Perspectives on Micro-Generation:

Public Participation in the Low-Carbon Transition in Ireland

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No.23 November 2021

An Oifig Náisiúnta um Fhorbairt Eacnamaíoch agus Shóisialta National Economic & Social Development Office NESDO



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Executive Summary

Micro-generation refers to small-scale electricity generation through for example, the use of rooftop solar PV. Public participation has become an increasingly important issue for realising an effective and just low-carbon transition. Material participation, such as micro-generation, is crucial for fostering this more active role of the public (e.g. Ryghaug et al., 2018).

The Irish Micro-Generation Scheme (Government of Ireland, 2021c) aims to incentivise and support the uptake of microgeneration in Ireland, and to provide a route to market for citizens to generate electricity and receive a fair price for doing so. The new scheme is prompted by European level developments and the requirements of the recast EU renewable energy directive (RED II) (Directive (EU) 2018/2001, 2018). It represents the next step in facilitating more active public participation in Ireland, following the Renewable Electricity Support Scheme (RESS) (Government of Ireland, 2019b).

This paper explores stakeholder views on micro-generation as expressed through the Irish Micro-Generation Scheme consultation process. The data for the paper consists of 368 consultation submissions and the official documents related to the consultation (Government of Ireland, 2021b, 2021c). Access to the consultation submissions was gained through a Freedom of Information request (Freedom of Information Act 2014, 2014).

The paper investigates public participation in the low-carbon transition in Ireland. In particular, it is concerned with more active participation of individuals in the low-carbon transition and how this is framed. It is informed by two key concepts: prosumer and energy citizen (e.g. Devine-Wright, 2007; Lennon et al., 2020; Miller & Senadeera, 2017). Prosumers are individuals actively participating in energy production. They can be seen as a subset of energy citizens who are considered to have a broader role and responsibility in the low-carbon transition. This framing is in contrast to that of the public as consumers, passive users of energy often perceived as delaying progress and the transition to low carbon.

The paper analyses different perspectives on micro-generation, by focusing on two research questions:

- 1. What perspectives on prosumerism are expressed in the Irish Micro-Generation Scheme consultation submissions?
- 2. What are the challenges and opportunities for Irish energy citizenship highlighted by the Micro-Generation Scheme consultation?

The paper is timely as it can inform debate before the final version of the scheme is published. The paper provides a number of findings which can help the finalisation of the scheme, expected to be considered by Government before the end of the year but also help shape future work on active public participation in Ireland. This future work includes for example the National Dialogue on Climate Action, which is a forum for collaboration between citizens, communities, youth, the Government, and relevant agencies on climate change (Government of Ireland, 2021a).

First, it finds, that the views expressed in the submissions are aligned with a strong prosumerist viewpoint and a desire to actively participate in and benefit from the low-carbon energy transition. This highlights potential for significant increase in micro-generation in Ireland.

Second, there are tensions between the prosumerist perspective which emerges in the submissions, and the approach proposed in the consultation process. The core tension is between the commitment by government to the energy efficiency first principle which means, that supports for micro-generation are linked to requirements around Building Energy Rating (BER). The commitment to energy efficiency first principle in Ireland is in line with wider EU and Irish policy but may work to hinder the uptake of micro-generation and decrease the accessibility of the scheme. A second tension is linked to caps which the public feels are limiting but which are seen as a means of ensuring against over remuneration and to support self-consumption.

Third, the paper argues that, in terms of future consultation, the value of the consultative work would be increased if a more comprehensive official response was provided to the submissions. In addition, increased attention to the readability and clarity of consultation documents would improve the effectiveness and accessibility of consultation. Finally, transparent assessment of the inclusivity and costs of the scheme for micro-generators would further underpin the credibility of the consultation process.

Definitions of concepts used throughout the paper:

Micro-generation: small-scale electricity generation, such as solar PV, or micro-wind.

Prosumer: individuals who are simultaneously consumers and producers of energy.

Energy citizen: individual who takes an active role and responsibility in the low-carbon transition.

Low-carbon transition: transition to decarbonize the energy system.

Just Transition: The justice of the low-carbon transition relates to questions over who participates and who benefits from the transition (e.g. NESC, 2020).

Clean Energy Package: package of legislative proposals introduced by the EU called Clean Energy for all Europeans.

RED II: EU recast renewable energy directive, which is part of the Clean Energy Package (Directive (EU) 2018/2001, 2018).

EMD: EU electricity market directive, which is part of the Clean Energy Package (Directive (EU) 2019/944, 2019).

Renewable energy community (REC): legal entities defined in the RED II which develop and operate renewable energy projects and are based on open and voluntary participation. RECs are effectively controlled by the members and their primary purpose is to provide environmental, economic and social benefits instead of financial profit. (Directive (EU) 2018/2001, 2018.)

Self-consumer: consumers defined in RED II who generate renewable electricity for self-consumption, and may store or sell self-generated electricity, with the restriction that those activities may not constitute a primary commercial or professional activity. The self-consumers can be either individuals or jointly acting self-consumers. (Directive (EU) 2018/2001, 2018.)



1.1 Introduction

The increasingly alarming evidence of the impacts and severity of climate change (IPCC, 2021) is highlighting a need for a rapid system wide decarbonisation, a low-carbon transition. With recent policy changes, and the Clean Energy Package (discussed in section 1.2), European countries are increasingly supporting public participation in the low carbon energy transition. A key part of this is supporting energy prosumers. This paper explores prosumerism in Ireland as expressed through the Irish Micro-Generation Scheme consultation (Government of Ireland, 2021c). The scheme aims to incentivise and support the uptake of renewable micro-generation in Ireland and is set to be finalised by the end of 2021. Some elements of the scheme contrast with the vision for micro-generation expressed in the consultation submissions for the scheme. Through analysing these tensions between different views on what the scheme could and should be, this paper aims to answer two research questions:

- 1. What perspectives on prosumerism are expressed in the Irish Micro-Generation Scheme consultation submissions?
- 2. What are the challenges and opportunities for Irish energy citizenship highlighted by the Micro-Generation Scheme consultation?

The idea that individuals are more than consumers of energy, passively generating demand, has recently become more prevalent (DCENR, 2015; Fischer et al., 2021; Lennon et al., 2020; Marinetto, 2003). With the consumer framing, the public has often been perceived as a barrier to progress, but framing the public as an active participant can highlight the potential of citizens in the low-carbon transition (Ryghaug et al., 2018). Material participation, such as micro-generation, has been identified as a key measure for fostering this more active participation (Ryghaug et al., 2018), connected to the transition from centralised to decentralised or distributed energy systems (Devine-Wright, 2007; Wolsink, 2020).

These more active individuals are often called prosumers or energy citizens. Simply put, prosumers refer to individuals who are simultaneously consumers and producers of energy (e.g. Brown et al., 2020). Other expectations are also connected to prosumerism in the low-carbon transition which has been described as resulting in "social, economic and environmental benefits to society" (Campos & Marín-González, 2020). Prosumers have been described as ideal citizens of energy democracy, and as a way to democratize the energy system and to make it more just (Szulecki, 2018).

Energy citizenship is a broader concept, which has been defined as people participating actively and democratically in sustainable energy transitions (Devine-Wright, 2007; Ryghaug et al., 2018). The two terms, prosumers, and energy citizens are often also used interchangeably. A distinction made in this paper is that prosumerism focuses specifically on participation in energy production. Energy citizenship also takes the form of broader participation through behaviours and participation in decision-making processes in addition to energy production (Määttä, 2021). Therefore, prosumerism can be seen as a part of energy citizenship. The Irish Micro-Generation Scheme focuses on public participation in energy production, but also highlights challenges and opportunities for broader active public participation in the low-carbon transition.

The more active public participation of prosumers and energy citizens is connected to the goals of distributive and procedural justice in the low-carbon transition, or a just transition (e.g. Pellegrini-Masini et al., 2020). The questions over justice in the low-carbon transition have often revolved around who participates, who does not or cannot participate, and who benefits (or loses) from the transition (e.g. Creamer et al., 2019; Government of Ireland, 2021a, pp. 37–38; NESC, 2020; Walker & Baxter, 2017). The support schemes for public participation are likely to have a significant impact on the justice of the low-carbon transition as they aim to make it possible for individuals to participate in and benefit from the transition rather than be left behind.

One key issue highlighted in the literature on prosumers and energy citizens is the question of whether individuals are willing or able to take on the responsibility (Devine-Wright, 2007, p. 80; Fischer et al., 2021; Lennon et al., 2019). Other barriers to more active public participation include institutional barriers, representations of the public as passive consumers, and lack or deficiency of policies supporting participation (Devine-Wright, 2007, pp. 80–81). The institutional barriers arise from the fact that the energy system has not been created for public participation in energy production, but instead for centralised energy production (Devine-Wright, 2007, p. 81).

In Ireland, the idea of active participation is embedded in an idea of energy citizens who are active participants, who have a role and responsibility in the low-carbon transition (DCENR, 2015). The increasing focus on prosumers and energy citizens is also connected to EU-level developments and the Clean Energy Package. The next two sections of the paper discuss prosumers and energy citizens firstly in the European and then in the Irish context. Section 1.4 of the paper assesses an analysis of the Irish Micro-Generation Scheme consultation. Section 1.5 discusses three key themes to consider for Irish micro-generation, and Section 1.6 concludes the paper with a reflection on points to consider for future consultations on policies aiming for active public participation.

This research was carried out as a part of a secondment with the National Economic and Social Council (NESC) of Ireland, in connection with the author's role as an Early Stage Researcher in MISTRAL Innovative Training Network (ITN). The MISTRAL-ITN has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie actions (Grant Agreement No 813837). The work draws upon the author's Doctoral research at Queen's University Belfast, which investigates citizen involvement in the low carbon energy transition.

1.2 EU - The Clean Energy Package

The increased focus on citizen participation in Ireland is pushed forward by EU-level developments. The EU finalised a package of legislative proposals called Clean Energy for all Europeans in 2019. The Clean Energy Package includes the broad goals of supporting and empowering citizen participation in the low-carbon transition and alleviating fuel poverty (Frieden et al., 2020, p. 44). For these goals, two directives are especially important, the recast renewable energy directive (RED II) (Directive (EU) 2018/2001, 2018) and the electricity market directive (EMD) (Directive (EU) 2019/944, 2019). These directives are relevant to all recent and upcoming initiatives to support citizen participation in energy production in Europe. The Irish Micro-Generation Scheme is directly linked to the RED II directive as the scheme is implemented to fulfil the responsibilities under the directive. The directive (RED II, article 2) sets out key requirements for implementing citizen participation in energy production by defining renewables self-consumer and renewable energy community (REC) models (Directive (EU) 2018/2001, 2018).

As defined in the RED II, renewable energy communities are legal entities which develop and own renewable energy projects and are based on open and voluntary participation. RECs are effectively controlled by the members and their primary purpose is to provide environmental, economic and social benefits instead of financial profit. (Directive (EU) 2018/2001, 2018.) In the EMD, the REC term was changed to a citizen energy community (Directive (EU) 2019/944, 2019). The main difference is that the REC definition emphasises renewable energy projects, and the citizen energy community term emphasises wider range of activities: *"generation, including from renewable sources, distribution, supply, consumption, aggregation, energy storage, energy efficiency services or charging services for electric vehicles or provide other energy services to its members or shareholders"* (Directive (EU) 2019/944, 2019).

"Renewable energy community' means a legal entity:

(a) which, in accordance with the applicable national law, is based on open and voluntary participation, is autonomous, and is effectively controlled by shareholders or members that are located in the proximity of the renewable energy projects that are owned and developed by that legal entity;

(b) the shareholders or members of which are natural persons, SMEs or local authorities, including municipalities;

(c) the primary purpose of which is to provide environmental, economic or social community benefits for its shareholders or members or for the local areas where it operates, rather than financial profits." (Directive (EU) 2018/2001, 2018)

Self-consumers on the other hand are defined as consumers who generate renewable electricity for self-consumption, and may store or sell self-generated electricity, with the restriction that those activities may not constitute a primary commercial or professional activity. The self-consumers can be either individuals or jointly acting self-consumers. (Directive (EU) 2018/2001, 2018.)

"(14) 'renewables self-consumer' means 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, provided that, for a nonhousehold renewables self-consumer, those activities do not constitute its primary commercial or professional activity." (Directive (EU) 2018/2001, 2018.)

The mandatory transposition of the RED II into national law leaves room for context specific adaptation (Frieden et al., 2020; Lowitzsch et al., 2020), with a mid-2021 deadline for the establishment of collective self-consumption and renewable energy community models (see S.I. No. 704, 2020; S.I. No. 365, 2020). The transposition process includes decisions over the spatial limitation of collective self-consumption and renewable energy communities, generation capacity limits, local grid tariffs, use of public grids and governance elements (Frieden et al., 2020, p. 1). Embedding communities in the aims of the Clean Energy Package is seen to require consumer empowerment, and reduction of energy poverty, supported by information provision, facilitation of processes, and by guaranteeing open participation (Frieden et al., 2020, p. 2).

One key aspect of individual and community participation in energy generation, as defined by the RED II, is a selfconsumption focus, meaning the majority of the generated electricity is consumed by the prosumer instead of being exported to the grid. This key principle is now guiding how citizen participation in energy generation is facilitated throughout Europe. The benefits of self-consumer model are argued to include cheaper energy bills, increased energy autonomy, increased flexibility of the energy supply, increased awareness of individuals, energy consumption behaviour change, reduced carbon emissions and creation of new jobs in the local area (Interreg Europe, 2020, p. 5). These apply to prosumerism in general. Use of the term 'self-consumer' instead of the more well-known 'prosumer' highlights the perspective taken on public participation in electricity generation. Another connected feature of how the participation of individuals and communities is to be implemented is a focus on environmental, economic and social community benefits instead of financial profit (Directive (EU) 2018/2001, 2018).

The wider transposition processes and fulfilling the commitments under the directive remain ongoing, such as with the Micro-Generation Scheme in Ireland. This limits the possibility of drawing on other research to compare the elements of countries, but some examples do exist (Barone et al., 2020; Burgos et al., 2021; Di Silvestre et al., 2021; Frieden et al., 2020; Gallego-castillo et al., 2021). Some of the lessons from this research include that the transposition processes vary based on geographical, cultural, economic and political factors (Frieden et al., 2020; Hoicka et al., 2021), and that introducing RECs to the grid is not without challenges (Di Silvestre et al., 2021). Additionally, smart meters and smart charging, for example with electric vehicles, have been identified as key measures for supporting self-consumption (Barone et al., 2020).

The Spanish case also shows that self-consumption can be cost-effective with or without remuneration if the installations are sized appropriately (Burgos et al., 2021; Gallego-castillo et al., 2021). Analysis of self-consumption in Spain highlighted that electricity cost savings from self-consumption compared to a situation without self-consumption varied between 11-20% without remuneration and 14-32% with remuneration (Gallego-castillo et al., 2021, p. 13). It is important to note here that these numbers are not directly transferable to other countries, but still showcase the potential savings from self-consumption to be significant.

1.3 Ireland and Energy Citizens

Ireland has been going through a rapid increase in the deployment of renewable energy. The share of renewables in electricity generation has increased from 3.5% in 2005 to 25.7% in 2019 (SEAI, 2020, p. 33), with the goal of 80% by 2030 (Government of Ireland, 2021a, p. 9). Despite the successes in electricity generation, Ireland is still facing significant challenges in decarbonisation (Government of Ireland, 2021a, p. 18; SEAI, 2020). In 2019 renewable energy represented 3.9% of final energy use in Ireland (SEAI, 2020, p. 17). This highlights the deep-rooted reliance on energy from carbon-based sources (Barnett et al., 2015). In terms of carbon emissions, the biggest challenges come from agriculture, transport and energy industries (Government of Ireland, 2021a, p. 18). Based on The Sustainable Energy Authority of Ireland (SEAI) 2020 report (SEAI, 2020, p. 6), also decarbonising heat poses one of the biggest challenges for Ireland, with 2019 share of renewables used for heat being halfway (6.3%) to the 2020 target (12%). The report also identified households as the biggest heat energy consumers, even bigger than industry (SEAI, 2020, p. 20). This is also reflected on in the goal to retrofit 500,000 homes to a B2 equivalent Building Energy Rating (BER) standard (Government of Ireland, 2021a, p. 19). This challenge is reflected on in the design of the Micro-Generation Scheme discussed in this paper and gives some context to the decisions made for the scheme.

Alongside the rapid deployment of renewables, mostly wind energy, more recently Ireland has also been shifting towards increased public participation in the low-carbon transition. Around 2014/2015 the concept of energy citizens emerged in Irish policy discourse (DCENR, 2014, 2015). Even though the idea of individuals as more active participants emerged in these discourses, the ground reality has not yet fully represented this. The majority of the incremental measures to involve individuals in the low-carbon transition have begun to be implemented recently. This process has been pushed forward by European-level policy changes and mandatory commitments (see section 2). The practical reality in Ireland has been reliance on large scale developers and a centralised power system, with limited opportunities for individuals to participate in the low-carbon transition and value-sharing (NESC, 2014, p. 33), but this is now gradually changing towards a more participatory approach. The potential for community energy projects in Ireland has been estimated to be strong due to history of community-led organisations in other areas, with lack of available support identified as a key barrier (NESC, 2014, p. 36). The recent measures to support the more active individuals in the low-carbon transition in Ireland include:

- i SEAI has supported public participation in energy projects though grants and initiatives such as the Sustainable Energy Communities (SEC) programme (SEAI, 2018) and the National Home Retrofit Scheme (SEAI, n.d.). The SEC network was started in 2015 as a follow-up of the 2015 *Energy White Paper* (DCENR, 2015). Recently, the ambitions for the programme have increased, and the Irish Government has set a goal of 1500 SECs by 2030 (Government of Ireland, 2019a, p. 136). This represents a significant increase from the 256 SECs in 2019 (Government of Ireland, 2019a, p. 136).
- iii The Irish Renewable Electricity Support Scheme (RESS) supports renewable electricity projects through a series of competitive auctions (Government of Ireland, 2019b). The scheme also supports public participation in three ways. Firstly, the auctions include a separate community category, which includes many qualifying criteria such as registration as a SEC, and compliance with the definition of a renewable energy community (see section 2) (Government of Ireland, 2020, p. 18). Secondly, the auctions set a mandatory community benefit fund of €2/MWh, which shares the benefits of developments with the local community and can be used to support local community projects (Government of Ireland, 2019b, p. 14). Lastly, the future auctions will also include a shared ownership element, which was not part of the first auction round (Government of Ireland, 2019b, p. 5, 2020).

iii The Micro-Generation Scheme analysed in this paper. The scheme, and simultaneous supporting developments are discussed in the next section.

iv These schemes are supported by other measures as well, such as statements of future measures and commitments to support active public participation (e.g. DCENR, 2015; Government of Ireland, 2019a, 2021a) and budget allocation of €858 million to support the transition to "climate-neutral, circular and connected economy and society" (DECC, 2021). The latest policy addition, the 2021 *Climate Action Plan* (Government of Ireland, 2021a) also states increased ambition to support active public participation through the National Dialogue for Climate Action and additional funding to support public participation.

1.4 The Irish Micro-Generation Scheme

1.4.1 Key Elements of the Scheme

*Micro-generation refers to small-scale electricity generation. The proposed framework for the Irish Micro-Generation Scheme defines micro-generation as: "micro-generation technologies including micro-solar PV, micro-hydro, micro-wind and micro-renewable CHP*¹ with a maximum electrical output of 50kW" (Government of Ireland, 2021c, p. 21).

The proposed framework for the Irish Micro-Generation Scheme has multiple policy objectives guiding the design of the scheme. The primary objective is to: "provide a route to market for citizens and communities to generate their own renewable energy and receive a fair and efficient price for doing so" (Government of Ireland, 2021c, p. 3). Other stated objectives include establishing a renewables self-consumer model for energy generation and consumption and supporting citizen and community participation in the transition to "a net-zero carbon economy". (Government of Ireland, 2021c, p. 3.) The scheme aims to create a framework which will comply with the requirements of the RED II (Directive (EU) 2018/2001, 2018) and other policy goals stated in the 2019 *Climate Action Plan* (Government of Ireland, 2021c, p. 3). This highlights that the Irish Government (Department of the Taoiseach, 2020) (Government of Ireland, 2021c, p. 3). This highlights that the Irish Government for Economic and Social Affairs), 2019). In addition to these policy objectives, the scheme design also aims to ensure equity and cost burden sharing in the scheme, protect vulnerable consumers, and to be accessible to all (Government of Ireland, 2021c, p. 3).

The scheme is implemented alongside other connected developments. These include a smart meter rollout, review of the grid connection process by The Commission for Regulation of Utilities (CRU), assessment of the impact of micro-generation on the distribution network, and assessment of different micro-generation scheme designs (Government of Ireland, 2021c, pp. 6–7). It is important to note here, that all these connected developments will not be fully in place in time for the Micro-Generation Scheme, limiting the extent to which ordinary citizens can become prosumers. The estimated timeline for the ongoing rollout of smart meters for every home and business for example is by 2024.

These connected developments guide the scheme design. A report from ESB Networks on the impact of microgeneration on the electricity grid (ESB Networks, 2020) highlighted that the network can currently accommodate widespread micro-generation penetration at levels up to 3-4kWp. At lower levels of penetration, the estimated capacity was 6-11kWp. Higher levels of exported electricity would require reinforcement of the grid. (ESB Networks, 2020, p. 12.) This highlights a limited capacity for micro-generation in the Irish electricity network, which has most likely impacted the scheme design.

The consultation document highlights that the uptake of micro-generation currently in Ireland is low, approximately 1.5.% of domestic electricity end-users (Government of Ireland, 2021c, p. 12). The benefits of increasing microgeneration in Ireland are seen to include helping Ireland reach its energy and emission targets, and to positively change energy consumption. The proposed reasons for the low uptake of micro-generation are identified as *"installation costs, low awareness of micro-generation among homeowners and homeowners' willingness to pay (WTP) falling significantly below market prices"* (Government of Ireland, 2021c, p. 12) The scheme appears to target especially the installation costs by improving the viability of micro-generation.

The design of the scheme was chosen based on a review of international best practice and comparison of policy choices (Boer et al., 2020). Key elements suggested for the scheme include that it focuses on self-consumption (Government of Ireland, 2021c, p. 12). This key principle is evident in the policy choices. The scheme proposes that the electricity export would be capped at 30%, meaning 70% of the electricity would self-consumed (Government of Ireland, 2021c, p. 17). Additionally, the size of installations is capped at maximum of 50kW to further support that majority of the electricity

¹ CHP means combined heat and power, using one source of energy production to produce both electricity and thermal energy (heat). In the Micro-Generation Scheme this is limited to renewable energy production.

generated would be self-consumed. There is also indications that the size limit of installations could be smaller for different types of micro-generators (ESB Networks, 2020; Government of Ireland, 2021c, p. 20).

The financial incentives of the scheme are calculated based on a viability gap assessment. The viability gap means the level of financial support needed to cover the difference between the cost of installing micro-generation and the savings from self-consumption. (Government of Ireland, 2021b, p. 15). The proposed framework describes remuneration as a small additional benefit instead of a revenue generating opportunity, and over-remuneration as a risk that the scheme aims to avoid. The financial focus of the scheme is to save on electricity costs compared to the retail price paid otherwise. (Government of Ireland, 2021c, p. 17.)

The scheme proposes two tariffs, a Clean Export Guarantee (CEG) for excess electricity exported to the grid and a Clean Export Premium (CEP). The CEG will not be limited to the 50kWe upper limit, and would be paid for all excess electricity exported to the grid (Government of Ireland, 2021b, p. 34).

The CEP is proposed as an additional payment for installations installed after June 30th, 2021, for the excess electricity exported to the grid. Additionally, the CEP would be offered only for existing buildings. The purpose of the CEP is to fill the viability gap, which would not be filled by the CEG alone. (Government of Ireland, 2021c, p. 26) The rates would be set at an amount which is less than the electricity price paid by consumers to encourage self-consumption (Government of Ireland, 2021c, p. 35). It is suggested that the premium tariff lasts for a maximum of 15 years due to the estimated decrease in the cost of micro-generation technology (Government of Ireland, 2021b, p. 35). From the consultation submissions, it appeared that the differentiation between the CEG and CEP caused some confusion (discussed in Section 1.4.3), highlighting that this differentiation was not clear enough in the consultation document.

Another proposed financial incentive of the scheme is a suggested discount rate of 3.75%, which was chosen "to strike a balance between the competing interests of a return on investment and the cost of the support required to close the viability gap" (Government of Ireland, 2021c, p. 23). The discount rate is aimed at covering the opportunity cost of investment (Government of Ireland, 2021b, p. 23), meaning the cost of choosing to invest in micro-generation instead of other investment options.

The energy efficiency first approach to building retrofit is connected to the scheme, supported by previous experiences and alignment with other support schemes (Government of Ireland, 2021c, p. 9). Therefore, a post-works Building Energy Rating (BER) is required to access the premium tariff. To follow other policy developments, it is suggested that the minimum BER requirement be increased over time from a C to a B rating. (Government of Ireland, 2021c, p. 36)

Another elements of the scheme include that community groups need to conform to the definition of a renewable energy community (Section 1.2) and register with the SEAI. (Government of Ireland, 2021c, p. 36) This aims to align the scheme with the RESS auctions design (Government of Ireland, 2021c, pp. 9–10). Additionally, the applicants for the scheme will be required to have an export connection from the Distribution System Operator (DSO) to access the grid for exporting energy (Government of Ireland, 2021c, p. 36).

The initial framework defines the micro-generators as (Government of Ireland, 2021c, pp. 17–18):

- 1. Domestic
- 2. Agricultural
- 3. Small-Medium Enterprises (SME's) (commercial and industrial)
- 4. Public buildings (school and local authority buildings)
- 5. Community/social enterprise
- 6. Citizen Energy Communities

Jointly acting self-consumers are mentioned in the consultation document alongside renewable energy communities, but it is left unclear how this will be implemented and how and if there will be a peer-to-peer sharing or trading element to the scheme. Frieden et al. (2020, p. 25) highlight that the prevalence of single dwellings may be the reason there is no jointly acting self-consumer framework in Ireland. Lastly, it is proposed that the scheme will be paid through the Public Service Obligation² (PSO) levy (Government of Ireland, 2021c, p. 32).

1.4.2 Data

The Irish Micro-Generation Scheme went through a public consultation period from 14th January 2021 to 18th February 2021. This consultation resulted in 875 submissions, of which 158 were industry and 717 were general public submissions. The general public submissions included 489 mass mailing submissions and 228 individual submissions. (Government of Ireland, 2021b.)

Access was gained to 368 consultation submissions through Freedom of Information (FOI) request from the FOI body holding the record, the Department of the Environment, Climate and Communications (Freedom of Information Act 2014, 2014). From the total of 875 submissions (Government of Ireland, 2021b), access was gained to the contents of 158 industry submissions and 228 general public submissions. Access to the 489 mass mailing submissions was declined under the Section 15 (1) (c) of the Act (Freedom of Information Act 2014, 2014). Personal information (names and contact details) were removed from the submissions under Section 37 of the Act (Freedom of Information Act 2014, 2014), and the author was provided with excel spreadsheets containing the content of the submissions.

The official summary of the consultation (Government of Ireland, 2021b) does not give much information about the mass mailing submissions and what was included in these, other than that these were general public submissions. By comparing the issues discussed in Section 1.4.3 and the official summary document (Section 1.4.4), it appears that the 368 submissions are a representative take of the consultation submissions. Still, it cannot be excluded that some key issues were missed due to the lack of access to all 875 submissions.

The analysis in this paper initially differentiated between types of respondents, but no major differences were identified. Therefore, the following discussion focuses on general topics throughout the submissions. The vast range of stakeholders who provided submissions for the consultation included energy companies, governmental actors (local and national), practitioners and experts (e.g., engineers and consultants), political and advocacy actors and groups, academics and researchers, energy agencies, various potential users of the scheme and their representative organisations, the general public, community energy actors, energy co-ops, and Sustainable Energy Communities (SECs).

In addition to the content of 368 consultation submissions, the documents provided for the consultation (Government of Ireland, 2021c) and summary of consultation submissions provided by the Department of Environment, Climate and Communications (Government of Ireland, 2021b) were analysed. The final scheme was not yet published when this paper was written, so it is important to note here that the final scheme may not be the same as the initial framework.

The submissions were analysed for key issues and the perspectives these portray on prosumerism in Ireland. These were then compared with the proposed design for the scheme and the official summary of the consultation submissions. This analysis highlighted also issues related to the consultation process itself. The next section addresses the key issues discussed in the submissions, and Section 1.4.4 gives an overview of the departmental summary of the consultation submissions.

² PSO (Public Service Obligation) levy is charged to all electricity customers in Ireland to support the generation of electricity from sustainable, renewable, and indigenous sources.

1.4.3 Key Issues in the Consultation Submissions

The consultation submissions included varying perspectives on some elements of the Micro-Generation Scheme. The consultation summary document provides mostly quantitative assessment of the submissions to the consultation questions (Government of Ireland, 2021b). The analysis here focuses on qualitative aspects. The official summary of the consultation submissions (see Section 1.4.4) highlights that majority of the submissions agreed with the proposed scheme elements, with varying levels of agreement between consultation questions (Government of Ireland, 2021b). The analysis here focuses on instances representing alternative perspectives.

BER REQUIREMENT

As stated in the consultation document, the scheme adopts an energy efficiency first principle. Following this, the scheme requires a minimum post-works BER C rating for the premium tariff. (Government of Ireland, 2021c, p. 4.) This feature of the scheme was strongly objected to in the consultation submissions. Some of the submissions argued that there is no connection with micro-generation and BER, and that this requirement would discriminate against low-income households and restrict their access to the scheme. This is due to the high cost of house retrofitting in addition to the costs of micro-generation technology. Adding micro-generation is one possible part of house retrofitting but does not alone represent the more comprehensive renovations needed to improve the energy efficiency of buildings. In addition to the low-income households, this was seen as a restricting element also towards other interested participants.

It was also argued that the BER requirement is not suitable for all buildings, such as farm buildings or protected buildings, and that it leaves out the buildings which are most in need of micro-generation and decarbonisation. Some of the submissions argued that by essentially excluding low BER houses and low-income households, there is a risk of creating a group of high emitting actors, who are not able to utilise micro-generation as their first step towards sustainability. This was argued to represent a missed opportunity to involve those who are most in need of measures to decrease their carbon emissions. Some of the submissions argued that energy efficiency is important but, implemented this way, it would be counterproductive, hindering the scheme and uptake of micro-generation in Ireland.

"Farm sheds in the sunny south east might have excellent rooftops for solar panels, but it would make no sense to insulate them. Similarly many community buildings, schools or businesses might have extremely complex and expensive energy retrofit opportunities, but could still host solar panels and produce very valuable renewable electricity. Requiring a minimum standard for homes would likely only exclude those who cannot afford a deep energy retrofit."³

"No. These two things are not related. Making them a necessary part will reduce installations when we should be encouraging them by any and all means. The retrofit program is plagued with enormous delays. Doing this would signal that the government is interested in window dressing not providing solutions."

CAPS ON EXPORT AND SIZE

Another issue discussed in the submissions is the proposed caps on export (max 30%) and size of installations (max 50kW) (Government of Ireland, 2021c). It appears from the initial framework that these impact only the premium tariff, a feature which appeared to be misunderstood in some of the submissions. Many of the submissions argued that the caps are too restrictive and will work as disincentives. The submissions suggested removal of the caps or making them higher to better incentivise the scheme, to increase the return on investment, and to decrease the payback time for the investment. The caps were also seen as inflexible in relation to changing consumption patterns, such as schools during summer periods.

³ All quotes are anonymized due to the data being accessed under the FOI act (Freedom of Information Act 2014, 2014), and no permissions having been sought of individuals.

"There should be no cap on the amount of electricity which should be exported. The concept of "overremuneration" seems non-sensical, the more that a renewable generator can produce, the better to meet our climate targets, why should it be limited."

Some of the submissions also highlighted that the reason for the export cap is most likely grid limitations (ESB Networks, 2020) instead of the self-consumption focus, as the design of the scheme would be sufficient to support this without this restriction.

"It does not make sense to attribute this limit [30% export limit] to 'maximise self-consumption savings'. It does not make sense financially for a prosumer to sell their electricity to the grid if they are going to have to buy electricity from the grid (at a higher price than what they sold). This means that the prosumer will automatically use as much electricity as they need, and then let the excess be exported onto the grid."

The cap on the size of installations is proposed at maximum 50 kW, but discussion on the capacity banding (Government of Ireland, 2021c, p. 20) makes it unclear whether smaller limits are proposed depending on type of micro-generator. This caused some confusion in the consultation submissions, as the respondents were not sure whether the smaller limits or the 50 kW limit would apply to them. Some of the submissions also raised questions over what would happen to electricity exported beyond the capped amount, highlighting that this was not made clear in the consultation document.

"No. The installation limits proposed are extremely small - houses (3 kW), school/community/farm (11 kW), SME (50 kW)."

"The proposal to cap export at 30% is overly restrictive for many building types. It is unclear why 30% has been suggested as this is not the case in many other European countries. If more than 30% is exported it is unclear from the proposal where it would go or to whom the benefit of that electricity would be attributed?"

TIMEFRAME RESTRICTIONS

Another element of concern was the timeframes suggested for who would be eligible for the premium tariff. The scheme proposes that only existing buildings with new micro-generation installed after 30th June 2021 would be eligible for the premium tariff (Government of Ireland, 2021c, p. 34). Some of the submissions argued that such limitations would penalise early adopters, and disincentivise new builds to incorporate micro-generation. Some submissions highlighted that several existing micro-generators have been feeding electricity to the grid for years without compensation, and this should be considered in the scheme to increase fairness. Some submissions from existing micro-generators argued that excluding them from the premium tariff is a breach of previous promises and punishes them for their efforts to help the environment.

"It would be totally unjust to exclude early adopters from full payment for the energy exported to the grid. They assumed at the time of installation that they would eventually be rewarded, and have been fuming at the delay in implementation. Penalising them would be a big slap in the face and would inhibit future early adopters of new energy saving technologies."

The misunderstandings over the elements of the scheme were apparent also in some of the discussion around the timeframe limitations. The proposed framework suggests that the existing micro-generators and new builds would still be eligible for the CEG, but be limited from the CEP, premium tariff which is aimed towards closing the viability gap. This distinction is not directly stated in the consultation document but needs to be deducted based on the consultation questions.

AMOUNT OF FINANCIAL BENEFITS

The suggested level of financial benefits also raised concerns. Many submissions viewed the proposed tariffs and discount rates as too low to incentivise uptake of the scheme and argued that they would make the payback time for investment too long. The long payback time was argued to be a factor which would exclude or disincentivise many interested participants from the scheme. These responses showed clear interest in gaining revenue from investment in micro-generation. Some of the energy supplier responses on the other hand were concerned over how they would recover the costs of the scheme and whether the end consumer would end up paying for the scheme even if they are not able to participate.

"Microgeneration also allows the possibility of an income stream for community and non-profit groups and this should be given specific consideration, particularly in terms of energy communities where surplus power will be consumed locally."

"Paying for the Microgeneration Support Scheme through the PSO levy is a sensible approach, and conforms with the standard practice of using the PSO levy to subsidise renewable electricity. Care must be given to ensure those in fuel poverty are not overly burdened as a result of any hike in the PSO levy"

INCLUSIVITY

The perspective that the scheme should be accessible to as many as possible was common in the submissions. Restricting access to the premium tariff raised concerns about equality and fairness, as many people would be excluded from the scheme due to the required level of investment. Incorporating grants (existing and new) into the scheme or replacing the CEP with a grant was suggested as a solution to increase the accessibility of the scheme. Some of the submissions argued that this inclusivity should be included in the review and governance of the scheme, which should include a wide range of stakeholders.

COMPLEXITY

Another key concern raised in the submissions was the complexity of the proposed measures. Many of the submissions highlighted that the scheme should be easy to understand and implement, with minimal bureaucracy and complexity for participants. This was raised especially in relation to the tariffs and discounts, connection with the DSO, and registration with the SEAI. Many of the submissions suggested that the prices should be set in an easy-to-calculate and easy-to-understand way. The DSO connection process, although majority agreed with the requirement, raised concerns over costs and time, with many highlighting that this process should be easy, fast, and low-cost or free. These concerns were also raised in relation to planning permission. The suggested requirement for community groups to register with the SEAI also raised concern over whether this process would be an added complication.

READABILITY

Some of the submissions also noted that the consultation document was unclear. This was also highlighted by the apparent misunderstandings about some elements of the scheme in the consultation submissions. One common misunderstanding appeared to be the differentiation between the CEG and CEP tariffs. The consultation document left it difficult for readers to understand that many of the restrictive elements applied only to the premium tariff, and what this would mean for the viability of micro-generation.

"The formal consultation is for good reason technical and set at a policy level. But it would be inappropriate for practical public views to be omitted."

"There is also a lot of jargon relating to micro and alternative power generation. This is off-putting and sometimes completely over the heads of ordinary people. -- The grant system, where one exists, needs to be made more visible, and mail shots promoting such technology must lay out for the customers in easy to understand language what they will get."

1.4.4 Official Summary of the Consultation Submissions

The Government provided a document summarising the consultation submissions (Government of Ireland, 2021b), providing mostly quantitative analysis and comments on some of the key issues raised in the submissions. The final form of the scheme was not yet published when this paper was written, so there is no clarity on the details of it.

Even so, the 2021 *Climate Action Plan* published before the final Micro-Generation Scheme gives some information on it. The plan provides an expectation of the amount of micro-generation that the scheme is expected to result in, 260 MW by 2030, and that all micro- and small-scale generators will receive an export payment (Government of Ireland, 2021a, p. 97). There is no clarification on the amount of the tariff, or whether this means that there will be one payment or two separate payments with restrictive elements to one of them. The Plan also gives clarification on the simultaneous supporting developments. The plan states that planning regulations will be amended to extend exemptions for solar installations (Government of Ireland, 2021a, p. 97), answering some of the concerns raised in the submissions about the planning system.

More importantly, the plan gives information on one of the key challenges raised in the submissions, the caps for size of installations and exclusion of many interested participants due to this. The plan states that the Irish Government will develop another scheme, a Small-Scale Generation Scheme for installations more than 50 kW (Government of Ireland, 2021a, p. 97). The Plan states that the Micro-Generation Scheme will be aimed towards households and the upcoming Small-Scale Generation Scheme will be aimed towards farmers, businesses and communities (Government of Ireland, 2021a, p. 9). No further information was given on the Micro-Generation Scheme or the Small-Scale Generation Scheme, but this indicates major changes to the final scheme in comparison to the initial framework.

The official consultation summary highlighted that a majority of the submissions agreed with the proposed Micro-Generation Scheme, but different elements of the scheme attracted different levels of approval (Government of Ireland, 2021c). It is important to note here that many of the submissions which agreed with the proposed elements of the scheme provided conditional agreement, such as agreeing to the tariffs if they are high enough to incentivise uptake. These are included as 'yes' answers in the consultation summary (Government of Ireland, 2021b).

The official response identified two elements of the scheme where significant differences in opinion emerged (Government of Ireland, 2021b, p. 3). These were the BER requirement, and caps on installation size and export. The comments to these two main points of objection indicated that these would likely remain as part of the final scheme. The BER requirement was argued to be necessary measure to align with the energy efficiency first principle. The caps on export and size were argued to be intended to encourage self-consumption and to avoid the risk of over-remuneration. (Government of Ireland, 2021b, p. 3.) The *Climate Action Plan* on the other hand indicates that these will be addressed by the introduction of another scheme, which could take an alternative approach to the BER-requirement (Government of Ireland, 2021a, p. 97).

Additionally, the summary document highlighted some of the concerns raised in the submissions in relation to:

- Vulnerable consumers and energy poverty;
- Payback period;
- Availability of grants;
- Simplicity and ease of access; and
- Flexibility of the scheme.

Similar issues as discussed in Section 1.4.3 were also identified in the summary document, except for readability of the consultation document. As a summary of the submissions, the document does not give a response to the raised concerns. With many of the issues, the document also concludes that the issues were raised without supporting evidence, indicating that these may not be considered for the final scheme (Government of Ireland, 2021b, pp. 4–8). On the other hand, the information given in the *Climate Action Plan* (Government of Ireland, 2021a, p. 97) indicates that there may be major changes to the final scheme design.

The public interest in the scheme is significant as signalled by the 717 consultation submissions from the general public. The summary document does not give a response to how the public views will be taken into consideration in the scheme design. The final scheme may provide a more comprehensive response. A more comprehensive response could address the key concerns such as (i) why the energy efficiency first principle was included in the scheme despite the increased costs required to achieve this; (ii) or why setting the tariffs below the price of electricity bought otherwise was not seen as sufficient to support self-consumption and avoid over-remuneration. What constitutes a sufficient response is not straightforward and worth further research and analysis, but increased clarification can support the meaningfulness of consultation processes.

The consultation process also highlighted that the language used in the consultation document was not easy to read for non-experts, with many submissions asking for more clarity and clearer communication. This highlights a need for use of Plain English in consultation documents, with stronger emphasis on making the language easy to understand for non-experts (NALA, n.d.).

1.5 Key Issues for Irish Micro-Generation

The issues raised in the consultation submissions, as well as the official documents themselves, raise three key topics to consider for micro-generation in Ireland. These are:

• Type of prosumerism;

- Inclusivity of micro-generation; and
- Ambition.

1.5.1 Type of Prosumerism

Many of the key issues in both the scheme design and the consultation submissions, such as the value of financial benefits and caps on export and size, revolve around the focus on self-consumption. The design of the scheme is focused on encouraging self-consumption. The reasoning for this is clear as the RED II sets the focus on self-consumption, and the Micro-Generation Scheme is part of Ireland's efforts to fulfil the commitments under the directive. Self-consumption is also accepted to have many positive impacts for prosumers, such as cheaper energy costs, increased autonomy, and increased awareness (Interreg Europe, 2020, p. 5). Other practical considerations include the limitations of the electricity grid and managing the costs of the scheme (Government of Ireland, 2021c, pp. 32–33).

Many of the submissions, on the other hand, showed clear interest in higher energy export and financial revenue from the investment in micro-generation, shorter payback times, and a more flexible and open scheme. Most of the discussion in the consultation submissions revolved around this clear difference in between what energy prosumers should and could be.

As framed in the RED II (Directive (EU) 2018/2001, 2018) and EMD (Directive (EU) 2019/944, 2019), prosumerism in the low-carbon transition should focus on environmental, social and economic benefits, instead of financial profit. Based on the consultation submissions, this might not align with the varying motivations of prosumers and can disincentivise participation. The discrepancy between the scheme and the interests raised in the consultation submissions suggested possible tensions for micro-generation, prosumers as self-consumers or as investors.

An important point to consider in relation to this is whether the self-consumption focus excludes a more open approach. Are the restrictive elements necessary to encourage self-consumption, and curtail the costs, as argued by the Government, or would setting the export tariff price below the price paid for imported electricity sufficient as suggested by some of the consultation submissions? Further investigation and comparison of other EU countries could elaborate this question.

1.5.2 Inclusivity of Micro-Generation

Another point highlighted by the consultation submissions is the inclusivity of the scheme. Many of the submissions argued that the scheme appears to target domestic homeowners, while not giving enough consideration to other possible micro-generators, such as early adopters, people with old or protected buildings, small to medium size enterprises and farmers. The scheme was seen as especially limiting for low-income households. These concerns were raised especially in relation to the BER requirement.

The *Climate Action Plan* (Government of Ireland, 2021a, p. 97) gives some indications that these concerns may be attempted to be answered by dividing the scheme to two separate schemes, the Micro-Generation Scheme and a Small-Scale Generation Scheme. Still, there is no clarification on how the BER requirement will be part of either of the schemes, and how the increased costs resulting from it for micro-generators will be mitigated.

As discussed in Section 1.4.1, the key goal of the scheme is "to provide a route to market for citizens and communities to generate their own renewable energy and receive a fair and efficient price for doing so" (Government of Ireland, 2021c, p. 3). If the goal of the scheme was to maximise micro-generation, the adoption of energy efficiency first principle

would seem to work to hamper that objective. The principle is stated to have been adopted to align the scheme with other Government commitments and goals (Government of Ireland, 2021c, p. 9), with energy efficiency and heating being key challenges for the Irish low-carbon transition (SEAI, 2020) and key elements of EU-level policy (Directive (EU) 2018/844, 2018). Additionally previous experiences from SEAI initiatives indicate that adopting the BER requirement will not negatively impact the uptake of micro-generation (Government of Ireland, 2021c, p. 9). SEAI also provides support and grants for communities to improve the energy efficiency of housing, and the 2021 *Climate Action Plan* states that more funding is allocated to make house retrofitting accessible to low-income households (Government of Ireland, 2021a, p. 45). Still, it does represent a significant barrier for receiving the premium-tariff, as prosumers could be required to invest in both micro-generation and building retrofit to access it, while investing in micro-generation alone already represents a barrier to some micro-generators. The cost of house retrofitting alongside installing a heat pump in Ireland is estimated to range from €14,000 to €66,000 (Government of Ireland, 2021a, p. 133). Further investigation, perhaps with a comparison to other European countries, could highlight how such measures impact participation in the low-carbon transition.

1.5.3 Ambition

Based on the consultation submissions, micro-generation has high demand and interest from Irish citizens. This highlights a potential for much higher uptake of micro-generation in Ireland. Some of the submissions argued for a goal of incentivising as much micro-generation as possible. The submissions also provided options for maximising micro-generation by opening the scheme to initiatives such as using public parking spaces or unoccupied buildings for micro-generation, with goals such as a "rooftop revolution" mentioned. The interest from the Irish public highlights a potential for significant increase in micro-generation in Ireland if the incentives of the scheme are suitable to facilitate this.

Taking a more ambitious approach would be consistent with the *Energy White Paper* (DCENR, 2015), 2019 and 2021 *Climate Action Plans* (Government of Ireland, 2019a, 2021a) and the ambitions to involve Irish citizens in a just lowcarbon transition. The approach that seems to be being considered in the initial Micro-Generation Scheme does fit with other policy goals, such as energy efficiency and house retrofit goals, and takes a careful approach with the grid network and costs of the scheme. This proposed approach also correlates with many elements of the Clean Energy Package and RED II (Directive (EU) 2018/2001, 2018). It appears that the discrepancy between the interests voiced in the consultation submissions and the initial scheme design are a largely a question of balancing policy objectives, practical considerations, and costs of the scheme. While it is not clear from the documentation, it is possible that a cautious approach was being considered in the light of the heat incentive scheme in Northern Ireland. In the scheme, the lack of cost-control mechanisms and rate being paid for burning wood pellets was lower than the cost of fuel and resulted in a public cost of an estimated £500 million (see Moriarty, 2016).

1.6 Lessons learned

This paper reviewed the consultation process for the Irish Micro-Generation Scheme (Government of Ireland, 2021b, 2021c). The challenges and depth of the low-carbon transition call for more active public participation, and this has also been understood in Irish energy and climate policy (DCENR, 2015; Government of Ireland, 2021a). Therefore, the implementation and design of policies aiming to support public participation in the low-carbon transition have long-lasting impact. This paper highlights tensions in relation to more active public participation in Ireland. These tensions stem from different perspectives on what micro-generation could and should be. The differences in the proposed scheme design and the perspectives raised in the consultation submissions highlight the challenge of how to implement policies aiming for active public participation while taking into consideration the practical limitations of a system that is not created for it. The analysis of this paper highlights a number of key findings for future policies aiming to support more active public participation in the low-carbon transition. One of the measures to which these lessons could be applied to is the National Dialogue on Climate Action, which was stated as the main measure to support more active public participation and the just transition in the 2021 *Climate Action Plan* (Government of Ireland, 2021a, p. 57).

Firstly, the consultation process highlighted key communication challenges as wider range of stakeholders are attempted to be involved in the energy transition. The aim to involve wider range of individuals in the energy transition puts greater emphasis on making public involvement in decision-making processes meaningful and accessible. The meaningfulness of consultation processes could be increased by greater extent of communication with the general public on the consultation process and its outcomes. Additionally, consultation documents could be made more accessible and consultation process more effective by improving the readability of documents. Making the documents clearer could be achieved for example by providing clear explanations of terms used (e.g., micro-CHP, discount rate, opportunity cost of investing, over-remuneration) and visually separating these explanations from the bulk of the text. Consultation documents would also benefit from a clear summary of the key features of the policy, and online tools to help explain it. In this Ireland could use the example of initiatives such as the Net Zero Scotland website (The Scottish Government, n.d.) with online tools such as short videos and explanations of policy issues. Many Irish Government organisations already comply with international plain English standards approved by National Adult Literacy Agency (NALA) (NALA, n.d.), and this practice could be adopted also in energy transition policy to facilitate wider participation.

Secondly, it has been highlighted that the transposition processes of the Clean Energy Package in EU countries have been facing challenges in terms of including vulnerable groups (Frieden et al., 2020, p. 43). Specifically, measures requiring further investment have been flagged as risks to inclusivity (Frieden et al., 2020, p. 43). The consultation submissions for the Irish Micro-Generation Scheme highlighted the BER requirement as such a measure, which could limit vulnerable groups, such as low-income households, from accessing the benefits of micro-generation. Questions over access to support for participating in micro-generation will impact justice of the Irish low-carbon transition. The need to share both the burdens and benefits, and to take an inclusive approach, is a cornerstone of the comprehensive transformation required for a low-carbon transition (Määttä, 2021; NESC, 2020, p. 46). Therefore, future work on micro-generation in Ireland could review the possible costs for participating in micro-generation and available grants and other financing options to assess the inclusivity of the Irish low-carbon transition.

Finally, the consultation process, initial Government response and potential change to the final scheme, and the introduction of another scheme, point to a willingness of Government to engage and respond to issues raised, albeit slowly. At the same time, this offers insights into the complexity and challenges of designing a robust, cost-effective scheme in a way that it meets the needs of multiple stakeholders. If the willingness to engage and participate in the energy transition among the population can be supported through appropriate policy measures, it will help to develop a more participative and inclusive energy transition in Ireland.

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