



An Coimisiún
um Rialáil Fónais
**Commission for
Regulation of Utilities**



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Microgeneration

Information paper

Information Paper

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Public/Customer Impact Statement

This Information Paper provides an outline of the relevant legislation and areas of work being progressed by the CRU in order to support microgeneration in Ireland. Renewable energy of all scales, including microgeneration, has a part to play in enabling the transition to a low carbon future, as envisaged by Irish and European policy.

Microgeneration involves the installation of small generators, such as solar PV or wind turbines, by households or small businesses, which produce electricity and can reduce the amount that would otherwise be used from the grid. This can help to increase overall levels of renewable electricity and participation in the energy transition by engaged, active consumers.

The following sections provide an overview of microgeneration and information intended for households and small businesses considering the installation of microgeneration.

How can customers install and connect microgeneration to the grid?

The CRU set out the technical arrangements for microgeneration in its 2007 Decision Paper CER/07/208. Microgeneration can include a number of forms of generating technologies including solar-power photovoltaic panels, small hydroelectric schemes, wind turbines and micro combined heat and power.

ESB Networks has a process in place to facilitate the connection of microgeneration to the network, which applies to generators that produce less than 6kW for single phase connections (e.g. two wires connecting to your house) and 11kW for 3 phase connections (e.g. 3 wires connecting to a large farmyard). The majority of domestic connections in Ireland are single phase connections.

There is a separate process for larger connections which is addressed further in Section 3 of this paper. The grid connection process for generators greater than 6kW (single phase) and 11kW (three phase) is outlined under CRU's Enduring Connection Policy (ECP). The CRU is currently considering Enduring Connection Policy Stage 2 (ECP-2) and a decision on this will be published in 2020. This paper will discuss the need for a new/separate treatment for projects above 11kW and below 50kW.

Microgeneration installations should be installed and connected by a qualified installer and Registered Electrical Contractor¹, and ESB networks must be informed of the intention to install a microgenerator through a Microgeneration Installation Notification Form (NC6 form). Further details on this process can be found at ESNB's website here². Once this form is received, ESNB will inform the customer within 20 working days if there is any technical or location specific reason why the installation should not proceed.

How can microgeneration exports be measured?

Currently, the majority of households have legacy, analogue meters (with a spinning disc) which are read manually by ESB Networks and cannot record export associated with microgeneration. Smart meters are currently being installed in Ireland and will provide customers with accurate information about their electricity import and export throughout the day, including export arising from microgeneration. The meter replacement programme commenced in 2019 and involves the upgrade of meters in every domestic and small business premises by 2024.

Smart meters will be installed in three phases. Phase 1, which started in 2019, will see an initial installation of 250,000 meters. This initial phase of the National Smart Metering Programme is mainly a meter replacement programme focused on locations where the majority of the existing meters have reached the end of their technical lives and a new meter needs to be installed. In 2021, the rate of installation of smart meters will increase considerably, with 2,000,000 new meters to be installed by the end of 2024.

Can customers be paid for exported electricity?

There are a small number of schemes in operation which allow for microgenerators to receive payment for the electricity that they have exported to the grid, however these are limited to pilot projects or schemes targeting specific customer groups.

Under the new Renewable Energy Directive, customers are entitled to *'receive remuneration, including, where applicable, through support schemes, for the self-generated renewable electricity*

¹ A list of Registered Electrical Contractors can be found here; <https://safeelectric.ie/find-an-electrician/>

² <https://www.esbnetworks.ie/new-connections/generator-connections/connect-a-micro-generator>

that they feed into the grid, which reflects the market value of that electricity and which may take into account its long-term value to the grid, the environment and society’.

With the implementation of smart metering, it is envisioned that a customer’s import of any electricity consumed in addition to their export of any excess microgeneration exported to the grid for each 30-minute period can be recorded and shared with the customer’s permission. Smart meters will facilitate the implementation of systems for payment for the output of microgeneration, as the accurate measurement of the amount of electricity exported to the grid from a customer’s microgeneration will enable this to be taken into account in any payments that are made to customers based on each unit of exported electricity. A number of processes will need to be put in place between ESB Networks, Suppliers and market systems in order to facilitate this. This process has commenced and will allow for a market-based price to be paid to microgenerators based on the volume of electricity exported.

Within the Climate Action Plan, it is stated that a support scheme for microgeneration will be put in place by the Government by 2021 at the latest, focusing on equity and accessibility, ongoing technology costs and remuneration analysis, technical barriers and planning constraints, grid connection policy and community participation. This support scheme will be designed and implemented by the Department of Communications, Climate Action and Environment.

What electricity charges do microgenerators pay?

Electricity bills are comprised of variable unit charges based on the amount of electricity consumed, fixed standing charges and other charges including the PSO levy. Customers with microgeneration can reduce the variable (or per kWh) component of their electricity bills by replacing imported energy by self-generated electricity. This will reduce the portion of their bill related to electricity consumed from what it otherwise would have been.

Currently, customers with and without microgeneration pay the same fixed component of electricity charges. Suppliers are charged the same network charges for each household regardless of whether or not microgeneration is installed, as these charges relate to the development, maintenance and operation of the transmission and distribution networks. Customers with microgenerators continue to use the transmission and distribution networks when they import electricity, often at peak times and should therefore continue to pay a fair contribution to those charges. They will also be using these networks in order to export their electricity to other consumers and the market.

The CRU is of the view that customers who may not be in a position to invest in microgeneration should not be disadvantaged or cross-subsidise those customers who can do so. All customers should have the opportunity to contribute to the transition to a low carbon energy system, whether through microgeneration, taking up time of use or dynamic tariffs or through demand response.

In 2020, the CRU plans to commence a review of the structure of electricity network charges and along with a range of other factors will consider the equity, transparency and fairness of network charges in the context of microgeneration during this review.

Can microgeneration be installed as part of a larger group or community?

Jointly acting Active Customers and Citizen Energy Communities are described in the Electricity Directive and identified as key areas of focus for the CRU in its Roadmap for implementation of the Electricity and Renewables Directives under the CEP (CRU/20/043). The Directive requires regulatory frameworks to be developed in relation to these types of final consumers, particularly focusing on ensuring non-discriminatory, clear and transparent procedures to be applied by network operators, retail suppliers and other electricity undertakings.

The CRU will engage with DCCAE and other stakeholders during 2020 to contribute to a thorough understanding of active consumers, jointly acting consumers and renewable self-consumers prior to, and during, the transposition and implementation of the Electricity Directive.

Building on this work, the CRU expects to publish a Consultation Paper in Quarter 4 of 2020 on the framework to be developed with regards to the related topics of active customers, renewable self-consumers and energy communities.

CRU Mission Statement

The Commission for Regulation of Utilities (CRU) is Ireland's independent energy and water regulator. The CRU's mission is to protect the public interest in Water, Energy and Energy Safety. The work of the CRU impacts every Irish home and business. The sectors we regulate underpin Irish economic competitiveness, investment and growth, while also contributing to our international obligations to address climate change.

The CRU is committed to playing its role to help deliver a secure, low carbon future at the least possible cost, while ensuring energy is supplied safely, empowered and protected customers pay reasonable prices and we deliver a sustainable, reliable and efficient future for energy and water. The CRU is guided by four strategic priorities that sit alongside the core activities we undertake to deliver on the public interest. These are:

- Deliver sustainable low-carbon solutions with well-regulated markets and networks
- Ensure compliance and accountability through best regulatory practice
- Develop effective communications to support customers and the regulatory process
- Foster and maintain a high-performance culture and organisation to achieve our vision

Further information on the CRU's role and relevant legislation can be found on the CRU's website at www.cru.ie.

Executive Summary

This Information Paper sets out the areas of work being progressed by the CRU to support microgeneration uptake in Ireland based on the requirements outlined in the Climate Action Plan and the broader requirements introduced in the Recast Renewable Energy Directive and Internal Market for Electricity Directive.

The paper sets out the legislative context for microgeneration in Ireland and aims to set out clearly the CRU's driving principles in terms of inputting to an enabling framework for microgeneration, and how this interacts with the CRU's strategic priorities and ongoing work within and across a number of CRU teams. The key principles the CRU considers important in relation to microgeneration are as follows –

- The CRU's approach is to facilitate customers that want to contribute to decarbonisation, enabling a reasonable, market-based price for exports, while avoiding unfair outcomes for customers that do not have the means or opportunity to invest in microgeneration themselves.
- The CRU wants to support and encourage engaged customers to manage their own demand in an affordable and low-carbon way.
- The CRU wants to ensure that the network, system operation and market costs associated with the provision of a reliable, safe and secure supply of electricity continue to be attributed in an equitable and transparent way between customers with and without microgeneration.

In line with these principles, the CRU will support DCCAE in developing an enabling and sustainable framework for microgeneration, in addition to the core CRU responsibilities of defining an appropriate connection policy, identifying a settlement approach to facilitate payments for microgeneration exports and overseeing the Smart Metering roll-out, which ensures the best value for all consumers.

Within the Climate Action Plan, it is stated that a support scheme for microgeneration will be put in place by the Government by 2021 at the latest. This support scheme will be designed and implemented by DCCAE.

The aim of this Information Paper is to set out the CRU vision for microgeneration beyond 2021 and consider the areas of work that need to be progressed in order to facilitate this. The paper also aims to provide useful information to customers that may be interested in microgeneration and market stakeholders and aims to set out a number of steps which are being progressed with ESB Networks and DCCAE to enable further uptake of microgeneration.

Section 3.2 provides an overview of the current grid connection process for microgenerators and the requirements introduced under the Recast Renewable Energy Directive.

The CRU is currently progressing a Decision in relation Stage 2 of its Enduring Connection Policy (ECP-2). This paper will discuss the need for a new/separate treatment for projects above 11kW and below 50kW. There are a number of workstreams progressing in parallel to meet Action 30 of the Climate Action Plan. The outcome of this work will likely inform the need for distinct policy which will be consulted upon in due course.

Section 3.3 of this Paper provides an overview of the timelines for the National Smart Metering Programme, which will see smart meters installed in all Irish homes and businesses over three distinct phases from 2019 to 2024, and how this interacts with the microgeneration support scheme being developed by DCCAE for 2021. While legacy analogue meters are unable to measure the export of generated electricity, smart meters will enable domestic customers to measure the export on their meter associated with excess microgeneration. As part of the facilitation of microgeneration under the Climate Action Plan, where a domestic customer with a single phase connection has installed and connected microgeneration or expects to do so before June 2021, but the scheduled rollout of smart meters in their area is between June 2021 and Phase 3 of the NSMP, they have the opportunity to request a smart meter in advance of this date in order to ensure that the correct metering solution is available to them when a support scheme is put in place in June 2021. ESB Networks will have limited programme capacity available to install smart meters for microgenerators during 2020, so the availability of meters will be dependent on demand and cannot be guaranteed within this timeframe.

Section 3.4 of this Paper details the CRU's view on interim arrangements for settlement of any payments associated with a microgeneration. We note that there are a number of balanced and transparent options that can be considered to facilitate payment and settlement for microgenerators once a smart meter is in place, and, before systems are developed for the transfer of information on import and export from smart meters in 2024 as part of Phase 3 of the National Smart Metering Programme. The CRU held a workshop with ESN, SEMO and Supplier representatives in January 2020 to look at options for an interim settlement solution, which will need to be carried out on a manual basis for any support scheme put in place by DCCAE for June 2021. The CRU is also progressing work in relation to the development of a facilitative framework for aggregation in 2020 based on the requirements under the new Electricity Regulation and Electricity Directive and is of the view that this could potentially provide a route to consumers interacting with the wholesale electricity market while minimising their exposure to balancing market risks.

The CRU notes in Section 3.5 that increased uptake of microgeneration and the nature of the support scheme that is implemented by DCCAE (which will be consulted on in Q3 2020 and could for example involve customers being paid for electricity exported to the grid) will require a review of the structure of network charges and potentially the PSO levy, based on the principle that costs should be distributed on an equitable basis between network users.

Section 3.6 outlines related opportunities for aggregators and renewable energy communities as set out in the Electricity and Renewables Directives. The CRU welcomes the opportunities presented by microgeneration and distributed generation generally and the opportunities for electricity customers to participate in the energy transition, energy markets and demand response in the future. The CRU has identified these as key areas of focus in its Roadmap for implementation of the Electricity and Renewables Directives under the CEP (CRU/20/043).

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1. Introduction

1.1 Background

1.1 Microgeneration in Ireland

Microgeneration in Ireland refers to the generation of electricity from renewable technologies such as solar photovoltaic (PV), wind, hydropower and combined heat and power (CHP) from units below 11kw installed capacity, as per the CRU's 'Arrangements for Micro Generation' Decision Paper in 2007 (CER/07/208). The CRU has a role in facilitating the use of microgeneration in Ireland which is the subject of this Information Paper.

This Information Paper sets out the areas of work being progressed by the CRU to support microgeneration uptake based on the specific CRU actions identified in the Climate Action Plan and the broader requirements introduced in the Recast Renewable Energy Directive and Internal Market for Electricity Directive.

The CRU is cognisant that there is significant interest in microgeneration and opportunities for active consumers and new developments in this area. The CRU understands that there have been limited tariff offerings and microgeneration schemes available to customers since the CRU published its 2007 Decision Paper on arrangements for microgeneration (CER/07/028). This Information Paper is a part of a wider effort, working with ESNB and DCCA, to improve the level of understanding of the key issues associated with the introduction of a framework for microgeneration. A separate paper addressing the technical aspects of microgeneration in Ireland is also being published by ESNB.

In this paper, the legislative context for microgeneration is set out, along with the regulatory challenges that might arise in implementing a framework for microgeneration. In addition, this paper aims to set out clearly the CRU's driving principles in terms of inputting to an enabling framework for microgeneration, and how this interacts with the CRU's strategic priorities and ongoing work within and across a number of CRU teams.

1.2 Related Documents

- Electricity Regulation Act, 1999
- Internal Market for Electricity Directive (Recast)
- Renewable Energy Directive (Recast)
- Climate Action Plan
- CER/07/028 arrangements for Microgeneration

1.3 Structure of Paper

Section 1 and 2 of this Information Paper provide an overview of the current microgeneration framework in Ireland and relevant legislation and policy. Section 3 sets out the CRU's principles in relation to a regulatory framework to facilitate microgeneration and outlines progress and proposals to meet the CRU's actions under the Climate Action Plan in this area. Section 4 outlines the anticipated next steps in this process and related areas of work being progressed by the CRU.

2. Context for Microgeneration in Ireland

2.1 Definition of Microgeneration

A number of definitions under the new Renewable Energy Directive (RED II) and recast Electricity Directive (Directive (EU) 2019/944) are relevant to the definition of microgeneration in Ireland. Under the Renewable Energy Directive (RED II), Article 2, a ‘renewables self-consumer’ is defined as;

‘a final customer operating within its premises located within confined boundaries or, where permitted by a Member State, within other premises, who generates renewable electricity for its own consumption, and who may store or sell self-generated renewable electricity, provide that, for a non-household renewables self-consumer, those activities do not constitute its primary commercial or professional activity’.

This definition prioritises generation of electricity for a customer’s own consumption, with the storage or sale of such electricity as a secondary objective.

In the CRU’s ‘Arrangements for Micro Generation’ Decision Paper in 2007 (CER/07/208), the technical parameters for the definition of microgeneration for grid connection purposes were set out, as a source of electrical energy designed to operate in parallel to the low voltage distribution system and rated up to;

- 6kW of installed capacity, when the DSO network connection is single phase;
- 11kW of installed capacity, when the DSO network connection is three phase³, and;
- Designed to operate in parallel with the ESBN low voltage system.

The supply to domestic dwellings is usually single phase, with a voltage of 230 Volts. A three-phase supply has 3 conductors which each carry an AC current. The voltage for three-phase supplies in

³ The National Smart Metering Programme is initially focused on single phase meters with three phase meters are planned to be exchanged in 2023-2024.

Ireland is either 230 or 400 Volts and commercial premises and some farms may have a three-phase supply. Full details and conditions can be found on the ESB Networks site using this link [here](#).⁴

2.2 Relevant Legislation and Policy

The Commission for Regulation of Utilities (the Commission) has a duty under Section F78 (4)(a) of the Electricity Regulation Act, 1991 to *'promote the use of renewable, sustainable or alternative forms of energy'*. In addition, the Commission has a duty to encourage the efficient use and production of electricity and under Section F78 (4)(b) of the Act is required to *'facilitate access to the network for electricity generation and for gas production, in particular removing barriers that could prevent access for new market entrants and of electricity and gas from renewable energy sources'*.

The Climate Action Plan, published by the Irish Government in 2019, aims to facilitate the transformation to a low carbon future with a goal of reaching 70% of electricity generated from renewable energy by 2030. This plan includes a dedicated section on microgeneration where it is stated that *'the Government strongly supports enabling people to sell excess electricity they have produced back to the grid.'*

A number of actions are being progressed by the CRU in line with the requirements of the Climate Action Plan in order to develop an enabling framework for micro-generation, including a review of requirements for resolving market settlement issues for renewable self-consumers exporting to the grid and determination of an appropriate grid connection policy to facilitate renewable self-consumers. The CRU has also been assigned actions to assess the impact of the current structure of electricity bill charges on renewable self-consumers and other consumers in 2020 and ensure that the functionality to enable smart services is in place as part of the Smart Metering Programme. It is anticipated that the delivery of the Smart Metering Programme will support the development of a market for micro-generation in Ireland.

The Recast Renewable Energy Directive (RED II) and the Recast Internal Market for Electricity Directive under the Clean Energy Package, published in 2019, set out a new legislative basis for microgeneration in EU Member States. The Clean Energy for all Europeans package consists of eight legislative acts which were adopted by the European Parliament and European Council in 2018 and 2019 following Commission proposals in November 2016. This involves a comprehensive update of the EU's energy

⁴ https://www.esbnetworks.ie/docs/default-source/publications/conditions-governing-connection-and-operation-of-micro-generation-policy.pdf?sfvrsn=ad5c33f0_8

policy framework aimed at enabling the transition to cleaner energy and facilitating a reduction in greenhouse gas emission levels of 40% by 2030 compared to 1990.

The eight legislative acts within the CEP cover a range of actors and stakeholders in the energy sector including Member States, regulatory agencies, network operators and market participants. The Regulation seeks to amend aspects of wholesale electricity markets in Europe, enhance integration and progress the transition to renewable energy. Having entered into force in July 2019, the majority of the articles in the Regulation apply from January 2020.

The Recitals section of the RED II is clear that a regulatory framework is required to empower self-consumers to generate, consume, store and sell electricity without facing disproportionate burdens. This applies to apartments and to single family homes. This framework should include consideration of how consumers can contribute in a balanced and adequate way to the overall cost-sharing system of producing, distributing and consuming electricity and the financial sustainability of the electricity system.

Under Article 21(2) of the new Renewable Energy Directive, Member States are required to ensure that renewable self-consumers are entitled, either individually or through aggregators to;

(a) to generate renewable energy, including for their own consumption, store and sell their excess production of renewable electricity, including through renewables power purchase agreements, electricity suppliers and peer-to-peer trading arrangements, without being subject:

(i) in relation to the electricity that they consume from or feed into the grid, to discriminatory or disproportionate procedures and charges, and to network charges that are not cost-reflective;

(ii) in relation to their self-generated electricity from renewable sources remaining within their premises, to discriminatory or disproportionate procedures, and to any charges or fees;

‘to receive remuneration, including, where applicable, through support schemes, for the self-generated renewable electricity that they feed into the grid, which reflects the market value of that electricity and which may take into account its long-term value to the grid, the environment and society’.

And;

(d) to receive remuneration, including, where applicable, through support schemes, for the self-generated renewable electricity that they feed into the grid, which reflects the market value of that

electricity and which may take into account its long-term value to the grid, the environment and society.

2.3 Previous CRU Decision on Microgeneration

The CRU published a Decision Paper in 2007, titled 'Arrangements for Micro Generation' (CER/07/208). The Consultation Paper prior to this Decision considered three options for payment arrangements which might apply to exports made by a microgenerator; sale of electricity directly into the wholesale market, sale of electricity to a supplier, or for microgenerators to spill excess generation to the system without payment. It was decided that the most appropriate route was for microgenerators to be compensated by suppliers at a rate derived from the wholesale price of electricity.

In terms of the metering options for this, at the time the Commission considered that smart metering offered the best prospect for measurement export but in the interim, micro generators would have the option of having an interval meter installed (for a fee) which would facilitate payment for their output by their supplier, though it was noted that this might be a relatively expensive option.

In practice however, as this was to be a matter for negotiation between the off-taking supplier and microgenerator, and as no suppliers developed an enduring, publicly available tariff arrangement for microgenerators, uptake to date has been very low. This was also inhibited by the upfront cost to a customer of having an interval meter installed as the Smart Metering Rollout had not commenced at that time.

2.4 Current Microgeneration schemes in Ireland

In terms of commercial microgeneration offerings for customers, there have been limited tariffs offered by suppliers to date along with a number of pilot microgeneration support schemes.

The Sustainable Energy Authority of Ireland (SEAI) provides grants for the installation of up to 2kW (solar PV installation) and 4kW (solar PV and battery installation) per house. SEAI has recently announced a number of changes to the government funded domestic solar PV grant – as a review showed applicants were often installing larger capacity systems than required – installing 2.8kWp systems on average whereas less than 2kWp is appropriate for average Irish homes. Grant amounts

have subsequently been rebalanced to steer homeowners to smaller systems with higher levels of self-consumption.

In a number of Member States, microgenerators are eligible for feed-in tariffs for export to the grid in order to increase the viability of investment in microgeneration and encourage uptake by consumers. In many cases, only microgeneration above a certain rate of self-consumption can receive a premium tariff in order to encourage direct consumption of self-generated electricity over export to the grid. Where feed-in tariffs are applied, experience has demonstrated that the electricity market price and technology costs need to be monitored in order to adjust tariffs paid to microgenerators in order to avoid overcompensation and limit the overall financing cost of support schemes.

Recent changes to the deployment of microgeneration schemes have included a primarily market-based approach where electricity exported to the grid is rewarded at or below the market price, in some instances with lower tariffs during certain time periods to reflect the value of the export to the market. Such price-based incentives can encourage customers to consume electricity from microgeneration onsite at certain times and export at certain times which may help to avoid the need for system investments.

3. Facilitation of Microgeneration

3.1 CRU Principles for Microgeneration

The CRU is cognisant that there is significant interest in microgeneration in Ireland. As stated earlier, this Information Paper is a part of the effort to improve the level of understanding of the key issues associated with the introduction of a framework for microgeneration, the regulatory challenges that might arise and to set out clearly the CRU's driving principles in terms of a microgeneration framework.

The Renewable Energy Directive focuses on renewable self-consumers generating renewable energy for their own consumption and the benefits associated with this (such as the avoided costs of purchasing electricity). This is because, unlike the electricity purchased from electricity suppliers, self-generated electricity can reduce some of the upstream costs and these savings can then accrue to the customer. The storage and sale of self-generated electricity can also benefit consumers where there is a greater level of export than a customer's demand at any point in time.

The CRU is of the view that the cost of providing the network for import and export of electricity for renewable self-consumers will have to be borne on an equitable basis. In addition, the market value in terms of €/kWh of electricity exported from microgeneration will need to be considered in terms of a system with an increasing share of lower cost renewable electricity.

Notwithstanding the above, the CRU is conscious of the potentially significant benefit consumers may attribute to microgeneration that goes beyond the monetary value of the sale of exported microgeneration, in terms of the importance of consumers playing their part in the energy transition. The CRU recognises that microgeneration, while potentially making a smaller contribution in meeting Ireland's overall renewable energy targets in quantity terms, can play an important role in increasing public understanding and acceptance of low-carbon technologies, and associated infrastructure, and facilitate a shift in system demand.

The key principles the CRU considers important in relation to microgeneration are as follows –

- The CRU's approach is to facilitate customers that want to contribute to decarbonisation, enabling a reasonable, market-based price for exports, while avoiding unfair outcomes for customers that do not have the means or opportunity to invest in microgeneration themselves.

- The CRU wants to support and encourage engaged customers to manage their own demand in an affordable and low-carbon way.
- The CRU wants to ensure that the network, system operation and market costs associated with the provision of a reliable, safe and secure supply of electricity continue to be attributed in an equitable and transparent way between customers with and without microgeneration.

In line with these principles, the CRU will support DCCAE in developing an enabling and sustainable framework for microgeneration, in addition to the core CRU responsibilities of defining an appropriate connection policy, identifying a settlement approach to facilitate payments for microgeneration exports and overseeing the Smart Metering roll-out, which ensures the best value for all consumers.

3.2 Grid Connection Process

Micro-generation involves installing a small generator powered by a renewable source such as wind, solar or hydropower and connecting this to the electricity network. Under Article 17 of RED II, Member States are required to establish a simple notification procedure for grid connections for installations or aggregated production units of renewables self-consumers and demonstration projects with an electrical capacity of 10.8 kW or less (or equivalent for connections other than three-phase connections).

The process should allow microgeneration to be connected to the grid following a notification to the Distribution System Operator (DSO). Under the Directive the DSO may, within a limited period following the notification, reject the requested grid connection or propose an alternative grid connection point on justified grounds of safety concerns or technical incompatibility of the system components.

Projects less than or equal to 11kW are classified as micro-generation and subject to the CRU's relevant policy as set out in CER/07/208. Under CER/07/208, ESNB currently defines microgeneration as equipment rated up to and including;

- 6kW of installed capacity, when the DSO network connection is single phase;
- 11kW of installed capacity, when the DSO network connection is three phase, and;
- Designed to operate in parallel with the ESNB low voltage system.

This does not distinguish between any specific forms of generating technology. While many types of microgeneration technologies are commercially available, in Ireland this typically involves domestic Solar PV microgeneration. It is important that the installation of these units can be monitored so that appropriate controls can be put in place if necessary. To date, there have been over 15,000 approved connection applications for microgeneration. The following process is followed by ESBN for microgeneration applications;

- **Single Applications:** For Single Applications, where only one customer and installation is involved and the penetration level is less than 40% of the capacity in kVA of the existing MV/LV substation that supplies the site, a Microgeneration Installation Notification form (NC6) needs to be filled out.
- **Multiple Installations:** For planned installation on multiple sites, if the total capacity of installed microgeneration is expected to exceed 50kVA on the transformer or if the penetration level is greater than 40%, a network study needs to be completed before connection.

This process involves a customer filling out a straightforward NC6 Application Form⁵ in order to inform ESBN in writing of the intention to install a microgenerator with ESBN providing a response within 20 business days. Where no technical study is required there is unlikely to be any need to reinforce the network before connection. If no instruction to suspend installation is received from ESB Networks (within 20 working days of receipt of Notification Form), then installation can proceed.

Under RED II, Member States may also allow a simple-notification procedure for installations or aggregated production units with an electrical capacity of above 10.8 kW and up to 50 kW, provided that grid stability, grid reliability and grid safety are maintained.

In 2018 the CRU published a decision on Enduring Connection Policy – Stage 1 (ECP-1) with the principal objective of allowing projects which were ‘shovel ready’ (i.e. with planning permission) to have an opportunity to connect to the network. In November 2019, the CRU published a Proposed Decision Paper in relation to its Enduring Connection Policy, stage 2 (ECP-2), which proposes to

⁵ [https://www.esbnetworks.ie/docs/default-source/publications/micro-generation-notification-form-\(nc6\).pdf?sfvrsn=c54433f0_4](https://www.esbnetworks.ie/docs/default-source/publications/micro-generation-notification-form-(nc6).pdf?sfvrsn=c54433f0_4)

prioritise, in the first instance, large renewable energy projects in line with the CRU strategy of delivering sustainable low-carbon solutions with well-regulated networks.

As part of ECP-1, the CRU decided that there should be a route for small-scale generation and autoproducers to be connected outside the more formal, commercial framework of the batch process. This non-batch process in ECP-1 applied to:

- Small projects, i.e. greater than 11kW and less than or equal to 500kW
- DS3 system services trial projects - up to 500kW; and
- Autoproducers

The above categories of projects were to be processed according to the non-batch ruleset outlined in Annex I, Section 12 of the ECP-1 decision and subject to the eligibility criteria set therein. This allowed for up to 30 non-batch connection offers to be progressed on an annual basis.

The CRU is currently progressing a Decision in relation Stage 2 of its Enduring Connection Policy (ECP-2). This paper will discuss the need for a new/separate treatment for projects above 11kW and below 50kW. There are a number of workstreams progressing in parallel to meet Action 30 of the Climate Action Plan. The outcome of this work will likely inform the need for distinct policy which will be consulted upon in due course.

3.3 Smart Metering Rollout and Early Sign-up Process

Smart meters are capable of measuring a customer's electricity import and export and can provide customers with accurate information about their energy usage throughout the day. These smart meters will replace current analogue electricity meters, which are manually read by ESB Networks up to four times a year and do not have the capability to measure export of generated electricity. The accurate, timely and remote measurement of a customer's import and export via a smart meter will enable the measurement of excess electricity generated by microgenerators, which in future could facilitate market-based payments for the value of exported electricity⁶. The information collected by

⁶ Where the remote measurement of a customer's import and export is not possible via a smart meter, a manual read may be required.

smart meters will facilitate the development of settlement processes for microgeneration discussed in Section 3.4.

The National Smart Metering Programme (NSMP) is the delivery plan for the roll out of smart meters across Ireland which will enable the development of smart grids and support the electrification of heat and transport and facilitate microgeneration. By the end of 2020 it is envisaged that 250,000 meters will have been replaced and approximately 500,000 meters will be installed in each of the four years thereafter.

During the first phase of delivery between 2019 and 2020, ESB Networks will deliver 250,000 smart meters, with smart services such as time-of-use tariffs, smart bills and access to historical consumption information being made available by suppliers at the end of 2020. The second phase (2021 – 2022) will see an additional 1 million meters rolled out and will layer in additional functionality and make available a new form of smart prepayment (Smart PAYG) in the market in Q4 2022. This new model of prepayment will provide consumers with the opportunity to pay up-front for their energy without the need for an additional meter or device in the home. The third phase (2023 – 2024) of ESNB's delivery plan will involve the rollout of a further 1 million meters, with additional functionality being made available which will allow consumers to access real-time data on their household energy usage via a device in their home in addition to the full integration of an enduring microgeneration solution into the electricity retail market systems .

Smart meters will enable domestic customers to measure the export on their meter associated with microgeneration. As part of the facilitation of microgeneration under the Climate Action Plan, where a domestic customer with a single phase connection has installed and connected microgeneration or expects to do so before June 2021, but the scheduled rollout of smart meters in their area is between June 2021 and Phase 3 of the NSMP, they have the opportunity to request a smart meter in advance of this date in order to ensure that the correct metering solution is available to them when a support scheme is put in place in June 2021. ESB Networks will have limited programme capacity available to install smart meters for microgenerators during 2020, so the availability of meters will be dependent on demand and cannot be guaranteed within this timeframe.

Customers with installed microgeneration are also required to complete an NC6⁷ registration form to send to ESB Networks in order to be eligible to sign up to a tariff with their supplier and to ensure that there is visibility regarding the location of microgeneration installations for the assessment of technical implications for the Distribution System, in line with the CRU's relevant policy as set out in CER/07/208 and ESB Networks' microgeneration installation notification process, as outlined under Section 3.2. Once a smart meter is in place, Customers can permit their import and export data to be provided to their supplier in order to avail of any support scheme which may be put in place.

It should be noted that the details of any support scheme that will be developed under the Climate Action Plan will be the subject of a Consultation process carried out by DCCA later this year.

3.4 Microgeneration Settlement Process

The primary benefit to customers from microgeneration is the replacement of imported energy by self-generated electricity, reducing the variable component of customer's electricity bills. At times the on-site generation may be greater than the customer demand and electricity may be exported onto the network. Under the new Renewable Energy Directive, customers are entitled to *'receive remuneration, including, where applicable, through support schemes, for the self-generated renewable electricity that they feed into the grid, which reflects the market value of that electricity and which may take into account its long-term value to the grid, the environment and society'*.

The existing stock of legacy analogue electricity meters will be replaced in every house by 2024 under the National Smart Metering Programme. With the implementation of smart metering, it is envisioned that a customer's import for any electricity consumed and export for any excess microgeneration exported to the grid for each 30-minute period can be recorded and shared with the customer's permission. Smart meters can facilitate the implementation of systems for payment for the output of microgeneration, as the accurate measurement of the amount of electricity exported from a customer's microgeneration will enable this value to be taken into account in any payments that are made to customers based on each unit of exported electricity. Settlement processes need to be

⁷ More information on this process can be found here; <https://www.esbnetworks.ie/new-connections/generator-connections/connect-a-micro-generator>

developed in order to provide any market-based remuneration to microgenerators and integrate this into supplier's systems and the wholesale market, allowing microgeneration export to be fairly settled.

Under the Climate Action Plan, the CRU is required to review requirements for market settlement for renewable self-consumers exporting to the grid. The CRU held a workshop on settlement for microgeneration with suppliers, the Market Operator (SEMO) and ESB Networks in January 2020. The aim of this workshop was to outline the CRU's proposals on potential options for market settlement within this time period and for stakeholders to provide feedback on other regulatory barriers that may exist for microgeneration.

The CRU considers that there are a number of balanced and transparent options that can be considered to facilitate payment and settlement for microgenerators once a smart meter is in place and once systems are developed for the transfer of information on import and export from smart meters as part of Phase 3 of the National Smart Metering Programme. However, in the interim, in order to facilitate a microgeneration support scheme for June 2021 as per the Climate Action Plan, an interim settlement solution will be required. This will involve a transition to increasing numbers of microgenerators with smart meters towards a more enduring scenario where the smart metering rollout is complete along with IT system configuration. If the support scheme that is progressed under the scheme involves a tariff mechanism for microgenerator's export, an interim settlement process to facilitate this would involve;

1. The installation of smart meters for microgenerators, where feasible, with such customers notifying ESB Networks of their installation via the NC6 process (described in Section 3.4 below).
2. The collection of export meter data by ESBN.
3. The provision of export meter data to suppliers on a periodic basis, to process for customers to receive payment/rebate against their bills based on the tariff mechanism, with suppliers being made whole through the support mechanism.

Under Article 13 (1) of the new Electricity Directive, it is stated that *'Member States shall ensure that all customers are free to purchase and sell electricity services, including aggregation, other than supply, independently from their electricity supply contract and from an electricity undertaking of their choice'*.

In the long term, direct microgenerator participation in the wholesale market may not be cost effective for micro generators and would potentially expose them to balancing market risk associated

with any imbalances if they were to trade in the ex-ante markets. One option to facilitate microgenerator participation in the wholesale market could entail the development of an aggregator solution on behalf of microgenerators.

This entity, or multiple entities, could aggregate the export from microgenerators and trade in the market on behalf of customers and specific settlement rules could be established to place balance responsibility on the aggregator, but not on consumers. Aggregators would settle their aggregated portfolio through the wholesale market, taking balancing risk on behalf of customers and reflecting this in market payments. Any earnings from the market could then be paid to microgenerators. Customers would have a choice between entities for the sale of their exported electricity. The CRU is considering how this could be managed and whether a third party would be required between SEMO, suppliers and microgenerators to manage this aggregation, along with any associated licensing requirements.

The SEM Committee will be consulting on the framework for aggregation in the SEM in 2020 based on the requirements for aggregation under the new Electricity Regulation, with a focus on participation by aggregators in the wholesale electricity market.

In tandem with the transposition of the Electricity Directive into Irish Law in December 2020, the CRU will commence a separate review for the development of a facilitative framework for aggregation focusing on consumer participation, protection and empowerment in Q3 of this year. This is outlined in further detail in the CRU's Roadmap to the Clean Energy Package's Electricity and Renewables Directives (CRU/20/043⁸) published in March 2020. This will focus on Articles 13 and 17 of the Directive, where;

- Article 13 allows for participation by final customers in aggregation for the purchasing or selling of electricity outside their contracts with suppliers.
- Article 17 allows for participation by final customers offering demand response through in electricity markets alongside other market participants.

⁸ https://www.cru.ie/document_group/roadmap-to-clean-energy-package-implementation/

3.5 Structure of Electricity Charges

As part of its role in protecting consumers, the CRU is of the view that it will be important to ensure that the costs and benefits of microgeneration are not unevenly distributed. For example, it is important to ensure that microgenerators which rely in the network for electricity when they have no on-site generation face cost-reflective network charges in the same way as consumers that exclusively rely on the network for their energy supply, such as those without microgeneration. Such tariffs should be designed to reflect the value of the network to all customers.

The CRU is responsible for the economic regulation of the electricity network companies in Ireland, including the Transmission System Operator and Distribution System Operator which are regulated under licences issued by the CRU. To do this, the CRU sets Price Reviews which limit the revenues that the relevant licensees can recover from electricity customers via network tariffs. Price Reviews are set every 5 years and the upcoming Price Review (“PR5”) will cover the period between 2021-2025.

Following the conclusion of this Price Review process, the CRU plans to commence a review of the structure of electricity network charges and along with a range of other factors will consider the equity, transparency and fairness of network charges in the context of microgeneration during this review.

Increased uptake of microgeneration will have potential impacts on both the transmission and distribution systems which may be dependent on the configuration and age of the network. This will be influenced by existing installed microgeneration, trends in installation of electric vehicles, heat pumps and electrification of heat. Any additional costs associated with significant reinforcement due to the interaction between these factors will need to consider the most equitable means of recovering additional network costs. Any potential benefits accruing from microgeneration, or the efficient aggregation of same in the longer term, could also be considered such as the potential for reduction in system losses associated with the transport of electricity at the distribution level.

The CRU is of the view that customers who are not in a position to invest in microgeneration should not be disadvantaged compared to microgenerators and the costs for the network and any supports should be allocated fairly, with no cross-subsidisation or unfair discrimination between network users.

Monitoring of the initial phase of implementation of arrangements for microgeneration will be important to understand and forecast the estimated uptake in microgeneration and exports. This will inform further work to ensure that these system impacts are mitigated. Any costs associated with this will also need to be considered.

The CRU is also responsible for the administration of the Public Service Obligation (PSO) levy, which is collected from all electricity customers in order to support various subsidy schemes for renewable energy and indigenous fuels in Ireland. Depending on the nature of the funding arrangements for any microgeneration support scheme implemented by DCCAE and the impact of these arrangements on the PSO, the CRU may provide advice to DCCAE on the equitable allocation of the cost of the PSO across electricity consumers where there are a certain cohort of microgenerators receiving support funded by the PSO levy.

3.6 Framework for Aggregation and Energy Communities

Section 3.4 of this Information Paper noted some of the potential opportunities for the aggregation of microgenerator's export, the potential role for aggregators in the settlement of microgeneration and outlined the work the CRU is carrying out in 2020 in order to implement a framework for aggregation.

The Recitals section of RED II notes the growing importance of self-consumption of renewable electricity and the need for a definition of 'renewables self-consumers' and of 'jointly acting renewables self-consumers', which may provide further opportunities for renewable energy communities to advance energy efficiency. This is linked to the concepts of Active Customers and Citizen Energy Communities which are described in the Electricity Directive and identified as key areas of focus for the CRU in its Roadmap for implementation of the Electricity and Renewables Directives under the CEP (CRU/20/043).

The CRU welcomes the opportunities presented by microgeneration and distributed generation generally and the opportunities for electricity customers to participate in future through novel aggregating entities – whether that is through Virtual Power Plants, micro-aggregators; community self-consumers or demand-side aggregators. This is a key element of the CRU's work on renewable energy communities and aggregation as part of the implementation of the Clean Energy Package. The CRU sees the support of a framework for microgeneration under the Climate Action Plan as a first step in the development of further opportunities in this area.

3.7 Summary of requirements for an enabling framework for microgeneration

As set out in sections 3.2 to 3.6, from a regulatory perspective there are a number of interrelated pieces of work to be completed in order to further support microgeneration in Ireland. These involve a number of national and European legal requirements, financial considerations, technical implementation challenges associated with the development of settlement processes and interaction with the retail and wholesale electricity markets and broader frameworks for community participation. Figure 1 below attempts to summarise these areas and the sequencing of implementation of requirements under the Climate Action Plan and Clean Energy Package.

Summary of requirements for an enabling framework for microgeneration	
Legal Requirements	
Requirement	Actions being progressed
Under the Renewable Energy Directive, customers are entitled to <i>‘receive remuneration, including, where applicable, through support schemes, for the self-generated renewable electricity that they feed into the grid, which reflects the market value of that electricity and which may take into account its long-term value to the grid, the environment and society’</i> .	<ul style="list-style-type: none"> ➤ Under the Climate Action Plan, a support scheme for microgeneration will be put in place by the Government by 2021 at the latest. This support scheme will be designed and implemented by DCCAE. ➤ The CRU will further engage with stakeholders to understand whether there are barriers to offering market-based payments for microgeneration.
Under Article 13 (1) of the new Electricity Directive, <i>‘Member States shall ensure that all customers are free to purchase and sell electricity services, including aggregation, other than supply, independently from their electricity supply contract and from an electricity undertaking of their choice’</i> .	<ul style="list-style-type: none"> ➤ The CRU will be consulting in 2020 on a broader framework for aggregation which will include potential aggregation of microgeneration export. ➤ Active Customers and Citizen Energy Communities have been identified as key areas of focus for the CRU in its Roadmap for implementation of the Electricity and Renewables Directives under the CEP (CRU/20/043).

<p>Under Article 17 of RED II, Member States are required to establish a simple notification procedure for grid connections with an electrical capacity of 10.8 kW or less. Member States may also allow a simple-notification procedure for installations with an electrical capacity of above 10.8 kW and up to 50 kW, provided that grid stability, grid reliability and grid safety are maintained.</p>	<ul style="list-style-type: none"> ➤ A simple notification process for grid connections up to 11kW has been put in place by ESBN. ➤ For connections between 11-50 kW, the Proposed Decision in relation to ECP-2 proposes to maintain the 30 offer per year target for non-batch connection offers but to allocate up to half of this number for community-led renewable energy projects. A Final Decision on this is expected in Q2 2020.
Technical Requirements	
Requirement	Actions being progressed
<p>Smart meters can facilitate the implementation of systems for payment for the output of microgeneration, as the accurate measurement of the amount of electricity exported from a customer’s microgeneration will enable this value to be taken into account in any payments that are made to customers based on each unit of exported electricity.</p>	<ul style="list-style-type: none"> ➤ The National Smart Metering Programme commenced in 2019 and involves the upgrade of legacy analogue meter to smart meters in every domestic and business premise by 2024.
<p>Settlement processes need to be developed in order to provide any market-based remuneration to microgenerators and integrate this into supplier’s systems and the wholesale market, allowing microgeneration export to be fairly settled.</p>	<ul style="list-style-type: none"> ➤ In order to facilitate a microgeneration support scheme for June 2021 as per the Climate Action Plan, the CRU has set out high level principles for settlement in this Information Paper. ➤ The CRU will engage with interested stakeholders on the development of an enduring microgeneration settlement solution for 2024, when the systemization of microgeneration information sharing is facilitated in Phase 3 of the National Smart Metering Programme.

Financial Considerations	
Requirement	Actions being progressed
Customers that may not be able to invest in microgeneration should not be disadvantaged compared to microgenerators and the costs for the network and any supports should be allocated fairly, with no cross-subsidisation or unfair discrimination between network users.	<ul style="list-style-type: none"> ➤ The CRU plans to commence a review of the structure of electricity network charges and along with a range of other factors will consider the equity, transparency and fairness of network charges in the context of microgeneration during this review.

Table 1

4. Next Steps

4.1 DCCAE Consultation

In addition to this Information Paper, ESB Networks is publishing a Microgeneration Framework document which seeks feedback from interested stakeholders on the topic of facilitation of microgeneration. Following publication of this Information Paper and ESB Network's Microgeneration Framework document, DCCAE will consult on options for implementation of a microgeneration support scheme in Q3 of this year. The CRU will continue to provide support for this through regular engagement with DCCAE's Microgeneration Working Group.

4.2 Development of enduring settlement process for microgeneration support

Once a decision is made by DCCAE on the nature of the support scheme to be implemented for microgeneration support and its funding mechanism, the CRU will engage with interested stakeholders on the development of an enduring microgeneration settlement solution based on the information sharing facilitated through Phase 3 of the National Smart Metering Programme. This may involve a CRU Consultation process with stakeholders.