

CLUSTER METHODOLOGY REVIEW

Consultation Paper

7 November 2023



About the Utility Regulator

The Utility Regulator is the independent non-ministerial government department responsible for regulating Northern Ireland's electricity, gas, water and sewerage industries, to promote the short and long-term interests of consumers.

We are not a policy-making department of government, but we make sure that the energy and water utility industries in Northern Ireland are regulated and developed within ministerial policy as set out in our statutory duties.

We are governed by a Board of Directors and are accountable to the Northern Ireland Assembly through financial and annual reporting obligations.

We are based at Queens House in the center of Belfast. The Chief Executive leads a management team of directors representing each of the key functional areas in the organisation: Corporate Affairs; Electricity; Gas; Retail and Social; and Water. The staff team includes economists, engineers, accountants, utility specialists, legal advisors and administration professionals.

Our Mission

Value and sustainability in energy and water.

Our Vision

We will make a difference for consumers by listening, innovating and leading.

Our Values

Be a best practice regulator: transparent, consistent, proportional, accountable, and targeted.

Be a united team.

Be collaborative and co-operative.

Be professional.

Listen and explain.

Make a difference.

Act with integrity.

Abstract

In this consultation paper the Utility Regulator (**the UR**) seeks feedback on the Cluster Methodology Review Recommendation Paper¹ published by NIE Networks so as to facilitate decision on potential approval of changes to the Cluster Methodology in NIE Networks' Statement of Charges (**SoCC**).²

Audience

This paper will be of interest to: NIE Networks; System Operator for Northern Ireland (**SONI**); new large scale demand customers; generators connected to an existing cluster; new data centres; new battery sites; developers and new synchronous compensators in close proximity to an existing cluster site or potential new cluster site, There may also be interest from consumer representative bodies such as: RenewableNI (**RNI**); Consumer Council Northern Ireland(**CCNI**); Major Energy Users Council (**MEUC**); and Manufacturing NI.

Consumer impact

Responses to this paper might have an impact on customers who are currently connected to, or in the future will be connected to, a cluster. UR will consider whether the proposed recommended changes to NIE Networks' SoCC are in the best interest of NI consumers.

¹ [Cluster Methodology Review \(nienetworks.co.uk\)](https://www.nienetworks.co.uk)

² [NIE Networks' Statement of Charges | Northern Ireland Electricity Networks](#)

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1. Executive Summary

- 1.1 In 2011 UR published a decision paper³ in which approval was given to NIE Networks to modify its Statement of Connection Charges (SoCC)⁴ to reflect connection of groups of Generators to the NI distribution system by means of “clusters”. The paper outlined that NIE Networks, should - under Condition 32 of its Distribution License⁵ - submit a revised SoCC which would set out the basis of charges for connection. This resulted in the development of Appendix 2 - Methodology for Connecting Groups of Generators to the Northern Ireland Distribution System using Cluster Substations - in the current SoCC.
- 1.2 Since then, the cluster methodology of connecting groups of generators (mostly Wind Farms) has been very successful in NI. It has been a major contributor in developing Northern Ireland’s path to Net Zero.
- 1.3 The Climate Change Act 2022⁶ inter alia sets targets for 2030, 2040 and 2050 with the overall aim to reduce greenhouse gas emissions; provides for a system of carbon budgeting; provides for reporting and statements against those targets and budgets; confers power to impose climate change reporting duties on public bodies; provides for reports and advice from the Committee on Climate Change.
- 1.4 Over 10 years have passed since the (Appendix 2) Methodology for Connecting Groups of Generators was established. The network is changing and needs to change further to achieve the ambition of Net Zero. Now is an optimal time for the cluster methodology to be reviewed.
- 1.5 Part of this review involves consideration as to whether or not clusters should be limited to just connecting groups of *Generators*, or whether the methodology should be expanded to incorporate *Demand* connections. On 22 September 2023 NIE Networks published the Cluster Methodology Review Recommendation Paper⁷ (the Recommendation Paper). This follows on from its Call for Evidence (CfE)⁸ and Consultation Paper⁹ published in 2020 and 2022 respectively.
- 1.6 In the Recommendations Paper NIE Networks proposes several changes in relation to matters affecting “clusters”. NIE Networks states that the proposed changes reflect its statutory duty (under Article 12 of the Electricity (NI) Order

³ [Decision Paper on Charges for Connecting Groups of Generators.pdf \(uregni.gov.uk\)](#)

⁴ [NIE Networks' Statement of Charges | Northern Ireland Electricity Networks](#)

⁵ [NIE Networks Distribution Licence \(nienetworks.co.uk\)](#)

⁶ [Climate Change Act \(Northern Ireland\) 2022 \(legislation.gov.uk\)](#)

⁷ [Cluster Methodology Recommendation Paper \(nienetworks.co.uk\)](#)

⁸ [Cluster Methodology Call for Evidence \(nienetworks.co.uk\)](#)

⁹ [Cluster Methodology Consultation \(nienetworks.co.uk\)](#)

1992¹⁰) to “develop and maintain an efficient, coordinated and economical system of electricity distribution”. Revised updates to the SoCC are submitted for the UR’s approval.

- 1.7 We are consulting on NIE Networks’ proposals in order to widen the potential range of stakeholders who may wish to respond.
- 1.8 We also aim to provide additional clarity on the potential impact to NI consumers as a result of facilitating Large Customer and Network Demand into cluster infrastructure, should this result in additional need for network reinforcement.
- 1.9 Responses received to this consultation will be considered in UR decision making on the proposed changes to the Appendix 2 Cluster Methodology section of the SoCC. The UR encourages all interested parties to respond to this consultation whether or not they have responded to the previous NIE Networks’ Consultation.

¹⁰ [The Electricity \(Northern Ireland\) Order 1992 \(legislation.gov.uk\)](https://legislation.gov.uk)

2. Introduction

- 2.1 The Cluster Methodology was consulted on in detail between 2010¹¹ and 2013, after which the detailed cluster methodology and charging arrangements were introduced into the SoCC.
- 2.2 The Cluster Methodology was originally proposed to *“improve access to the network for remote renewable generation, by extending the 110 kV transmission system, in the form of a 110/33 kV substation ¹²(referred to as a cluster substation), to a point more central to these groups of renewable generation projects. This enabled a more efficient connection arrangement with a reduced environmental impact by decreasing the aggregated length of overhead network required”* ¹³
- 2.3 In 2011, UR published a Decision Paper on the charges for Connecting Groups of Generators (Clustering) to the Northern Ireland Distribution System. This was an approval of the development of a new connection charging methodology. The UR instructed NIE Networks to submit for approval its revised SoCC, which was then submitted and approved. Since its implementation, the Cluster Methodology has been very successful in NI, in connecting groups of generators. Between 2012 and 2021, six clusters were commissioned enabling approximately 590 MVA of renewables to be connected, meaning that cluster connections represent approximately a third of all renewables connected in NI”. ¹⁴
- 2.4 The methodology has been a key enabler in meeting government targets such as the 2020 target of 40% renewable energy consumption. It is likely to continue to contribute to achieving new targets set out in the NI Energy Strategy and Climate Change Act .
- 2.5 NIE Networks published the Cluster Methodology Review Call for Evidence (CfE) in 2020 and the Cluster Methodology Consultation in 2022.
- 2.6 NIE Networks has recently published a Cluster Methodology Recommendation Paper presenting its proposed modifications to the SoCC for both present and future cluster matters.
- 2.7 In parallel to this workstream, the UR and Department for Economy (DfE) have published a Call for Evidence in relation to Electricity Connection Policy Framework Review. The Call for Evidence is seeking stakeholder views and evidence to assess potential changes to the current connections policy framework in NI and the costs and benefits of those potential changes. Although

¹¹ [Consultation Opens on Electricity Connection Policy for the NI Distribution System \(uregni.gov.uk\)](https://www.uregni.gov.uk/consultation/consultation-opens-on-electricity-connection-policy-for-the-ni-distribution-system)

¹² [Technical specification of 33/11 kV 2x31.5 MVA power substations](#)

¹³ [Cluster Methodology Consultation Paper \(Page 7\) \(nienetworks.co.uk\)](#)

¹⁴ [Cluster Methodology Review Consultation Paper \(Page 6\) \(nienetworks.co.uk\)](#)

this Call for Evidence is being conducted alongside this consultation (paper), any potential changes to the Cluster Methodology would be facilitated through NIE Networks' SoCC.

3. The Purpose of the Paper

- 3.1 NIE Networks has recently published its decision on a Cluster Methodology Review Recommendation Paper.
- 3.2 It has proposed modifications to the SoCC and sought approval from the UR as required under Condition 32 (Basis of Charges for Use of and Connection to the Distribution System) of its Electricity Distribution Licence¹⁵.
- 3.3 The UR considers that this consultation paper might reach persons who might not be aware of the NIE Networks Clusters Consultation. Additionally, this consultation (paper) will provide any stakeholders who might have missed NIE Networks' consultation with the opportunity to contribute.
- 3.4 We are seeking to provide further clarity on the potential impact of connecting Demand into Clusters on NIE Networks' reinforcement requirements and on any subsequent additional cost which may be incurred by NI consumers as a result of the proposed changes.
- 3.5 Clusters can be described as hubs that connect groups of generators (mostly wind farms) which are connected by short individual 33kV lines to this local hub substation with this hub then connected to the Transmission system. What NIE Networks is proposing is to move away from connecting only generators to Clusters to allowing demand customers to also connect.
- 3.6 We consider that the proposals made by NIE Networks should be clearly defined and explained to enable responders to be able to fully understand the impact these changes may have on connectees and NI consumers.
- 3.7 The proposed changes will impact new connectees, existing cluster share allowances, existing connectees and the remaining NI customer proportion of the existing cluster.
- 3.8 The UR would welcome feedback on how to deal with the current participants that are connected into existing Clusters.

¹⁵ [nie-distribution-licence-effective-24-may-2023 \(nienetworks.co.uk\)](https://www.nienetworks.co.uk/nie-distribution-licence-effective-24-may-2023)

4. NIE Networks' Consultation for Matters Regarding Existing Clusters.

This section has been taken from the NIE Networks' Cluster Methodology Consultation Paper. It outlines, in detail, the proposed changes to the SoCC and the reasons NIE Networks has provided.

This chapter also gives our initial considerations on the changes proposed by NIE Networks.

4.1 Standardisation of Capacity Allocation

4.1.1 Reason for Consultation

“The current NIE Networks' charging arrangements for Authorised Generators connecting to the network as part of a cluster makes some explicit assumptions about the use of MW and MVA. The NIE Networks' Distribution Code¹⁶ requires all Type C Power Generating Facility(s)¹⁷ to be capable of operating at its Registered Capacity in a stable manner as a minimum within the power factor range 0.95 absorbing to 0.95 producing. This would mean a generator with a 10 MW Registered Capacity must (as a minimum) be capable of providing ± 3.3 MVar equating to an MVA capacity installed or to be installed of 10.5 MVA.

The NIE Networks' Distribution Code requires all Type C Power Generating Facility(s) to be capable of operating at its Registered Capacity in a stable manner as a minimum within the power factor range 0.95 absorbing to 0.95 producing. This would mean a generator with a 10 MW Registered Capacity must (as a minimum) be capable of providing ± 3.3 MVar equating to an MVA capacity installed or to be installed of 10.5 MVA. NIE Networks proposes updating the

¹⁶ <https://www.nienetworks.co.uk/distribution-code>

¹⁷ Type C Power Generating Facility(s) means Power Generating Facility(s) with a Registered Capacity of 5 MW and above.

Statement of Connection Charges to reflect that MVA will be calculated based on a 0.95 power factor and update the charging examples to align with this”.

4.1.2 Consultation Proposal

NIE Networks has proposed the following modifications;

“- To update the SoCC text, and examples within the SoCC, to reflect the reactive power element of the generator MVA rating.

- To update wording in the SoCC to include reference to the Distribution Code requirements for reactive power when determining the MVA capacity of a generator as opposed to a power factor reference

- That NIE Networks will continue to determine the transformer generation capacity based on the manufacturer nameplate rating.

- That if the generator wants to provide reactive power in a range in excess of what is required within the Distribution Code, they can inform NIE Networks of this through the application process. NIE Networks will then base all network design studies and costing on the capacity requested.”

4.1.3 UR view

The UR agrees, in principle, with the proposals outlined in the Clusters Consultation for standardisation of capacity allocation. UR encourages responders to this consultation to make any relevant representations on this matter.

4.2 Cluster Designation

4.2.1 Reason for Consultation

“At present a threshold of 56 MVA is used as the minimum combined weighted MEC needed to justify a cluster. This is based on the typical capacity of two 33 kV overhead lines (28 MVA) and the need to reduce aggregated overhead line lengths. Weighting factors are applied to the generator MEC based on which stage of the planning process it is in”.

*“Currently this MVA value is calculated based on an assumed unity power factor i.e. 1 MW = 1 MVA. Based on the technical reasons discussed in section” **4.1**”*

NIE Networks believe the MVA value should be calculated based on a 0.95 power factor”

4.2.2 Consultation Proposal

NIE Networks’ Consultation paper proposed the following recommendations to Cluster Designation:

- *“Currently the 56 MVA Value is calculated based on an assumed unity power factor i.e., 1 MW = 1 MVA. Based on the technical reasons discussed in section” 4.1, “the MVA value should be calculated based on a 0.95 power factor.*
- *The 0.8 weighting factor for generators who have made a submission for planning or submitted an appeal to the PAC should be maintained.*
- *While acknowledging that developers undertaking environmental impact assessments (EIA) would be a good early indicator, no proposal was made to change the weighting factor (0) applied to this group of generators.*
- *The category currently titled “Applied for Grid Connection”¹⁸ that had a weighting factor of 0.8 should be removed. This is because a generator that has applied for a grid connection will either be consented and have a weighting factor of 1 applied or have submitted to planning or appealed to the Planning Appeals Commission (PAC) and will have a weighting factor of 0.8 applied.*
- *No proposal was made to expand the scope of designation beyond the renewable generation it currently applies to.”*

4.2.3 UR view

UR shares NIE Networks’ view that there is a need is to find the correct balance between preventing speculative applications for connection and ensuring that the process of obtaining a connection into a cluster is not unduly onerous, either financially or administratively. The UR welcomes further engagement from responders in this regard.

¹⁸ [NIE Networks SoCC \(Page 81\) \(nienetworks.co.uk\)](https://www.nienetworks.co.uk)

4.3 Timing

4.3.1 Reason for Consultation

“The NIE Networks’ SoCC acknowledges that a connection offered to a generator via a designated cluster may take longer to deliver than an individual 33 kV connection to an existing constructed main substation.”¹⁹

NIE Networks’ experience is that the timing provision in its current form does not reflect the length of time required to develop and construct a cluster and is unclear as to the point in time at which each of the three conditions must be assessed.

1. The applicant is the “first in the queue” for connection to a designated or approved cluster and has suffered or will suffer a ‘Delay’ in being connected to that cluster. In this context ‘Delay’ shall mean a delay in excess of 24 months, commencing on the estimated scheduled completion date stated in the offer of terms for connection issued to the applicant by NIE Networks, which is wholly attributable to NIE Networks.

2. The first in the queue has applied for and paid NIE Networks for a connection design and analysis study to be undertaken within 3 months of the connection design and analysis study application date, to determine if a direct connection to an existing node is technically acceptable; and

3. Where a direct connection to an existing node is technically acceptable, offering a direct connection to an existing node to the first in the queue would not result in the cluster falling below the 56 MVA threshold for designation should the offer for the direct connection to an existing node be accepted.”

4.3.2 Consultation Proposal

NIE Networks proposed the following recommendations in its Clusters Consultation paper:

“- That the first in the queue is required to indicate to NIE Networks that they wish to pursue a direct connection to trigger the timing provision (assuming other criteria are also met). The intention behind this is to provide certainty to the other generators in the cluster queue and to NIE Networks when applying the timing provision.

- That the proposed timing provision now determines a delay based on the difference between the estimated scheduled completion date stated in the offer of terms for connection issued to the applicant by NIE Networks and the latest scheduled completion date. In addition to this, the consultation proposed that some consideration will be given to the source of the “Delay”. Where the latest scheduled completion date has been delayed due to a connecting party change or delay e.g.,

¹⁹ [NIE Networks SoCC \(Page 86\) \(nienetworks.co.uk\)](https://www.nienetworks.co.uk)

change of route or connection methodology for the unique connection, this will not be considered when determining the “Delay”. However, if the delay in the latest scheduled completion date is attributable to NIE Networks, this delay will be considered when determining the “Delay”.

4.3.3 UR view

UR considers that, based on NIE Networks’ reasoning, the timing provision regarding developing and constructing a designated cluster should be reviewed to ensure that it is reflective and clear.

UR seeks views on the proposed updates from NIE Networks, and whether these would provide clarity to applicants and any alternative solutions the UR should consider in this context. Respondents are also encouraged to consider any risks and/or associated consequences which they foresee in relation to the change in timing in relation to Connections into Designated Clusters.

4.4 Technical Assessment – Geographic Extent of a Cluster

4.4.1 Reason for Consultation

“When determining the amount of generation capacity that is likely to connect to a potential cluster substation NIE Networks carried out an assessment of all generation anticipated in an area. The current cluster methodology limits this area to approximately 310 km² based on a 10 km radius from the potential cluster substation location. The current cluster methodology also allows for this radius to be extended when it is technically acceptable to do so.

The radius is based upon average conditions so engineering principles and judgement are to be applied to refine any case. The inclusion of a radius is to act as a guide for NIE Networks when carrying out technical assessments to designate a cluster and for generators to understand the likely geographical extent of the cluster area. Developments in NIE Networks’ connection policy including development of long cable connections and design means this 10 km limit can be extended in many scenarios, whilst maintaining the 33 kV voltage at the generator within statutory limits, based on factors such as generator size, technical specification and connection method i.e., overhead line or underground cable.

Based on the feedback to the CfE, NIE Networks carried out an assessment of the length of the 33 kV connections into existing cluster substations. This assessment agreed with the wider view of industry, in that almost all connections were made using a combination of overhead line and underground cable or were exclusively underground cable.”

4.4.2 Consultation Proposal

NIE Networks proposed the following recommendations to the SoCC:

- “- To increase the cluster designation radius within the SoCC to 15 km*
- To maintain the allowance for engineering judgement to be applied.”*

4.4.3 UR View

The URs present view, based on NIE Networks’ reasoning and stakeholder feedback, is that there is a case for increasing the radius of cluster designation radius within the SoCC to 15km while maintaining the allowance for engineering judgment to be applied. We are seeking any additional views which stakeholders may have on this matter.

4.5 Definitions

4.5.1 Reason for Consultation

“NIE Networks through the consultation process recognized that there may be a requirement for new definitions and/or updates to existing definitions within the SoCC as part of the proposed cluster methodology update. The subsequent definition changes can be found in the updated SoCC document.”

4.5.2 Consultation Proposal

“NIE Networks proposed that any required new definitions should be added to the SoCC document, and any previous definitions should be updated accordingly if needed.”

4.5.3 UR View

NIE Networks will submit an update of the SoCC to reflect updates to cluster methodology and definitions where appropriate for UR approval pursuant to NIE Networks’ Distribution Licence Condition 32(12). The outcome of this consultation will assist in the UR decision making process. Therefore, stakeholder responses to the proposals raised in this consultation as well as any further considerations are welcomed by UR.

5. NIE Networks' Consultation for Future Cluster Matters

Section 5 is taken from NIE Networks' Cluster Methodology consultation paper. It presents how NIE Networks intend to move forward with connecting demand into cluster substations, subject to UR approval of the necessary SoCC changes.

5.1 Drivers and Benefits of Change

5.1.1 Reason for Consultation

"Many of the justifications for connecting generation into a cluster are also applicable for the connection of demand. This approach can reduce overhead line lengths and hence minimises environmental impact, and a cluster connection may be the most cost-effective solution to resolving network constraints in terms of the contribution required from the Northern Ireland customer. It could be considered environmentally and commercially unsustainable to maintain a policy that requires the planning of 33 kV reinforcement infrastructure to by-pass a local cluster substation and connect to a more remote traditional 110 kV substation.

Northern Ireland is expected to see considerable growth in demand due to the electrification of heat and transport. It is expected that this increase in load will utilise existing demand capacity at all voltage levels, leading to network congestion as the volume of these new Low Carbon Technologies (LCTs) increases. In order to reduce the amount of conventional reinforcement (new lines, cables and transformers) required and ultimately minimise customer bills, NIE Networks is seeking to implement smart and market-based solutions²⁰ to unlock further capacity on the network. With this context in mind, it is important that NIE Networks continues to consider how all network assets can be used as efficiently as possible to deliver customer and network benefits. This therefore drives a need for NIE Networks to investigate the potential for using constructed cluster infrastructure for the connection of demand.

Electricity (NI) Order 1992, Article 12(1) states that" It shall be the duty of an electricity distributor to develop and maintain an efficient, coordinated and economical system of electricity distribution". Therefore, it is an obligation on NIE Networks that existing assets are used in the most efficient and economical way."

5.1.2 Consultation Proposal

"Facilitating the connection of large customer and network demand to existing cluster infrastructure is in keeping with NIE Networks duty to "develop and maintain an efficient, coordinated and economical system of electricity distribution" and delivers benefits to large demand, generation and general NI customers."

²⁰ <https://www.nienetworks.co.uk/future-networks/level2/our-innovation-projects>

5.1.3 UR view

UR understands the potential benefits outlined by NIE Networks of facilitating the connection of large customer and network demand to existing cluster sites. The UR sought clarity from NIE Networks to evidence the wider benefits to demand, generation and general NI customers. NIE Networks responded as below -

“The connection of network demand to constructed cluster infrastructure allows network assets to be used as efficiently as possible to maximise customer and network benefits. The potential to connect network demand into clusters would increase the efficiency of future network design and would ensure the minimising of network charges borne by the NI customer by increasing the optionality of potential reinforcement solutions, allowing the most economical and technically advantageous option to be selected. It could be considered environmentally and commercially unsustainable to maintain a policy that requires the planning of 33 kV reinforcement infrastructure to bypass a local cluster substation and connect to a more remote traditional substation.

We are informed by NIE Networks, as above, that the proposed updates to the Cluster Methodology will likely benefit stakeholders including NI consumers. We would like to understand whether there are any potential risks which stakeholders may foresee, particularly of additional costs to the NI consumer, as a result of this change in methodology.”

5.2 Demand Security of Supply Requirements

5.2.1 Reason for Consultation

“Cluster substations solely facilitate the connection of renewable generation and consequently are not required to have any level of security of supply. NIE Networks is governed by statute and by licence in respect of the manner in which it plans, operates and maintains its electrical network.

NIE Networks’ minimum security of supply planning obligations are defined by Engineering Recommendation (EREC) P2 (NI) of the Distribution System Security and Planning Standards. Applying EREC P2 to demand connecting at existing clusters necessitates that the demand is appropriately secured.”

5.2.2 Consultation Proposal

NIE Networks propose applying EREC P2 to demand connecting at existing clusters to necessitate that the demand is appropriately secured.

5.2.3 UR View

UR’s view is that, as with any demand connection, it would expect *Engineering Recommendation (EREC) P2 (NI)* to be the minimum security of supply planning

obligation. The UR welcomes views on whether the Engineering Recommendation (EREC) P2 (NI) should apply to demand connecting at existing clusters to necessitate that the demand is appropriately secured, and any supporting evidence.

5.3 Network and Large Customer Demand Connection Charges

5.3.1 Reason for Consultation

“Unlike for generation, there is currently no demand-specific charging methodology for clusters. Therefore, under current arrangements the charging which would apply to any demand which would connect to a cluster would be according to NIE Networks SoCC and would mirror the principles for how demand is charged across the network.”

The CfE sought to present the implications of connecting demand into a cluster. It is worth noting that charging principles for all connections will be considered in a full connection charging review which will involve a full consultation process; however, it falls outside the scope of this consultation. It was considered appropriate to present how this would currently be achieved according to the existing SoCC. This approach was used in order to clearly outline the implications of connecting network and large customer demand into clusters.”

5.3.2 Consultation Proposal

NIE Networks proposed the following recommendations in the consultation paper.

“- A large demand customer connection at a cluster, will be required to pay for their connection assets, including any 33kV and/or 110kV infrastructure required to provide security of supply to comply with the DSSPS and TSSPS.

- For network reinforcement projects which will utilize existing cluster infrastructure, the required network reinforcement is funded (including security of supply infrastructure if not already present) through the use of system charges borne by the NI customer.

- Generators seeking to connect are still charged according to the cluster charging methodology.”

5.3.3 UR View

As stated above, NIE Networks' current charging policy states that large demand customers pay for their connections assets including any 33kV and/or 110kV infrastructure required for reinforcement.

We have sought further clarity from NIE Networks to understand how the proposed amendments to the Cluster Methodology may impact connection charges and whether this could result in increased costs to NI consumers.

NIE Networks has provided helpful scenarios in their call for evidence and consultation documents to help demonstrate the above. The key points it has provided to UR are –

- Demand customers connecting to a cluster will bear the costs of connection themselves.
- Where a demand connection drives the need for an additional transformer, the customer will incur the full security of supply costs as well as their unique connection cost. Note: this is not unique to clusters and could occur at any Bulk Supply Points (BSP)²¹. It is only a consideration for clusters constructed with a single point of connection to the transmission system (i.e., single 110kV line and 110/33kV transformer).

NIE Networks' proposal states that for network reinforcement projects which will utilise existing cluster infrastructure, the required network reinforcement is funded (including security of supply infrastructure to comply with the Distribution System Security and Planning Standards (DSSPS) and Transmission System Security and Planning Standards (TSSPS) if not already present) through the use of system charges borne by the NI customer.

The UR sought clarity from NIE Networks specifically on the potential need for additional reinforcement on Clusters driven by network reinforcement projects resulting in increased socialised costs to NI consumers. NIE Networks responded;

“The potential to connect network demand into clusters would increase the efficiency of future network design and would ensure the minimising of network charges borne by the NI customer by increasing the optionality of potential reinforcement solutions, allowing the most economical and technically advantageous option to be selected.

The connection of demand into clusters and the subsequent increase of network demand capacity will have the positive affect of reducing network reinforcement costs and therefore reducing the financial impact of such projects on NI customers.”

The UR would welcome stakeholders' views in regard to the addition of Demand Connections into Clusters and its impact on connection charges.

5.4 Demand at Clusters – Technical considerations

5.4.1 Reason for Consultation

“Due to the uniqueness of Cluster substations a number of technical considerations when connecting large customer or network demand into existing clusters were presented in the consultation, which are summarised below:

²¹ Bulk Supply points are sections on the network which connects the transmission section of our network to the distribution section of the network.

1. Allowable Connection Voltage

It is important to mitigate against the risk that cluster infrastructure is only minimally utilized. For this reason, a threshold for connected generation was introduced to ensure that the infrastructure is not used inefficiently. It is important to ensure that any connection of demand also respects this principle and does not represent inefficient use of the assets.

2. 33 kV Busbar Voltage Considerations

Cluster substations differ from traditional 110/33 kV arrangements (BSPs) in that the voltage at the 33 kV busbar is designed to be 1.0pu, as opposed to BSPs where it is designed to be 1.03pu. Limiting the source voltage to 1.0pu is to provide extra headroom for voltage rise on the 33 kV circuits connecting the generators to the cluster substation, ensuring that upper voltage limits are not exceeded and thereby maximizing the amount of renewable generation that can be connected to a cluster substation.

3. Cluster Designation

Under the SoCC a large demand customer seeking to connect to the network must be offered the Least Cost Technically Acceptable (LCTA) connection. In order for this offer to be considered technically acceptable, it has to provide a connection to network infrastructure which currently exists. Similarly, for network reinforcement projects, an expenditure allowance is provided for reinforcement works for the subsequent regulatory period. The reinforcement work to alleviate any identified network deficiencies cannot be based on speculative assets, and therefore speculative costings, due to the mitigation proposal taking account of assets which do not currently exist.”

5.4.2 Consultation Proposal

In the consultation paper, NIE Networks proposed the following recommendations:

“1. The connection of distribution transformers to a 33 kV circuit of a cluster substation should not be permitted. Consequently, it follows that only 33 kV (EHV) customers and 33 kV circuits used for network reinforcement, including the connection of new or existing Primary (33/11 kV) substations, are permitted to directly connect to the cluster infrastructure.

2. As the primary function of a cluster substation is to maximize the capacity for renewable generation connections, it is therefore required that any connection of demand into a cluster substation should be designed in such a way that it does not compromise this arrangement meaning the 33kV busbar voltage remains at 1.0pu for cluster substations.

3. The connection of network or large customer demand (including electricity storage

connections) should not be considered in the designation of a cluster.”

5.4.3 UR View

The UR liaised with NIE Networks on the potential of increased costs to NI consumers as a result of the changes to the Cluster Methodology, as proposed in its recommendations paper. Under the current connections charging methodology costs driven by NIE Networks’ reinforcement requirements are recovered through use of system charges which are borne by the NI customer. Under the proposed Cluster methodology NIE Networks state that “constructed cluster infrastructure would only be utilised as part of a distribution network operator (DNO) network reinforcement project when following an options assessment, it is shown to be technically advantageous and is an economical solution for the entire customer base”.

Therefore, NIE Networks state, “the potential to connect a large demand customer to a constructed cluster substation will increase the optionality for possible connection assessments, but only be offered where it is the least cost technically acceptable (LCTA) connection. The LCTA connection will be the least cost connection to demand customers, so will present savings based on other approaches if the connection of demand into clusters was not available”.

NIE Networks states that the potential to connect to constructed cluster will increase options and may reduce overall costs for demand customers connecting to clusters. We are seeking views from stakeholders on this matter.

5.5 Transmission/Distribution Interactions

5.5.1 Reason for Consultation

“At present, when a cluster is designated and approved by the Utility Regulator, NIE Networks applies to the SONI for a 90 MVA MEC on the transmission network. SONI carries out a technical assessment of the transmission system and provides NIE Networks with an offer. Based on the proposals for cluster substations to facilitate the connection of demand, NIE Networks would have to apply to SONI for an associated Maximum Import Capacity (MIC). As per EREC P2, a transformer capacity of 180 MVA provides a demand capacity of 90 MVA, allowing for full security of supply.

The NIE Networks’ SoCC states in section 7.11 that in circumstances where an Authorised Generator makes an application for connection which has the effect of increasing the electrical capacity required from the Designated Generation Cluster Infrastructure or Approved Generation Cluster Infrastructure or Constructed Generation Cluster Infrastructure above the capacity of the First Transformer and therefore necessitates the installation of a second transformer or a third transformer (where the capacity of a second transformer is exceeded by the connection application) or triggers the need for further transmission reinforcement then that

Authorised Generator shall be required to pay for the full cost of the second transformer or the third transformer or further transmission reinforcement (as the case may be) and associated works notwithstanding that the transformer and / or further reinforcement may subsequently become a shared asset. The SoCC also makes provisions for interactive offers.”

5.5.2 Consultation Proposal

NIE Networks proposed the following recommendations regarding transmission/distribution interactions:

“Upon receipt of an effective connection application, NIE Networks will form a view as to whether the distribution connection might require a transmission construction project. This situation would arise in scenarios where the need for additional transmission infrastructure at a cluster is identified.

- If in NIE Networks’ view a transmission construction project might be required, NIE Networks will apply to SONI to provide any necessary transmission works. NIE Networks will apply incrementally to SONI based on the information provided to them by the distribution applicant.

- Providing the required capacity at clusters will be delivered through the installation of additional 90 MVA transformers and 110kV lines that comply with NIE Networks minimum design standards. However, the requested MEC/MIC will be applied for through SONI incrementally and will be based on the information supplied to NIE Networks in the effective connection application.

- Should the need for additional transmission infrastructure arise from a network/system need rather than a connecting customer application, the cost of delivery of that additional transmission infrastructure will be considered in the economic evaluation of all options for system/network reinforcement. The installation of the additional transmission infrastructure may create capacity at a cluster, but it is not guaranteed to deliver the necessary network capacity for additional customer generation or load connections.”

5.5.3 UR View

NIE Networks acknowledges in Section 3.3.2 that proposed connections, which are not funded by connecting customer and therefore would need to be funded to SONI by a TNPP (Transmission Network Preconstruction Project) and to NIE Networks via the D5²² processes, both of which would be subject to approval by UR.

UR would like to understand the potential scale of the cost and how this would be evaluated as economic for NI consumers. We encourage stakeholders to respond

²² The D5 reopener mechanism is used by NIE Networks to request from the UR additional Capex investment to increase capacity and capabilities of the transmission system.

with their views and any supporting evidence.

5.6 Cluster Innovations

5.6.1 Reason for Consultation

“The creation of cluster substations has been very successful in facilitating greater connections of renewable generation and has been a major contributor to the whole system drive towards a low carbon future. It marked an innovative approach to anticipatory investment, whilst overcoming capacity, environmental and technical problems and the cluster methodology will continue to be utilized to deliver these benefits and meet future renewable generation targets.

Clusters will continue to play an important role in meeting targets, specifically the DfE target that at least 80% of electricity consumption is from renewable sources by 2030. It is NIE Networks view that moving forward opportunities for flexible and innovative approaches for clusters, which currently are not covered in the SoCC cluster methodology, may become available.”

5.6.2 Consultation Proposal

NIE Networks proposed the following in their consultation:

“When opportunities for cluster innovation emerge, these would be carefully considered and engagement with stakeholders will be undertaken.”

5.6.3 UR view

We agree with NIE Networks’ approach, in principle, that should proposed changes to the cluster methodology be approved, opportunities for cluster innovation should be carefully considered and engagement with stakeholders undertaken. In order to ensure this approach is taken NIE Networks should work closely with UR and other stakeholders to develop a framework for Cluster Innovation. UR encourages any responses regarding Cluster Innovation and invite any comments and queries to be submitted in response to this consultation.

6. Next Steps

Responding to the Consultation

- 6.1 We welcome any feedback regarding NIE Networks' recommended changes to the SoCC and invite respondents to share their views regarding any part of this consultation. Responses should be received on or before 12 noon on 7th December 2023, addressed to:

Tiernan Lyness
Networks Directorate
Utility Regulator
Queens House
14 Queens street
Belfast BT1 6ER

- 6.2 Electricity_networks_responses@uregni.gov.uk with cc to Tiernan.lyness@uregni.gov.uk and Jody.oboyle@uregni.gov.uk
- 6.3 Our preference would be for responses to be submitted by e-mail.
- 6.4 Your response may be made public by the Utility Regulator. If you do not want all or part of your response or name made public, please state this clearly in the response by marking your response as 'CONFIDENTIAL.'
- 6.5 Information provided in response to this consultation, including personal information, may be subject to publication or disclosure in accordance with the access to information regimes (these are primarily the Freedom of Information Act 2000 and the Data Protection Act 2018).
- 6.6 As stated in the GDPR Privacy Statement ²³for consumers and stakeholders, any personal data contained within your response will be deleted once the matter being consulted on has been concluded though the substance of the response may be retained.
- 6.7 Individual respondents may ask for their responses (in whole or in part) not to be published, or that their identity should be withheld from public disclosure. Where either of these is the case, we will ask respondents to supply a redacted version of the response which can be published.
- 6.8 This document is available in other accessible formats, such as large print, Braille, audio cassette and a variety of relevant minority languages if required.

²³ <https://www.uregni.gov.uk/privacy-notice>

To request this, please contact Tiernan Lyness, either by telephoning +44 (0) 28 90 894681, or email to: Tiernan.lyness@uregni.gov.uk

Next steps

- 6.9 This consultation is seeking views on NIE Networks' proposals - set out in its recommendation paper - to change the Cluster methodology. We will collate a summary of all responses which will be considered when making our decision.
- 6.10 NIE Networks will then update the SoCC, depending the outcome of our decision, and resubmit for our consideration, once approved NIE Networks will publish their Charging Statement with any updates on their website.
- 6.11 Updates to the SoCC are effective one month after it has been published on NIE Networks' Website.