
Summary of Responses to Consultation Paper
*“Consideration of Proposed Changes to Small
Scale Generation Connection to the Northern
Ireland Electricity Distribution System”, 3rd
September 2015*

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1. Introduction

This document summarises the responses to NIE Networks consultation, “*Consideration of Proposed Changes to Small Scale Generation Connection to the Northern Ireland Electricity Distribution System*”, 3rd September 2015.

1.1. Background

Northern Ireland Electricity issued a stakeholder consultation on the management of Small Scale Generation (SSG) connections seeking permanent parallel operation on the electricity distribution network.

A number of working sub-groups were established comprising technical, commercial, financial and legal representation from NIE Networks, together with representation from Industry, the Utility Regulator (UR), the Northern Ireland Renewables Industry Group (NIRIG), the Ulster Farmers Union (UFU), the Department of Enterprise Trade and Investment (DETI), the Department of Agriculture and Rural Development (DARD), the College of Agriculture Food and Rural Enterprise (CAFRE) and other stakeholders where appropriate.

The consultation was specifically written to seek stakeholder feedback on proposals for future ‘Managed Connections’ relating to SSG.

The consultation explained the existing issues in respect of connecting SSG, outlined the concept of the ‘*managed connection*’, and invited interested parties to submit views and answer appropriate specific questions.

The consultation was published on 3rd September 2015 and closed on 16th October 2015. The consultation was distributed directly to members of the working sub-groups and was available to download on the NIE Networks website, with a further link provided from the Utility Regulator web site.

2. Summary of Responses

NIE Networks received eight responses to the consultation. Five respondents provided detailed responses to the specific consultation questions. The remaining three respondents provided more general comments.

Section 2.1 summarises the responses from the five respondents that provided detailed responses. Section 2.2 outlines the more comments by the other three respondents.

The identity of individual respondents have been withheld.

2.1. Detailed Responses

This section summarises the answers to each question from the five respondents that submitted answers to the specific consultation questions. The questions were grouped under the following headings:

- Viability of the Managed Connection
- Provision of Information
- Queuing Principles and Transition to MC
- Operational Factors
- Charging Principles

2.1.1. Viability of the Managed Connection

1. Given the increasing incidence of connections not being achievable at an escalating number of the locations, the current connection methodology has become untenable and a change in connection methodology might better utilise any remaining headroom between generator output and network load.

Assuming that an appropriate alternative managed connection approach can be developed which optimises remaining headroom at primary substations, do you believe such an alternative connection method should be considered to maximise the amount of generation that is able to connect, albeit that individual generator output it is likely to be **constrained** at certain times?

Industry Response

Four respondents replied positively in respect of developing a managed connection approach.

One respondent suggested that the amount of generation released was not worthy of the complex and expensive managed connection approach, and

shutting down generators and incurring them additional significant upfront costs doesn't make economic sense.

Other comments:

- Consider micro grids & storage.
- Consider further investment in RP6 to remove constraints.
- The economics of these grid connections make the whole suggestion of managed connections unworkable.
- The only workable solution for managed connections may be to manage one or two large generators already connected to each substation and use these larger generators to control reverse power flow. This would then allow smaller generators to connect.

NIE Networks Comment

It is difficult to fully assess cost/benefit until we have concluded the Managed Connections Pilot and worked through the commercial arrangements e.g. costs, chargeability, constraint estimation etc.

Micro grids and storage are likely to be a medium to long term solution.

The Competition & Mergers Authority Final Determination for RP5 outlines their position that it was not in the public interest for the general customer base to fund further work in the area of 33kV investment to support renewables.

NIE Networks have commissioned a third party to review the potential investment required on the 33kV network to meet both the current applications for connection of generators and the potential impact resulting from load erosion. How this investment is funded has still to be determined and therefore the report will form the basis for additional funding in NIEN's RP6 submission.

We don't believe there is scope to change existing generators that are currently connected as non-managed connections to managed connections.

2. Our current estimate suggests that the earliest implementation of the managed connection would be around quarter 2, 2016. How do you believe this timeline might impact on the viability of the managed connection approach?

Industry Response

It was considered that without the NIRO support mechanism a managed connection solution was unlikely to be relevant. However, the DETI proposals still need to be confirmed by the Assembly and a future FIT for NI still needs to be considered. It was suggested that the project should proceed unless a point is reached where it becomes clear that it had no obvious future role.

One respondent considered this to be the most relevant question in the consultation.

NIE Networks Comment

We agree that the removal of NIRO support will be critical to individual project viability; however there may still be sufficient interest from developers who wish to avail of a managed connection. NIE Networks will therefore continue at this stage to develop the Managed Connection.

3. The estimated network **constraint** will be provided as a 'snap-shot' based on the network conditions at the time of application. Due to varying load and generation conditions over time NIE Networks will not be able to guarantee future network **constraint** levels. Therefore there can be no undertaking to include the estimated constraint within the connection agreement.

Do you accept therefore, that in adopting a managed connection approach, generators manage the risk of constraint due to changes in these conditions?

Industry Response

In general respondents agreed but stated that future network reconfiguration should not adversely impact the constraint.

One respondent stated that *"if generators manage the risk of constraint, it would impose unmanageable risks on the developer that are unquantifiable."*

NIE Networks Comment

While it may not be practicable to fix network configuration indefinitely, NIE Networks will be cognisant of managed connections and the implications of any changes to network configuration, and where possible will seek to maintain network configuration.

NIE Networks will seek to outline the risk to a generator of a configuration change, in the context of a generators connection point to the network. For example a generator located close to a network normally open point may be at higher risk of a future change to configuration than one connected close to the primary substation.

Ultimately, based on information provided by NIE Networks, the developer will need to assess the risk of constraints changing over time (up or down) due to changes to network load and/or changes to network configuration.

4. The consultation paper considers two theoretical levels of **constraint** that apply during **a) 10%** and **b) 20%** of the total hours in any single year. These notional levels were chosen following initial industry engagement which suggested that

a **constraint** beyond these levels was unlikely to be acceptable in the majority of cases. For significant numbers of developers a **constraint** of only **10%** may in fact be at the high end of what is considered acceptable, although it should be noted that a **constraint** of 10% of the total hours in any single year does not necessarily correlate to a 10% reduction in capacity factor as this will be depend on the type of generation technology employed and any additional locational factors.

Do you consider these theoretical levels of generator constraint, notably ‘**10%**’ and ‘**20%**’, as being the appropriate levels to consider? Please explain your reasons.

Industry Response

One respondent considered these theoretical limits to be appropriate.

One respondent considered 10% to be the highest acceptable.

Two respondents considered that acceptable levels will be site specific and that levels higher than 20% are unlikely to be viable.

One respondent stated their view that that *“A 10% constraint for a wind turbine will lead to a loss of up to around a 25% loss in production. This is because a turbine could be shut down at an equivalent of to 36 windy days a year. This level of shutdown combined with a shrinkage in government renewable energy incentives simply means that managed connections are not viable for wind generated renewables or other small scale renewables.”*

NIE Networks Comment

10% - 20% constraint appears to be the upper limit for most developers, although the acceptable constraint will depend on the profile of each individual generator connection. Each developer will ultimately determine the viability of their individual connection.

One response suggests that a 10% constraint will result in a 25% loss in production. We imagine other parties may take a different view of this.

5. The managed connection attempts to best utilise any remaining **headroom** between generator output and network load, albeit with consequent possibility to **constrain** generators under specific network conditions.

Do you believe there is scope for developers to consider utilising energy storage/conversion in a way that increases the overall capacity factor of a power plant?

Industry Response

Four respondents replied positively, with three of the four commenting that this technology was unlikely to be relevant in the short to medium term.

One respondent suggested NIE Networks should consider investing in network storage to prevent unacceptable levels of reverse power flow.

NIE Networks Comment

We are planning to undertake a preliminary project during RP6 with the objective of developing a suitable framework for contracting energy storage services to mitigate a variety of network constraints. This project will be subject to regulatory funding.

As previously stated however, it is unlikely that energy storage will be a short term solution.

2.1.2. Provision of Information

6. Do you believe that the relevant technical matters have been adequately explained?

Industry Response

Four respondents replied positively.

One respondent did not specifically address this question.

NIE Networks Comment

No comment.

7. Do you believe the information to be provided by NIE Networks in respect of network load profiling, connected generator profiling and estimated network **constraint**, to be reasonable and consistent with those areas where NIE Networks is well placed to provide relevant information, as part of the overall information to allow a business case to be drawn up by the connecting generator?

Industry Response

Four respondents replied positively. It was further commented that the Information provided should be up to date and that constraint reports should be available and include committed generation.

One respondent did not specifically address this question.

NIE Networks Comment

NIE Networks intend to include the number and type of generation sites (Solar/Wind/Other) broken down in to Offered/Committed/Connected by conventional and actively managed connection. All data provided will be current and up to date at the time of offer.

8. Do you accept that the network **constraint** analysis undertaken by NIE Networks will make no assumption around the load factor of generators connecting to the relevant circuits and that it is up to the applicant to incorporate NIE Networks' **constraint** analysis along with specific information in relation to generator load factor in order to complete a more complete picture of the possible level of **constraint**?

Industry Response

One respondent said 'yes'.

One respondent said 'no'.

Two respondents accepted that analysis will be used solely at the risk of the generator, however, stated it would be helpful if NIE Networks would provide an analysis of typical generator load factors with a statement of the assumptions made.

One respondent did not specifically address this question.

NIE Networks Comment

While NIE Networks does not have access to the site specific load factor information, we will endeavour to source generic information that will assist developers with their assessment of the load factor of their individual connection.

9. Have we provided sufficient information for you to understand the technical requirements of your generator to operate as a managed connection? I.e. that it is capable of:
- being monitored by NIE Networks at all times
 - receiving a signal from NIE Networks in a specified protocol and converting that signal to a protocol specific to the particular generator;
 - acting on that signal to reduce output to zero in a controlled and timely manner (as agreed by the connection agreement);
 - inhibiting further generation until such times as a further signal is received from NIE Networks to allow the generator to reconnect;
 - providing a fail safe facility to allow NIE Networks to disconnect the generator from the NIE Networks network should the generator fail to act on the 'disconnect' signal within the agreed timeframe.
 - Being required to disconnect in the event of a communications failure

Industry Response

One respondent replied positively.

Two respondents stated *'until the detail is worked through at installation level we cannot confirm that sufficient information has been provided'*.

One respondent stated that *"NIE should ask the applicant to provide an estimate of the load factor of the generator connecting to the relevant circuits, and respond accordingly"*.

One respondent did not specifically address this question.

NIE Networks Comment

NIE Networks will provide specific technical requirements at the appropriate time following completion of the Managed Connection Pilot.

As previously commented, while NIE Networks does not have access to the site specific load factor information, we will endeavour to source generic information that will assist developers with their assessment of the load factor of their individual connection.

For the avoidance of doubt, the final bullet point in question 9 above should read:

- *Being required to disconnect in the event of a communications failure beyond any agreed 'acceptable duration.'*

2.1.3. Queuing Principles and Transition to MC

10. All existing and committed non-managed generation will retain their non-managed status. All managed connections will be processed according to their position in the **generation queue** and any **constraint** will be estimated based on this position.

In respect of any generator **constraint**, managed connection generators will be controlled based on either a) a 'last in first off' principle of generator control, OR b) a 'shared' principle of generator control. Initial feedback from industry groups favours the 'last in first off' principle of generator control over the 'shared' principle of generator control.

- I. Have we adequately explained the 'last in first off' principle of generator control vs. the 'shared' principle of generator control?

Industry Response

Four respondents replied positively.

One respondent did not specifically address this question.

NIE Networks Comment

No comment.

- II. The 'shared' principle adds significant complexity, time and cost to implement the managed connection. Taking account of this and the general view from early industry engagement, do you concur therefore with the initial view that favours the 'last in first off' principle of generator control? Please give reasons.

Industry Response

Four respondents replied positively. Further comments stated that the 'shared' approach would not maximise the number of generators likely to connect.

One respondent did not specifically address this question.

NIE Networks Commentary

It is clear from the responses that The "Last in first off" is the preferred approach.

- III. If the 'shared' principle were to be adopted, bearing in mind that existing customers' constraint expectation increases as each new customer connects, what do you consider to be the maximum acceptable percentage constraint?

Industry Response

Only one respondent responded with a value, that being 10%.

One respondent did not respond with a value stating that they do not believe the 'shared' approach to be practical.

Three respondents did not specifically address this question.

NIE Networks Commentary

The 'shared' option was not considered to be a practical option for Managed Connections.

11. To ensure a consistent approach the managed connection will apply to all new applicants from a specified date, and to all existing applicants that have chosen to remain in the generation queue awaiting the managed connection. For new applicants, while this may result in some managed connections initially having little or no constraint, all connecting generators will need to comply with the requirements of the managed connection.

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- I. Have we adequately outlined these requirements?

Industry Response

Two respondents replied positively.

Two suggested that a generator should be offered a non-managed connection in locations where there is adequate capacity.

NIE Networks Comment

As NIE Networks do not have control over changes to connected network loads, or to existing connected small scale generation output, some risk exists that future load decrease could result in reverse power flow issues which would require further costly network investment.

Furthermore load erosion can occur due to energy conservation, continued G83 installations and/or increased utilisation of generation/storage through future technology advancements

Whilst NIE Networks have to date sought to have a “balanced” risk approach, by facilitating limited generation, up to the level of minimum load, even when no reverse power capability is available, it is now be appropriate to review this position in order to reduce or remove the risk of additional network investment being required, thereby protecting the general customer base from increased costs.

The introduction of managed connection from a future date for all small scale generators seeking connection may provide an opportunity to control generator output to reduce or remove the risk of load erosion causing further network investment. This would however increase costs to potential generators and may make some small generation sites financially unviable.

NIE Networks have therefore concluded that further work is required to assess other options to reduce the level of risk, for example by reducing the level of generation permitted when no reverse power capability is available, before any final decision is made as to the introduction of managed connections for all future small scale generation connections.

In the meantime the current “balanced” risk approach will be maintained and non-managed connections will continue to be offered where capacity is available. It should be noted however that the level of generation permitted, beyond which managed connections at a substation may become mandatory, at some future point may be reduced following further risk analysis by NIE Networks.

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- II. Please outline any further comments of observations relating to this approach, together with any supporting examples.

Industry Response

No further comments were offered.

NIE Networks Comment

No comment.

12. Careful consideration will need to be given to prioritising the rollout of automated control at the appropriate substations which will ultimately release offers at those locations first.

While baring in mind that rollout costs may ultimately be impacted by how substations are prioritised, which of the following options do you feel provides the fairest means of prioritising this rollout? (Please provide rationale and outline any further options that you consider appropriate for consideration).

- a. Prioritise substation with highest summation of queue positions applying to connect at that substation.
- b. Prioritise substation with highest developer queue position; but offering connection to all developers wishing to connect to that substation.
- c. Prioritise substation with highest summation of connection capacity.

Industry Response

One respondent chose Option A. Stated this was the fairest option, which might not maximise the initial additional capacity, but provides an equitable solution for all applicants.

One respondent chose Option B. No supporting comments provided.

Two respondents chose Option C. Both stated that this was the best option to allow largest capacity to connect in quickest time and should minimise costs of each managed connection. They further stated that Option A might be similar in terms of capacity and cost and would be fairer to those in the queue. Option B is probably the least desirable as neither maximising capacity nor generally being fair (on average) to those in the queue (e.g. the highest developer queue position at that location might be number one but the rest could be considerably further down the queue).

NIE Networks Comment

Following the Utility Regulator Determination (DET-572), which concluded that NIE Networks was not entitled to insist on grant of planning permission as a pre-requisite for applying for connection, on 12th August 2016 NIE Networks changed its application policy to align with this determination.

The current approach to processing applications would not allow NIE Networks and SONI to develop the overall transmission and distribution networks resulting from the subsequent influx of applications in an efficient and coordinated manner in line with our legal obligations and would result in an increased burden on the NI customer base. At a workshop in December 2016, chaired by the UR, it was announced that an integrated queue of both large and small scale applications is to be consider in a 'batch'¹ approach. This approach will be in line with Option B.

2.1.4. Operational Factors

13. Do you believe that the generator operational management & control principles have been adequately explained?

Industry Response

All respondents replied positively.

NIE Networks Comment

No comment.

14. Provision of communications from the generator to the source substation will be the responsibility of the generator. Reliable communications is central to the operation of the managed connection. If communication to a generator is lost (beyond any agreed 'acceptable duration') the generator will be required to disconnect until such times as communication is restored. It should be noted that any restriction to generator output due to a break in communication, is in addition to any constraint applied under the managed connection. The extent of this further restriction due to communications reliability **may be a determining factor in a generators business case**, and will therefore require further evaluation by the developer depending on the communications technology solution employed.
- I. Do you understand that any break in communication (beyond any agreed 'acceptable duration') will further restrict a generators output?

¹ Refer to Alternative Connection Application and Offer Process Proposal
<http://www.nienetworks.co.uk/documents/Generation/Alternative-Connection-Application-and-Offer-Proce.aspx>

Industry Response

All respondents replied positively. Two respondents commented that network conditions at time of lost communications should factor in the length of acceptable duration e.g. high load periods where capacity issues are low should result in longer acceptable duration.

NIE Networks Comment

In respect of applying a 'duration factor' depending on the load at a particular time, NIE Networks would have no means to adjust the duration in real-time, owing to the break in communications.

The only way to achieve this would be by employing a pre-set 'time of day/year' approach, but this would be impractical as it does not take account of any sudden unforeseen variations in load, for example, due to fault occurring during the break in communications.

- II. In this context, but bearing in mind that the level of reliability will be somewhat in proportion to the cost, what level of communications reliability would you consider appropriate? Please give reasons.

Response

Only three responded. Two stated that it was dependant on the length of 'acceptable duration'. The third stated it was up to NIE Networks to define the level.

NIE Networks Comment

NIE will follow up with industry on this point. The question needs to focus more on the acceptable level of additional generator downtime due to a break in communication. As this will be in addition to the estimated constraint due to network load variations, it is likely that industry will seek to minimise further downtime due to breaks in communications.

- III. Do you have a view on the type of communication medium that you consider to be most appropriate for this application?

Industry Response

Respondent 1 - GPS

Respondent 2 – 'MUD BUS' with full communication data link.

Respondent 3&4 – will depend on level of reliability but if cost is too high it will undermine the entire concept.

NIE Networks Comment

The resilience of the communication will need to be balanced between the cost of the technology and the full cost of operating a managed connection. Any minimum resilience requirement may therefore depend on the specific connection.

In respect of response from respondent 2, we think 'MUD BUS' should read 'Modbus'.

2.1.5. Charging Principles

15. The development of a 'managed connection' will be subject to the findings of a suitable working pilot. While it is too early to accurately evaluate costs at this stage, pending the outcome of the pilot, the following table provides an approximate indication of the scale of costs to implement managed connection, as a total cost based on 50 generators connecting at 10 primary substations:

Based on 50 Generators connecting to 10 Substations	
Item	Cost
Hardware & Integration (Substation & generator)	c.£700k
Annual Licence & Support	c.£300k

These costs are provided for indication only. Final costs will ultimately depend on the outcome of a competitive tendering process and will further depend on the total number of generators connecting, and the relative numbers connecting at a specific substation location.

The Competition Commission Final Determination outlines their position that it was not in the public interest for the general customer base to fund further work in the area of 33kV investment to support renewables².

- i. Accepting that while this position may ultimately limit the available investment options, do you believe:
 - a. Developers should pay the full cost for the automation (reverse power control) required to implement 'managed connections' at their connecting substation, or a portion thereof where:

² Refer to Competition Commission 'Final Determination', sections 10.316 to 10.319.
https://assets.digital.cabinet-office.gov.uk/media/535a5768ed915d0fdb000003/NIE_Networks_Final_determination.pdf

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- i. developers are invited to apply through a ‘gating’ type approach, where implementation at a specific location might require a minimum number of accepted offers to implement, with each developer paying a share of the cost?; or,
 - ii. developers collaborate to share the costs through an agreed single point of contact, and settle payment through one of the collaborating parties?

We invite developers to bring forward options as to how apportionment of cost between developers might be achieved given that NIE Networks must be entirely certain of payment via a single interface with the developers.

- b. Developers should pay the full cost for automation (reverse power control) in advance at a location and seek to recover the cost from subsequent connecting parties through some form of rebating approach?

Note however that this option relies on establishing and implementing a rebate mechanism which would ultimately require legislative change involving DETI and a public consultation. This could potentially take many months to process and implement, adding significant delay to any implementation of the managed connection.

- c. The cost of automation (reverse power control) is treated as an ‘optimisation cost’ (this assumes that separately further investment at the primary substations are not justified from an asset replacement viewpoint) and this optimisation cost is initially funded by the NI customer with each connecting party paying a contribution to wind out the net RAB?

Note however that this would require a public consultation and a subsequent modification to NIE Networks’ Licence. This could potentially take many months to process and implement, adding significant delay to any implementation of the managed connection.

- d. The cost of automation (reverse power control) is borne by the NI customer as the most efficient way to develop the network to enable NIE Networks to meet its obligations.

Note however, as outlined above, this appears to run in the face of the CC determination and therefore may not ultimately be a viable option. Furthermore, it should be noted that this would require a public consultation and subsequent modification to NIE Networks’ Licence. This could potentially take many months to process and implement, adding significant delay to any implementation of the managed connection.

Please note that no guarantee can be provided by NIE Networks at this point that any of the above arrangements may readily be put in place however NIE Networks will assess as best possible the workability of proposals brought forward by respondents

- II. Notwithstanding your answer to i. above, in respect of any perceived benefits to customers in general:
- a. Do you believe that developers alone should bear the costs for automation (reverse power control) required to implement ‘managed connections’?; or
 - b. Do you believe that customers in general would benefit from the ‘smart’ solutions required to implement ‘managed connections’, and in line with your view on the extent of any perceived benefit to customers in general, how should the costs associated with the automated control arrangement to implement the managed connection be shared between the NI customer and the developer?

Please state in percentage terms what you consider to be an appropriate sharing of benefit, and hence cost sharing, Developers: NI Customers, where 100% : 0% assumes the developer pays the full cost and 0% : 100% assumes the NI customer pays the full cost.

Please provide any detail you can and appropriate rationale to support your view.

Please note, as outlined above this approach may not align with the CC determination and therefore may not ultimately be a viable option.

Industry Response

Only four responded. One respondent felt they didn’t have enough experience to comment.

Two respondents answered as follows:

1.a (Full cost) – probably the only mechanism that would be practical to implement, given the short timescales.

The best arrangement for the sharing of costs will have to be thought through although option 1.a.ii (Developers Collaborate) is likely to be the most practical, again given the timescales.

1.b (Rebate) & 1.c (Cluster) - With regard to current DETI position on support for renewables neither were considered viable due to short length of time for implementation.

1.d (NI Customer) - Felt it was unfair developers should pay 100% of the arrangements required to implement managed connections, accepting that the principle of NI customers bearing all or part of the cost would take some time to put in place.

With respect to part ii of the question, we believe that is unfair that developers should pay 100% of the arrangements (automation/reverse

power control) required for managed connections. These types of facility should surely be part of a modern, present day network and, when established, they will give NIE Networks improved visibility of conditions on their network which should be of benefit to all customers. We believe that a 50%/50% sharing, developers/NI customer would be appropriate.

One respondent answered as follows:

1.c (Cluster) & 1.d (NI Customer) - believed that the cost of automation (reverse power control) should be treated, either as an 'optimisation cost', or that the cost should be borne by the NI customer, as the most efficient way to develop the network, to enable NIE Networks to meet its obligations.

With respect to part ii of the question we believe that developers, alone, should not have to bear the costs for automation (reverse power control) required to implement 'managed connections'. It is difficult to determine an appropriate sharing of benefit, at this stage.

One respondent commented that the cost of controlling generators should be borne by the general public.

NIE Networks Comment

The decision will ultimately depend on the length of time to achieve a practical chargeability arrangement, given the current position in respect of early closure of the NIRO. Some opinion suggests sharing this cost with the NI customer, however agreeing a suitable arrangement with the Utility Regulator may add considerable time with no guarantee of achieving a suitable outcome.

Should the timescale remain short then the obvious approach would be for the developers to bear the cost of implementing the managed connection.

2.2. General Responses

This section outlines more general responses from three respondents.

Industry Responses

SONI expressed some concern on how Managed Connections might impact the operation of the transmission network.

One respondent commented specifically in respect of Anaerobic Digester Generation, summarised as follows;

'Managed Connections will not work for biogas plant. A biogas plant needs consistency in feedstock in order to maintain continual sufficient good quality biogas output. If it is in the on/off mechanism proposed by NIE Networks managed connections, the system will not be efficient in any way whatsoever.'

One respondent commented as follows;

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- Closure of NIRO may make this exercise pointless.
 - Should be combining different renewable sources coupled with energy storage.
 - Some constraint should be put on existing connected and committed generated connections
 - Last in first off constraint principle - disagree with this principle.
 - The last in will need idea of the amount of time they will be connected.

NIE Networks Comment

SONI are currently assessing the overall impact of non controlled generation on the network.

NIE Networks have no specific expertise of Anaerobic Digester Generation processes and so cannot provide any specific comment. However as we have outlined in the consultation, the absence of some level of control at particular locations is making it difficult to connect further uncontrolled generation.

NIE Networks are aware that early closure of the NIRO may impact the viability of the 'managed connection'. Combining different renewable sources along with energy storage will increase the utilisation factor for generators, but may also impact future managed connection constraint levels as it acts to erode the base load.

We don't believe there is scope to manage existing generators connected as non-managed connections.

3. Managed Connections Pilot Update

The following stages of the Managed Connection pilot are complete:

- Pilot Scoping
- Pilot Design
- Equipment Manufacture
- Factory Acceptance Testing (FAT)

The FAT highlighted some minor redevelopment needs. A redevelopment phase has been on-going during January/February 2016.

It is anticipated that installation, commissioning and site acceptance tests will be completed at the two volunteer wind generator sites and the associated NIE Networks substation by mid March 2016.

The managed connections testing phase is on-going.

4. Further commercial considerations

The consultation has focussed on the managed connection principles and the technical requirements. During the design and scoping of the pilot, further issues have emerged that will require appropriate consideration by both NIE Networks and industry.

We believe the most appropriate way to advance our thinking on these matters will be to include on the agenda of our next industry workshop. The areas for consideration are outlined below:

Disconnection for non compliance

Where a generator is provided with a set-point based on network conditions at a point in time, and subsequently fails to comply with the requirements, that generator will be disconnected from the network.

The most appropriate means of disconnecting the generator is to utilise an output from the generator controls to trip the customer circuit breaker (in a similar manner to the G59 & NVD arrangement).

The elements of such an arrangement that need to be agreed and formalised include:

- any ESQCR requirement for NIE Networks to monitor the maintenance/testing of a customer’s circuit breaker.
- the process for disconnection and subsequent reconnection
- persistent non-compliance – process for formal investigation/actions
- formalisation of non-compliance arrangements within the Generator Connection Agreement

Contract term for managed connection service

This relates to the length of contract that NIE Networks can commit to in respect of providing the required control arrangements for the lifetime of a generator.

Given the specialised nature of the managed connection control arrangements it is envisaged that this, together with any associated customer support function, will be contracted out to a third party as a managed service.

Typical contract terms would suggest that it is unlikely that a contract length for such an arrangement would be more than c.7 years. There is concern therefore around:

- the certainty of re-engaging the contract, and;
- how we assess any arising cost changes with any certainty.

Furthermore it is likely that the hardware and software associated with the managed connection will have a lifetime of around 7 to 10 years, so during the lifetime of a generator the control systems would require to be replaced at least once.

Again there is concern therefore around how we:

- assess any arising cost changes with any certainty, and;
- recover the on-going control equipment replacement costs over the lifetime a generator.

System security

The level of reliability of the managed connections control and communication systems may impact the level of constraint applied to a generator. In that context the level of system redundancy needs to be considered.

One option is to install a 'thin' model with no contingency or redundancy, another a 'thick' model with a level of built in contingency or redundancy. Ultimately the thicker the model the higher the cost.

Provision of communications

The simplest communications arrangement is where the managed connections service provider provides the communications functionality. The cost of communications to the managed connection end user will depend on a range of factors:

- Communications reliability
- Service Level Agreement, in the event of break in communications
- Support/help desk process and availability i.e. 24/7, 365 days per year

Connection Agreement

Connection Agreements need to be developed to reflect:

- Service Level Agreements
- Constraint estimation
- Other arrangements relating to any of the above.

5. Generator utilisation & the potential impact to managed connections

We have explained the challenges we face with the continuing demand to connect generation to the network. But we are also facing growing interest from the entire LSG and SSG community for developers to utilise their generation in different ways which may impact the available load network.

As has been explained, the managed connection concept has been developed to exploit any available headroom resulting from diversity, so any erosion of this load will ultimately act to increase the potential constraints applicable to manage connections.

In addition to general energy conservation, the following initiatives might act to reduce the available load on the network and potentially impact the managed connection.

Over installation of capacity

Developers have increasingly expressed interest to connect generators larger than their proposed MEC, controlled to ensure the generator output will be limited to their MEC. In the case of a wind generator the maximum rating will only be reached during optimum wind conditions, with a lower output during lighter wind conditions so this type of arrangement provides the generator with better utilisation.

The ability to connect a growing numbers of generators relies heavily on the fact that they will not all be generating their full capacity simultaneously, so there is diversity between them. Over-sizing potentially reduces that diversity, using up the available headroom that managed connections wish to avail of.

Extending MEC for mixed technology installations

This is where a new or existing generator requests to connect additional generation using a mix of technology, while retaining the same MEC. So, for example a wind generator might install some solar panels so that during low wind periods his maximum export capacity may still be reached increasing the utilisation of the site.

This is similar to the over-sizing example above, although it has the potential to result in an output at or close to the full MEC for even longer periods, thus potentially eroding diversity and minimum load to a greater extent.

These approaches are also considered in the consultation document “Alternative Connection Application and Offer Process Proposal” (previously referred to on page 14)

Further Consultation

We expect to consult further on a wider industry basis on the matters referred to in this Section 5, however we believe it would be useful to discuss and understand the views of parties more directly interested in managed connections as part of this debate.

6. Next Steps

Based on the information provided in this document we are holding a further industry workshop on 25th at The Mount Business and Conference Centre - 2 Woodstock Link Belfast BT6 8DD.