

FLEXIBLE CONNECTIONS

A Call for Evidence
What Stakeholders Told Us

03/09/2024



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1. INTRODUCTION

In the summer of 2023, NIE Networks published a call for evidence on flexible connections. In that paper we:

- described what we mean by flexible connections and some different forms of flexible connections;
- considered the impact of flexible connections on systems, including systems operated by NIE Networks, SONI, suppliers, wholesale and system services market operators; and
- sought the views of customers and other stakeholders on the opportunities and efficiencies that might be achieved by different flexible connection arrangements.

We noted that any decision to move forward with a form of connection flexibility would be subject to a detailed cost benefit analysis by NIE Networks and regulatory engagement.

In this paper we summarise the feedback we received from stakeholders.

The call for evidence, which includes definitions of key terms, remains available at <https://www.nienetworks.co.uk/about-us/regulation/flexible-connections-call-for-evidence>.

2. RESPONSES

We received ten responses from stakeholders, through our website form and by email. Most respondents provided feedback on most questions we asked and some provided supplementary, supporting information. We received responses from:

- Consumer Council
- Energy Storage Ireland
- EVANI
- iPower
- RenewableNI
- RES
- SONI
- Strategic Power Connect
- Translink
- Ulster Farmers Union

We are very grateful to our stakeholders, who took the time to consider our call for evidence in detail and provide thoughtful responses. In this document we summarise sentiment among this group of stakeholders and share our own remarks in response.



Theme	Question	Stakeholder Sentiment and Additional Remarks (Brackets indicate the number of similar responses to a question. Italic text for a direct quote.)	NIE Networks' Remarks
Benefits of Flexible Connections	Question A: Do you agree with the anticipated benefits of flexible connections, as described above?	<p>Nine out of ten stakeholders broadly agreed, with one offering no response.</p> <p>Additional comments:</p> <ul style="list-style-type: none"> • Flexible connections could use capacity that is underutilised. • This initiative, together with other reforms, could impact how charges and benefits are shared between connecting parties and consumers. • More efficient use of connection and system assets could reduce costs for the connecting customer and act as an enabler of decarbonisation. 	<p>We are pleased that respondents generally agreed with our view of the anticipated benefits flexible connections could provide.</p> <p>We also agree with the suggested range of potential beneficiaries.</p> <p>We are alert to the effect of this initiative, along with other reforms, on charges incurred by connecting parties and consumers.</p> <p>Through a separate workstream we have been considering the potential opportunity for community energy in Northern Ireland.</p>
	Question B: What other benefits do you identify?	<p>Eight respondents provided answers, generally grouped thus:</p> <ul style="list-style-type: none"> • Releasing capacity or maximising use of existing network assets (2) • Faster connection (2) • Lower cost connection or avoidance of deep reinforcement (2) • Increasing connection of LCTs, including EV charging (2); renewables and storage. • Sharing import or export capacity. • Reduced energy costs for all consumers. • Reduced asset investment programmes. 	

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		<ul style="list-style-type: none"> • Reduction of dispatch down of renewables. • Increased use of smart, technology driven solutions to network issues. <p>One stakeholder provided an additional comment on the connection charging regime, which has recently been the focus of a joint call for evidence by the Utility Regulator and the Department for the Economy.</p>	
	Question C: What kinds of customers or assets might benefit from flexible connections?	<p>Seven respondents specified:</p> <ul style="list-style-type: none"> • Transport (including public transport and electric vehicle charge point operators) (2), including for off-peak charging. • Prosumers • Community energy projects • Generation, generally (1) • Storage (1) • Demand (1) • Consumers (2), including domestic and small business customers, should be able to share in the benefits and no category of customer should be left behind. • Renewable generation (2), including small scale generation. • Aggregated generation units • Demand side units 	

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Types of Flexible Connection	Question D: What form of flexible connection would be of most benefit to you? Why?	Six respondents indicated a view on this question. While three specified a single type of flexible connection - timed static, seasonal static, dynamic - three others noted that a combination of types would have value or that different types would have value for different types of customer. For example, profiled or seasonal static for forecastable renewables, profiled or dynamic for electric vehicle charge point operators.	<p>We agree with stakeholders that the different types of flexible connection we proposed have utility for different kinds of customer. We will take this into account as we develop our proposals, noting that our management of the network should be generally technology independent.</p> <p>We are aware of the portfolio of network management and flexibility tools that are in use in GB. Some of these are in trial in Northern Ireland through NIE Networks FLEX trial, which is also based on the principle of optimising the network in terms of utilisation and investment.</p> <p>Some of the suggested GB mechanisms, for example time of use tariffs, go beyond the scope of this call for evidence, which focuses on connection capacities. Others, for example the balancing mechanism, dynamic containment and capacity market, are arrangements which are operated by the TSO to ensure system wide capacity availability, frequency response and system balancing capability. These are therefore not services that a DNO/DSO would procure.</p>
	Question E: Are there any other forms of flexible connection that would be of value to customers?	<p>Three respondents suggested other forms of flexible connection used variously in GB:</p> <ul style="list-style-type: none"> • Single Generation Active Network Management, which is a form of active network management used in GB. • 3rd party Active Network Management, where customers share capacity and demand management. • Fourteen GB active participation programmes: Balancing Mechanism, Capacity Market, Dynamic Containment, Optional Downwards Flexibility Management, - Sustain Peak Management, Sustain Export Peak Management, Secure DSO Constraint Management (pre-fault), Dynamic DSO Constraint Management (post-fault), Exceeding Maximum Export Capacity, Exceeding Maximum Import Capacity, Offsetting, Wholesale Trading, Time of Use Tariffs, Transmission Charge Management, Distribution Charge Management, Constraint Managed Zone <p>Additionally:</p>	

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	<p>Question F: Recognising that more granular resolution would mean greater complexity in systems, what resolution would be optimal for a flexible connection, and why?</p>	<ul style="list-style-type: none"> • <i>Semi dynamic flexibility provided by a signal would also be beneficial to customers and companies charging EVs.</i> <p>Six stakeholders indicated a specific optimal resolution for changes in capacity in a flexible connection:</p> <ul style="list-style-type: none"> • Two proposed a night time block or the Economy 7 window. • One proposed hourly resolution. • Three noted the wholesale SEM operates at 30 minute resolution, which would be appropriate for flexible connections, and two of these suggested that should be the minimum (no longer period) resolution. <p>One stakeholder urged more detailed modelling to explore the options.</p>	
Charging	<p>Question G: Bearing in mind the increasing importance of customers not exceeding their contracted connection capacity, do you agree with the principle that customers should be incentivised not to exceed their MIC/MEC?</p>	<p>Of the eight stakeholders who provided a response, seven were in clear agreement. One other referred to individual businesses having unique challenges and differing views.</p>	<p>We are pleased that stakeholders generally agreed with the important principle of customers not exceeding their contracted connection capacity.</p> <p>We will continue to explore how to manage the risk of exceedance in a proportionate way, taking account of the cost of installation of physical apparatus and ongoing communications.</p> <p>Our approach might involve different measures for different kinds of customers – for example physically limiting export from a renewable generator has a quite different impact from limiting import to a demand site.</p>
	<p>Question H: Do the present exception charges for MIC provide a suitable and sufficient incentive for customers not to exceed their MIC?</p>	<p>Stakeholders were generally silent or neutral on this question, with one suggesting that existing customer behaviour in relation to exceedance charges could be analysed.</p>	

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	Question I: Do you agree in principle that an equivalent exception charging mechanism should be established for exceedance of MEC?	<p>Four respondents provided a response to this question and all were in agreement. Additional comments concerned:</p> <ul style="list-style-type: none"> • Whether MIC and MEC exceedance drive costs in a materially different way. • Alignment with the approach for monitoring and limiting exceedance at transmission level, particularly for hybrid sites. 	We agree that charging customers for MIC held in each period is likely to be the most appropriate approach for MIC charging, but we must be mindful of the impact on all consumers.
	Question J: Would you advocate or be willing to install physical controls on site to reinforce adherence to MIC/MEC limits?	<p>Again, all four of the respondents who provided an opinion were positive. Additional comments included:</p> <ul style="list-style-type: none"> • The need for greater clarity on the controls. • The need for customers to pay for the apparatus, so long as the compliance incentive justifies that. 	
	Question K: What approach to charging for MIC provides a meaningful incentive for customers to hold no more than sufficient capacity for their needs? Options: Charge for maximum MIC; charge for MIC in each period; some other approach – please describe?	<p>Five stakeholders provided a response to this question. The responses included:</p> <ul style="list-style-type: none"> • Charge for MIC held in each period. (3) • More analysis is required/learn from other jurisdictions. • Consider time banded capacity charging linked to firmness or flexibility, as has been discussed in other jurisdictions. • Charge for maximum MIC would provide no incentive. 	
Reducing Connection Capacity	Question L: Would customers seek to move to a flexible connection in order to reduce	Of the five stakeholders who expressed a clear view on this question, all were positive. Additional remarks included:	We agree with stakeholders that customers would, in principle, move to a flexible connection in order to reduce total network charges, but that the effect

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	connection capacity in certain periods and therefore reduce total network charges?	<ul style="list-style-type: none"> • This would depend on the level of charging, as well as related access rights. • Need to consider the relationship with Firm Access Quantity. 	<p>would depend on the measure of the incentive or saving.</p> <p>On the prospect of a market for connection capacity, we note agreement in the principle and we will continue to evaluate the potential for such an arrangement, though our initial review indicates concern about liquidity and the overhead of operating such a market.</p> <p>To be clear, the absence of an open, liquid market for capacity does not mean that we would not offer flexible connections in any location.</p>
	Question M: Does the cost saving of moving to a flexible connection provide sufficient incentive for customers to release capacity?	<p>Two stakeholders expressed clear positive sentiment on this question. Additional comments included:</p> <ul style="list-style-type: none"> • <i>Further analysis and customer engagement is required.</i> • <i>The arrangements need to be flexible enough to respond to emerging experience.</i> • <i>Impact of charges should be assessed against market driven flexibility to achieve the same results.</i> • <i>Unclear at this stage.</i> 	
	Question N: Do customers think a market for connection capacity is, theoretically, a useful approach?	<p>Six stakeholders agreed clearly with the concept proposed in this question. However, comments expressed reservations about its practical viability:</p> <ul style="list-style-type: none"> • <i>Difficult to envisage a viable and efficient market arrangement in the short term.</i> • <i>As this is something we do not have experience with at present within the SEM it is difficult to comment wholly on the practicalities of this at this point.</i> <p>These are further reflected in answers to the next question.</p>	
	Question O: Do customers agree that a market for connection capacity is, in practice, unlikely to	<p>Most stakeholders (6) were neutral or did not express a clear opinion on this question. Two others agreed and two disagreed. Those who disagreed noted the urgency</p>	

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	<p>be a useful approach in the short to medium term?</p> <p>Question P: Should a connection capacity market remain a consideration in the longer term?</p>	<p>of flexible arrangements and the context of the 2030 target.</p> <p>Comments included:</p> <ul style="list-style-type: none"> • <i>Only limited information has been given about the reasons for dismissing this option in the short term. While concerns about cost and liquidity seem reasonable, further detail on the analysis supporting this view would be welcome.</i> • <i>The logistics of a connection capacity market in the short term appear to be considerable.</i> • <i>Experience of other markets where transmission capacity trading was implemented but market take up has been very limited ... suggests that there needs to be a robust demand for such an option before committing significant resources to exploring feasibility.</i> <p>Eight respondents provided a brief, positive answer, while two were neutral or did not respond.</p>	
Network Risk	<p>Question Q: Which approach should we pursue: The 'deterministic' approach, where we keep total contracted capacity within the capacity of the network; or the 'probabilistic' approach, where we offer additional connections based on historic and forecast network flows?</p>	<p>Of the seven respondents who explicitly answered this question, all seven indicated a clear preference for a probabilistic approach. Supporting comments included:</p> <ul style="list-style-type: none"> • <i>Probabilistic as will get us through the current transition period until the network is sufficiently reinforced.</i> • <i>The deterministic approach is still likely to lead to network under-utilisation and by its very nature, embedded generation would benefit</i> 	<p>We are grateful for stakeholder feedback in support of the probabilistic approach, which we agree with for the reasons stakeholders have identified.</p> <p>A signal based approach is likely to be part of a more active network management methodology, which we have referred to as a dynamic flexible connection.</p> <p>We note stakeholder comment on the totality of reforms and innovations underway and the total</p>

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		<p><i>from the issuing of flexible connection agreements whilst taking into account real measured network flows based on historic and forecast data.</i></p> <ul style="list-style-type: none"> • <i>Based on the analysis presented in the consultation, we believe that a 'probabilistic' approach towards network operation is likely to bring forward a greater level of benefit.</i> • <i>From the perspective of the consumers who ultimately bear a substantial element of the cost of providing network capacity, the benefits and costs (for example of systems and monitoring) of the approach should be articulated and where possible quantified.</i> • <i>The probabilistic approach will deliver greater utilisation and is more reflective of actual network performance. The deterministic approach will result in a worst case view that limits utilisation. The utilisation of physical controls and communication channels provides an opportunity to consider interventions should worst case scenarios materialise.</i> 	<p>effect on consumers. This is a topic we will consider further, because we see value in mapping the emerging opportunities and evaluating their coordinated impact.</p>
	<p>Question R: Is there another approach we should explore?</p>	<p>Most respondents were silent on this question. However, two provided comments:</p> <ul style="list-style-type: none"> • <i>Consider a signal based approach where a customer can be provided with a network based signal to increase or decrease demand, when needed.</i> • <i>We believe that the various possible reform initiatives should be considered in a joined-up way as there are interdependencies between</i> 	

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		<p><i>them. Thus, all possible approaches should be explored, including the use of flexibility markets (being considered by the FLEX Innovation Project), decisions in relation to the setting of the connection charging boundary (being consulted on concurrently by DfE and UR) and hence the burden of costs to be recovered directly from connectees or from DUoS charges. This holistic view of reform will require a degree of co-ordination between the parties (DfE, UR, NIEN and others). Absent such co-operation there is a likelihood of inconsistent approaches which may waste cost, reduce benefits, or result in unintended consequences. At present the Consumer Council sees limited evidence of such a co-ordinated approach and we do not believe that the development of such arrangements are "inherently co-ordinated" as noted in the consultation document.</i></p>	
Regulation and Standards	<p>Question S: With regard to the regulatory framework do you agree that no changes are required in order to connect customers with flexible connections? If not, please explain.</p>	<p>Of eight respondents who provided an answer to this question, five agreed, one of whom suggested:</p> <ul style="list-style-type: none"> <i>I agree that no changes are required in order to connect customers with flexible connections. In fact I believe that you are required to under the terms of your licence otherwise you will be unduly to discriminating between customers.</i> <p>Of the two who disagreed, neither highlighted a specific obstacle, but both considered changes might be required and one focused on the need for a full pathway.</p>	<p>We agree with the majority of stakeholders, who saw no impediment to the flexible connections we have proposed in the present regulatory framework and we note the single view that the value offered by flexible connections is the kind of thing we are required to provide under our licence.</p> <p>We note the concern expressed by two stakeholders that changes in the regulatory framework might be required. We do not disagree in principle that, as we roll-out new approaches to network optimisation that interact with customer needs and behaviours, some changes might be required. However, at this time our priority is to test what can be delivered in the relative short term,</p>

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		<ul style="list-style-type: none"> <i>To enable the efficient roll out of these proposals, there may be a requirement to treat certain customers differently due to their requirements and as a result a change may be required to the Framework.</i> <i>We believe it extremely unlikely that a well-designed set of changes to encourage greater flexibility and efficiency will be able to be achieved without the need to change the regulatory framework. It may be possible to alter certain arrangements without such changes, but the consultation does not adequately explain exactly what these are and how the regulatory framework can accommodate them. We believe that a well thought out reform pathway needs to be developed highlighting the requirements and risks at each stage. The fact that change might be accommodated without changing the regulatory framework is not of itself a compelling reason to do things in a particular order. We think more thought be given to how overall reforms are to be co-ordinated and, in particular, consumers may be impacted during the evolution of the reforms.</i> 	<p>without the need for time-consuming structural changes.</p> <p>Nevertheless, as our learnings from flexible connections and other innovation projects develop, we will consider what enabling reforms, if any, are required in the framework of regulation, licensing, standards, etc.</p>
Proposed Principles for Flexible Connections	Question T: Do you agree with these proposed principles for flexible connections?	<p>Most respondents (5) who provided a response agreed with our proposed principles, though some acknowledged further detail is required:</p> <ul style="list-style-type: none"> <i>We would ask that the application and final decision making process is transparent. Any requests for information throughout the application process should be made available where permitted and applicants should be guided through the process. Furthermore,</i> 	<p>We largely agree with stakeholder sentiment on principles we proposed and others we should adopt.</p> <p>Certainly, there is more detail to be developed around the processes that our connections team would use with customers, and in other areas. While we think the high level principles are fairly</p>

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		<p><i>applicants should be kept full updated through the application.</i></p> <ul style="list-style-type: none"> <i>The proposed principles for flexible connections seem to be statements of intended operating practice rather than principles, and in any case need further elucidation. For example, "trying to accommodate a flexible connection based on our knowledge" is not really a principle: what needs to be set out are the criteria which would be used in making decisions about accepting such proposals. Risk assessment is desirable but what risks (and to whom) are being assessed and how? How will the requirement for "more" monitoring be determined?</i> <i>We think the overall objective for a new flexible connections regime should enable the delivery of an optimised flexible power system whilst also supporting investment in the zero carbon technologies necessary to achieve decarbonisation targets.</i> 	intuitive, the effectiveness of a flexible connections regime depends on the detail of its implementation.
	Question U: Are there other principles we should adopt?	<p>Three stakeholders provided comments on this question:</p> <ul style="list-style-type: none"> <i>The principles should be reviewed in parallel with the introduction of a flexible connections roadmap to ensure that customers have access to the greatest level of connection capacity possible.</i> <i>A principle on communication regarding flex connections to ensure all network users understand the benefits.</i> 	

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		<ul style="list-style-type: none"> <i>Given the complexity and the potential plethora of design decisions, the Consumer Council believe that an overarching set of high-level principles needs to be set out which not only emphasises the desirability of efficiency, but also recognises distributional impacts. We suggest the design of new arrangements should follow principles in four areas (three of which are based on those used by Ofgem in its equivalent reforms):</i> <ul style="list-style-type: none"> <i>Arrangements to support efficient use of and development of system capacity;</i> <i>Facilitates net zero transition;</i> <i>Reflect needs of consumers of an essential service;</i> <i>Practical and proportionate.</i> 	
Flexible Connections Roadmap	Question V: Do you have any comments on our draft flexible connections roadmap?	<p>Seven stakeholders provided a range of comments on the roadmap. These are summarised thus:</p> <ul style="list-style-type: none"> <i>The Flexible Connections Roadmap must be treated as a live roadmap and updated on a regular and timely basis.</i> <i>There is a need for co-ordination across all reform initiatives.</i> <i>Further work needs to be done to flesh out the roadmap, and this should include consultation with consumers and connectees.</i> <i>We would urge NIEN to be clear at each stage what will be the impact on consumers in terms of costs and benefits of the reform, and also their ability to participate in provision of flexibility especially if the extension of arrangements to lower voltages is a later</i> 	<p>Our proposed roadmap was deliberately high level and it would require further work to develop a detailed plan, which we acknowledge is necessary.</p> <p>We generally agree with stakeholders' remarks on this topic.</p> <p>Regarding timing, we note comments about the temporal priority. In our roadmap we are trying to find a way to deliver benefits as early as possible, while managing risk in a proportionate way and learning from our early experience. We are keen to explore what can be delivered without structural changes in the regulatory framework, which can take time to deliver.</p> <p>On voltage, we hear the comment about access to flexible connections for customers connected at lower voltages and we will take this into account as we refresh the roadmap.</p>

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		<p><i>phase of reform. In particular, care should be taken that the phasing of the reform initiative does not deter potential early adopters of low carbon technologies which offer the ability to monetise flexibility.</i></p> <ul style="list-style-type: none"> • <i>It is vital that focus is on implementation.</i> • <i>Critical 11kV/LV gain early access.</i> • <i>Need to be explained and advertised to all customers to review/amend their connection.</i> • <i>The roadmap should include timescales, we believe these are essential to ensure route to flex connections is focused and goal driven.</i> • <i>The timescale of the roadmap is too long. There is an immediate risk of outages this winter due to lack of available generation. Offering flexible connections for export immediately will help alleviate the risk of outages for consumers because AGU & DSU can move quickly to synchronise existing standby generators and export surplus capacity onto the system.</i> • <i>We would enquire as to how flexible connections should be prioritised. For example, if a battery storage site and a factory both wanted to connect for flexible MIC, and it is important for the factory to electrify but also for the battery storage site to contribute to our decarbonisation targets, who would have priority to the capacity in this scenario? We would suggest that a pricing mechanism should be considered.</i> 	<p>Regarding AGU and DSU, we note the capabilities of these types of unit. However, we are also mindful of the challenge that a connection with more than one value of MIC or MEC can present in terms of market access. In the short term, until the impacts on markets, scheduling and dispatch systems have been understood and any necessary changes have been delivered, there might be practical limitations on flexible connection utility by certain types of customer.</p>

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		<ul style="list-style-type: none"> <i>A detailed plan will need to be developed setting out the various reviews and changes that need to be implemented before progressing to each of the stages.</i> 	
System Impacts	Question W: Please let us know about any other systems which might be impacted by a connected customer having connection capacity which is not a single value.	<p>Two respondents specifically highlighted the relevant of the proposals with energy market and TSO scheduling and dispatch systems, noting the need for early and full engagement with SONI and SEMO.</p> <p>Additionally:</p> <ul style="list-style-type: none"> <i>Clearly connectees and customers should be consulted on potential system impacts.</i> <i>It is important that the data which will become more complex and held by NIEN reflects the current and ongoing capacity utilisation to enable an assessment made of new connections to be made efficiently.</i> 	We agree completely that considerations relating to market and TSO systems need to be fully explored, especially for certain unit types.
Proposed Next Steps	Question X: Do you agree with our proposed next steps? If not, please explain your thinking.	<p>Of seven respondents who provided comments, six broadly agreed, though one thought a further consultation could be unnecessary:</p> <ul style="list-style-type: none"> <i>I don't agree that further consultation is a definite requirement on more detailed proposals unless they are a requirement under the terms of your licence. Unnecessary consultations will only delay the delivery of flexible capacity.</i> <p>Additional comments included:</p> <ul style="list-style-type: none"> <i>The formal consultation should be a matter of the priority in light of the pending 2030 target of 80% of energy from renewable sources.</i> 	<p>We thank stakeholders for their input on next steps and note especially the emphasis placed on:</p> <ul style="list-style-type: none"> Priority and timing in the context of the renewable energy targets. Coordination with other reforms and with TSO and market systems. Consideration of the impact on consumers. <p>We expect to provide further information on each of these themes as we progress our next steps.</p>

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		<ul style="list-style-type: none"> • <i>We agree more detail needs to be worked up because there are very many issues of detail which will impact the ability of such changes to generate benefits, the costs needed to realise them and their impact on consumers of all types. But we do not believe such detail can be worked up without the engagement of those affected by the proposed changes. We believe that the next steps should therefore involve a substantial programme of engagement and ideally joint working before proceeding to formal consultation.</i> • <i>SONI broadly agree with the proposed next steps set out in the call for evidence. We would reiterate the importance of considering the outcomes of the current Department for the Economy and Utility Regulator's joint call for evidence on the Review of the Connections Policy Framework in Northern Ireland. Many of the key themes in the call for evidence impact on considerations set out in this call for evidence and so it is essential that these are not considered in isolation.</i> • <i>SONI welcomes this Call for Evidence on Flexible Connections and recognise the potential benefit flexibility can provide for customers and to the electricity system. The implementation of flexible connections has potentially far-reaching consequences for SONI with respect to our managing the operation of the transmission and market systems. SONI will build on the ongoing engagement with NIE Networks around these challenges and how they can be managed.</i> 	

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	Question Y: Please share any other comments.	<p>Stakeholders provided a range of comments, in response to this question or in covering materials. Key themes included:</p> <ul style="list-style-type: none"> • The need for coordination across a wide range of reforms that are currently underway or proposed, so that the impacts on consumers can be fully understood and managed. • The potential for flexible connections to facilitate connections more quickly and at lower cost. • The need for coordination with SONI, to consider alignment between distribution and transmission, and the interaction with markets, scheduling and dispatch. 	

3. SUMMARY OF STAKEHOLDER FEEDBACK

Key messages included in stakeholder responses are summarised below.

Benefits of Flexible Connections

- General agreement on anticipated benefits, including optimising capacity utilisation, faster connection, lower cost connection, avoidance of deeper reinforcement, increased utilisation of renewable generation.
- Utility in transport, consumers and prosumers, renewable generation and other customers.

Types of Flexible Connections

- Different types of static and dynamic will be useful for different types of customers.
- Optimal resolution likely 30 minutes to align with SEM, or day/night.

Charging

- Adherence to contracted MIC/MEC values is important and could involve apparatus on a customer's premises to limit use.
- Charging for MIC held in each period is likely to be an incentive.

Reducing Connection Capacity

- Reduced network charges could be an incentive to move to a flexible connection, but this would need to be tested.
- A market for connection capacity is theoretically useful but unlikely to be efficient in the short term.

Network Risk

- A probabilistic approach to management of network capacity is more efficient.

Regulation and Standards

- No specific obstacles to flexible connections were identified.

Proposed Principles for Flexible Connections

- General agreement, but more detail is required for implementation.

Flexible Connections Roadmap

- The roadmap should be refreshed in light of feedback received and emerging thinking from the DSO transition.

System Impacts

- There are potentially significant interactions with TSO and wholesale market systems.

Proposed Next Steps

- Particular emphasis on urgency, coordination and consumer impact.

Cross Cutting Remarks

- It is important to consider the effect on customers not just of flexible connections but the totality of innovations and reforms underway, particularly with regard to charging, using a joined-up approach.



4. NEXT STEPS

We propose a number of next steps, including pilot projects, to further develop processes and tools to facilitate forms of flexible connection for both demand and generation customers.

On **demand**, we plan a pilot trial of a timed connection on our HV network which would enable a customer to draw increased demand overnight. This is likely to be a static, timed connection and we foresee the need to develop in particular processes to monitor compliance and demand growth more generally on that part of the network.

On **generation**, we plan a pilot trial of an active network management scheme to maximise access to the network for a small scale renewable generator. This would involve a trial of apparatus and communications to reliably manage the generation unit.

These trials will be funded through our existing innovation allowances.

In parallel, we propose to develop policies to facilitate and manage flexible connections more widely, with particular foci on:

- Connections processes. How might we offer flexible connections and how might a flexible connection fit into the connections application processes?
- Lifetime: Is a flexible connection agreement for a fixed period only, dependent on some other factors, or enduring? This relates to the possibility of a queue for connecting customers.
- Queue management: If a customer has accepted a flexible connection as a compromise, to get connected earlier and at lower cost, does that customer enter a queue for a less flexible connection when capacity has been created in the future? How might that queue be managed?
- Charging: We will develop proposals for how customers are charged for these flexible connections, taking into account the intent of the charging policy and the present limitations of the IT systems. Changes to systems may need to be incorporated into our IT systems roadmap.
- Network planning: How should we integrate flexible connections into our network planning processes?
- Network management: What tools and incentives should we use to monitor and manage compliance?
- TSO and Markets: What are the implications for customers who are participants in wholesale energy or TSO system services markets? What are the implications for the emergent TSO-DSO operating model?

We anticipate these pilot projects will be developed shortly, with early learnings emerging within a period of about eighteen months. Subject to establishment of proportionate policies for efficient and effective management of such flexible connections, we foresee that an updated roadmap for flexible connections will be published and that greater numbers of such connections could be entertained from about 2026.

