

## **NIRIG response to NIEN Call for Evidence: Greater access to the Distribution Network in NI**

**2 October 2018**

The Northern Ireland Renewables Industry Group (NIRIG) represents the views of the renewable electricity industry in Northern Ireland, providing a conduit for knowledge exchange, policy development, support and consensus on best practice between all stakeholders. Committed to making a positive difference, we promote responsible development, support good community engagement and deliver low-cost electricity generation from sources such as onshore wind, tidal, solar and storage using our greatest natural resources.

NIRIG welcomes the opportunity to respond to NIE's Call for Evidence on Greater Access to the Distribution Network in NI. We believe that this Call is an opportunity to discuss important aspects of NIE Networks' role in the future and examine elements of the legal and regulatory framework that underpins our energy sector.

The further decarbonisation of our entire energy sector is a crucial element of our contribution to national and international targets. Low-carbon growth will enable high-value jobs and inward investment, and the Clean Strategy sets out how the low-carbon sector can help to increase the competitiveness and productivity of our economy in the decades ahead. A key aspect of decarbonisation will be the need for increased levels of renewable electricity. This will deliver increased potential for decarbonisation (through electrification and potential hydrogen production) of both the heat and transport sectors.

While we recognise the importance of some of the issues raised in this Call, we continue to urge for conventional reinforcement as a network solution in parallel with, rather than instead of, more innovative solutions. Optimised future infrastructure development will still be necessary to maintain security of supply for all consumers, and to de-risk the network to support future business growth and attract investment.

We note the potential for significant change arising from this Call but note that there may be other issues that have not been addressed, and we refer to some of these below.

**We would welcome a meeting with NIEN in the coming weeks to discuss our response to this Call for Evidence**

### Definition of DSO

**Q1 – In the Northern Ireland context do you agree with the DSO definition? If not, please state how you believe the DSO should be defined (p9)**

We believe that the growing complexity of network operations may lead to increasing digitalisation which requires capabilities that traditional network operators may not be able to provide. Given the far-reaching changes that the energy sector faces in the coming years we suggest that additional models need to be considered. For example:

**DSO as market facilitator:** The responsibility for data management, including collection of data and construction of the necessary information infrastructure, would be allocated to the DSO, who would be responsible for the electricity network as well as information infrastructure, data storage and management of the exchange of data.

**Information management as the responsibility of the network operators:** One option is data management as a task for the network operators, separated from their regulated business. Another is based on the concept of an Independent System Operator (ISO), where one entity takes responsibility for operational activities (system operation) and is independent of transmission asset ownership.

**Third party:** Delegate responsibility for data management to third parties, i.e. a party that is only responsible for data management. This could be an independent and neutral third party market facilitator (centralised) or a competitive market whereby independent and unregulated service providers (decentralised) can be chosen by each consumer.

More specifically, based on the proposed definition we note that given existing grid capacity constraints, reference should be made to the use of innovative methods (relative to conventional methods) such as smart metering, energy storage etc to optimise and balance the system use, as this may not be immediately apparent from the 'active distribution' description.

Role of DSO

**Q2 - Are there any additional functions which you feel should be included in the evolution to a DSO? If so, please provide a detailed description of the function(s). (p11)**

NIRIG firmly believes that within the function descriptions, conventional reinforcement should still be considered as a network solution in parallel, as opposed to instead of, more innovative solutions. Optimised future infrastructure development will still be necessary to maintain security of supply for all consumers, and to de-risk the network to support future business growth and attract investment. Additionally, improved transmission-distribution interface processes around connections, planning, system operation should be prioritised, whether this activity is carried out (and described) under one of the existing functions already listed, or under a new function heading.

The seven DSO functions described define the functions needed to transition from DNO to DSO (acknowledging that these functions do not fully define all the business practices). However, as noted

above we believe that other, more fundamental questions may need to be asked about the role and function of the system operator in the context of increased digitisation.

We would highlight one potential consideration: the number of transactions to secure the required volume of ancillary services is likely to increase significantly as many distributed generators and consumers will provide services that are currently centralised. Opportunities may be provided by blockchain technology in this context, providing a basis for different markets that focus on products for ancillary services and at the same time reduce market entry barriers for smaller devices.

## **DSO functions**

### Market facilitator

**Q3 - NIE Networks currently use static annual instruction sets. Do you think NIE Networks should develop more dynamic instruction sets based on real time power flows, voltages and network topology, potentially providing system service participants with greater access to the network for the provision of system services and protecting the network from sudden changes? (p13)**

If moving from the current static annual instructions to more dynamic instruction sets facilitates reduced constraints and maximises the use of network capacity this then NIRIG is supportive of this approach. Market participation should be facilitated as long as these objectives are met.

System services provide valuable support for energy system management and will require ever-increasing levels of information provision.

**Q4 - Do you agree that NIE Networks should develop a technical solution to enable customers to participate in reactive power system services? (p14)**

Yes. NIE have already trialled technology which would support a solution: in 2016 a Nodal Voltage Control Pilot project was begun with the aim of making better use of the available MVARs at distribution level to support the transmission voltage while maintaining voltages on the distribution system within acceptable limits.

If nodal voltage control is available to the TSO and they can call upon Nodal VARs in the same manner as any other TSO generator then the DSO generators controlled by the DSO Nodal Controller should be able to participate in the market.

### Service provider

**Q5 - NIE Networks has existing assets on the network which potentially have the capability of providing additional services to the TSO. Should NIE Networks be allowed to provide cost effective solutions to the TSO in balancing the network to help reduce bills for all customer types? (p15)**

It is important to enable a competitive approach for the provision of these services. Broadly-speaking cost-effective solutions are welcome to enable a more flexible and balanced system, but a range of companies should be able to provide these services. It is vital to ensure continued investment in transmission and distribution network to accommodate decarbonisation.

### Congestion management

#### **Q6 - Should NIE Networks continue to invest conventionally to maintain a high level of network resilience and security but at a higher cost or should they adopt and integrate smart solutions to reduce network costs and deliver the network security through a more dynamic approach to operating the network? (p18)**

Yes. This is of vital importance. There is still a strong need for NIE Networks to invest conventionally, i.e. upgrading existing and new transmission circuits and investing in existing substations to bring up to modern standards. In parallel with this conventional investment there a need for NIE to consider smart solutions that can maximise the use existing and new assets.

As mentioned in all NIRIG responses to recent NIE Networks, NIAUR and SONI consultations there is an immediate need for NIE Networks and SONI to bring forward the appropriate conventional and smart transmission solutions to provide firm transmission access for all contracted wind generation. We understand that although generators can connect with non-firm access the system operators are responsibly for advancing the necessary transmission works to provide firm access for these generators.

We are concerned that for a substantial capacity of non-firm generation the transmission works are either not advancing or progressing extremely slowly. We request that these works are prioritised going forward and SONI and NIE Networks communicate regularly with generator on progress on these works.

NIRIG continue to strongly support the new North-South 400kV interconnector. It is an example of how conventional transmission infrastructure has proven to still be central to the development of the all-island transmission system.

Britain and Northern Ireland will have to continue to decarbonise its electricity sector to meet national and global commitments to addressing climate change. This will drive the requirement to connect substantially more renewable generation onto the NIE transmission and distribution system. NIRIG acknowledges and supports that the electricity system will have to become 'smarter' to allow this change. This includes changes of how both demand and generation connect and operate.

However, this will not take away from the need to continue to develop the transmission system with conventional technologies. Some of the best wind resources and sites for new wind projects will continue to be in the West of Northern Ireland whereas the demand and export points will continue be in the East of Northern Ireland. This will require the continued development of the transmission system, both upgrading the existing circuits and the construction of some new circuits. Considering the long timeline to develop transmission infrastructure it is critical that SONI and NIE start works on

new projects that can increase the capacity of the transmission system in the West of Northern Ireland.

#### Microgeneration

**Q7 - Do you believe that installations similar to that illustrated in Figure 8b, where a total energy source >16A/phase connects behind a single inverter rated at 16A/phase, should be allowed to connect under an Engineering Recommendation G83/1 arrangement on a 'fit and inform' basis? If so, please set out in detail.**

Yes

**Q8 - Do you believe that installations similar to illustration Fig. 8c, if fitted with a G100 export limiting device should be allowed to connect on an Engineering recommendation G59 "fast track" process? In this case customers would still be required to contact NIE Networks to receive permission to connect; however, due to the reduced likelihood of considerable grid impact NIE Networks would be able to expedite any network assessment and revert to the customer, informing them that they can or cannot connect to the network in reduced timescales. (p23)**

Yes

#### Data provision

**Q9 (a) – Do you agree that the DSO/TSO requires increased data to efficiently develop and operate the system to help reduce network operating costs and facilitate greater access to the network for existing and future customers?**

As more generation is now deployed at distribution level than ever before, it becomes critical for the efficient development of both distribution and transmission systems that there is visibility over the power flows on a real-time basis on the system. Such visibility would allow for a reduction of curtailments and would release new capacity for new generators.

In order for power systems to operate more effectively they must be controlled at greater depths of granularity and much shorter control cycles than is currently enabled. Sufficient information is required from each level of the network and the control cycle needs to be nearer to real time.

The control and reduction of capacity constraints will enable more access for low-carbon and smart generation.

**Q9 (b) - Do you agree that to achieve this, increased levels of data need to be made available in the areas identified and be efficiently transferred between the TSO and the DSO?**

Please note our response to question 1 regarding the model of System Operator going forward.

Should the model of 2 SOs be taken forward, we recommend full visibility. The boundary between TSO and DSO should not represent a barrier to data flow. The DSO could assist the TSO by 'deconstructing' disturbances aggregating below 110kV. Similarly, the effect of TSO level disturbances need to be reflected down the voltage levels as the DSO could mitigate impacts by deploying flexibility from customers on lower voltage levels.

We urge improved communication and processes to enable full use of data across all system operators. We also believe that consideration needs to be given to how data collection and management can be fully utilised (see answer above).

Specifically, we would like to highlight the example of UKPN (DNO) and National Grid (TSO) in GB. They have been testing successfully the 'Kent active system management' which aims to have both systems achieve reciprocal visibility on the control rooms through SCADA.

**Q9 (c) - Are there any other areas that you believe the DSO should have visibility of?**

Please see answer to Q1.

Given that most new installed generation is wind or solar (non-dispatchable), the sharing of forecasting tools across DSO-TSO is also very important to align the above-mentioned power flows and avoid any unnecessary curtailment.

The compilation, retention and standards of storage and retrieval should be mandated and monitored by an appropriate regulatory body. Any System Operator should have the ability to use the combined data to further refine network design.

**Q10 (a) - The provision of data and visibility of the network plays a significant factor in ensuring the efficient management and operation of the electricity network to help reduce energy costs. Do you believe that greater metering functionality is required in Northern Ireland to provide the DSO with increased data? If so, please set out in detail.**

Yes, we believe that whichever system operator approach is taken forward (see answers above), data provision and visibility will be vital to ensure efficient management of the network. Metering is currently too simplistic and limited for the challenges ahead. A data gathering, analysis and provision capability based on factors such as flexibility, response and compliance to grid standards should be considered as a requirement for participants in a new market.

**Q10 (b) – Do you believe customers should have increased access to network data? If so, please set out in detail (p24)**

Yes, we believe that smart and efficient management of the network will require all customers to have greater visibility of energy use, generation, cost and storage. Smart metering will provide

information on energy usage but will not enable customers to respond to market signals or manage energy use based on self-generation, for example. Customers should be able to access their own data and consideration should be given to wider Data (anonymised) so that they can understand their choices for new services. Service Providers should also be required to provide data (anonymised where necessary).

The regulatory function needs to be amended to reflect their role as clearing house for data sources and guardian of data standards.

We note above the importance of deciding upon a model for system management. There should not be an assumption that the existing TSO or future DSO is the only or most effective model for system management in an increasingly digitised age.

### Network management

#### **Q11 - Should NIE Networks invest in technologies to enable generation constraints on the distribution network to be reduced? (p25)**

NIRIG believe that investment in both technologies and operational philosophies to reduce constraint is vital to facilitating future renewable build out. With increased curtailment likely in the coming years due to the lack of capacity and increased renewable generation, implementing solutions to minimise the dispatch down of generation for events other than curtailment is vital. Allowing special protection schemes and operating dynamically rather than in N-1 scenarios will all contribute towards reducing constraint on the network.

We believe that NIE should be continually looking to maximise the efficient and economic operation of the grid network through all means available. For example, Active Network Management and real time monitoring with improved signalling/ communications would allow both generation and demand to flex with the grid to ensure this is possible.

We would point out that any assets or technologies that could be installed and operated by third parties should be open to competitive tender.

#### **Q12 - Do you believe the existing tariffs are fit for purpose, or do they need amendment to deliver benefit to all customer types?**

NIRIG believes that it is inevitable as more and more self-generation users connect to the distribution system that the mechanism for socialising DUoS will need to change. NIRIG are in favour of a transparent, fair solution with visibility of costs into the future. Over-complex charging methodologies with too many variables introduces uncertainty and will discourage new self-generation investment.

Existing tariffs do not provide sufficient visibility and flexibility for customers to respond to price signals or influence customer behaviour. A smart system with storage, demand-side response and maximised efficient network use will require greater incentivisation of customer flexibility and active network management. Tariffs must be prepared to facilitate this in a fair and transparent way, while incentivising innovation and greater provision of services

We agree with the assumptions in the CfE that the tariff structure should be reviewed to cater for the future expectations of how the electricity network will operate and interface with customers.

We would like to point out the recent findings of the Energy System Catapult study into Cost Reflective Pricing. This report indicates that a review of the tariff structure for NI needs to take account of storage, demand, heat and transport:

<https://es.catapult.org.uk/news/shift-in-energy-bill-charges-could-boost-low-carbon-heating/>

Regulatory models may have to be extended to embrace new paradigms where data capacity is also valued and potentially rewarded. Further studies are required. However, the solution proposed to re-balance DUoS charges seems a logical solution, which values the “always available” capacity provided by the distribution system.

**Q13 – Do you believe the areas of potential change as outlined in this section, are correct? Are there other areas of change that should be considered? If so, please set out in detail. (p29)**

Yes. NIRIG believes the area of changes proposed are appropriate. Further studies and worked examples are required to identify the most suitable charging methodology moving forward.

What this means for our customers

**Q14 - Do you agree with the customer groups and definitions set out in this section? If not, please set out in detail.**

We believe that the high level customers identified are a good baseline to work from and would assume that as customers develop in terms of technology and participation, (e.g. prosumers) that the groups could flex to accommodate a customer’s needs and requirements.

**Q15 - Please detail which customer group(s) you either identify with or represent.**

“System Service Providers” and “Active Participants”

**Q16 - What are your views on benefits of the DSO evolution across these consumer groups and how this can be maximised? Please set out in detail (p31)**

Customer type – other

**Q17 - Do you believe that there are any policy inhibitors that may prevent or restrict NIE Networks evolving to a DSO? If so, please set out in detail.**

NIRIG believes that a fundamental review of the policy and legislation underpinning energy in Northern Ireland is required.

New technologies, new markets, increased interconnection, the growth in flexible demand and an increasing number of disruptors will all mean that the energy system in the next decade will be significantly different to the current one. NIAUR and policy-makers must prepare for these changes by ensuring that policy and regulation facilitates and promotes decarbonisation, flexibility, coordination, innovation and cost-effective modernisation.

For example, existing legislation only facilitates competition in the supply and generation of electricity, which effectively restricts competition in the distribution of electricity. It allows exemptions for connections based on capacity, which is now impacting upon the connection of low-carbon generation. It prevents rapid responses to necessary policy changes such as rebate policy we understand that it is hampering EV charge-point delivery. There are likely to be other issues that cannot be progressed under existing legislation.

Regarding the evolution to DSO, please note our response to Q1 which outlines alternative models which we believe should be considered and consulted upon.

Should the existing model be adopted we urge that the interface between SONI as TSO and NIEN as DSO will require a streamlined and barrier-free communication mechanism. Our members have experienced delays and mis-communication in certain cases of generator connections involving both SONI and NIE. If the interface between SONI and NIE is not able to function effectively at this stage then it does not give confidence that more complex interactions will run smoothly.

We recommend a comprehensive and clear Transmission Interface Agreement, developed with appropriate consultation and deploying rapid response mechanisms for identifying and rectifying any problems as they may arise.

We recommend a review of the duties and obligations of public bodies, including to strengthen requirements for sustainability, and a review of NIAUR powers to enable more flexible policy-making

**Q18 - Do you have any other suggestions on how NIE Networks could give customers greater access to the distribution network? If so, please set out in detail.**

Upgrading existing and new transmission circuits, investing in existing sub-stations, modelling and delivering battery requirements for system management, developing innovation mechanisms that enable the rapid deployment of flexible responses.

There is an urgent need for NIE Networks to invest conventionally, i.e. upgrade existing and new transmission circuits and invest in existing substations to bring them up to modern standards. The network has been 'sweated' to enable a 40% renewable electricity target but this will not suffice for the additional renewable generation required to reach even more ambitious decarbonisation targets for electricity, heat and transport.

In parallel with this conventional investment there a need for NIE to consider smart solutions that can maximise the use existing and new assets. As mentioned in all NIRIG responses to recent NIE Network and SONI consultations there is an immediate need for NIE Networks and SONI to bring forward the appropriate conventional and smart transmission solutions to provide firm transmission access for all contracted wind generation.

NIRIG would recommend that NIE reviewed the reactive power requirements for generators that are embedded on the distribution system. The requirement introduced in 2010 into the distribution code are too onerous (0.95 to 0.95 power factor) and drive unnecessary upgrades or unviable generator connections. If reactive power is required there are probably better method of providing the reactive power such as appropriately located reactive power devices rather than a blanket generator requirement.

**Q19 - Do you believe greater access to the distribution network will bring other customer benefits? If so, please set out in detail.**

Potential for greater participation in system services market, especially if this is enabled by aggregators.

**Q20 - Do you believe there is any downside for customers in receiving greater access to the distribution network? If so, please set out in detail. (p32)**

No

We look forward to engaging further with NIE, SONI and NIAUR as this important consultation progresses. We would like to request a meeting with NIE to discuss our response.

We look forward to hearing from you.

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Meabh Cormacain

**NIRIG**