



NETWORKS

# Overview

NATIONAL NETWORK,  
LOCAL CONNECTIONS  
PROGRAMME

DOC-230921-GYL



# Document Purpose

The purpose of this document is:

- 1** To give the background to the National Network, Local Connections Programme.
- 2** To present a proposed approach to delivering the National Network, Local Connections Programme.
- 3** To encourage you to 'Have your say!' on our consultation documents.

Through our 9 consultation documents we look forward to getting your views, comments and insights as these will shape the direction on how we will deliver on the National Network, Local Connections Programme.

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# Background to the National Network, Local Connections Programme.

## OVERVIEW

The decarbonisation of Irish society relies on fundamental changes to how energy is generated and consumed. To enable these changes at the right pace and the right price, we will rely on the electricity network, and we need to make the connection between how renewable energy is generated, and how we use or store it. Every Irish home, farm, community, and business is being called on to play a part. The National Network, Local Connections Programme has been established to work with, and for, customers to make this possible.

To support Ireland's 2030 Climate Action targets ESB Networks have committed to:

- 1 Facilitate people in Ireland adopting up to 936,000 electric vehicles and 600,000 heat pumps.**
- 2 Connect up to an additional 10 GW of renewable generation at transmission and distribution level, so that we can charge our cars and heat our homes using renewable electricity.**
- 3 Operate on 70% or more renewable electricity in Ireland, which will mean running fully on renewables over a third of the time.**

As our electricity use grows and changes, our vision is that every Irish home, farm, community, business and distributed generator has the opportunity to participate in local marketplaces. These marketplaces will signal when it is a good time to use or store power, for example, when there is an abundance of energy available locally or nationally; or to save power when "turning on" could mean turning on costly or carbon intensive generation.

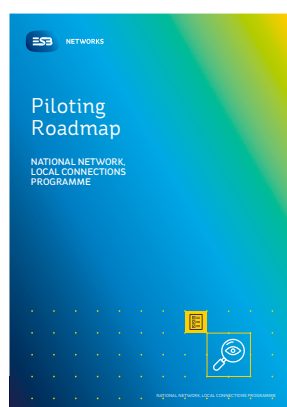
We are entering a period of rapid change and uncertainty. Over the coming years, technologies will change as will the energy needs of Irish homes, farms and communities. We will need to be able to adapt to meet changing needs and emerging challenges.

Over the life of this programme we will face uncertainties and risks. If we proceed too quickly, we increase the risk that customers will not be ready, or technologies will not be as mature. But if we do not proceed quickly enough, there is a risk that the solutions will not be in place when then need to be. Without taking the initial steps now, there is a risk that we and our partners could not replicate solutions that we pilot or commence a national rollout until later in the decade.

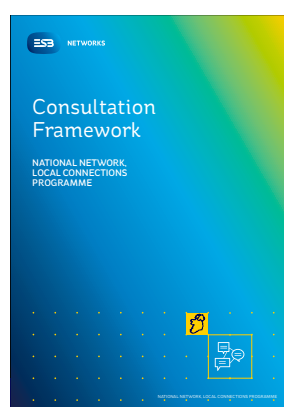
We will need to commit people and capital to deliver this programme, and we are reaching a critical decision point regarding the level of resources to commit. ESB Networks serves, and is funded by, all electricity customers. All our customers will share in the benefit, but they will also share in the costs and the risk if we act too slowly or too soon. As such, we want to give all customers an opportunity to consult.

We are consulting on a suite of documents which set out our proposed plan, focussing on different aspect of the plan in different documents. The proposed plan accounts for uncertainty by progressing foundational technology investments in parallel with piloting with customers on the ground. This proposal is designed to provide us with the ability to introduce and adapt solutions at a pace and scale which reflects changing industry, customer, and community requirements.

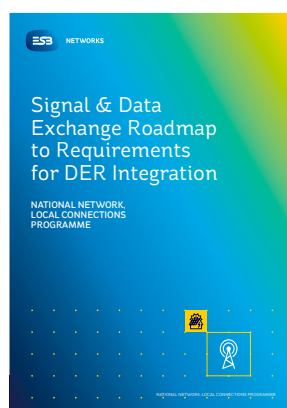
Below is a snapshot of our consultation documents, and we give a more detailed synopsis in the final part of this document as well as some of the key dimensions we are particularly keen to understand your insights and perspectives on.



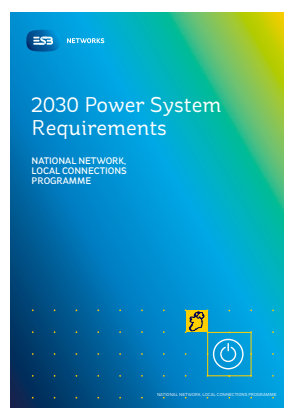
Illustrates how we propose to adopt a “discovery led” approach to piloting and the feed into the longer-term, national roll out.



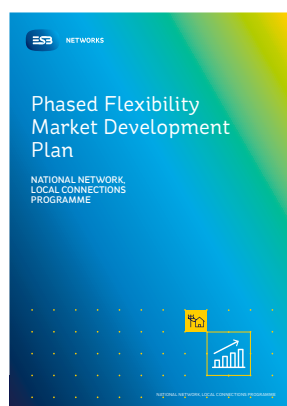
Sets out the approach to building customer and stakeholder awareness, ownership and participation over the life of the programme.



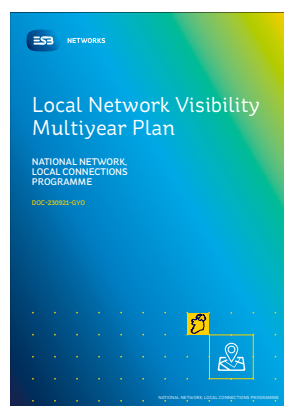
Proposes clear, timely and transparent data and signalling requirements associated with new DER (Distributed Energy Resources) technologies to allow them to participate flexibly in the new market.



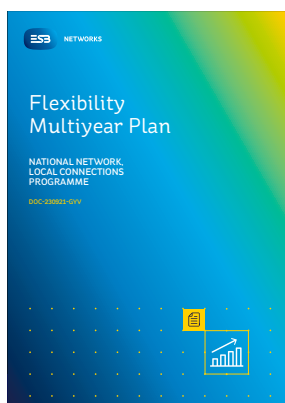
Sets out the robust, multi-scenario analysis of changes to the Irish electricity system over the coming decade and the likely power system requirements (or “technical scarcities”) to meet customer needs on the power system.



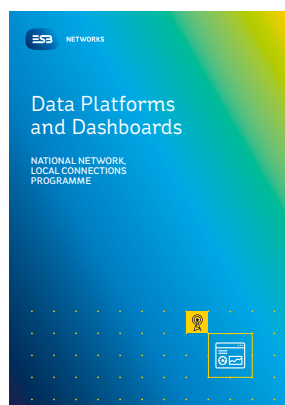
Proposes a roadmap for introducing local flexibility market arrangements on the Irish distribution system. Including the proposed products, sequencing, market framework and longer term options.



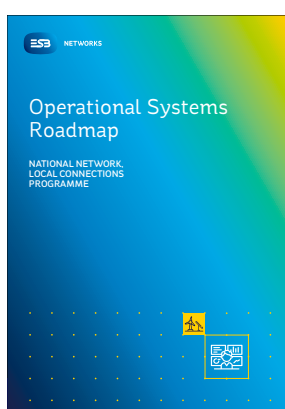
Defines a proposed roadmap for securing operational visibility of local, low voltage distribution systems across the Irish distribution system.



Sets out a proposed roadmap for rolling out local flexibility markets and solutions across the Irish distribution system. Including the proposed timelines, releases and annual targets.



Proposes a roadmap for rolling out new online interfaces to homes, farms, communities and businesses across Ireland to help us build a shared awareness of our local energy systems, and the impact of our actions on our individual, regional and national carbon footprint.



Shares the outcome of a current state technology review, and the proposed future technology roadmap for operation system upgrades and deployments. These relate in particular to Distributed Energy Resource Management System (DERMS), Distribution Management and Market Management. The paper also proposes the associated operational, licensing, and hardware requirements.

Each of these individual documents provides different insights, and speaks to different areas of interest. We do not expect all stakeholders to respond to all documents, but we welcome all responses and perspectives which are shared with us. Throughout this period of consultation, we want to understand what this programme may mean to you. Is it important to you that we act now, invest in developing the technologies and services that would allow a national rollout commencing in 2024/2025? How can we reflect your priorities when there are trade-offs to consider as we develop local flexibility markets? We want your view, coming from the perspective of your household, business, community or industry.

In this document we provide an overview of why we think that it is important to engage with these questions now. We do this by sharing some of the insights we have gathered about the impact of changes in electricity generation and use in Ireland. We would welcome your input on any/all of the consultations. Your insights will help shape the delivery of the National Network, Local Connections Programme.

## SUPPORTING THE DELIVERY OF 2030 CLIMATE ACTION TARGETS BY DELIVERING A BRIGHTER FUTURE

### The Challenge

Ireland's strategy to address carbon emissions, as set out in the Climate Action Plan, is to finish the move to renewable electricity generation, and using that renewable electricity to power our heating, our transport, our economy and our society.

The first Climate Action Plan of 2019 put figures – targets – on that strategy, targeting:

- 1** 936,000 electric vehicles (i.e. one home in two has an electric car).
- 2** 600,000 heat pumps (i.e. one home in four has electric heating).
- 3** c. 10 GW of wind and solar farms (in addition to nearly 5GW already connected).
- 4** 70% or more of electricity to come from renewable energy sources.

This strategy will mean that all of us, in our homes and businesses, will use more electricity and will use it very differently over the coming decade. Like the changes in how we are generating electricity – more locally, distributed across the country in wind, solar and battery farms and local microgeneration – this requires major changes in the infrastructure that we need.

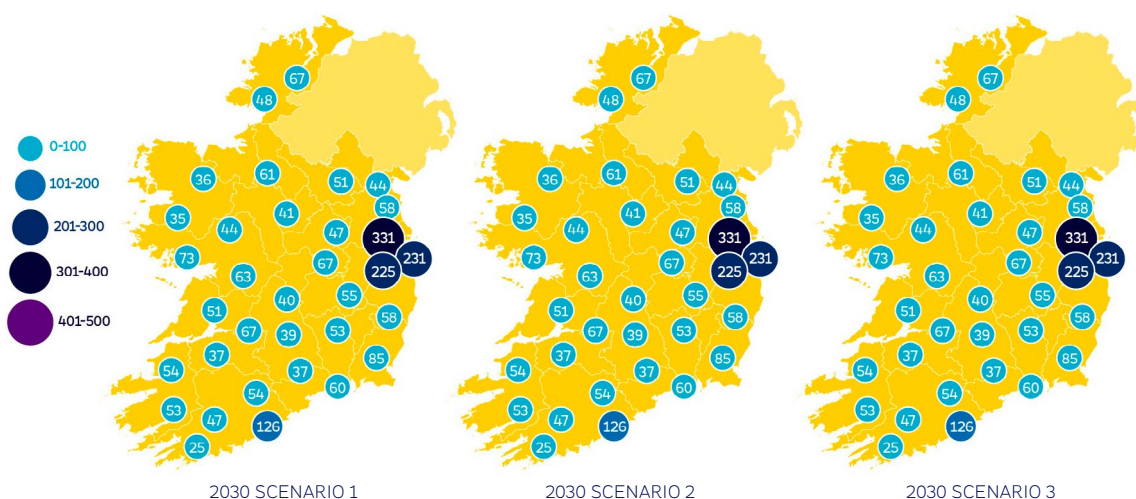


To build a clear, evidence based picture of what changes are required, we have undertaken studies of the Irish electricity system based on forecast scenarios for the uptake of low carbon technologies (renewable generation, microgeneration, electric vehicles and heating).

We provide more detail on how we delivered these studies in the consultation document 2030 Power System Requirements.

The scenarios we used were developed applying data and expert guidance provided by the Sustainable Energy Authority of Ireland (SEAI), and the Irish renewable energy industry. The input data to the scenarios is illustrated in the graphics below, showing the incremental load impact caused by each change. By analysing a range of scenarios, we have developed an understanding of “what is common between different futures” to be able to determine the actions most likely to have an impact. The objective of these studies was to identify what customers will need the network infrastructure to support as they adopt these technologies connect. It was also to identify the potential of existing (“wired”) and new (“flexible”) ways of meeting these needs. Once these studies are complete, we plan to share the results widely, to help facilitate the market for those new “flexible” solutions to develop.

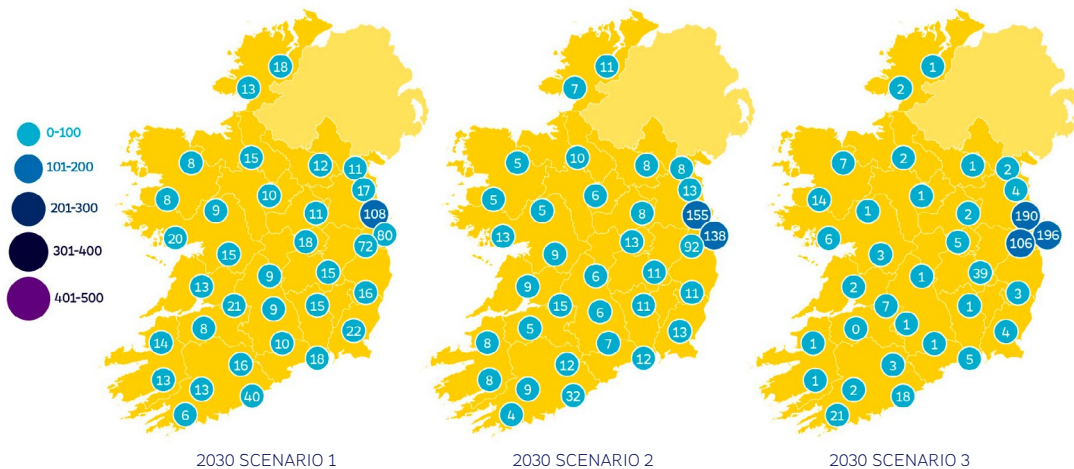
 **Electric Vehicles (MW)**



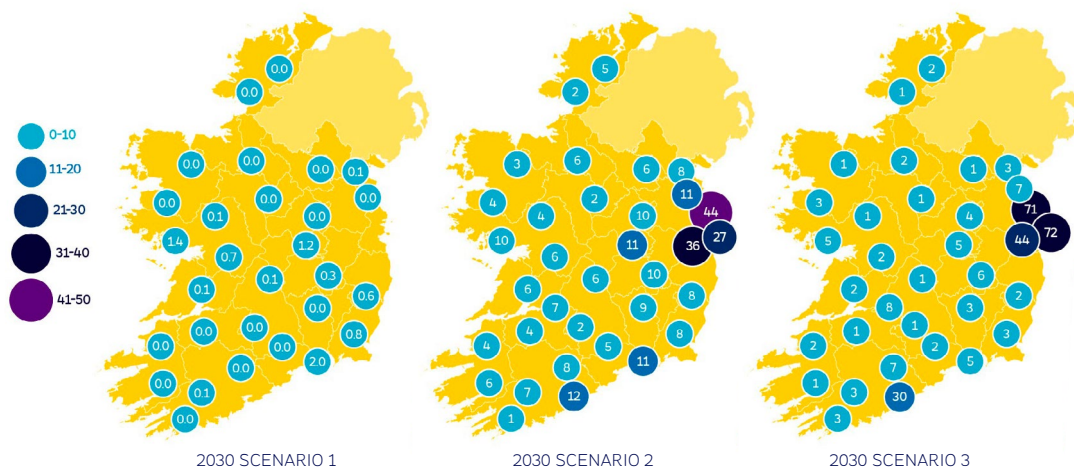




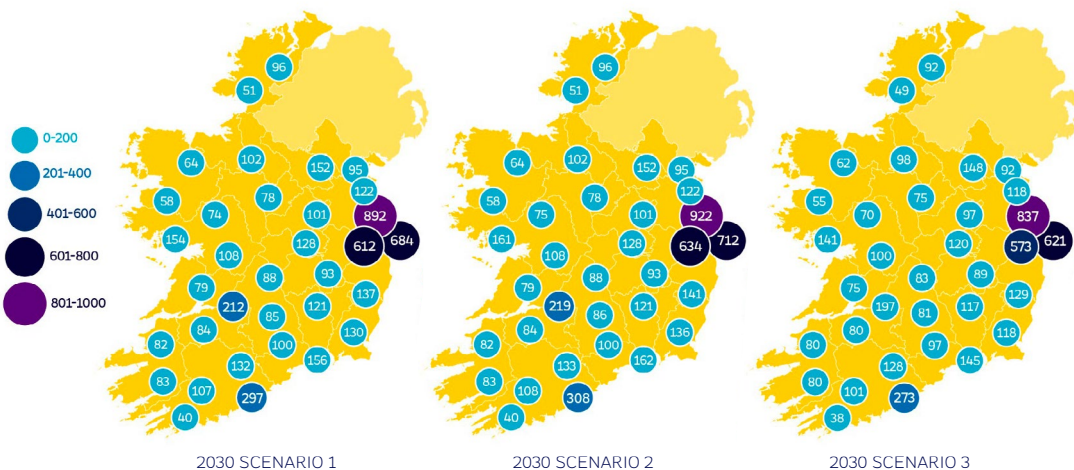
### Heat Pumps (MW)



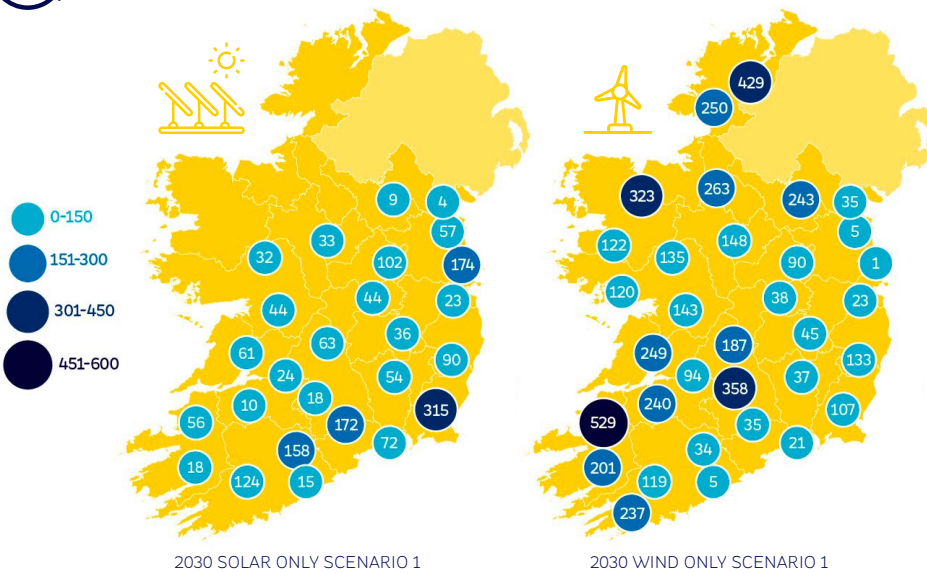
### Micro Generation (MW)



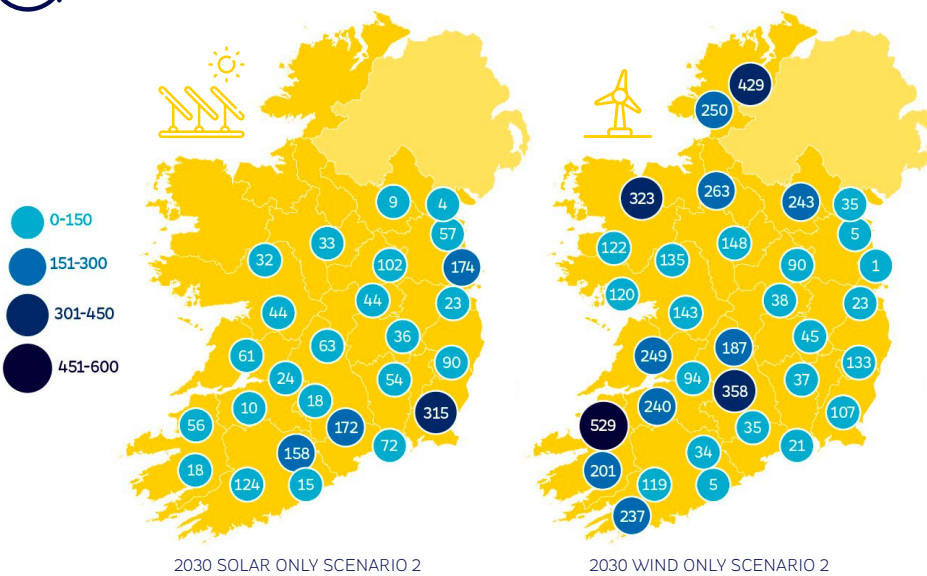
### Underlying Demand (MW)



### Larger Generation Scenario 1 (MW)



### Larger Generation Scenario 2 (MW)



### What will electricity demand look like in 2030?

Our analysis shows that in 2030, we expect that new low carbon technologies which replace oil and gas will create many new local peaks in electricity demand. In total these will result in roughly 36% of peak electricity demand, with many different localised peaks at different times, in different places. As this is new electricity demand, which we are not supporting today, it means we will need new solutions to support this additional load. These can include extending the network (“wires” solutions) but also using new “flexible” solutions where, for example, customers’ demand can be moved to an alternative time of the day to spread out a localised peak load on the network.

These impacts will vary by location – in some localities and regions people will adopt these technologies sooner than in others. By running multiple scenarios, we have developed good profiles of the likely locations where the new electricity demand will be greatest, soonest.

FIGURE 1 PEAK DEMAND

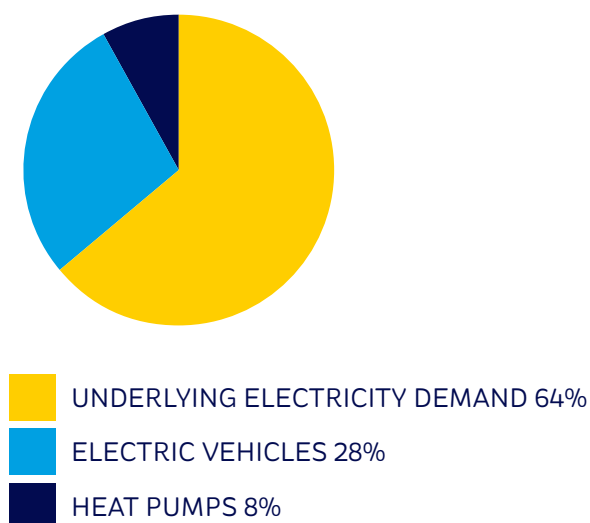


TABLE 1 SCENARIO 1 LOAD GROWTH

SCENARIO 1 EV1, HP1, WP1	UNMANAGED PEAK LOADING (GW)		
	2020	2025	2030
Total Load at peak	5.3 GW	6.3 GW	8.8 GW
Base Load (before LCT)	5 GW	5.6 GW	5.6 GW
Average % of load due to EVs	3%	9%	28%
Average % of load due to HPs	2%	6%	8%

### 2030

Year Displayed on Map

Key Reference

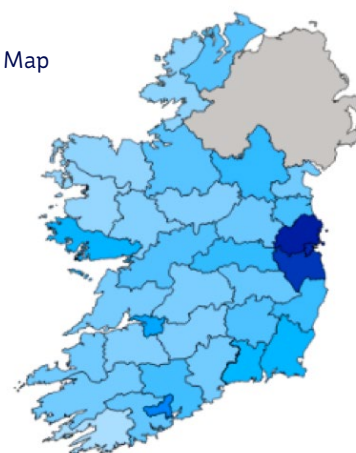


FIGURE 2 GEOGRAPHIC REPRESENTATION OF SCENARIO 1 2030 LOAD

In almost every locality around the country, new demands will be placed on the network infrastructure. In some localities, this will be at a very local level, for example on a street or in a village. In other localities, it may be at a county level. If we can manage our electricity demand in smarter ways, we will be able to get more out of the local network infrastructure that we already have. Although we will often need to upgrade those networks eventually, this work will take time and cost money. As such, it is important that we can target this at the locations where it will deliver most value.



### What will electricity generation look like in 2030?

As of April 2021, there was approaching 5GW of wind generation on the Irish electricity system. By 2030, to meet the target of 70% or more generation from renewable sources, today's best estimates are that an additional 10GW of generation will need to be connected. If we fail to meet our energy efficiency objectives, or if electricity demand increases, for example as a result of increased housing, social or economic development, that figure may increase further.

Of this additional 10GW, a little over 5GW is expected to connect at a local level, on the distribution system. Our challenge across the country will be to get smarter about how and when we use electricity, so that we can run our homes, farms, and businesses, power our cars and heat our homes, using this renewable electricity.

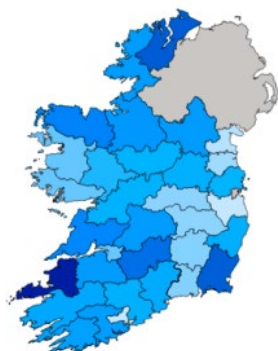
**TABLE 2 MICRO-GENERATION SCENARIO 3**

MICRO-GENERATION SCENARIO 3		GENERATION CONNECTED (MVA) 2020 AND BEYOND		
Existing generation	2.5GW			
	2020	2025	2030	
Impact of Micro-generation	0.02 GW	0.2 GW	0.3GW	
Commercial generation - scenario 1 - wind	2.2GW	3GW	5GW	
Commercial generation - scenario 1 - solar	0GW	1.3GW	1.8GW	
Commercial generation - scenario 2 - wind	2.2 GW	2.9GW	3.9GW	
Commercial generation - scenario 2 - solar	0GW	1.3 GW	2.8GW	

**6.8 GW**  
Total Gen GW

**2030**  
Year Displayed on Map

Key Reference



**6.7 GW**  
Total Gen GW

**2030**  
Year Displayed on Map

Key Reference

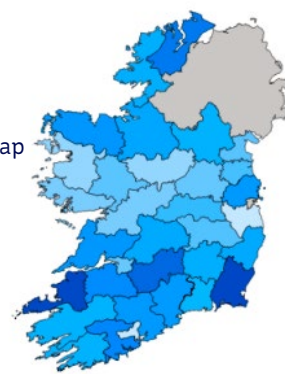


FIGURE 3 LEFT HAND SIDE - LARGE SCALE GENERATION SCENARIO 1 ; RIGHT HAND SIDE SCENARIO 2

Depending on the mix of wind generation, solar generation and microgeneration, across the country, this will mean different things in different places. Although microgeneration (for example, solar panels on our roofs) may only contribute a small amount to our overall generation nationally, it has an important role at a local level, creating an opportunity for individuals and communities to take a first step.

Finally, over the past 3 decades, almost all of our renewable generation has been wind farms. However we expect at least 1.5 GW of the additional 5 GW of onshore renewable generation we connect over the coming decade to be solar farms. This means that there will be new opportunities to “flatten” the generation curve, because there is diversity between when the sun shines and when the wind blows. Coupled with battery storage, which is also connecting, and smart demand side flexibility, there will be many opportunities to repurpose existing infrastructure.

### Key Insights about electricity demand and generation in 2030

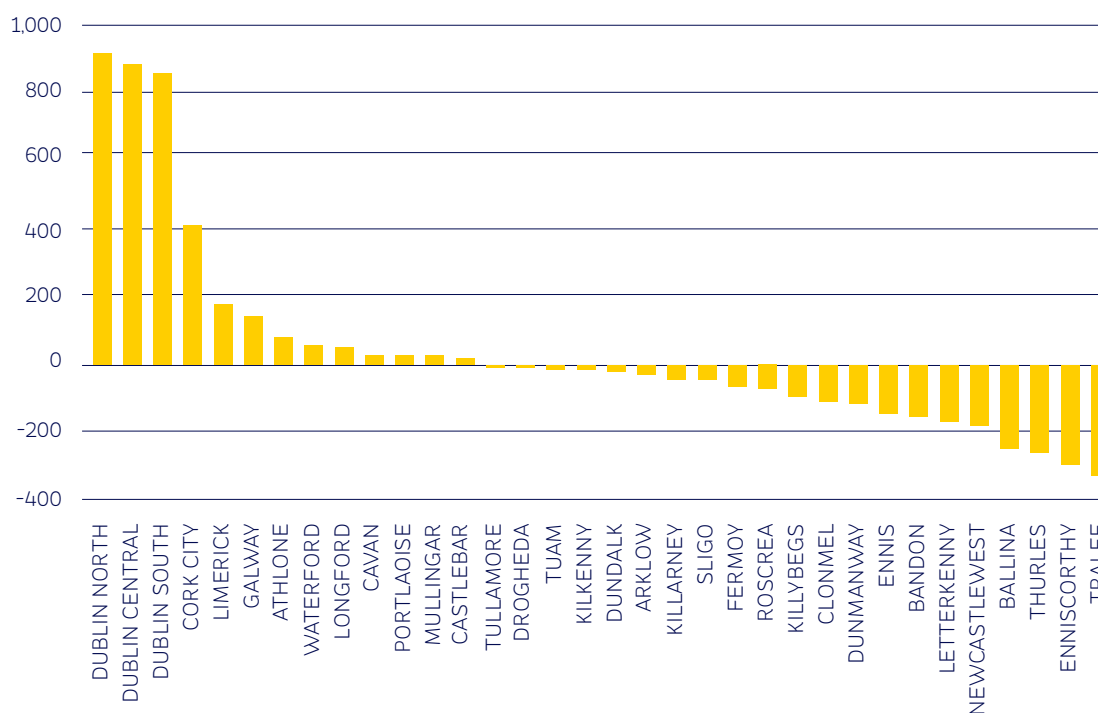
For more detail on customers' network needs over the coming decade, based on our intensive multi-scenario projections and system studies, please read the National Network, Local Connections 2030 Power System Requirements document, which will be published in this series of consultations.

The key insight is that “smart” is not just about demand, and it is not just about generation. Over the coming years, every Irish home, farm and business will be using more electricity and using it in different ways. The opportunity is to make sure that we are smart about how we do that, so that it is more renewable electricity that we are using and so we can make that change at the right pace and the right price on the network.

There are thousands of streets where as little as a dozen homes shifting a few kW (dishwashers and tumble-dryers) could mean all the difference as they or others in the community put solar panels on their roofs. In a locality with high demand, 20 – 50 electric vehicle owners who are willing to defer (or bring forward) their charging could be all that is needed to be smarter about how we use our infrastructure. In hundreds of areas across the country, 600 homes in a community acting together to shift or change their electricity demand could make a big difference. In bigger or more dense areas, thousands of homes and hundreds of businesses all making small changes could make a transformative difference to the pace, and the cost, of driving our carbon footprint down.

The chart below shows localities around Ireland in 2030 at “peak demand” (typically between 6pm and 8pm in the evening) on a cold, windy evening. Many areas are going to be net producers of renewable energy.

FIGURE 4 IS MY COMMUNITY USING OR PRODUCING ELECTRICITY?



## Key Insights about electricity demand and generation in 2030 continued

To create new opportunities on the network, we will rely on customers' participation across the country. Based on our analyses to date, we believe that up to 0.75 GW of additional wind and solar generation could be connected to the existing networks across Ireland. To do that, we would need up to 0.75 GW of smart, flexible demand (people shifting their electricity usage – car charging, dishwasher, washing machine or tumble dryer cycles, factory production cycles etc).

Across the system, when we also take into account the demands of electric heating and transport, up to 2 GW of additional capacity will be needed. While in many instances new infrastructure may be needed, demand side flexibility nationwide could play a role and give us an alternative solution. However, 2 GW is a lot. While in an individual community of 600 households each managing 1kW in smarter ways will be enough to make a difference locally, across the country 2 GW would mean hundreds of thousands of Irish homes, farms and businesses all playing a role.

Therefore, ESB Networks believes that it is important to act now and to act together. We have a responsibility to work with partners right across the electricity industry and across Irish society, up and down the supply chain. From the network company, to the energy retailer, from the tradespeople installing new technologies to the community groups committed to change. We all have a role. There are new connections which we will need to build together.

## OUR PROPOSED APPROACH IN DELIVERING NATIONAL NETWORK, LOCAL CONNECTIONS

We believe it is important to act now. Our proposed approach in the National Network, Local Connections programme is based on:

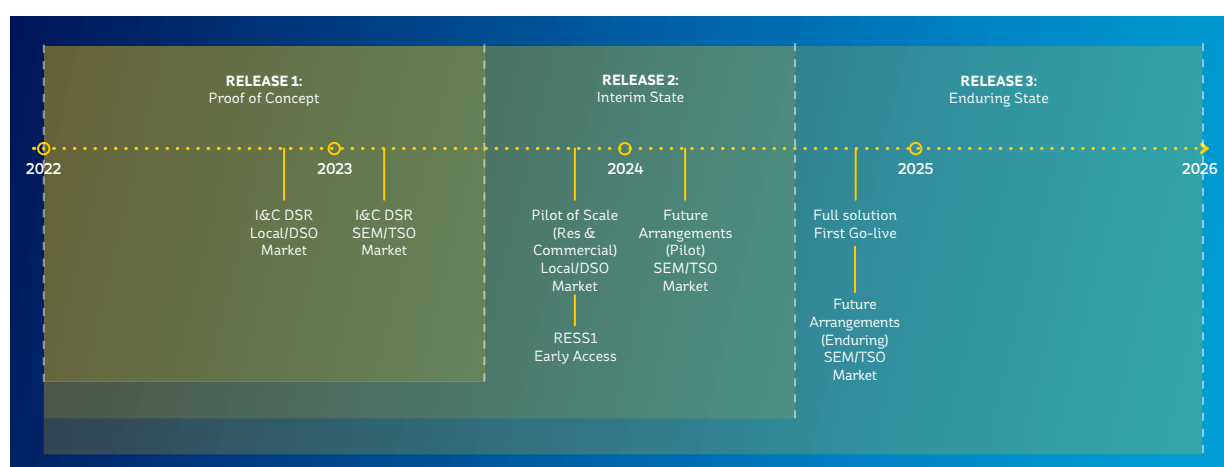
- 1 Building people connections so we can place customers and stakeholders at the centre of our decision making, ensuring their insights inform the delivery of the programme – as such, we are investing in getting relevant insights from all stakeholders.**
- 2 Building operational connections so that we are providing the right technologies on our side and ensuring that our customers have access to the right technologies on theirs.**
- 3 Building market connections by providing incentives, both to customers and the companies who work with them, to encourage uptake and empower community and individual participation.**

### People Connections

We are dependent on our customers having the support and information they need to be able to participate. Our objective is to build an inclusive network to support the energy requirements of customers and industry participants in Ireland. Our Consultation Framework document illustrates how we propose to:

- 1 Listen and respect varying opinions and insights.**
- 2 Be transparent and communicative on the programme delivery plan.**
- 3 Share knowledge with industry in an open and timely manner.**
- 4 Engage and collaborate with customers, communities, and industry.**
- 5 Together with industry and policy makers, ensure that we will not leave anyone behind.**

Our Piloting Roadmap consultation document illustrates how we propose to adopt a “discovery led” approach, designed around extensive piloting and agilely applying what we learn through piloting into the longer-term solutions to be rolled out nationally.





### Operational Connections

One of the biggest barriers to customers and communities participating in the electricity system today is that we do not yet have the “operational connections”. Over the coming years, we are proposing that we should put in place the right technologies on our side, so we can manage the network more locally and provide opportunities for customers to participate. The national rollout will then rely on ESB Networks investing in new system management technologies. Our proposal to deliver this involves two parallel workstreams to put in place the right technology. The first workstream will support piloting in 2022, 2023, and 2024. The second workstream would enable a national rollout, replicating successful pilot activities, from late 2024 onwards.

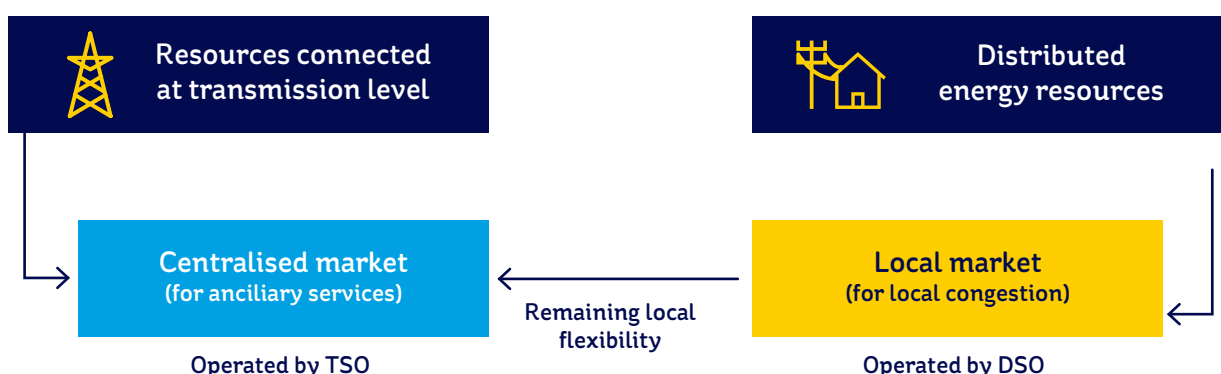
Our Operational Systems Roadmap and Data & Signal Guidance consultation documents give detailed functional requirements and a clear outline of the technologies that both we and our customers will need, and proposals for how to deliver them.

### Market Connections

ESB Networks propose to build market connections as part of this programme. We believe we need to provide incentives, both to customers and the companies who work with them, to encourage uptake and empower community and individual participation. This belief is backed up by our stakeholder and customer research, and by European legislation.

Currently, there is no market for local flexibility services on the Irish electricity distribution system. To enable energy companies, communities and customers to benefit from a range of different incentives, it will be important that the local market arrangements introduced are operationally compatible with other market arrangements. These include the Integrated Single Electricity Market (iSEM) wholesale energy market, the capacity market and the transmission system ancillary services market called “DS3”. We are working closely with our partners in EirGrid, the Irish transmission system operator, to ensure that we achieve this.

FIGURE 5 SMARTNET DECENTRALISED MARKET MODEL



You can learn how we propose to build momentum and encourage early participation, while building towards a longer term framework, in the Phased Flexibility Market Plan consultation document.

2

# 'Have Your Say !' on Our Consultation Documents

## HAVE YOUR SAY ON OUR PROPOSALS

This programme will rely on the participation of stakeholders, customers, and communities across the country. As such, we want to give all electricity customers an opportunity to weigh in – from generators, to industry, to homes, farms and communities. By the end of the year, we will hit a decision point on how and where we commit the resources within the programme, whether there is a need to drive towards a national rollout in 2024 / 2025, or whether to take a more measured pace and begin to scale closer to 2030. We need your input to determine the path forward.

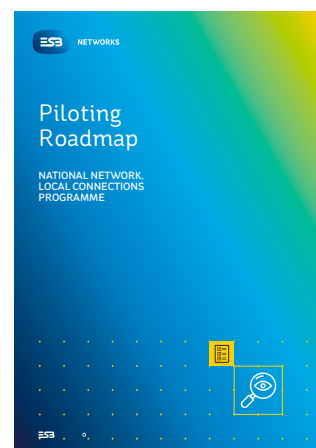
Our 9 Consultation documents are ready for your input. Below is a synopsis of each of the documents and some of the key questions we would like you to consider as you are reviewing them. There is no expectation that any respondent will answer these questions by way of formal response, they are to help trigger your thoughts. If you have any questions on the consultations please email [engagement@esbnetworks.ie](mailto:engagement@esbnetworks.ie).

## HAVE YOUR SAY ON OUR PILOTING ROADMAP

The National Network, Local Connections Programme Piloting Roadmap is a proposed roadmap for piloting new flexibility services and system management approaches on the distribution system. It adopts a discovery-led approach, introducing new capabilities in live network environments. It seeks to create opportunities for customers to participate and engage with the programme over its full lifecycle.

It includes:

- 1 The range of proposed objectives and criteria for each successive pilot over the period 2021 – 2024.
- 2 The timing and criteria for selecting the location of each pilot.
- 3 The learning objectives and policy context of each pilot.
- 4 The number and types of customer or system user who will be eligible to participate in each pilot over the life of the programme.



We are looking for your perspective on each of these.

Below are some questions to help trigger your feedback on our proposed Piloting Roadmap:

	<b>SELECTION CRITERIA</b> Do you support the proposed pilot objectives and selection criteria, and are there other criteria that you think we should be using?
	<b>TARGET LOCATIONS</b> Do you think more, less or other locations should be selected? Why?
	<b>NUMBER OF CUSTOMERS PARTICIPATING</b> Do you think more (or fewer) customers will be ready and willing to participate?
	<b>TYPES OF CUSTOMERS PARTICIPATING</b> Are we targeting the right range of customers at the right times over the life of the programme?
	<b>PILOT TECHNOLOGY</b> Do you think there are alternative technologies which we should be adopting or alternative technological approaches?
	<b>PILOT GO-LIVE AND DURATION</b> Do you think that the proposed go-live dates and pilot durations are a good fit for the piloting objectives at each step?
	<b>LEARNING OBJECTIVES</b> Are there additional customer, DSO or market learning objectives we should pursue?
	<b>CUSTOMER &amp; POLICY OBJECTIVES</b> Are there other upcoming policy developments or customer needs we should reflect in this proposed roadmap?
	<b>CUSTOMER EDUCATION AND AWARENESS</b> Are there opportunities in this proposed roadmap to drive customer education and awareness?
	<b>SUPPLY CHAIN</b> Are there opportunities for other parts of the supply chain to learn and develop through the piloting proposed roadmap?

## HAVE YOUR SAY ON OUR CONSULTATION FRAMEWORK

The National Network, Local Connections Programme Consultation Framework sets out the approach to building customer and stakeholder awareness, ownership and participation over the life of the project.

By adopting evidence based approaches, we will ensure that clear, timely and relevant information is provided, and that our stakeholders have an opportunity to shape the programme with us.

### This document sets out:

- 1 Our stakeholders' initial perspectives, and how we are applying these insights.
- 2 How we propose to engage over the life of the programme, in an insight driven way.
- 3 The role of consultation and communications in supporting piloting, continuous improvement, and making it real for customers and communities.



We are looking for your perspective on each of these.

Below are some questions to help trigger your feedback on our proposed Consultation Framework:

	<b>SELECTION CRITERIA</b> Do think that the proposed approach to identifying gaining and understanding of our stakeholders is effective? Are there other steps we should take?
	<b>TARGET LOCATIONS</b> As we begin to roll out in pilot locations, will the proposed approach (insight driven communications, continuous monitoring, engagement and listening) be effective?
	<b>NUMBER OF STAKEHOLDERS PARTICIPATING</b> Have you views on the number of stakeholders in each category (stakeholders, targeted stakeholders, everybody else) we should reach at each stage in the programme?
	<b>TYPES OF CUSTOMERS PARTICIPATING</b> Are there groups of customers who are more at risk of being left behind? How can we address this? Who should we work with?
	<b>PILOTING</b> How do you think we could support stakeholders through piloting? How could we leverage piloting to support general awareness and education?
	<b>LEARNING OBJECTIVES</b> Are there customer and stakeholder learning objectives we should prioritise? e.g. journey maps, recruitment approaches, effective nudges?
	<b>CUSTOMER &amp; POLICY OBJECTIVES</b> Are there key customer or societal objectives we should focus on through our consultation and communications approach?
	<b>CUSTOMER EDUCATION AND AWARENESS</b> What do you think the key opportunities to drive customer education and awareness will be?
	<b>SUPPLY CHAIN</b> What other parts of the supply chain should we focus on engaging?

## HAVE YOUR SAY ON OUR SIGNAL & DATA GUIDANCE

The National Network, Local Connections Programme Signals, Control and Data Exchange Guidance sets out clear, timely and transparent data and signalling requirements associated with new DER (Distributed Energy Resources) technologies to allow them to participate flexibly in the new market.

This proposed document provides one of the foundations for flexibility in Ireland – consistent technology standards and certainty for consumers and for the other organisations across the supply chain, including technology wholesalers, retailers, installers and others.

It includes:

- 1** Standard technology requirements for microgeneration inverters, electric vehicle chargers and heat pumps.
- 2** Transparency of future signals exchange architecture for local flexibility management.
- 3** International benchmarking insights and best practice.

We are looking for your perspective on each of these.

Below are some questions to help trigger your feedback on our proposed Signal & Data Exchange Roadmap to Requirements for DER Integration:



	<b>SELECTION CRITERIA</b> Do you think other technologies should be included?
	<b>NUMBER OF CUSTOMERS PARTICIPATING</b> How could we work to ensure that standard requirements improve the customer experience?
	<b>TYPES OF CUSTOMERS PARTICIPATING</b> Are there other types of customers whose technology needs should be considered?
	<b>PILOT TECHNOLOGY</b> Do you support these standards and are there alternative standards that you think we should consider?
	<b>PILOT REQUIREMENTS</b> Should we begin to work with other organisations (for example the NSAI, the CRU or others) for these standards to become requirements in Ireland? What other organisations?
	<b>CUSTOMER &amp; POLICY OBJECTIVES</b> Do you think these technology standards could contribute to meeting Irish policy objectives (for example relating to climate action or inclusiveness)?
	<b>CUSTOMER EDUCATION AND AWARENESS</b> Are there further opportunities to drive increased customer education and awareness of these proposals?
	<b>SUPPLY CHAIN</b> Are there opportunities for other parts of the supply chain to get involved and be ready to champion, install or commission these technologies for customers?

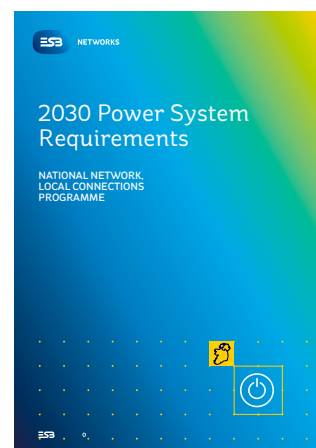
## HAVE YOUR SAY ON OUR 2030 POWER SYSTEM REQUIREMENTS

Building from the Clean Energy Package, the Climate Action Plan and ESB Networks' Strategy, the National Network, Local Connections Programme has undertaken robust, multi-scenario analysis of the Irish electricity system over the coming decade.

This is being used to develop a technical strategy to address the future power system requirements (or "technical scarcities") to meet customer needs on the power system.




The 2030 Power Systems Requirements document sets out:

- 1 Insights from the initial analysis, in advance of completing the full body of analysis. These indicate when, where and how much flexibility will be needed over the coming years.
- 2 The approach taken, the sources of data and the partners we are working with.
- 3 How we are proposing to apply the results.



We are looking for your perspective on each of these.

Below are some questions to help trigger your feedback on our proposed 2030 Power System Requirements:

	<p><b>SELECTION CRITERIA</b> Do you agree with our modelling approach? Do you think that these analyses should be used to inform pilot and rollout planning?</p>
	<p><b>TARGET LOCATIONS</b> Based on the initial results, have you ideas on where we should be targeting the rollout of flexibility?</p>
	<p><b>CUSTOMERS PARTICIPATION</b> What do you think these results mean in terms of the need for customers to participate? What do they mean for the number of customers who could or should participate?</p>
	<p><b>TYPES OF CUSTOMERS PARTICIPATING</b> What do you think these results mean in terms of the kinds of customer of system user who could or should participate?</p>
	<p><b>FOUNDATIONAL TECHNOLOGY</b> Based on this information, do you think that we need to roll out foundational system management technology sooner, later or as proposed in these plans?</p>
	<p><b>PILOTING AND ROLLOUTS</b> Based on this information, how soon do you think that we need to act?</p>
	<p><b>LEARNING OBJECTIVES</b> The 2030 Power System Requirements provides a range of insights - which do you find most useful? Are there areas where you would like to see further detail?</p>
	<p><b>CUSTOMER &amp; POLICY OBJECTIVES</b> How best can we use these results (and the detailed results to come) to support national policy objectives?</p>
	<p><b>CUSTOMER EDUCATION AND AWARENESS</b> How could this information be used to further support customers?</p>
	<p><b>SUPPLY CHAIN</b> Are there opportunities for other parts of the supply chain to learn or use the information in this document?</p>



## HAVE YOUR SAY ON OUR PHASED FLEXIBILITY MARKET PLAN

The National Network, Local Connections Programme Phased Flexibility Market Development Plan sets out a proposed roadmap for introducing local flexibility market arrangements on the Irish distribution system.

It includes:

- 1 The proposed set of products to be introduced and their sequenced introduction.
- 2 The proposed short term market framework.
- 3 Options for the medium to long term local market framework.
- 4 Options for the funding arrangements associated with different flexibility services, depending on the value driver or objective in question.
- 5 The legislative basis underpinning the proposed introduction of flexibility services on the distribution system.



We are looking for your perspective on each of these.

Below are some questions to help trigger your feedback on our proposed Phased Flexibility Market Development Plan:

	<b>PRODUCT CRITERIA</b> Do you support the proposed product criteria? Are there other criteria you think we should use?
	<b>TARGET USE CASES</b> Do you support the proposed use cases in the market framework? Do you think other use cases should be addressed? Why?
	<b>NUMBER OF CUSTOMERS PARTICIPATING</b> What aspects of the market framework (for example minimum bid sizes) could increase customers' ability to participate?
	<b>TYPES OF CUSTOMERS PARTICIPATING</b> How could the market framework maximise the range of customers who can participate or benefit?
	<b>PILOT SEQUENCING</b> Do you support the sequenced introduction of these products and frameworks?
	<b>LEARNING OBJECTIVES</b> Are there learning objectives we should pursue prior to making a full proposal to the CRU regarding the local market framework?
	<b>CUSTOMER &amp; POLICY OBJECTIVES</b> Are there other upcoming policy developments or customer objectives which should be accounted for in the product roadmap and future market framework?

## HAVE YOUR SAY ON OUR LOCAL NETWORK VISIBILITY MULTIYEAR PLAN

The National Network, Local Connections Programme Local Network Visibility Multiyear Plan sets out a proposed roadmap for securing operational visibility of local, low voltage distribution systems across the Irish distribution system.

This includes:

- 1 The technological approaches we propose to take to map and monitor the low voltage system, including through the use of data analytics and retrofit monitoring.
- 2 The proposed criteria to prioritise and sequence locations across the country for inclusion in these programmes.
- 3 The proposed annual milestones and targets over the life of the programme.



We are looking for your perspective on each of these.

Below are some questions to help trigger your feedback on our proposed Local Network Visibility Multiyear Plan:

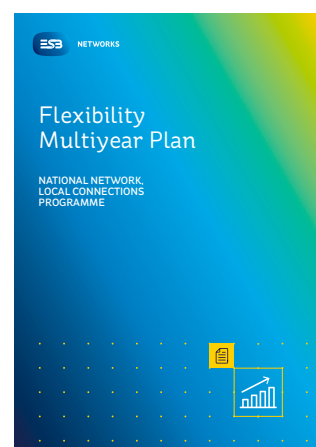
	<b>SELECTION CRITERIA</b> Do you support the proposed criteria for prioritising locations to roll out local mapping and monitoring? Are there other criteria you think we should use?
	<b>TARGET LOCATIONS</b> We are targeting the mapping of 50% of the country and monitoring of 20%. Do you think more, less or other locations should be selected? Why?
	<b>NUMBER OF CUSTOMERS PARTICIPATING</b> Our programme should enable 20 - 50% of customers to participate in the market by 2025. Do you think more (or fewer) customers will be ready and willing to participate?
	<b>TYPES OF CUSTOMERS PARTICIPATING</b> The local network visibility programme is to enable domestic, small business, and community participation. Do you support this approach?
	<b>TECHNOLOGY</b> Do you think there are alternative technological approaches we should take to monitor and manage the local (Low Voltage) system?
	<b>PROGRAMME GO-LIVE AND DURATION</b> The programme commences in 2022 and will conclude in 2025. Do you think this is aligned with national policy objectives (or too fast, or too slow)?
	<b>LEARNING OBJECTIVES</b> Are there additional customer, DSO or market learning objectives we should pursue as we secure visibility of the local network?
	<b>CUSTOMER &amp; POLICY OBJECTIVES</b> Are there other upcoming policy developments or customer needs we should reflect in this roadmap?
	<b>CUSTOMER EDUCATION AND AWARENESS</b> Are there opportunities to drive customer education and awareness by sharing visibility of the local system as we gather it?
	<b>SUPPLY CHAIN</b> Are there opportunities for other parts of the supply chain to learn and develop through this local mapping and monitoring initiative?

## HAVE YOUR SAY ON OUR FLEXIBILITY MULTIYEAR PLAN

The National Network, Local Connections Programme Flexibility Multiyear Plan sets out a proposed roadmap for rolling out local flexibility markets and solutions across the Irish distribution system.

This includes:

- 1 How the policy and technical objectives set out in the individual technology and market documents could be delivered over the PR5 period.
- 2 The proposed programme releases, pilots and key milestones over the life of the programme.
- 3 The proposed annual targets and scorecard assessment framework.
- 4 How these can be set to account for higher or lower ambition in terms of the scale and pace of rollout over the coming years.



We are looking for your perspective on each of these.

Below are some questions to help trigger your feedback on our proposed Flexibility Multiyear Plan:

	<b>SELECTION CRITERIA</b> Do you support the proposed pilot selection criteria, and are there other criteria you think we should be using?
	<b>TARGET LOCATIONS</b> The rollout set out would touch up to 1% of the country through 2022 - 2024 and rollout to 20 - 50% of the country in 2025. How does this compare with your, or your organisation's, needs?
	<b>NUMBER OF CUSTOMERS PARTICIPATING</b> The rollout set out would allow up to 100 customers participate through 2022-2024 and up to tens of thousands by end 2025 onwards. Do you think more (or fewer) customers will be ready and willing to participate?
	<b>TYPES OF CUSTOMERS PARTICIPATING</b> The rollout set out would involve a small number of domestic customers, and primarily commercial customers and generators through 2022-2024, then domestic customers at scale from early 2025. How does this compare with customer and industry needs?
	<b>TECHNOLOGY MILESTONES</b> A range of short, medium and long term technology milestones are proposed in the plan. Are there others you would like to see?
	<b>PILOT GO-LIVE AND DURATION</b> The programme commences in 2022 and ramps up through to 2025. Do you think this is aligned with national policy objectives (or too fast, or too slow)?
	<b>LEARNING OBJECTIVES</b> Are there additional customer, DSO or market learning objectives we should pursue over the life of this programme?
	<b>CUSTOMER &amp; POLICY OBJECTIVES</b> Are there other upcoming policy developments or customer needs we could reflect in this roadmap?
	<b>CUSTOMER EDUCATION AND AWARENESS</b> What are the key opportunities to drive education and awareness over the life of the programme? Do you agree that these should be accounted for in the scorecard "impact" assessment?
	<b>SUPPLY CHAIN</b> What are the key opportunities for other parts of the supply chain to learn and develop over the life of the programme?

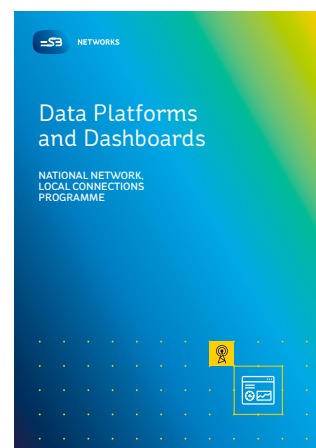
## HAVE YOUR SAY ON OUR PLATFORMS & DASHBOARDS GUIDANCE

The National Network, Local Connections Programme Data Platforms & Dashboards deliverable sets out a proposed roadmap for rolling out new online interfaces to homes, farms, communities and businesses across Ireland.

These new platforms and dashboards will help us build a shared awareness of our local energy systems, and the impact of our actions on our individual, regional and national carbon footprint.

**This document sets out:**

- 1** The key information and views that could be provided on a local and regional basis.
- 2** The potential services and interaction that will need to be supported on future platforms.
- 3** International comparisons and examples which we are using to inform our proposals.



**We are looking for your perspective on each of these.**

Below are some questions to help trigger your feedback on our proposed Data Platforms and Dashboards Roadmap:

	<p><b>PRIORITIES</b> We set out the priority we are proposing for different platform / dashboard functionalities. Have you other priorities for the functionality which could be provided?</p>
	<p><b>INTERNATIONAL STATE OF THE ART</b> We have set out some of the best examples we have found. Are there other international examples you think we should learn from? Or requirements not deployed elsewhere that we should investigate as they would be valuable here?</p>
	<p><b>EMPOWERING CUSTOMERS</b> How can we make local, regional and national renewable energy dashboards accessible and engaging for customers?</p>
	<p><b>EMPOWERING COMMUNITIES</b> We want to empower people to make a local impact; individually, or in communities. Are there others we should be seeking to serve and empower?</p>
	<p><b>TECHNOLOGY</b> Are there particular technologies, or technological approaches, you think we should leverage in rolling out data platforms and dashboards?</p>
	<p><b>PILOTING</b> Do you think we should focus the development of platforms and dashboards to support piloting activities initially?</p>
	<p><b>LEARNING OBJECTIVES</b> Are there customer, DSO or market learning objectives which we could progress through the introduction of new data platforms and dashboards?</p>
	<p><b>CUSTOMER &amp; POLICY OBJECTIVES</b> Are there other upcoming policy developments or customer needs we could reflect in new data platforms and dashboards?</p>
	<p><b>CUSTOMER EDUCATION AND AWARENESS</b> How best can new data platforms or dashboards be used to help drive customer education and awareness?</p>
	<p><b>SUPPLY CHAIN</b> How best can new platforms or dashboards be used to help support other parts of the supply chain?</p>

## HAVE YOUR SAY ON OUR OPERATIONS SYSTEMS ROADMAP

The National Network, Local Connections Programme Operational Systems Roadmap shares the outcome of a current state technology review, and the proposed future technology roadmap for operation system upgrades and deployments. These relate in particular to Distributed Energy Resource Management System (DERMS), Distribution Management and Market Management. The paper also proposes the associated operational, licensing, and hardware requirements.











It includes:

- 1** A current state analysis and an overview of the capabilities and functional requirements needed to introduce the proposed flexibility services into distribution system management.
- 2** A technology deployment plan needed to support each successive pilot / release.
- 3** A potential long term technology deployment plan, pending the pace, scale and targets set for the National Network, Local Connections Programme.

We are looking for your perspective on each of these.

Below are some questions to help trigger your feedback on our proposed Operational Systems Roadmap:

	<p><b>FUNCTIONAL REQUIREMENTS</b> We set out the key functional requirements to introduce flexibility on the distribution system. Are there others you think we should prioritise?</p>
	<p><b>TARGET LOCATIONS</b> The Deployment Schedule in Section 8.2 includes the foundational technology required to go from 1% of the country "flexibility ready" in 2024 to up to 50% by the end of 2025. Should we proceed with this?</p>
	<p><b>NUMBER OF CUSTOMERS</b> The Deployment Schedule in Section 8.2 includes the foundational technology required to go from supporting &lt;100 customers in 2024 to thousands nationwide by the end of 2025. Should we proceed with this and at this pace?</p>
	<p><b>TYPES OF CUSTOMERS</b> The Deployment Schedule in Section 8.2 includes the foundational technology needed to be able to go beyond industry / generators, and support homes, farms and communities nationwide by the end of 2025. Should we proceed with this and at this pace?</p>
	<p><b>TECHNOLOGY</b> We set out key technology needs including a Distribution Management System (DMS), Distributed Energy Resource Management System (DERMS) and Market Management System (MMS). Do you agree with these and/or are there other needs that you think should be included?</p>
	<p><b>PILOTING TECHNOLOGY</b> Though much of the technology supporting the pilots would be superseded if we proceed with a full technology rollout, do you think there is still value in technology investment to support piloting in 2022 - 2024?</p>
	<p><b>LEARNING OBJECTIVES</b> What are the technological learning objectives we should pursue over the life of the technology rollout?</p>
	<p><b>SUPPLY CHAIN</b> Are there opportunities for other parts of the supply chain to learn and develop through the technology rollout?</p>