



NETWORKS

Flexibility Multiyear Plan

NATIONAL NETWORK,
LOCAL CONNECTIONS
PROGRAMME

DOC-230921-GYV



OPENING STATEMENT

The decarbonisation of Irish society relies on fundamental changes to how energy is generated and consumed. To make this possible, securely, at the right pace and the right price, 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.

We are entering a period of rapid change and uncertainty. Over the coming years, technologies will change and Irish homes', farms' and communities' energy needs will too. We will need to be able to adapt to meet changing needs and emerging challenges. In this document we have sought to develop a proposed plan that accounts for uncertainty and delivers that adaptability.

For example:

- 1** Iterative piloting using interim upgrades and processes so we can learn what works well and what needs to be done differently as we prepare for a national rollout;
- 2** Committing resources and investment to sustainable, longer term technologies in our control room that will deliver adaptability and agility in future years;
- 3** Extensive commitment of resources to communications and collaboration, working with partners and customers to understand their needs and how they change, so we can adapt.

There are uncertainties and risks, and these will likely continue over the life of this programme. If we proceed too quickly, we increase the risk that customers will not be ready, or technologies will not be mature. But if we delay investment, we and our partners cannot apply what we learn, replicate successful pilots and commence a national rollout until later in the decade.

Delivering this programme will demand that we commit people and capital. 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. As such, we want to give all electricity customers an opportunity to contribute. By the end of the year, we will need to make informed decisions, and we want your view:

- 1** Do you think we should take a more measured pace and begin to scale closer to 2030, or commit resources needed to begin build towards a national rollout commencing in 2024 / 2025?
- 2** There are trade offs between different developments in this plan that we could prioritise. What do you think we should prioritise, and how will this affect your business.

We need your input to determine the path forward. So please have your say!

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1

National Network, Local Connections Programme – Have Your Say

1 NATIONAL NETWORK, LOCAL CONNECTIONS PROGRAMME – HAVE YOUR SAY!

HAVE YOUR SAY ON THE PACE AND SCALE OF THE PROGRAMME

This proposal is the proposed National Network, Local Connections Programme Flexibility Multiyear Plan.

In this document we set out:

- 1** The proposed roadmap and plan to deliver flexibility services.
- 2** The programme delivery approach we are adopting.
- 3** How the policy and technical objectives set out in the individual technology and market documents can be delivered over the PR5 period.
- 4** The key parameters of each release.
- 5** Flexibility plan milestones.
- 6** Key dependencies.
- 7** Supplementary submissions.
- 8** Pace and scale options.
- 9** Key findings from an independent quality assurance, completed by EPRI.
- 10** The proposed annual targets and scorecard assessment framework including 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 seeking your perspective specifically on the pace and scale of the programme which is discussed later in this document, so please read through this submission and any of the linked supplementary materials that you would find useful to read in parallel.

1 NATIONAL NETWORK, LOCAL CONNECTIONS PROGRAMME – HAVE YOUR SAY!

1.2 HAVE YOUR SAY ON OUR FLEXIBILITY MULTIYEAR PLAN

It is critical that we implement solutions that optimally meet the wishes and needs of the customers and industry participants in the Republic of Ireland. In developing these proposals, we have taken time to seek and utilise stakeholder input from round tables and focus groups, as well as to research and utilise exemplar international experiences. This has enabled us to develop the proposed approaches within this document. While we have confidence that these can meet the overall programme objectives, we are open to change and, as a result, we have prioritised this transparent and consultative approach. There were several key dimensions on which we based this document and it is important to us that we develop an understanding of your perspectives, objectives and concerns across each of those. It may be useful to consider the below questions while reading this document.

Please note when responding to this document, it is not necessary to respond to each of the below questions; responding to a specific question or a general response is welcomed and appreciated.



SELECTION CRITERIA

Do you support the proposed pilot selection criteria, and are there other criteria you think we should be using?



TARGET LOCATIONS

The rollout set out would touch up to 1% of the country 2022 - 2024 and rollout to 20 - 50% of the country in 2025. How does this compare with your organisation's needs?



NUMBER OF CUSTOMERS PARTICIPATING

The rollout set out would allow up to 100 customers participate 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?



TYPES OF CUSTOMERS PARTICIPATING

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?



TECHNOLOGY MILESTONES

A range of short, medium and long term technology milestones are proposed in the plan. Are there others you would like to see?



PILOT GO-LIVE AND DURATION

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)?

1 NATIONAL NETWORK, LOCAL CONNECTIONS PROGRAMME – HAVE YOUR SAY!

It is also important to us that we maximise the overall value of the programme across our stakeholders. As such, we are inviting perspectives on additional considerations that we could fold into our approach:



LEARNING OBJECTIVES

Are there customer, DSO or market learning objectives we should pursue over the life of this programme?



CUSTOMER & POLICY OBJECTIVES

Are there other upcoming policy developments or customer needs we could reflect in this roadmap?



CUSTOMER EDUCATION AND AWARENESS

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?



SUPPLY CHAIN

What are the key opportunities to ensure other parts of the supply chain to learn and develop over the life of the programme?

2

Glossary

2 GLOSSARY

TERM	DEFINITION
AMI	Advanced Metering Infrastructure
BPD	Business Process Document
BPO	Business Process Overview
CRU	Commission for Regulation of Utilities
DER	Distributed Energy Resources
DERMS	Distributed Energy Resource Management System
DD	Detailed Design
DSO	Distribution System Operator
DSU	Demand Side Unit
DUoS	Distribution Use of System
HLD	High Level Design
HV	High Voltage
MMS	Market Management System
MV	Medium Voltage
NSAI	National Standards Authority of Ireland
PR5	Price Review 5
RESS-1	Renewable Electricity Support Scheme 1
SCADA	Supervisory Control and Data Acquisition
SEM	Single Electricity Market
TSO	Transmission System Operator

3

Flexibility Multiyear Plan Overview

The objective of the National Network, Local Connections Programme Flexibility Multiyear Plan is to outline the roadmap for delivering flexibility services.

This document is

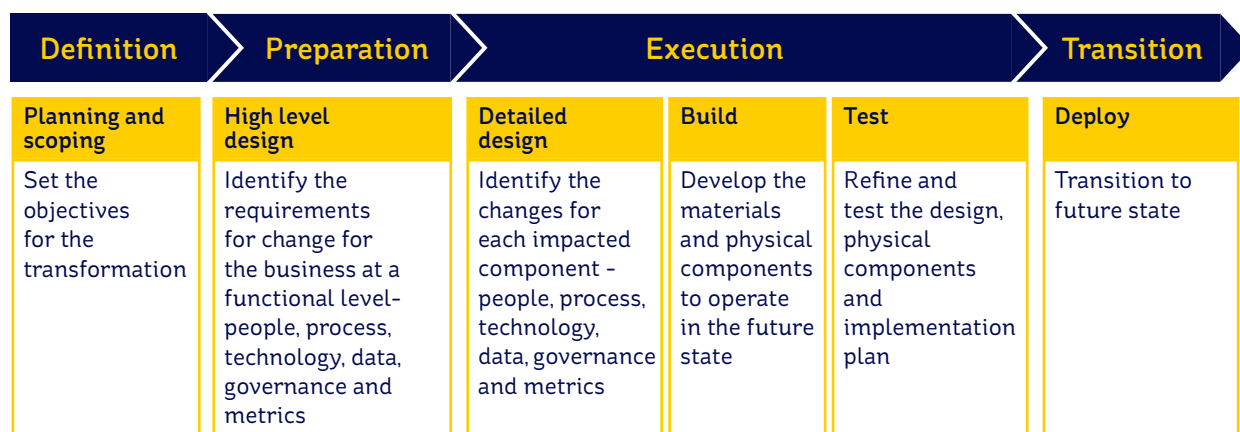
- Underpinned by detailed delivery planning;
- Informed by the analysis, research and technical insights set out in the National Network, Local Connections Programme 2030 Power System Requirements and the National Network, Local Connections Programme Data, Control & Signals Guidance;
- Designed to implement the proposals set out in the National Network, Local Connections Programme 2030 Power System Requirements Flexibility Market Plan, Piloting Roadmap, Operations Systems Roadmap and Platforms & Dashboards Roadmap.

3 FLEXIBILITY MULTIYEAR PLAN OVERVIEW

3.1 PROGRAMME DELIVERY APPROACH

The National Network, Local Connections Programme is using a hybrid delivery approach. This is based on ESB's Project Delivery methodology which will be applied in an agile, iterative manner through a series of pilots and releases, over the course of the programme.

The phases associated with each release are captured and described at a high level below:



Given the multi-year scope of work, this hybrid delivery approach to deliver business capabilities aligned to a number of key releases and associated pilots, allows us take a discovery led approach. This discovery-led approach will see the programme demonstrating early rollout of capability, that will scale into a full, value-generating asset. Our approach to piloting is explained more in the National Network, Local Connections Piloting Roadmap Programme. Please see Appendix C for further information.

Delivery phases will follow typical project delivery lifecycle phases of High Level Design (HLD), Detailed Design (DD), Build, Test and Deploy as outlined above. For example, for Pilot 1, the delivery approach will be predominantly waterfall in nature, albeit there will be a certain level of overlap between phases to cater for specific capabilities where delivery can be accelerated (e.g. where capabilities are self-contained, etc.).

Pilot 1 will also deliver an extensive HLD and DD which will be refined and refreshed during subsequent pilots/releases. Learnings from Pilot 1 will then inform the most efficient delivery approach for subsequent releases/pilots. This will be factored into overall planning at the appropriate stage.

Then, as the programme moves to Pilot 2 and beyond, the delivery approach will move increasingly towards a hybrid combination of waterfall and agile delivery approaches. For example, certain capabilities will require adaptation and extension in subsequent releases/pilots as new technological capabilities or customer needs are introduced into the programme; these updates will be delivered utilising an agile delivery approach.

4

What this Plan is Delivering

This Flexibility Multiyear Plan has been developed to deliver on the needs and objectives set out in the National Network, Local Connections Programme technical and policy documentation. These are all linked in the Appendix, but summaries of the documents have been captured below for reference.

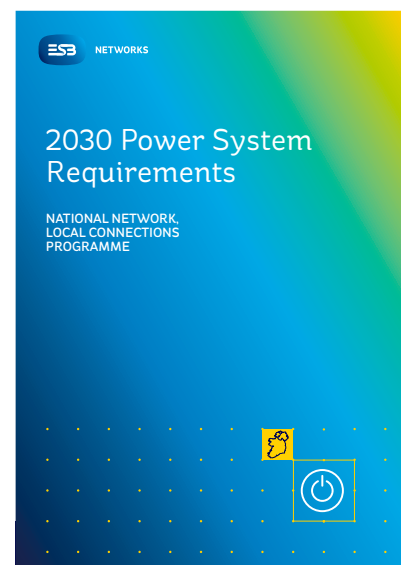
4 WHAT THIS PLAN IS DELIVERING

4.1 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:

- 1 Sets out the process to identify the limits on the system and its ability to provide the capacity and security to meet generation and demand needs on the system up to 2030.
- 2 Shares insights from the initial analysis, in advance of completing the full body of analysis.
- 3 Identifies how the information is being applied, including to develop the National Network, Local Connections Programme technical strategy.

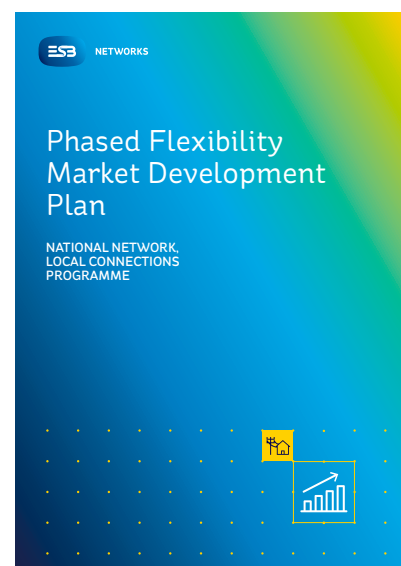


4.2 PHASED FLEXIBILITY MARKET PLAN

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

It includes:

- 1 The 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 introduction of flexibility services on the distribution system.



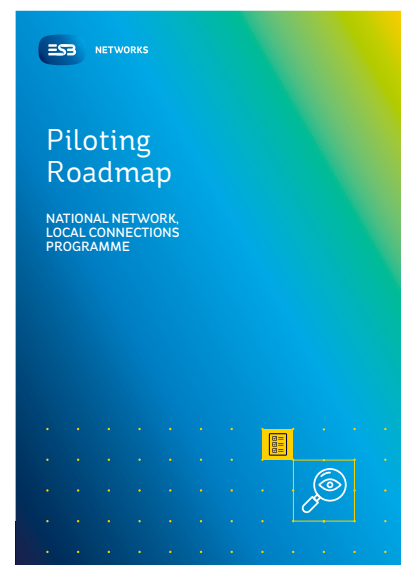
4 WHAT THIS PLAN IS DELIVERING

4.3 FLEXIBILITY PILOT 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 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 kinds of customer or system user who will be eligible to participate in each pilot over the life of the programme.

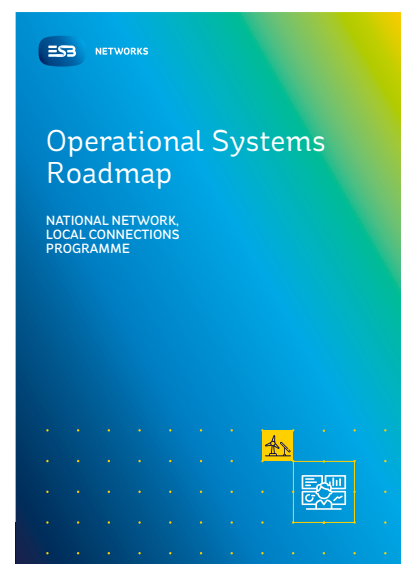


4.4 OPERATIONAL SYSTEMS ROADMAP

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 details the associated operational, licensing, and hardware requirements.

It includes:

- 1 The current state analysis and an overview of functional requirements to introduce 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.



4 WHAT THIS PLAN IS DELIVERING

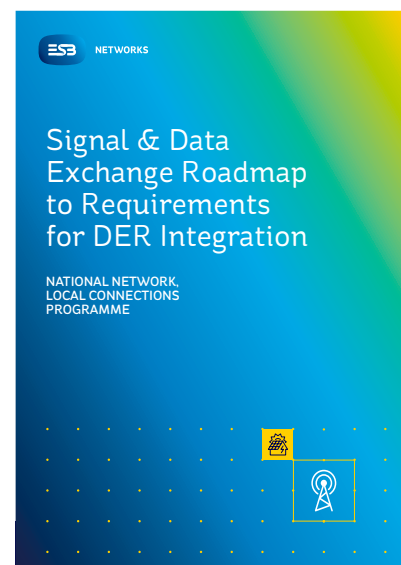
4.5 SIGNALS, CONTROL AND DATA EXCHANGE GUIDANCE

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 be able to be flexible.

This 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.



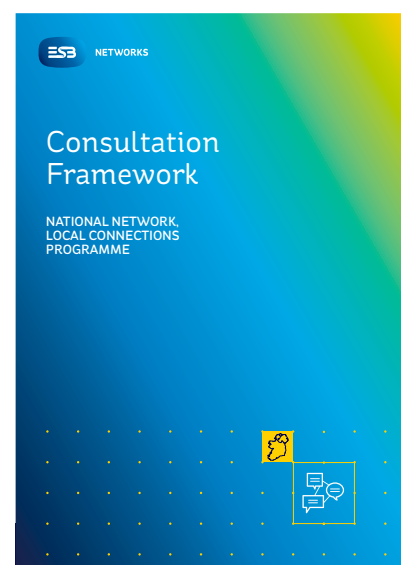
4.6 CONSULTATION FRAMEWORK

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 will 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.



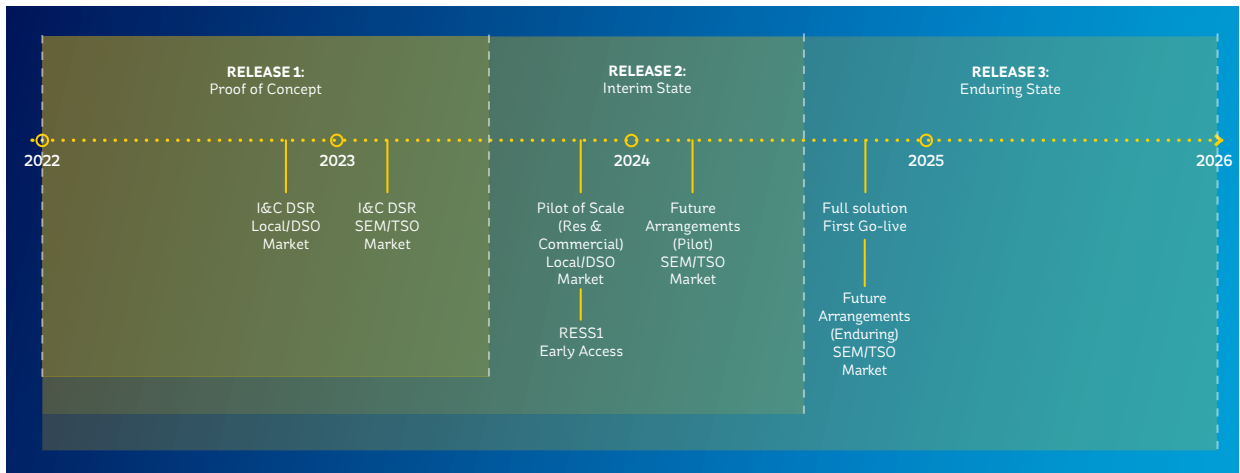
5

Programme Releases

5 PROGRAMME RELEASES

As described in 3.1 above, the National Network, Local Connections Programme has adopted a release-based approach to the delivery of the Flexibility Multiyear Plan.

An outline of each release is documented below.



5 PROGRAMME RELEASES

5.1 RELEASE 1

This release commences at the beginning of 2022 and will end in April 2023. The two proof points for us and for customers within this release are:

- 1 Pilot 1: Local/DSO Market for Demand Side Response (Industrial and Commercial Scale).**
- 2 Pilot 2: SEM/TSO Market for Demand Side Response (Industrial and Commercial Scale).**

As part of this release, the following capabilities will be delivered:

REF	RELEASE OUTCOME
1	Standard processes for identifying thermal or voltage scarcity associated with demand, and providing engineering definition for a service solution.
2	Operational safety measures relating to switching, earthing and cybersecurity with relevant processes (and/or training) updated to account for the use of flexibility services as an operational tool.
3	Engineering impact assessments, and process and technology updates to account for the impact of flexibility services on protection, contingency management, HILP planning, black start and load shedding activities.
4	Powerflow, optimisation and forecast functionality available to control room staff who have been suitably trained.
5	Flexibility services and related pilot market, and regulatory framework appropriate to piloting in this release. Learnings and outcome report to inform the development of a market and regulatory framework for local flexibility services.
6	New DSO/TSO operating model to manage the interaction between local and transmission operations and services / market management. This will address (in a preliminary manner) registration, operational planning, scheduling, dispatch, redispatch and contingency management.
7	Processes and system functionality to utilise contracted flexibility services to manage demand congestion or network contingencies.
8	Preliminary (email/phone-based) modalities to enable distribution connected resources participate in TSO system services and wholesale market, addressing ex-ante, failsafe and compliance processes.
9	Preliminary contract flexibility services and the ability to schedule and dispatch contracted service providers.
10	End to end customer journeys for customers and aggregators participating in local or transmission services from the distribution system, based on the customer segments involved in pilots 1 and 2.
11	Validation and settlement processes for contracted flexibility service providers.
12	Evidence-based customer experience and satisfaction measurement/baseline with improvements identified, based on the customer segments involved in pilots 1 and 2.

5 PROGRAMME RELEASES

5.2 RELEASE 2

This release will end April 2024, and includes:

- 1 Pilot 3: Pilot of Scale which will involve multiple services and customer types, at a given network location.**
- 2 Pilot 4: RESS-1 Early Access which will seek to enable RESS-1 projects connect in advance of completion of their full connection works.**
- 3 Pilot 5: Future Arrangements (Pilot Release) which involves a first step towards implementing new modalities enabling the participation of distributed resources in transmission system services.**

As part of this release, the following capabilities will be delivered:

REF	RELEASE OUTCOME
1	Connection agreement amendment/side letter for early access arrangement for connection generation.
2	Standard process to identify thermal and/or voltage issues associated with demand and generation congestion. Appropriate solution in terms of the standardised flexibility services for the Release 2 pilots.
3	Operational safety measures accounting for the impact of flexibility services under Release 2 pilots related to switching, earthing and cybersecurity with relevant processes (and/or training) updated.
4	Engineering impact assessments, process and technology updates to account for the impact of flexibility services (associated with Release 2) on protection, contingency management, high impact, low probability (HILP) event planning, black start and load shedding activities.
5	Data policy, strategy and sharing processes/technology associated with Release 2 activities.
6	Adaptation and update of standardised flexibility services to support Release 2 pilots and the related flexibility market framework (incremental to Release 1).
7	Processes and system functionality to utilise contracted flexibility services to manage demand and generation congestion or network contingencies.
8	Preliminary (email/phone-based with some SCADA functionality) modalities to enable distribution connected resources participate in TSO system services and wholesale markets, addressing ex-ante, failsafe and compliance processes.
9	DSO dispatch of new distribution connected resources.
10	Contracts for flexibility services for Release 2 pilots and ability to dispatch contracted service providers.
11	Contingency plans to maintain network security where service providers become unavailable in operational timescales.
12	End to end customer journeys for customers and aggregators participating in local or transmission services from the distribution system, based on the customer segments involved in pilots 3, 4 and 5.
13	Evidence-based customer experience and satisfaction measurement with improvements identified, based on the customer segments involved in pilots 3, 4 and 5.

5 PROGRAMME RELEASES

5.3 RELEASE 3

Pending the decisions made regarding the pace and scale of the National Network, Local Connections programme, arising of this consultation process, a third release could go live in late 2024. This release would deliver scalable, automated capabilities allowing ESB Networks to:

- 1 Replicate / roll out solutions based on the learnings of pilots 2 – 5 nationally**
- 2 Introduce and update flexibility services and market framework elements in an agile manner**
- 3 Improve the customer and stakeholder experience of participating in flexibility**
- 4 introduce standard solutions to support community and active energy citizen activities.**

As part of this release, the following capabilities could be delivered:

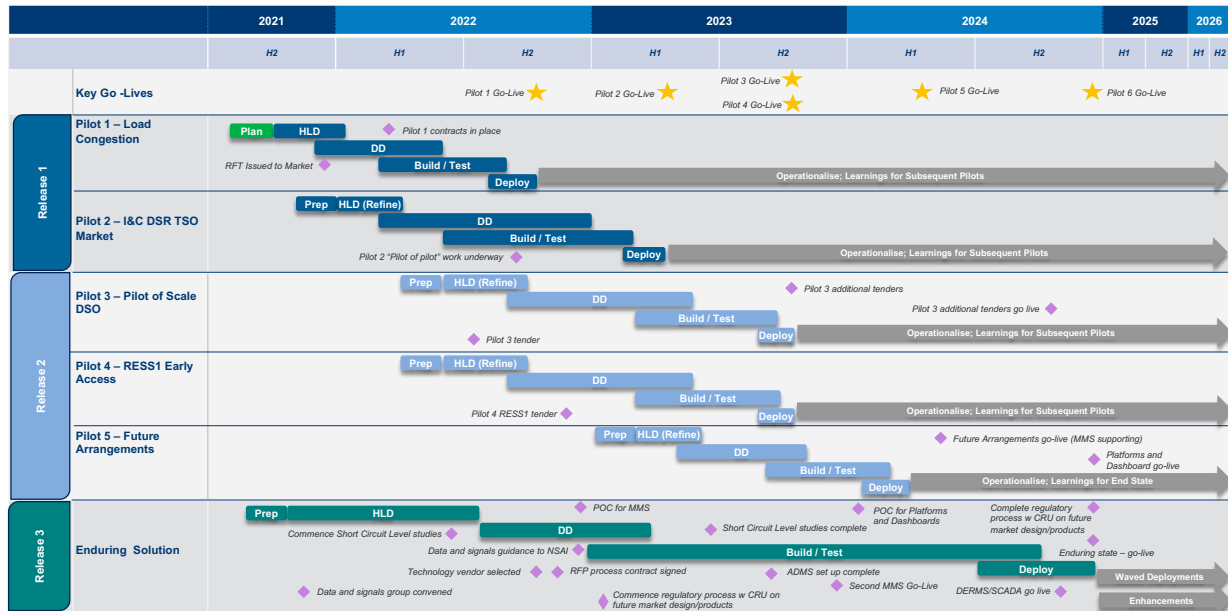
REF	RELEASE OUTCOME
1	Connection agreement amendment/side letter for non-firm or flexible access arrangements for connection generation developed.
2	Standard processes to identify thermal, voltage, short circuit level, dynamic stability issues associated with demand, and generation congestion and solutions available as standard network planning options.
3	Operational safety measures accounting for the impact of contracting for flexibility services under Release 3 related to switching, earthing and cybersecurity with relevant processes (and/or training) updated.
4	Engineering impact assessments, process and technology updates to account for the impact of flexibility services (associated with Release 2) on protection, contingency management, high impact, low probability (HILP) event planning, black start and load shedding activities.
5	Data policy, strategy and sharing processes/technology for Release 3 pilot.
6	Standardised flexibility services to address thermal, voltage, short circuit level, dynamic stability issues and the related flexibility market framework developed (incremental to Release 1 & 2).
7	Processes and system functionality to utilise contracted flexibility services to manage demand and generation congestion or network contingencies.
8	Automated modalities (based on interface between operational and market systems) to enable distribution connected resources participate in TSO system services and wholesale markets.
9	DSO dispatch of all new distribution connected resources.
10	Contracts flexibility services for thermal, voltage, short circuit level, dynamic stability issues and ability to directly dispatch contracted service providers.
11	Contingency plans established to maintain network security where service providers become unavailable in operational timescales.
12	End to end customer journeys for customers and aggregators participating in local or transmission services from the distribution system, based on the customer segments involved in pilots 3, 4 and 5.
13	Evidence-based customer experience and satisfaction measurement with improvements identified, based on the customer segments involved in pilots 3, 4 and 5.
14	Standard products and services available for energy communities and active energy customers, to support their interaction with local renewables and networks.
15	Standard dashboards and platforms available for energy communities and active energy customers, to support their interaction with local renewables and networks.

6

Flexibility Milestone Plan

6 FLEXIBILITY MILESTONE PLAN

Please see the below high-level plan on a page for the Flexibility Multiyear Plan. This multiyear plan provides the basis of the proposed annual milestones to be used as targets in the PR5 Flexibility Incentive.



As outlined above at 3.1, the National Network, Local Connections Programme’s initial pilot will include an integrated High Level Design (HLD) phase to define the ‘As-Is’ interim and enduring ‘To-Be’ for all capabilities in the programme’s scope.

The output of this phase will include a series of business process overview (BPO) documents. These documents will build on our capability model to articulate the next layer of the programme’s business architecture and will include sections on items such as high level technical and non-technical requirements, process descriptions and hierarchy, change impact assessment and organisation design.

The detailed design (DD) phase of Pilot 1 will drill down further (individual/role impacted level) for the subset of capabilities relevant to that pilot. One of the core outputs will be a suite of business process documents (BPDs) which cover similar items as the BPOs (listed above) but at a detailed level, and for the interim state that pilot will deliver. From Pilot 2 onwards, our HLD phases will include a refresh of BPOs taking lessons learned from phases completed in previous pilots. This will act as a mechanism to ensure solution integrity by validating our enduring solution and associated actions are still valid and achievable.

From the perspective of our customers and stakeholders, appropriate processes, services and supports will be developed, along with communications, awareness and education activities. For further detail on this, please see Appendix F which is the National Network, Local Connections Consultation Framework.

6 FLEXIBILITY MILESTONE PLAN

6.1 KEY MILESTONES FOR BALANCED SCORECARD TARGETS

6.1.1 SYSTEMS MILESTONES & CAPABILITIES

<i>Unit</i>	2021 PR5	2022 PR5	2023 PR5	2024 PR5	2025 PR5
4.18.1 Systems Developments					
CRITICAL PATH MILESTONES					
Proof of concept release forecasting		☆			
Proof of concept market management system go-live		☆			
Technology vendor selected		☆			
SCADA dispatch			☆		
Second market management system go-live			☆		
Commence Market Management System specification				☆	
Nationwide rollout - technology go-live				☆	

The critical path technology milestones, and capabilities added, as set out above, are described in the table below. These milestones and capabilities refer to:

- 1** Milestones and capabilities being introduced as per the National Network, Local Connections Programme Operations Systems Roadmap, for ESB Networks to procure and manage flexibility services.
- 2** Milestones and capabilities being introduced as per the National Network, Local Connections Programme Data Exchange & Signals Guidance, to introduce standard requirements for electricity system customers' new technologies, to be able to participate in flexibility.

Note:

- Customer and stakeholder related developments and milestones are not captured in this table, as it is proposed that these relate to the impact of the plan, rather than simple delivery. As such, objectives with respect to customers and stakeholders are set out later in this document as relates to the multiyear scorecard and in more detail in the National Network, Local Connections Consultation Framework.
- Release 3 refers to the nationwide rollout of flexibility i.e. the ability to introduce flexibility services and support the activities of citizen or renewable energy communities, and active energy citizens, nationwide. This release will only proceed pending the targets set by the CRU, based on stakeholders' views relating to the right pace and scale of the programme during the PR5 period, and other regulatory considerations. As such, these milestones are marked with an asterisk (*) in the table below.

6 FLEXIBILITY MILESTONE PLAN

6.1.1 SYSTEMS MILESTONES & CAPABILITIES continued

TABLE A

	DATE	MILESTONE	IMPACT	RELEASE
2022	H2 2022	Proof of concept release forecasting	Needed to begin planning the dispatch of flexibility services and scheduling demand side units on a weekly and daily basis (for dynamic instruction sets).	R1
		Proof of concept market management system (MMS) go-live	Needed to begin piloting market management capabilities in Pilot 2	R2
		Technology vendor selected	Needed to implement the technology needed for a national rollout of flexibility, enabling active customers, energy communities, wind and solar farms, and others participate in flexibility services nationwide, by the end of PR5.	R3*
2023	H1 2023	SCADA dispatch	Needed to begin dispatching active and reactive power set points to pilot participants in a more automated manner.	R2
	H2 2023	Second Market Management System go-live.	Second Market Management System go-live. Needed to support customers' and stakeholders' interaction with the market for Pilots 3, 4 and 5.	R2
2024	H2 2024	Commence Market Management System specification	Needed to go to market for a production market management system before the end of PR5.	R3
		Nationwide Rollout – technology go-live	Enduring solution go-live on a pilot area of the network, to be scaled in 2025 pending successful pilot.	R3*

6 FLEXIBILITY MILESTONE PLAN

6.1.2 DSO MILESTONES & CAPABILITIES

Unit	2021 PR5	2022 PR5	2023 PR5	2024 PR5	2025 PR5
4.18.2 Products & Processes					
CRITICAL PATH MILESTONES					
Commence System Strength (short circuit level) Studies	☆				
Commence dynamic stability studies	☆				
Pilot 1 contracts in place		☆			
Pilot 1 go-live			☆		
Early Access pilot flexible connection products			☆		
Pilot of Scale - flexibility schemes procurement			☆		
System Strength (short circuit level) Studies complete			☆		
Dynamic stability studies complete			☆		
Pilot 2 go-live				☆	
Pilot 3 go-live				☆	
Pilot 4 go-live				☆	
Pilot 3' schemes go to tender				☆	
Standard industry reporting				☆	
Future Arrangement initial go-live				☆	
Enduring products regulatory process commences				☆	
Enduring market framework process commences				☆	
Nationwide rollout - flexibility procurement				☆	
New products rollout					☆

The critical path DSO milestones and capabilities added (as set out above) are described in the table below. These milestones and capabilities refer to:

- 1 Power system engineering milestones and capabilities needed to identify the need for, define and use new flexibility services.**
- 2 Market design milestones and capabilities needed to introduce and manage local flexibility markets, including the rollout of the products introduced in the National Network, Local Connections Programme Phased Flexibility Market Plan.**

Note:

- Customer and stakeholder related developments and milestones are not captured in this table, as it is proposed that these relate to the impact of the plan, rather than simple delivery. As such, objectives with respect to customers and stakeholders are set out later in this document as relates to the multiyear scorecard and in more detail in the National Network, Local Connections Programme Consultation Framework.
- Release 3 refers to the nationwide rollout of flexibility i.e. the ability to introduce flexibility services and support the activities of citizen or renewable energy communities and active energy citizens nationwide. This release will only proceed pending the targets set by the CRU, based on stakeholders' views relating to the right pace and scale of the programme during the PR5 period, and other regulatory considerations. As such, these milestones are marked with an asterisk (*) in the table below.

6 FLEXIBILITY MILESTONE PLAN

6.1.2 DSO MILESTONES & CAPABILITIES continued

TABLE B

	DATE	MILESTONE	IMPACT	RELEASE
2022	H1 2022	Pilot 1 contracts in place	Needed to give confidence to the market and enable customers / services providers proceed with investment to prepare for pilot go-live.	R1
	H2 2022	Pilot 1 go-live	Needed to go live with the use of the secure and dynamic flexibility services as part of distribution system operational management.	R1
		Early Access Pilot flexible connection products	Early Access Pilot flexible connection products to become available enabling contracting and initial procurement for services to go live in Q4 2023.	R2
		Pilot of Scale – flexibility schemes procurement	Procurement for a number of flexibility schemes to operate within the pilot area, including customers down to domestic level. This includes the launch of new products including: - Reactive power product. - Sustain product.	R2
	H1 2022	System Strength (Short Circuit Level) Studies	Foundational system profiling and analysis to enable the design of system strength flexibility products to go live in 2025.	R3*
		Dynamic Stability Studies	Foundational system profiling and analysis to enable the design of system stability flexibility products to go live in 2025.	R3*
2023	H1 2023	Pilot 2 Go-live	Week-ahead and day-ahead scheduling of individual demand sites within DSUs commences, replacing annual instruction sets.	R1
	H2 2023	Pilot 3 Go-live	Multiple flexibility schemes operating within the pilot area go live, including customers down to domestic level.	R2
		Pilot 4 Go-live	RESS-1 projects can connect in advance of end-year 2023 as a result of the go-live of local flexibility markets.	R2
		Pilot 3 schemes go to tender	Tendering for additional services in the pilot location, based on updated system needs and capabilities implemented for first go-live.	R2
		Standard Industry Reporting	Establishment of standard market and regulatory reporting on the procurement and dispatch of DSO flexibility, and of TSO flexibility bids validated.	R3*
	H1 2023	System Strength (Short Circuit Level) Studies Complete	Needed to commence design of new products to go to tender in 2024..	R3*
		Dynamic Stability Studies Complete	Needed to commence design of new products to go to tender in 2024..	R3*

6 FLEXIBILITY MILESTONE PLAN

6.1.2 DSO MILESTONES & CAPABILITIES continued

TABLE B

	DATE	MILESTONE	IMPACT	RELEASE
2024	H1 2024	Future Arrangements Initial Go-Live	Needed to enable initial distribution system customers participate in new transmission system services arrangements.	R2
		Enduring Products Regulatory process commences	Review and update of standard products for flexibility (based on 2021 –2023 experience and stakeholder consultation), and submission to CRU for consideration.	R3*
		Enduring Market Framework process commences	Submit proposals for enduring flexibility market framework (based on 2021 –2023 experience and stakeholder consultation), and submission to CRU for consideration.	R3*
	H2 2024	Nationwide Rollout – Flexibility Procurement	All eligible pipeline HV or MV reinforcement schemes to be tested for a flexible solution, with rolling tenders established.	R3*
		New products rollout	First call to tender for piloting services relating to - System strength (short circuit levels) - Dynamic stability	R3*

6.2 2025 HIGH LEVEL

The targets set in Q4 2021 for the programme will determine whether Release 3 proceeds during PR5. If this is the case, then the objective in 2025 will be to extend a nationwide rollout over the course of 2025. As a result, the key developments (at a high level) in 2025 would include:

- 1** Nationwide rollout of flexibility services at high, medium and low voltage
- 2** Introduction of nationwide standard services / support for citizen energy communities and renewable energy communities
- 3** Introduction of nationwide standard services for active energy customers
- 4** Go to market for a production market management system
- 5** Full rollout of effective modalities for distribution system customers' participation in transmission and SEM markets.

6 FLEXIBILITY MILESTONE PLAN

6.3 PACE AND SCALE OPTIONS

Our R1, R2 and R3 milestones as set out in the previous section have us driving out the Climate Action Plan. In practice, this means we are planning to deliver at an ambitious, but realistic, pace. We welcome your feedback on the proposed pace and scale of the programme's delivery.



As set out below, it is important that the full scale from a measured pace to a very fast pace be considered.

6.4 PACE AND SCALE AS PER OUR PLANNED R1, R2 AND R3

FLEXIBILITY DELIVERABLE	OUTCOME
2030 Power System Requirements	We set targets based on the Power System Requirements, and we hit them. In 2021, our 2030 Power System Requirements and Studies are just the beginning. In 2022, we head into studies to prepare for advanced services for short circuit levels and dynamic stability.
Phased Flexibility Market Plan	By end PR5, the National Network, Local Connections Programme will seek to pilot a range of long term local market options and go to market for a full Market Management System. Market based services are a material part of ESB Networks' system development strategy for PR6. We would see daily market signalling / scheduling, however intraday pricing is pre-contracted.
Flexibility Pilot Roadmap	We will seek to maximise participation in each pilot. We will transfer successful pilots into scale / BaU offering within 2 years.
Operations Systems Roadmap	The programme will go to market for a fully fit for purpose technology platform by end 2021 / Jan 2022. This goes live in Nov 2024 and by end PR5, 20-50% of customers / locations are enabled to participate in a flexibility market. From '24 / '25 onwards, flexibility services in Ireland are used as an alternative solution to address thermal, voltage, short circuit level and stability issues.
Signals and Data Exchange Guidance	The programme will work closely with the NSAI, CRU, and relevant industry bodies to support the adoption of smart standards in Ireland, so that the default offering for all customers is the "flexible-ready" one.
Geography	Nationwide rollout of flexibility with up to 50% of customer locations eligible to participate in local and / or TSO markets.
Customers	Of the order of tens of thousands of customers eligible to participate in new services (including flexibility, energy community and active customer activities) by end PR5.
Automation	Flexibility management would be primarily automated, including procurement, scheduling and dispatch. This would allow us to progressively tighten risk margins, based on successful pilot experience.

6 FLEXIBILITY MILESTONE PLAN

6.5 MEASURED PACE AND/OR SCALE

Feedback from this consultation may indicate that a very measured scale and pace of the programme should be taken.

Across the key flexibility deliverables, it will look and feel as follows:

FLEXIBILITY DELIVERABLE	OUTCOMES
2030 Power System Requirements	We treat the 2030 Power System Requirements as a way of informing where we take small steps, and a measure of the risk we face if uptake of low carbon technologies proceeds as per the Climate Action Plan, but no more than that.
Phased Flexibility Market Plan	Local flexibility services are a niche / pilot offering only, not available to the vast majority of customers. Market principles are applied through long term contracts.
Flexibility Pilot Roadmap	The programme would minimise volumes and technology requirements for all pilots, to test the concept but no more.
Operations Systems Roadmap	The programme goes to market for a fully fit for purpose technology platform at the end of 2025 / beginning of 2026. Flexible offerings are only available to a small number of large / generation customers until mid / late PR6 (2028-2030). Services as set out above are likely from 2030 onwards.
Signals and Data Exchange Guidance	The programme completes the guidance documentation, but it is informational only. This means that many customers will remain locked out of participation in flexibility.
Geography	Less than 1% coverage nationwide where customers would be enabled to participate in either local / DSO or SEM / TSO markets.
Customers	Of the order of 100 customers may be able to participate in piloting activities nationwide, in specific pilot locations. Participants would be primarily industrial – utility scale wind and solar farms and batteries, industrial and large commercial demand side participation.
Automation	Flexibility management would be primarily manual or offline. This means that most activities would be strictly pre-scheduled, and involve relatively wide risk margins.

6 FLEXIBILITY MILESTONE PLAN

6.6 HIGH PACE AND/OR SCALE

Conversely, feedback from this consultation may indicate that the programme should seek to deliver a high pace and scale of rollout.

Across the key flexibility deliverables, it will look and feel as follows:

FLEXIBILITY DELIVERABLE	OUTCOMES
2030 Power System Requirements	This would be as per our existing plan, but we would run higher penetration scenarios.
Phased Flexibility Market Plan	Dynamic intraday pricing before end PR5 (end 2025).
Flexibility Pilot Roadmap	This would be as per our existing plan, but pilots target automated approaches from release 2 onwards.
Operations Systems Roadmap	This would be as per our existing plan, but in parallel, ESB Networks would invest in legacy systems to maximise the scale of piloting.
Geography	Nationwide rollout of flexibility with >50% of customer locations eligible to participate in local and / or TSO markets.
Customers	Of the order of tens to hundreds of thousands of customers eligible to participate in new services (including flexibility, energy community and active customer activities) by end PR5.
Automation	Flexibility management would be primarily automated, including procurement, scheduling and dispatch. This would allow us progressively tighten risk margins, based on successful pilot experience.

7

Scorecard Proposal

7 SCORECARD PROPOSAL

7.1 OBJECTIVES

The CRU is introducing an annual balanced scorecard based on ESB Networks' development and execution of a plan to enable customers actively participate in a flexible distribution system. The CRU will use an annual balanced scorecard approach which will be based on high-level milestones that were proposed by ESB Networks to reflect the following parameters:

- 1 Introduce tenders for flexible, non-wires alternative within ESB Networks' system development plan;**
- 2 Establish standard products and services to the benefit of all system users; and**
- 3 Establish robust reporting and transparency arrangements, to provide confidence to the market as ESB Networks' role as neutral market facilitator grows.**

The incentive is also in line with the requirements of Article 32 of the Electricity Market Directive 2019, 2019/944 (Incentives for the use of flexibility in distribution networks).

In September each year, aligning with its consultation with stakeholders, a detailed flexibility multi-year plan covering the three following years (and the two years after at high level) must be submitted to the CRU by ESB Networks. Based on the submission, the CRU will decide, by year-end, on the milestones, deliverable targets and weightings for the following year. The first multi-year plan and balanced scorecard proposals are to be submitted by 1 October 2021 and as outlined above, will cover 2022 to 2024 as well as 2025 and 2026 at high level.

In assessing the outcome of performance, the CRU will consider the following criteria:

- 1 Quality of the plan and defined actions (20% of scoring);**
- 2 Quality of implementation of the plan (40% of scoring); and**
- 3 Effectiveness of the plan and demonstrable impact (remaining 40% of scoring).**

7 SCORECARD PROPOSAL

7.2 ASSESSMENT

ESB Networks' assessment against the criteria is discussed below:

7.2.1 QUALITY OF THE PLAN AND DEFINED ACTIONS

ESB Networks propose that the quality of the plan and defined actions are measured by:

- 1 Independent quality assurance, through EPRI, or another third party as contracted by ESB Networks, to the National Network, Local Connections Programme. A report shall be shared with the CRU that will document the assessment and any associated actions.**
- 2 Demonstrable adherence to the defined programme delivery method/approach.**
- 3 Demonstrable and robust risk, assumption, issue and dependency management.**

7.2.2 QUALITY OF IMPLEMENTATION OF THE PLAN

ESB Networks propose that measurement of the quality of the implementation plan should be based on delivering the milestones set out in the Regulatory Reporting pack and as identified in Table A and Table B.

Should the CRU judge that a measured pace and scale should be adopted in PR5, this would defer the nationwide rollout of flexibility services (including non-wires alternatives, non-firm / flexible connections for generators etc), and supports of energy communities and active customers. However, it would also reduce upfront costs for DUoS customers and participants, and would mean that customers have more information at a later date when they are faced with the question of whether they will participate.

If this more measured pace is the CRU's preference, then all R3* milestones should be removed, as these would require upfront commitment of resources from end 2021 onwards.

Should a higher pace of rollout be preferred by the CRU, enabling higher numbers of customers and stakeholders to participate sooner, and enabling a nationwide rollout to 50%+ of customer locations, communities and active customers by the end of PR5, then all milestones should be included, and it will be necessary to commence recruitment of the associated resources from end 2021 onwards.

7 SCORECARD PROPOSAL

7.2.3 EFFECTIVENESS OF THE PLAN AND DEMONSTRABLE IMPACT

ESB Networks propose that the effectiveness of the Flexibility Multiyear Plan, and demonstrable impact, is assessed against our approach to, and outputs from, stakeholder education, awareness and engagement plan.

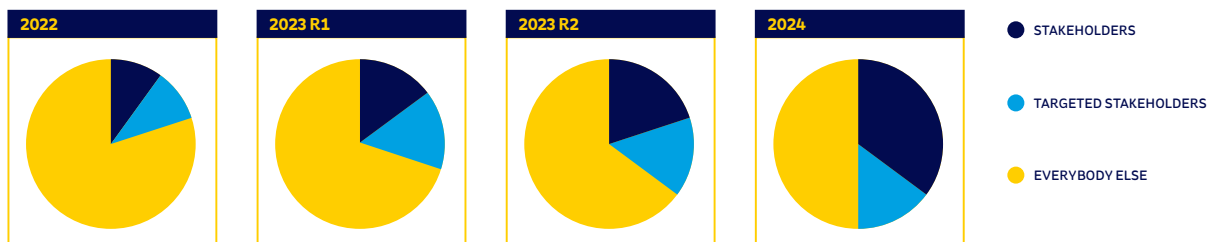
A core tenet of our National Network, Local Connections Programme is that we purposefully engage to generate insights that are directly fed back into the programme design as illustrated below.

TARGET AUDIENCES

Stakeholders on our Stakeholder List – these people are here because they want to be, they need to be, or they must be.

Targeted stakeholders to support this period of programme development.

Everybody else – people who are unaware of the programme because it is not relevant ...yet nor is it necessary for them to understand the programme...yet!



	STAKEHOLDERS (ON OUR MAP)	TARGETED STAKEHOLDERS	EVERYBODY ELSE
2022	80% of registered stakeholders have been invited to participate in activities relating to the programme.	Increase our registered stakeholder database by 10%.	Phase 1 – national awareness campaign is the tool to educate and build awareness – Deliver research via survey to measure awareness of programme and set benchmark (using independent third party to measure effectiveness and define targets to adopt in line with programme ambition).
2023 R1	80% of registered stakeholders have been invited to participate in activities relating to the programme.	Increase our registered stakeholder database by 15%.	To be confirmed once baseline is set.
2023 R2	80% of registered stakeholders have been invited to participate in activities relating to the programme.	Increase our registered stakeholder database by 15%.	To be confirmed once baseline is set.
2024	80% of registered stakeholders have been invited to participate in activities relating to the programme.	Increase our registered stakeholder database by 15%.	To be confirmed once baseline is set.

7 SCORECARD PROPOSAL

7.2.3 EFFECTIVENESS OF THE PLAN AND DEMONSTRABLE IMPACT continued



DEMONSTRATING HOW WE APPLY INSIGHTS INTO KEY ACTIVITY AS BELOW	
High Level Programme Design	Case study to illustrate how insights have been applied into high level programme design.
Focus Groups	Case study to illustrate how insights have been applied into delivering relevant focus groups.
National Campaign	Case study/sample campaign elements to illustrate how insights have been applied into delivering relevant communication materials.
Consultations	Case study/sample consultation element to illustrate how insights have formed and developed our consultation approach.
Programme Releases	Clear demonstration how insights can be traced to programme scope items, which are then delivered via programme releases.

For more information on the broader National Network, Local Connections Programme Consultation Framework, please click through to the document.

8

Dependencies

As with all transformation programmes, there are dependencies and constraints that require close and careful management to ensure the plan is delivered effectively.

8 DEPENDENCIES

8.1 EXTERNAL DEPENDENCIES

The key external dependencies have been captured below:

DEPENDENCY	DESCRIPTION	FOR	WHEN
CRU - data code ESB Networks - integration	Smart Metering interval and instrumentation data, along with MPRNs, are required. This is intended to be used to measure and verify response for domestic and small business customers. This means that we are dependent on the transposition of the Clean Energy Package assigning the CRU as the competent authority to develop a data code, and subsequently on the CRU to develop the data code which would provide for the access needed.	Release 2	Mar 2022
TSO	Timely delivery of joint TSO-DSO workplan and establishment of the JSOP operating model.	All Releases	Sep 2022
SEMC	Future Arrangements high level design decision with regard to management of distribution system customers' participation in future system services.	Release 2 Release 3	Dec 2021
CRU	Regulatory sandbox treatment or decision on regulatory treatment of services providers' access to system services markets.	Release 1	Oct 2022
CRU	Regulatory sandbox treatment (on pilot funding model) or decision on regulatory treatment of distribution system constraint costs and their recovery.	Release 2	Dec 2022
CRU	Decision on regulatory framework that defines the approach to the market framework for allocation of network capacity.	Release 3	Feb 2023

9

Quality Assurance

As with all transformation programmes, there are dependencies and constraints that require close and careful management to ensure the plan is delivered effectively.

9 QUALITY ASSURANCE

The National Network, Local Connections Programme commissioned an independent quality assurance review, undertaken by the Electrical Power Research Institute (EPRI), to assess the scope, review the proposed delivery approach, and to provide any findings or recommendations that may be pertinent at this early stage of the programme.



A summary of the key findings related to the Flexibility Multiyear Plan are captured below:



Project Initiation Document

The Project Initiation Document (PID) provides an excellent description of the overall Programme and the strategy behind it. This document provides the roadmap for implementing the National Network, Local Connections Programme tools, infrastructure, and processes.



DSO assumptions

Clear definition of assumptions and assumed role for the DSO. The role of the DSO in the energy transition is clearly defined as the interface to distributed resources. TSO/DSO coordination will provide access to these resources for wholesale market services and functions, as well as advanced forecasting.



Stakeholder Engagement

Excellent stakeholder involvement. This applies to internal stakeholders, engaged through numerous workshops, to external stakeholders engaged through a combination of workshops and the ESB Networks Innovation initiative. This is key as the National Network, Local Connections Programme effort involves integration of numerous stakeholders with the planning and operation of the grid.



Requirements

Detailed requirements' specifications have been developed. These specifications are the result of workshops with ESB subject matter experts as well as input from EV and support from other experts. They provide a great foundation for initial implementation of [programme] components.



Two early initiatives

Two early initiatives have tremendous potential to improve reliability and to provide a foundation for broader programme implementation:

- Increasing the visibility of the low voltage network. This involves significantly expanded monitoring, utilising AMI data, communications infrastructure and data systems. The effort is critical to deal with electrification of heat and transport as well as to take advantage of resources on the LV system that can contribute to flexibility needs.
- Continued automation of the MV grid. This is one of the most cost-effective reliability improvement measures and can be integrated with the operation of local resources over time.



Delivery approach

A staged approach to implement local markets for flexibility services has been developed with an initial approach outlined that mirrors approaches used by multiple DNOs in the UK. The initial efforts will provide the opportunity to contract for local services that can relieve expected distribution constraints. A longer-term development of a platform that integrates with aggregators, customers, communities and the TSO in real time is in the vision.



Delivery aligned to Power System Studies

Overall, the detailed specification of initial capability drops and the range of power system studies being performed to provide the basis for detailed roadmap development, modelling requirements and future operational approaches provides a well-structured approach to the initial programme deliverables and should be a foundation for the broader implementation.

10

Appendices

Appendix A
2030 POWER SYSTEM REQUIREMENTS

Appendix B
PHASED FLEXIBILITY MARKET PLAN

Appendix C
FLEXIBILITY PILOT ROADMAP

Appendix D
OPERATIONS SYSTEMS ROADMAP

Appendix E
SIGNAL AND DATA EXCHANGE GUIDANCE

Appendix F
CONSULTATION FRAMEWORK