

# Greater Access to the Distribution Network in Northern Ireland

Consultation Document



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## 1. EXECUTIVE SUMMARY

This document follows on from the NIE Networks' Call for Evidence<sup>1</sup> (CfE) on Greater Access to the Distribution Network in Northern Ireland which closed on 2<sup>nd</sup> October 2018 and the related workshop held on 14<sup>th</sup> September 2018 at the Crowne Plaza, Belfast.

NIE Networks welcomes the level of engagement received from all sections of industry and strongly encourages continued engagement throughout this process. This engagement has provided NIE Networks with a very helpful insight on stakeholder views across a broad range of related matters and has helped influence the Distribution System Operator (DSO) vision presented within this document.

### 1.1 Scene Setting

Climate change legislation, such as the EU's Renewable Energy Directive and subsequent Clean Energy Package, and the consequential decarbonisation of the energy sector, is forecast to create significant growth in technologies in turn requiring major changes in how the electricity industry manages and operates the network. Examples of such changes, many of which are already having an impact, are:

- Renewable generation continues to grow;
- Electric vehicle and heat pump uptake is accelerating;
- More and more consumers now have the ability to produce their own electricity;
- New technology is giving consumers more control over how they use electricity;
- Energy storage technology is rapidly improving and its use growing accordingly.

As a result, the demands on the electricity network are changing. The network which was designed to efficiently facilitate the flow of electrical energy towards the customer is now experiencing significant energy flows in the opposite direction. Distribution Network Operators (DNOs) have already started to play a more active role in the operation of the electricity system, performing new roles and functions. Technology has enabled this change away from a traditionally passive role of transporting electricity in one direction, i.e. from the transmission network to the end user, to that of playing a much more active role in network control and management.

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<sup>1</sup>[http://www.nienetworks.co.uk/documents/future\\_plans/greater-access-to-the-distribution-network-in-nort.aspx](http://www.nienetworks.co.uk/documents/future_plans/greater-access-to-the-distribution-network-in-nort.aspx).



This is the future direction of travel for operating a distribution network<sup>2</sup>, and one that all network operators including NIE Networks must embrace. If managed effectively the shift will deliver real benefits, creating new opportunities for customers and placing downward pressure on electricity bills. It will enable the more intelligent management of the network through more active customer participation and for the network to act as a platform for the greater deployment of smart energy technologies as alternatives to conventional higher cost investments. However, this shift will not result in unfettered access to the distribution network for all customers. Whilst the DNO must be more flexible in how it manages and operates the distribution network, greater flexibility from customers will also be required.

NIE Networks is not alone on this journey and the Energy Networks Association (ENA)<sup>3</sup> through the Open Networks Project has started to consider what this evolution will entail, an evolution they call the transition from a DNO to a DSO. The Open Networks Project has developed a working definition of a DSO.

*“A Distribution System Operator (DSO) securely operates and develops an active distribution system comprising networks, demand, generation and other flexible distributed energy resources (DERs). As a neutral facilitator of an open and accessible market it will enable competitive access to markets and the optimal use of DERs on distribution networks to deliver security, sustainability and affordability in the support of whole system optimisation. A DSO enables customers to be both producers and consumers; enabling customer access, customer choice and great customer service.”*

## **1.2 Purpose of document**

It is intended that this document should be read in conjunction with the corresponding CfE<sup>4</sup> on Greater Access to the Distribution Network in Northern Ireland.

Within this consultation document a number of specific questions are raised for respondents to consider. The response to these questions and any general points raised by respondents will be used by NIE Networks to produce a Recommendations Paper which will be submitted to the Utility Regulator (UR) for approval.

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<sup>2</sup> 33kV, 11kV, 6.6kV and 0.4kV Networks

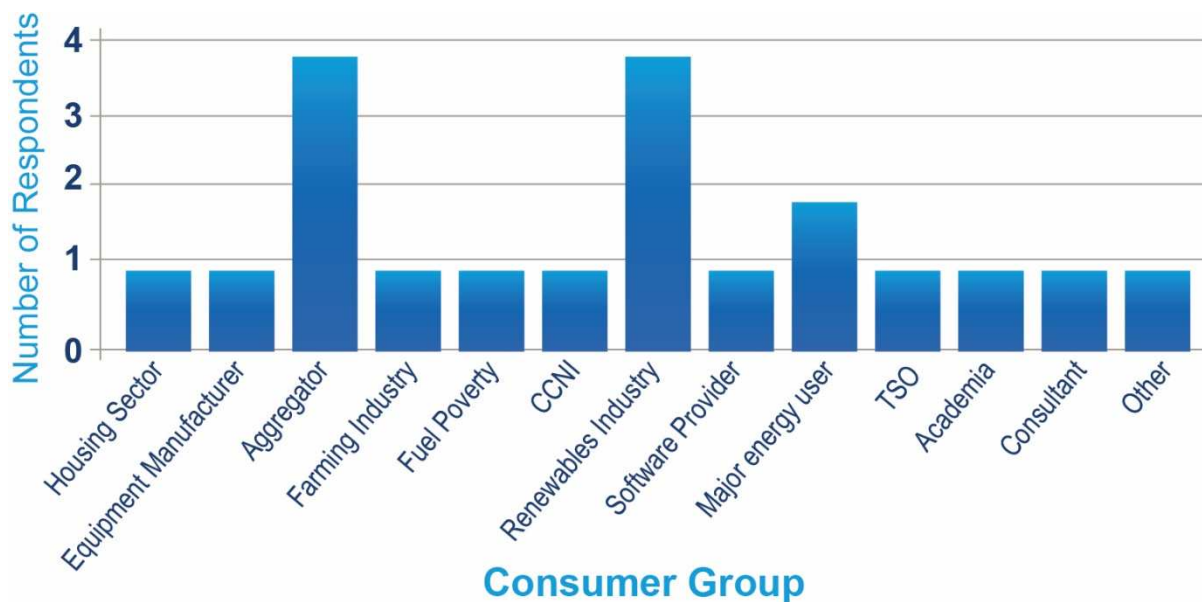
<sup>3</sup> Energy Networks Association (ENA) is the voice of the networks, representing the transmission and distribution network operators for gas and electricity in the UK and Ireland.

<sup>4</sup> [http://www.nienetworks.co.uk/documents/future\\_plans/greater-access-to-the-distribution-network-in-nort.aspx](http://www.nienetworks.co.uk/documents/future_plans/greater-access-to-the-distribution-network-in-nort.aspx).

### 1.3 Summary of Respondents

NIE Networks would like to thank all stakeholders who submitted responses to NIE Networks’ CfE on Greater Access to the Distribution Network and those stakeholders that attended the associated workshop on 14th September 2018.

A total of 20 responses<sup>5</sup> were received to the CfE, four of which have requested to remain anonymous in this consultation document. Respondents represented a good cross section of the industry, as illustrated in Figure 1.



**Consumer Group**  
**FIGURE 1**

### 1.4 General Views

In general, respondents were supportive of the proposals outlined within the CfE. Most respondents felt that the DSO evolution should help all customer groups, with some respondents suggesting that this evolution would result in a more efficient, resilient and optimised network providing customers with the opportunity to participate in the delivery of TSO and DSO services.

However, there were a number of important themes that were prevalent within the responses that require consideration:

<sup>5</sup> NIE Networks believes that this represents an extremely good level of engagement and compares favourably with the 47 responses received for Open Networks’ Future Worlds consultation in GB. [http://www.energynetworks.org/assets/files/14969\\_ENA\\_FutureWorlds\\_AW06\\_INT.pdf](http://www.energynetworks.org/assets/files/14969_ENA_FutureWorlds_AW06_INT.pdf)



- Protection for passive consumers, including vulnerable customers and the importance that they are not left behind in this evolution.
- The need for engagement throughout this process.
- With the increased data flows, IT systems and communications it is imperative that cyber security risks are fully considered.
- Increased complexity at distribution level may make the management of the system increasingly difficult and increases the potential for unintended impacts if the DSO initiatives are not considered in a holistic manner.
- Additional, more radical models for network operators were suggested.

#### 1.4.1 Proposed Approach

NIE Networks' response to the general views raised by respondents is detailed below:

NIE Networks agrees that all customers should benefit from this evolution and not just those customers with the technical and financial capability to purchase low carbon technologies and participate in various markets. In acknowledgment of this NIE Networks is proposing a charging reform to help limit the impact of unintended consequences associated with this evolution and the decarbonisation of the energy sector on passive customers including vulnerable customers. The proposed charging reform is described in section 4.7. Furthermore, by delivering whole system optimisation through for example, providing additional services to the TSO and using smart and market-based solutions in conjunction with conventional reinforcement, NIE Networks believes that this evolution will help place downward pressure on electricity costs for all customers including those passive and vulnerable customers.

NIE Networks agrees with stakeholders that there is a need for engagement with industry throughout this process. NIE Networks believes that to date this has been achieved through the CfE, associated workshop and the issuing of this consultation document. However, to ensure that industry engagement continues beyond this consultation process and into the implementation of this DSO vision, NIE Networks proposes that the overall stakeholder engagement strategy associated with this evolution should be included within the scope of the existing Customer Engagement Advisory Panel<sup>6</sup> (CEAP). Separate sub groups will exist to ensure industry engagement associated with the specific aspects of this evolution e.g. Connections Innovation Working Group (CIWG).

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<sup>6</sup> The Panel is made up of designated members of the Consumer Council for Northern Ireland, Department for the Economy, Utility Regulator and NIE Networks.

The evolution from a DNO to a DSO will necessitate an exponential increase in the IT and data requirements of the business. NIE Networks agrees with respondents that as the IT and data requirements increase so does the cyber security risk. To mitigate this NIE Networks has comprehensive plans for Cyber Security and Data Protection strengthening measures. The implementation of these measures will also greatly enhance NIE Networks' position for compliance with NIS<sup>7</sup> and Data Protection Regulations. NIE Networks will continue to ensure that cyber security and data management considerations are of paramount importance in the development of solutions within the business.

NIE Networks agrees that through the decentralisation of the electricity sector the management of the system is becoming increasingly difficult and more complex. As part of the evolution from a DNO to a DSO, NIE Networks is seeking to ensure that distributed energy resources are managed in a coordinated way delivering whole system benefits. Furthermore, the overall stakeholder engagement strategy associated with this evolution should be included within the scope of the existing CEAP, helping to ensure that this evolution is delivered in a holistic manner.

Whilst NIE Networks recognises that there are variations of network operator models as presented by some respondents, the model being proposed by NIE Networks is an extension of existing DNO processes and systems and does not require wholesale license and/or statutory regulation changes. For this reason the DNO to DSO evolution proposed by NIE Networks is considered as a low risk, least regrets approach. It should be noted however, that the adoption of the proposed evolution in the short to medium term does not preclude the transition to more radical models in the longer term if it is proved more efficient.

## **1.5 Implementation Plan**

NIE Networks are adopting a least regrets approach to the evolution from a DNO to a DSO. This means that NIE Networks will be evolving their current systems and processes as opposed to investing in wholesale changes. Whilst adopting a least regrets approach will minimise the funding requirement, a need will still exist for funding in order to implement the DSO vision outlined in section 4. At this early stage accurate costs associated with the enablers cannot be quantified. Whilst some of these enablers will already have associated funding allowances within the RP6 period, additional funding may be required to enable progress and NIE Networks will explore with the UR the best approach to minimise additional costs for the general customer base.

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<sup>7</sup> Networks and Information Systems

## 1.6 Responding and Next Steps

Although NIE Networks is keen to receive responses to all questions within the Consultation, we appreciate that respondents' areas of interest may vary depending on their DSO customer type. Respondents may answer all questions or only those that are relevant to them. More general comments are also welcomed.

Responses should be submitted via email to [Carl.Hashim@nienetworks.co.uk](mailto:Carl.Hashim@nienetworks.co.uk). Please note that NIE Networks intend to publish all responses to this paper online at [www.nienetworks.co.uk](http://www.nienetworks.co.uk). Respondents who wish to remain anonymous should highlight this when submitting their response.

The responses to this consultation will be analysed by NIE Networks and will be used in the development of a subsequent Recommendations Paper which will be submitted to the UR for approval.

Key Milestones	Proposed Date
Consultation Release	25 <sup>th</sup> Feb 2019
Consultation Close	20 <sup>th</sup> May 2019
Recommendations Paper to UR	Q3 2019

## 2. INTRODUCTION

This document follows on from the NIE Networks' Call for Evidence<sup>8</sup> (CfE) on Greater Access to the Distribution Network in Northern Ireland which closed on 2<sup>nd</sup> October 2018 and the related workshop held on 14<sup>th</sup> September 2018 at the Crowne Plaza, Belfast.

NIE Networks welcomes the level of engagement received from all sections of industry and strongly encourages continued engagement throughout this process. This engagement has provided NIE Networks with a very helpful insight on stakeholder views across a broad range of related matters and has helped influence the DSO vision presented within this document.

### 2.1 Scene Setting

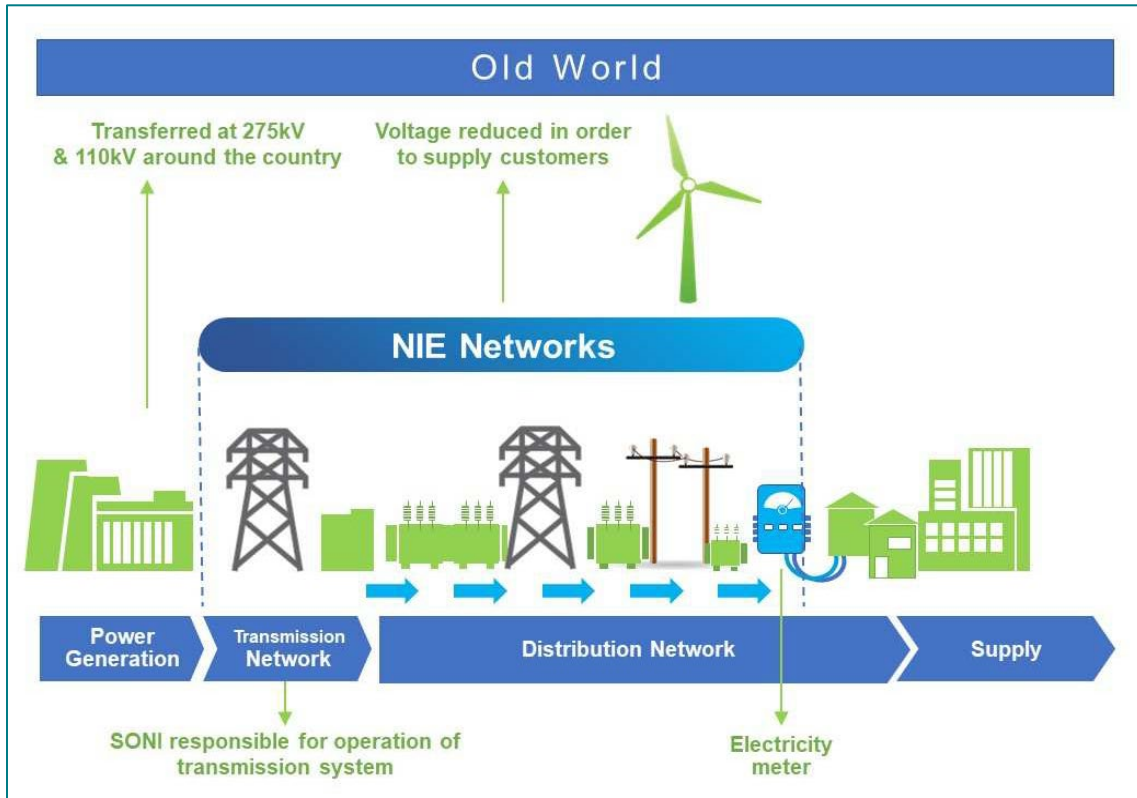
Climate change legislation, such as the EU's Renewable Energy Directive and subsequent Clean Energy Package, and the consequential decarbonisation of the energy sector, is forecast to create significant growth in technologies in turn requiring major changes in how the electricity industry manages and operates the network. Examples of such changes, many of which are already having an impact, are:

- Renewable generation continues to grow;
- Electric vehicle and heat pump uptake is accelerating;
- More and more consumers now have the ability to produce their own electricity;
- New technology is giving consumers more control over how they use electricity;
- Energy storage technology is rapidly improving and its use growing accordingly.

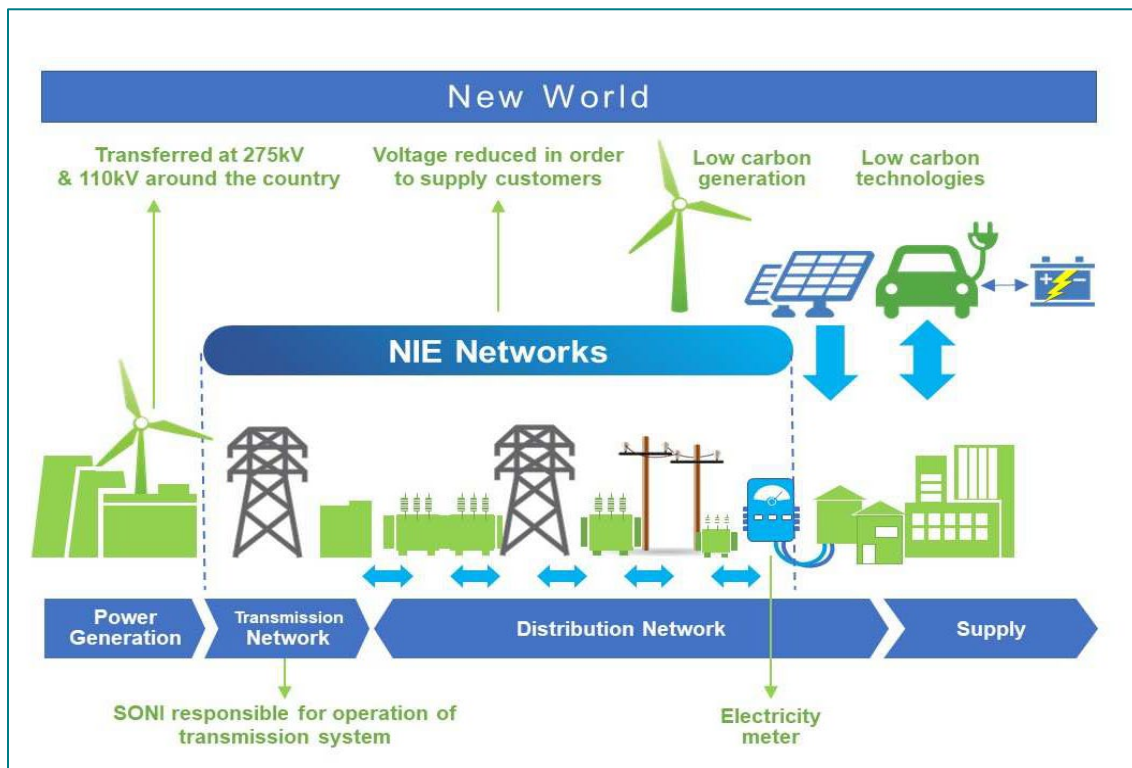
As a result, the demands on the electricity network are changing. The network, illustrated by the "old world" in Figure 2, which was designed to efficiently facilitate the flow of electrical energy towards the customer, is now experiencing significant energy flows in the opposite direction, illustrated by the "new world" in Figure 3. DNOs have already started to play a more active role in the operation of the electricity system, performing new roles and functions. Technology has enabled this change away from a traditionally passive role of transporting electricity in one direction, i.e. from the transmission network to the end user, to that of playing a much more active role in network control and management.

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<sup>8</sup> [http://www.nienetworks.co.uk/documents/future\\_plans/greater-access-to-the-distribution-network-in-nort.aspx](http://www.nienetworks.co.uk/documents/future_plans/greater-access-to-the-distribution-network-in-nort.aspx).



**FIGURE 2**



**FIGURE 3**

This is the future direction of travel for operating a distribution network<sup>9</sup>, and one that all network operators including NIE Networks must embrace. If managed effectively the shift will deliver real benefits, creating new opportunities for customers and placing downward pressure on electricity bills. It will enable the more intelligent management of the network through more active customer participation and for the network to act as a platform for the greater deployment of smart energy technologies as alternatives to conventional higher cost investments. However, this shift will not result in unfettered access to the distribution network for all customers. Whilst the DNO must be more flexible in how it manages and operates the distribution network, greater flexibility from customers will also be required.

The potential customer benefits are illustrated in Figure 4.



**FIGURE 4**

The first step is to define the required evolution of the network. Whilst the high level principle of the evolution is well understood within the industry, there is a wide range of activity that could fall within its definition, and understanding and mapping out what that role will entail is a vital prerequisite to delivering the evolution that will ultimately have a real and tangible impact for customers and for NIE Networks, as a business. NIE Networks is not alone on this journey and the Energy Networks Association (ENA)<sup>10</sup> through the Open Networks Project has started to consider what this evolution will entail, an evolution they

<sup>9</sup> 33kV, 11kV, 6.6kV and 0.4kV Networks

<sup>10</sup> Energy Networks Association (ENA) is the voice of the networks, representing the transmission and distribution network operators for gas and electricity in the UK and Ireland.



call the transition from a DNO to a DSO. The Open Networks Project has developed a working definition of a DSO.

*“A Distribution System Operator (DSO) securely operates and develops an active distribution system comprising networks, demand, generation and other flexible distributed energy resources (DERs). As a neutral facilitator of an open and accessible market it will enable competitive access to markets and the optimal use of DERs on distribution networks to deliver security, sustainability and affordability in the support of whole system optimisation. A DSO enables customers to be both producers and consumers; enabling customer access, customer choice and great customer service.”*

## **2.2 Document Structure**

It is intended that this document should be read in conjunction with the corresponding CfE on Greater Access to the Distribution Network in Northern Ireland. In order to address the key points raised in the CfE and ensure that this consultation document remains succinct, NIE Networks has summarised key areas highlighted by stakeholders. This consultation document is structured as follows:

- **Section 3, Call for Evidence General Response**  
This section provides a summary of the respondents and addresses responses surrounding the general points regarding the evolution from a DNO to a DSO.
- **Section 4, DSO Vision**  
This section addresses responses surrounding the specific DSO functions and demonstrates how these responses have influenced the DSO functions.
- **Section 5, Implementation Plan**  
This section provides a proposed high level implementation plan for the DSO functions.
- **Appendix 1**  
This section provides a more comprehensive summary of the responses accompanied by NIE Networks' associated views.
- **Appendix 2**  
In this section all non-confidential responses are published.

Within this consultation document a number of specific questions are raised for consultees to respond to. The responses to these questions and any general points raised by respondents will be used by NIE Networks to produce a Recommendations Paper which will be submitted to the UR for approval.

### 3. CALL FOR EVIDENCE GENERAL RESPONSE

NIE Networks would like to thank all stakeholders who submitted responses to NIE Networks’ CfE on Greater Access to the Distribution Network in Northern Ireland and those stakeholders that attended the associated workshop on 14th September 2018. This section will provide a summary of the respondents and an overview of the general responses received.

#### 3.1 Summary of Respondents

A total of 20 responses<sup>11</sup> were received to the CfE, four of which have requested to remain anonymous in this consultation document. Respondents represented a good cross section of the industry, as illustrated in Figure 5.

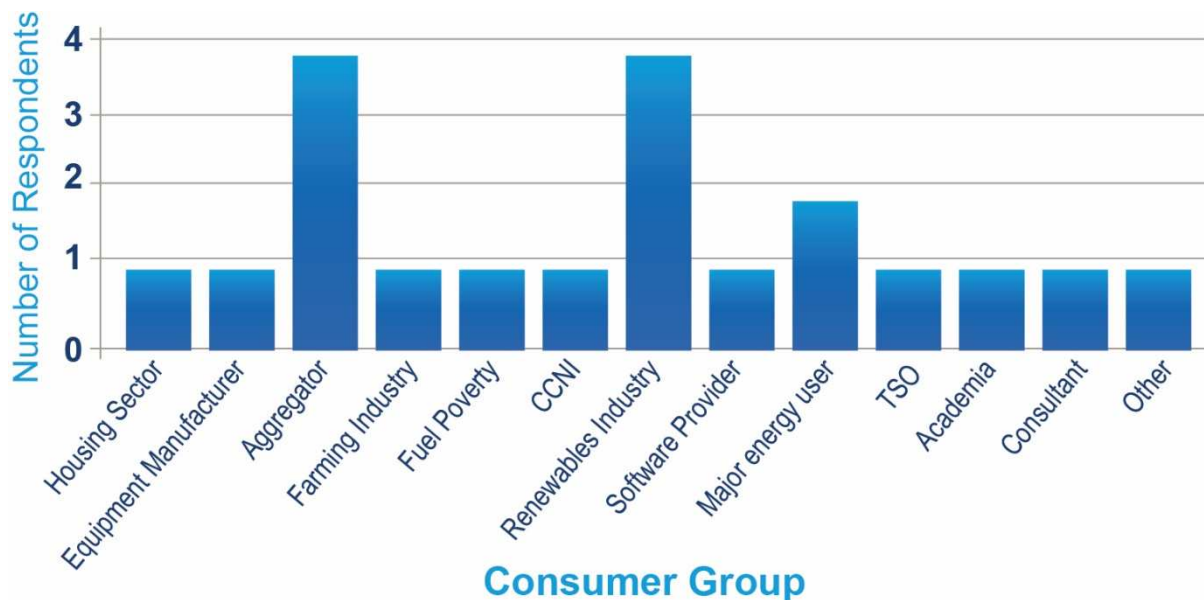


FIGURE 5

#### 3.2 General Views

In general, respondents were supportive of the proposals outlined within the CfE. Most respondents felt that the DSO evolution should help all customer groups, with some respondents suggesting that this evolution would result in a more efficient, resilient and optimised network providing customers with the opportunity to participate in the delivery of TSO and DSO services.

<sup>11</sup> NIE Networks believes that this represents an extremely good level of engagement and compares favourably with the 47 responses received for Open Networks Future Worlds consultation in GB. [http://www.energynetworks.org/assets/files/14969\\_ENA\\_FutureWorlds\\_AW06\\_INT.pdf](http://www.energynetworks.org/assets/files/14969_ENA_FutureWorlds_AW06_INT.pdf)

However, there were a number of important themes that were prevalent within the responses that require consideration:

- Protection for passive consumers, including vulnerable customers and the importance that they are not left behind in this evolution.
- The need for engagement throughout this process.
- With the increased data flows, IT systems and communications it is imperative that cyber security risks are fully considered.
- Increased complexity at distribution level may make the management of the system increasingly difficult and increases the potential for unintended impacts if the DSO initiatives are not considered in a holistic manner.
- Additional, more radical models for network operators were suggested.

### 3.2.1 Proposed Approach

NIE Networks' response to the general views raised by respondents is detailed below:

NIE Networks agrees that all customers should benefit from this evolution and not just those customers with the technical and financial capability to purchase low carbon technologies and participate in various markets. In acknowledgment of this NIE Networks is proposing a charging reform to help limit the impact of unintended consequences associated with this evolution and the decarbonisation of the energy sector on passive customers including vulnerable customers. The proposed charging reform is described in section 4.7. Furthermore, by delivering whole system optimisation through for example, providing additional services to the TSO, as outlined in 4.2, and using smart and market based solutions in conjunction with conventional reinforcement, as outlined in section 4.3, NIE Networks believes that this evolution will help place downward pressure on electricity costs for all customers including passive and vulnerable customers.

#### **CONSULTATION Q1: Do you believe that passive consumers are suitably protected by the DNO to DSO evolution proposed? If not, please provide examples of suitable protections.**

NIE Networks agrees with stakeholders that there is a need for engagement with industry throughout this process. NIE Networks believes that to date this has been achieved through the CfE, associated workshop and the issuing of this consultation document. However, to ensure that industry engagement continues beyond this consultation process and into the implementation of this DSO vision, NIE Networks proposes that the overall stakeholder engagement strategy associated with this evolution should be included within the scope of the existing CEAP. Separate sub groups will exist to ensure industry

engagement associated with the specific aspects of this evolution e.g. Connections Innovation Working Group (CIWG).

The evolution from a DNO to a DSO will necessitate an exponential increase in the IT and data requirements of the business. NIE Networks agrees with respondents that as the IT and data requirements increase so does the cyber security risk. To mitigate this NIE Networks has comprehensive plans for Cyber Security and Data Protection strengthening measures. The implementation of these measures will also greatly enhance NIE Networks position for compliance with NIS<sup>12</sup> and Data Protection Regulations. NIE Networks will continue to ensure that cyber security and data management considerations are of paramount importance in the development of solutions within the business.

NIE Networks agrees that through the decentralisation of the electricity sector the management of the system is becoming increasingly difficult and more complex. As part of the evolution from a DNO to a DSO, NIE Networks is seeking to ensure that distributed energy resources are managed in a coordinated way delivering whole system benefits. Furthermore, the overall stakeholder engagement strategy, included within the scope of the existing Customer CEAP, will help ensure that this evolution is delivered in a holistic manner.

Whilst NIE Networks recognises that there are variations of network operator models as presented by some respondents, the model being proposed by NIE Networks is an extension of existing DNO processes and systems and does not require wholesale license and/or statutory regulation changes. For this reason the DNO to DSO evolution proposed by NIE Networks is considered as a low risk, least regrets approach. It should be noted however, that the adoption of the proposed evolution in the short to medium term does not preclude the transition to more radical models in the longer term if it is proved more efficient.

## **3.3 Customer Groups**

### **3.3.1 Call for Evidence Overview**

Within the CfE various customer groups describing broad behaviours in the new DSO world were introduced:

- System Service Provider
- Active Participant
- Passive Participant
- Passive Consumer

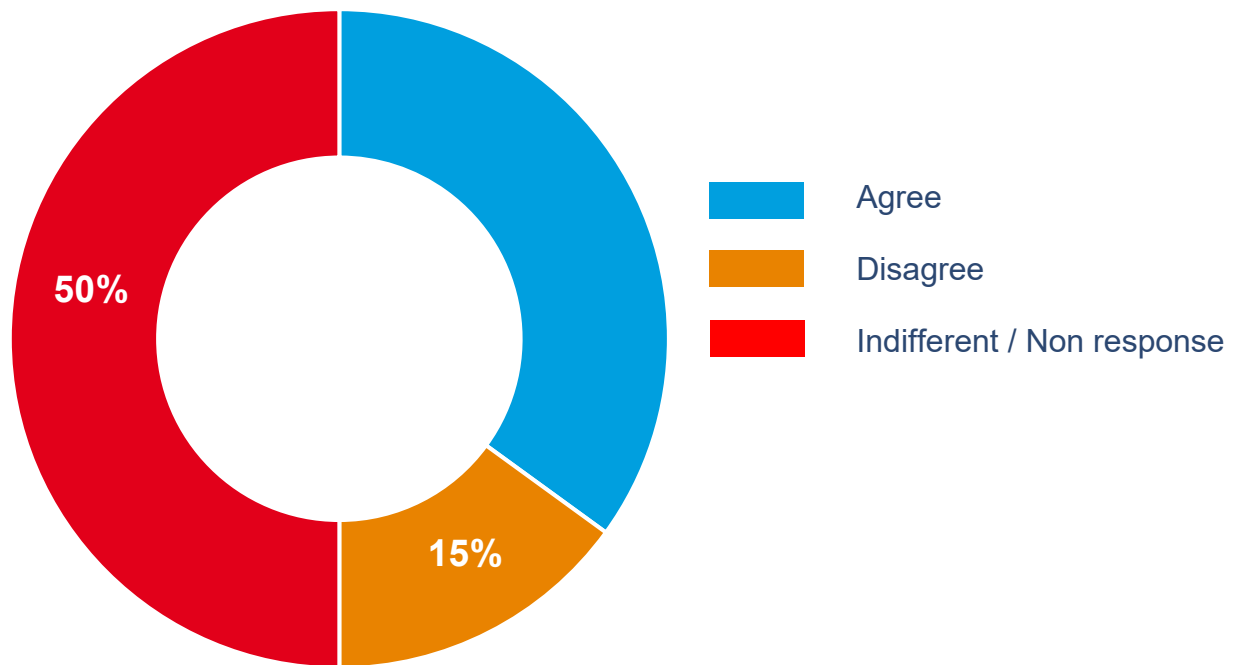
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<sup>12</sup> Networks and Information Systems

Respondents were asked which customer group they belong to and if they agree with the customer groups.

### 3.3.2 Call for Evidence Responses

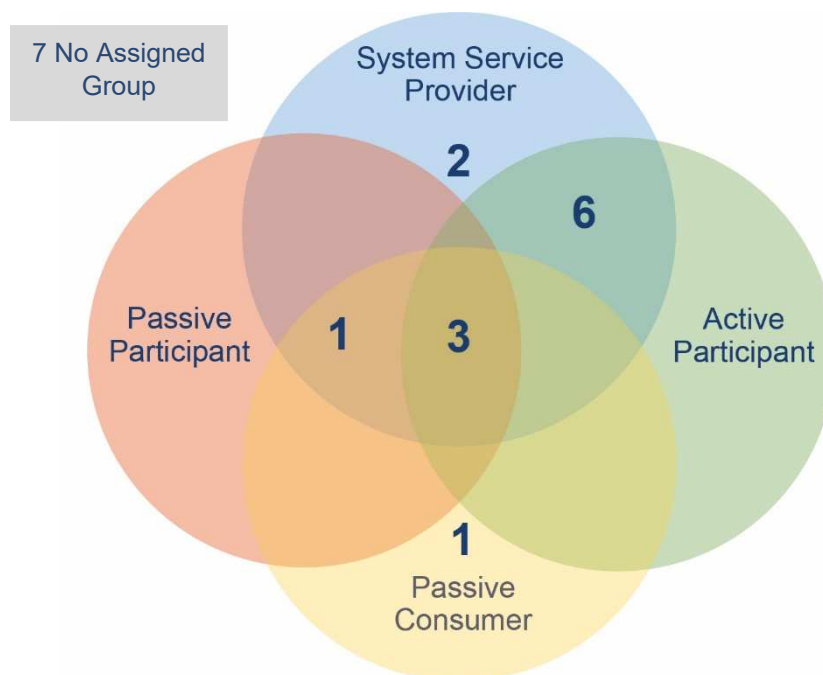
As illustrated in Figure 6, 35% of respondents agreed with the proposed customer groups, 15% disagreed and 50% either didn't respond or their response was indifferent. Several respondents felt that customers could fall across several customer groups, especially within social housing where, for example, a bill payer or tenant may be perceived as a 'passive consumer' with regards to their interest or interaction with the electricity grid, however their home may have technologies such as solar panels or heat pumps installed, and so they could also be classed as 'passive participants'. Respondents also felt that customers could move between customer groups over time.



**FIGURE 6 - DO YOU AGREE WITH THE CUSTOMER GROUPS AND DEFINITIONS SET OUT IN THIS PAPER? IF NOT, PLEASE SET OUT IN DETAIL.**

Figure 7 displays which customer groups respondents identified as, from which the following conclusions can be made:

- c77% of respondents did not believe that they fall specifically into one of the identified customer groups but rather operate across several customer groups. In general this corresponds to bodies or organisations that represent or whose membership is comprised of several customer groups.
- c0% of respondents identified as being solely a passive participant and only c38% of respondents believed that they had any identification or representation of the passive participant or passive consumer group. It can therefore be concluded that the views from customers which identify as being solely passive, which represents the majority of customers, may not be as well represented as other customer groups. Whilst this may have been anticipated it should be acknowledged when reviewing the responses.



**FIGURE 7**

### 3.3.3 Proposed Approach

The proposed customer groups have been developed by the Energy Networks Association's (ENA's) Open Networks Project to assess the experience of different types of customers through their customer journeys and assess the impact of the DSO functions on these groups. For clarity these groups are used to broadly categorise customer behaviours for modelling purposes only. NIE Networks acknowledges the comment that customers will move between customer groups over time and customers will continue to



have choice in purchasing low carbon technologies and becoming more flexible with their demand.

Whilst acknowledging that bodies or organisations may have membership comprising of several customer groups, NIE Networks believe that customers can only fall into one group at any time. This view aligns with the ENA Open Networks interpretation.

Based on the fact that more respondents agreed than disagreed with the proposed customer groups and in order to maintain consistency across the UK and Ireland, NIE Networks proposes maintaining the existing customer groups. However, taking into consideration the respondents comments NIE Networks proposes that they remain under review to reflect changes to the industry and associated customers.

## **3.4 DSO definition**

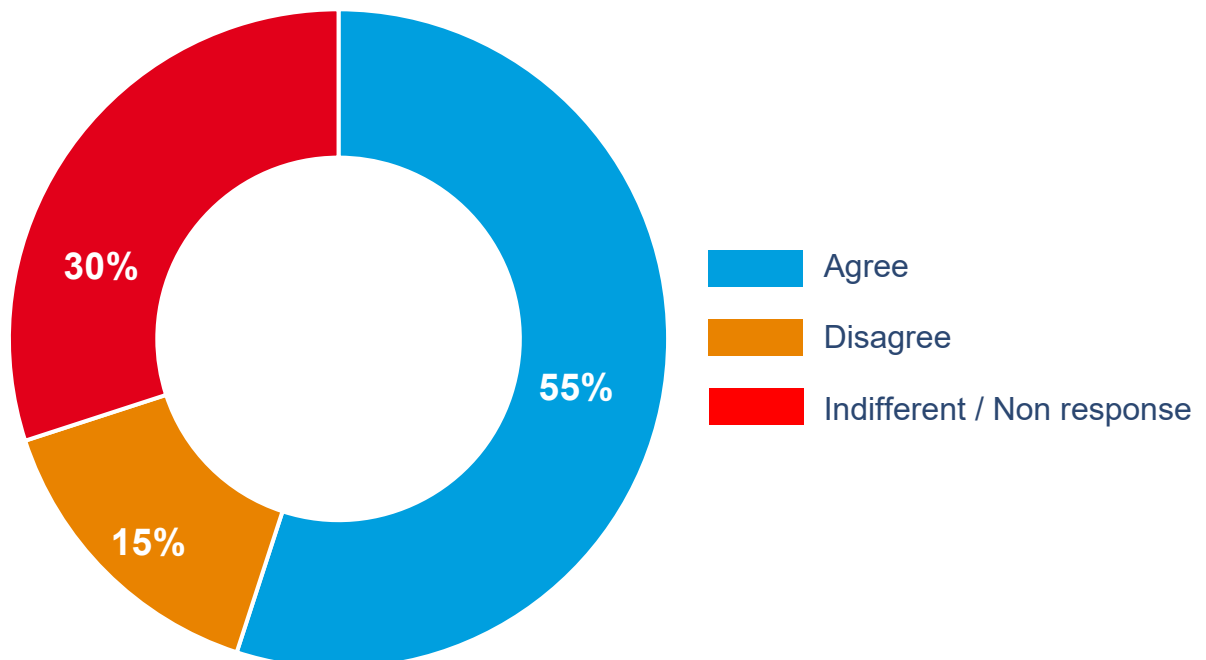
### **3.4.1 Call for Evidence Overview**

In conjunction with the ENA a working definition for a DSO was proposed in the CfE:

*“A Distribution System Operator (DSO) securely operates and develops an active distribution system comprising networks, demand, generation and other flexible distributed energy resources (DERs). As a neutral facilitator of an open and accessible market it will enable competitive access to markets and the optimal use of DERs on distribution networks to deliver security, sustainability and affordability in the support of whole system optimisation. A DSO enables customers to be both producers and consumers; enabling customer access, customer choice and great customer service.”*

### **3.4.2 Call for Evidence Response**

Figure 8 displays the responses received regarding the DSO definition. 55% of respondents agreed with the proposed definition; however, 15% disagreed suggesting amendments to the definition such as providing clarity to any changes to the future role of the TSO and ensuring that the DSO should not introduce unnecessary risk to the commercial operation of embedded generation or the whole system security of supply. A respondent also requested that further clarity is required around what markets are referred to in the proposed definition. The remaining 30% of respondents didn't provide a response to this question or their response was indifferent.



**FIGURE 8 - IN THE NORTHERN IRELAND CONTEXT DO YOU AGREE WITH THE DSO DEFINITION? IF NOT PLEASE STATE HOW YOU BELIEVE THE DSO SHOULD BE DEFINED.**

### 3.4.3 Proposed Approach

NIE Networks does not believe that the evolution from a DNO to a DSO will fundamentally change the role of the TSO, but rather evolve the existing roles and responsibilities of the DSO to help deliver whole system coordination and benefits. However, even if changes to the role of the TSO were expected, NIE Networks does not believe it to be appropriate for the role of the TSO or any changes to its role to be included within the DSO’s definition.

Furthermore, NIE Networks believes that within the existing definition of a DSO there is sufficient emphasis placed on the commercial impact for all customers, making reference within the definition to “enabling competitive access to markets” and “affordability in support of whole system optimisation”. Similarly, the existing definition does specifically make reference to the delivery of security in the context of whole system optimisation. NIE Networks therefore believes that the definition does not require any additional reference regarding the risk to the commercial operation of embedded generation or the security of supply. Finally, NIE Networks are conscious that there are various markets available which customers can participate in and furthermore in the future there are likely to be additional markets that customers can participate in, for example, local DSO markets. NIE Networks believe that as a DSO they will be responsible for facilitating access to all markets for distribution connected customers and therefore believes that the use of the generic term “markets” within the definition is appropriate.

Based on the fact that only 25% of respondents disagreed with the proposed DSO definition and in order to maintain consistency across the UK and Ireland, NIE Networks proposes maintaining the existing DSO definition, but ensuring that it remains under review to reflect changes to industry and associated customers.

### 3.5 DSO Functions

#### 3.5.1 Call for Evidence Overview

In the Call for Evidence, 7 key future DSO functions were presented, shown below in Table 1. Respondents were given the opportunity to suggest any additional functions that should be included in the evolution to a DSO.

DSO Function	Description
Market Facilitator	Enabling DERs to participate in TSO markets whilst respecting distribution network integrity and maintaining a neutral market position.
Service Provider	Utilisation of network assets to provide services to help the TSO to balance the system.
Congestion Management	Enabling smart solutions and market based solutions to be deployed as alternatives to conventional reinforcement.
Connections	Providing customers with options in how they connect to the network and utilising innovation to connect customers in a heavily congested network.
Data Provision	Provision of detailed data between the TSO and DSO to enable more efficient system development and operation.
Network Management	Development of new tools and operational procedures to improve operational processes and efficiencies.
Charging	Charging reform to provide opportunities and appropriate incentives to both demand and generator network users.

TABLE 1

### 3.5.2 Call for Evidence Response

A significant number of respondents commented regarding the proposed DSO functions. Many respondents discussed functions which NIE Networks believes currently fall within the proposed functions outlined in Table 1. However, the following functions, identified by respondents represent proposed functions that do not explicitly fall under those in Table 1:

- Contingency planning for Low Carbon Technology (LCT) uptake.
- Community energy – to support the evolution and adoption of a range of new business models, including community energy models.
- Industry engagement, education and collaboration – e.g. grid edge parties and aggregators.

### 3.5.3 Proposed Approach

Whilst NIE Networks recognise the importance of the proposed additional functions, they do feel that most of these are implicitly addressed in the existing DSO functions:

#### **Contingency Planning for LCT uptake**

As part of its RP6 business plan submission NIE Networks performed contingency analysis for the uptake of Low Carbon Technologies. Within this analysis a low, medium and high uptake was considered and the resulting impact on the network identified. NIE Networks will continue to periodically perform contingency analysis on the uptake of LCTs. Since this function is already embedded within NIE Networks Business as Usual (BaU) processes it is not considered necessary to include this function within the proposed DSO functions which represent new functions or functions which will be subject to significant change.

#### **Community Energy**

Under the congestion management function NIE Networks will be considering the development of local network services. Such services will include Demand Side Response (DSR) and Energy Storage Services. Through this process, community energy schemes will have the opportunity to participate in local network services.

## Industry Engagement, Education and Collaboration

NIE Networks fully agrees that cross industry engagement, education and collaboration is essential to the successful evolution from a DNO to a DSO. To date NIE Networks believes that this has been achieved through the CfE, associated workshop and the issuing of this consultation document. However, to ensure that industry engagement continues beyond this consultation process and into the implementation of this DSO vision, NIE Networks proposes that the overall stakeholder engagement strategy associated with this evolution should be included within the scope of the existing CEAP. Separate sub groups will exist to ensure industry engagement associated with the specific aspects of this evolution e.g. Connections Innovation Working Group (CIWG). Other opportunities for engagement and collaboration will be presented during the delivery of the RP6 innovation projects. Whilst NIE Networks believes that engagement, collaboration and education are required across all the DSO functions they do not feel that this warrants a separate DSO function.

A common theme arising from the responses was the need for improved network data for customers. In acknowledgement of this NIE Networks has amended the Data Provision definition from “Provision of detailed data between the TSO and DSO to enable more efficient system development and operation” to “Provision of detailed data between the TSO, DSO and customers and/or their agents to enable more efficient system development and operation”. This is discussed in more detail in section 4.5 where the provision of improved network data for customers is detailed.

### **3.6 Policy Inhibitors**

#### **3.6.1 Call for Evidence Overview**

Question 17 asked: “do you believe that there are any policy inhibitors that may prevent or restrict NIE Networks evolving to a DSO?”

#### **3.6.2 Call for Evidence Responses**

Responses to this question included:

- An overarching review of the energy policy and legislation in Northern Ireland is required.
- A review of the Utility Regulator powers to enable more flexible policy-making.
- As the transition to DSO progresses it will be important for regulation to appropriately keep pace with the change.
- The existing RAB based revenue model for NIE Networks is outdated.

### 3.6.3 Proposed Approach

Whilst the development of energy policy and review of the Utility Regulator powers are outside the role of NIE Networks, it does not believe that there are currently any policy inhibitors or regulatory barriers which prevent the commencement of the DNO to DSO evolution. However, taking respondent's comments on board NIE Networks does acknowledge a number of inhibitors that may become prevalent over the medium term which require consideration, for example:

- The current tariff structure may not be fit for purpose as the growth of LCTs increases. This is discussed further in section 4.7.
- The price control mechanism will have to evolve to ensure the DSO evolution progresses in a manner that is symmetrical to customers and investors.
- As data becomes increasingly more beneficial, it may be necessary for a policy decision on the roll out of greater customer metering functionality to provide the DSO with network data to help unlock customer benefits. This is discussed further in section 4.5.

NIE Networks will continue to engage with the relevant parties to ensure that any future inhibitors are identified and managed to help unlock customer benefits.

**CONSULTATION Q2: Do you agree that there are currently no policy or regulatory inhibitors preventing the commencement of the DNO to DSO evolution? If not, please provide rationale.**

**CONSULTATION Q3: Do you agree with the identified policy inhibitors that may become prevalent in the medium term? If not, please provide rationale.**



## 4. DSO VISION

Within the CfE the following 7 DSO functions were presented:

DSO Function	Description
Market Facilitator	Enabling DERs to participate in TSO markets whilst respecting distribution network integrity and maintaining a neutral market position.
Service Provider	Utilisation of network assets to provide services to help the TSO to balance the system.
Congestion Management	Enabling smart solutions and market based solutions to be deployed as alternatives to conventional reinforcement.
Connections	Providing customers with options in how they connect to the network and utilising innovation to connect customers in a heavily congested network.
Data Provision	Provision of detailed data between the TSO and DSO to enable more efficient system development and operation.
Network Management	Development of new tools and operational procedures to improve operational processes and efficiencies.
Charging	Charging reform to provide opportunities and appropriate incentives to both demand and generator network users.

This section of the consultation document will:

- Provide an overview of each DSO function as outlined within the CfE.
- Summarise what respondents said about each DSO function.
- Outline NIE Networks' response.

## 4.1 Market Facilitator

This DSO function is concerned with how the distribution system can facilitate distribution customers participating in electricity markets, for example the DS3 System Services market. Whilst it is anticipated that the principles underpinning this DSO function can be introduced across the various existing and future markets, the DS3 System Services market is specifically considered in this section.

Within the DS3 System Services market there are 14 services available in Northern Ireland which can be delivered by customers through the dropping of demand, increasing of generation or providing reactive power in response to system events or on receipt of a dispatch signal.

However, as the majority of these services will ultimately be provided by customers connected to the distribution network, the collective response of these customers can cause violations on the distribution network. If not properly managed this will have an impact on the safety, security and quality of supply for all customers.

It is therefore important that NIE Networks is able to facilitate the provision of these services for distribution connected customers whilst protecting the safety, security and quality of supply for all customers.

It should be noted that neither this function nor the entire DNO to DSO evolution will result in firm access for the delivery of System Services. This function will require flexibility from customers seeking to participate in System Services to enable them to offer system services when the network can accommodate them but also to inhibit the delivery of their services when the network cannot accommodate them.

### 4.1.1 Active Power

#### 4.1.1.1 Call for Evidence overview

Currently NIE Networks issue instruction sets to customers seeking to participate in DS3 system services. The instruction set provides customers an operational window in which they can reduce demand. These are developed through a manual, time intensive desktop process. It is the responsibility of the individual demand site (IDS) to ensure that they do not offer or provide system services outside of their designated instruction set. This process is used to keep load reduction within a window where the distribution network is capable of supporting all connected generation and allows customers to participate in the market without compromising the safety, security and quality of supply for all customers. The current instruction set process is shown in Table 2.

Instruction Set	Weekdays						Weekends							
	0000	0400	0800	1200	1600	2000	2400	0000	0400	0800	1200	1600	2000	2400
0														
1	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2			■	■	■	■		■	■	■	■	■	■	
3			■	■	■	■								
4	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5			■	■	■	■		■	■	■	■	■	■	
6			■	■	■	■								
7			■	■										
8					■									

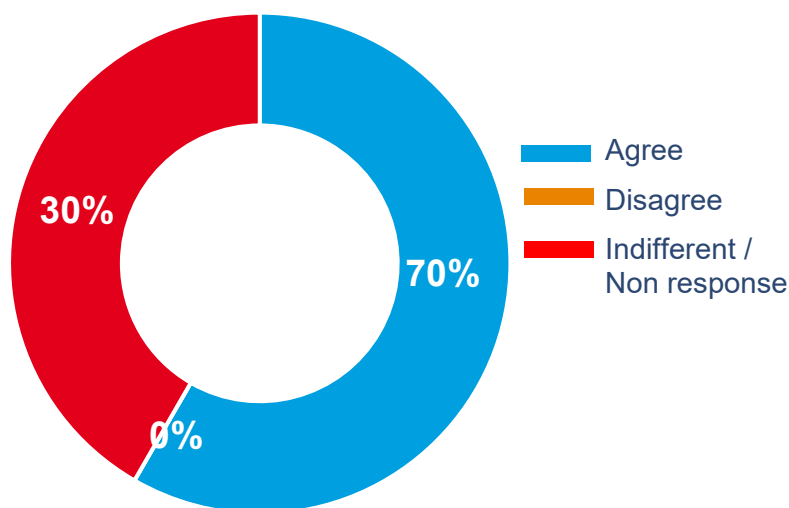
All Year ■  
 Winter ■

**TABLE 2**

The CfE asked in Question 3 if respondents believed NIE Networks should develop more dynamic instruction sets based on real time power flows, voltages and network topology, potentially providing system service providers with greater access to the network for the provision of system services and protecting the network from sudden changes of active power.

#### 4.1.1.2 Call for Evidence responses

Respondents strongly agreed that NIE Networks should develop more dynamic instruction sets. Figure 9 displays the responses received where 70% of respondents agreed with the development of more dynamic instruction sets, with some suggesting that the use of dynamic instruction sets will enable greater levels of network utilisation and more efficient operation of the grid. The remaining 30% did not respond to the question. Whilst the majority of respondents agreed with the proposal a number of important considerations were suggested:



**FIGURE 9 - NIE NETWORKS CURRENTLY USE STATIC ANNUAL INSTRUCTION SETS. DO YOU THINK NIE NETWORKS SHOULD DEVELOP MORE DYNAMIC INSTRUCTION SETS BASED ON REAL TIME POWER FLOWS, VOLTAGES AND NETWORK TOPOLOGY, POTENTIALLY PROVIDING SYSTEM SERVICE PARTICIPANTS WITH GREATER ACCESS TO THE NETWORK FOR THE PROVISION OF SYSTEM SERVICES AND PROTECTING THE NETWORK FROM SUDDEN CHANGES?**

- NIE Networks may need to invest in their own SCADA, allowing load flows on the LV Network to be analysed in real time.
- Consideration should be given to the provision of these instruction sets in real time, as timelines will need to be aligned with the wholesale market design and timeframes to help limit any unintended consequences.

#### 4.1.1.3 Proposed Approach

Based on the affirmative responses received from the CfE NIE Networks proposes to modify the current instruction set process. This modified process would seek to provide “network capacity” to system service providers closer to real time as opposed to a conservative yearly process. This could be achieved through the development of a Network Capacity Allocation Platform (NCAP) which could publish network capacity based on real time power flows and network topology. The NCAP will determine the allowable provision of collective system services on the local network before a network violation occurs. When a violation occurs the NCAP allocates capacity to the system service providers in an agreed manner. The NCAP will be refreshed periodically to reflect any load flow changes or network topology changes and will be published on a suitable interface.

It is anticipated that the NCAP will enable system service providers greater access to the distribution system to provide system services whilst importantly ensuring that the safety, security and quality of supply isn’t adversely impacted for all customers. Whilst this process will require development on the NIE Networks’ side it will also require development on the system service provider’s side to respect the NCAP. The proposed architecture for the NCAP is shown below in Figure 10. In this process SONI are responsible for procuring and dispatching system service providers, by either dispatching directly or through a supplier/aggregator. NIE Networks ensures that the distribution system remains safe and secure through the NCAP<sup>13</sup>.

NIE Networks agrees with the respondent that when LV connected customers begin to participate in system services in larger volumes then increased visibility of the LV network will be required. This is discussed in more detail in section 4.5, Data Provision.

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<sup>13</sup> Currently referred to as instruction sets.

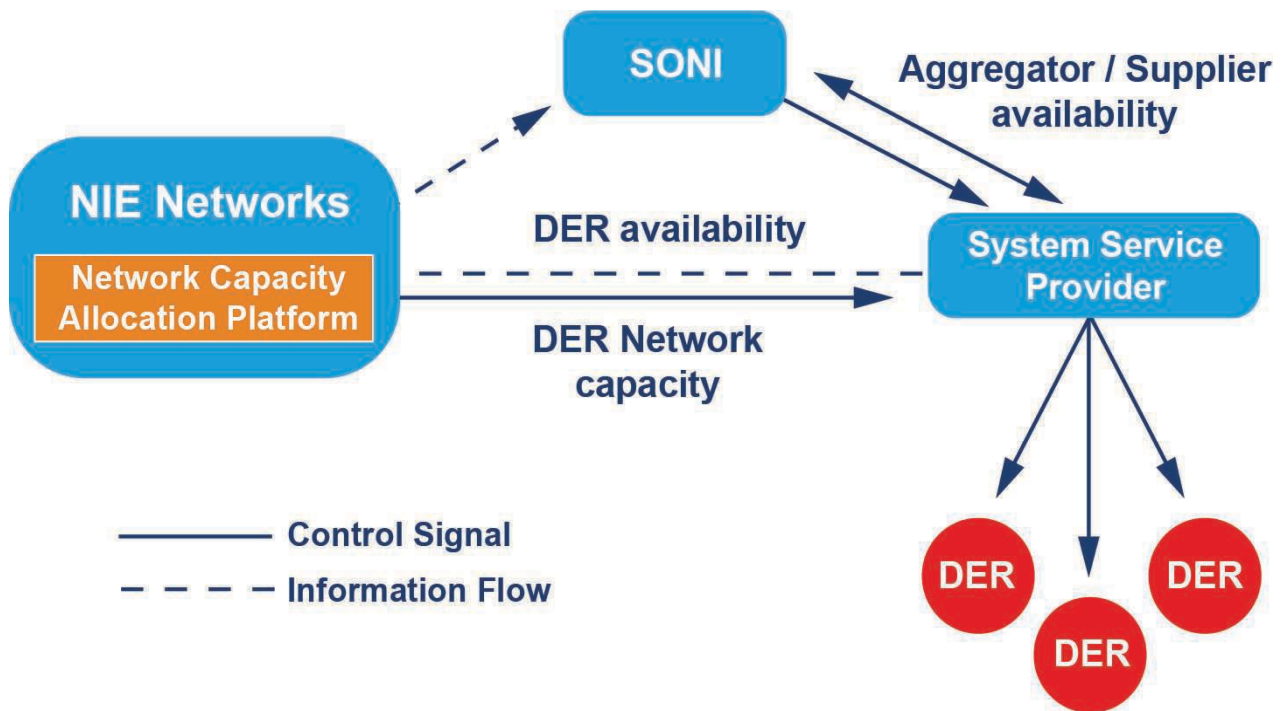
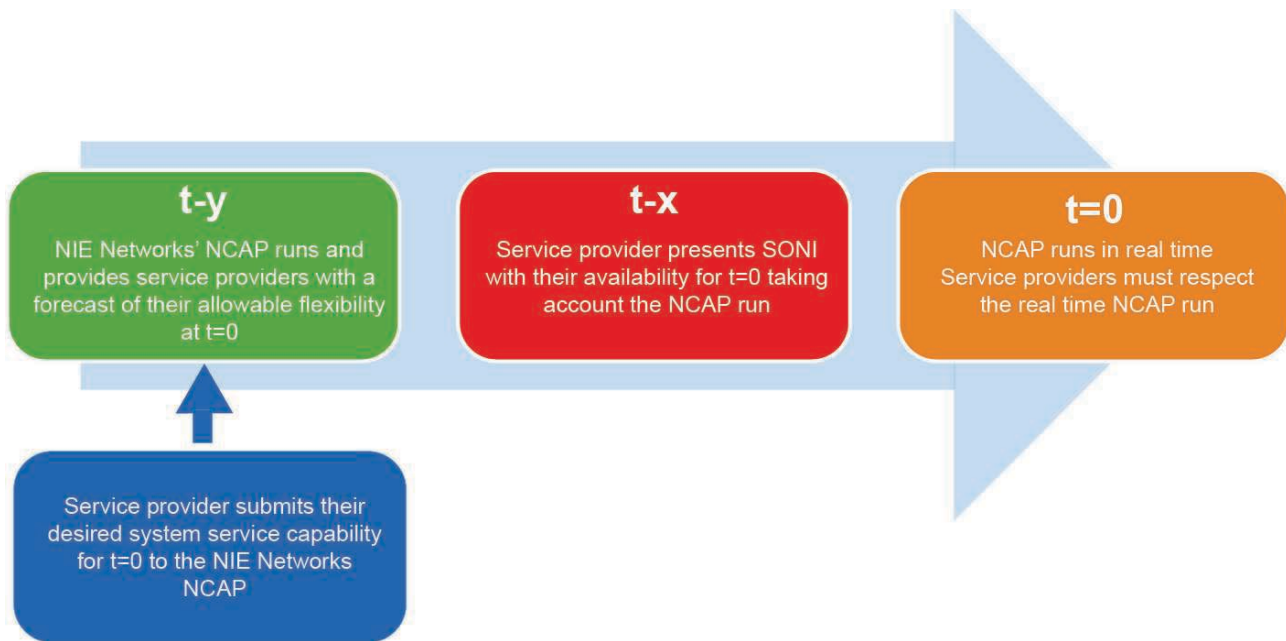


FIGURE 10

**CONSULTATION Q4: Do you agree with the proposed architecture for the Network Capacity Allocation Platform? If not, please provide an explanation.**

As suggested by a respondent it is important that timelines are aligned with the existing market to help limit any unintended consequences. To mitigate this risk, NIE Networks is proposing that the NCAP provides a forecasted network capacity which can be used by system service providers for declaration of availability to the market. Importantly the NCAP will also run in real time to ensure that network topology changes or forecasting errors are taken account of; the real time NCAP run must always be respected by system service providers. This approach, illustrated in Figure 11, ensures that more often than not the capability declared to the market will equal the capability available in real time and therefore will not have a material impact on the market.



**FIGURE 11**

**CONSULTATION Q5: Do you agree with the proposed running sequence of the NCAP, as outlined in Figure 11? If not, please provide an explanation.**

To ensure that the NCAP process is fair and non-discriminatory, Principles of Access (PoA) will be developed, consulted upon, and then implemented. Currently the existing instruction set process uses a Last in First Off (LIFO) approach. However, in the longer term once the local network reaches saturation a LIFO approach may not provide any further capacity for service providers. Possible PoA options include:



Principles of Access	Description	Pros	Cons
<b>Last In First Off (LIFO)</b>	System service providers will have a registration date associated with them. Under this PoA the NCAP will give capacity to providers in order of registration date i.e. the provider registered first should get the first preference on capacity. This concept is illustrated in Figure 12.	<p>Early adopters rewarded.</p> <p>Clear Principles of access.</p> <p>Easier to forecast future network access as access will not be affected by the location or volume of future system service providers.</p>	<p>Latecomers will have limited or no network access. This is likely to include the domestic market.</p> <p>Not economically optimum. For example, if the system service provider first registered is the most expensive<sup>14</sup> then they will always have priority network access.</p>
<b>Cost<sup>14</sup></b>	System service providers may have a cost associated with them. Under this PoA the NCAP will give capacity to DERs in order of cost i.e. the cheapest DER will get first preference on network capacity.	<p>Economically optimum solution. Always ensures that the cheapest provider has priority access to deliver their service.</p> <p>Ensures “latecomers”, likely to include the domestic market, can avail of network access for the provision of system services.</p>	<p>Complex to manage if costs are updated on a regular basis.</p> <p>Difficult to forecast longer term network availability as will be dependant on the future number and price of other providers connected to the local network.</p>
<b>Equal Division</b>	Under this PoA the available network capacity will be distributed across all system service providers connected behind the	Ensures that network capacity is equitably divided amongst participants on a pro-rata basis.	Difficult to forecast longer term network availability as will be dependant on the future number and price of other providers

<sup>14</sup> Premised on the evolution of the existing tariff based System Services Market to a price based market.

	violation point, on a pro-rata basis.	Ensures “latecomers”, likely to include the domestic market, can avail of network access for the provision of system services.	connected to the local network.  Does not reward early adopters. As the number of participants connected to the same electrical assets increase network capacity will become eroded for the early adopter.
<b>Round Robin</b>	Under this PoA the available network capacity will be rotated amongst all system service providers connected behind the violation point i.e. if a system service was at the top of the priority list in the last network capacity allocation run then they should be at the bottom of the priority list for the next run. An example of this process is shown in Figure 13.	Ensures that network capacity is equitably divided amongst participants.  Ensures “latecomers”, likely to include the domestic market, can avail of network access for the provision of system services.	Difficult to forecast longer term network availability as will be dependant on the future number and price of other providers connected to the local network.  Does not reward early adopters. As the number of participants connected to the same electrical assets increase network capacity will become eroded for the early adopter.

**TABLE 3**

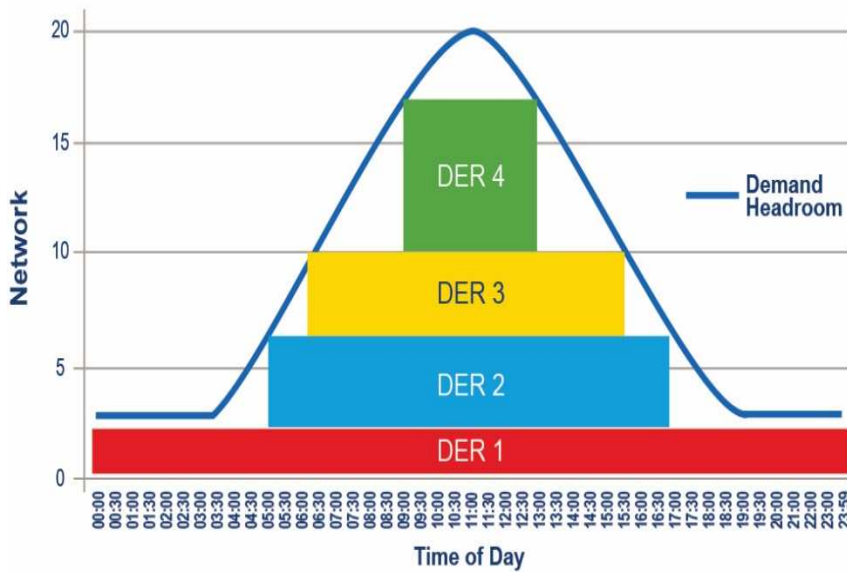


FIGURE 12



FIGURE 13

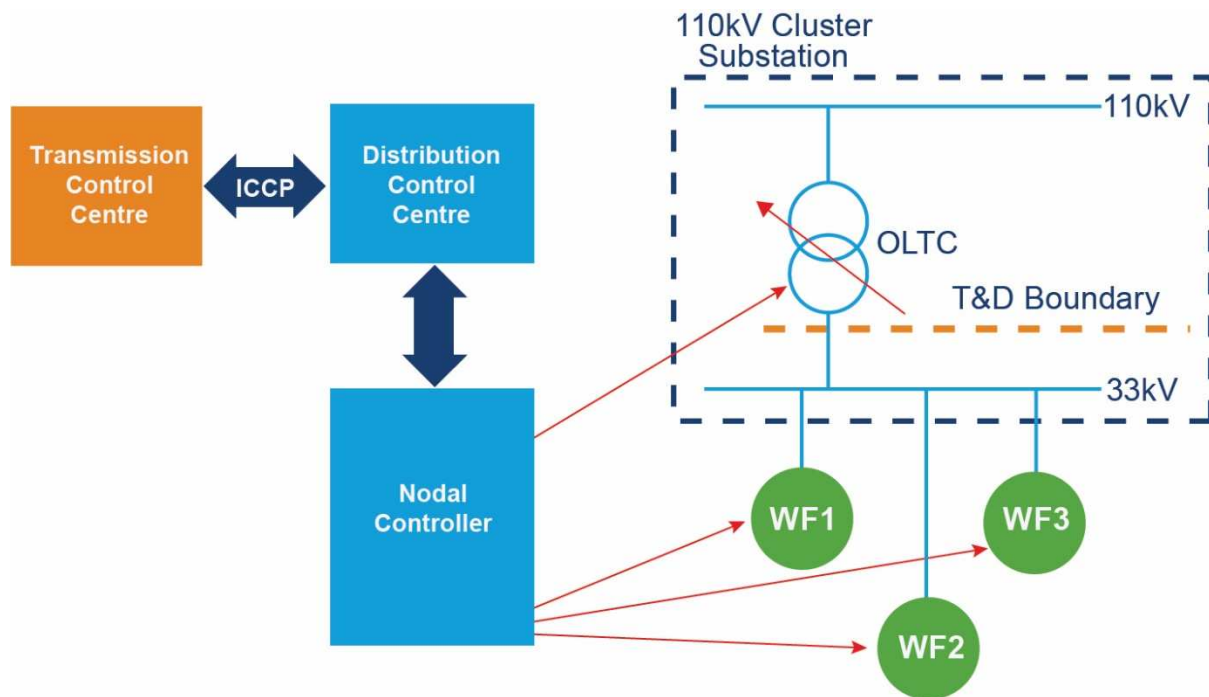
**CONSULTATION Q6: Which, if any, PoA arrangement do you believe should be used in the Network Capacity Allocation Platform? Please provide rationale.**

### 4.1.2 Reactive Power

#### 4.1.2.1 Call for Evidence overview

Unlike active power, NIE Networks solely controls reactive power on the distribution network. This ensures that voltage remains within acceptable limits, system stability is maintained and remedial action is taken swiftly to resolve any issues. The instruction set process cannot be employed for reactive power system services as it does not provide co-ordinated reactive power management, does not prevent dynamic instability and does not allow fast remedial action to be taken if required.

To address this NIE Networks is developing a Nodal Controller solution. The Nodal Controller if successful will coordinate the reactive power from DERs to deliver the required reactive power at a TSO/DSO interface whilst respecting the voltage and thermal capabilities of the network. Figure 14 displays a high-level architecture of the Nodal Controller.

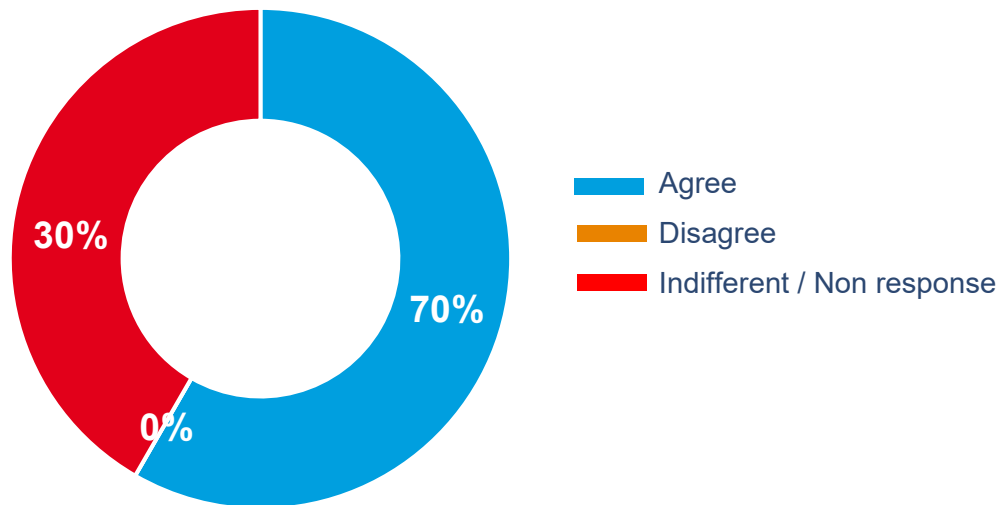


**FIGURE 14**

Question 4 of the CfE asked should NIE Networks develop a technical solution to enable customers to participate in reactive power system services.

#### 4.1.2.2 Call for Evidence responses

As illustrated in Figure 15, 70% of the respondents agreed with the proposal of using a Nodal Controller solution and 30% either did not respond or neither agreed or disagreed with the proposal. General comments suggested that the Nodal Controller appears to be a robust solution, allowing all customers to have an equal chance of participating in the delivery of reactive power system services. Whilst not disagreeing with the Nodal Controller a respondent suggested that the proposal is not the only method available to enable customers to participate in reactive power system services.



**FIGURE 15 - DO YOU AGREE THAT NIE NETWORKS SHOULD DEVELOP A TECHNICAL SOLUTION TO ENABLE CUSTOMERS TO PARTICIPATE IN REACTIVE POWER SYSTEM SERVICES?**

#### 4.1.3 Proposed Approach

When conducting market research for potential solutions to facilitate access to the system services reactive power market NIE Networks identified two key projects:

- ESB Networks’ Nodal Controller
- UKPN and National Grid’s Power Potential Project<sup>15</sup>

Both of these projects have the same use case as NIE Networks, particularly the ESB Networks’ Nodal Controller project. Based on this market research NIE Networks felt that it would be prudent to deploy a similar technological solution to that used by ESB Networks and UKPN.

Whilst NIE Networks appreciate there may be other methods that could, in theory, be deployed to deliver coordinated dispatch of reactive power, from the market research it appears that this solution is the most developed and commonly considered by network operators. This approach also ensures greater consistency for customers participating in the Steady State Reactive Power System Service in both Northern Ireland and the Republic of Ireland.

<sup>15</sup> <http://innovation.ukpowernetworks.co.uk/innovation/en/Projects/tier-2-projects/power-potential/>

Based on the above rationale and the responses received, which clearly demonstrate that respondents agree with the approach of using a Nodal Controller, NIE Networks propose that they will continue to develop the Nodal Controller solution. It should be noted that this does not preclude NIE Networks from considering evolving technologies in the future. NIE Networks believes that a phased approach to the Nodal Controller roll out should be adopted, as explained below:

1. NIE Networks will trial the Nodal Controller at one cluster substation over a period of one year. This is the minimum time required to assess the operation of the Nodal Controller over all operational conditions.
2. If Phase 1 is deemed successful and subject to conditions “a” and “b” set out below, NIE Networks will roll out the Nodal Controller solution at the remaining cluster substations.
  - a. A positive cost benefit analysis for the delivery of reactive power at each substation is produced by NIE Networks and SONI.
  - b. Subject to industry consultation and regulatory approval an approach covering the upfront and ongoing operational costs of the wider roll out of the Nodal Controller is agreed.
3. After the delivery of Phase 2 and subject to the continued need for the procurement of additional reactive power and conditions “a” and “b” above being met, NIE Networks will roll out the Nodal Controller solution<sup>16</sup> at other Bulk Supply Points<sup>17</sup>.

**CONSULTATION Q7: Do you agree with the phased approach regarding the delivery of the Nodal Controller solution? If not please provide rationale.**

## 4.2 Service Provider

### 4.2.1 Call for Evidence overview

NIE Networks has a history of providing services to the TSO when required during critical events, often referred to as High Impact Low Probability (HILP) events, to support the security of the system. These services are provided in a very infrequent basis and include:

- Load Shedding.
- Voltage Reduction to offer system wide demand response.

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<sup>16</sup> May be subject to a trial to prove functionality at a Bulk Supply Point.

<sup>17</sup> 110/33kV substations with demand customers connected. These substations will in many cases also have generators connected.



It should be noted that these services are only utilised in system critical events as they impact on the security and quality of supply of customers. These types of services are not acceptable for more frequent events. However, there is the potential for the electricity network to offer other solutions, through the flexing of its existing assets, to further support the TSO in system balancing. These services could be utilised by the TSO on a more frequent basis for Low Impact High Probability (LIHP) events to help reduce energy bills and if developed and managed correctly by the DSO can be delivered without compromising the security or quality of supply for customers. Examples of such services are shown in Table 4.

Service	Frequency Response		Voltage Control
<b>Delivery Method</b>	Operation of circuit breakers to reduce voltage and therefore reduce demand (Fast Frequency Response)	Operation of tap changers to reduce/increase substation voltage and therefore reduce/increase demand (Slower Response)	Stagger transformer tap positions to support reactive power management

**TABLE 4**

The potential for the distribution network to offer services to the TSO has been trialled by Electricity North West Limited (ENWL) in GB through their Customer Load Active System Services (CLASS<sup>18</sup>) project. Using the same technologies as described in Table 4 the CLASS project is being used to support the system by providing Voltage and Frequency services through National Grid’s STOR<sup>19</sup> market. Importantly, the CLASS project has demonstrated that these services can be provided without compromising the customer’s security or quality of supply if managed correctly by the DSO.

The CfE in Question 5 asked: “NIE Networks has existing assets on the network which potentially have the capability of providing additional services to the TSO. Should NIE Networks be allowed to provide cost effective solutions to the TSO in balancing the network to help reduce customer bills for all customer types?”

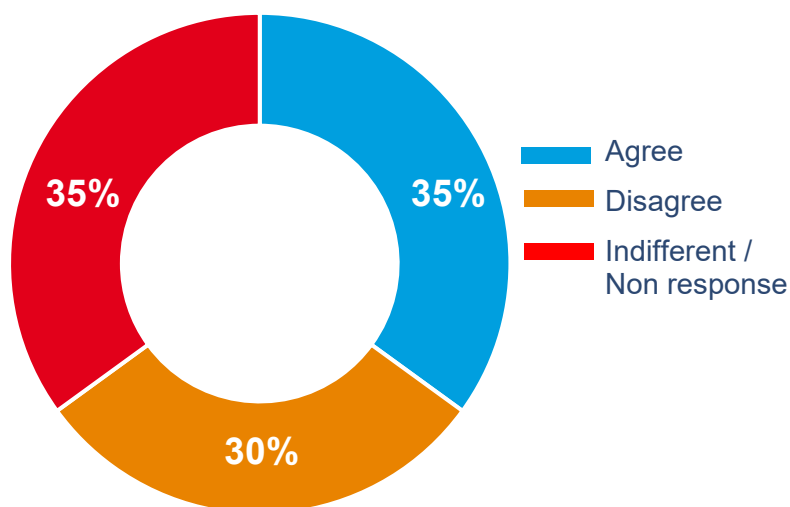
<sup>18</sup> <https://www.enwl.co.uk/class>

<sup>19</sup> <https://www.nationalgrideso.com/balancing-services/reserve-services/short-term-operating-reserve-stor>

## 4.2.2 Call for Evidence responses

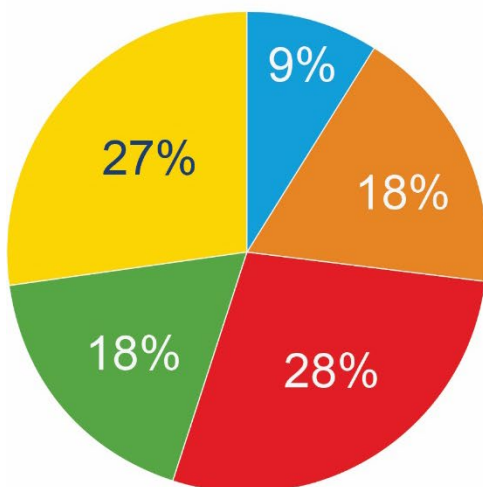
The responses to this question were split with 35% suggesting that NIE Networks should use their assets to provide additional services to the TSO, 30% disagreeing and 35% did not respond or neither agreed or disagreed. Some respondents in agreement with the proposal suggested that this is a good use of innovation. In general respondents disagreeing suggested that a potential conflict of interest between the role of neutral market facilitator and service provider may exist and NIE Networks' assets should not be given preference over other solutions. Other respondents suggested that the assets have been paid for by the consumers and not for the benefit of the DSO to become a service provider.

When assessing the response to this question it is important to understand the make up of the customer groups that responded in agreement and in disagreement to this question Figure 17 and Figure 18 illustrate this. From these figures it can be seen that a much larger percentage of active participants and system service providers disagreed with NIE Networks offering these services compared to passive consumers and passive participants; in fact no passive consumers or passive participants disagreed with NIE Networks offering these services. Conversely, almost 30% of the respondents agreeing with NIE Networks offering these services were passive consumers. Consequently, from this analysis it could be generalised that active customers are more likely to disagree with NIE Networks offering services to help balance the system at lower cost, whereas passive customers are more likely to agree with NIE Networks offering services to help balance the system at lower cost.



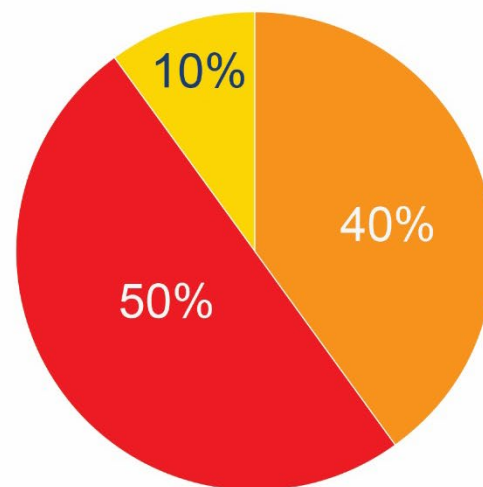
**FIGURE 16 - NIE NETWORKS HAS EXISTING ASSETS ON THE NETWORK WHICH POTENTIALLY HAVE THE CAPABILITY OF PROVIDING ADDITIONAL SERVICES TO THE TSO. SHOULD NIE NETWORKS BE ALLOWED TO PROVIDE COST EFFECTIVE SOLUTIONS TO THE TSO IN BALANCING THE NETWORK TO HELP REDUCE BILLS FOR ALL CUSTOMER TYPES?**

**Agreed**



**FIGURE 17**

**Disagreed**



**FIGURE 18**



### 4.2.3 Proposed Approach

NIE Networks agrees with the comment that “if there is potential within NIE Networks existing assets to provide cost efficient solutions to the TSO in balancing the network, this should be explored. However, NIE Networks should not be given preference over other solutions if they are available and offer a better outcome for consumers”. Intuitively NIE Networks believes that the flexing of assets to provide additional services to the TSO to meet the system needs at lower cost should be encouraged. This represents an extension of the existing processes of offering services during HILP events and helps deliver more efficient whole system optimisation as per the DSO definition. However, as pointed out by some respondents there are important questions to consider particularly regarding how the DSO remains a neutral market facilitator whilst utilising network assets to provide services to the TSO.

To consider this question further, NIE Networks has identified 4 potential variants of the service provider function, shown in Table 5.

Option	Description
1	Maintain the current process
2	DSO as system service provider
3	DSO as first call provider
4	DSO as last call provider

**TABLE 5**

#### 4.2.3.1 Maintain the current process

The first option is to maintain the existing process and not develop any additional functionality to enable the existing network assets to deliver additional services to the TSO. In essence the DSO will provide services to the TSO during HILP events but not provide any services during LIHP events. Whilst this option ensures that the DSO will be viewed as a neutral market facilitator it does not allow all customers to potentially benefit from cost reductions associated with NIE Networks offering services to the TSO.

#### 4.2.3.2 DSO as system service provider

In this option the DSO participates in DS3 System Services using network assets. A percentage of the DSO System Service revenue will be passed back to the general customer base. Consequently, the general customer base benefits are threefold:

1. The TSO is able to purchase the required system services volume at lower cost since DSO assets can be flexed at lower cost<sup>14</sup>.
2. The DSO will deliver a predefined percentage of system service revenue back to the general customer base. The overall volume of procured System Services will remain the same.
3. DSO participation in system services may increase market competition and drive down costs over time.

Importantly, by delivering a predefined percentage of system service revenue back to the general customer base, in essence this option effectively enables all customers to benefit from system services not just those customers with the technical and financial capability

to do so. By delivering customer benefit NIE Networks believes that this approach alleviates concerns raised by respondents that “the assets have been paid for by the consumers and not for the benefit of the DSO to become a service provider”. This aligns closely with the approach currently adopted by ENWL in GB.

Addressing the concerns raised by some respondents regarding the neutrality of the process, NIE Networks believes that this can be mitigated through several mechanisms:

- The DSO assets will be subject to the same NCAP process, as described in section 4.1.1.3, with the same principles of access as the other system service providers.
- Regular reporting, regulatory scrutiny and transparency of the process. Ultimately, NIE Networks will need to satisfy the UR that neutrality is being continually achieved.
- Following developments in ENWL closely and adopting industry best practice.

#### **4.2.3.3 DSO as First Call Service Provider**

In this option the DSO assets do not directly compete in the system services market. Instead the DSO assets are utilised first by the TSO on the premise that the DSO assets can be flexed at least cost, and the remaining need is supplied through system service providers; in this way the volume and therefore cost to operate the system services market is reduced.

Whilst in this option the DSO does not participate in system services it is predicated on the principle that the DSO will be subject to an additional regulatory revenue stream to recover costs associated with the delivery of these services and a regulatory incentive acknowledging the additional risk management in delivering such services. It is anticipated that this additional regulatory revenue stream and incentive will be considerably lower than the cost to procure the equivalent volume of system services and therefore the general customer base will benefit through the downward pressure placed on bills.

This option offers very clear operational principles and benefits to the general customer base.

#### **4.2.3.4 DSO as Last Call Provider**

In this option the TSO first procures system services from the market. If there is still a need for additional services then these are delivered by the DSO assets. In this way the DSO assets are not directly competing with other third-party system service providers since third party providers will get dispatched first with priority access in the NCAP. However, it will not offer the most cost effective solution for the general customer base as the DSO acting as a last call provider will not reduce the volume of System Services

procured from third parties. Furthermore, as the System Services market matures and evolves, DSO assets will be used less often as third parties will deliver the system need. This presents a risk of “stranded assets” associated with the additional functionality required to enable assets to deliver services.

Similarly, to the DSO as first call service provider, this option is predicated on the principle that the DSO will be subject to an additional regulatory revenue stream to recover costs associated with the delivery of these services and a regulatory incentive acknowledging the additional risk management in delivering such services.

To help respondents make as informed a decision as possible, in Table 6 each service provider option has been assessed against a list of criteria developed by NIE Networks. A red, amber, green assessment has been used were:

- Red = Largely does not fulfil the criteria
- Amber = Fulfils the criteria in part
- Green = Largely fulfils the criteria

Options \ Criteria		1	2	3	4
		<b>Economically optimum solution<sup>20</sup></b>	<b>Short Term</b>	<b>No additional cost reduction</b>	Cost reduction by flexing lower cost DSO assets and sharing revenue with general customer base. Explained in section 4.2.3.2.

<sup>20</sup> Assumes that NIE Networks can deliver the required services, through the flexing of their assets, at lower cost than a third party system service provider.



	<p>Long Term</p>				<p>As system services market matures and evolves DSO assets used less often. Risk of stranded assets associated with the additional functionality required to enable assets to deliver services.</p>
<p>Benefit for passive customers, including vulnerable customers</p>	<p>Largely active customers able to participate in and receive benefit from system services</p>	<p>All customers benefit by the DSO passing a percentage of system services revenue back to all customers.</p>	<p>All customers benefit as volume of system services required from third parties is reduced.</p>	<p>Similar to Option 3; however, DSO assets only flexed on a last call basis and therefore revenue received and passed back to all customers is less.</p> <p>As system services market matures and evolves, DSO assets used less often and therefore benefit to passive customers reduces over time.</p>	

<p><b>Benefit for active customers participating in system services.</b></p>	<p>Active customers receive revenue from participating in system services.</p>	<p>Volume of system services procured from active customers likely to be less. However, all customers will benefit through the DSO passing a percentage of system service revenue back to all customers.</p>	<p>Volume of system services procured from active customers likely to be less. However, all customers will benefit through the reduced volume and therefore cost to operate the system services market.</p>	<p>Similar to Option 3; however, DSO assets only flexed on a last call basis and therefore volume and revenue received from system services for active customers unaffected.</p>
<p><b>Perception of neutral market facilitator</b></p>	<p>NIE Networks not offering services and therefore no potential for perceived conflict of interest.</p>	<p>Potential for perception of a conflict of interest; however, NIE Networks believes the identified mitigation measures in section 4.2.3.2 will alleviate concerns.</p>	<p>Potential for perception of a conflict of interest; however, NIE Networks believes the identified mitigation measures in section 4.2.3.2 will alleviate concerns.</p>	<p>Third parties are given first call on system services and therefore limited potential conflict of interest.</p>
<p><b>Simplicity/cost to deliver for NIE Networks</b></p>	<p>No change to existing process therefore no additional complexity/cost to deliver.</p>	<p><b>NIE Networks required to adhere to stringent system services requirements and therefore will require additional cost to deliver.</b></p>	<p>Some expenditure and changes to operational procedures and practises required to deliver.</p>	<p>Some expenditure and changes to operational procedures and practises required to deliver.</p>

**TABLE 6**

**CONSULTATION Q8: Which service provider option do you feel should be adopted by NIE Networks? Please provide rationale for your selection.**

## 4.3 Congestion Management

### 4.3.1 Call for Evidence overview

As demand and generation customers connect to the electricity network the capacity of the network for further connections diminishes until no further capacity remains, at which point network reinforcement is triggered, at additional cost, enabling additional demand and/or generation to connect. There are various forms of constraints on the network including:

- Thermal
- Fault Level
- Voltage
- Power Quality

NIE Networks is responsible for planning investment on the distribution system to ensure that future demand and generation growth can be accommodated without compromising the safety, security and quality of supply to existing customers. Since local demand is expected to increase significantly due to the electrification of heat (Heat Pumps, etc.) and transport (Electric Vehicles, etc.) it is vital that NIE Networks has the appropriate processes in place for managing this.

There are two investment philosophies that can be adopted, namely: **conventional reinforcement** and **smart incremental reinforcement**:

A conventional reinforcement strategy deploys traditional solutions for example building new lines and substations, installing larger transformers and increasing the cross sectional area of overhead lines and cables.

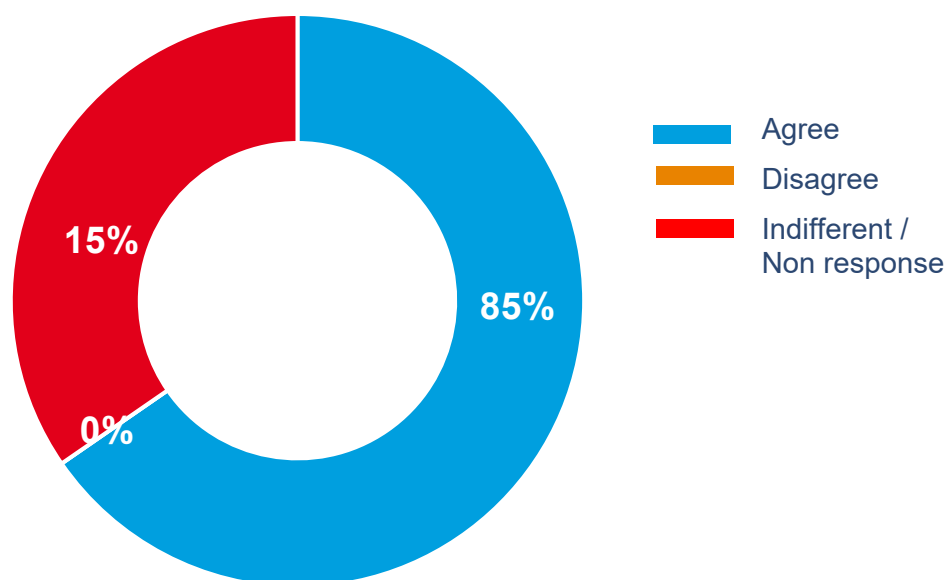
A smart incremental strategy continues to deploy traditional solutions but, where appropriate, it also deploys smart solutions and market-based solutions. Smart solutions refer to new technological and/or commercial solutions that, in most cases, have not yet been fully developed or widely deployed. Even technologies which are well understood and have been trialled are considered to be smart in this framework, since they have not yet been widely deployed. These solutions can be operating on the network-side, generation-side or customer-side of the distribution system. Examples of smart solutions include dynamic network reconfiguration, dynamic thermal ratings and enhanced automatic voltage control. Smart solutions also consider market-based solutions whereby NIE Networks could issue a Request for Tender (RfT) to solve congestion problems in specific locations. This may be in the form of, for example, energy storage, Demand Side Response (DSR), Vehicle to Grid (V2G) technology and may enable the development of

Peer to Peer (P2P) energy trading. The main benefit of smart solutions is that they can be used to defer capital expenditure on the network and therefore deliver financial benefits to the general customer base.

The CfE asked “Should NIE Networks continue to invest conventionally to maintain a high level of network resilience and security but at a higher cost or should they adopt and integrate smart solutions to reduce network costs and deliver the network security through a more dynamic approach to operating the network?”

### 4.3.2 Call for Evidence responses

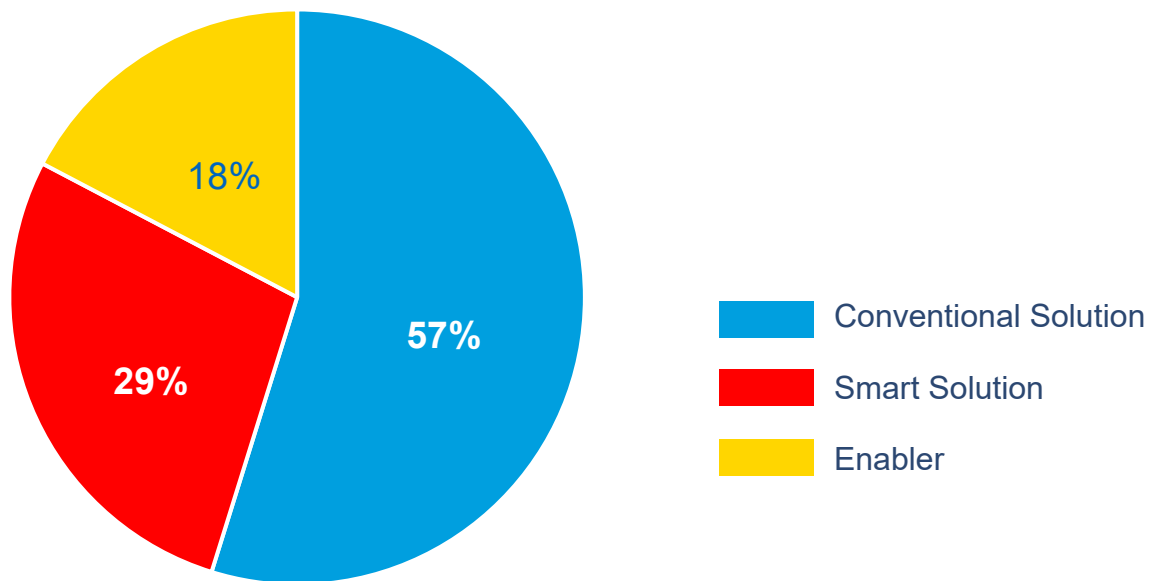
Respondents strongly supported the adoption of smart solutions to reduce network costs and deliver network security through a more dynamic approach. 85% of respondents supported the idea while 15% didn’t respond or had an indifferent response. Many respondents suggested that NIE Networks should adopt smart solutions in the short term however conventional reinforcement still needs to be made to ensure longer term capacity. Other respondents concluded that the use of “smart solutions” could help stimulate the electricity market, as measured by enhanced reliability and lower costs for customers. A respondent commented that there is a range of smart, innovative technologies which can be deployed within the conventional business as usual approach which can bring potential cost savings as the technology is mature and has been successfully deployed within other DNOs. Finally, respondents stated that If NIE Networks adopt this solution it should be undertaken in a transparent manner, with on-going engagement with stakeholders.



**FIGURE 19 - NIE NETWORKS CONTINUE TO INVEST CONVENTIONALLY TO MAINTAIN A HIGH LEVEL OF NETWORK RESILIENCE AND SECURITY BUT AT A HIGHER COST OR SHOULD THEY ADOPT AND INTEGRATE SMART INCREMENTAL SOLUTIONS TO REDUCE NETWORK COSTS AND DELIVER THE NETWORK SECURITY THROUGH A MORE DYNAMIC APPROACH TO OPERATING THE NETWORK?**

### 4.3.3 Proposed Approach

Taking the responses from the CfE into account NIE Networks believes that a “smart incremental” investment approach should be adopted. With regards to some respondent’s comments, this investment approach will still require significant conventional reinforcement: In general, smart or market-based solution will be installed to defer traditional reinforcement, not eliminate it. This is demonstrated below in Figure 20 which shows the predicted conventional, smart and enabler intervention mix out to 2060 for a central LCT uptake scenario.



**FIGURE 20**

In GB a significant number of solutions have been trialled and some are being integrated into BaU. However, it should be noted that solutions being integrated into BaU in London may not be appropriate in the Scottish Highlands due to the differences in distribution network topologies. Similarly, the differences prevalent in NI, some of which are outlined below, necessitate that NIE Networks must integrate innovative solutions into BaU before these solutions can be deployed on a wide spread basis with the confidence that they will continue to perform as required to ensure ongoing compliance with statutory and license obligations:

- Higher penetration of distributed generation.
- More rural network with different voltage levels.
- Different electricity market and regulation.

NIE Networks recently secured funding for 6 innovation projects to implement a fast follower approach to successful innovation projects trialled in GB. These 6 innovation projects will be trialled by NIE Networks within RP6 and, if successful, rolled out into Business as Usual. As suggested by one respondent NIE Networks will ensure that these projects are undertaken in a transparent manner with ongoing engagement with stakeholders. It is proposed that the overall stakeholder engagement strategy associated with this evolution will be included within the scope of the existing CEAP, discussed in section 3.2. A brief overview of the projects can be viewed in Table 7. NIE Networks is also working with industry and academia on a number of other innovation projects:

- DINOSAURS<sup>21</sup>
- GIRONA
- SPIRE 2<sup>22</sup>
- Smart Energy Collaboration
- B9 Energy
- PhD project support with local Universities.

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<sup>21</sup> <https://sites.google.com/view/dinosaurs-qub/project-updates>

<sup>22</sup> <https://www.ulster.ac.uk/spire2>

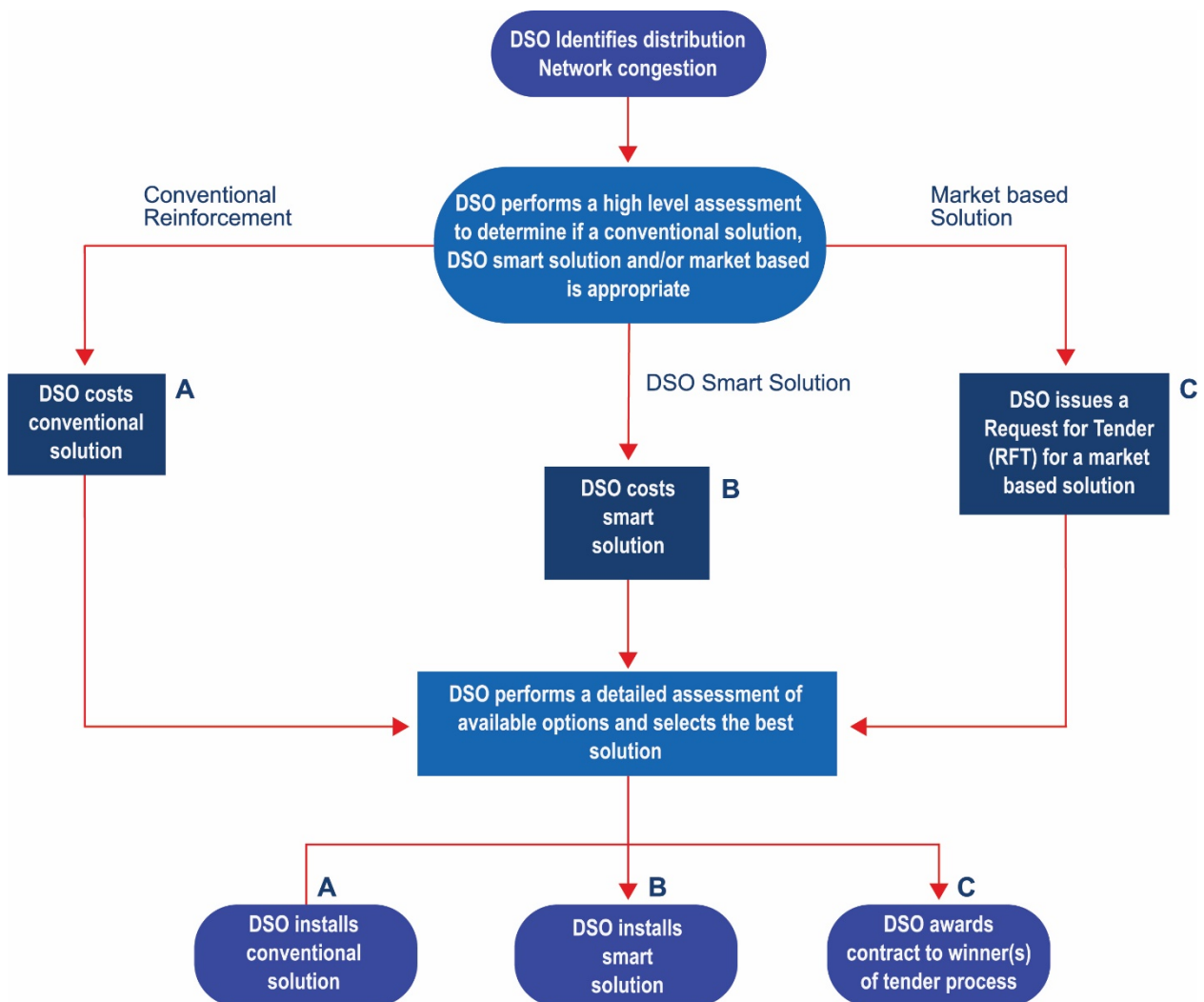


Innovation Project	Description
<b>Low Voltage Active Network Management (LVANM)</b>	<p>Involves the real time management of the low voltage network configuration.</p> <p>This project, if successful, can primarily increase network headroom for LCTs and defer conventional network investment.</p>
<b>Facilitation of Energy Storage Services (FESS)</b>	<p>Energy Storage has long been seen as a potential solution to flatten demand profiles and help reduce generation and network costs.</p> <p>This project, if successful, will identify and overcome the barriers to the efficient deployment of energy storage on the distribution network.</p>
<b>Demand Reduction through Voltage Control (DRVC)</b>	<p>This project will seek to deploy technology on the network to reduce demand by reducing substation voltage at times of need, whilst keeping voltages within statutory voltage limits.</p> <p>If successful, this can help reduce power consumed from the network and defer conventional network reinforcement.</p>
<b>Demand Side Response (DSR)</b>	<p>DSR is the name given to schemes where electricity customers are financially incentivised to lower or shift their electricity use at peak times.</p> <p>This, if successful, can help to manage load and voltage profiles on the electricity network and thus defer conventional network reinforcement.</p>
<b>Smart Asset Monitoring (SAM)</b>	<p>This project will use specialist equipment to monitor 33kV overhead lines and transformers in congested parts of the network and apply real-time thermal ratings based on actual weather conditions.</p> <p>This project, if successful, can reduce the total network expenditure associated with upgrading overhead lines and transformers.</p>

<b>STATCOM</b>	<p>It has been identified that parts of the network can be constrained by both low and high voltages.</p> <p>This project plans to install a STATCOM to produce and absorb reactive power to manage voltage on the 11kV network.</p> <p>If successful, this will mitigate against conventional network investment to resolve voltage constraint issues.</p>
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**TABLE 7**

When suitably trialled and if successfully integrated into BaU, NIE Networks will have at its disposal conventional reinforcement, DSO smart solutions and market based solutions to choose from. The proposed approach for determining which solution should be selected is outlined in Figure 21.



**FIGURE 21**

**CONSULTATION Q9: Do you agree with the proposed approach, outlined in Figure 21, for managing congestion on the electricity network? If not, please provide rationale.**

## **4.4 Connections**

### **4.4.1 Call for Evidence overview**

With c1.7GW of renewable generation connected and a further c0.1GW committed to connect to the NIE Networks' transmission and distribution system, there is limited unused capacity for future generation to connect in the absence of network investment. As Northern Ireland is already close to Government targets for energy consumption from renewable sources, it is now becoming more difficult to justify further proactive network investment for renewable generation. Consequently, NIE Networks and SONI invited stakeholders to explore how further generation could be connected in the future for example by adopting more innovative approaches rather than traditional network investment through the issuing of a joint CfE<sup>23</sup> on 12 October 2017 and joint consultation<sup>24</sup> on 31 January 2018. Following on from this the Connections Innovation Working Group (CIWG) has been established to consider both the technical and commercial aspects of:

- Zero Firm Access Quantity (FAQ) offers with no Associated Transmission Reinforcement (ATR)
- Active Network Management Connections

As Microgeneration<sup>25</sup> is connected mainly on a 'fit and inform' basis, it has not been included in the scope of the CIWG. For this reason a number of questions were outlined in the CfE on Greater Access to the Distribution Network in Northern Ireland relating to microgeneration.

Under Engineering Recommendation G83/1 a single generator with an energy source of 16A/phase or less can connect to the low voltage network if the DNO is advised of the intention to use the source in parallel with the network before, or at the time of commissioning. In this case the customer is not required to apply and receive a connection offer prior to connection to the network. In the case of projects where the proposal is to install multiple generators with energy sources of 16A/phase or less in a number of customer installations in a 'close geographic region', the installer is required to discuss the project with NIE Networks at the earliest opportunity. NIE Networks will then assess the impact that these connections may have on the network and specify conditions for connection. The process currently used by NIE Networks is displayed in Figure 22.

<sup>23</sup> [http://www.nienetworks.co.uk/documents/final-cfe-soni\\_nie-networks.aspx](http://www.nienetworks.co.uk/documents/final-cfe-soni_nie-networks.aspx)

<sup>24</sup> <http://www.nienetworks.co.uk/getattachment/Connections/Generation-connections/Generation-Consultation/NI-Gen-Connections-Consultation.pdf.aspx>

<sup>25</sup> Generation<16A/phase

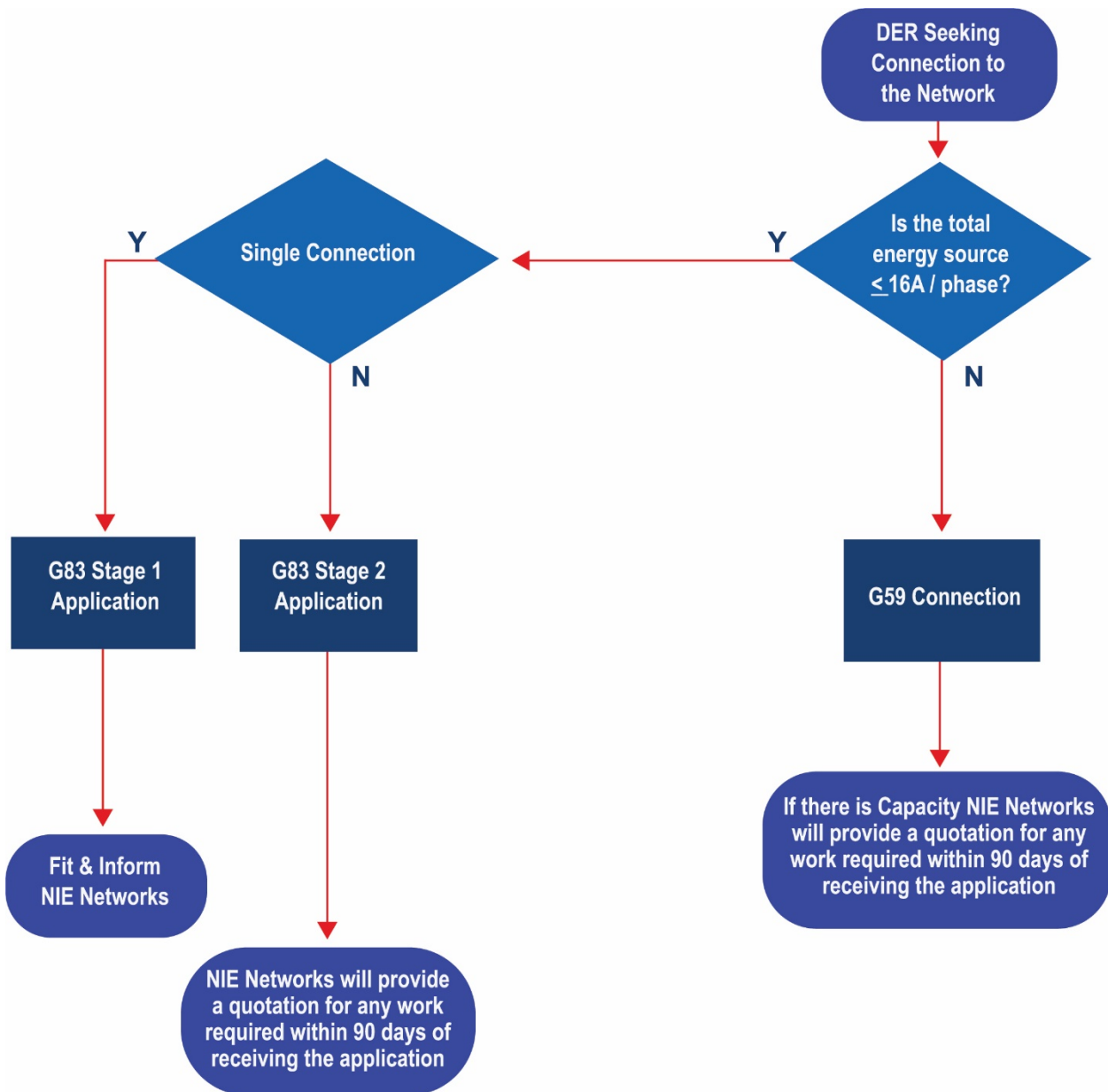
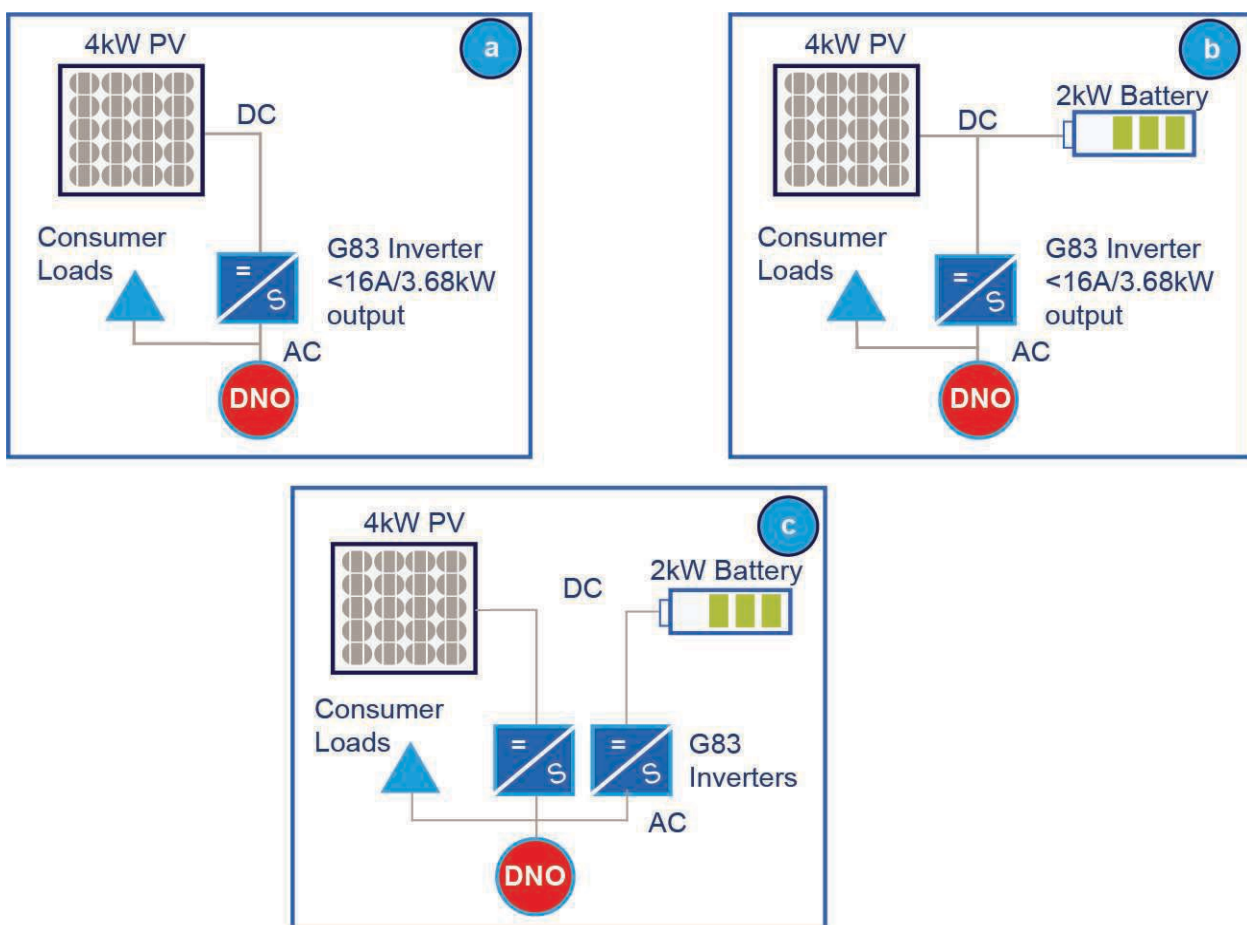


FIGURE 22

Figure 23a illustrates a typical Engineering Recommendation G83/1/NI connection, whereby customers can fit the generator and inform NIE Networks of the intention to use the source in parallel with the network before, or at the time of commissioning.

Figure 23b, illustrates an installation where the source of energy behind a single inverter is >16A/phase. Even though the inverter is rated at 16A/phase this installation is currently regarded as an Engineering Recommendation G59/1/NI connection, necessitating that the customer must apply for a connection offer from NIE Networks and will be subject to any associated network costs and generation queues. This is based on the Electricity Safety, Quality and Continuity Regulation (ESQCR) obligations placed on the owner/installer.

Figure 23c, illustrates an installation where two inverters are connected at a customer's premises. Whilst each inverter is rated at 16A/phase this installation is currently regarded as an Engineering Recommendation G59/1/NI connection, meaning that the customer must apply for a connection offer from NIE Networks and will be subject to any associated network costs and generation queues.



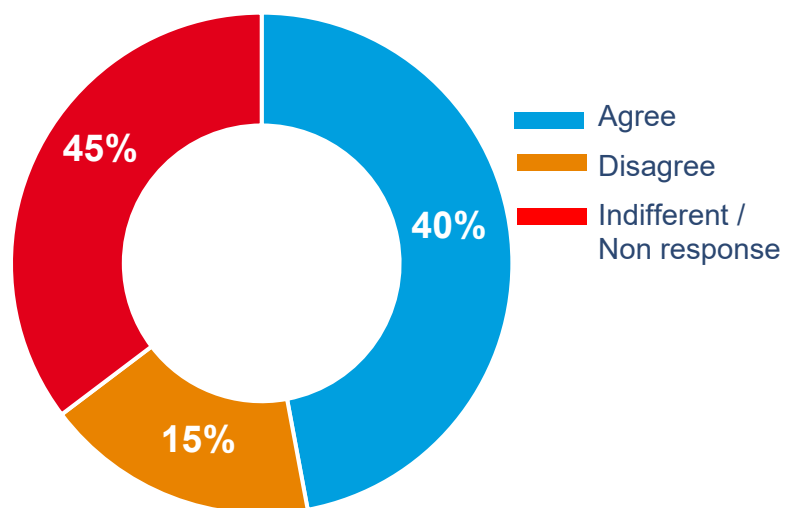
**FIGURE 23**

Within the CfE the following questions were asked:

- Do you believe that installations similar to that illustrated in Figure 23b, where a total energy source >16A/phase connects behind a single inverter rated at 16A/phase, should be allowed to connect under an Engineering Recommendation G83/1 arrangement on a ‘fit and inform’ basis? If so, please set out in detail.
- Do you believe that installations similar to that illustrated in Figure 23c, if fitted with a G100 export limiting device should be allowed to connect on an Engineering Recommendation G59 “fast track” process? In this case customers would still be required to contact NIE Networks to receive permission to connect; however, due to the reduced likelihood of considerable grid impact NIE Networks would be able to expedite any network assessment and revert to the customer, informing them that they can or cannot connect to the network in reduced timescales.

#### 4.4.2 Call for Evidence Responses

With regards to Q7 in the CfE, out of those respondents that either agreed or disagreed, the vast majority agreed with the proposal, 15% disagreed and the remaining 45% not responding or neither agreeing nor disagreeing (Figure 24). Comments included “small domestic generating installations, rated smaller than the size of the supply should be treated under a more streamlined application process”. Other respondents acknowledged that whilst a strict interpretation of ESQCR would appear to prevent installations similar to those illustrated in Figure 23b from connecting under a fit and inform basis they consider that because the inverter is rated at 16 A/phase there is an argument that the source of energy from the ac electrical networks perspective is the inverter. They therefore argue installations similar to those in Figure 23b should be allowed to connect under a fit and inform basis. One respondent suggested that they would like to see the “fit and inform” limit being increased from 3.68kW to 8kW

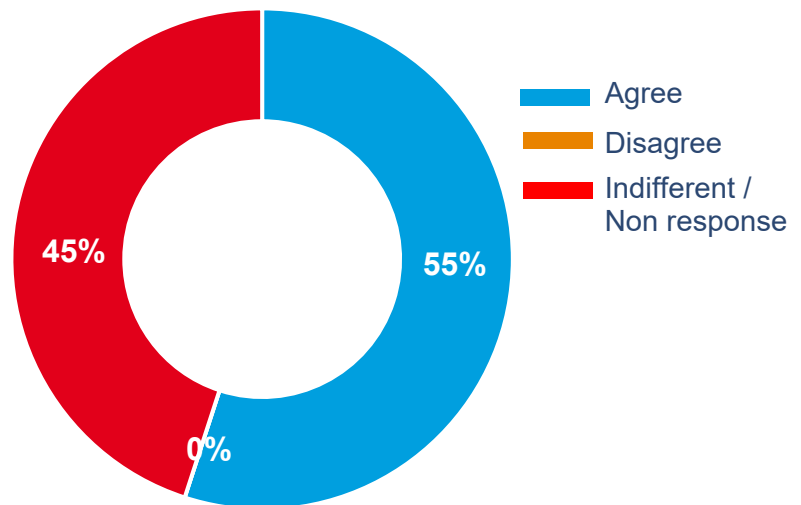


**FIGURE 24 - DO YOU BELIEVE THAT INSTALLATIONS SIMILAR TO THAT ILLUSTRATED IN FIGURE 8B, WHERE A TOTAL ENERGY SOURCE >16A/PHASE CONNECTS BEHIND A SINGLE INVERTER RATED AT 16A/ PHASE, SHOULD BE ALLOWED TO CONNECT UNDER AN ENGINEERING RECOMMENDATION G83/1 ARRANGEMENT ON A ‘FIT AND INFORM’ BASIS? IF SO, PLEASE SET OUT THE DETAIL.**



Conversely a small number of respondents raised concerns with the proposal depicted in Figure 23b. One respondent suggested that the fit and inform process may lead to unintended consequence of promoting a “sell it quick and move on” attitude, instead they suggest that the process should follow an approach of ‘Prove it, Fit it, Share it’. Another respondent suggested that the further connection of generation on a fit an inform basis may adversely impact the quality of the information provided to SONI in regard to zero export generation connected to the system.

Regarding Q8 in the CfE, whilst the majority of respondents agreed with NIE Networks’ proposal (Figure 25) some concerns were raised, for example one respondent suggested that the G59 fast track process may compromise the quality of network analysis carried out by SONI. Other respondents suggested that the G100 process may result in a slower connection process with additional connection costs. Finally one respondent warned against risks of battery storage by an overly ‘laissez faire’ approach from the DNO.



**FIGURE 25 - DO YOU BELIEVE THAT INSTALLATIONS SIMILAR TO THAT ILLUSTRATED IN FIGURE 8C, IF FITTED WITH A G100 EXPORT LIMITING DEVICE SHOULD BE ALLOWED TO CONNECT ON AN ENGINEERING RECOMMENDATION G59 “FAST TRACK” PROCESS? IN THIS CASE CUSTOMERS WOULD STILL BE REQUIRED TO CONTACT NIE NETWORKS TO RECEIVE PERMISSION TO CONNECT; HOWEVER, DUE TO THE REDUCED LIKELIHOOD OF CONSIDERABLE GRID IMPACT NIE NETWORKS WOULD BE ABLE TO EXPEDITE ANY NETWORK ASSESSMENT AND REVERT TO THE CUSTOMER, INFORMING THEM THAT THEY CAN OR CANNOT CONNECT TO THE NETWORK IN REDUCED TIMESCALES.**

Finally, although not specifically asked within the CfE, respondents also suggested that the DSO should accommodate connections with Non-Firm Access.



### 4.4.3 Proposed Approach

#### 4.4.3.1 Microgeneration

NIE Networks agrees with respondents that the quality of information on connected generation is essential to ensuring system security; however NIE Networks believes that by not adopting a new connections policy for microgeneration they will be operating against the desire of the majority of customers, will hinder the decarbonisation of the energy sector, particularly at domestic level, and will ultimately lead to poor data and increased cost for customers. The rationale for such is discussed below:

- NIE Networks strongly believes that the best way to acquire data from connecting microgeneration is by facilitating access to the network through efficient network connection policies. Whilst the existing connection policies have enabled significant volumes of microgeneration to connect to the network, industry has made it clear to NIE Networks that the connection policy for microgeneration is not fit for current requirements and will form a financial barrier to the deployment of domestic battery storage. In order to mitigate the risk of customers connecting such technologies outside of existing connection policy and not informing NIE Networks, NIE Networks believes that facilitating access to the network through efficient network connection policies will increase the likelihood of the customers informing NIE Networks that they have indeed connected such technologies. This will then allow NIE Networks to pass the aggregated volume of connected generation at each Transmission/Distribution boundary through to SONI on a monthly basis as per the current arrangement. Facilitating access to the network through efficient network connection policies will also help mitigate the risk of unregulated connection of generation without suitable G100 limiting control devices.
- If the proposed change to connection policy is not progressed, then this will present significant barriers to the connection of domestic energy efficiency schemes such as a PV and battery combination, through the requirement to install a stand alone protection relay and be subject to potentially long generation connection queues. This will ultimately result in a barrier to the decarbonisation of the energy sector. Contrary to one respondent's comment the deployment of the solutions outlined in Figure 23b and Figure 23c will significantly reduce the connection times for such schemes.
- Moreover, if the proposed change to connection policy is not progressed then this will mean that NI is out of line with all other parts of the UK. Consequently, customers in NI will have to pay more and wait longer to fit the same equipment as they would in GB. Alignment with GB ensures that NIE Networks can utilise the well established ENA type tested verification report register. Utilising this register will ensure that only proven technology can connect to the network alleviating

some respondents concerns that the process should follow an approach of ‘Prove it, Fit it, Share it’.

- Similarly, NIE Networks do not believe that the “fit and inform” limit should be increased from the existing 3.68kW level. By doing so would be in breach of ESQCR and would be out of step with GB. NIE Networks believe that the proposed amendments to this process will remove any blockers to the development of the microgeneration market whilst ensuring that the safety, security and quality of supply for all customers are unaffected.

Based on the responses received and the aforementioned rationale it is NIE Networks’ view that the proposed changes to the microgeneration connections policy is favourable and therefore should be progressed in a timely fashion to reduce the risk of large numbers of unauthorised connections. With the arrival of the ENTSO-e European codes NIE Networks is in the process of updating its various documents, including G83/1 and G59/1/NI. Following suit with GB, NIE Networks is adopting replacement documents called G98 and G99<sup>26</sup> respectively. In G98 the inverter rating will be used as opposed to total energy source, allowing customers to connect installations such as Figure 23b under a fit and inform arrangement. Furthermore, within G99 NIE Networks will include a fast track option whereby if solutions such as Figure 23c are G100 compliant then the NIE Networks’ network assessment would be performed in reduced timescales.

The existing generation connection process is outlined in Figure 22. The proposed connections process for microgeneration and G99 fast track is shown in Figure 26.

**CONSULTATION Q10: Do you agree with the proposed connections process for micro generation and G99 fast track as outlined in Figure 26? If not, please provide rationale.**

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<sup>26</sup> G98 and G99 documents will be consulted upon in 2019.

#### 4.4.3.2 Flexible Connections

Regarding respondents comments that NIE Networks should accommodate connections with non-firm access, NIE Networks are currently chairing a joint Connections Innovation Working Group (CIWG) with SONI. This group has been developed through a consultation process and will consider flexible<sup>27</sup> type connections for generation within areas with transmission constraints. This group comprises of experts from industry, UR and DfE.

As part of the DSO workshop held on 14<sup>th</sup> September 2018 the potential of introducing a flexible connections option to all applicants based on timed or active network management was discussed. In general, this was well received by attendees whilst appreciating that this may not suit all customers. It is important to note that a potential flexible connections offer will require the customer to be flexible within the terms of the offer.

**CONSULTATION Q11: Do you believe that NIE Networks should consider providing an option for a flexible connection in the future? If so, do you have a preferred method of flexibility to be implemented? How much detail do you require in relation to hours of constraint and connection offer lifetime?**

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<sup>27</sup> The ENA definition of flexible connections is as follows:

*Flexible Connections are connection arrangements whereby a customer's export or import is managed (often through real-time control) based upon contracted and agreed principles of availability of capacity. Timed Connections and connections utilising Active Network Management arrangements are examples of Flexible Connections.*

*Occasionally, Flexible Connections are also referred to as Managed Connections.*

*The need for network access to be managed may arise through capacity limitations which are local or remote from the Connection Point. For example, a Flexible Connection might comprise a Firm local connection, but with a constraint being present deeper in the network. Flexible Connections are offered to customers so that Reinforcement can be avoided or deferred.*

## Proposed Microgeneration and G99 fast track process

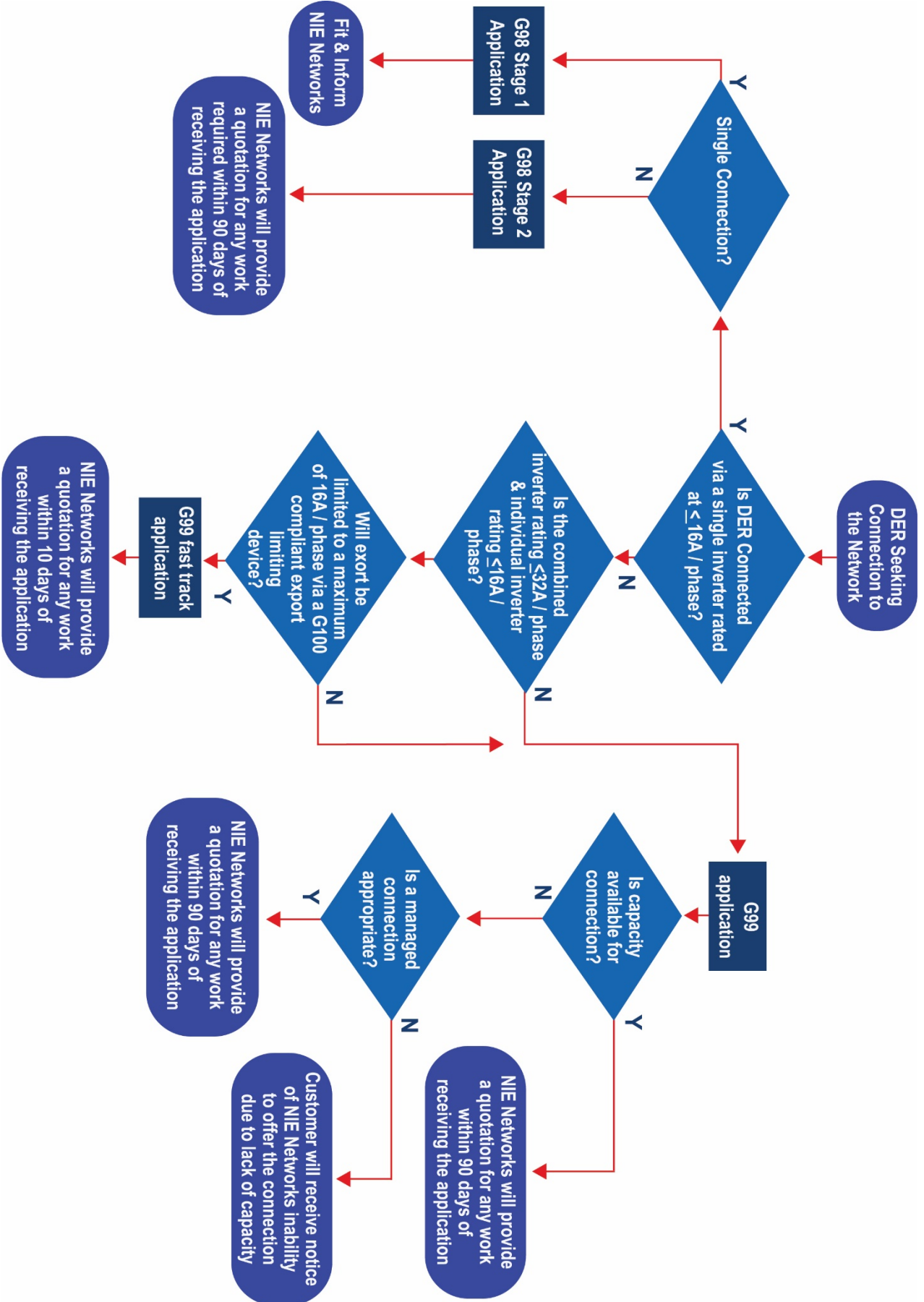


FIGURE 26

## 4.5 Data Provision

### 4.5.1 Call for Evidence overview

As the volumes of DERs connecting to the distribution network increases the need to have greater data and visibility of the network becomes more important, which is necessary to ensure the efficient development and operation of both the distribution and transmission system. Currently there is real time visibility through Supervisory Control and Data Acquisition (SCADA) down to 6.6kV circuit level; however, below these levels there is extremely limited real time data.

Three potential areas where the increased provision of data may be required between TSO and DSO and also the DSO and TSO to allow for the efficient development and operation of the electricity system include:

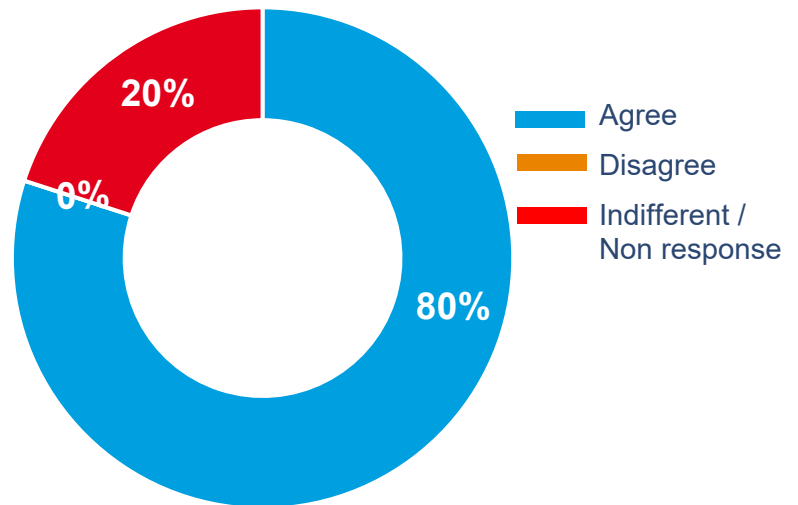
- Future data – data provided ahead of time
- Real Time data – data provided in real time
- Past data – data provided after an event

This DSO function had the largest number of questions associated with it in the CfE:

- Question 9a: Do you agree that the DSO/TSO requires increased data to efficiently develop and operate the system to help reduce network operating costs and facilitate greater access to the network for existing and future customers?
- Question 9b: Do you agree that to achieve this, increased levels of data need to be made available in the areas identified and be efficiently transferred between the TSO and DSO?
- Question 9c: Are there any other areas that you believe the DSO should have visibility of?
- Q10 (a): The provision of data and visibility of the network plays a significant factor in ensuring the efficient management and operation of the electricity network to help reduce energy costs. Do you believe that greater metering functionality is required in Northern Ireland to provide the DSO with increased data? If so, please set out in detail.
- Q10 (b): Do you believe customers should have increased access to network data? If so, please set out in detail.

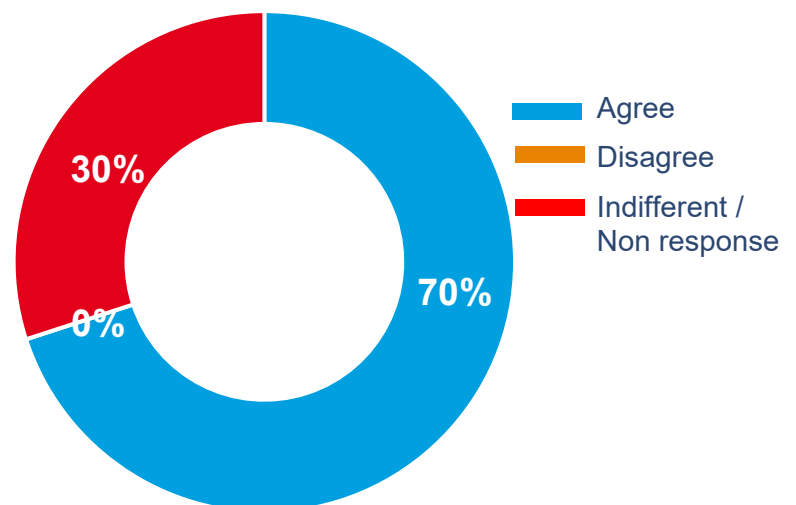
### 4.5.2 Call for Evidence Responses

Regarding question 9, the responses received strongly supported that the DSO/TSO requires increased data to efficiently develop and operate the system and that this data should be efficiently transferred between the TSO and DSO. No respondents disagreed with Q9 in the CfE. The responses received to question 9a and 9b are illustrated in Figure 27 and Figure 28 respectively: Some respondents suggested:



**FIGURE 27 - DO YOU AGREE THAT THE DSO/TSO REQUIRES INCREASED DATA TO EFFICIENTLY DEVELOP AND OPERATE THE SYSTEM HELP REDUCE NETWORK OPERATING COSTS AND FACILITATE GREATER ACCESS TO THE NETWORK FOR EXISTING AND FUTURE CUSTOMERS?**

- Higher levels of visibility on networks would allow for a reduction of curtailments, release new capacity for new generators and allow customers to make more informed business decisions. In general the use of information is likely to benefit customers and the DSO via the increased efficient operation of the system.



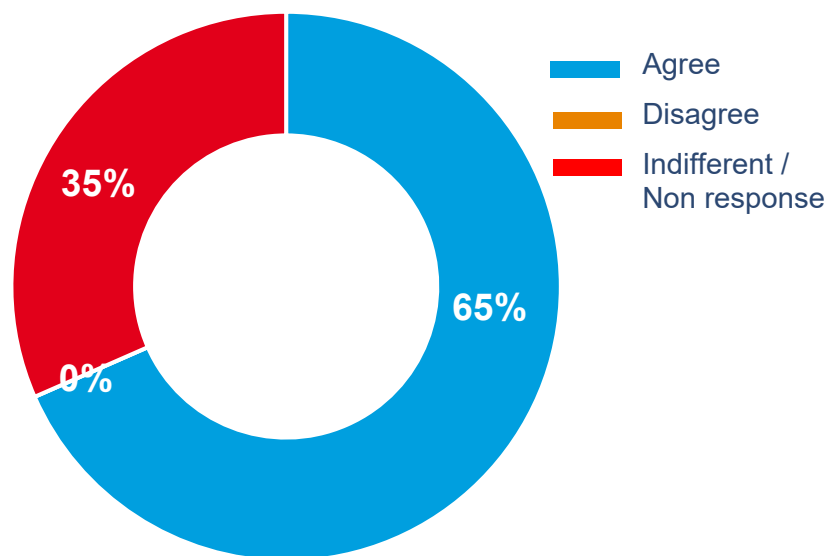
**FIGURE 28 - DO YOU AGREE THAT TO ACHIEVE THIS, INCREASED LEVELS OF DATA NEED TO BE MADE AVAILABLE IN THE AREAS IDENTIFIED AND BE EFFICIENTLY TRANSFERRED BETWEEN THE TSO AND THE DSO?**

- Higher levels of visibility are required of the networks down to the Low Voltage network at much shorter control cycles closer to real time.
- It is necessary to understand what data is required, in what location and with what granularity.
- The boundary between TSO and DSO should not represent a barrier to data flow.

- Instead of transferring all the actual; raw data from the DSO to TSO, there should be process efficiency and it may be useful for automatic reports or processed information to be exchanged only.
- Sharing of forecasting tools across DSO-TSO to align power flows and avoid any unnecessary curtailment.

Regarding question 10a 65% of respondents believed that greater customer metering functionality is required in Northern Ireland with the remaining respondents giving an indifferent or non-response. No respondents disagreed with Q10 in the CfE. Some respondents suggested that:

- The current metering arrangements are too simplistic while the scale of the NI market is too great to operate using quarterly meter readings.
- NIE Networks needs to explore the possibility of upgrading all meters to online versions.
- Although greater metering functionality could be advantageous, the cost of such metering should not be placed on the customer, either directly or in system charges.



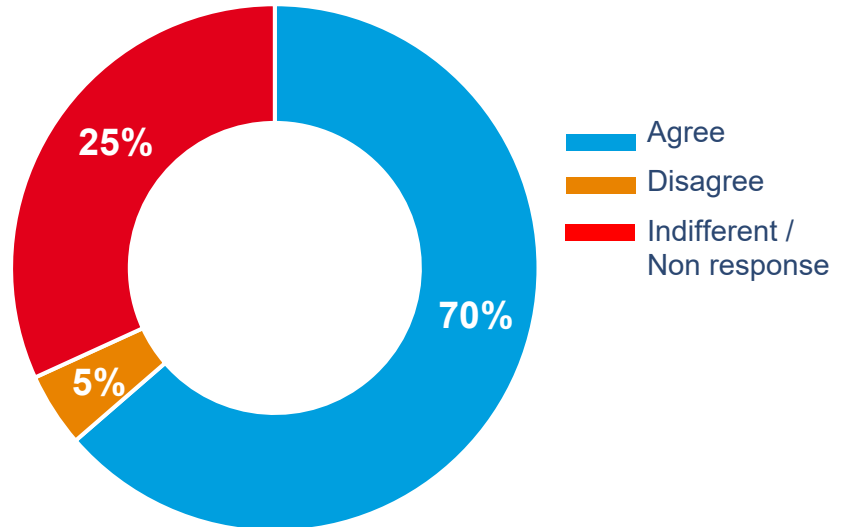
**FIGURE 29 - THE PROVISION OF DATA AND VISIBILITY OF THE NETWORK PLAYS A SIGNIFICANT FACTOR IN ENSURING THE EFFICIENT MANAGEMENT AND OPERATION OF THE ELECTRICITY NETWORK TO HELP REDUCE NETWORK ENERGY COSTS. DO YOU BELIEVE THAT GREATER METERING FUNCTIONALITY IS REQUIRED IN NORTHERN IRELAND TO PROVIDE THE DSO WITH INCREASED DATA? IF SO, PLEASE SET OUT IN DETAIL.**



Finally, regarding question 10b, 70% of respondents believed that customers should have increased access to network data, 5% disagreed with no explanation and the remaining 25% did not respond or issued an indifferent response.

Respondents suggested:

- This data in association with smart metering will give customers the information required to manage their electrical load and play a vital part in the overall management of grid capacity.



- The development of markets for flexibility and consumer-owned DERs depends on access to data.

**FIGURE 30 - DO YOU BELIEVE CUSTOMERS SHOULD HAVE INCREASED ACCESS TO NETWORK DATA? IF SO, PLEASE SET OUT IN DETAIL.**

- Information and data should be shared so that those wanting to connect load or generation can make informed choices early in their design; thus removing the possibility of paying a fee to be told there is no capacity available.

### 4.5.3 Proposed Approach

As described in the CfE there are three key areas where the provision of additional data is required to ensure the efficient development and operation of the system: Future data, Real Time data and Past data. It should be emphasised that this section refers to provision of additional data and not existing data or processes. Based on the responses from the CfE which strongly supported making more data publicly available, NIE Networks has included an additional key data area: Publicly available data. The definition of this function has also been changed to reflect this. Previously this function was defined as “Provision of detailed data between the TSO and DSO to enable more efficient system development and operation”. NIE Networks now proposes that this definition is changed to: “Provision of detailed data between the TSO, DSO and customer to enable more efficient system development and operation.”

The key data provision areas are described below:

## Future data

As the license holder for frequency management SONI has the responsibility for near time forecasting of demand and generation on the NI electricity system. Historically in the centralised electricity network forecasting has been very accurate; however, in the ever increasing decentralisation of the electricity network, with high levels of generators and control mechanisms such as managed generation connections this is and will become increasingly more difficult.

As owners of the real time distribution network model the most appropriate and efficient solution is for NIE Networks to develop near time forecasting functionality for the distribution system and present this information to SONI at Transmission and Distribution boundaries to enable more accurate whole system forecasting. By feeding weather forecast information and customer profile data into the Network Management System, it can be developed to deliver forecasting functionality and can take account of planned network outages and the real time status of the network. This approach aligns with respondent's suggestions of "sharing of forecasting tools across the DSO and TSO".

Ultimately, the accuracy of the forecasting will be dependant on the quality of customer profiling which relies heavily on data. Greater customer metering functionality would provide an abundance of this data. Relating to Q10a NIE Networks will continue to work with the Department for Economy (DfE) to supply the potential network benefits associated with greater customer metering functionality, allowing these to be fed into DfE's Cost Benefit Analysis (CBA) and subsequent decision.

With regards to the respondents comment for Q9b this proposal demonstrates that the boundary between TSO and DSO will not represent a barrier to data flow.

## Real Time data

As described in future data, real time generation data is provided to SONI on a site specific basis for generators greater than 5MW. However, to ensure the efficient balancing of the system SONI is seeking visibility of generators less than 5MW. This view was corroborated by the Ministerial Energy & Manufacturing Advisory Group Report (EMAG) recommendation<sup>28</sup>:

*"New distributed renewable (e.g. solar) projects over a certain threshold should be smart metered so that they are visible to the system operator, reducing demand forecast uncertainty and facilitating more efficient system operation."*

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<sup>28</sup> [https://www.economy-ni.gov.uk/sites/default/files/publications/deti/EMAG%20Report%20March%202016%20-%20submitted%20to%20DETI\\_0.pdf](https://www.economy-ni.gov.uk/sites/default/files/publications/deti/EMAG%20Report%20March%202016%20-%20submitted%20to%20DETI_0.pdf)

Whilst there is currently limited real time visibility of generators less than 5MW NIE Networks is rolling out a programme of SCADA to all generators greater than 200kW. This data is currently fed back to the NIE Networks control room. In accordance with the System Operator Network Code<sup>29</sup>, NIE Networks will provide real time information to SONI of the output from DERs, aggregated as per energy type. This will be presented to the TSO at every T/D boundary on the network via the existing Inter Control Centre Protocol link (ICCP). NIE Networks believes that the aggregation of this data, as opposed to the provision of site specific data to the TSO, provides an efficient method of data delivery between the DSO and TSO and aligns with respondents comments that “Instead of transferring all the actual; raw data from the DSO to TSO, there should be process efficiency and it may be useful for automatic reports or processed information to be exchanged only”.

As suggested by respondents in relation to Q9, NIE Networks agrees that higher levels of visibility are required of networks down to the Low Voltage (LV) network. Moving into the next regulatory period it will be necessary for NIE Networks to ensure that suitable allowances are included to increase visibility on constrained sections of the LV network<sup>30</sup>.

Respondents also suggested that it is necessary to understand what data and where data is required. As NIE Networks begin to increase visibility of the LV network, the roll out of this visibility will be prioritised at locations based on need. For example locations with a higher connection of LCTs might be targeted first. The data required at LV will be similar to the data currently retrieved on the HV network where parameters such as MW, MVA<sub>r</sub>, Voltage, Current, etc. are retrieved.

### **Past data**

NIE Networks currently fit disturbance recorders at all generation sites directly connected to the HV network for the purpose of diagnostics and performance monitoring of generation. Technical difficulties have meant that this data cannot currently be remotely accessed by NIE Networks. However, as the distribution network becomes more dynamic it is important that disturbance recorders can be remotely accessed for diagnostic purposes and to manage network performance in terms of voltage quality and background harmonics.

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<sup>29</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32017R1485>

<sup>30</sup> Subject to a positive Cost Benefit Analysis

## Publicly available data

Based on feedback received from the CfE NIE Networks has included a fourth key data area considering the provision of data for public use. This will include:

- Improved capacity maps for both demand and generation to improve customer investment decisions.
- As described in section 4.3 Congestion Management, NIE Networks are trialling innovation projects, some of which are seeking to develop market based solutions for network congestion. If successful, NIE Networks will be procuring solutions from industry to help manage network congestion, such as, but not limited to demand side response and energy storage services. In these scenarios, NIE Networks will be making the real time data for network congestion available to enable future market based solutions to manage network congestion in real time.

## **4.6 Network Management**

### **4.6.1 Call for Evidence overview**

When planning an outage, generation is sometimes required to be constrained when the system is abnormal. In general, generation is only connected and charged for a Normal System Operation (NSO) connection and therefore may have to be constrained under Abnormal System Operation (ANSO) feeding arrangements. Consequently, NIE Networks' control engineers will reduce the output from generators, if required, by sending SCADA signals or by instructing operational staff to disconnect generation from the system. When determining the level of constraints to apply, generally conservative assumptions are used, for example, when paralleling between two Bulk Supply Points (BSPs) it is current practice to ensure that there is zero reverse power flow at both substations prior to carrying out the parallel. In reality it may be appropriate to allow a level of reverse power flow without causing any network violations.

The CfE, in question 11, asked whether NIE Networks should invest in technologies to enable generation constraints on the distribution network to be reduced?

### **4.6.2 Call for Evidence Responses**

65% of respondents agreed with investment to reduce generation constraints with 5% disagreeing with no reasoning. The general consensus from the CfE was that it would be to the ultimate benefit of customers in offering greater support to the system operation and may avoid higher generation and ancillary service costs. Suggested examples of how this could be achieved are: increased network visibility, active network management, real time rating and optimisation, use of storage, managed connection and meshing of networks.

### 4.6.3 Proposed Process

Based on the feedback from the CfE and in order to appropriately manage the day-to-day operation of the distribution system with high levels of DERs connected to it NIE Networks believes that there are several key network management changes that are required relating to the following areas:

1. Outage Planning
2. Generation Constraints
3. Network Performance

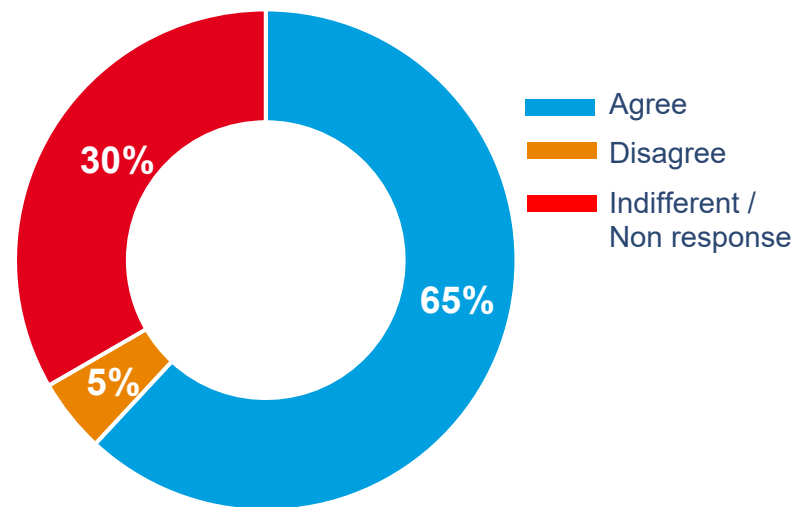
In order to ensure that NIE Networks continues to deliver quality service to customers NIE Networks believes that its Network Management System (NMS) will require significant development. Ultimately, NIE Networks plan to extend the area of NMS control to the LV network, where the vast volume of LCTs will be connecting, and in doing so will be able to manage higher levels of micro generation and customer demand from Electric Vehicles and heating. Currently, only the HV network is centrally controlled by NIE Networks' control centre. NIE Networks will therefore work with its NMS provider to ensure that it is fit for purpose as they evolve from a DNO to a DSO.

## 4.7 Charging

### 4.7.1 Call for Evidence Overview

NIE Networks' Distribution Use of System (DUoS) charges are set annually to recover allowed revenues as determined by the price control. By using cost reflective principles, DUoS charges provide network users with signals about the costs they confer on the distribution network in terms of investment and operation. The price signals should incentivise network users to make decisions on how and when they use the network to achieve the most economically efficient outcome. If customers change their behaviours in response to the price signals, this will ultimately reduce future network costs for the benefit of all network users.

The emergence of new LCTs and the growth in distributed generation is changing how and when the distribution network is used and will influence the effectiveness of NIE Networks' DUoS tariffs. The connection of heat pumps and electric vehicles have the



**FIGURE 31 - SHOULD NIE NETWORKS INVEST IN TECHNOLOGIES TO ENABLE GENERATION CONSTRAINTS ON THE DISTRIBUTION NETWORK TO BE REDUCED?**

potential to cause system peaks and network constraints. Set against this, the emergence of smart technologies and innovative business models offer opportunities to adjust supply and demand at times and places where there are network constraints, potentially reducing or deferring network reinforcement. NIE Networks' tariffs need to change to facilitate these opportunities and provide the appropriate incentives to both demand and generator network users.

NIE Networks' DUoS tariffs are primarily volume based with approximately 74% of distribution revenue recovered from unit (kWh based) charges. As customers generate more of their own electricity locally but still want to remain connected to the network for continuity of supply and to avail of system services, a higher proportion of network costs will be recovered from customers who are less willing or unable to reduce their electricity usage (passive consumers). In general, this will be domestic and small business customers and will include customers in vulnerable situations.

In the CfE three potential areas were set out for consideration for DUoS charging reform to meet the challenges and opportunities of the new technologies and facilitate flexibility:

- **Rebalance DUoS charges** – The amount of electricity taken off the distribution network is reduced when a customer produces their own electricity. As the DUoS tariffs are heavily weighted towards volume based unit charges (kWh charges), these customers will contribute significantly less to the cost of network development, operation and already incurred infrastructure costs. However, the decentralisation of generators does not reduce fixed network costs, for example the network must still be built to deliver peak demand. Reducing the proportion of costs recovered from volume based unit charges and increasing the proportion recovered from fixed charges, such as capacity or standing charges, could provide a fairer and more appropriate allocation of costs in the future as more network users install alternative energy sources reducing their electricity consumption.
- **New Tariff Groups or Charging Arrangements** – Under the current approach, network costs are allocated to each tariff group based on the “average” user within the tariff group. With the increasing adoption of LCTs such as electric vehicles, heat pumps and storage, customers on the same tariff may have a range of network usage profiles. Charges based on the average may not provide the appropriate price incentives for LCTs. New tariffs or pricing structures could be introduced to provide more appropriate price incentives for LCT and flexible users as well as locational signals for generators to site close to customer demand.
- **Time of Use Pricing** – In Northern Ireland, time of use DUoS tariffs are mandatory for large and medium business customers. Small business and domestic customers can however opt for single rate DUoS tariffs and the uptake of time of use tariffs in these sectors is low (less than 30% of small business and 5% of domestic customers). Suitable smart charging arrangements for new technologies



such as electric vehicles, heat pumps and storage are required. If these technologies were to cluster at certain parts of the network they could drive network reinforcement. Time of use DUoS tariffs for these technologies could provide price signals to influence customer behaviour, thereby avoiding network usage at peak times when the network is constrained.

Greater metering functionality is required to facilitate some new tariffs and appropriate time of use pricing to maximise customer benefit. Such changes in metering functionality will require consultation with electricity suppliers as well as discussion with DfE and the Utility Regulator in respect of wider metering strategy and price control impacts.

The CfE also noted that careful consideration will be required on how newer types of costs (e.g. expenditure on smart grid assets and flexible services) should be mapped to the tariff components as this will impact the proportion of costs recovered from each user group and individual network user.

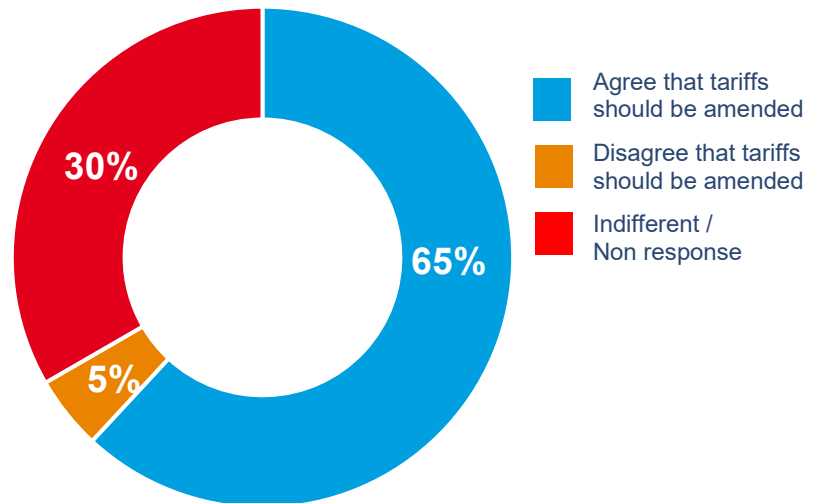
Within the CfE the following questions were asked:

- Q12 - Do you believe the existing tariffs are fit for purpose, or do they need amendment to deliver benefit to all customer types?
- Q13 – Do you believe the areas of potential change as outlined in this section, are correct? Are there other areas of change that should be considered? If so, please set out in detail.



## 4.7.2 Call for Evidence Responses

Regarding question 12 in the CfE, the majority of respondents (65%) agree that going forward NIE Networks' tariffs should be amended to make the most out of new technology and deliver benefits. 30% of respondents either didn't respond or were indifferent. Only one response stated that they considered the existing tariffs are fit for purpose and do not need to be amended. Figure 32 provides a summary of the responses to question 12.



**FIGURE 32 - DO YOU BELIEVE THE EXISTING TARIFFS ARE FIT FOR PURPOSE, OR DO THEY NEED AMENDMENT TO DELIVER BENEFIT TO ALL CUSTOMER TYPES?**

Question 13 also asked if the three potential areas for charging reform as described in the paper were correct and asked for feedback on other areas of change that should be considered. Of the 20 responses received, 15% were content that the changes proposed in the CfE were correct. 45% were generally positive about the changes proposed but provided suggestions of additional changes that should be considered, these are discussed below. 5% (one response) stated that the proposed changes were not correct but didn't provide any reasoning or other suggestions. Some respondents raised concerns and points that they believe NIE Networks need to consider when developing changes to charging arrangements.

In general, the respondents acknowledged that the way the electricity network is being used is changing and a review of tariffs is required to provide greater incentives for customer flexibility and network management. It was noted that the change in tariffs needs to be managed to support customers who are willing to adopt LCTs, manage their energy use and provide system and local services; however, those customers who are not participating in this way, and particularly vulnerable customers, need to be protected against unfairly high costs.

Several respondents mentioned the desire for tariffs to be transparent and fair. Some concerns were raised that if tariffs become overly complex it could result in uncertainty and could discourage investment in renewables.

There were also some specific suggestions made in the responses such as,

- A stepped down tariff to reward generators for lowering their usage through investment in renewables and batteries;
- Fractional tariffs for domestic customers, e.g. with normal consumption via a normal supplier, but with a variable and interruptible heating tariff linked to market prices and grid conditions;
- Tariffs to encourage users to operate heat pumps and charge electric vehicles at night to reduce the load during evening peak times;
- Tariffs based on utilised assets, rather than just energy delivered to encourage generators to connect in areas where demand is higher; and
- Smart grid technology where “time-of-use” price is enabled to address mismatches between electric vehicle load and renewable generation.

Further detail of the responses received to questions 12 and 13, and our comments on these responses are discussed in in Appendix 1.

#### 4.7.3 Proposed Approach

Taking account of the responses to the CfE, NIE Networks propose to undertake a comprehensive review of our DUoS charging methodology and separate consultation. This review will include detailed analysis of the allocation of costs to customer groups and types of charges and will take account of the potential change in costs incurred by NIE Networks with the evolution to DSO. NIE Networks’ DUoS charging methodology was introduced in 1992 based on the DUoS charging model used by GB DNOs at that time. While NIE Networks has introduced a number of new DUoS tariffs to facilitate flexibility and customer choice, the fundamental principles for the allocation of costs to customer groups and types of DUoS charges has remained unchanged.

NIE Networks also propose to consider GB DNO’s current charging arrangements and ongoing charging reforms for comparable and compatible solutions. In GB, similar to NI, the distribution network costs are recovered through two types of charges: ‘forward-looking’ charges designed to incentivise the efficient use of the network, and ‘residual’ charges which are top-up charges set to ensure that total allowed revenues are recovered. The GB charging reform has been ongoing for some time and includes the following charging projects lead by Ofgem:

**Targeted Charging Review<sup>31</sup> (TCR)** – launched in August 2017 to assess how residual network charges should be set and recovered in GB. Ofgem state “the TCR aims to address our concerns that the current framework for residual network charges could lead to inefficient use of the network, leading to adverse impacts on consumers”. Ofgem’s recent consultation paper<sup>32</sup> published on 28 November 2018, seeks views on their minded to decision on changes to residual charges and some embedded benefits for small generators and their draft impact assessment. Ofgem are minded to recover residual charges through fixed or capacity charges rather than unit based charges.

**Reform of Network Access and Forward-Looking Charges<sup>33</sup>** – launched in November 2017, the purpose of this project is to provide users with better signals about the costs and benefits they incur on the network at a particular time and place to facilitate Ofgem’s strategy for regulating the future energy system and plan for a smart, flexible energy system. On 18 December 2018, Ofgem published their decision on the scope and form of review for the access and forward-looking charging arrangements.

Given that the responses to the proposals in the CfE were generally positive NIE Networks propose to focus on developing options for the three areas of charging reform set out in the CfE and will be subject to a separate consultation. These areas for reform have been considered by the DNO’s in GB:

- **Rebalance DUoS Charges** – reduce the proportion of costs recovered from volume based unit charges and increase the proportion recovered from fixed charges (i.e. capacity or standing charges), to provide a fairer and more appropriate cost recovery from all customers.
- **New Tariff Groups or Charging Arrangements** – develop new cost reflective tariffs or charging arrangements to recognise common modes of behaviour, with price incentives for LCT and flexible users, and charging arrangements to encourage generators to site close to customer demand.
- **Time of Use Pricing** – this area of reform has two parts:
  - Encourage a higher uptake in Economy 7 tariffs by small business and domestic customers in general; and
  - Develop appropriate time of use charging arrangements for new technologies.

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<sup>31</sup> <https://www.ofgem.gov.uk/electricity/transmission-networks/charging/targeted-charging-review-significant-code-review>

<sup>32</sup> Ofgem’s consultation “Target Charging Review: Minded to decision and draft impact assessment”.

<sup>33</sup> <https://www.ofgem.gov.uk/electricity/transmission-networks/charging/reform-network-access-and-forward-looking-charges>

It is not possible at this time to define more detailed proposals on any changes to charging arrangements until the decisions on the DSO vision have been made and GB charging arrangements have been fully considered. NIE Networks will engage further with market participants and the UR, including the issuing of a separate consultation, as more detailed proposals for charging reform are developed.

NIE Networks appreciates the feedback received on charging reform to date from respondents to the CfE. The alternative options proposed by the respondents (such as those listed in section 4.7.2 above) and concerns they raised in the CfE will be considered in the development of the proposed charging reforms.

NIE Networks will also consider the balance of costs between customer groups when developing options as it will be important to encourage the uptake of new technologies, but it will also be important to protect other customers, including vulnerable customers, who are less able to adopt new technologies.

The range and complexity of NIE Networks' proposed charging reforms will require sufficient time to develop options and assess their impact on customers. It is anticipated that the charging reforms will be developed in RP6<sup>34</sup> with a view to implementing the reforms in RP7<sup>35</sup>. However, introducing some reforms earlier may be considered to maximise customer benefit if agreed with the UR.

There are no specific questions in relation to charging arrangements within this consultation paper as NIE Networks intend to consult publicly at a later date on more detailed proposals for charging.

**CONSULTATION Q12: Please indicate if you would like to be included on a circulation list for this subsequent consultation and provide relevant contact names and email addresses.**

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<sup>34</sup> RP6 refers to NIE Networks' regulatory price control which covers the period 1 October 2017 to 31 March 2024

<sup>35</sup> RP7 refers to NIE Networks' regulatory price control which is due to commence on 1 April 2024

## 5. IMPLEMENTATION PLAN

NIE Networks are adopting a least regrets approach to the evolution from a DNO to a DSO. This means that NIE Networks will be evolving their current systems and processes as opposed to investing in wholesale changes. Whilst adopting a least regrets approach will minimise the funding requirement, a need will still exist for funding in order to implement the DSO vision outlined in section 4. At this early stage accurate costs associated with the enablers cannot be quantified. Whilst some of these enablers will already have associated funding allowances within the RP6 period, additional funding may be required to enable progress and NIE Networks will explore with the UR the best approach to minimise additional costs for the general customer base.

A list of the expected enablers to deliver the DSO vision outlined in Section 4 is shown below in Table 8.

DSO Function		Enabler	
Market Facilitator	Active Power	Network Capacity Allocation Platform	Tech development and trial
			BaU roll out
	Reactive Power	Nodal Controller	Tech development and trial
			BaU roll out
Service Provider		Tech development and trial	
		BaU roll out	
Congestion Management		Smart and market based solution trials	
		BaU roll out	
Connections		G99 & G98 codes	

<b>Data Provision</b>	Future	Forecasting functionality development
		BaU roll out
	Real-time	SCADA roll out to SSG
		Increased visibility of LV network <sup>36</sup>
	Past	Disturbance recorder data
	Publicly available	Network Capacity Maps
		Network data to enable market based solutions
	<b>Network Management</b>	
		BaU roll out
<b>Charging<sup>37</sup></b>		Charging reform development
		Charging reform implementation

**TABLE 8**

It should be noted that the delivery of this will not be a step change as the development of each function will happen over various durations. High level indicative timescales for key enablers are shown in Figure 33. These may change if/when new energy policy is introduced.

**CONSULTATION Q13: Do you agree with the indicative implementation timescales illustrated in Figure 33? If not, please provide rationale.**

<sup>36</sup> Related to DfE decision on greater customer metering functionality.

<sup>37</sup> Related to DfE decision on greater customer metering functionality.

Key enablers – high level indicative timeline

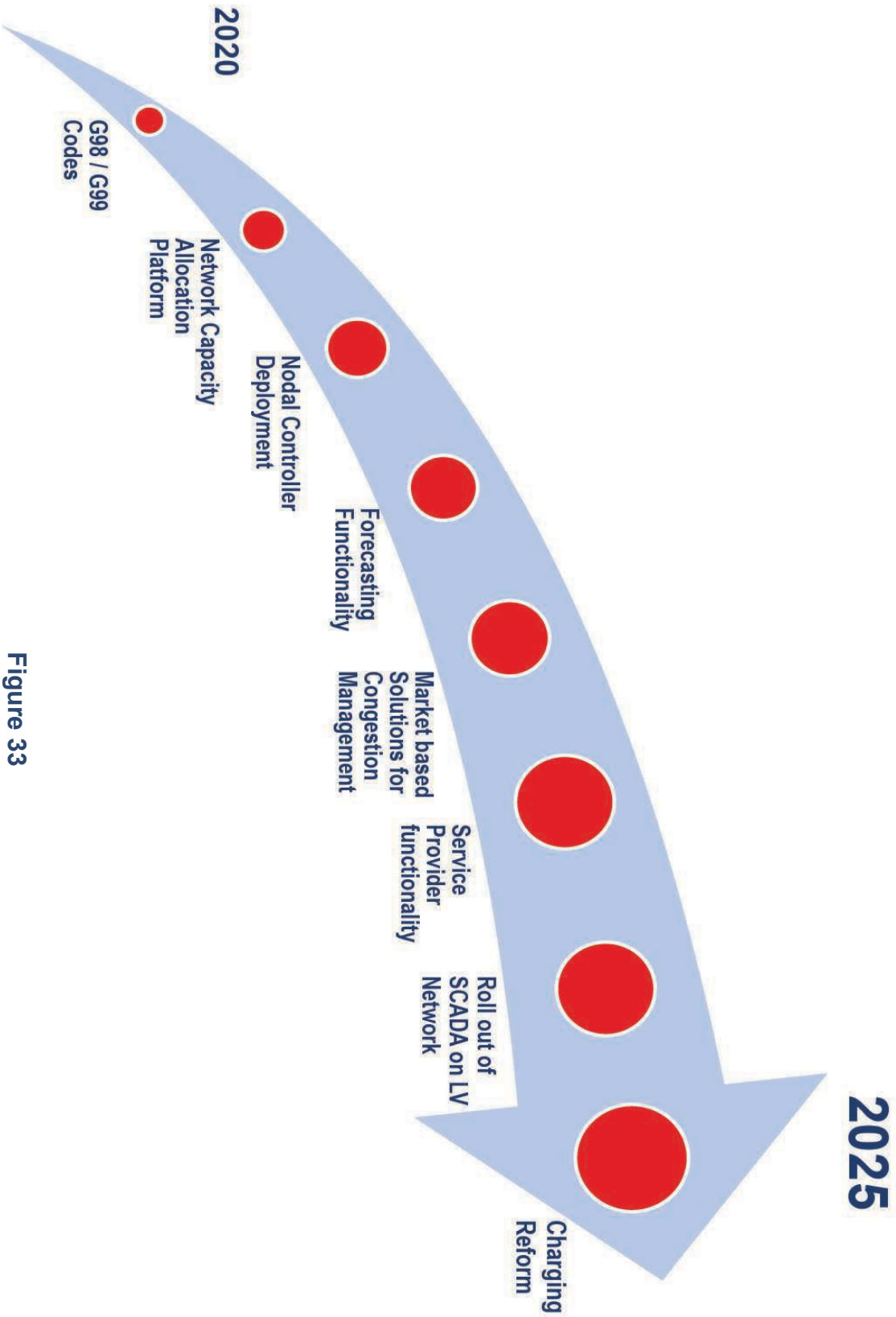


Figure 33



## 6. RESPONDING

Although NIE Networks is keen to receive responses to all questions within this Consultation, it appreciates that respondents' areas of interest may vary depending on their DSO Customer type. Respondents may answer all questions or only those that are relevant to them. More general comments are also welcomed.

A summary of all the questions asked is shown below:

**CONSULTATION Q1:** Do you believe that passive consumers are suitably protected by the DNO to DSO evolution proposed? If not, please provide examples of suitable protections.

**CONSULTATION Q2:** Do you agree that there are currently no policy or regulatory inhibitors preventing the commencement of the DNO to DSO evolution? If not, please provide rationale.

**CONSULTATION Q3:** Do you agree with the identified policy inhibitors that may become prevalent in the medium term? If not, please provide rationale.

**CONSULTATION Q4:** Do you agree with the proposed architecture for the Network Capacity Allocation Platform? If not, please provide an explanation.

**CONSULTATION Q5:** Do you agree with the proposed running sequence of the NCAP, as outlined in Figure 11? If not, please provide an explanation.

**CONSULTATION Q6:** Which, if any, PoA arrangement do you believe should be used in the Network Capacity Allocation Platform? Please provide rationale.

**CONSULTATION Q7:** Do you agree with the phased approach regarding the delivery of the Nodal Controller solution? If not, please provide rationale.

**CONSULTATION Q8:** Which service provider option do you feel should be adopted by NIE Networks? Please provide rationale for your selection.

**CONSULTATION Q9:** Do you agree with the proposed approach, outlined in Figure 21, for managing congestion on the electricity network? If not, please provide rationale.

**CONSULTATION Q10:** Do you agree with the proposed connections process for micro generation and G99 fast track as outlined in Figure 26? If not, please provide rationale.

**CONSULTATION Q11:** Do you believe that NIE Networks should consider providing an option for a flexible connection in the future? If so, do you have a preferred method of flexibility to be implemented? How much detail do you require in relation to hours of constraint and connection offer lifetime?

**CONSULTATION Q12:** Please indicate if you would like to be included on a circulation list for this subsequent consultation and provide relevant contact names and email addresses.

**CONSULTATION Q13:** Do you agree with the indicative implementation timescales illustrated in Figure 33? If not, please provide rationale.

Responses should be submitted via email to [Carl.Hashim@nienetworks.co.uk](mailto:Carl.Hashim@nienetworks.co.uk). Please note that NIE Networks intends to publish all responses to this paper online at [www.nienetworks.co.uk](http://www.nienetworks.co.uk). Respondents who wish their response to remain confidential should highlight this when submitting their response.

## 7. NEXT STEPS

The responses to this consultation will be analysed by NIE Networks and will be used in the development of a subsequent Recommendations Paper which will be submitted to the UR and will set out the finalised DSO plan and seek approval to proceed on the implementation of this plan.

Key Milestones	Proposed Date
Consultation Release	25 <sup>th</sup> Feb 2019
Consultation Close	20 <sup>th</sup> May 2019
Recommendations Paper to UR	Q3 2019

## 8. APPENDIX 1

A more comprehensive summary of the CfE responses accompanied by NIE Networks' associated views can be found at the following location:

[https://www.nienetworks.co.uk/getmedia/aa000f7d-5f17-4745-aae8-8b9db5d0ff2c/Greater-Access-to-the-Distribution-Network-in-Northern-Ireland\\_Consultation\\_Appendix-1.pdf.aspx](https://www.nienetworks.co.uk/getmedia/aa000f7d-5f17-4745-aae8-8b9db5d0ff2c/Greater-Access-to-the-Distribution-Network-in-Northern-Ireland_Consultation_Appendix-1.pdf.aspx)

## 9. APPENDIX 2

All non-confidential CfE responses can be found at the following location:

[https://www.nienetworks.co.uk/getmedia/8c6a5c36-4136-4e21-bbca-fb3d6d3205ee/Greater-Access-to-the-Distribution-Network-in-Northern-Ireland\\_Consultation\\_Appendix-2.pdf.aspx](https://www.nienetworks.co.uk/getmedia/8c6a5c36-4136-4e21-bbca-fb3d6d3205ee/Greater-Access-to-the-Distribution-Network-in-Northern-Ireland_Consultation_Appendix-2.pdf.aspx)



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