NI was applied on connections for all customers with maximum connected capacity below 1MW, hence it also captured medium sized business customers. The subsidy was then recovered via DUoS charges to the same customer groups.
- Paragraph 4.2 - 11kV and 33kV are noted as medium voltage, we would generally refer to these voltages as high voltage and extra high voltage respectively.
- Paragraph 4.5 – the wording reflects the recovery of socialised Transmission costs but not Distribution costs. The following explains the recovery of each:
    - Investments on the distribution network are included in NIE Networks' regulated distribution entitlement. These investments are recovered through DUoS charges levied on both demand and generation customers connected to the distribution network. For clarity there are no DUoS charges in relation to exported energy or capacity.
    - Investments on the transmission network are included in NIE Networks' regulated transmission entitlement. These investments are recovered through transmission service charges (TSC) levied on SONI. 75%of the TSC is recovered by SONI from demand and generator customers connected to both the transmission and distribution networks, on the basis of their imported units. The remaining 25% is recovered from generators through the Generator export charge. This is applied to all generators connected to the transmission system and all export capacity above 5MW connected to the distribution system.
- Tables 5.10 5.13 & 5.15 - The tariff groups identified in these tables are wrong. They imply one size fits all however that is not the case; the appropriate tariff group will depend upon the voltage the customer is connected to and then if the socialised

costs are for reinforcement on the transmission or the distribution network. In simple terms, socialised transmission network reinforcement will be recovered through TUoS charges while socialised distribution network reinforcement will be recovered through DUoS charges.

Q15. Please list any connection issues you have raised in order of priority. Please explain your reasoning behind your priority.

NIE Networks would encourage the UR and DfE to progress matters that can be addressed without the need for legislation change, alongside developing the legislation changes needed to address the other matters. This will allow for the majority of changes to be introduced in a timeline that will materially benefit Northern Ireland on the journey to 80% by 2030.

It is likely that there will need to be a level of industry engagement when developing the details of some of the changes discussed in the CfE and this response. NIE Networks offers support in any areas where it is possible and appropriate and would welcome engagement with UR in DfE when developing a timeline for changes.

Changes that can be made without the need for legislation change:

- **Distribution Connection Charging Methodology Review**
  In September 2021, NIE Networks commissioned independent legal advice which concluded:
  1. There is no requirement for new legislation to be introduced in NI to allow NIE Networks to change its Statement of Charges or to allow the Utility Regulator to approve it.
  2. Ofgem, which operates under directly comparable legislation, did not consider there to be any requirement for legislative changes to be introduced prior to approving modifications to the statement of charges.

  NIE Networks has provided a lot of information through this response and through documentation and presentations shared ahead of the CfE being published. It is NIE Networks view that the current distribution connection charging methodology is currently and will continue to be a blocker to economic investment and green recovery in Northern Ireland, and has a negative impact on the likelihood of NI achieving 80% RES-E by 2030 and the desired electrification of heat and transport. There are many options to be considered when developing a distribution connection charging methodology suitable for all customers in NI, including vulnerable customers, and the impact on SEM and other markets, and NIE Networks is strongly encouraging these conversations to happen as soon as possible.

- **Cluster Matters**
  In addition to the ongoing review of the cluster methodology to facilitate the connection of customer and network demand and storage to existing clusters, there are other cluster matters that need addressed. These include:
  1. Charging arrangements for assets needed to increase cluster capacity e.g. additional transformers and/or transmission assets. As these are wholly chargeable to the customer that triggers the need and this is prohibiting the further development of existing cluster infrastructure.
  2. The use of cluster assets for the connection of transmission customers, and the associated charging impacts.

3. Expanding the scope of the generation that can be considered when designating a cluster i.e. to include generation that is at environmental impact assessment (EIA) stage, with an appropriate weighting factor.
4. Clusters at different voltage levels

- **Review and alignment of transmission and distribution policies, documentation and charges, where appropriate**
  As policies have developed and been amended, areas of misalignment have developed. For example, distribution cluster infrastructure and charging are not considered in any transmission documentation, which can lead to issues around rebates and shared asset charges.

- **Queuing Principles**
  As discussed in the previous questions, it is NIE Networks view that the current first come first serve queueing principle, is leading to suboptimal connections and network reinforcement. This is due to the requirement for each application to be considered in turn and the lack of ability for holistic design.

- **Expansion of distribution cluster methodology to connections and network reinforcement at transmission and distribution for generation and demand**
  The anticipatory investment for cluster infrastructure, where the risk has been assessed and considered to be appropriate, has proven to be instrumental in connecting large amounts of renewable generation in order to achieve the 2020 RES-E targets. Given the long planning and lead times for large infrastructure projects, at distribution and transmission, for connections and network reinforcement, the expansion of this risk balanced anticipatory investment would be appropriate.

- **License standards regarding timelines for Connection Offers**
  As discussed in Q11, the current 3-month license standard is outdated and no longer fit for purpose. As is noted in the CfE, the legislation does not stipulate a specific timeline. NIE Networks are happy to work with the UR, DfE and industry to develop a connections process that is fit for purpose in terms of enabling access to the network in an efficient manner and facilitating connections to achieve 80% by 2030 and the electrification of heat and transport.

- **Flexible Connections**
  NIE Networks recently held a call for evidence on this topic which closed on Friday 25th August. All responses not marked as confidential can be shared with the UR and DfE.

- **Extensions to Offer Timelines**
  As an interim step to a change of connection process, or as a new enduring process, the process for extensions for issuing Connection Offers could be amended so that agreement is required between the relevant SO and customer without the need for UR approval (unless there is disagreement between the customer and SO).

- **Tariff Reform**
  This is a key enabler for prosumers and all customers to actively engage with their electricity usage, and to influence electricity usage in a way that is advantageous to the operation of the whole system and market.

- **Energy Dashboard**
  This item has been discussed with UR and DfE and industry at the Renewable Grid Liaison Group (RGLG). The proposed dashboard would look-ahead at generation and grid projects in planning, consider build timescales and the growth of demand due to electrification of heat and transport. The output would act as an idiciator of the likelihood of achieving 80% by 2030, and provide early sight of any forecasted issues in order to enable corrective action to be taken. Due to the inputs required, this dashboard would need to be a collaborative effort between government departments, and licensed companies.

Changes that require legislation change:

- **Application Fees**
  Updated legislation to enable SOs to require an application fee from all types of applicants (generation, demand and storage etc.) in order to minimise speculative applications and to ensure full cost recovery of work driven by each application by that applicant. This work should be followed up with a full review of application fees to ensure the charges in each charging statement are reflective and suitable.

- **Alignment of legislation and license obligations on NIE Networks and SONI**
  For example, NIE Networks cannot publish connection queue, but SONI can. And NIE Networks can refuse to connect, but SONI cannot. The misalignment on some issues can lead to confusion within the industry and sub-optimal design of connection processes.

- **Planning Reform**
  As discussed in our responses to Q12 and Q13, this reform would have a significant impact on the connection methodology in NI, including queueing principles, capacity hoarding and efficient network design. Therefore any planning reform should take account of this impact.

APPENDIX

Appendix 1 - Worked Examples for GB DNO's and ROI DNO

The DNO charging principles are applied to the following examples to compare the different costs that would be charged to the customer. The costings within these examples use the prices provided within WPDs Statement of Charges (SoC) and assume that each DNO would charge the same for each example. This approach ensures that the charging principles are the only variable between each DNO to compare the impact on the overall cost of connection. **This piece of work was completed in 2021 and so uses the GB charging methodology that was in place prior to 1st April 2023 (shallowish).**

GB DNO Distribution Connection Charging Methodology

Western Power divides the cost allocation into four separate groups:

- Costs for providing the connection which are to be paid in full by the customer.
- Costs for providing the connection which are to be apportioned between the customer and Western Power's regulatory allowance.
- Costs to be paid by the customer in respect of works that have previously been constructed or are committed and are used to provide the connection.
- Cost to be paid fully through Western Power's regulatory allowance.

Costs paid in full by the customer mainly comprise of new Connections Assets (Extension Assets[21]) that are required to meet the Minimum Scheme design. For generation connections, Reinforcement costs in excess of the high-cost project threshold of £200/kW are fully charged to the customer.

Costs that are apportioned between WPD's regulatory allowance and the customer include Reinforcement on the existing network to allow the customer to connect. There are some exceptions where reinforcement works are charged fully to WPD's regulatory allowance or the customer. Apportionment is determined using the two equations below to determine the Cost Apportionment Factor (CAF):

$$Security\ CAF = \frac{\text{Required Capacity}}{\text{New Network Capacity}}\ x\ 100 \qquad (\max 100\%)$$

$$Fault\ Level\ CAF = 3 \times \frac{\text{Fault Level Contribution from Connection}}{\text{New Fault Level Capacity}}\ \text{x}\ 100 \qquad (\max 100\%)$$

Security CAF refers to Reinforcement required due to capacity and voltage levels. Fault Level CAF applies to Reinforcement required to maintain fault level limits.

WPD will pay in full through the regulatory allowance any Reinforcement greater than one voltage level above the voltage at the Point of Connection (POC). Reinforcement works required to allow equipment to connect at existing supplies rated at 100A or less per phase will be paid in full through WPD's regulatory allowance provided any and all generation equipment is less than 16A per phase and complies with technical requirements of the relevant standards. This would mainly apply to the connection of micro-generation and LCTs.

[21] Extension Assets are defined by WPD as assets installed to connect a party or parties to the existing distribution network but which exclude Reinforcement assets

ESB Networks Distribution Connection Charging Methodology

ESB Networks determines the cost of connection through calculating the following charges:

- Standard MIC Charge
- Network Charge
- Trenching Charge
- Exceptional Charge
- Shared Network Charge

ESB Networks categorises each application into separate groups to determine the standard MIC charge to be paid by the customer. The categories assigned to each application consider:

- Topology – Domestic, Apartment, Commercial
- Capacity Requirements
- Number of houses & average cable length for Housing Sites
- Phasing required
- Distance from existing network

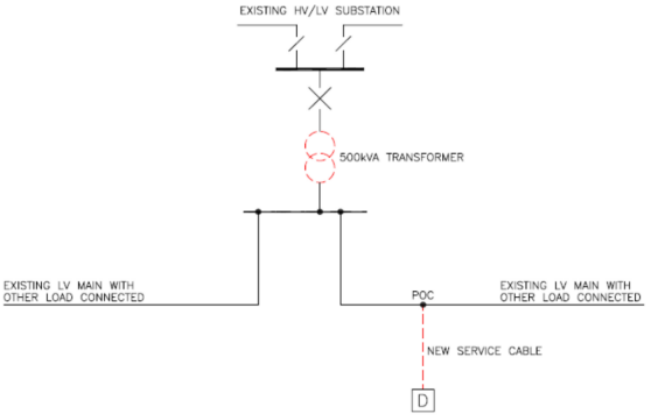
Where Network Charges apply, a 50% allowance is applied to the cost of any MV network (20kV or 10kV9) up to 1km. For any MV network beyond 1km, no allowance is applied to the MV charge per meter. MV Network Charges are apportioned for mixed developments based on the required MICs of apartments, housing scheme or business connections.

Reinforcement charges to the customer are only applied to business connections. For business connections less than 500kVA, 50% of the customer's share of the capacity of the MV/LV substation is charged. For connections greater than 500kVA, 25% of an average cost of network Reinforcement is applied. Network reinforcement includes reinforcement of substations, circuits and protection equipment.

A Shared Network Charge / Refund applies in cases where a connection to a new customer makes use of the Connection Asset of an existing customer who fulfils the necessary eligibility criteria. The criteria include the requirement of existing Shared Connection Assets being constructed within the previous 5 years with the refund only applying in respect of capital contributions not covered by a standard charge. Refunds do apply for business connections but not those quoted under the Business Parks Policy.

ESB Networks does not charge for connection of LCTs that are within the MIC of an existing premise. Where the LCT connection will result in the existing MIC being exceeded, the connection is classed as an increased load and the relevant Standard Charge applied.

Example 1 – Transformer Reinforcement
A customer requests a new 100kVA connection. There is sufficient spare capacity on the adjacent LV main but the existing 300kVA transformer at the local 11kV/LV substation is fully loaded. The Least Cost Technical Acceptable/Minimum Scheme is to provide a new service cable and to replace the 300kVA transformer at the local substation with a 500kVA transformer.



WPD Connection Charge Calculation
Security CAF calculation: the numerator in the CAF calculation is based upon the Required Capacity of the Customer, i.e. 100kVA. The denominator is based on the New Network Capacity following Reinforcement, i.e. 500kVA.

$$Security\ CAF = \frac{100}{500} \times 100 = 20\%$$

Fault Level CAF calculation: this scheme does not have any significant Fault Level contribution to the existing shared use distribution network and Fault Level CAF is therefore not applicable here.

Reinforcement

	Cost (£)	**Apportionment**	**Customer Contribution (£)**
Non-Contestable Work			
Replacement of 500kVA transformer	10,000	20%	2,000
Total Reinforcement Cost	10,000		2,000

Extension Assets

	Cost (£)	**Apportionment**	**Customer Contribution (£)**
Contestable Work			
Provision and Installation of LV Service	1,500	n/a	1,500
Non-Contestable Work			
LV Joints to Network	500	n/a	500
Total Extension Asset Cost	2,000		2,000

Total connection charge using WDP methodology = £4,000

NIE Networks Connection Charge Calculation
Both the reinforcement of the existing transformer to a 500kVA transformer and the new service cable are categorised as Connection Assets. Therefore, these works are fully chargeable to the customer. The total cost for replacement of the 500kVA transformer and new service cable are £10,000 and £2,000 respectively.

Total NIE Networks Connection Charge = £10,000 + £2,000 = £12,000

ESB Networks Connection Charge Calculation
With a request for 100kVA, this connection is assumed to be commercial. The requested MIC is below 500kVA resulting in a charge of 50% of the customer's share of the capacity of the MV/LV substation.

In this example, the customer's share of the transformer is 100kVA of a 500kVA transformer (20%). The total cost for replacement of the 500kVA transformer is £10,000. The cost of the customer's share of the capacity of the MV/LV substation is a total of £2,000. 50% to the cost of the customer's share of the capacity of the transformer is therefore £1,000.

ESB Networks charge 50% of the cost of the dedicated connection asset which applies for the new service cable within this example. The total cost for the new service cable is £2,000, therefore the customer contribution for this work is 50% at £1,000.

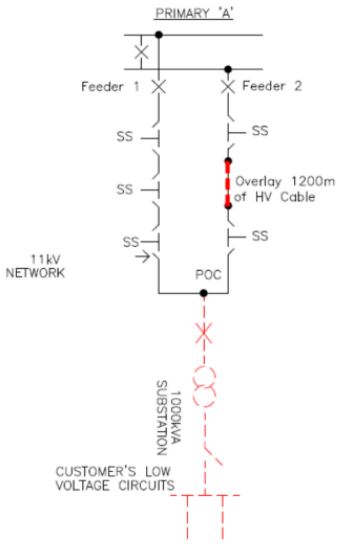
Total ESB Networks Connection Charge = £1,000 + £1,000 = £2,000

Example 1 Summary Table

	Reinforcement Cost of Connecting Customer (£)	Extension Assets for Connecting Customer (£)	Total Up-Front Cost for Connecting Customer (£)	Total Socialised Cost (£)
Western Power Distribution	2,000	2,000	4,000	8,000
NIE Networks	10,000	2,000	12,000	0
ESB Networks	1,000	1,000	2,000	10,000

Example 2 – HV Reinforcement
A customer requests to increase the Maximum Capacity of their existing LV connection from 200kVA to 850kVA; an increase of 650kVA (the Required Capacity). As the Customer's existing LV connection is unable to deliver the Required Capacity a new connection will be required from the local HV network. This will be a non-secure connection to a secure network[22]. The Least Cost Technically Acceptable/Minimum Scheme is to overlay part of the nearest HV circuit (Feeder 2) which only has spare capacity of 200kVA. The Reinforcement to make the capacity available requires 1200m of existing HV cable to be overlaid with a larger capacity cable. Following the Reinforcement, the New Network Capacity will be 8000kVA. (i.e. after Reinforcement, in this particular case, the section of cable with the lowest rating in the ring represented by Feeder 1 and Feeder 2 is rated at 8000kVA).

[22] A non-secure connection has only one point of connection onto the existing network. In the event a fault occurs beyond the point of connection, the customer is unable to be re-supplied. A secure network is inter-connected through more than one POC and can be re-supplied should a single fault occur.



WPD Connection Charge Calculation

Security CAF calculation: as this request is from an existing customer the numerator in the CAF calculation is based upon the increment of capacity requested, i.e. 650kVA (850kVA – 200kVA). The denominator is based upon the New Network Capacity following the Reinforcement.

$$Security\ CAF = \frac{650}{8000} \times 100 = 8.1\%$$

Fault Level CAF calculation: this scheme does not have any significant Fault Level contribution to the existing shared use distribution network and Fault Level CAF is therefore not applicable here.

Reinforcement

	Cost (£)	Apportionment	Customer Contribution (£)
Non-Contestable Work			
Overlay 1200m HV cable	120,000	8.1%	9,750
HV Jointing	4,800	8.1%	390
Total Reinforcement Cost	124,800		10,140

Extension Assets

	Cost (£)	Apportionment	Customer Contribution (£)
Contestable Work			
Provision and Installation of HV Cable	29,000	n/a	29,000
1000kVA Substation	20,000	n/a	20,000
Termination of customer LV cables	1,400	n/a	1,400
LV Metering Panel	800	n/a	800
Non-Contestable Work			
HV Jointing	1,600	n/a	1,600
Total Extension Asset Cost	52,800		52,800

Total connection charge using WDP methodology = £62,940

	Reinforcement Cost of Connecting Customer (£)	Extension Assets for Connecting Customer (£)	Total Up-Front Cost for Connecting Customer (£)	Total Socialised Cost (£)
Western Power Distribution	10,140	52,800	62,940	114,660
NIE Networks	124,800	52,800	177,600	0
ESB Networks	31,200	26,400	57,600	120,000

NIE Networks Connection Charge Calculation
Both the reinforcement of the HV circuit and the new transformer and associated service cable are categorised as Connection Assets. Therefore, these works are fully chargeable to the customer. The total cost for HV circuit reinforcement and new transformer and associated service cable are £124,800 and £52,800 respectively.

Total NIE Networks Connection Charge = £124,800 + £52,800 = £177,600

ESB Networks Connection Charge Calculation
With a request for a new MIC of 850kVA, this connection is assumed to be commercial. The requested MIC is above 500kVA resulting in a charge of 25% of the average cost of network reinforcement.

In this example, the network reinforcement required is the overlaying of the HV circuit. The cost of this work is a total of £124,800. Therefore 25% of the average cost of the network reinforcement is £31,200.

ESB Networks charge 50% of the cost of the dedicated connection asset which applies for the new transformer and associated service cable within this example. The total cost for the new transformer and associated service cable is £52,800, therefore the customer contribution for this work is 50% at £26,400.

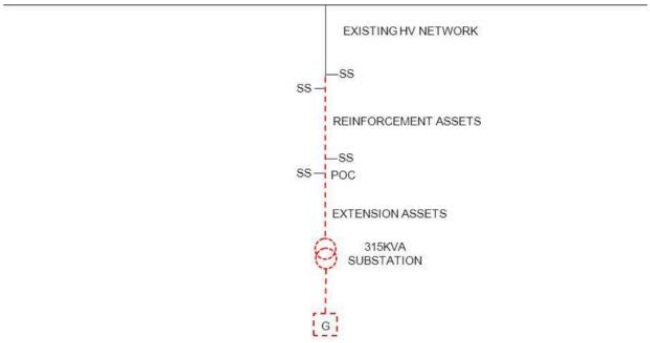
Total ESB Networks Connection Charge = £31,200 + £26,400 = £57,600

Example 2 Summary Table

	Reinforcement Cost of Connecting Customer (£)	Extension Assets for Connecting Customer (£)	Total Up-Front Cost for Connecting Customer (£)	Total Socialised Cost (£)
Western Power Distribution	10,140	52,800	62,940	114,660
NIE Networks	124,800	52,800	177,600	0
ESB Networks	31,200	26,400	57,600	120,000

Example 3 – Generation Connection with HV Reinforcement
A customer wishes to connect a new generator with a Required Capacity for export of 250kVA. The Least Cost Technically Acceptable/Minimum Scheme for connection of the generator requires the local 11kV overhead line to be reinforced with 100mm2 conductor

over part of its length in order to keep voltage rise within acceptable limits. The thermal capacity of the 100mm2 overhead line is 5MVA. The thermal capacity of the original 50mm2 overhead line is 3MVA. A new 315kVA ground mounted substation requires to be installed at the premises. The overhead line is 1km in length but only 500m is required to be reinforced in order to keep voltage rise within acceptable limits. This is the first generator to connect on this part of the network.



WPD Connection Charge Calculation

Security CAF calculation: the numerator in the CAF calculation is the Required Capacity of the Customer, i.e. 250kVA. The denominator is the New Network Capacity Following Reinforcement, this being the maximum generation that could be connected whilst keeping the voltage rise within acceptable limits. As the length of overhead line to be reinforced has been determined to accommodate the 250kVA requirement only, then this is also 250kVA in this case.

$$Security\ CAF = \frac{250}{250} \text{ x } 100 = 100\%$$

Fault Level CAF calculation: this scheme does not have any significant Fault Level contribution to the existing shared use distribution network and Fault Level CAF is therefore not applicable here.

Reinforcement

	Cost (£)	**Apportionment**	**Customer Contribution (£)**
Non-Contestable Work			
Replacement 11kV OHL conductor	25,000	100%	25,000
Total Reinforcement Cost	25,000		25,000

Extension Assets

	Cost (£)	**Apportionment**	**Customer Contribution (£)**
Contestable Work			
Provision and Installation of 315kVA Substation	50,000	n/a	50,000
Non-Contestable Work			
11kV joint to network	1,000	n/a	1,000
Total Extension Asset Cost	51,000		51,000

Total WPD Connection Charge = £25,000 + £51,000= £76,000

NIE Networks Connection Charge Calculation
Both the reinforcement of the existing 11kV overhead line and the new transformer and associated service cable are categorised as Connection Assets. Therefore, these works are fully chargeable to the customer. The total cost for replacement of the 11kV overhead line and new transformer and associated service cable are £25,000 and £51,000 respectively.

Total NIE Networks Connection Charge = £25,000 + £51,000 = £76,000

ESB Networks Connection Charge Calculation
With the connection of a generator, this connection is classed as commercial. It is assumed that the Standard Charge calculation for generation follows the same process as load connections. The requested MEC is below 500kVA, therefore only existing substation reinforcement is chargeable.

In this example, the network reinforcement required is the replacement of the 11kV overhead line. There is no reinforcement of any existing substations and therefore no charge for the reinforcement works.

ESB Networks charge 50% of the cost of the dedicated connection asset which applies for the new transformer and associated service cable within this example. The total cost for the new transformer and associated service cable is £51,000 therefore the customer contribution for this work is 50% at £25,500.

Total ESB Networks Connection Charge = £0 + £25,500 = £25,500

Example 3 Summary Table

	Reinforcement Cost of Connecting Customer (£)	Extension Assets for Connecting Customer (£)	Total Up-Front Cost for Connecting Customer (£)	Total Socialised Cost (£)
Western Power Distribution	25,000	51,000	76,000	0
NIE Networks	25,000	51,000	76,000	0
ESB Networks	0	25,500	25,500	50,500

Conclusion
NIE Networks charging methodology differs in key areas when compared to other DNOs. Our current methodology of fully charging reinforcement works is resulting in higher connection charges for customers and could be seen as a deterrent for investment in new connections in NI.

The table below provides a comparison overview of the DNO charging principles:

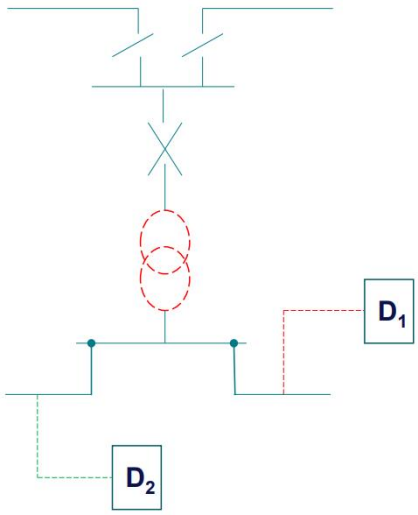
	New Connection Assets	Reinforcement Works (up to one voltage level above POC)	Reinforcement Works (greater than one voltage level above POC)	Housing Development of 12 or more domestic houses	LCT connections compliant with relevant standards connecting to existing supplies within existing MIC
NIE Networks	Fully Chargeable	Fully Chargeable	Not Chargeable	Standard Connection Charge	Not Chargeable
Wester Power Distribution	Fully Chargeable	Part Chargeable	Not Chargeable	Fully Chargeable[23]	Not Chargeable
ESB Networks	Fully Chargeable as Standard Connection Charge	Part Chargeable	Part Chargeable	Standard Connection Charge based on average length of roadway per house	Not Chargeable

[23] Extension Assets are fully chargeable. Apportionment applies for any reinforcement work required.

Appendix 2 – Network Charging Comparison

Below is a simple example that shows how much connection charges for the same capacity in the same part of the network can vary under the current distribution connection charging methodology. Example 2 shows the same example but with a shallowish charging methodology using apportionment of reinforcement costs.

Example – Charging Principles



Available capacity on LV main but existing 300kVA transformer is fully loaded.

D1 Connects (100kVA)

New service cable is fully chargeable (£2k) and upgrade of existing 300kVA transformer is fully chargeable (£10k) (£10k + £2k = £12k)

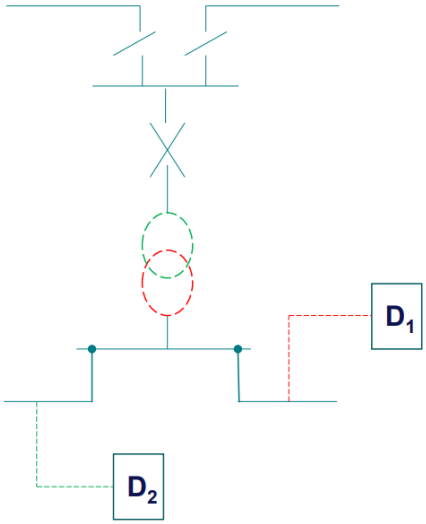
Available capacity on LV main and new 500kVA transformer.

D2 Connects (100kVA)

New service cable is chargeable (£2k)

Connection costs for the same capacity in the same part of the network are vastly different due to timing of application and charging principles. D1 has no priority access rights to the capacity created in the new transformer –if they were to apply for an increased connection and there was no remaining capacity, they could be charged for further reinforcement.

Example – Charging Principles (2)



Available capacity on LV main but existing 300kVA transformer is fully loaded.

D1 Connects (100kVA)

New service cable is fully chargeable (£2k) upgrade to 500kVA transformer is partially chargeable. (£10k * 100/500 = £2k) (£2k + £2k = £4k)

Available capacity on LV main and new 500kVA transformer.

D2 Connects (100kVA)

New service cable is fully chargeable (£2k) and capacity required in existing 500kVA transformer is chargeable (£10k * 100/500 = £2k) (£2k + £2k = £4k)

500kVA transformer total cost is £10k. £4k has been recovered through these connections.