Northern Ireland Electricity Networks

CLUSTER METHODOLOGY REVIEW

Recommendations Paper

22/09/2023

Contents

EXECUTIVE SUMMARY

This document follows the NIE Networks' Cluster Methodology Review Call for Evidence (CfE) which closed on the 13th November 2020 and the subsequent NIE Networks Cluster Methodology consultation which closed on the 9th September 2022. These documents consulted on aspects of the existing cluster methodology and future considerations, including the connection of large scale customer and network demand into clusters.

NIE Networks welcomes the level of engagement received from all sections of industry throughout the entire Cluster Methodology Review process. This engagement has provided a helpful insight on stakeholder views on the topics raised in the CfE and consultation and has influenced the recommendations presented within this recommendations paper.

The NIE Networks Statement of Charges[1] for Connection to the Northern Ireland Electricity Networks distribution system (the 'SoCC') sets out a methodology, in Appendix 2, for the connection of generation sites within a defined area to a cluster substation (the 'cluster methodology'). The cluster methodology has been a major success in facilitating the connection of renewable generation in Northern Ireland, and a major contributor towards the early achievement of the 2020 40% target. The cluster methodology has provided significant capacity, technical and environmental benefits for the connection of renewable generation in Northern Ireland.

The Northern Ireland Energy Strategy – The Path to Net Zero Energy [2] outlines a range of recommendations and policies to achieve a 56% reduction in energy related emissions, including delivering at least 70% of electricity consumption from a diverse range of renewable resources. More recently, as per the Climate Change Act[3], the Department for the Economy must ensure that at least 80% of electricity consumption is from renewable sources by 2030. Therefore, it is appropriate that the cluster methodology is reviewed so that assets are utilised efficiently to facilitate the delivery of these targets. By completing this review of the cluster methodology, NIE Networks is acting to comply with the Electricity (NI) Order 1992[4], Article 12(1), 'It shall be the duty of an electricity distributor to develop and maintain an efficient, coordinated and economical system of electricity distribution'.

General Views

In general, respondents were supportive of the proposals outlined in the consultation. This included the proposed changes to aspects of the existing cluster methodology such as the geographic extent of a cluster, capacity allocation, cluster designation and timing as well as the proposal on future cluster matters.

Respondents were also in agreement with the proposals made in the consultation with regard to future cluster matters, including on the connection of large scale customer and network demand into clusters. NIE Networks welcomes the broad support for connecting network and large customer demand using existing cluster infrastructure and the general agreement that it provides benefits to generation customers, large demand customers and the overall NI customer base.

[1] https://www.nienetworks.co.uk/statementofcharges
[2] https://www.economy-ni.gov.uk/sites/default/files/publications/economy/Energy-Strategy-for-Northern-Ireland-path-to-net-zero.pdf
[3] http://www.niassembly.gov.uk/globalassets/documents/legislation/bills/executive-bills/session-2017-2022/climate-change-no.-2-bill/climate-chnage-no.-2-bill-as-amended-at-fcs---full-print-version.pdf
[4] https://www.legislation.gov.uk/nisi/1992/231/contents

Recommendations

NIE Networks has decided, following the completion of the consultation process, to make the recommendation to the Utility Regulator (UR) to allow connection of large customer demand, network demand and storage into constructed cluster infrastructure. This recommendation aligns with the direction of the energy system evolution including the electrification of heat and transport, and emphasises the importance of maximising the use of existing and future assets. In addition to this, NIE Networks has also recommended several enhancements to the existing cluster methodology all of which have been consulted upon. These include extending the range for the geographic extent of a cluster, standardising capacity allocation with regards to clusters, reviewing cluster designation weightings and updating the timing provision for clusters.

This recommendations paper has been developed alongside updates to the SoCC that incorporate the recommended changes and have been submitted to the Utility Regulator (UR) for review and approval.

The changes proposed in the recommendations paper will go-live one month after the required changes in the NIE Networks' Statement of Charges for Connection to Northern Ireland Electricity Networks' Distribution System (SOCC) are approved by the Utility Regulator.

1. INTRODUCTION

This document follows on from the NIE Networks' Cluster Methodology Review Call for Evidence (CfE) which closed on the 13th November 2020 and the subsequent NIE Networks Cluster Methodology Consultation which closed on 9th September 2022. These documents consulted on aspects of the existing cluster methodology and future considerations, including the connection of large customer and network demand into clusters.

NIE Networks welcomes the level of engagement received from all sections of industry throughout the entire Cluster Methodology Review process. This engagement has provided a helpful insight on stakeholder views on the topics raised in the CfE and consultation and has influenced the recommendations presented within this recommendations paper.

1.1 Cluster Background

The introduction of the Northern Ireland Renewables Obligation (NIRO) in April 2005 provided financial incentives for renewable generation. When this was coupled with the Northern Ireland Assembly's stated intention (in 2010) to achieve 40% of electricity consumption from renewables by 2020[5], it was clear that more sophisticated arrangements were required both technically and commercially to enable high volumes of renewable generation to connect within reasonable timelines and in a manner more sustainable for the environment.

The purpose of the cluster methodology was 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 (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.

The cluster methodology was consulted on in detail, with endorsement from the Utility Regulator (UR), from March 2010 through May 2013, at which point the detailed cluster methodology and charging arrangements were introduced into the SoCC as Appendix 2 and section 7 respectively [6].

1.2 Benefits and Success of Clusters

The cluster methodology has been a major success in enabling the high levels of renewable generation connected to and committed to connect in Northern Ireland, and a major contributor towards the early achievement of the 2020 40% target. This target was in fact exceeded ahead of time, as 44% of electricity consumption for the 12-month period ending 30 June 2019 came from renewable sources[7]. It is probable that clusters will also play an important role in achieving 2030 NI Energy Strategy and Climate Change Act targets.

Six clusters were commissioned between 2012 and 2021, enabling approximately 590 MVA of renewables to be connected, meaning that cluster connections represent approximately a third of all renewables connected in NI.

Without the cluster methodology, it is unlikely that the 2020 target would have been met due to a number of logistical and technical constraints. Not only does the cluster methodology provide much more robust technical control, but it has also enabled efficient connections of 24 large scale[8] generation projects.

The cluster methodology has provided benefits in the following areas:

- Capacity – a greater volume of renewable generation has been able to connect to the network. It has created large volumes of generation capacity in areas of the country where it was previously limited.

[5] https://www.economy-ni.gov.uk/sites/default/files/publications/deti/sef%202010.pdf
[6] https://www.nienetworks.co.uk/statementofcharges
[7] https://www.economy-ni.gov.uk/news/40-electricity-consumption-renewable-sources-by-2020-achieved-ahead-schedule
[8] NIE Networks defines large scale as greater than or equal to 5 MW

- Technical – improved power flow, voltage management and communications control from a central point. It has provided more efficient control of generation onto the Distribution and Transmission systems.
- Environmental – the aggregated length of overhead lines has been greatly reduced by extending the 110 kV network, therefore shortening the 33 kV lines connecting the renewable generation to the network.
- Constraint Reduction – the creation of capacity at clusters has bypassed potential constraints at existing 110/33 kV Bulk Supply Points (BSPs).
- Advancing Infrastructure – The funding arrangement agreed with the UR has enabled work to commence in advance of applicant funding, therefore putting downward pressure on connection timescales.

The creation of cluster substations has been very successful in facilitating large volumes 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 utilised to deliver these benefits and meet future renewable generation targets.

1.2.1 Why Change the Cluster Approach?

As outlined, the cluster methodology has provided significant capacity, technical and environmental benefits for the connection of renewable generation in Northern Ireland. In the light of future targets, such as those included in the new Northern Ireland Energy Strategy – The Path to Net Zero Energy and the Climate Change Act, plus the existing commitment for the UK to bring all greenhouse gas emissions to net zero by 2050, it is appropriate that the cluster methodology is reviewed so that assets are utilised efficiently to facilitate the delivery of these targets.

NIE Networks considers that, following the experience gained from connecting renewable generation to cluster infrastructure, further benefits could be derived in certain areas. Due to the direction of travel of the whole energy system, including maximising the utilisation of existing assets and the electrification of heat and transport, it is also prudent to consider future cluster matters such as connecting large customer and network demand into constructed cluster infrastructure.

NIE Networks sought evidence from stakeholders regarding the proposed changes to the cluster methodology in the CfE and consultation, including the facilitation of demand connections into clusters. The current cluster methodology has been successful in helping to facilitate large volumes of renewable generation to the network and assist in Northern Ireland achieving ambitious clean energy targets. The success of this was in part due to the successful engagement between NIE Networks and its stakeholders to create a robust and suitable cluster methodology.

NIE Networks welcomes the broad support on the proposals outlined in the CfE and consultation and believes that this support consolidates the need for the proposed changes to the cluster methodology, as outlined in this recommendations paper.

2. PRESENT CLUSTER MATTERS

2.1 Standardisation of Capacity Allocation

2.1.1 Consultation Proposal

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, and in other places uses the terms interchangeably. For example, the SoCC states that the proportion of the cost of the cluster infrastructure that will be charged to each Authorised Generator connecting to the first transformer will be assessed on the basis of the MVA of capacity installed, or to be installed. The example that follows calculates this proportion of cost based on MW installed or to be installed, omitting the reactive power element of the connection.

The NIE Networks' Distribution Code[9] requires all Type C Power Generating Facility(s)[10] 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. Consequently, the consultation paper proposed the following:

- 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.

2.1.2 Consultation Responses

There was general agreement with the proposals outlined in the consultation for standardisation of capacity allocation, though some respondents raised queries. One respondent queried if it was necessary to apply a power factor of 0.95 when calculating MVA capacity as they felt it may result in capacity reduction. As explained in the consultation, and above, the Distribution Code requires 0.95 power factor. System security is of the upmost importance and reactive power support is a crucial element of this.

On the query of capacity reduction, NIE Networks is proposing changing how these limits are defined in the cluster methodology, not how they are treated when it comes to allocating capacity. A 90MVA rated transformer can hold 90MVA of capacity and this is the current arrangement, though it has not been well defined to date in the cluster methodology, hence the proposed changes.

Another respondent suggested that overload of transformers at cluster substations could be considered. NIE Networks wishes to emphasise that transformer overload at cluster substations is already built in through the connections design principles and process.

2.1.3 Recommendation

The consultation proposals with regards to standardisation of capacity allocation are accepted as proposed and the SoCC has been updated accordingly to reflect this. The changes to the SoCC document are subject to approval from the UR. These proposals would only apply to connection applications received after the SoCC has been updated and approved by the UR.

---

[9] https://www.nienetworks.co.uk/distribution-code

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

2.2 Cluster Designation

2.2.1 Consultation Proposal

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.

The consultation paper proposed the following updates with regards the cluster designation process:

- 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 2.1, 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” 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.

2.2.2 Consultation Responses

Respondents were asked if they agreed with the changes proposed for cluster designation. There was overall agreement on maintaining the 56 MVA weighted capacity threshold and to include reactive power requirements within the calculation of the weighted capacity. There was agreement and positivity around planning permission being linked as a requirement in the connection offer process.

Some respondents suggested that greater consideration should be given to generator projects that have commenced the EIA process. NIE Networks has carefully considered the cluster weightings and explained the reasoning for the proposed weightings within the consultation document.

The overall idea of weightings 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. An application that has submitted to planning or PAC has a weighting of 0.8 not only because it is backed up by the approval rate for renewable applications taken from DfI published figures (as outlined in the consultation paper), but also because the NIE Networks generation team felt it was reflective of their own experience to date.

Although projects that have commenced EIA may be a good symbol of intent to obtain planning, it is not secure enough to obtain a weighting factor and may result in cluster thresholds being met prematurely. There is no publicly available data of all projects that have commenced EIA and therefore the information that could be gathered by NIE Networks may be incomplete or inaccurate.

2.2.3 Recommendation

The consultation proposals with regards to cluster designation are accepted as proposed and the SoCC has been updated accordingly to reflect this. The changes to the SoCC document are subject to approval from the UR.

It should be noted that the updated cluster designation process would strictly only apply to connection applications received after the SoCC has been updated and approved by the UR.

2.3 Timing

2.3.1 Call for Evidence Proposal

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. This can be due to a number of factors, including the need to obtain legal and regulatory consents for the cluster substation. The time required to complete substation design, line surveys, legalities and procurement of the equipment can be considerably longer for a clustered arrangement than with a direct connection to an existing node.

The timing provision within the cluster methodology was developed prior to NIE Networks having experience of the cluster process from designation to construction and energisation. Six clusters were commissioned between 2012 and 2021, enabling approximately 590 MVA of renewables to be connected, meaning that cluster connections represent approximately a third of all renewables connected in NI. This practical experience has shown that the time taken from pre-construction to completion of a cluster can range between 4 years and 8 years.

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.

Therefore, NIE Networks made the following proposals in the consultation:

- 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. 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".

To incorporate these proposals, in the consultation document NIE Networks proposed to amend the SoCC so that the timing provision could only be applied if all of the following conditions were met:

a. 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.

b. 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

c. 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.

2.3.2 Consultation Responses

The consultation responses acknowledged NIE Networks work to alter the timing provision for cluster substations, as one of the main challenges posed by the current generator cluster connections is the time

delay. Respondents supported the proposal for provisions permitting the exit of renewable generation connections from a cluster where delay is “excessive” provided it does not cause the cluster to fail the justification process.

One respondent suggested that the timing provision should apply to all applicants in the queue, not just the first. NIE Networks wishes to point out that an assessment of connection options for the first in the queue is required each time there is a change in the connection queue. When the first in the connection queue comes out, the second becomes the first and this process is repeated.

The idea of having this option open to the first in the queue only is because they are most likely to face the longest delays.

2.3.3 Recommendation

The consultation proposals with regards to the timing provision are accepted with some minor edits to the wording proposed to reflect recent experience gained with a Cluster application. Bullet point ‘b’ has been edited to include text clarifying that longer timeframes for feasibility analysis can be agreed with the customer. The second edit is to include the detail that the 56MVA threshold is not the only criteria for Cluster designation and applies to bullet point ‘c’ of the proposed new timing provision. The text added to the SoCC now reads as follows:

a. The applicant is the “first in the queue” for connection to Designated Cluster Infrastructure or Approved Cluster Infrastructure and has suffered or will suffer a Delay in being connected to that cluster. In this context ‘Delay’ shall mean that connection shall not occur within a period of 24 months commencing on the estimated scheduled completion date as stated in the Terms Letter offering terms for connection issued to the applicant by NIE Networks.

b. 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 (or such longer period as agreed with the customer) of the connection design and analysis study application date, to determine if a direct connection to an existing node is technically acceptable; and

c. 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 removal of justification for that Cluster should the offer for the direct connection to an existing node be accepted.

The changes have been made to the draft SoCC document and are subject to approval from the UR.

It should be noted that the updated timing provision would strictly only apply to connection applications received after the SoCC has been updated and approved by the UR.

2.4 Technical Assessment – Geographic Extent of a Cluster

2.4.1 Call for Evidence Proposal

When determining the amount of generation capacity that is likely to connect to a potential cluster substation NIE Networks carries out an assessment of all generation anticipated in an area. The current cluster methodology limits this area to approximately 310 km^2 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 particular 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.

NIE Networks therefore made the following proposals in the consultation document:

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

As outlined in the consultation document, some previous applicants have been connected to a cluster even though they were outside the 10km radius guideline. Engineering principles and judgement have been applied to any applicants who have previously applied under the existing SoCC Appendix 2 guideline of a 10km radius.

2.4.2 Consultation Responses

All respondents were in full agreement with the proposals outlined regarding the geographic extent of a cluster.

2.4.3 Recommendation

The consultation proposals with regards to cluster designation are accepted as proposed and the SoCC has been updated accordingly to reflect this. The changes have been made to the updated draft of the SoCC document and are subject to approval from the UR.

It is important to note that the new radius guideline would strictly only apply to connection applications received after the SoCC has been updated and approved by the UR. It should also be noted that to date, engineering judgement has been applied when it comes to connecting to a cluster substation.

2.5 Definitions

2.5.1 Call for Evidence Proposal

NIE Networks through the consultation process recognised 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 attached updated SoCC document.

2.5.2 Consultation Responses

There was full agreement with definition changes. One respondent highlighted that where possible, definitions should be consistent with, and ideally replicate, those already in place within other approved industry documents such as SONI's Transmission System Connection Charging Methodology or the NIE Networks Transmission Statement of Charges. NIE Networks acknowledges this.

2.5.3 Recommendation

Definitions have been updated accordingly in the SoCC and are subject to approval from the UR.

3. FUTURE CLUSTER MATTERS

The original cluster methodology was intended to facilitate solely the connection of renewable generation into cluster sites. NIE Networks now considers that network reinforcement costs to meet increases in demand, in particular associated with facilitating the future electrification of heat and transport to meet carbon reduction targets in more rural communities, can be minimised by utilising the connection and network reinforcement opportunities presented by existing cluster infrastructure.

The following sections detail the key issues which were highlighted to our stakeholders, responses which we received through the consultative process and subsequently presents how NIE Networks will move forward with connecting demand into cluster substations, subject to UR approval of the necessary SoCC changes.

3.1 Drivers and Benefits of Change

3.1.1 Consultation Proposal

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 are seeking to implement smart and market-based solutions 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.

Consequently, the consultation paper proposed the following:

- 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 (as shown in Table 1 below).

Benefits to the NI Customer	Efficient Use of Assets	Under the Electricity (NI) Order 1992, NIE Networks has an obligation to develop and maintain an efficient, coordinated and economical system of electricity distribution which has the long-term ability to meet reasonable demands for the distribution of electricity. It is therefore vital that NIE Networks continues to consider how assets can be used as efficiently as possible to deliver 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. This improved efficiency would also reduce electrical

		losses on the network, reducing the impact of Distribution Loss Adjustment Factors (DLAFs) on network charges.
	Environmental Conservation	NIE Networks' Environmental Statement[11] states that it will aim to mitigate the impact of its activities on the environment. If NIE Networks determines an environmental assessment is needed to support a decision then an assessment will be carried out by environmental and planning specialists. This was a key factor in the establishment of clusters, as the aggregated length of overhead lines has been greatly reduced by extending the 110 kV network, therefore shortening the 33 kV lines connecting the renewable generation to the network. The same concept can apply to demand connections as a cluster may represent the (geographically) closest point of connection. The opening up of clusters to demand would prevent the undesirable scenario where a demand connection would be required to bypass a cluster site and connect elsewhere, adding avoidable overhead line lengths to the NI landscape.
	Facilitating Future Energy Targets	Future energy targets will require significant infrastructure build. Considering the increasing difficulties that infrastructure projects face regarding planning and legalities, building the necessary infrastructure to achieve targets will be extremely challenging. Several recent primary substation upgrades have been subject to lengthy delays due to planning and legalities, with specific examples of work sanctioned in 2015 and 2018 still ongoing due to difficulties with landowner engagement. If accepted, connecting demand into clusters will reduce the infrastructure required and therefore increase the likelihood of achieving future targets and ensuring that the network doesn't become a blocker for the uptake of LCTs.
Benefits to Large Demand Customers	Releases Additional Locations for Demand Connections	With six clusters already constructed, the opening of clusters to demand would represent a release of previously unavailable capacity. As clusters are often located in remote locations (driven by the location of renewable generation) the alternative connection option would be advantageous to a large demand customer seeking a connection in such regions.
	May Reduce Costs and Timescales of Projects	A demand customer seeking to connect to the network is offered the Least Cost Technically Acceptable (LCTA) connection. The possibility of connecting a large demand customer into a constructed cluster will provide alternative options for a network connection. This alternative may represent the most cost effective connection by potentially reducing the length of overhead line or underground cable routes, or by preventing the need for costly network reinforcement to facilitate the connection. In certain situations, the timescale for a demand customer to connect to the network could be reduced because of the ability for a nearby cluster to accept demand connections.
Benefits to Generators	Better Security of Supply	Clusters are currently a means of connecting generation, and therefore they do not have any requirement to have a level of security of supply. The addition of demand to clusters could benefit the existing generators at that cluster by reducing the constraint during an outage condition of the existing 110 kV line and transformer and increasing the security of their connection.

[11] https://www.nienetworks.co.uk/documents/environment/environmental-statement-oct-15.aspx

		The TSSPS requirement following the connection of demand to a cluster will be assessed by SONI on a case-by-case basis.
	Improved Power Quality	The requirement for security of supply will, in some cases reduce the impedance of this section of the network and will consequently increase fault level. Among other benefits, this will help to reduce the impact of generator harmonic current emissions and voltage step changes, making it easier for future generation schemes to remain within the relevant statutory limits and potentially avoiding the need for a costly mitigating solution.
	Additional Generation Capacity Released	Under current arrangements (demand is not connected into clusters), the release of additional generation capacity at a cluster substation would require the reinforcement costs to be borne by the generation connection which triggers the need for a second transformer. The requirement for security of supply may require a second 110/33 kV transformer and 110 kV circuit following the connection of demand to a cluster which will consequently provide additional transformer capacity which can then be utilised by subsequent generation connections, without incurring the cost of the second transformer. It is worth noting that the method of providing transmission and distribution security of supply at cluster substations will be considered by SONI and NIE Networks respectively in line with the TSSPS and DSSPS on a case-by-case basis.

TABLE 1 - BENEFITS OF CONNECTING DEMAND INTO CLUSTERS

3.1.2 Consultation Responses

Stakeholders were asked if they agreed with the proposed approach in the consultation. There was overall agreement that NIE Networks should facilitate the connection of large customer and network demand to existing cluster sites and that this will provide wider benefits to demand, generation and general NI customers.

Compliance with Planning Standards

One respondent highlighted that the connection of large customer demand into existing cluster infrastructure should be in 'exceptional circumstances.' NIE Networks believe that the connection of demand into clusters should not be only in exceptional circumstances, but rather should be considered in all instances where it proves to be economically advantageous to either the connecting customer or the overall NI customer base.

A respondent also raised that the connection of demand into a cluster should only be considered where there are already two 110 kV circuits connecting the cluster substation, or where the demand customer formally accepts the lower standard of security of supply associated with the cluster design standard and the UR has approved the necessary derogation from the TSSPS. NIE Networks view is that the connection of demand to an existing cluster with only one 110kV circuit should also be considered as a connection or network reinforcement option for further assessment of its economic viability, according to the charging and socialisation process detailed in section 3.3. On the subject of derogations from the TSSPS (accepting a lower security of supply than that described in the planning standards), such a scenario would need to be considered on a case-by-case basis. NIE Networks have engaged with SONI to agree a process for the interactions for considering a derogation from security of supply requirements at cluster substations.

As well as security of supply standards, a respondent also raised that care should be taken to ensure compliance with all power quality standards. Whilst clusters will present unique electrical characteristics due to the high penetration of renewable generation, ensuring compliance with these standards forms the basis of the network studies conducted by NIE Networks for any connection or network reinforcement project.

Benefits

One respondent believed that the benefits of connecting demand into cluster substations may not automatically equate to increased capacity to allow increased generation to connect to the cluster, such as for demand connections which may also include embedded generation or zero export schemes. NIE Networks design the connection of generation to zero network load to ensure that if no demand was present no limits would be breached by the connected generation. In this respect, the connection of large customer demand will have no effect on the available generation capacity at a cluster. However, the TSSPS requirement to secure proposed demand connections at a cluster will be assessed by SONI on a case-by-case basis and may consequently provide additional transformer capacity which can then be utilised by subsequent generation connections, without incurring the cost of the second transformer.

NIE Networks believes that Table 1 above is a balanced representation of the benefits that connecting network and large customer demand to a constructed cluster substation would provide to the NI customers, large demand customers and generators.

Treatment of Electricity Storage

A respondent raised concerns regarding the treatment of electricity storage demand as normal demand subject to the relevant security standards. NIE Networks acknowledges that electricity storage is a new technology and cannot be accurately categorised as purely demand or generation. However, electricity storage is capable of being both a demand customer and a generation customer and therefore it is necessary to consider both when designing their connection to the network.

The export of an electricity storage unit will be treated in the same way as other forms of generators at clusters and the electricity storage applicant will be charged according to the cluster charging methodology, which is detailed in section 2.1.1.

In relation to the classification of an electricity storage units demand as being an 'interim demand' or a 'final demand', NIE Networks takes direction from the DSSPS, which includes EREC P2. Engineering Report (EREP) 130[12], which is a supplementary guide to the application of EREC P2 states in section 9.5 that 'The import from a Non-Contracted ES (Electricity Storage) should be assumed as being accounted in the normal demand profile, i.e. within the Measured Demand[13].' Therefore, the demand required by a storage unit is included in the overall Group Demand, and therefore a level of distribution security of supply is required for connections where the MIC of the storage unit is over 1 MW. SONI is also required to secure demand groups over 1 MW, with the minimum planning supply capacity increasing as the demand group increases.

However, NIE Networks acknowledges the concerns expressed by our stakeholders through this consultative process and realise that in some cases electricity storage operators would be content to operate outside of security of supply standards. NIE Networks will be issuing a consultation (expected Q4 2023) on proposed updates to EREC P2 and will consider within this review the applicability of the existing standard for electricity storage connecting at existing clusters and, if deemed to be required, investigate methods of reducing the security of supply requirement for electricity storage in certain instances.

Impact on Existing Connections

One respondent requested that the general principle of not negatively impacting the connection of renewable connections is maintained when considering any amendments. NIE Networks fully agrees and has provided more information in section 3.4.

[12] EREP 130 - https://www.ena-eng.org/ena-docs/Index?Action=ViewDetail&EID=99921&tab=dcode

[13] *Measured Demand* - summated demand measured at the normal (network) infeed points to the network for which Group Demand is being assessed

Connection Charging

The subject of connection charges and potential socialisation of costs is a key issue and therefore merited a dedicated consultation question. Though some stakeholders have raised the subject in response to this question, please refer to section 3.3 for a complete view of NIE Networks proposed approach on this matter.

3.1.3 Recommendation

The Drivers and Benefits of connecting large customer and network demand into existing cluster infrastructure are agreed as proposed.

NIE Networks welcomes the broad support for connecting network and large customer demand using existing cluster infrastructure and the general agreement that it provides benefits to generation customers, large demand customers and the overall NI customer base. On this basis the connection of network and large customer demand using existing cluster infrastructure should be facilitated and made permissible through changes to the NIE Networks SoCC. The changes to the SoCC are subject to approval from the UR.

3.2 Demand Security of Supply Requirements

3.2.1 Consultation Proposal

At the time of writing, cluster substations solely facilitate the connection of renewable generation and consequently are not required to have any level of security of supply[14]. 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[15]. Applying EREC P2 to demand connecting at existing clusters necessitates that the demand is appropriately secured.

NIE Networks recognises SONI's obligation to meet the Transmission System Security and Planning Standards (TSSPS) for the connection of demand and generation to the transmission system. SONI is also required to secure demand groups over 1 MW, with the minimum planning supply capacity increasing as the demand group increases.

No specific questions were asked with regards to security of supply required at cluster substations as it is NIE Networks view that the requirement for security of supply are clear under EREC P2.

3.2.2 Recommendation

The consultation proposals with regards to Demand Security of Supply Requirements are accepted as proposed. For clarity, it is worth noting:

- SONI also have an obligation, under condition 20 of its transmission licence to meet the planning standards (TSSPS).
- As described in section 3.1.2, EREC P2 treats the demand element of electricity storage as conventional demand and is therefore subject to the same security of supply requirements. NIE Networks will be issuing a consultation (expected Q4 2023) on proposed updates to EREC P2 and will consider within this review the applicability of the existing standard for electricity storage connecting at existing clusters.

[14] Though security of supply requirements do exist for generation, the maximum potential generation capacity connected to cluster infrastructure is not sufficient to trigger them.
[15] https://www.nienetworks.co.uk/distribution-code

3.3 Network and Large Customer Demand Connection Charges

3.3.1 Consultation Proposal

Unlike for generation, there is currently no demand-specific charging methodology for clusters. 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[16].

The TSSPS requirement to secure the proposed connection of a large demand customer to a cluster will be assessed by SONI on a case-by-case basis and take account of distribution applicants requests for reduced security. The criteria for this assessment are set out in Section 3 (Demand Connection Criteria Applicable to the Onshore Transmission System) of the SONI Transmission System Security and Planning Standards. According to the NIE Networks SoCC, where 110kV network reinforcement is required to comply with the TSSPS, this reinforcement is chargeable to the connecting 33kV demand customer.

Consequently, the consultation paper proposed the following:

- 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 utilise 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.

3.3.2 Consultation Responses

Stakeholders were asked if they agreed with the proposed approach in the consultation that where 110kV network reinforcement is required to comply with the TSSPS, this reinforcement is chargeable to the connecting 33kV demand customer. There was overall agreement with this proposed approach, however respondents did raise a number of points detailed below.

<u>Funding</u>

One respondent pointed out that any 110kV assets that are not funded by the connecting customer would need to be funded via the TNPP and D5 processes and are therefore subject to approval by the UR. NIE Networks acknowledges this and would clarify that for large customer demand connections to existing clusters where 110kV reinforcement is needed for TSSPS compliance, then this will be funded by the connecting customer.

<u>Compliance with Standards</u>

A respondent reiterated that the conversion of a ‘generation’ cluster substation to one that can also connect demand should be in exceptional circumstances. As described in section 3.1.2, NIE Networks believe that the connection of demand into clusters should not be only in exceptional circumstances, but rather should be considered in all instances where it proves to be economically advantageous to either the connecting customer or the overall NI customer base.

3.3.3 Recommendation

The consultation proposals with regards to network and large Customer demand connection charges are accepted as proposed.

[16] 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

3.4 Demand at Clusters - Technical Considerations

3.4.1 Consultation Proposal

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:

Allowable Connection Voltage

It is important to mitigate against the risk that cluster infrastructure is only minimally utilised. 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.

For these reasons, the consultation paper proposed:

- 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.

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.

For these reasons, the consultation paper proposed:

- 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.

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.

For these reasons, the consultation paper proposed:

- The connection of network or large customer demand (including electricity storage connections) should not be considered in the designation of a cluster.

3.4.2 Consultation Responses

Stakeholders were asked if they agreed with the proposed approach in the consultation with regards to cluster designation considerations, allowable connection voltage and 33kV busbar voltage considerations. There was general agreement with the approaches from the respondents.

One respondent outlined that the inclusion of demand within the designation process would trigger a higher standard of connection, therefore in their opinion this should not form part of the designation process. They also detailed that in order to ensure the efficient use of assets, they agree that direct customer connections should be restricted to 33kV connections since a connection at 11kV or below could not be charged for transmission reinforcements, meaning that permitting connection below 33kV is unlikely to be consistent with developing the system economically and efficiently. Any funding for non-chargeable reinforcements would need to be approved separately by the UR under the TNPP/D5 framework. Given the timelines for these approvals, any connection offer would need to be conditional on these being achieved.

Two respondents again outlined their concerns regarding the treatment of storage demand as normal demand subject to the security standards as normal demand. As described in section 3.1.2, NIE Networks acknowledges the concerns expressed by our stakeholders through this consultative process and realise that in some cases electricity storage operators would be content to operate outside of security of supply standards. NIE Networks will be issuing a consultation (expected Q4 2023) on proposed updates to EREC P2 and will consider within this review the applicability of the existing standard for electricity storage connecting at existing clusters and, if deemed to be required, investigate methods of reducing the security of supply requirement for electricity storage in certain instances.

3.4.3 Recommendation

The consultation proposals with regards to allowable connection voltage, 33 kV busbar voltage considerations and cluster designation are accepted as proposed and the SoCC has been updated accordingly to reflect this. These changes will be reflected in future network design policy. The changes to the SoCC are subject to approval from the UR.

3.5 Transmission/Distribution Interactions

3.5.1 Consultation Proposal

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.

It is proposed that:

- 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.

3.5.2 Consultation Responses

Stakeholders were asked if they agreed with the proposed approach in the consultation with regards to Transmission/Distribution Interactions. There was general agreement with the approaches from the respondents.

<u>Charging Mechanism</u>

One respondent highlighted that the capacity created by installing an additional transformer would also be dependent on whether or not any future charging mechanism would be based on a similar 'per MVA' allocation of the costs of this transformer, or on the basis of the party triggering the need paying for it in full. NIE Networks

would clarify that under the current SoCC capacity is applied for incrementally, while the charging mechanism may require a customer to pay for the full cost of an additional transformer and/or transmission reinforcement. The capacity applied for to SONI will be based on the information provided by the distribution applicant, rather than the capacity which will be created by the installation of an additional transformer and/or transmission reinforcement.

Network Reinforcement Need

A respondent highlighted that consideration needs to be given in the scenario where the need for the second (or third) transformer has arisen from a network/system need rather than a connecting customer application. In this instance, then the cost of delivery of that additional transmission infrastructure will be considered in the economic evaluation of all options for network reinforcement. The capacity required to provide a sufficient scheme life for the reinforcement will be considered in the Transmission/Distribution interactions.

3.5.3 Recommendation

The consultation proposals with regards to Transmission/Distribution Interactions are accepted as proposed and will be reflected in the future interactions between NIE Networks and SONI.

3.6 Cluster Innovation

3.6.1 Consultation Proposal

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 utilised 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

Consequently, it was therefore proposed:

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

3.6.2 Consultation Response

Stakeholders were asked if they agreed with the proposed approach in the consultation with regards to Cluster Innovation. There was general agreement with the approaches from the respondents.

One respondent highlighted that any innovative approaches at transmission voltages can only be developed in line with the roles and responsibilities of the TSO and as set out in the Transmission Interface Agreement (TIA). Respondents provided examples of innovation including the application of dynamic line ratings to cluster infrastructure and the overloading of transformers/ flexible cluster transformer ratings.

3.6.3 Recommendation

The consultation proposals with regards to Cluster Innovation are accepted as proposed.

4. OVERVIEW OF PROPOSED CHANGES TO STATEMENT OF CONNECTION CHARGES

The implementation of the contents of this recommendations paper will be reflected in an updated version of NIE Networks SoCC and submitted to the UR for review. For clarity, this section outlines the proposed changes to the SoCC as a result of this recommendations paper.

Section 3 - Customer Categories

- Removal of term Generator from Generator Cluster to align with proposed changes in definitions.

Section 4 – Authorised Generators

- Removal of term Generation from Designated Generation Cluster Infrastructure, Approved Generation Cluster Infrastructure and Constructed Generation Cluster Infrastructure to align with proposed changes in definitions.

- Removal of term Generator from Generator Cluster to align with proposed changes in definitions.

Section 5 – Customers who are not an Authorised Generator

- Addition of section 5.5 Connection of Customers who are not an Authorised Generator to Constructed Cluster Infrastructure

Section 6 – NIE Networks' Charging Arrangements Applicable to all Customers

- Removal of term Generation from Designated Generation Cluster Infrastructure, Approved Generation Cluster Infrastructure and Constructed Generation Cluster Infrastructure to align with proposed changes in definitions.

Section 7 – NIE Networks' Charging Arrangements for Authorised Generators connecting to the network as part of a Cluster

- Removal of term Generator from Generator Cluster to align with proposed changes in definitions.

- Removal of term Generation from Designated Generation Cluster Infrastructure, Approved Generation Cluster Infrastructure and Constructed Generation Cluster Infrastructure to align with proposed changes in definitions.

- Text inserted to clarify that this section does not apply to customers who are not an Authorised Generators connecting to a Cluster.

- Removal of term Generation from Generation Cluster to align with proposed changes in definitions.

- Removal of term Generation from Designated Generation Cluster Infrastructure Connection Capacity, Approved Generation Cluster Infrastructure Connection Capacity and Constructed Generation Cluster Infrastructure Connection Capacity to align with proposed changes in definitions.

- Text added to 7.2 to clarify that Electric Storage is not offered connection to Designated or Approved Cluster Infrastructure.

- Addition of 7.2.1 to explain that Electric Storage is offered connection to Constructed Cluster Infrastructure when it is the LCTA connection.

- Example in 7.8 updated to reflect charges will be based on MVA capacity.
- Example in 7.15 updated to reflect charges will be based on MVA capacity and inclusion of an example Electric Storage site.
- Table 3 updated to reflect amended text in 7.15.
- Table 4 updated to reflect amended text in 7.15.

Definitions

- Removal of term Generation in defined term Approved Generation Cluster Infrastructure.
- Removal of term Generation in defined term Approved Generation Cluster Infrastructure Connection Capacity.
- Removal of term Generation in defined term Constructed Generation Cluster Infrastructure.
- Removal of term Generation in defined term Constructed Generation Cluster Infrastructure Connection Capacity.
- Removal of term Generation in defined term Designated Generation Cluster Infrastructure.
- Removal of term Generation in defined term Designated Generation Cluster Infrastructure Connection Capacity.
- Update of First Transformer Definition to reflect changes in other defined terms.
- Update of Authorised Generator Definition to account for Electric Storage.
- Removal of the term Generator in defined term Generator Cluster and definition updated to reflect customers who are not Authorised Generator can connect to Constructed Cluster Infrastructure. Definition reordered based on updated alphabetic position.
- Update of Interactive Connection Application to reflect changes in other defined terms.

Appendix 2 – Methodology for Connecting Groups of Generators to the Northern Ireland Distribution System using Cluster Substations

- Title updated to Methodology for Connection to the Northern Ireland Distribution System using Cluster Substations.
- Text added to the introduction section discussing the update of the cluster methodology to enable the connection of network and large customer demand.
- Extent of Generator Capacity to be Accommodated – text added to clarify that Electric Storage sites are not considered during cluster designation.
- Geographical Extent of a Cluster – Text updated to reflect increase in radius from 10km to 15km.
- Anticipated Extent of Generation – Weighted to Take Account of Uncertainty – text added to reflect most up to date planning statistics and removal of the “Applied for Grid Connection” category in Table 2.

- Weighted Capacity Threshold for Consideration of a Cluster Substation – text updated to reflect MEC will be calculated in MVA and take account of Distribution Code reactive power requirements.

- Timing – Clarity added to explain the circumstances when the timing provision can apply. Concept of delay amended. Timing provision conditions added.

- Removal of term Generation from Designated Generation Cluster Infrastructure, Approved Generation Cluster Infrastructure and Constructed Generation Cluster Infrastructure to align with proposed changes in definitions.

- Process flow chart updated to reflect MEC will be calculated in MVA.

5. CONCLUSION AND NEXT STEPS

NIE Networks has decided, following the completion of the consultation process, to make the recommendation to the Utility Regulator (UR) to allow connection of large scale customer and network demand into constructed cluster infrastructure. This recommendation aligns with the direction of the energy system including the electrification of heat and transport, and emphasises the importance of maximising the use of existing and future assets. In addition to this, NIE Networks has recommended several enhancements to the existing cluster methodology all of which have been consulted upon and explained within this recommendations paper. These include extending the range for the geographic extent of a cluster, standardising capacity allocation with regards to clusters, reviewing cluster designation weightings and updating the timing provision for clusters.

5.1 Next Steps

This recommendations paper has been developed alongside updates to the SoCC that incorporates the proposed changes and will be submitted to the Utility Regulator (UR) for review.

The changes proposed in the recommendations paper will go-live one month after the required changes in the NIE Networks' Statement of Charges for Connection to Northern Ireland Electricity Networks' Distribution System (SOCC) are approved by the Utility Regulator.