
CONSULTATION ON CONNECTING FURTHER GENERATION IN NORTHERN IRELAND

CONSULTATION PAPER

31st January 2018



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2. INTRODUCTION

This document follows on from the joint SONI and NIE Networks connections process Workshop of 18 August 2017, which highlighted the level of connected and committed renewable generation at 1.8GW and progress towards the Government target of 40% electricity consumption from renewables, and is further to the Consultation Call for Evidence (CfE) document issued on 12 October 2017. These recent interactions also highlighted the lack of unused capacity at Transmission and Distribution level, without the need for additional system reinforcement, and the conclusion of processing applications under Phase 1, albeit with a small number of exceptions in certain discrete locations such as some existing or designated clusters.

Furthermore, and in light of considerable uncertainty around the likelihood of further proactive network investment for renewable generation being approved by the Utility Regulator (UR) without the support of new government energy policy, stakeholders were invited to explore, with NIE Networks and SONI, how further connection offers might be made in the future, i.e. by adopting more innovative approaches rather than traditional network investment.

The stakeholders' response to the CfE has provided NIE Networks and SONI with a very helpful insight on stakeholder views across a broad range of related matters including the technical, commercial, process and information sharing arrangements that they believe would be central to moving forward with further connection of generation in Northern Ireland.

NIE Networks and SONI also welcome the UR encouraging us to consider what is working well in other jurisdictions facing similar challenges and to transparently evidence what may (or may not be) suitable in Northern Ireland. The UR has also indicated support for NIE Networks' and SONI's stated aim of taking forward solutions which meet the test of being commercially viable for developers, but which also sit within the wider obligations on NIE Networks and SONI to develop an economic and efficient grid.

The stakeholder feedback has focused on the need to release further capacity as soon as practical and also brought forward strong views on matters including:

- Prioritisation of different types of technologies connecting to the grid;
- Mechanisms to limit capacity hoarding;
- The need to update cluster rules;
- Introducing policy changes to enable rebates at Distribution level, which may require legislative changes.

In respect of the current Alternative Connection Application and Offer Process (ACAOP) arrangements for capacity allocation and as a result of the UR's recently stated position in its Review of Electricity Distribution and Transmission Connections Policy Decision Paper

issued on 31st May 2017¹, that it will not approve further 'block extensions' for the issuing of connection offers, it is now necessary for NIE Networks and SONI to introduce an updated set of rules to address the UR's position and the requirement to make connection offers (and in the case of NIE Networks, subject to capacity being available) even where planning permission is not in place. NIE Networks and SONI wish to take the opportunity to understand stakeholder views on how best to update capacity allocation rules.

In preparing this consultation paper NIE Networks and SONI have taken account of the CfE feedback and have given consideration to a number of relatively complex matters that must be resolved. This includes consideration of where further connection opportunities might lie going forward.

This consultation document addresses a number of aspects of Connection Policy, which are:

- Imminent Process Modifications – to address immediate issues with the Phase 1 rule set in the changing generation connection process landscape;
- Potential DS3 Prioritisation – to consider how DS3 system service providers may be prioritised;
- Potential Capacity Solutions – to establish, in parallel with the SONI-EirGrid Hybrid Working Group, an industry working group to investigate potential innovative alternative connection methods.

There were some other areas brought up by respondents such as rebates and cluster rules that were out of scope and as such would be considered through separate processes.

¹<https://www.uregni.gov.uk/sites/uregni/files/media-files/Electricity%20Connections%20Decision%20FINAL.pdf>

3. NETWORK CAPACITY AND OPERATIONAL CAPABILITY

Following the successful conclusion of Phase 1 of the ACAOP, NIE Networks and SONI initiated this consultation process against the backdrop of a rapidly changing landscape for connections, and in particular, generation connections in Northern Ireland. The connection of further generation in Northern Ireland must be considered in light of the following:

1. Network saturation for generation and network capacity exhaustion;
2. Likely achievement of Government renewable targets and absence of new energy policy beyond 2020;
3. Uncertainty around justification of network investment without the support of new energy policy and;
4. Closure of Northern Ireland Renewable Obligation (NIRO) scheme with no current indication that future incentive schemes will be put in place.

Further to these capacity and incentive issues, the stakeholder must also consider the impact of the Single Electricity Market (SEM) transition to Integrated Single Electricity Market (I-SEM)², changes to Generation Connection Standards (with regards to change in Rate of Change of Frequency (RoCoF) standards and incoming EU Network Code on Requirements for Generators)³, contestable market for new connections and technological advances and cost reductions in technologies.

Alongside these changes, the CfE set out in detail the technical challenges associated with allocating capacity and operating the system with increasing levels of renewable and uncontrollable generation for both NIE Networks and SONI. For further details please refer to the CfE document⁴.

The complete generation queue was assessed during Phase 1 of the ACAOP and offers were made where capacity was available and no Associated Transmission Reinforcements (ATRs) were required as a result. There still remains limited potential to connect at a number of nodes. The aim of the below sections is to provide network information where such potential may be available.

3.1 REMAINING TRANSMISSION LEVEL CAPACITY

With Phase 1 of the ACAOP process having now reached conclusion, remaining Transmission capacity (without the need for additional system reinforcements) for generation has been substantially exhausted, except for those specific circumstances previously referred to (e.g. existing or designated clusters).

Prior to 30 November 2017, NIE Networks issued letters informing circa 240 applicants that an offer of connection could not be made due to the lack of capacity now remaining on the

² www.sem-o.com/isem/Pages/Home.aspx

³ ec.europa.eu/energy/en/topics/wholesale-market/electricity-network-codes

⁴ www.nienetworks.co.uk/documents/Generation/Generation-Consultation-SONI_NIE-Networks.aspx

network, notwithstanding other issues that may also have applied to particular applications (as per NIE Networks Electricity Distribution Licence, Condition 30 and the Electricity (NI) Order 1992, Article 21).

The UR's decision of June 2017⁵ highlighted that under its interpretation of the framework, SONI may not use the sole grounds of insufficient Transmission capacity to refuse to make offers for connection to the Transmission System. Typically applicants seeking to connect to the Transmission System are larger scale projects due to the significantly higher costs associated with a Transmission connection. This is likely to remain the same going forward, as projects need to be commercially viable and the cost of the connection is a key consideration.

In providing such offers SONI will identify ATRs required to deliver the full Firm Access Quantity (FAQ). For renewable generation projects however, there is uncertainty over whether regulatory approval for these investments would be achieved for the ATRs in the absence of a renewable policy that takes us beyond the current Government target of 40% electricity consumption from renewables.

Appendix 1 provides a summary of the Transmission assessment carried out by SONI as part of the ACAOP Phase 1 process and includes information on the capacity status of Transmission nodes where applications were received.

The outcome of this assessment was that the binding limitation for any further generation beyond Phase 1 is the limited transfer capacity between Northern Ireland and the Republic of Ireland during times of minimum load. This overriding limitation is in addition to the various local network constraints found at both Transmission and Distribution level. It should also be noted that the new North-South interconnector has been assumed to be operational in all Phase 1 studies.

There is, therefore, no remaining Transmission capacity for any further generation in Phase 1 that could export power onto the network during a minimum load scenario, except for generation that might utilise existing designated capacity at cluster substations.

At a number of Transmission nodes there may be some limited potential capacity for generation which does not export power at minimum load times, which will need to be considered on a case by case basis. Such generation will require a detailed Transmission assessment, in order to determine if an offer for connection can be made and in such circumstances, an extension to NIE Networks Distribution Licence Condition 30 (90 day standard) may be required.

⁵ www.uregni.gov.uk/sites/uregni/files/media-files/Electricity%20Connections%20Decision%20FINAL.pdf

3.2 FIRM ACCESS

Firm access is a market concept in the SEM and only applies to generation connections with a Maximum Export Capacity (MEC) of 5 MW and above. Firm access is a measure of the Transmission capacity available to generators connecting to either the Transmission System or the Distribution System.

The level of firm access available on the Transmission System for a generator is known as that generator's FAQ. A generator is said to have full firm access to the Transmission System if their FAQ is equal to their MEC. Under current market arrangements in the SEM⁶, generators with firm access may receive compensation based on their availability up to the generator's FAQ in the event that its output is reduced by the Transmission System Operator (TSO). To calculate a generator's FAQ, the TSO carries out detailed studies to determine the point at which the generator causes any issues (i.e. the Transmission System is not compliant with the planning standards) during likely outages on the Transmission System. The output of the generator at the point that the issue is caused becomes that generator's FAQ. The methodology is contained in the FAQ Decision Paper July 2013⁷.

If a generator causes issues on the Transmission System, the TSO will identify how the Transmission System should be strengthened to mitigate any breach in planning standards. These reinforcements, known as ATRs, will then be included in the studies with an estimated lead time for delivery, which will in turn release firm access to generators in the queue. Presently, each generator is given a list of ATRs and the FAQ that is released by the delivery of these ATRs. When all the ATRs associated with a generator's FAQ are complete the generator will have full firm access (i.e. the generator's FAQ will equal its MEC).

Firm access is currently ordered, assessed and granted based on the later of:

- Date valid connection application received ('Date 1') or;
- Planning permission or relevant consents⁸ granted date ('Date 2').

Where, for each application, the later of Date 1 and Date 2 will be the 'Key Date' and the application with the earliest Key Date will be first in the queue and so forth.

SONI and NIE Networks do not propose a change to this FAQ rule set as part of this consultation. It should be noted that the continuance of this rule set for future connections will mean that generators 5MW and above will not be able to receive an FAQ assessment until such times as they have obtained planning permission or relevant consents. This will also mean that the FAQ list will be ordered differently from the connection queue.

⁶ More information on SEM rules can be found in the Trading and Settlement Code at www.sem-o.com/MarketDevelopment/Pages/MarketRules.aspx

⁷ www.soni.ltd.uk/media/documents/Generator%20Connection%20Process%20Decision%20Paper%20-%20July%202013.pdf

⁸ Refer to Appendix 3

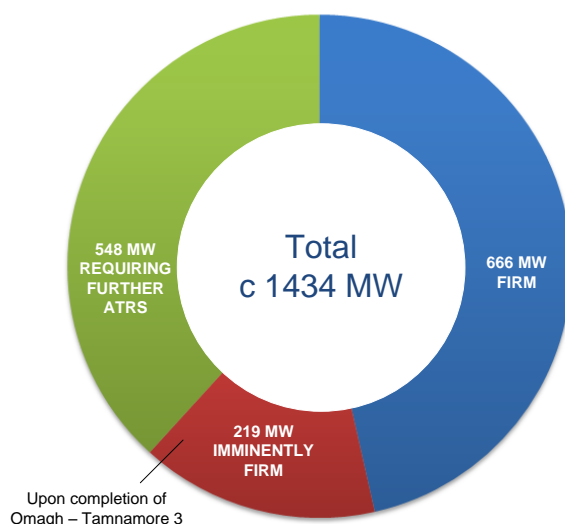


FIGURE 1: OVERVIEW OF THE FAQ STATUS OF COMMITTED AND CONNECTED RENEWABLE GENERATION ≥ 5 MW AS OF JANUARY 9TH 2017

ATR		Project Status
1	Third Omagh – Tamnamore 110 kV Circuit	Complete (January 2018)
2	Omagh – Dromore 110 kV Double Circuit Uprate	Pre-construction
3	Voltage Support	Pre-construction outline design
4	New 400 kV North - South Tie-Line	Pre-construction
5	Coolkeeragh – Magherafelt 275 kV – Asset Replacement Project	Pre-construction
6	Kells – Rasharkin 2 - New 110 kV Circuit	Pre-construction outline design
7	Ballylumford – Eden 110 kV Double Circuit Eden – Carnmoney 110 kV Double Circuit Carmmoney – Castlereagh 110 kV Double Circuit	Project Definition
8	Further Reinforcement of the Western Network	Project Definition

TABLE 1: ATRS TO BE COMPLETED

3.3 REMAINING DISTRIBUTION LEVEL CAPACITY

NIE Networks is at the advanced stages of development of a capacity map which is intended to be published in Q1 2018. This will illustrate where Distribution capacity may be available in Northern Ireland, should Transmission capacity become available.

NIE Networks is continuing to offer zero export and over install arrangements alongside micro generation connections. It is important to note that such projects may be dependent, in certain locations, upon the load erosion funding and associated network reinforcement that was detailed in the CFE (section 6.1.3). Some of these larger network reinforcement schemes may take a number of years to deliver due to their size and complexity. It should also be noted that the fault level limitations of the network may also impede these types of projects.

Changes to micro generation standards are due Q2 2018, which should provide more flexibility to enable battery installation behind the meter. For more information on changes to micro generation please visit the NIE Networks Website⁹.

⁹ www.nienetworks.co.uk/Connections/Generation-connections/micro-scale

4. SUMMARY OF CALL FOR EVIDENCE RESPONSES

We would like to take this opportunity to thank those who have taken the time to respond to our CfE. The feedback received from 16 stakeholders provides a solid platform upon which to build a comprehensive and engaging consultation process.

The call for evidence set out three main question areas:

1. Industry market information
2. Solutions to capacity restrictions and
3. Capacity allocation and connections process

4.1 MARKET INFORMATION

A significant number of respondents stated that there is still a commercial appetite for Large Scale Generation (LSG) to connect and that a market remains beyond meeting the target of 40% generation from renewable sources by 2020 even with the removal of financial support mechanisms. Respondents noted that the decarbonisation of heat and transport will continue to drive a market for further renewable connections.

Respondents also stated that mature renewable technologies such as large scale wind and solar are now amongst the cheapest forms of electricity generation due to significant drop in costs of building renewable generation

The responses from Small Scale Generation (SSG) developers suggested that without a financial support mechanism to incentivise SSG connections, the opportunities were limited. Respondents indicated that it was unlikely that the connection of SSG was feasible for new export connections in the market, but only for connections which allowed the maximising of existing MEC. Zero net energy and energy storage behind the meter were highlighted as possible markets for SSG.

Some respondents emphasised that the loss of financial support mechanisms for renewables may have a significant impact on investment decisions (including LSG projects). Given this backdrop it is evident that developers will be giving careful consideration to the financial implications of any connection arrangements.

4.2 SOLUTIONS TO CAPACITY RESTRICTIONS

The responses indicated significant levels of support for more innovative connection arrangements which encompassed a number of themes including:

- Further optimisation of existing MEC at connection points;
- Building on the ongoing work of the Hybrid Site Working Group;
- Enabling managed export arrangements;
- Taking account of the time when output restrictions might apply (cf. SNSP) and;
- Allowing for energy storage / batteries.

4.3 CAPACITY ALLOCATION AND CONNECTION PROCESS

The responses highlighted the need to avoid capacity hoarding, particularly in light of the capacity restrictions. Respondents again confirmed strong support for the re-introduction of Planning Permission¹⁰ as a pre-requisite at the time of application as a means to mitigate this risk. Beyond the use of Planning Permission various views on the application, timing and enforcement of certain milestones were also expressed.

A number of respondents highlighted the case for various forms of prioritisation for the allocation of capacity, for example linked to the provision of system services in line with DS3 to support system security arrangements for generation efficiency, with views less aligned on the form of prioritisation that might apply.

Nevertheless, the overall responses are in line with NIE Networks and SONI's aim of taking forward solutions which may be commercially viable for developers, and which also sit within the wider obligations of SONI and NIE Networks, to develop an economic and efficient grid while not unduly discriminating between applicants.

5. IMMIMENT PROCESS MODIFICATIONS

The following key principles for capacity allocation and connection process, that were consulted and agreed upon through the previous ACAOP consultation (known as 'Phase 1'). The ACAOP principles were based on stakeholder feedback received at a time when the closing NIRO deadlines were a key consideration for the renewables industry in Northern Ireland (where the renewables industry represented, by far, the largest market segment of the generation connections market).

The focus of these principles was to facilitate the connection of projects that were ready to proceed and provide every applicant with the best possible chance of availing of connection by efficiently exhausting all existing capacity across the network.

Phase 1 Principles:

- Export capacity applicants ordered by latter date of planning permission or relevant consents granted or receipt of valid connection application;
- Overinstall facility allowing additional 20% installed capacity on existing MEC's;
- Zero-export limit introduced and kept under review against operational constraints of the system.

These principles were successful in their aims as previously stated, with almost 200 projects receiving connection offers.

As noted in *Section 3*, there are changing factors that have led to the requirement for an updated connection process. A key factor that must be addressed is the UR consultation

¹⁰ Refer to Appendix 3

decision that extensions should be the exception, rather than the norm¹¹, going forward. This effectively means that a system-wide Transmission queue, which every applicant entered in the Phase 1 process, no longer exists.

Following the UR Decision Paper (May 2017), the practical implementation of the Phase 1 principles has changed somewhat between NIE Networks and SONI, due to each parties need to abide by their respective licence obligations to issue a connection offer within 90 days of receipt of a valid connection application.

By virtue of it's Distribution Licence and the Electricity Order (NI) 1992, NIE Networks is exempt from issuing connection offers under the circumstances set out by the Distribution Licence Condition 30 and Article 21 of the Electricity Order (NI) 1992. An example of where NIE Networks is exempt from the issue of a connection offer is where there is a 'lack of capacity' to do so. Practically, the process for extensions (e.g. extensions no longer the norm) means that applicants would instead receive notice that NIE Networks will be unable to issue a connection offer where there is no capacity.

The UR decision of May 2017 confirmed its interpretation of the framework that SONI may not use the sole grounds of insufficient Transmission capacity as an exemption to providing offers for connection to the Transmission system. SONI is therefore obliged to make connection offers, where these are not covered by the exemptions in its licence, and in doing so will identify the ATRs required to deliver full firm access. For renewable generation projects, there is uncertainty over whether regulatory approval for investment would be granted for ATRs in the absence of a renewable policy that takes us beyond the 40% target.

Current Application of Phase 1 Principles with no Connection Queue (where extensions are not the norm)

- Generation capacity applicants ordered by receipt of valid application;
 - Distribution connection offers issued where capacity is available, Electricity Order adhered to and exemptions applied where there is a 'lack of capacity';
 - Transmission connection offers issued with ATRs identified (uncertain whether ATRs might ever progress);
- Overinstall facility allowing additional 20% installed capacity on existing MEC's kept under review;
- Maintain review of Zero-export against operational constraints of the system.

¹¹ www.uregni.gov.uk/sites/uregni/files/media-files/Electricity%20Connections%20Decision%20FINAL.pdf

5.1 TRANSMISSION PROCESS - SONI CONNECTION POLICY UPDATE

Please note that, separate to this consultation, SONI has published a policy explaining the process for making an application to connect to the Transmission System, which becomes effective 1 February 2018 at 9:00am¹². The publication sets out the steps that the customer must follow to make a valid connection application, the offer requirements (particularly those related to planning permission for the proposed project), and details the steps for connection to the Northern Ireland Transmission System.

In particular the new process allows connection applications prior to planning permission consents being obtained. However, planning permission will be a key, early milestone within the Transmission connection offer process.

5.2 DISTRIBUTION PROCESS - NIE NETWORKS IMMIMENT PROCESS MODIFICATIONS

The ACAOP Phase 1 rule set for allocating scarce capacity to Distribution Connections has worked well, releasing almost 260 MW of Distribution Connection Offers since its introduction in May 2016. However, this rule set will not be appropriate for the future allocation of Distribution export capacity for the following reasons:

1. **UR Extension Arrangements** - the UR “Review of Electricity Distribution and Transmission Connections Policy, Final Decision Paper” June 2017 stated that “*Extensions for connection offers will be the exception rather than the norm*”, meaning that NIE Networks can no longer keep applications in a queue for an indefinite amount of time on a ‘block extension’ basis.

Preserving the generation application queue on an extended basis was a vital requirement for operation of the ACAOP Phase 1 rule-set. Applications remained in a queue and were ordered by the later of the date of application or the date of granting of planning permission or relevant consents¹³.

This resulted in offers for export capacity only being issued to projects with planning permission or relevant consents. This arrangement was supported by stakeholders during the ACAOP consultation process and which has worked effectively to mitigate any potential capacity hoarding.

However, where capacity is available going forward, it will be necessary to make Distribution connection offers to projects without planning permission or relevant consents.

¹² Please see the SONI website for more information (www.soni.ltd.uk/Customers/howconnected)

¹³ Refer to Appendix 3

2. **NIRO Closure** - following the changes outlined in (1) above along with removal of the NIRO incentive regime (and the requirement to meet related deadlines) there is a risk of capacity hoarding at Distribution level.

Projects with accepted offers but no planning permission or relevant consents¹⁴ or third party contractual deadlines to meet may decide to hold off progressing their connections until the position on any potential further incentive regime is clarified.

This may result in capacity being hoarded for a significant period of time which could effectively 'block' the progress of any new projects for a number of years.

Given the changing circumstances outlined above, it is important that NIE Networks puts an appropriate mechanism(s) in place when issuing Distribution connection offers which encourages projects with accepted offers to move forward on an orderly basis and to mitigate the risk of capacity hoarding.

NIE Networks referred to taking steps to minimise under-utilised capacity in its response to the UR "Review of Electricity Distribution and Transmission Connections Policy" consultation. In the CfE, NIE Networks and SONI asked if milestones should be introduced into the Distribution connection offers and if so should the Energy Networks Association (ENA) best practice milestones used in Great Britain be adopted.

5.3 DISTRIBUTION CONNECTION PROCESS MILESTONES

5.3.1 SUMMARY OF RESPONSES

The majority of respondents believe that planning permission or relevant consents should be a requirement for submitting a grid connection application as in the past it has proven to be extremely successful at minimising the hoarding of grid capacity. Stakeholders felt that the Department for the Economy (DfE) and the UR should prepare the ground to facilitate this legalisation.

It was also the view of multiple stakeholders that a milestone approach will not be as effective at minimising the hoarding capacity as reinstating the planning permission requirement for applying for connection. The majority however agreed that due to the length of time that it would take to get the planning permission requirement in legalisation, milestones could offer an interim solution.

¹⁴ Refer to Appendix 3

There was a common thread that some of the ENA best practice milestones could be the basis of milestones in Northern Ireland and should have the following objectives:

- Ensure that any capacity is allocated to “shovel ready” projects;
- Be more onerous in terms of planning permission being secured;
- Minimise hoarding of capacity;
- Allow capacity to be recovered if projects are not progressing.

While there was general acceptance of the use of milestones there was a lack of consensus regarding which milestones should apply and what the timing for achievement of milestones should be.

Some respondents suggested that the ENA best practice milestones were insufficient and were not strong enough to enforce. However other than expressing a view that the ENA milestones should be modified, specific details were not provided explaining this position nor was an alternative approach proposed.

Other respondents suggested however that the time to achieve the planning permission milestone should be reduced to either;

- At the time the applicant accepts their offer (i.e. 90 days after the applicant receives their offer) or;
- 2-3 months after the offer has been accepted.

In addition, multiple stakeholders expressed a view that capacity should only be assigned by NIE Networks to projects that are “shovel ready”. To further ensure that projects are “shovel ready” some respondents suggested that connection offers should not be issued until a project receives planning permission or relevant consents.

5.3.2 NIE NETWORKS VIEW

Taking stakeholder’s views into account NIE Networks shall convey to UR the industry view that planning permission should be introduced as a pre-requisite for all generation applications seeking export connections. As previously indicated by UR this will require new or amended legislation to be introduced by the DfE.

However, pending legislation that may be introduced in the long term, NIE Networks have developed a proposed set of milestones for Distribution connection projects seeking export in Northern Ireland, taking into account stakeholder’s initial views on the ENA Best Practice Guide milestones and the different circumstances that exist in Northern Ireland. Further explanation for the NIE Networks approach is given below together with a number of questions which are intended to provide respondents with the opportunity to express their thoughts on the approach.

NIE Networks only intends to add milestones at present to export offers and not to zero export or over-install connection offers as these connections offers are maximising existing connection arrangements.

5.3.3 NIE NETWORK PROPOSED MILESTONES

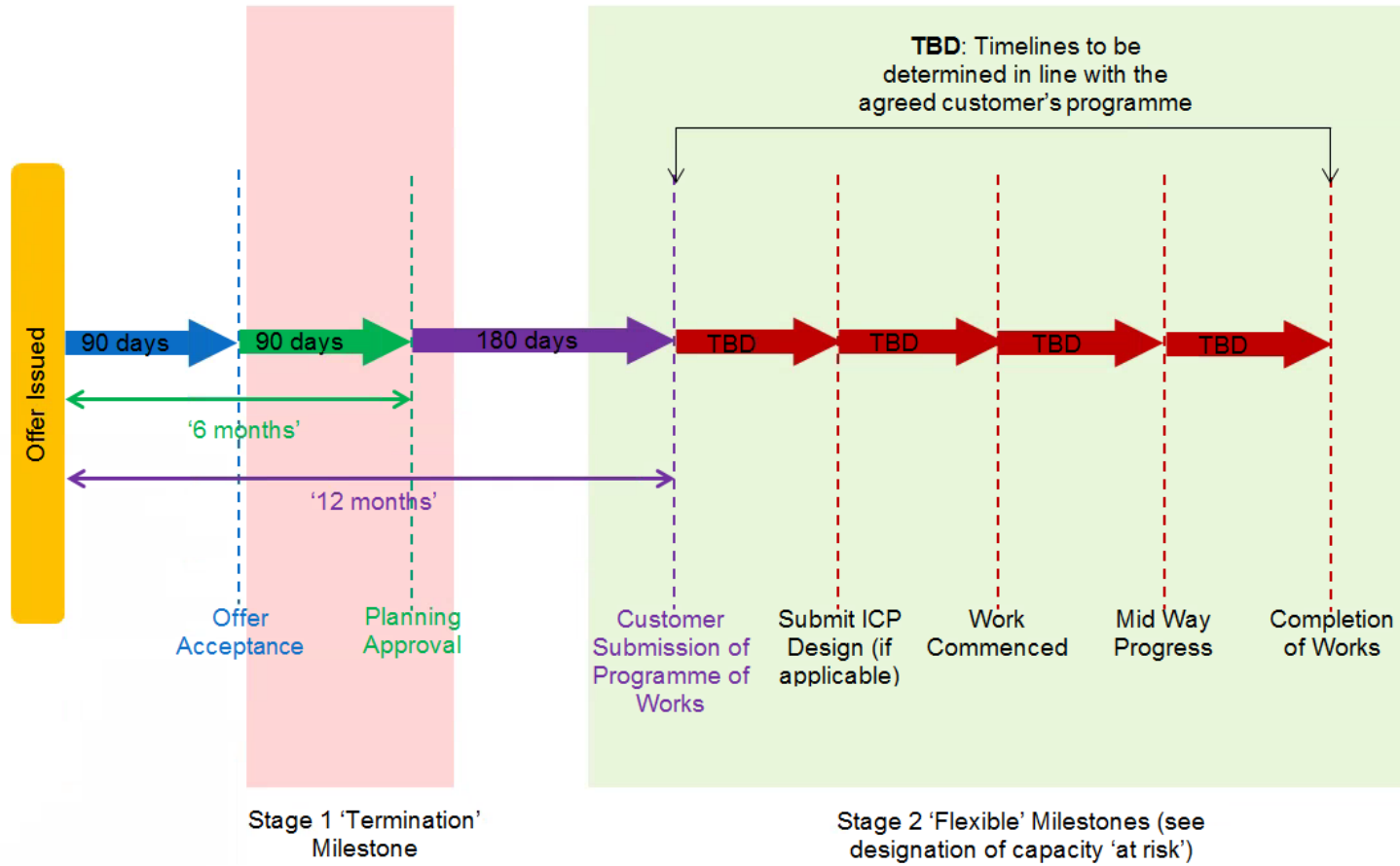


FIGURE 2 ILLUSTRATES NIE NETWORKS PROPOSED ADOPTION OF MILESTONES

5.3.3.1 NIE NETWORKS APPROACH TO STAGE 1 MILESTONES

Contrary to the approach adopted by the ENA Best Practice Guide, NIE Networks propose that the timelines for meeting the Planning Approval and Customer's Submission of Programme of Works' milestones are timed from the date of offer issued rather than offer acceptance. This will allow NIE Networks to specify the date on which these milestones should be met within the customer's connection offer. It will also mean that any party accepting their connection offer before the expiry of the 3 months validity period will not have their milestones dates revised. The Planning Approval Milestone will be known as, Stage 1 Milestone in order to differentiate how it will be enforced.

NIE Networks also proposes the following three milestones adopted by the ENA will not be required in Northern Ireland in order to take account of the views of a significant amount of CfE responses that the Planning Permission Milestone should be more onerous;

- Demonstrate EIA has been commissioned
- Secure Land Rights
- Submission of Planning Permission or relevant consents

Planning Approval or relevant consents must be achieved within '6 months' (180 days) from date of offer issued.

STAGE 1 EVIDENCE

The evidence for this milestone must be proof of planning permission received or relevant consents either on the planning portal or signed certificate.

STAGE 1 MILESTONE ENFORCEMENT RULES

Where applicants do not meet the 'Planning Approval' milestone, NIE Networks will deem this as a breach of the terms for connection and the connection offer will be terminated and the capacity released. NIE Networks will therefore not grant any extensions to the Planning Approval milestone for any reason, including for a planning appeal process.

Please note however that where an applicant has received planning permission but it is subject to a Judicial Review proceeding. NIE Networks will deem the Planning Approval milestone to be met and the project will progress through construction at the financial risk of the applicant. If the applicant does not wish to take this financial risk, the applicant will have to withdraw their application and the capacity will be released.

Question [1] – Do stakeholders agree;

- a) With the proposed NIE Networks Planning Approval milestone and timelines?**
- b) With the evidence required to meet the Planning Approval milestone?**
- c) With the Stage 1 enforcement rules?**
- d) That NIE Networks will not grant an extension to the Planning Approval milestone to allow applicants to go through planning appeal?**

Where stakeholders disagree with any of the above approach, please provide a full explanation for doing so and provide an alternative approach that would be acceptable and also comply with NIE Networks statutory and licence obligations.

5.3.3.2 NIE NETWORKS APPROACH TO STAGE 2 MILESTONES

It is NIE Networks' view that while the achievement of planning permission is a significant step in indicating that a project will proceed, further subsequent milestones will be required in accordance with the ENA Best Practice Guide, to ensure that the project progresses in a timely manner. Recent NIE Networks experience suggests that, as a result of the changing circumstances for new generation projects, achieving planning permission is no longer as strong an indicator that a project will proceed. Therefore NIE Networks strongly agrees with the objective of ensuring projects progress in a timely manner so as not to hoard capacity or unfairly disadvantage other projects. NIE Networks proposes that the following Stage 2 milestones will also be required in Northern Ireland for Distribution Connections:

- Customer Submission of Programme of Works;
- Submit ICP Design (if applicable);
- Work Commenced;
- Mid Way Progress;
- Completion of Works.

NIE Networks propose to refer to these milestones as Stage 2 milestones in order to differentiate how they are to be enforced.

The milestone Customer Submission of Programme of Works is to provide confirmation of proposed construction timescales by submitting a programme of work within 12 months of the connection offer being issued. Each of the subsequent milestones must be included within that programme of work together with the date on which each of the milestones are to be achieved. NIE Networks must agree the programme of work. It shall be a term of the connection offer that the milestones in the programme of work are to be achieved. A failure to achieve any of these milestones will be a breach of the terms for connection allowing NIE Networks to withdraw the connection offer.

As specified above NIE Networks have added an additional milestone, Mid Way Progress milestone. This has been introduced to the construction programme to further ensure that capacity is recovered as soon as possible should the customer's project fail to proceed as anticipated. Without this milestone capacity could be hoarded for a considerable length of time, particularly where a project has a long construction timeline but does not progress beyond initial works.

A determination of whether or not the project is progressing in line with the customer's original programme of work as agreed by NIE Networks will be at the sole discretion of NIE Networks and will be undertaken by taking into account the extent of the customer's works, and the works of NIE Networks. As described above the timelines associated with the construction milestones will be project specific and should be detailed by the customer in their programme of work to be submitted to NIE Networks.

STAGE 2 EVIDENCE

NIE Networks has proposed below the evidence required to be submitted for each of the Stage 2 milestones in order to be deemed as meeting these milestones.

- Customer's Submission of Programme of Works– Programme of works (which also details below milestones) accepted by NIE Networks;
- Submit ICP Design (if applicable) – the ICP design must meet the 'NIE Networks Design Submission Requirements for ICPs' which is published on the NIE Networks ICP Portal;
- Commence Works – As required to demonstrate commencement of works for purposes of satisfying planning permission;
- Mid Way Progress – Evidence that work is progressing as outlined in the programme of works;
- Completion of Works – Project completion and energisation.

STAGE 2 MILESTONES ENFORCEMENT

It is recognised that if a project progresses towards the Stage 2 milestones, then it becomes more likely that the project will progress through to completion. It is also recognised that the developer of that project is likely to have incurred greater costs through the latter stages of the project and when the latter milestones are reached. NIE Networks therefore proposes the enforcement of these Stage 2 milestones by designating the capacity of the projects 'at risk' where milestone dates are not met. See section 5.3.3.5 for more details on designation of 'at risk' capacity and capacity queuing following a failure to meet a Stage 2 milestone.

Question [2] – Do stakeholders agree with the;

- a) Use of Stage 2 milestones after planning permission has been obtained is reasonable?**
- b) Agreed customer's programme of works will be used to determine the timelines attached to the rest of the Stage 2 milestones?**
- c) Evidence required for each milestone stage as described in the table above is appropriate?**
- d) With the Stage 2 Milestone enforcement rules?**

Where stakeholders disagree with any of the above approach, please provide a full explanation for doing so and provide an alternative approach that would be acceptable and also comply with NIE Networks statutory and licence obligations

5.3.3.3 MEETING MILESTONES EARLY

NIE Networks view is that where an applicant meets a milestone well in advance of the respective milestones deadlines, they should not be penalised for doing so. The dates on which, Planning Approval and Customer's Submission of Programme of Works milestones should be achieved by, will be detailed in the connection offer and will therefore not move in the event that the customer accepts their offer early or receives planning permission early.

Also following the completion of the Planning Approval milestone and, the Customer's Submission of Programme of Works are met earlier than the 12 month milestone deadline, then the difference between 12 months and the date of submission will be allowed to extend to any of the latter Stage 2 milestones in the event of a construction delay.

Questions [3] – Do stakeholders agree with the meeting milestones early principles?

5.3.3.4 RESETTING STAGE 2 MILESTONES

Once a Programme of Work has been agreed by NIE Networks the developer may propose variations to that programme provided that the date for completion of the works does not change. The date for completion of the works may only be extended by the developer relying on (i) any additional time available for completion of the project due to meeting milestones early as per section 5.3.3.3 above (ii) an extension of time granted by NIE Networks in circumstances set out below.

If during construction the developer shall be delayed for any of the following reasons:-

- An instruction given by NIE Networks;
- A failure to obtain an outage;
- A third party instituting proceedings against the developer;
- A failure by the developer to secure possession of land required for the development;
- Delay in receipt by the developer of materials to be provided for the development
- Exceptional adverse weather;
- Other special circumstances of any kind whatsoever outside the control of the developer.

Then provided that the developer has taken all reasonable steps to avoid or minimise the delay NIE Networks shall upon a written request by the developer grant such extension of the relevant milestone as may in their opinion be reasonable. The extended period or periods for completion shall be subject to regular review provided that no such review shall result in a decrease in any extension of time already granted by NIE Networks.

Questions [4] – Do stakeholders agree with the resetting stage 2 milestones principles?

5.3.3.5 DESIGNATION OF 'AT RISK' AND CAPACITY QUEUING FOLLOWING FAILURE TO MEET A 'STAGE 2' MILESTONE

Where a party fails to meet a Stage 2 milestone and NIE Networks does not feel there is justification to reset milestones in line with Section 5.3.3.4 as an alternative to termination of the connection offer, the export capacity referred to in the connection offer would be designated 'at risk'.

Following the failure of a party to meet a Stage 2 milestone, NIE Networks would inform that party, in writing within 10 working days, that their export capacity will now be designated 'at risk'. When the export capacity becomes 'at risk', the process for how 'at risk' capacity is to be dealt with is set out below.

PROCESS FOR RE-ALLOCATION OF CAPACITY DESIGNATED 'AT RISK'

A 'Progressing project' is; a project with either a valid application for connection submitted to NIE Networks, a valid connection offer or an accepted connection offer where no milestones have been breached

An 'at risk' project is; a project; with an accepted connection offer but who has breached a Stage 2 milestone and NIE Networks does not feel there is justification to reset milestones in line with Section 5.3.3.4 and has had their capacity designated 'at risk'

When a project is designated 'at risk' the export capacity allocated to that project will be withdrawn and allocated to a 'Progressing project'. A capacity queue would therefore exist whereby capacity can be withdrawn from one connection applicant and allocated to another.

It should be noted that this proposed process will also apply to the payment obligations on the applicant for connection as set out in the connection offer. For example a failure to pay a stage payment (or provide security for same) in respect of connection works to be carried out by NIE Networks will result in capacity being "at risk".

Progressing projects take precedence over 'at risk' projects:

Capacity Queue Illustration

Project 1	Progressing
Project 2	Progressing
Project 3	Progressing
Project 4	Progressing

All projects progressing in accordance with milestones



Projects 1 & 2 fail to meet a milestone, and are designated 'at risk'

Project 3	Progressing
Project 4	Progressing
Project 1	'at risk'
Project 2	'at risk'

Projects 3 & 4 may now have reduced connection costs.



Project 2 fulfils milestone, returns to 'Progressing project' status, but is now behind projects 3 & 4 who have not missed milestones.

Project 3	Progressing
Project 4	Progressing
Project 2	Progressing
Project 1	'at risk'

Connection re-design and revised reinforcement costs are likely to apply to Project 2 in order to re-instate export capacity. Export capacity may no longer be available therefore re-instatement of export capacity may not be possible unless a project above in the queue withdraws.

RE-INSTATEMENT OF THE ORIGINAL EXPORT CAPACITY

When an 'at risk' project fulfils its milestones and is once again designated as a 'Progressing project', should that projects queue position have changed in the interactive queue then the project will have to go through the connection design phase again with respect to the new queue position.

This means that extra re-enforcement works or costs may be applicable. It should also be noted that due to the capacity issues in Northern Ireland, it is possible that capacity may not be available for the project in the latter queue position; therefore the re-instatement of the original export capacity may not be possible.

In the circumstances where capacity reinstatement is not available when considered in the new queue position, NIE Networks would aim to facilitate the connection of the project on a zero-export basis. The project would also be entitled to remain in the capacity queue until such times as the projects higher up the queue had progressed to completion and all capacity relevant to that queue has been utilised by connected projects.

Questions [5] – Do stakeholders agree with the NIE Networks approach for;

- a) Designation of 'at risk' capacity queuing following failure to meet Stage2 milestones**
- b) Re-allocation of capacity designated 'at risk'**
- c) Re-instatement of the original export capacity**

Question [6] - Do stakeholders believe that the proposals made by NIE Networks (as described in Section 5.3) is a reasonable approach to assigning capacity to projects which are ready and of minimising capacity hoarding?

If not, please suggest an alternative approach confirming what other milestones need to be included and what timelines should be attached to these?

Where stakeholders disagree with any of the above questions, please provide a full explanation for doing so and provide an alternative approach that would be acceptable.

5.4 SUMMARY OF IMMINENT PROCESS MODIFICATION

Until a decision paper on our next steps is published, the principles adopted for allocating capacity in Phase 1 will continue for Distribution connections. For further details on phase 1 rule set please refer to ACAOP link below.

It is NIE Networks view that once this decision paper on next steps has been published the Phase 1 rule set will no longer be applied to projects requiring an export connection (even where conventional capacity is still available) but instead Distribution connection offers will contain milestones as determined by this consultation. Process for Zero Export connections and over-install connections will however remain the same as in Phase 1.

The following provides a high level summary of the key aspects of the Phase 1 rule-set and the current high level view of the new rule-set (to be confirmed following stakeholder feedback to this consultation).

Phase 1 Principles

- Export capacity applicants ordered by later date of planning permission/relevant consents¹⁵ granted or receipt of valid application;
- Overinstall facility allowing additional 20% installed capacity on existing MEC's;
- Zero-export limit introduced and kept under review against operational constraints of the system.

New Principles for Distribution Connections

- Export capacity applicants ordered by receipt of valid application;
- Offers issued where capacity is available with [consulted on] milestones;
- Overinstall facility allowing additional 20% installed capacity on existing MEC's kept under review;
- Maintain review of Zero-export against operational constraints of the system.

For the processes related to Transmission connections, please see Section 5.1 of this consultation.

¹⁵ Refer to Appendix 3

5.5 FUTURE CAPACITY AND NETWORK INFORMATION

As Industry has shown a continued high demand to connect further generation schemes, NIE Networks and SONI recognise there will be an appetite for the communication of 'capacity availability' related information going forward.

There are a number of scenarios that may result in network capacity becoming available, these include but aren't limited to the following:

- Approval and progression of further network reinforcement, potentially driven by implementation of new energy policy and/or associated RES energy targets;
- Network refurbishment programmes;
- Retirement of existing connected plant;
- Expiration of existing offers;
- Significant increase in demand in an area;
- Works carried out to mitigate local Distribution issues;
- Implementation of network innovation¹⁶.

On an annual basis SONI publish the Transmission Forecast Statement. The statement provides important information to industry including the following:

- Network models and data of the All Island Transmission system;
- Forecasted generation capacity and demand growth;
- Maximum and minimum fault levels at Transmission system stations;
- Predicted Transmission system power flows at different points in time and;
- Demand and generation opportunities on the Transmission System.

NIE Networks proposes to communicate Distribution capacity available through the new Distribution capacity map.

SONI will also be publishing its first annual Ten Year Transmission Forecast Statement later this year.

Question [7] - Is there any other information that could be provided in the forecast statement to help inform industry in their commercial decision making?

¹⁶ Refer to Appendix 2

5.6 QUEUE INFORMATION

A number of respondents have requested that information of applicants in the queue is made available, in a similar fashion to the information provided in other jurisdictions such as the Republic of Ireland.

NIE Networks have investigated the provision of such information and has found that certain parts of the Electricity Order (NI) 1992 and NIE Networks' Distribution Licence would prevent NIE Networks from publicly disclosing information regarding individual applicants without the express permission of the respective applicants.

In light of the legislative issues, a voluntary trial was carried out with applicants in the queue for capacity at a cluster substation. Applicants were asked to voluntarily grant permission to share information on the basis that the queue information would only be shared if everyone was to opt in. A significant portion of the parties in the queue have not opted in, suggesting that this voluntary method may not be practical to implement or provide much benefit to the wider industry.

It should also be noted that for Grid Code compliant generators, information can already be found on SONI's connection register¹⁷, published under the terms of the Grid Code. This register includes any generation connections with valid connection applications and/or accepted connection offers (typically any generation >5MW).

Question [8] - Would stakeholders be in favour of a clause requiring mandatory disclosure of generator information to be published?

Please note that this will not be achievable solely by NIE Networks, but responses would inform how NIE Networks might approach engagement with parties such as the UR or DfE on the matter.

(This only applies to non-grid code compliant generation connections as grid code compliant connections are already published).

¹⁷ Available in the publication section of the SONI website (www.soni.ltd.uk)

6. PRIORITISATION OF DS3 CONNECTIONS

A number of respondents put forward the view that some provision should be made in any new connection process for those wishing to connect to the system to provide DS3 System Services in support of the delivery of the DS3 programme. This programme has identified services that are required to enable the secure operation of the power system, whilst meeting of RES-E targets. These system services will allow the running of the Transmission system with larger volumes of non-synchronous generation.

In the Republic of Ireland, the Commission for Regulation of Utilities (CRU) recently outlined a proposal that would see Connection Offers of DS3 service providers being prioritised as part of the proposed decision for Enduring Connection Policy Stage 1 (ECP-1)¹⁸. The detailed rules for DS3 prioritisation in are set out in Annex II of the CRU consultation¹⁹. It is proposed that priority would be given to the providers of the following services:

- Fast Frequency Response (FFR) and
- Primary Operating Reserve (POR)

The proposal to prioritise providers of FFR is based on SONI and EirGrid's recent studies that highlighted the need for increased fast-acting reserve in the short term to ensure safe and secure operation as the levels of system inertia, typically provided by conventional generation, reduce.

The proposal to also prioritise providers of POR is based on SONI and EirGrid's operational experience. POR remains a regular binding constraint on the system and is therefore a significant driver of dispatch balancing costs. As such, an increase in potential providers at this time might provide cost benefits. It is also anticipated that those providers which are able to provide POR will also be able to provide Secondary Operating Reserve (SOR) and Tertiary Operating Reserve 1 (TOR1), thus increasing the number of potential providers across the suite of reserve system services.

In order to avoid the unintended consequence of gaming in the new process the CRU's proposed decision paper also sets out specific DS3 related thresholds in terms of MEC offered. These include a limit to the total capacity offered to DS3 prioritised applicants, a limit to the number of Connection Offers prioritised for DS3 and a cap on such offers. The paper also rules that wind and solar applicants should not be prioritised for connection to provide DS3 System Services.

¹⁸ *CRU Enduring Connection Policy Stage 1 (ECP-1)* www.cru.ie/wp-content/uploads/2017/04/CRU17309-ECP-1-Proposed-Decision-FINAL.pdf

¹⁹ *DS3 Proposed Prioritisation Rule set* www.cru.ie/wp-content/uploads/2017/04/CRU17311-Annex-II-DS3-Proposed-Prioritisation-Ruleset-FINAL.pdf

Connections in the Republic of Ireland are processed through a batch process and as such this approach will not directly align with the Northern Ireland connection process. However the system issues that the DS3 System Services are designed to address are all-island in nature. Furthermore the FFR and POR services required may be provided anywhere on the island. Therefore to facilitate competition across the SEM, parties in Northern Ireland should also have an opportunity to provide the services.

Question [9] - Do you agree that a provision should be made in the Northern Ireland Connections Process to enable the prioritisation of connection applicants to provide DS3 System Services?

Question [10] - In the absence of a batch process, do you have any other suggestions or specific comments on how the approach discussed above should be augmented for Northern Ireland? What, if any, pre-conditions, rules or limits do you think should be applied?

7. POTENTIAL CAPACITY SOLUTIONS

Within the CfE responses there is a clear recognition that, in the absence of investment in the near future in ATRs further to those required for already contracted generation, alternative connection methods should be investigated to better exploit existing Transmission capacity where practical.

In that regard, many respondents to the CfE welcomed the establishment of the Hybrid Units Working Group. Responses expressed the view that the progress and implementation of solutions through the group was fundamental to ensuring the development of a flexible grid system for Northern Ireland.

As outlined in Section 4, the CfE responses identified a number of matters to be addressed including; maximising already allocated capacity under existing connection agreements; more complex technical arrangements; commercial arrangements; capacity allocation methodology; generation type prioritisation; legal and license related issues and the connections process as a whole.

Respondents also mentioned the use of a “smarter distribution network” and “energy storage to facilitate further generation connections”. It is worth noting that NIE Networks have included a number of innovation projects in their RP6 business plan to investigate such technologies and schemes. Appendix 2 includes a summary of these projects for information. It should be noted however, that as these projects are in the early stages of development, they do not fall under the scope of this consultation.

A number of respondents specifically suggested that connection of further generation could be enabled through use of connection offers with zero FAQ and no identified ATRs attached to them, increased over-installation limit, Active Network Management (ANM), Special Protection Schemes (SPS) and Dynamic Line Rating (DLR). In principle the approaches outlined above would enable a limited amount of additional generation to connect; however, in doing so they would impact on fault levels and increase the level of curtailment and constraints. This would affect both existing connectees and any new generation connecting.

As such both SONI and NIE Networks believe it would be prudent for all parties to gain a greater understanding of the impact of these potential solutions from a system position (including the impact on system stability and security) and the commercial implications for industry. In particular we hope to work with industry to understand from their perspective, the balance between gaining further opportunity to connect against the commercial impact of increased curtailment and constraints on new and existing connectees.

The following sections provide some details on the areas outlined above and set out a range of issues that require consideration by SONI, NIE Networks and industry.

7.1 HYBRID SITES WORKING GROUP

Many respondents to the CfE expressed the view that the progress and implementation of solutions by the Hybrid Sites Working Group was fundamental to ensuring the development of a flexible and modern grid system for Northern Ireland. The Hybrid Sites Working Group, chaired by SONI and attended by NIE Networks and industry representatives, has identified a number of potential opportunities and mechanisms to address and advance many aspects of hybrid connection such as Grid Code changes, market changes and connection policy.

The Hybrid Sites Working Group was established in response to the changing nature of the generation mix on the all-island system. A number of developers have expressed an interest in:

- 1) Having different generation technology types (e.g. wind and solar technologies) behind one connection point and;
- 2) Having sites comprising of generation and demand behind one connection point.

The aim of the Hybrid Sites Working Group is to review how such sites can be accommodated and how to potentially resolve the issues identified. In doing this the group seeks to produce workable solutions to allow hybrid sites to connect and operate on the Transmission or Distribution System, in a safe and secure manner and, where applicable, to participate in the SEM. A further aim of the group is to assess and work through the proposals and issues emerging from the European Network Code requirements and to recommend necessary modifications to Grid Code, the Trading & Settlement Code, connection processes and I-SEM.

The Hybrid Units Working Group relates to new and existing²⁰ Transmission and Distribution connections with a registered capacity ≥ 1 MW. There are a range of expected Hybrid Site combinations including Wind/Solar, Wind/Battery, Wind/Flywheel, Solar/Battery, Conventional/Storage, Biomass/Storage and Conventional/DSU.

The TSOs have performed a high level feasibility assessment of Wind/Solar and Wind/Battery Hybrid Sites considering (but not limited to) the Metering, Signalling, Controllability and Dispatch Modelling/Technical Studies, Availability, Forecasting and treatment in I-SEM. The working group has identified that Wind and Solar Hybrid should be acceptable operationally and in the new I-SEM Market. A Wind and Battery Hybrid may be acceptable but it may require rule changes which need to be investigated further. The range of other Hybrid Site combinations will be assessed over the course of 2018. In the coming months the Hybrid Working Group will continue to meet and will seek further formal engagement with wider industry with respect to how multiple entities behind a connection point are managed, review of the 20% over-install figure and DC metering.

²⁰ *i.e. existing single technology connections that wish to add a different technology type*

For on-going information on the progress and output of the working group interested parties can email Gridcode@soni.ltd.uk to be added to the circulation list for any future correspondence.

7.2 CONNECTIONS INNOVATION WORKING GROUP

SONI and NIE Networks believe it would be prudent for all to gain a greater understanding of the impact of various solutions proposed from a system position and commercially for industry. NIE Networks and SONI are committed to bringing forward an overall strategy which will address these matters in a co-ordinated way, subject to what is within the remit of NIE Networks and/or SONI.

With this in mind SONI and NIE Networks are proposing to establish a Connections Innovation Working Group to coordinate how these mechanisms could be further investigated and potentially developed.

A number of the issues outlined earlier in this section are common to those within the scope of the established Hybrid Sites Working Group. As such its findings will provide a key building block to any work on these other potential solutions. In particular the work around over installation and its system and commercial impact will act as fundamental parameter to the progression of the Connections Innovation Working Group.

Views are welcomed by SONI and NIE Networks on both the level of industry interest in pursuing the potential areas of investigation, the scope of each and how these should be best coordinated. Two proposed working group areas are set out in the following section.

It should be noted that both working group areas set out below may require changes to SONI and/or NIE Networks licences.

7.2.1 WORKING GROUP AREA 1 - DISTRIBUTION CONNECTION OFFERS WITH ZERO FIRM ACCESS QUANTITY

Prior to the influx of applications in August 2015, LSG applicants could apply to connect to the Distribution and Transmission System and receive a connection offer from NIE Networks with SONI providing relevant FAQ information (which included the ATRs required). This offer allowed a project to connect and subsequently export onto the system once its associated shallow works, Distribution deep reinforcements, short circuit works and other necessary works (including control systems) have been completed in full, but before the ATRs are completed. However it would not have full FAQ until the ATRs were delivered.

In the absence of imminent approval by the UR of further network investment, SONI and NIE Networks are seeking to understand if there is an appetite for offers with zero FAQ and no indication of ATRs being made available to LSG Distribution connected generation. Such a mechanism may be subject to limits such as total capacity released, geographic location, and technology type.

In this scenario the generator would be accepting an offer for zero firm access quantity (FAQ) and would have no indication of when any ATR works that would make the generator

firm would be completed. The connection of additional generation with zero FAQ would have an impact on the level of curtailment and constraint on the system particularly on existing generation that has not yet achieved full FAQ.

It is proposed that the working group would investigate the connection of further generation without firm access and how this would impact on constraint and curtailment levels and what this means commercially in market terms.

Question [11]: Is there industry appetite for Zero FAQ connections with no assurance of full FAQ being achieved?

Question [12] What indicative level of curtailment and constraint do industry believe such a solution would become commercially unviable?

7.2.2 WORKING GROUP AREA 2 - ACTIVE NETWORK MANAGEMENT SCHEMES - OPTIMISING CLUSTER CAPABILITY

Respondents of the CfE suggested that a Smarter Distribution Network utilising innovative technologies such as ANM schemes should be explored in Northern Ireland as a means to allow further generation to connect to the system. Some respondents believed that such a network should be introduced at all voltage levels.

When considering the generic connection topologies that currently exist on the network with respect to the potential for ANM, such as Cluster and Bulk Supply Points (BSPs) for LSG and embedded 11kV connections for SSG, the number of potential constraints to be managed must be considered. Generation connected at a low voltage is subject to any constraints at that voltage and all higher voltage levels including Transmission. Generation connected at Transmission has the potential to be subject to Transmission constraints only.

When considering techniques that could be used to manage constraints, the constraint related matters to be overcome are of lesser order for LSG connections at cluster substations than that of LSG connections at BSP substations or SSG connections at a primary substation. Cluster connections also benefit from 'hard wired' communication arrangements (required for controlling outputs) being already in place.

With this in mind, NIE Networks and SONI are of the view that LSG connections to clusters and the maximisation of reverse power capability of a cluster potentially present the most workable opportunity to explore the enabling of further connection of generation through ANM. With possibilities for further ANM schemes which may include DLR at clusters, ANM at BSP substations and Primary substations potentially being explored at a later date, depending on the outcome of the working group and take up of ANM at clusters.

An initial potential ANM scheme at a cluster would potentially allow further generation to connect on a 'managed' basis utilising any potential headroom. The ANM scheme would monitor the total output of all generation attached to the cluster to ensure the total output did

not exceed the cluster reverse power capability by controlling those connected on the ANM scheme basis.

Before such a scheme can be implemented there a number of complex matters need to be addressed for both developers and the system operators, these are listed below:

- The technical control arrangements required;
- How applicants would gain access to this 'managed' capacity or headroom;
- What control principals would be adopted i.e. LIFO or Shared;
- How the capital and O&M cost of such an ANM scheme would be charged for;
- Contractual arrangements;
- Determining the potential headroom that may be available and;
- Impact on existing generation;
- Impact on system security and stability.

With this level of complexity, the Connections Innovation Working Group will be essential in determining solutions to the above matters and confirming if indeed ANM schemes should be initially scoped for implementation at clusters. We understand that not all industry will be interested in connections with ANM schemes or will want to get involved in the complexities. Appendix 4 therefore has been included to provide further thinking regarding the above complex matters for those who do. The responses to these questions will provide the Connections Innovation Working Group with an informed platform to establish a Terms of Reference (TOR) and potentially determine what industry members should be in the Connections Innovation Working Group.

Question [13] - Does industry agree that a working group is required to deal with the more complex matters above including [A] technical and [B] process-commercial matters [YES/NO]

Question [14] - With respect to the potential ANM solution set out in Appendix 4 do you have any views on the various options outlined?

Question [15] - If the answer to (1) (2) or both is [NO] – please advise what alternative approach you believe might be workable

8. TIMELINES

Key Milestones	Proposed Dates
Consultation Release	31 st January 2018
Milestones and Other Connections Process Workshop	Week commencing 19 th February (details to be circulated via mailing list and website)
Consultation Close	4pm on 9 th March 2018
Decision Paper	Q2 2018

9. REQUEST FOR COMMENT

NIE Networks and SONI invite interested parties to respond to this consultation.

Responses should be sent electronically to ConnectionDesign@NIENetworks.co.uk and Connections@soni.ltd.uk by **4pm on Friday 9th March 2018**.

Respondents who wish that their response remain confidential should highlight this when submitting the response.

SONI and NIE Networks may share responses with UR. Respondents should be aware that as UR is a public body and non-ministerial government department, the UR is required to comply with the Freedom of Information Act (FOIA)²¹.

²¹ *The effect of FOIA may be that information contained in consultation responses that is shared with UR is required to be put into the public domain. Hence it is possible that all responses made to this consultation that may be shared with UR will be discoverable under FOIA, even if respondents ask for the responses to be treated as confidential. It is therefore important that respondents take account of this and in particular, if asking that the responses are treated as confidential.*

Alternative Connection Application and Offer Process

Phase 1 Capacity Assessment



1. TRANSMISSION ASSESSMENT

As highlighted in the ACAOP decision paper of May 2016, *“the Transmission System to the West and North-West of Northern Ireland is already heavily saturated”* and all *“Generation connected and committed to connect in the West and North-West are therefore subject to Associated Transmission Reinforcements (ATRs) that are required to strengthen the Transmission System in this general area.”* As SONI is already aware through previous connection and network studies that there is no capacity in the west without the need for transmission reinforcements, the assessment has focused on the eastern part of the network.

The assessment for export capacity was carried out in several phases:

- An initial screening study with onerous/deterministic dispatches for a base case before the influx and then a case with all of the influx. This was a thermal study the aim of which was to identify where potential issues could arise on the Transmission System.
- The circuits identified as being overloaded under specific contingencies in the screening study were selected for further analysis in thermal studies. These more detailed studies used realistic dispatches obtained from the market dispatch tool, PLEXOS, to stress those particular parts of the network.
- Fault level and voltage step change studies.
- Assessment of Bulk Supply Point (BSP) transformer and radial 110kV circuit capacity.

The network model for the above studies was based on the All Island Ten Year Transmission Forecast Statement 2014, as this was the most recent available at the time. The second 400kV North South Interconnector, which is presently planned for connection in Q4 2020, was assumed in service. This allowed higher levels of generation to be dispatched and was therefore the most onerous case.

The Transmission assessment was carried out against the Northern Ireland Transmission System Security and Planning Standards (TSSPS), which are approved by the UR. These are the standards to be used in the planning of the Northern Ireland Transmission System.

The following contingencies were carried out in these studies to assess steady state thermal overloads on the Transmission System:

- N and N-1 for all seasons; outages of 110kV and 275kV circuits and interbus transformers are considered
- N-DCT for all seasons; 275kV double circuits only are considered.

2. SUMMARY OF NODAL TRANSMISSION ASSESSMENT

NIE Networks identified a number of applications which required assessment for Transmission capacity under the rules of the ACAOP. The table below provides a summary of the MEC requested and the available Transmission network capacity which was allocated for export generation, which did not require additional system reinforcement.

The column showing “Remaining Transmission Capacity” refers to Transmission capacity without the need for further transmission reinforcement.

Where the table shows there is potential limited remaining Transmission capacity, this indicates that any new applications at these nodes will require specific Transmission assessment.

Table 2 Assessment of available capacity where an application was made to connect

Transmission Node	Large Scale Generation		Small Scale Generation		Remaining Transmission Capacity
	Requested MEC (MW)	Allocated MEC (MW)	Requested MEC (MW)	Allocated MEC (MW)	
Antrim	22.21	22.21	0.29	0.29	None
Ballylumford	N/A	62	0	0	Potential limited capacity*
Ballymena	15	6	0.75	0.75	None
Ballynahinch	5	5	1.15	1.15	Potential limited capacity*
Banbridge	0	0	1.49	1.49	Potential limited capacity*
Belfast Central	0	0	0.24	0.24	Potential limited capacity*
Coleraine	25	0	0.58	0	None
Coolkeeragh	0	0	0.053	0	None
Creagh	0	0	1.0	1.0	Potential limited capacity*
Cregagh	0	0	0.25	0.25	Potential limited capacity
Donegall South	0	0	0.19	0.19	Potential limited

Transmission Node	Large Scale Generation		Small Scale Generation		Remaining Transmission Capacity
	Requested MEC (MW)	Allocated MEC (MW)	Requested MEC (MW)	Allocated MEC (MW)	
					capacity*
Dungannon	4	4	5.81	5.81	Potential limited capacity*
Drumnakelly	0	0	0.9	0.9	Potential limited capacity*
Enniskillen	0	0	2.23	0	None
Finaghy	0	0	0.45	0.45	Potential limited capacity*
Glengormley	23.69	0	0.4	0.4	None
Kells Cluster	90	90	0	0	None
Knock	0	0	0.24	0.24	Potential limited capacity*
Larne	20.1	4	0.5	0.5	None
Limavady	24	0	0.79	0	None
Lisaghmore	0	0	0.038	0	None
Lisburn	35.5	35.5	3.035	3.035	Potential limited capacity*
Loguestown	0	0	0.17	0	None
Newry	0	0	1.08	1.08	Potential limited capacity*
Newtownards	0	0	0.92	0.92	Potential limited capacity*
Omagh	0	0	0.45	0	None
Power Station West	0	0	1.2	1.2	Potential limited capacity*
Rathgael	0	0	0.09	0.09	Potential

Transmission Node	Large Scale Generation		Small Scale Generation		Remaining Transmission Capacity
	Requested MEC (MW)	Allocated MEC (MW)	Requested MEC (MW)	Allocated MEC (MW)	
					limited capacity*
Rosebank	0	0	0.02	0.02	Potential limited capacity*
Waringstown	8.5	8.5	0.74	0.74	Potential limited capacity*

*The assessment indicated that there are a number of Transmission nodes where there is potential limited capacity for further generation which does not operate at minimum load periods. Such generation would not be limited by the binding constraints on the system. It should be noted that this assessment does not take account of Distribution related constraints at the individual nodes. Where potential limited capacity has been identified at Transmission level this will only be available to Distribution connectees if there is no Distribution constraints at the node they wish to connect to.

The assessment shows that there is no transmission capacity available for any generation with a Key Date²² after 13/12/2016 that had the potential to export power during a minimum load scenario, without the need for further transmission reinforcement.

In consideration of the applications in the queue, as of information provided by NIE Networks to SONI to date, there is now no capacity at the following Transmission nodes without the need for further Transmission reinforcement:

- Antrim
- Ballymena
- Coleraine
- Coolkeeragh
- Eden
- Enniskillen
- Glengormley
- Larne
- Limavady
- Lisaghmore

²² *Key Date refers to the later of the date of application to the network or receipt of planning permission or relevant consents for generation development*

- Loguestown
- Omagh

Remaining capacity at existing and designated clusters may be allocated up the total capacity at each as indicated below (in MW):

- Curraghamulkin (90)
- Garvagh (90)
- Gort (90)
- Kells (90)
- Magherakeel (138)
- Rasharkin (90)
- Tremoge (90)

APPENDIX 2: NIE NETWORKS INNOVATION PROJECTS SUMMARY

As a number of respondents to the CfE made reference to “smarter distribution networks” and “utilising energy storage” to enable further generation, the following summary of innovation projects planned by NIE Networks throughout RP6 is included in this appendix in order to provide stakeholders with information on these matters. These projects do not sit within the current remit of this consultation as they are only at the early stages of development.

In the RP6 business plan NIE Networks proposed to integrate suitably advanced smart technologies into Business as Usual (BaU) by undertaking a programme of five focused integration projects with the objective of developing cost effective alternatives to conventional network expenditure, utilising existing assets therefore deferring reinforcement and minimising the impact on future customers. Some technologies however will give the additional benefit of increasing capacity or decreasing connection times and costs for future connections and Low Carbon Technology (LCT) uptake.

The UR concluded that further work was required by NIE Networks to confirm that the innovation projects proposed will deliver value and that this further work should be completed and submitted to the UR before embarking on the procurement of assets and systems and the trials themselves. This work has since been completed and submitted to the UR. It is expected that the trials will be complete to inform the Transform Model re-evaluation in October 2020. These five focused integration projects are described in brief below.

Facilitation of Energy Storage Solutions

The mass deployment of intermittent renewable generation, growing demand and LCTs present significant challenges to the Distribution network in Northern Ireland.

Network thermal capacity is one of the most prevalent constraints in the network as power flows at times of peak demand exceed the network’s capability. The voltage level is also an issue as maintaining voltages within statutory limits using existing voltage control techniques is increasingly challenging. The problem is exacerbated due to the connection of Distributed Generation (DG) which introduces voltage rise. The current approach to reinforce the network to tackle any voltage issues is costly and often takes a considerable amount of time.

Energy Storage Solutions (ESS) can absorb or release energy and therefore can make use of system services by providing ancillary services to balance demand and generation; hence managing peak demand. This in turn will defer network reinforcement allowing the accommodation of further demand.

Smart Asset Monitoring

Traditionally Distribution networks were designed to be passive with unidirectional power flows. The recent and forecast growth in DG across the industry presents a challenge to network operators in that Distribution networks are expected to be active and accommodate

bidirectional power flows. Reverse power flows at a number of 33/11kV primary substations and saturation of sections of the 33kV networks has occurred as a result of the connection activity in Northern Ireland.

Smart Asset Monitoring (SAM) will implement an enhanced thermal monitoring system on the high voltage (HV) Distribution network through a combination of the use of Real Time Thermal Rating (RTTR) of 33 kV overhead lines (OHLs) and RTTR of 33/11 kV primary transformers. NIE Networks recognise that the SAM project can provide a novel solution to determine more accurately the available network headroom on a real-time basis, enhance utilisation of network assets, reduce fault restoration time and reduce capital and operational expenditures, thus ultimately reducing the costs to customers for use of the network.

Network assets are thermally rated based on these static ratings, which are usually based on pessimistic weather conditions e.g. low wind speed and high ambient temperature. It is anticipated that through the use of SAM techniques, it will be possible to improve the thermal capacity of the assets above the static values outlined in currently practiced industry standards, ER P2713 (for OHLs) and ER P1514 (for transformers). This will facilitate increased loading of network assets without the need for load-related reinforcement.

LV Active Network Management

LV networks are expected to be strained as new LCTs including electric vehicles and heat pumps are connected. In addition, increasing amounts of micro-generation, such as solar photovoltaic panels, are expected to be connected. Together, greater demand levels and higher penetrations of DG can cause thermal, voltage and fault level issues on LV networks.

The NIE Networks LV Active Network Management (ANM) project will evaluate the ability of ANM to overcome constraints and defer reinforcement requirements through better utilisation of the existing network. LV ANM also has the potential to reduce the connection process due to the availability of additional capacity and avoidance of delays associated with the need for reinforcement.

Voltage Management

Growing demand, penetration of DG and LCTs present significant challenges to the Northern Ireland Distribution network. Maintaining voltages within statutory limits with the existing voltage control techniques is increasingly challenging and one of the main network constraints. Network thermal capacity is also an issue as power flows at times of peak demand exceed the network's capacity.

Traditional reinforcement to combat these problems is costly and often takes a considerable amount of time. Voltage Management (VM) is a more cost effective approach which would provide the ability to actively manage the network voltage through the integration of Static Synchronous Compensator (STATCOM) in Distribution networks and Conservation Voltage Reduction (CVR).

The NIE Networks Voltage Management (VM) innovation integration project seeks to demonstrate how innovative technologies applied to existing networks have the potential to manage voltages and reduce demand, and hence unlock network capacity, and defer traditional reinforcements. They may also allow increased penetration of micro generation, for which the associated network reinforcement costs are not attributable to the generator.

APPENDIX 3: RELEVANT CONSENTS

In keeping with the relevant consents that were consulted upon with industry in 2014, the following specifies the relevant consenting for different types of projects that will be used by NIE Networks and SONI in processing connection offers²³:

- The required level of consent for onshore projects²⁴ to progress a connection offer is full Planning Permission;
- The required level of consent to progress a connection offer for a Compressed Air Energy Storage (CAES) plant that requires a Mineral Prospecting Licence is obtaining that licence;
- The required level of consent for offshore projects to progress a connection offer is either an Exclusivity Agreement or an Agreement for Lease from The Crown Estate.

²³ *Agreed consenting requirements can be found in the October 2014 Decision Paper at the following link: www.soni.ltd.uk/media/documents/Consultations/OffshoreConsentingRequirements/SONINIE%20Decision%20Paper%20on%20consenting%20requirements%20for%20offshore%20generation.pdf*

²⁴ *Onshore projects include generation projects such as conventional generators, wind farms, solar parks, biomass plants, energy from waste plants amongst others.*

APPENDIX 4: WORKING GROUP AREA 2 – ACTIVE NETWORK MANAGEMENT SCHEME

This appendix provides further detail on the potential Active Network Management (ANM) schemes at cluster and the complexity of implementing such a scheme.

Due to the complexity of the task at hand, it should be noted that it is the intention that these questions would be included in the working brief of the proposed 'Connections Innovation Working Group'. This will allow these questions, and the further questions that arise from them, to be worked through in detail by representatives of all relevant stakeholders.

POTENTIAL ANM SOLUTION – OUTLINE PRINCIPLES OF CONNECTION

NIE Networks and SONI are of the view that LSG connections to Clusters and the maximisation of reverse power capability of a cluster potentially present an opportunity to explore the enabling of further connection of generation through ANM. With the possibility for further ANMs schemes which may include DLR at Clusters, ANM at BSP substations and Primary substations being explored at a later date, depending on the, outcome of the working group and take up of the potential ANM at clusters. An outline of the principles of connection at a potential ANM cluster solution are below.

Clusters typically have reverse power capability of up to 90 MW. However, as a result of generation diversity this cluster reverse power capability will not be utilised at all times. Therefore, there may effectively be a level of diversity headroom within the current cluster reverse power capability which might be exploited by an ANM arrangement.

Such an arrangement would potentially allow additional generation to connect on a 'managed' basis exploiting this diversity headroom within current cluster reverse power capability and ensure, through that arrangement, that the 90 MW transformer limit was not exceeded.

This would require some level of 'managed' cluster capacity i.e. 'X' MW being 'made available' to applicants on the basis that 'managed' connections had access to this diversity headroom, subject to that headroom being available.

Important questions do arise however as to

- The technical control arrangements required; and
- How applicants would gain access to this 'managed' capacity or headroom; and
- Any overriding local and/or deeper Transmission constraints that may exist and how these might be managed.

The total output of all generation connecting to the cluster would be monitored with those connected on a 'Managed' basis controlled, in some way, to ensure the total output did not exceed the cluster reverse power capability.

The control arrangements would depend on the approach adopted (i.e. Shared; LIFO etc.), for access to the available headroom.

COMMERCIAL QUESTIONS ARISING

These questions recognise the commercial implications of ANM technical solutions which by their nature provide less certainty around the level of access as a trade-off to avoiding conventional (high cost) grid investment and relate broadly to the:

- Control / access to the grid;
- Charges / contractual arrangements which would apply; and
- Capacity allocation and process matters.

CONTROL PRINCIPALS

There are at least three generic options for the allocation of capacity where additional headroom is being made available, which are:

- A. Equal access or – i.e. the ‘shared’ approach or – for additional generation;
- B. Access on a last on first off basis – i.e. ‘LIFO’ – for additional generation; or
- C. Equal access for all generators connecting – including already connected.

Whilst there are potentially advantages for individual generators on the LIFO approach in terms of the level of access achieved, this would potentially result in the first connectee being required to fund the entirety of those control arrangements required to enable managed connections at that cluster.

Whereas if some ‘commercially acceptable’ level of curtailment and associated ‘ceiling’ of managed cluster capacity (i.e. ‘Cluster Managed Connection Capacity MW level were established at the cluster) then there may be potential to arrive at an arrangement to share costs across all subscribed managed MWs.

NIE Networks and SONI request the views of industry as to the most appropriate control method considering the above information or indeed proposing any alternative arrangements to the options A, B or C above for a ‘potential cluster ANM solution’.

CHARGES APPLICABLE - CAPITAL

While the intention is to avoid significant grid investment, the introduction of some form of ANM solution will require a level of capital investment and ongoing O&M. For example, if a control arrangement is being applied at a cluster then, as above, additional control and communication costs will arise.

Industry have indicated support for NIE Network’s clustering policy to continue and also for the introduction of rebating.

There are at least two generic options for the allocation of the total incremental managed connection capital costs to applicants.

- A. Total incremental costs are allocated to the first-comer in the Queue applicant being considered for additional headroom; or
- B. Total incremental costs are 'shared' between applicants being considered for the 'Cluster Managed Connection Capacity MW' – in proportion to the MW being 'subscribed to' by each applicant. (Note: in instances where the 'Cluster Managed Connection Capacity MW' is undersubscribed this would potentially result in the applicants at that point in time, who collectively fall below the 'Cluster Managed Connection Capacity MW' level, initially paying for the full cost and then seeking some rebate when further applicants seeking access to the remaining 'Cluster Managed Connection Capacity MW' arrived.) However, it is NIE Networks understanding that there is currently no such rebate mechanism allowed within the current legislative framework.

NIE Networks and SONI request the views of industry as to the most appropriate capital cost allocation method in terms of options A or B above or indeed to propose any alternative to A or B above for a 'potential cluster ANM solution'.

CHARGES APPLICABLE – OPERATION AND MAINTENANCE

The ongoing Operation and Maintenance (O&M) costs associated with ANM solutions are likely to be significant. This includes for both the control and communications arrangements. Communications in themselves can present significant challenges in terms of reliability.

In addition, contract durations for support arrangements are much less than O&M for conventional grid infrastructure and typically are in the order of about 7 years. There are at least three generic options for paying for these:

- A. Payment on an open ended ongoing basis
- B. Payment on some agree basis over the contract term – with some agreed review and cost adjustment arrangement
- C. Payment on an up-front basis

NIE Networks and SONI request the views of industry on the most appropriate basis to pay for the associated O&M charges in terms of A, B or C above or indeed to propose any alternative to A, B or C above – given that one or more of the above options may not eventually be available we would request that respondents list in order of preference

CONTRACTUAL ARRANGEMENTS

Taking account of Question (3) above and the contractual arrangements to be entered into for O&M charges the contract arrangements would mirror the generic payment options identified in A, B or C above. The options are:

- A. Payment on an open ended basis – variable contract
- B. Payment on some agreed basis over the contract term – with some agreed review and cost adjustment arrangement
- C. Payment on an up-front basis – with some risk premium to take account of potential price escalation on expiry of the initial contract – fixed price contract

NIE Networks and SONI expect that industry would prefer some certainty over the contract arrangement which may point to some variant of B or C above.

NIE Networks and SONI request the views of industry on the most appropriate contract arrangement in line with the generic options A, B or C above or indeed to propose any alternative arrangement

INFORMATION FOR DECISION MAKING – WITH REFERENCE TO ‘POTENTIAL CLUSTER ANM SOLUTION’

NIE Networks and SONI understand that industry will require certain information to support commercial decision making. This information is likely to be historical generation information local to the proposed managed connection location and some form of information forecast as well.

NIE Networks and SONI expect that such information would fall into at least three generic categories as follows:

- A. Historic generation information local to the proposed managed connection location in the form of time of year and time of day trends – based on connected generation
- B. Up to date information of committed generation – to enable a full assessment of the expected generation profile at the same location once committed generation was connected
- C. Estimates of the likely practical managed connection headroom to be made available at the same location

NIE Networks and SONI request the views on industry on the relevant information for decision in line with the categories A, B and C above and indeed any other important types of information that would be required for a ‘potential cluster ANM solution’