ESB NETWORKS

MICROGENERATION FRAMEWORK CONSULTATION RESPONSE

Enabling the Transition from Consumer to Prosumer

DOC-171220-FZS

December 2020

Overview

The power sector is undergoing transformative change with the growth of low carbon technology and changing consumer preferences. European policy, such as the Clean Energy Package (CEP) and the revised Renewable Energy Directive (RED II), are driving a change in behaviour and supporting the decarbonisation of the European power sector. Decarbonisation and technological advances are transforming the electricity sector with regard to both generation and demand. Technology developments such as the increase in households with microgeneration and a form of battery storage will most likely see the rise in active energy customers and changing customer behaviour. The new usage patterns are set to continue as local energy production grows and technologies such as electric vehicles, heat pumps and solar PV continue to expand as a key part of national decarbonisation strategies. As Distribution System Operator (DSO), ESB Networks has an important role to play in facilitating the energy transition to a low carbon future, with the growth of low carbon technology and changing consumer preferences.

The Climate Action Plan (CAP) published by the Irish Government in 2019 sets ambitious targets to facilitate and enable the transformation to a low carbon future for Ireland. This ambition includes the goal of reaching 70% of electricity generated from renewable energy by 2030. Renewable energy of all scales, from large-scale to small-scale renewable generation, community energy renewable energy projects and microgeneration, will all play a part in contributing to Ireland's decarbonisation goals.

ESB Networks views microgeneration as a form of renewable energy or low carbon generation that is likely to be more accessible to many energy customers across the country. ESB Networks aim to support our customers along each stage of the process as they adopt small-scale low-carbon technologies and make the transition towards being active participants in the energy system.

[1] https://www.esbnetworks.ie/docs/default-source/publications/microgeneration-framework-consultation---may-2020-final.pdf?sfvrsn=591d07f0_0

This document is an overview of responses received to our earlier publication *"Microgeneration Framework Consultation - Enabling the Transition from Consumer to Prosumer* [1] (DOC-300420-FSI) that closed on 26th June 2020. Fourteen responses were received to this consultation from a variety of actors within the industry. ESB Networks welcomes the feedback received to this consultation and the positive engagement from interested respondents.

This document provides a summarised version of the responses to each of the questions posed within the consultation along with ESB Networks feedback, updates on these issues (where appropriate) and planned next steps which we hope is useful for respondents, customers, policy makers and industry participants.

Question 1:

Do you have any feedback in relation to the existing grid connection process for microgeneration (up to 6 kW single-phase and 11 kW three-phase)?

In relation to the current grid connection application process for microgeneration known as an NC6 form, most responses were favourable. It is seen as a straightforward process by the respondents. The ability to submit distribution system connection applications by email and the recent removal of the need for inverter serial numbers on the application form were welcomed by respondents. It was suggested that all correspondence should be done via email as it saves time, reduces unnecessary costs, and facilitates a more straightforward and streamlined process, especially where there are multiple interactions. It is appreciated that the application process for connection is free.

The subject of community energy was referenced in some responses. One response seemed to indicate that the process for community or group schemes is less clear and they do not appear to fit into the single application or multiple application process. Clarity was sought around connections for group schemes, in particular across a number of community buildings on the same site or the same campus.

One response suggested that the definition of microgeneration be increased from (6kW/11kW) to 50kW in order to allow larger solar arrays on community and commercial building rooftops (i.e. schools, local authorities, businesses, and farms). It was suggested that the same application process should be maintained for these small generators as microgenerators. It was commented that the connection process is suitable for prosumers. Other areas mentioned in responses included the suggestion that (a) battery inverters should not be included when calculating the total kW on the NC6 and (b) any connection process should ensure that the maximum benefit can be achieved when microgeneration output is used for self-consumption.

ESB Networks Response:

ESB Networks welcomes the positive feedback in relation to the existing NC6 process. ESB Networks accepts NC6 correspondence by email or hard copy. NC6 Notification Forms can be sent via our inbox NetworkServicesBureau@esb.ie or post to:

ESB Networks DAC
NC6 Microgen Notifications
New Connections
Sarsfield Road
Wilton
Cork
T12E 367

In relation to the exporting thresholds relating to the distribution system connection process, ESB Networks connect generation of all scale and sizes from microgeneration up to large scale renewable generation. The energy regulator, CRU, determine the grid connection policy for renewables which is implemented by ESB Networks. As per the recent ECP-2 decision, projects larger than microgeneration and up to 500kW are contained within the non-batch category and allow for distribution system connection applications on an annual basis.

ESB Networks is currently examining the grid connection application process for customers with a grid connection of up to 50kW export capacity. ESB Networks aims to have a simplified grid connection application process in place for these customers in 2021. A technical study is a necessity for projects in excess of 6kW single-phase and 11kW three-phase due to possible impacts on the network and this will remain part of the simplified grid connection application process. A technical study is generally not required for microgeneration connections where the individual size and total connected at a point on the network is small in relation to the network strength at that point. However, a study may be required in some instances. These studies are triggered on factors such as the percentage of microgeneration installed as a percentage of the upstream transformer capacity.

ESB Networks as part of its innovation activities is engaging in three projects with three different communities in Dingle, Limerick and the Aran Islands. One of ESB Network's flagship innovation projects is located in the Dingle Peninsula, where we work with the community to trial clusters of low carbon technology, understand consumer behaviour towards the technologies and learn about the impacts on our networks. Through ESB Networks participation in the +CityxChange Project, a smart city project, in Limerick City we're partnering with Limerick City and County Council and others such as Limerick University, looking at, for example, how to create a positive energy district in the Georgian sector. Through our participation in the REACT project in Inis Mor on the Aran Islands where we are collaborating with locals as part of a broader European project, we are looking at sustainable island communities with integrated renewable energy and storage to provide safe, reliable and stable electricity. All 3 projects involve collaboration with a host of partners (from academia, industry and international organisations). Indeed 2 of the projects (the smart city project in Limerick and the sustainable island communities project in Inis Mor) are part-funded by the EU Horizon2020 initiatives.

ESB Networks also seeks to facilitate Community-Led Renewable Energy projects [2] (in the range of 0.5MW - 5MW). A dedicated section on the ESB Networks website has been created and a user-friendly guide document prepared for Community-Led Renewable Energy project applications with a dedicated email address set up where customers can direct their specific queries.

In relation to the treatment of batteries and microgenerators, if the battery is connected behind the same inverter as the microgenerator then it will be the inverter rating itself which will determine whether the microgeneration process is used. For example, if a 5kW inverter with 5kW$_p$ of PV and a 5kW$_p$ battery connected behind it would be considered as a 5kW microgeneration connection. However, if the battery and microgenerator both had separate inverters each with a rating of 5kW then the export potential could be up to 10kW and would thus not be assessed under the microgeneration process.

Generators which are not in the range up to 6kW (single-phase) and up to 11kW (three-phase) are not microgeneration, however as referenced above ESB Networks is investigating a simplified grid connection application process for customers with export of up to 50kW. It is our understanding that CRU is considering grid connection policy for connections in the range greater than microgeneration and up to 50kW in 2021. Please note, export capacity greater than microgeneration and up to 50kW is classified as minigeneration by ESB Networks. Unlike microgeneration, minigeneration requires a study as the size of the individual minigeneration is significant in terms of the LV Network to which it is connected. In contrast, it has been found that low volumes of individual microgeneration generally have little impact on the LV network except when it is densely clustered. Our policy is to ensure that the LV network remains within operational limits and that customers are not negatively impacted by microgeneration, is to assess areas of network where microgeneration is expected to be more than 40% of transformer capacity or 50kW.

2 https://www.esbnetworks.ie/new-connections/generator-connections/community-led-renewable-energy-projects

Question 2:

Do you have any feedback in relation to the examination of possible export limiting controls to facilitate self-consumption?

There were conflicting views on whether ELS should be allowed. Some responses acknowledged a possible need for export limiting schemes due to the different challenges that increasing volumes of microgeneration will bring to the distribution system. A number of the responses to this question queried the requirement for separate G10 relays and circuit breaker to be used, citing the additional cost of implementing these and the fact that many inverters and battery systems already have built in interface protection which can provide very similar functionality to the G10 relay.

It was suggested that for prosumers who are part of an energy community or prosumer group, then it should be the prosumer group and not the DSO who decides when to use the power limiter, e.g. based on a collective MEC for the prosumer group. Some respondents requested different grid connection application processes for MEC values outside the microgeneration thresholds.

It was suggested that the urban/rural technical differences may have implications to a standardised community roll out/community retrofit for microgeneration and ESB Networks views were sought on a community or aggregated roll out which considers both rural/urban technical differences and whether there can be a standardised approach for community uptake.

It was also suggested that the system operator conduct and publish a system impact assessment of microgeneration, simulating the system impacts under different scenarios, to provide more accurate analysis that the impact of widespread integration of microgeneration will have on the system before limitations and/or controls are provided for.

ESB Networks Response:

ESB Networks published a paper "*Assessment of the scope for higher penetrations of distributed generation on the low voltage distribution network* [3] (DOC-150720-FVC)" in July 2020 which examined the impact of increasing levels of microgeneration on the distribution network. Highlights and key points of this report included:

- The analysis in this report largely focuses on solar PV as it is likely to be the most common form of microgeneration installed.
- Customers installing microgeneration are required to notify ESB Networks in advance of the installations, by means of a completed NC6 form.
- In relation to differences between rural and urban networks and differentiating between prosumer profiles, the issue is that the design of the generator connection depends on the existing design of the network it is connecting into, whether urban or rural. This connection is based on the export levels of the generator and how these will be aligned with exports of other customers.
- A review of the rural network shows that up to 3 kW$_p$ export per house can be accommodated on the distribution network without encountering significant thermal capacity or voltage rise issues and limited associated reinforcement costs in most cases, generally where the capacity of the local 15 or 33 kVA transformer is not exceeded (assuming no capacity constraints upstream)
- A review of the urban network shows that up to 4 kW$_p$ export per house can be accommodated on the distribution network without encountering significant thermal capacity or voltage rise issues and limited associated reinforcement costs in most cases (assuming no capacity constraints upstream on the network)
- The amount of generation which can be exported onto the network is limited by the impact that such exports have on the network – up to a certain level it is tolerable, and above this level the export results in the network moving outside operational limits in terms of voltage rise and thermal capacity or power quality and thus will negatively impact other customers connected to the network.
- One typical example would be the voltage rise on the network produced by exporting power onto the grid, and if excessive power is exported then the voltage on the distribution network will move outside statutory limits. The allowable voltage rise can therefore dictate the amount of export that is possible.

3 https://www.esbnetworks.ie/docs/default-source/publications/microgeneration-framework-consultation---may-2020-final.pdf?sfvrsn=591d07f0_0

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- ESB Networks is examining the feasibility of an ELS pilot project. If a customer wants to install a generator in excess of this limit, then a pre-condition could be that it would not export more than the tolerable amount, and an ELS could potentially be used to provide certainty to ESB Networks that this cannot occur.

As part of an ongoing innovation project, ESB Networks issued a public consultation entitled *Smarter HV and MV Customer Connections – New Approaches to Distribution Planning and Security of Supply Standards*, in November 2019. *Smarter HV and MV Customer Connections – New Approaches to Distribution Planning and Security of Supply Standards*, in November 2019 [4].

This public consultation followed a comprehensive review and analysis, in collaboration and consultation with stakeholders, of existing distribution network planning standards and new innovative approaches to distribution network development, both here in Ireland and internationally.

A key focus of the innovation project was to facilitate the connection of increasing amounts of Distributed Energy Resources (DER), including utility scale distributed generation, energy storage and microgeneration. Additionally, enabling the electrification of heat and transport, accounting for advancements in technology with a move towards a more active network management system and changing customer consumption were further key drivers.

The Smarter HV and MV Customer Connections consultation period closed on 13th December 2019 and following consideration of consultation responses and further work and analysis carried out by ESB Networks, a suite of three documents were submitted to CRU in March 2020, for their review and approval.

- *Distribution Security of Supply and Planning Standards, Revision 3.3* [5]
- *Non-Wires Alternatives to Network Development, Revision 1.2* [6]
- *Non-Firm Access for Distribution Connected Distributed Generators, Revision 1.3* [7]

These documents cover general network development principles to cater for future expected load growth, the connection standards for new demand load and distributed generators, and the introduction of the use of flexibility, or non-wires alternatives, to conventional network reinforcements.

These standards were approved by CRU in September 2020 and have been published on the ESB Networks website. Within the publications, ESB Networks committed to follow on public consultation in relation to the provision of HV/MV transformer capacity for future growth in microgeneration connections to be used in technical assessments for distributed generation applications. This consultation is expected to be published in Q4 2020/Q1 2021. ESB Networks will assess the feedback received through the consultation process and will actively engage with CRU to determine if any further changes to approved policy are required.

4 https://www.esbnetworks.ie/docs/default-source/publications/public-consultation-on-the-smarter-hv-and-mv-customer-connections-project-0811195792622d46d164eb900aff0000c22e36.pdf?sfvrsn=f64306f0_0

5 https://www.esbnetworks.ie/docs/default-source/publications/doc-170220-fom-distribution-system-security-and-planning-standards.pdf?sfvrsn=d99501f0_0

6 https://www.esbnetworks.ie/docs/default-source/publications/doc-140220-fol-non-wires-alternatives-to-network-development.pdf?sfvrsn=659201f0_0

7 https://www.esbnetworks.ie/docs/default-source/publications/doc-190220-fot-non-firm-access-for-distribution-connected-distributed-generators.pdf?sfvrsn=9b9501f0_0

Question 3:

Do you have any feedback in relation to the application of Loss Adjustment Factors (LAF)'s for exported microgeneration?

Not all respondents submitted feedback in relation to this question, however, the responses received to this question were mixed. Several of the responses suggested that there should be no loss adjustment factor (LAF) for microgeneration as it is regionally generated and in the main, surplus energy will be redistributed to neighbouring properties. Others commented that the current LAF methodology is complex and could lead to a degree of uncertainty amongst investors. They suggested that there should be a single LAF applied (either for a localised prosumer group or for every customer) for simplicity and will help customers know exactly how they are applied, noting that it is important that customers are not unduly penalised on the basis of their location, as to do so might damage the appeal of the scheme for certain areas and thus the perceived equity of the scheme overall. It was noted that a single LAF approach may help to promote the uptake of microgeneration, while noting that this should remain under review and be reconsidered when rolling out an enduring solution. It was stated that the methodology behind LAFs needs to be simple and transparent, to help customers understand their application.

ESB Networks Response:

At present a site specific LAF is used for generators connected to the distribution and transmission system (please note this is for generators greater than microgeneration). ESB Networks welcomes the feedback from industry for LAF for microgeneration. It is our understanding that CRU will consider the application (or not) of LAF for microgeneration as part of any enduring solution for microgeneration settlement. ESB Networks will share the responses received with CRU in order to facilitate any decision on this matter.

CRU has established the 'Interim Retail Market Microgeneration Working Group' under the Industry Governance Group (IGG). The ultimate objective of this Working Group is to assess options for an 'interim' microgeneration solution to be introduced in June 2021, agree a preferred option and for a Market Discussion Request / Market Change Request to be drafted to give effect to a preferred option. CRU has outlined a suite of 'Design Principles' for this 'interim' solution which are as follows:

- As cost effective as possible
- Minimise impact on current, regulatory programmes
- Minimise impact on market design and market systems
- Fair
- Minimal Impact to operations
- Allows customers to be compensated for export
- Considerate of the interim nature of the solution

The application of LAFs, for any 'interim' solution, should complement CRU's 'Design Principles.' If the application of LAFs conflict with said principles, then this issue is best kept under review and considered for the enduring solution (end of 2024). It is our recommendation that the consideration of LAFs are included in the scope of the enduring design solution for microgeneration.

Question 4:

Is there any other feedback you would like to provide in relation to the topic of microgeneration?

The purpose of Question 4 was to give respondents an opportunity to provide feedback on any other points of interest regarding microgeneration that were not covered by the previous questions. It should be noted that several of the responses received are related to the possible support scheme which is not within ESB Networks' remit. This is a matter for the Department of Climate Change (DECC). It should be noted that ESB Networks will support both DECC and CRU to enable a future support scheme for microgeneration customers as per the Climate Action Plan (CAP).

For completeness an overview of the responses received is provided below.

In relation to Settlement:

- A response queried what will the settlement rules be for settling out of market? How will data be verified and how will suppliers be paid or made whole? What mechanisms must be complied with to ensure a fair and transparent playing field in relation to settlement. One response queried how will this be agreed and how will it be communicated to industry between the wholesale and retail markets? One respondent noted that microgeneration may require changes in the Trading and Settlement Code.

- One respondent noted that given the current market design, it would not be possible to introduce a market-based microgeneration product in advance of the retail market systems being ready to provide the relevant data to suppliers.
- One respondent queried how non-MCC01 and MCC02 customers will be considered in relation to any proposed settlement solution. A query was raised regarding CRU policy and any potential changes to the Supplier Handbook that may be required to enable the 2021 cutover to facilitate prosumer transition and establishment

Tariffs and Possible Pricing Structures:

A number of respondents submitted feedback on tariffs and pricing structure. An overview of these comments is provided below. However, as noted above some of these topics are not within the scope of ESB Networks and are more relevant for other stakeholders:

- One respondent commented that an efficient and effective renumeration mechanism will be of key importance to the success of microgeneration schemes. Price setting must be fair, cost reflective and transparent.
- When introducing a tariff for microgenerators, it is essential to avoid any unforeseen distributional effects, particularly on lower income customers. Any framework developed should ensure that costs associated with microgeneration schemes are not levied on customers who are unable to participate.
- For consumers and suppliers to make commitments to microgeneration, it is vital that stakeholders do not bear inefficient costs and drains on resources. Rather than investing in and building something that may only exist for a short period of time, any interim microgeneration solution must be a stepping stone towards an enduring solution which must ensure that it provides the right signals for customers to optimise between production, consumption and exports – this will require appropriate market signals to work alongside operational parameters for the microgeneration assets and the systems.
- One respondent queried the purpose of microgeneration for self-consumption and two respondents discussed the possibility of different tariffing structures or PSO arrangements for microgeneration. One respondent noted the current lack of incentivisation schemes for renewable energy, prosumer groups.
- One respondent noted their view of a future energy market moves away from a centralised wholesale/ retail market towards much more de-centralised, localised markets, including peer-to-peer markets for prosumer groups, all interconnected through a centralised balancing mechanism.
- Some respondents welcomed the upcoming publication by DECC in relation to possible support schemes for microgeneration.

Customer Experience:

- A number of respondents highlighted that it is important that the initial customer experience is positive to deliver a successful scheme. In order to ensure that the customer experience is positive, all systems and settlement rules will need to be in place prior to the interim solution rollout. Settlement should be prompt and accurate and customers should experience no unnecessary delays in receiving compensation for any exports.

Smart Metering:

- A number of responses questioned the role of the smart meter to support the trading and settlement of electricity in the market. There was a query relating to both the timing and how day/night customers would be facilitated in any future settlement solution, the mass replacement of day/night meters is not planned to occur until 2023 although these customers can request a single phase smart meter through their supply company. There were a number of questions from the respondents relating to the collection and sharing of data and how this data will be shared with both customers and suppliers for billing purposes.
- For consumers who are not eligible for a smart meter but already have microgen and an import/ export meter – will the interim settlement solution be afforded to them? How will suppliers manage the different data feeds based on the different meters? Will wholesale market allow both sources of data to be settled out of system?

ESB Networks Response:

ESB Networks actively want to support customers in their decarbonisation journey and seeks to inform and support customers who wish to install microgeneration. As noted above, a number of the points raised within the responses received were not related to the consultation or were outside ESB Networks' remit. For transparency, we have provided an overview of responses received but would like to highlight that areas such as the formation of any support schemes are not matters for ESB Networks consideration. However, ESB Networks seeks to support both CRU and DECC where appropriate and can provide details on the responses received to both CRU and DECC.

In 2019, ESB Networks published a number of documents and papers, including:

- Microgeneration Framework Consultation
- Assessment of the Scope for Higher Penetration of Distributed Generation on the Low Voltage Distribution Network
- Smarter HV and MV Customer Connections – New Approaches to Distribution Planning and Security of Supply Standards

In relation to the interim settlement solution, CRU has established the 'Interim Retail Market Microgeneration Working Group' under the IGG. The ultimate objective of this Working Group is to assess options for an 'interim' microgeneration solution to be introduced in June 2021, agree a preferred option and for a Market Discussion Request / Market Change Request to be drafted to give effect to a preferred option. An enduring solution is required and ESB Networks will implement any changes required as directed by CRU. It is important to note that any interim settlement solution will be for a relatively short duration whereas an enduring solution is to be designed and in place for post 2024.

ESB Networks is aware from the CAP publication in 2019, that a support scheme is likely to be introduced for microgeneration. ESB networks seeks to assist both the DECC and CRU in any policy changes that may be needed to enable this. ESB Networks is aware of that the development of any support scheme may lead to potential unintended consequences relating to customer cross subsidisation and/or the possibility of establishing distortionary signals for different customer types. It is ESB Networks understanding that CRU plans to undertake a review of the distribution tariff structure in 2021 and this may be an area considered within the review.

The roll out of smart meters in Ireland began in 2019 and is scheduled to complete by the end of 2024. The programme will focus on replacing general domestic 24 hour single phase meters up to the end of 2022 (1.8 million customers). Smart meters are a key tool in enabling the prosumer and will be a key component of any enduring settlement process. As referenced above, the 'Interim Retail Market Microgeneration Working Group' seeks to determine an appropriate interim settlement solution to be in place from June 2021. The export of data feeding into settlement will be considered in the design of the enduring solution. The interim solution will be determined by CRU. The export of data feeding into settlement will be considered in the design of the enduring solution. ESB Networks will work with all customers and suppliers to ensure that this solution is implemented successfully for the benefit of all participants. Any data sharing mechanisms must be compliant with GDPR requirements and any other legal obligations.

With regards to customers who have a Day/Night meter and a microgen installation they should contact their supplier to request a smart meter installation. The smart meter installation will require a change in tariff which will be facilitated by the supplier in coordination with ESBN and on completion of the installation.

Conclusion

This document seeks to provide the reader with information relating to microgeneration, specifically to provide an overview of the feedback received from our earlier consultation framework on microgeneration as well updates that are relevant. ESB Networks has an important role to play in assisting customers and it is hoped that this document provides relevant information in relation to the required grid connection process for microgenerators, the current development of a simplified grid connection application process for minigeneration connections (greater than microgeneration and up to 50kW), the role ESB Networks has to play in the development of a settlement solution for a microgeneration support scheme as well as outlining the role of smart meters. We hope that this document proves beneficial for the reader and is a useful resource for the customer on their decarbonisation journey. For further information, please refer to our *website*.

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Within this document, ESB Networks seeks to provide an update in relation to areas being progressed and considered to assist the continued development of microgeneration in Ireland. For simplicity, a summary of topics relating to microgeneration that ESB Network are actively progressing include:

- Working with industry and the energy regulator to develop an interim settlement solution (through the Interim Retail Market Microgeneration Working Group which was established in 2020) to facilitate a microgeneration support scheme
- The upcoming public consultation in relation to the provision of HV/MV transformer capacity for future growth in microgeneration connections to be used in technical assessments for distributed generation applications.
- An ESB Networks review of the grid connection application process for customers which will have generation greater than microgeneration and up to 50kW (minigeneration).
- ESB Networks continue to support both CRU and DECC in relation to policy development for microgeneration.

ESB Networks would like to thank respondents who provided such useful feedback to the earlier microgeneration framework consultation. ESB Networks through its recent publications and ongoing activities (outlined above) in microgeneration related areas endeavours to facilitate and inform our customers as they participate in their decarbonisation journey whilst we incorporate the feedback received into our thinking and processes. We hope that this document proves a useful tool and source of information for a wide variety of actors including industry participants, the prosumer, policy makers and others.

Microgeneration Consultation

esbnetworks.ie