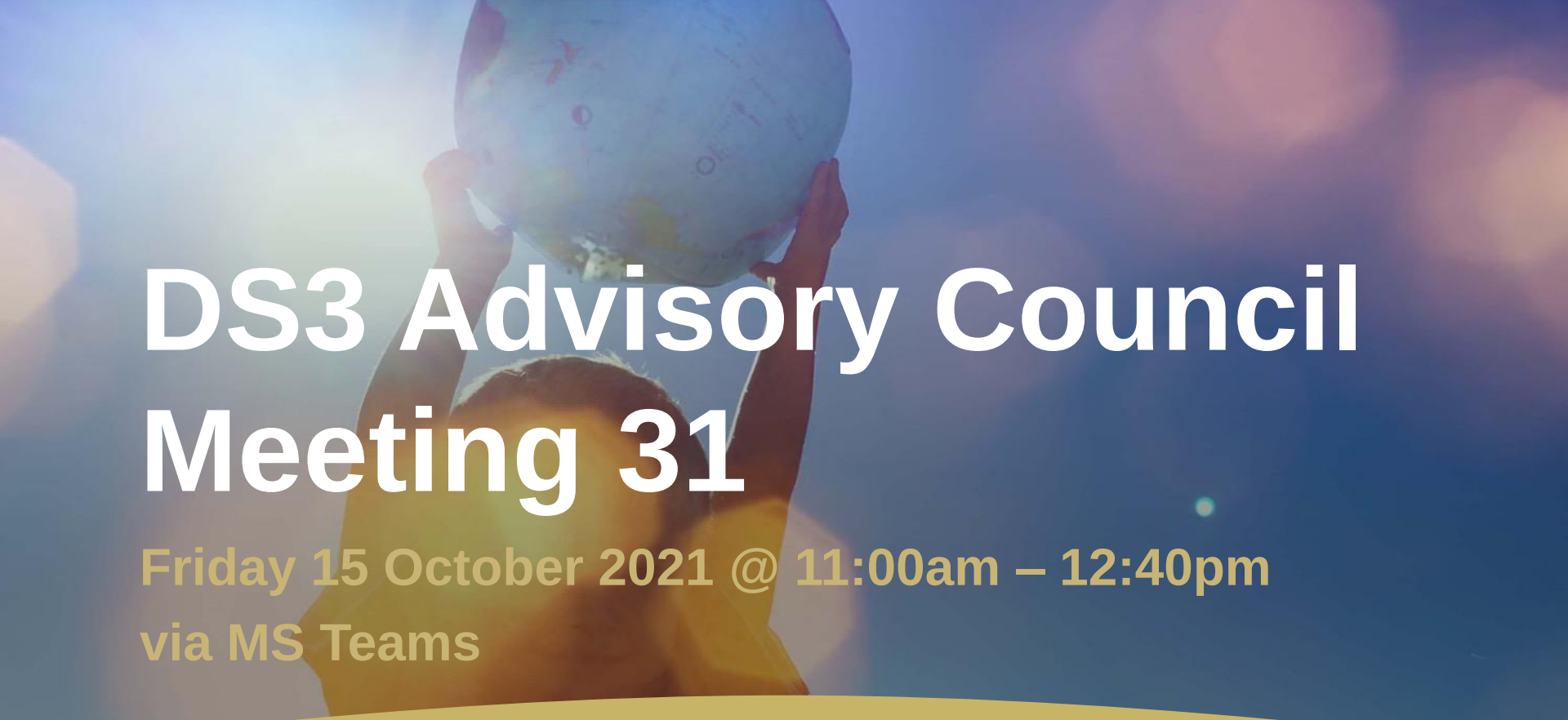

DS3 Advisory Council Meeting 31

Friday 15 October 2021 @ 11:00am – 12:40pm

via MS Teams

EIRGRID GROUP

Agenda

Chair: Eoin Kennedy

Topic	Time	Speaker
Introduction & Welcome	11:00	Eoin Kennedy, EirGrid (10 min)
Member Presentation – Nodal Controller	11:10	Tony Hearne, ESBN (10 min)
Wind Stats 2021	11:20	Emma Fagan, EirGrid (5 min)
Our future plans for the Grid Codes in Ireland and Northern Ireland	11:25	Eoin Kennedy, EirGrid (10 min)
DS3 Programme Updates	11:35	Emma Fagan, EirGrid (10 min)
DS3 Programme Close Out Plan	11:45	Emma Fagan, EirGrid (10 min)
Security of Supply	11:55	Diarmaid Gillespie, EirGrid (10 min)
Member Presentation - National Network Local Connections (NN-LC)	12.05	Ellen Diskin, ESBN (15 min)
SOEF Update	12.20	Ciaran Rabbitt, EirGrid (10 min)
AOB	12:30	All (10 min)

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Previous Actions

Actions	Owner
TSOs to present on our future plans for the Grid Codes in Ireland and Northern Ireland at the next DS3 Advisory Council meeting.	TSOs

ESB Networks
Nodal Controller update

DS3 Advisory Council 15th October 2021

Tony Hearne DSO-TSO Interface Manager

Presentation Outline

- Refresher – what is a Nodal Controller again?
- Update on progress
- Next steps

- Refresher – what is a Nodal Controller again?

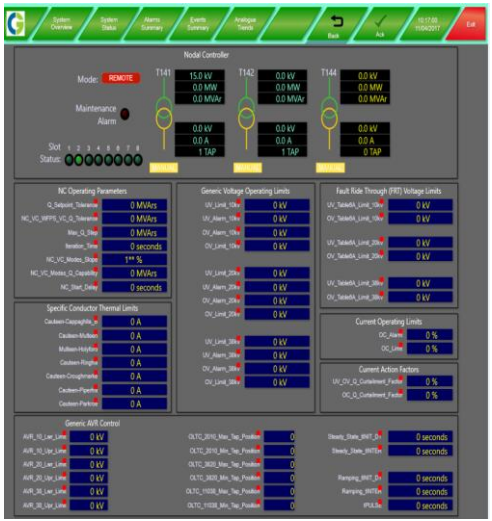
What is a Nodal Controller?

Concept:

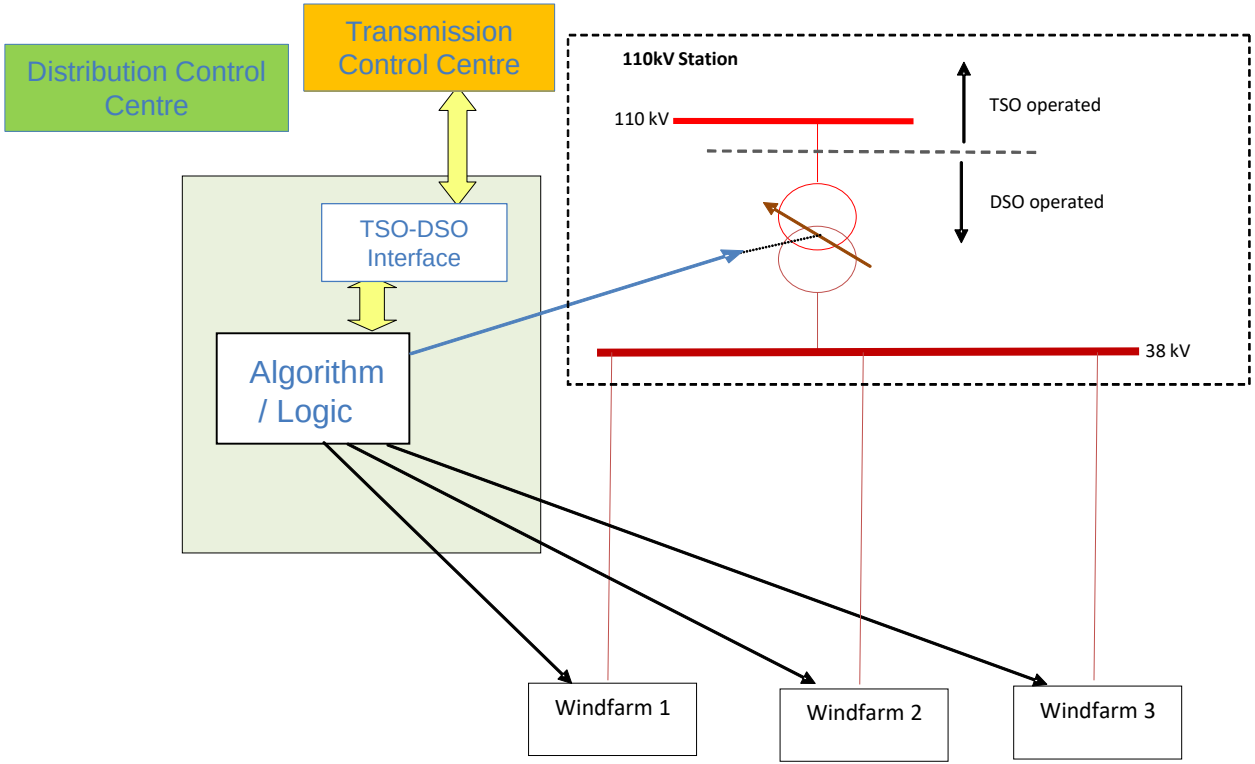
- To allow certain categories of larger distribution connected windfarms to contribute to the provision of reactive power support / voltage control to the transmission System

But

- Does so in a manner that keeps all distribution voltages and currents within operational limits
- Decision to trial at Cauteen cluster in Tipperary



How does it work?

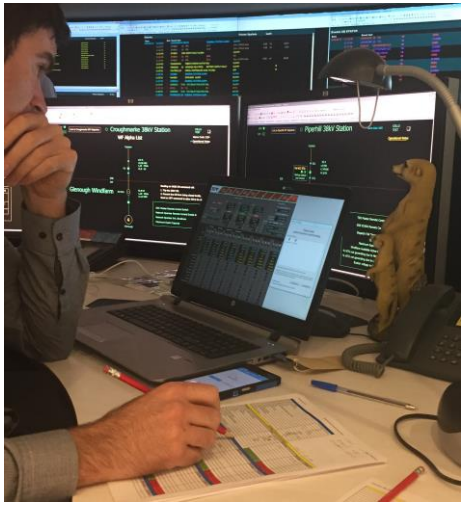


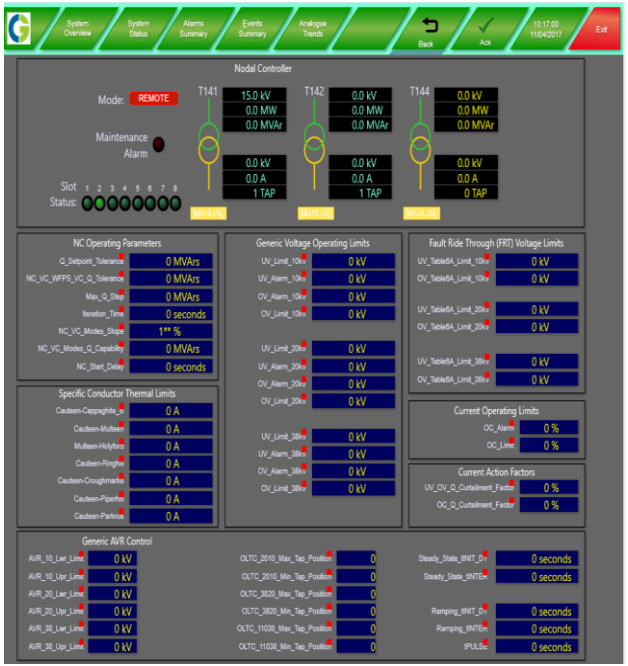
What does it look like? - 1

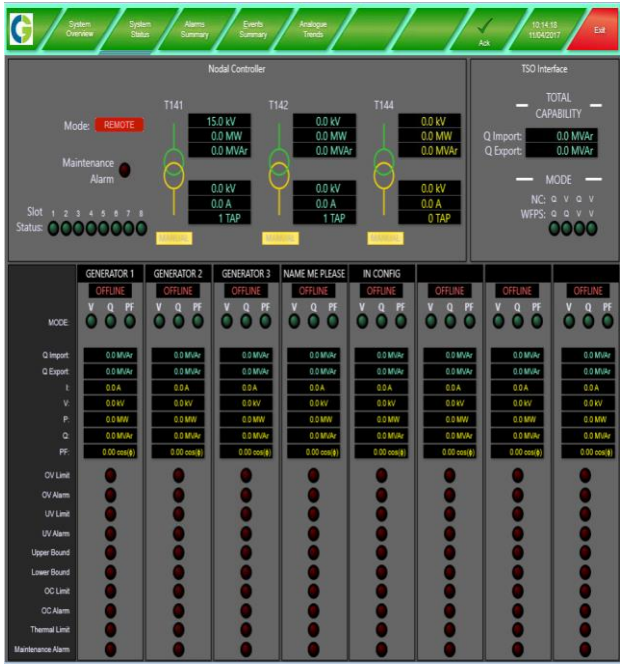
- DSO Master RTU
- OLTC panel

What does it look like? - 2

- HMI used to display/change “under the bonnet” parameters







Update on Progress

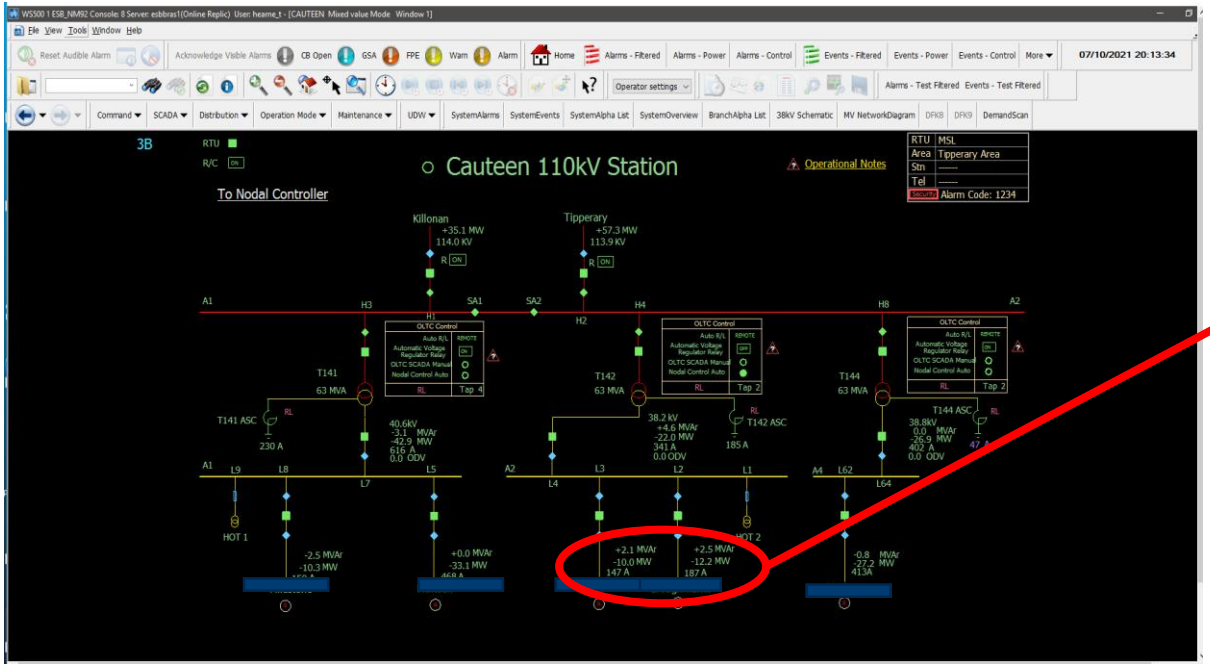
Update on progress – Cauteen Trial

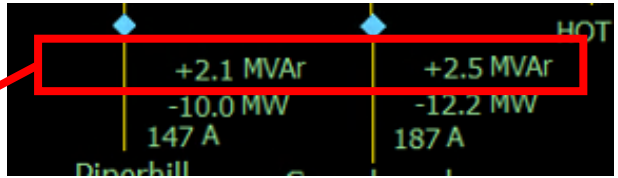
- Long journey to develop concept, move to design, build and install on sites
- Testing and Commissioning complete
- Three month soak test of operation from NCC started in November 2020
- Had to be suspended after a WF trip
- Resumption delayed due to;

1. Investigation of causes of trip and putting in place of mitigations
2. Covid restricting access to Control Centres

- Trial now resumed in October 2021

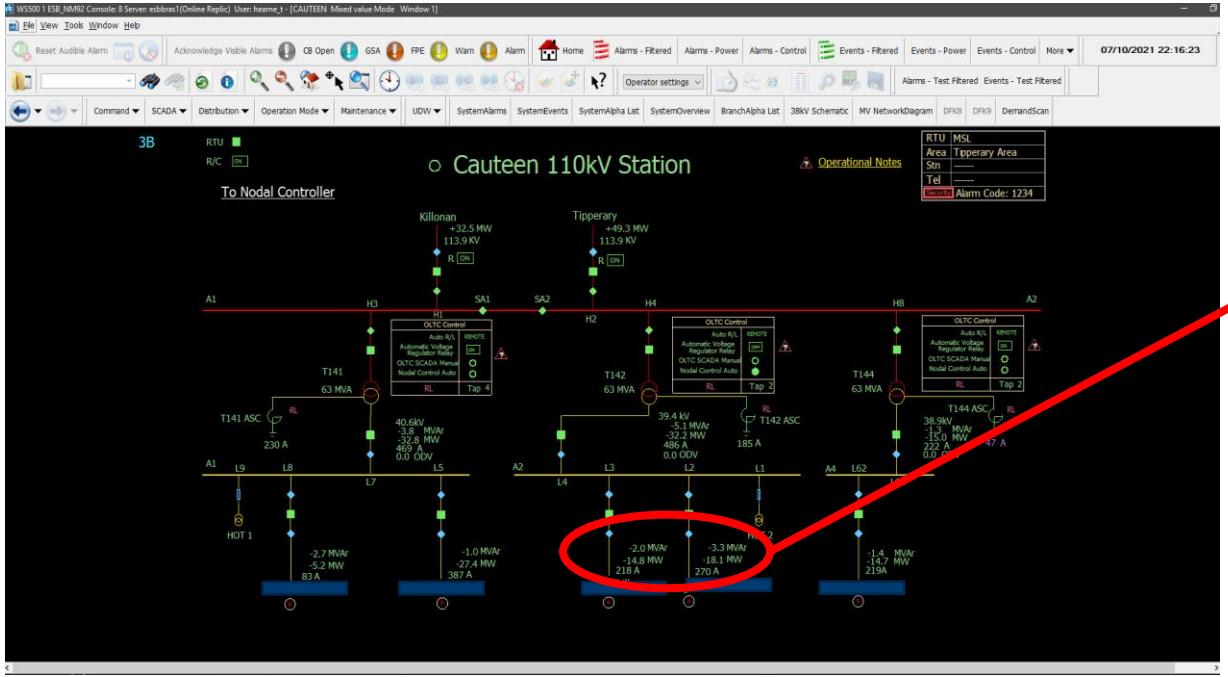
Nodal Controller in Operation - 1





Participating WFs absorbing MVArs to decrease 110kV voltage

Nodal Controller in Operation - 2

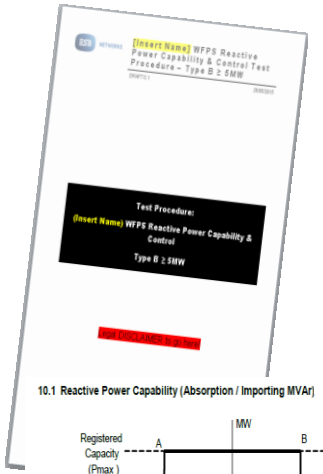


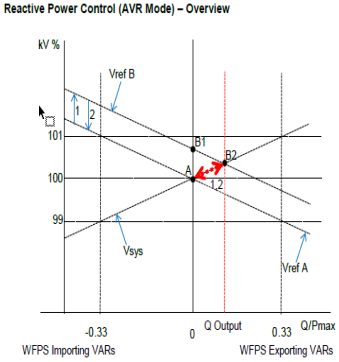
Participating WFs supplying MVArs to increase 110kV voltage

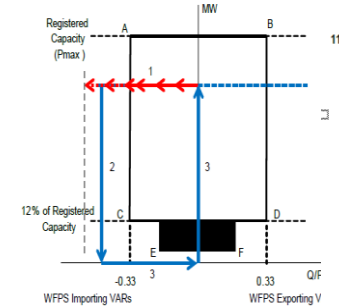
Update on progress – Topology 2 Reactive Power testing

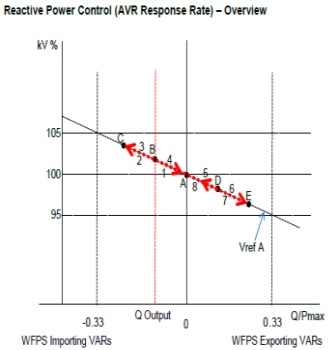
Steady progress on:

- RTU / Comms installations on ESBN side
- Reactive Power Testing for Topology 2 sites
- Learnings along the way, with some augmentations/changes to the ESBN Reactive Power Testing document









Next Steps

Next steps

- Complete NCC soak test trial
- Joint ESBN-EirGrid close-out report on trial to CRU

Thereafter:

- Broader ESBN-EirGrid-CRU discussion on options for wider roll-out, allocation of costs, SSRP etc.
- Socialisation of outcomes to Industry
- Further engagement/consultation

If this solution [or a variant] is adopted

Existing Topology 2 WF clusters will need to make informed decision based on

- Spectrum of costs of implementation of NC layer
- Any potential remuneration from SSRP

Layer 3: Steady State Reactive Power [SSRP] Procurement

Layer 2: Nodal Controller

Elective

Layer 1: Distribution Code compliance / Testing

Mandatory

Apart from that it’s all very straightforward….

Questions

System Data Summary

Emma Fagan

EIRGRID GROUP

All Island 2021 Summary

- Average wind generation of **1,208 MW** across January to September 2021.
- At times, wind generation provided up to **95%** of All Island demand with the maximum output of **4,472 MW** (15 min average) and **4,489 MW** (1 min average) in February 2021.
- The Power System was operated between 25% and 50% SNSP for **45%** of the time, and above 50% SNSP for **20%** of the time.

NB: Data is based on average quarter-hourly SCADA data
http://www.eirgridgroup.com/site-files/library/EirGrid/System-and-Renewable-Data-Summary-Report.xlsx

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Grid Codes Future Plans

Eoin Kennedy

EIRGRID GROUP

Development of Grid Codes: Need

- Need identified to focus on strategic development of Grid Codes
- This is due to the introduction of new technologies and the evolving role of existing technologies
- Some examples listed below
  - Existing/Evolving Technologies:
    - Demand Side participants
    - Large Energy Users
    - Battery Energy Storage Plants
  - New Technologies
    - Low Carbon Sources of Inertia
    - Hybrid Plants
    - Offshore Power Park Modules
    - Grid Forming Inverters
    - Dispatchable Demand

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Grid Code Strategic Development Group

- EirGrid and SONI have initiated a new Grid Code Strategic Development Group
- Internal initiative between Innovation & Planning and Operations to ensure coordinated strategic development of the Grid Codes is prioritised and advanced
- The group will progress Grid Code modifications through the existing Grid Code Review Panels
- Role will include:
  - Gap analysis of Grid Code requirements for new / evolving technologies
  - Monitor and engage with developments in European Network Codes
  - Recommend modifications
  - Identify any interim measures

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Grid Code Strategic Development Group: External Engagement

- Engagement with stakeholders on requirements for new technologies / evolutionary change will take place through the existing frameworks of the GCRP and the DS3 Advisory Council (or its replacement)

- Continued engagement with ESB Networks and NIE Networks on Distribution Codes through existing channels

- Engagement with ENTSO-E on European Network Codes

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DS3 Programme Updates

Emma Fagan

EIRGRID GROUP

System Service Procurement

- Gate 5 contract execution 01 Oct 2021
  - 5 new agreements
  - 15 amendments

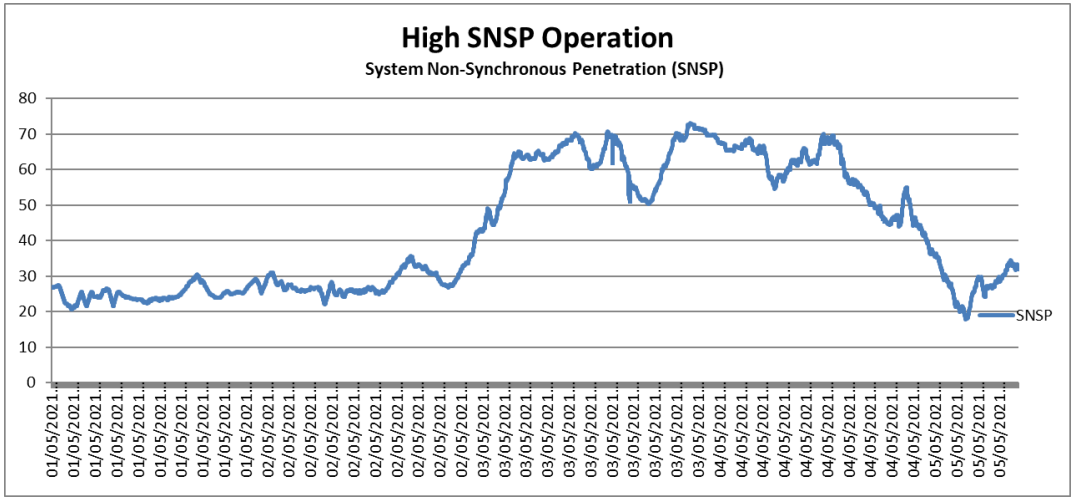
- Gate 6 will published on OJEU mid November for contact execution 01 April 2022.

Remaining Control Centre Tool Projects

- Ramping Margin Tool – Enduring
- Voltage Trajectory Tool

Operational Implementation

- 75% SNSP trial analysis to date
  - Trial is ongoing and is due to close out end March 2022.
  - Interim trial analysis period: 15 April 2021 – 14 October 2021
  - Hours above 70% SNSP to date: 3 hours, 21 minutes
  - Maximum wind: 3,716 MW



- RoCoF trial is ongoing. Due to close out March 2022.

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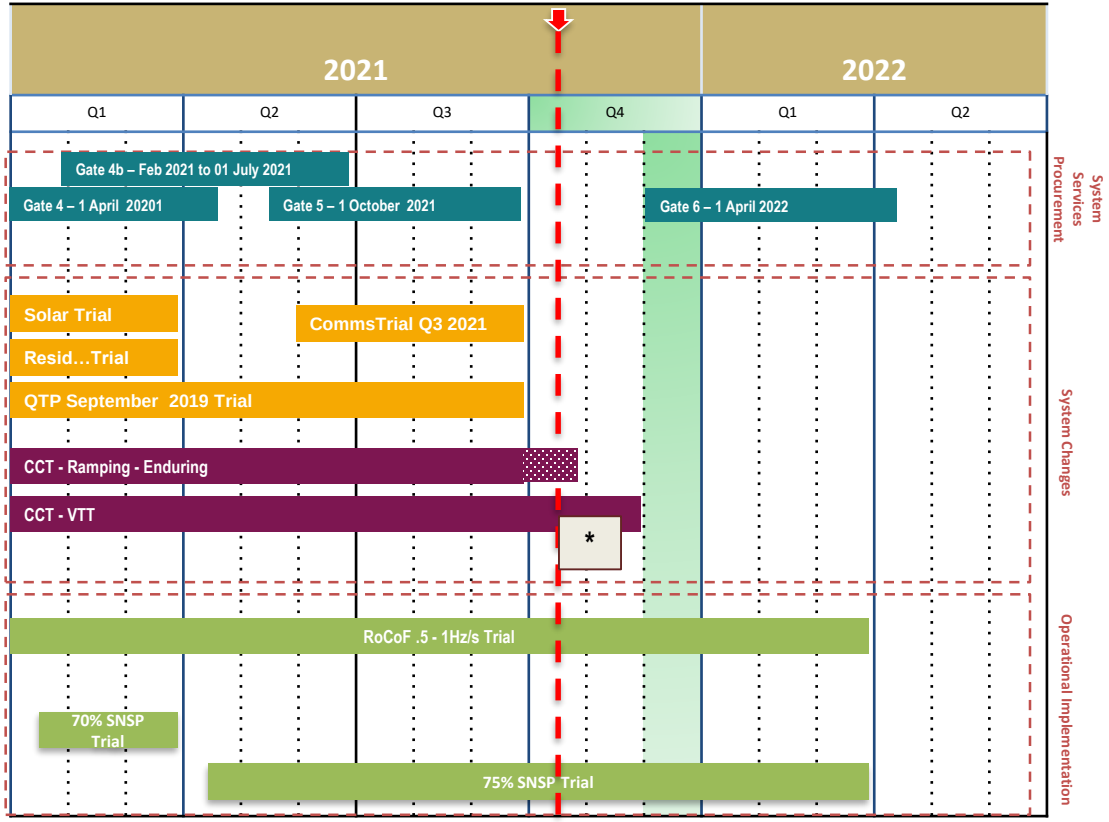
DS3 Milestone Plan October 2021



* VTT redesign and internal governance procedures

DS3 Close-out

- Remaining items from DS3 milestone plan
  - RoCoF Trial
  - 75% SNSP Trial
  - Voltage Trajectory Tool
- Expected close out Spring 2022
- Considering potential final close-out DS3 Advisory Council session:
  - To discuss workstream close out reports
  - To celebrate the success of the programme
  - To thank participants for many years of involvement

31

Future of the Advisory Council

- We will expand the remit of the Advisory Council to cover the Networks, Markets and Operations dimensions of *Shaping Our Electricity Future*
- Membership of the Advisory Council will be widened
- All existing members will be invited to join the new Advisory Council
- Similar meeting frequency to today i.e. 3 times per year
- Meetings likely to be longer to allow for appropriate presentation and discussion on a broader range of topics; having split sessions is an option being considered
- Many thanks for feedback to date; this continues to be welcome as we work to finalise the arrangements

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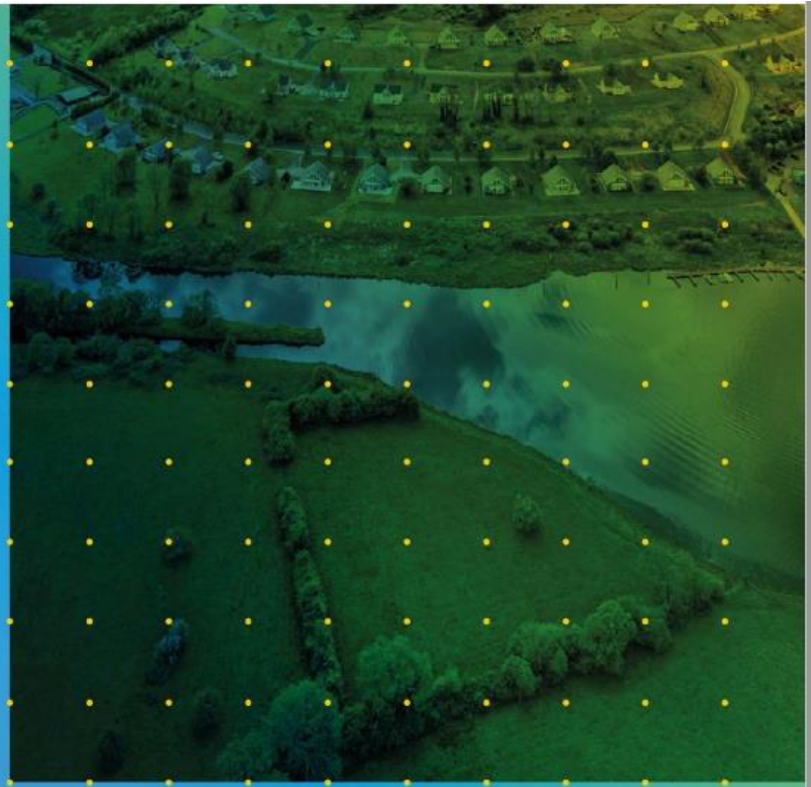
Security of Supply

Diarmaid Gillespie

EIRGRID GROUP

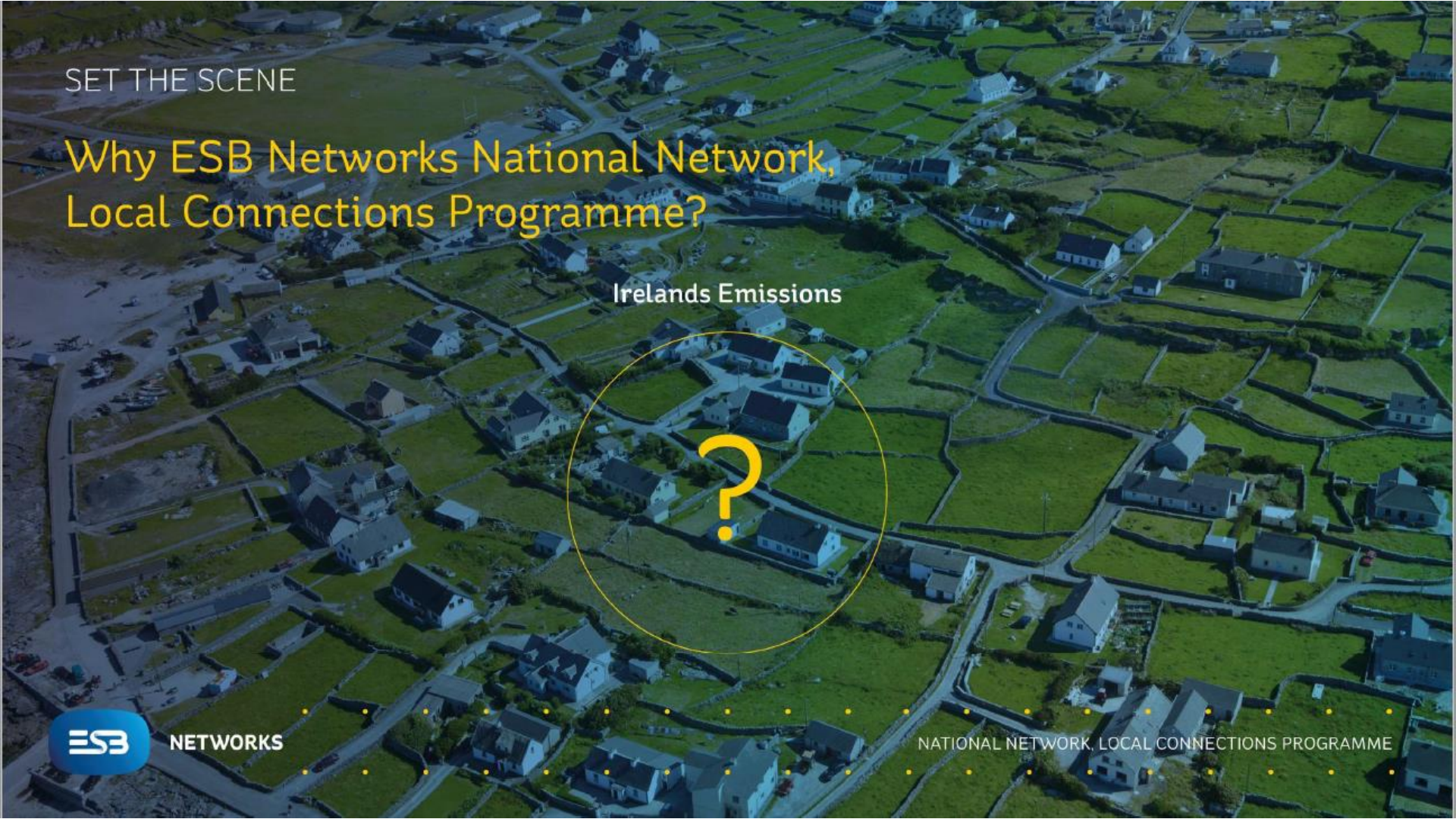
ESB NETWORKS

NATIONAL NETWORK LOCAL CONNECTIONS PROGRAMME



SET THE SCENE

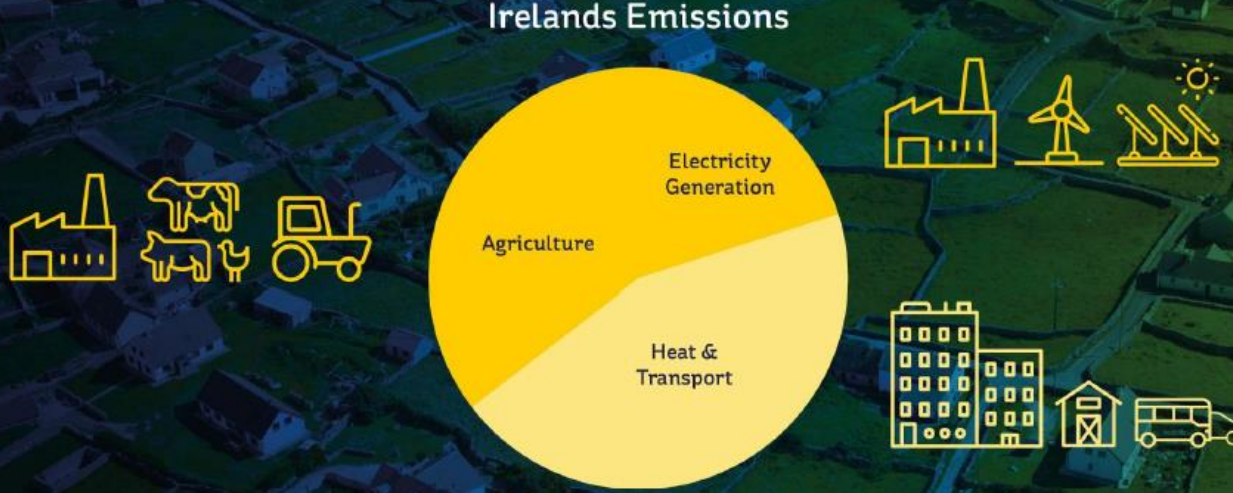
Why ESB Networks National Network, Local Connections Programme?



ESB NETWORKS

SET THE SCENE

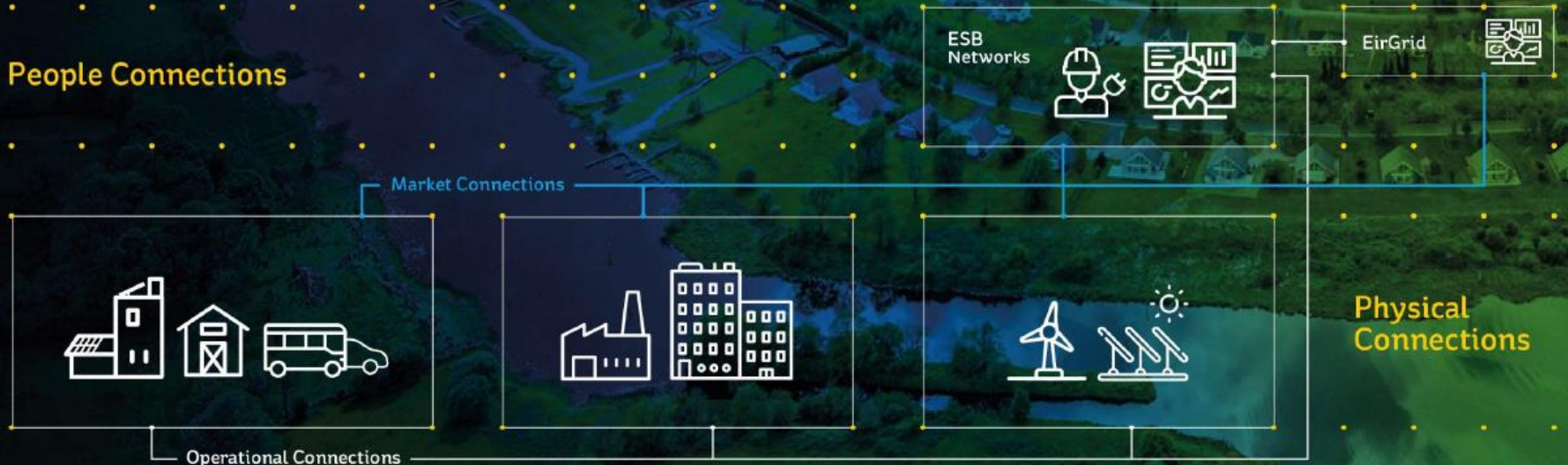
Why ESB Networks National Network, Local Connections Programme?



SET THE SCENE

Transforming our **Local Connections**
Working as a community on our National Network

People Connections

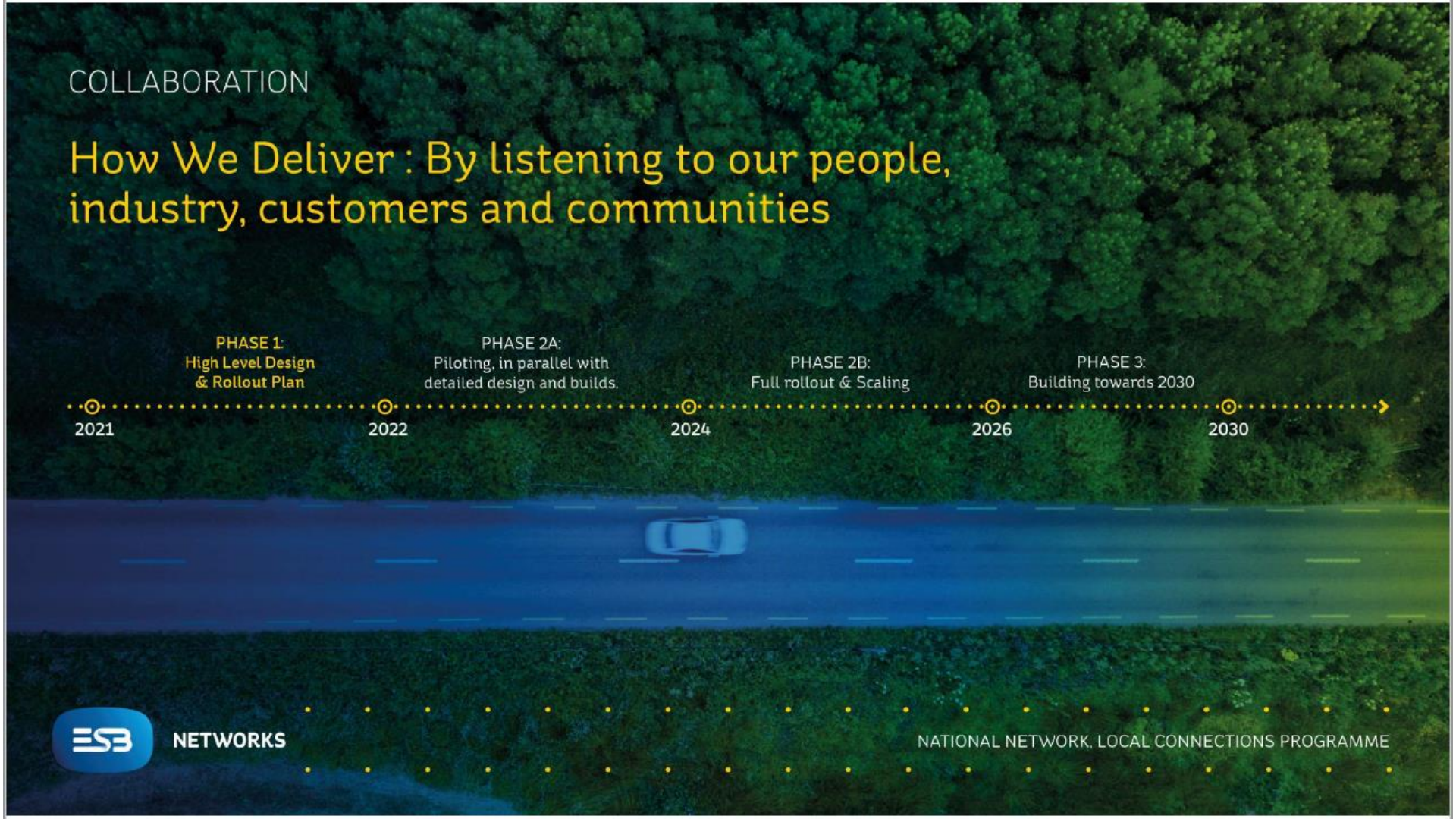


ESB NETWORKS

NATIONAL NETWORK, LOCAL CONNECTIONS PROGRAMME

COLLABORATION

How We Deliver : By listening to our people, industry, customers and communities

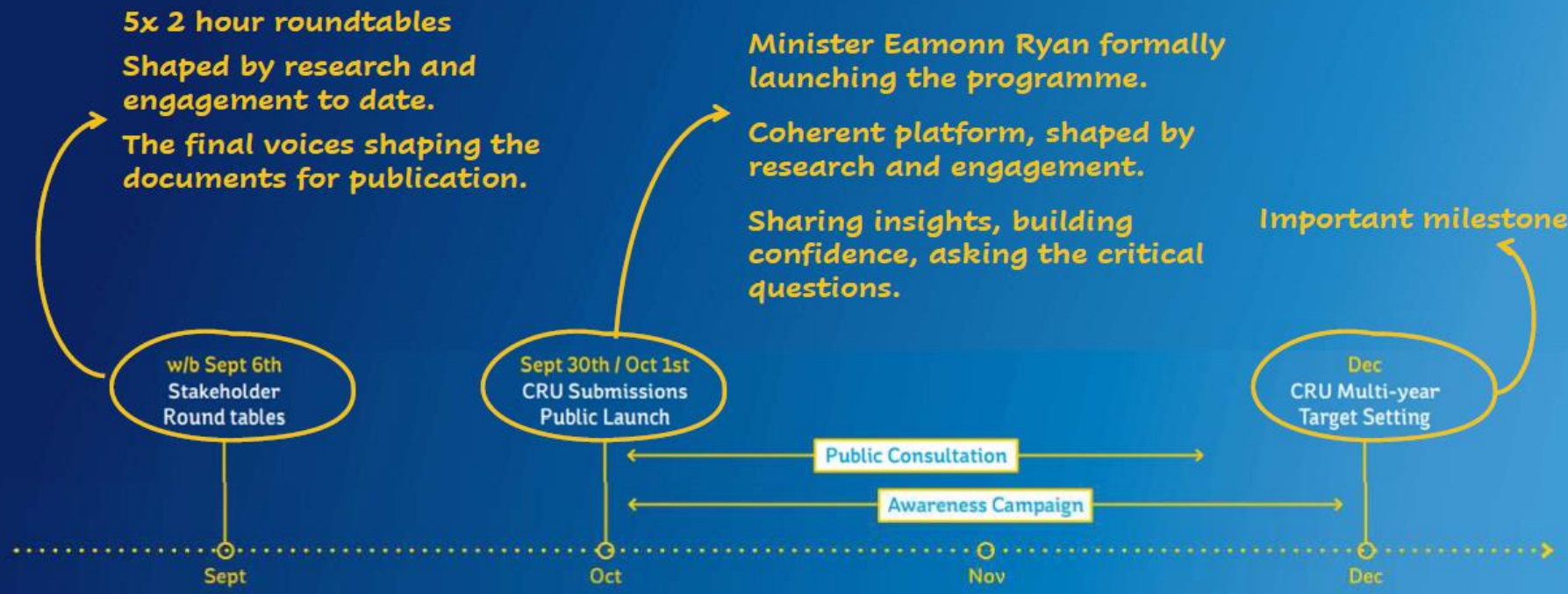


Launch


NETWORKS
National Network, Local Connections Programme

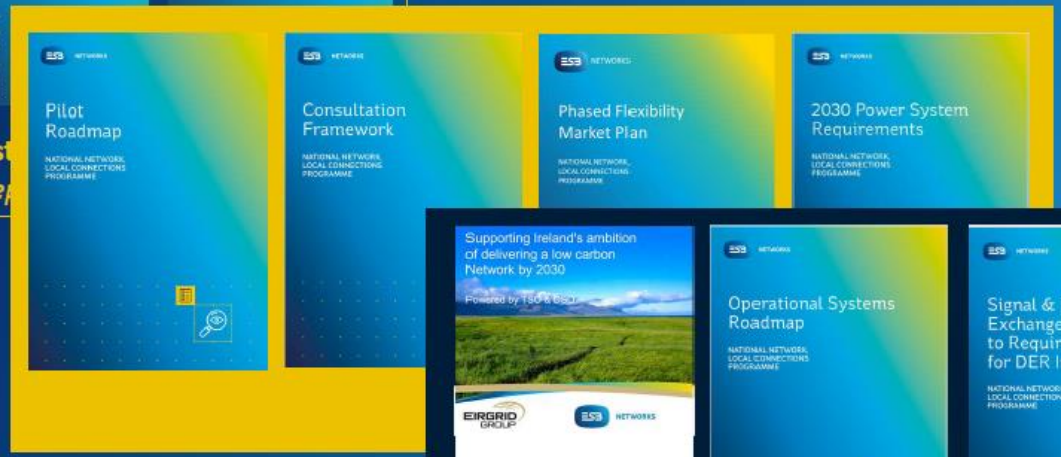

NATI
This will suppori
NETWORKS

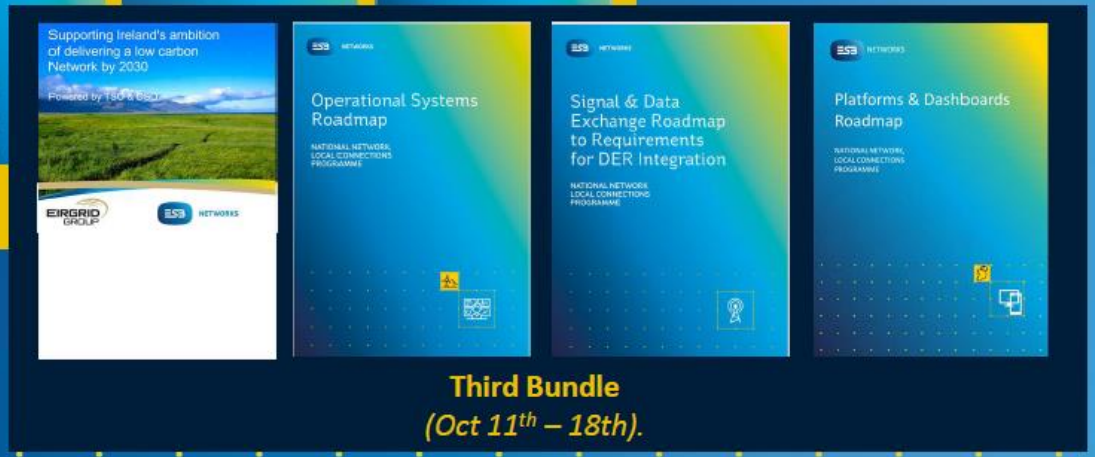
Launch, Consultation & Awareness Campaign



Public Consultation

Google "National Network Local Connections" or go to
www.esbnetworks.ie/who-we-are/national-network-local-connections-programme/

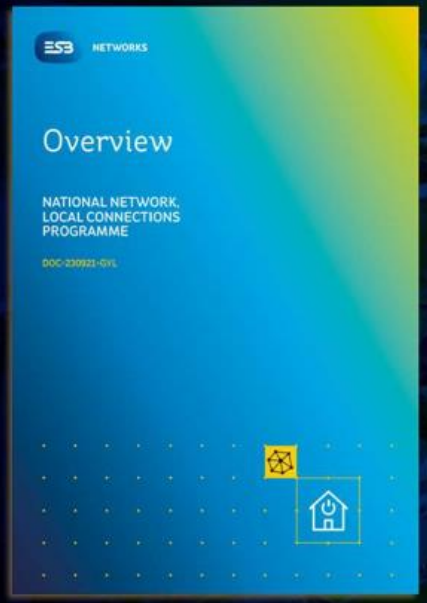




Third Bundle
(Oct 11th – 18th).

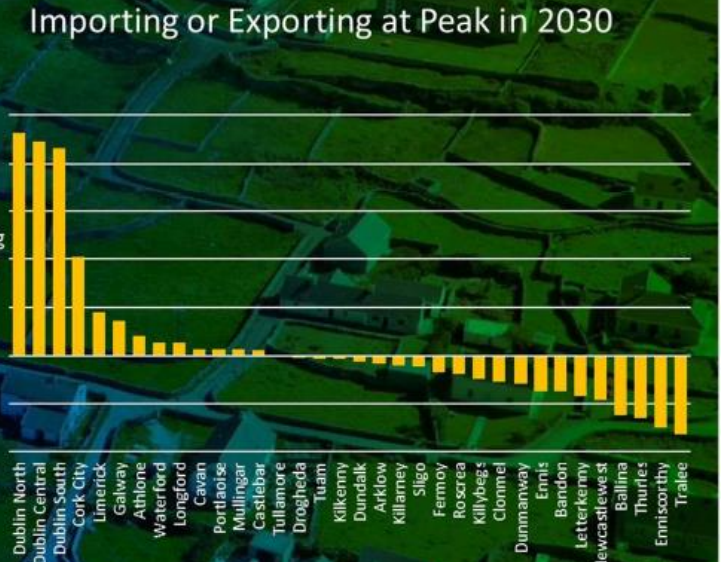
ESB NETWORKS

National Network, Local Connections Overview

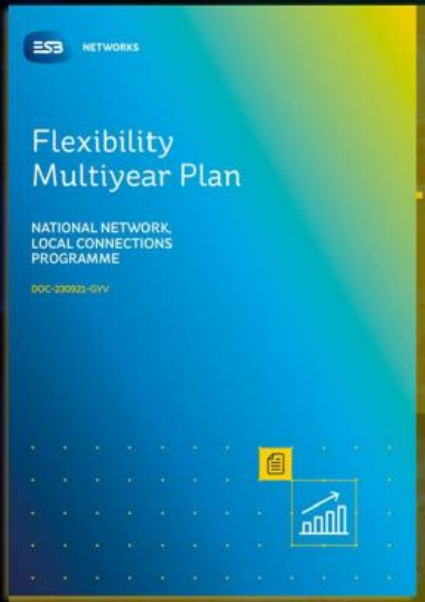


Published September 30th, consultation closes November 19th

- Scenarios, facts and figures explaining why
- Our core question: pace and scale



Flexibility Multiyear Plan



Published September 30th, consultation open until November 19th

Release 1: Proof of Concept

Release 2: Interim State

Release 3: Enduring State

2022 2023 2024 2025

I&C DSR DSO Market

I&C DSR TSO Market

Pilot of Scale (Res & Com) DSO Market

RESS 1 Early Access

Future Arrangements (Pilot) TSO Market

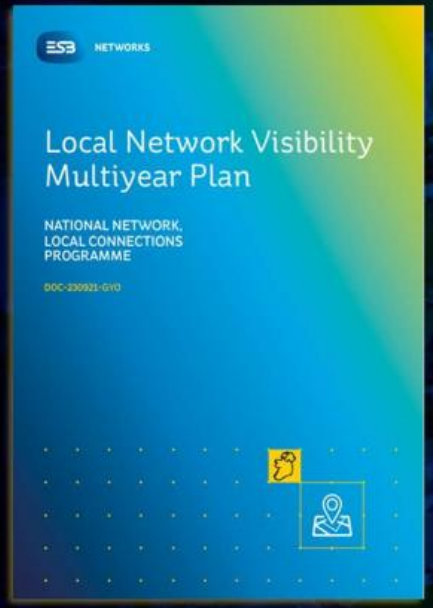
Future Arrangements (Enduring) TSO Market

Nationwide Rollout Commences

Opportunities to Participate

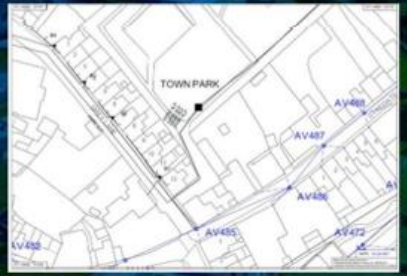
Our core question: pace & scale

Local Network Visibility Multiyear Plan



Published September 30th, consultation open until November 19th

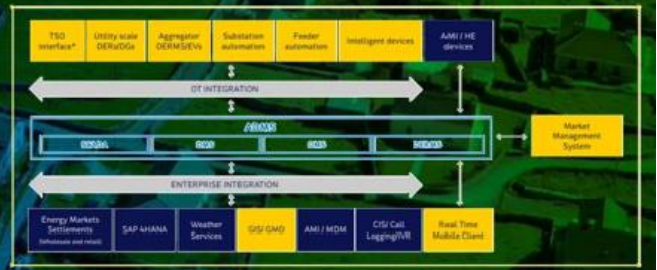
What is "visibility"



Mapping: What does it look like?

How will we develop it?

Monitoring: What and Where?



How will we integrate this into the future?

OK, now want to go a little deeper?

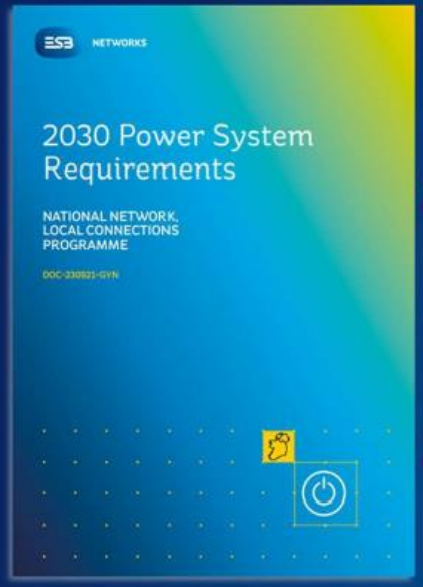
4x published last week

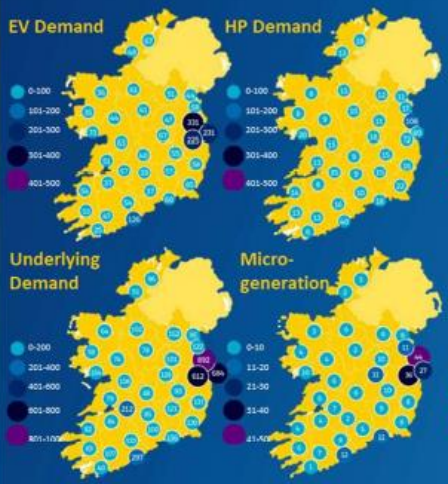
- 2030 Power System
- Piloting Roadmap
- Consultation Framework
- Flexibility Market Plan

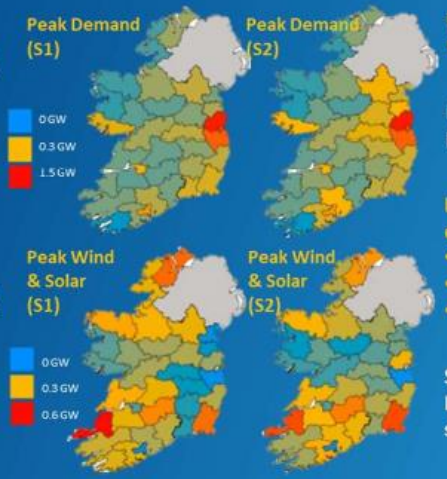
National Network, Local Connections Overview

Published October 8th, consultation closes November 19th

- Going beneath the surface on our scenarios, facts and figures
- Setting out how we developed them, and what they mean at a regional and local level.







Highest & Lowest Regional Uptakes

Highest & Lowest Regional Impacts

Impact of behavioural and economic trends

- New housing / retrofit
- Commuter belts
- Following early uptake

SEAI Planning Database, LARES tool, analysis of small area statistics

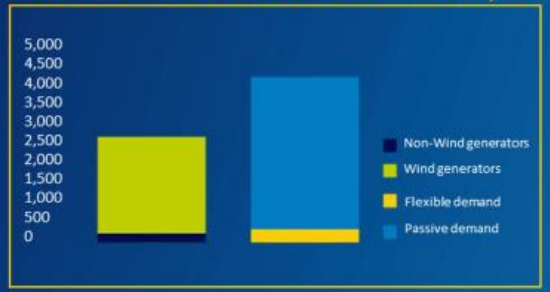
How were the scenarios developed?

What do they mean?

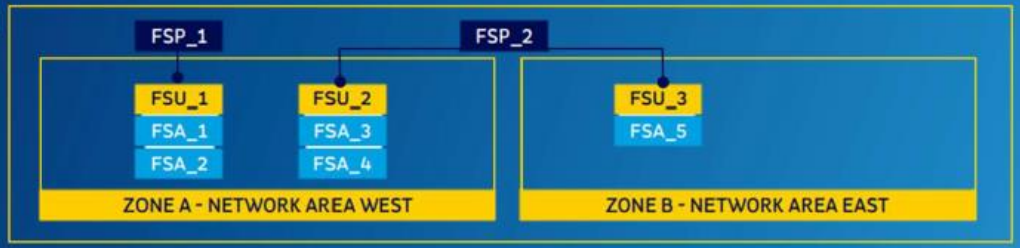
What does that mean for my region?

Phased Flexibility Market Plan

Published October 11th – 13th, consultation open until November 19th



Q3 YEAR AHEAD	Q4 YEAR AHEAD	Q4 YEAR AHEAD	Q1 SERVICE YEAR	Q2 SERVICE YEAR	Q4 SERVICE YEAR
Sign post locations and service needs	Prequalification of providers and assets	Request for Tender for prequalified providers	Tender evaluation	Contracts awarded	Service provision commences



OPTIONS & PROPOSALS FOR

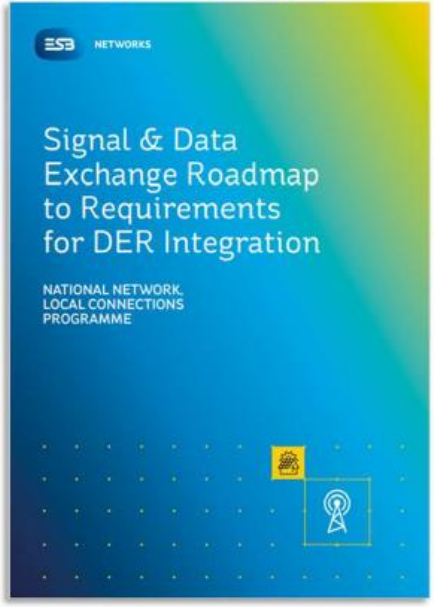
- Pilot Products
- Pilot Market Framework
- Longer term products
- Long term market framework
- Funding model options

OK, talk to me about the tech...

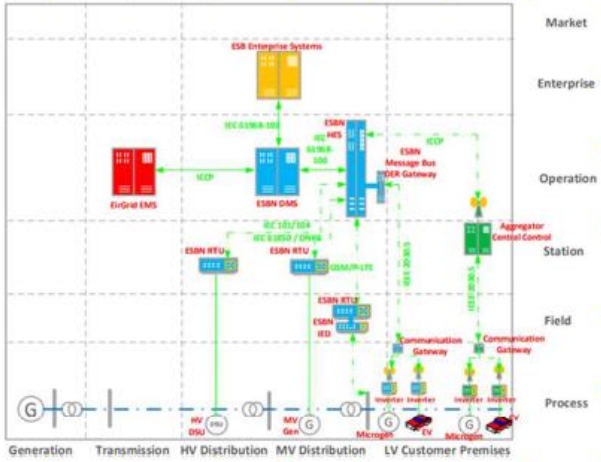
4x being published today

- Operations Systems Roadmap
- Platforms & Dashboards Roadmap
- Data & Signals Guidance
- TSO/DSO Multiyear Plan

Signals & Data Exchange Roadmap



Published October 11th – 18th, consultation open until November 19th



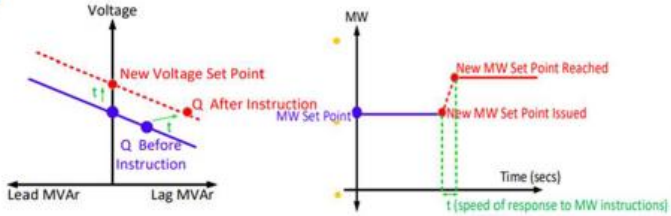


TABLE 12 ESB NETWORKS CHECK LIST CONDITIONS FOR DER PARTICIPATION

NO.	ESB NETWORKS CONDITIONS FOR DER PARTICIPATION	YES/NO
1	The DER shall be connected to the network asset being supported. ESB Networks will verify that the electrical connection is suitable.	
2	Generators and storage looking to export to the network shall have a long-term parallel connection and be compliant with the requirements of EU RfG Network Code, EN 50549-1 and IEEE 1547-2018 and all relevant DER communications standards.	
3	The DER shall have system capability to submit service availability.	
4	Reactive Power Service – DER shall be capable of operating in voltage droop control to automatically deliver changes in reactive power in response to system voltage changes.	
5	Reactive Power Service – DER shall be able to change the voltage set-point of its voltage droop control.	
6	Active Power Service – DER shall be able to change the voltage set-point of its voltage droop control.	
7	Active Power Service – The DER shall be able to deliver and manage, upon ESB Networks' request, a net change in the import or a change in the export, as seen by the distribution network.	
8	Active Power Service – The DER shall be able to declare a minimum running time. This is yet to be specifically defined.	
9	Provide Full Site-Specific Details – MPRN, MIC, MEC, monitoring and control capability & operational response capability.	
10	Provide full details of Technology Specific DER Characteristics – i.e. Storage Capacity (MWh) for Battery.	

TABLE 11 RESPONSIBILITY MATRIX - ESB NETWORKS AND CUSTOMER/AGGREGATOR

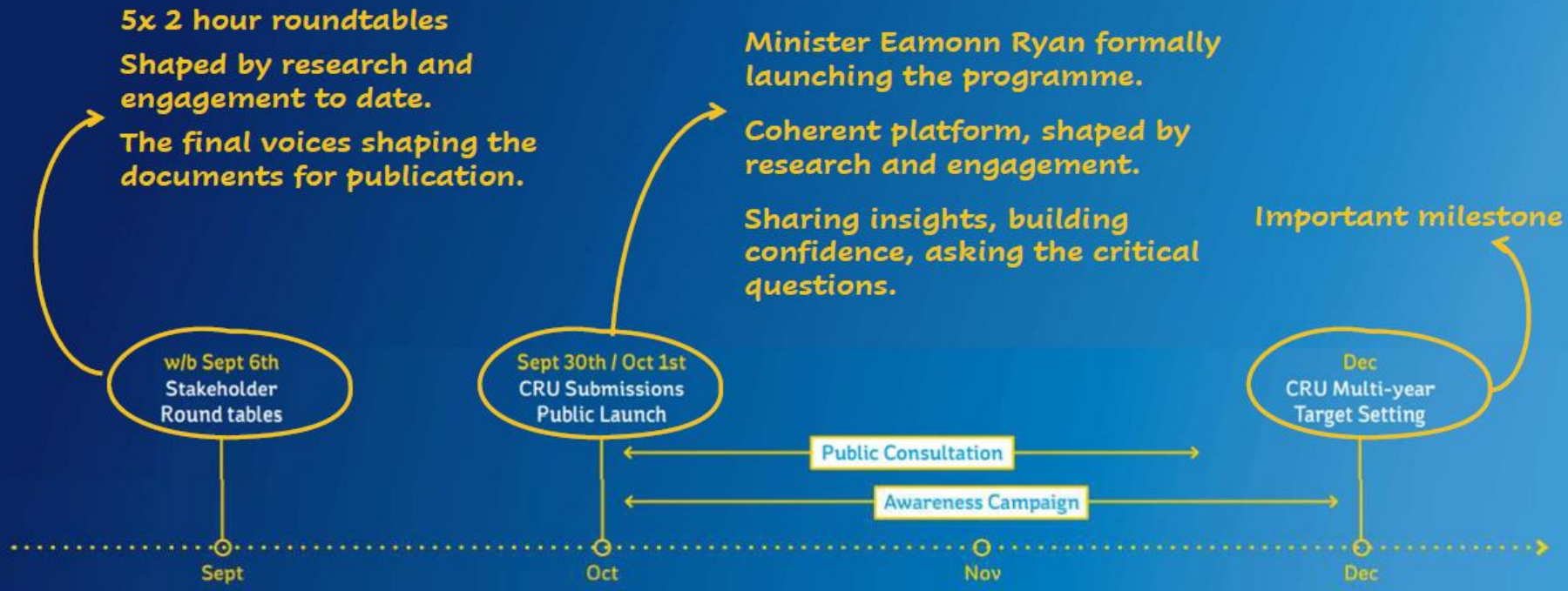
NO.	DATA EXCHANGE BETWEEN ESB NETWORKS AND CUSTOMER/ AGG DER	SOURCE	DESTINATION	DESCRIPTION
1	Active Power Upper Limit	ESB Networks Operational Systems	DER Cust/ Agg	Maximum (kW) limit - To control output active power of the DER to maintain within the appropriate limit.
2	Active Power Lower Limit	ESB Networks Operational Systems	DER Cust/ Agg	Minimum (kW) limit - To control output active power of the DER to maintain within the appropriate limit.
3	Reactive Power Upper Limit	ESB Networks Operational Systems	DER Cust/ Agg	Maximum (kVAr) limit - To control output reactive power of the DER to maintain within the appropriate limit.

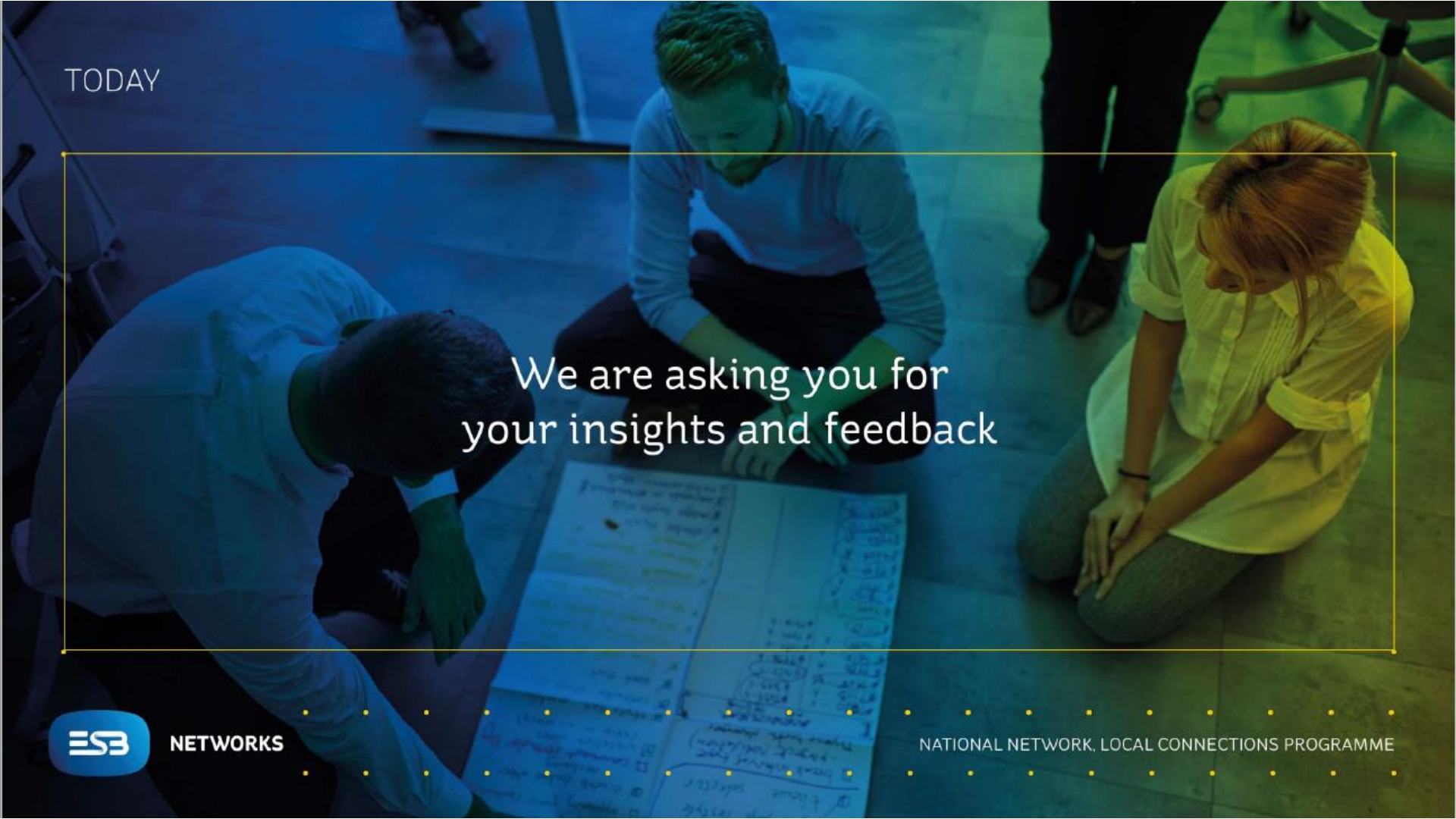
ESB NETWORKS

NATIONAL NETWORK, LOCAL CONNECTIONS PROGRAMME


...so...

Launch, Consultation & Awareness Campaign




TODAY
We are asking you for
your insights and feedback
ESB NETWORKS
NATIONAL NETWORK, LOCAL CONNECTIONS PROGRAMME

Shaping Our Electricity Future

Ciarán Rabbitt

EIRGRID GROUP

SHAPING OUR ELECTRICITY FUTURE

- Develop an **integrated vision** of the power system and market in 2030.

- To be used as the basis for developing a **deliverable, robust solution for 2030**, achieving at least 70% RES-E for Ireland and Northern Ireland.

- The work will be used to:
  - **Articulate the plan** for its delivery, and
  - Create the **framework for an informed discussion with stakeholders.**

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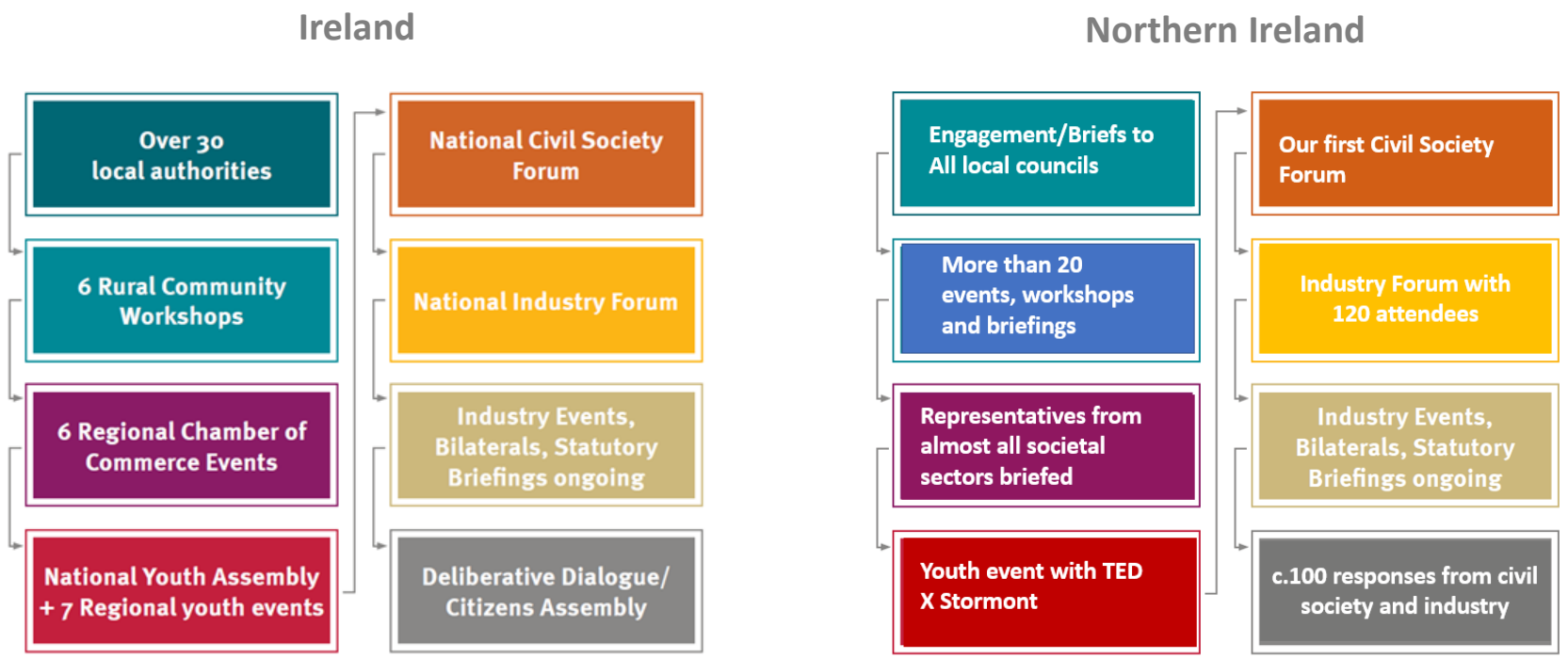
SHAPING OUR ELECTRICITY FUTURE – FOUR STRANDS

INTEGRATED PLAN

EIRGRID GROUP

SPRING 2021 CONSULTATION – SUMMARY



Engagement Impact

492
Public Responses

Questionnaires	225
Submissions	169
Campaigns	98

80
Industry Responses

Questionnaires	20
Submissions	60

Higher number of responses than usual for strategic non-grid project consultations

Lower opposition campaign responses than usual

The public care about the future of the electricity system and they want an active role in the transition to a low carbon system

Participants fed back an increased understanding of EirGrid and SONI's roles

All stakeholder segments consistently complimented the open, transparent and innovative approach

* Numbers Include SONI and EirGrid

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PUBLIC - KEY FEEDBACK THEMES

- **Agriculture -** A key concern of agriculture communities was the recognition and protection of landowner rights where infrastructural development takes place on farmland.

- **Cost** - public and civil society stakeholders are seeking further information on how SOEF will impact the consumer in terms of electricity bills, levies and other taxes. There is no appetite for the cost of electricity to rise in the transition to 2030.

- **Clarity around EirGrid and SONI Roles** - general public were not fully aware of EirGrid and SONI's respective roles in relation to the electricity grid. Similarly, this was the case across broad civil society.

- **Electricity Demand and Economic Development** - repeated references to the need for rural communities to share in any economic improvements as a result of renewable integration. This includes encouraging large energy users to locate in regional cities.

- **Energy Storage** – consistently raised as a means of facilitating renewable energy on the grid, in addition to contributing to security of supply.

- **Micro-generation –** requests from consumer and community groups that EirGrid and SONI advocate for developments in microgeneration in order to accelerate adoption rates, particularly in Ireland.

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PUBLIC - KEY FEEDBACK THEMES (2)

- **Security of supply and data centres –** some commentary on frequency of amber alerts. Regional growth of data centres seen as a possible aid to economic development in the regions while alleviating the pressure on the Greater Dublin Area.

- **Community Ownership of Renewables** - many stakeholders believed a community-led approach to renewable integration would provide significant community benefit, support acceptance of energy infrastructure and demonstrate a grassroots contribution to achieving climate action targets.

- **Offshore Electricity Generation -** large amount of support for offshore generation. Many stakeholders felt that offshore generation has a less negative environmental and visual impact. In Northern Ireland, concerns that offshore capacity may not be in place by 2030.

- **Onshore Electricity Generation** - Wind energy was widely considered and accepted as a solution to support the decarbonisation of the grid. However, in Ireland the public generally had a preference for solar and expressed acceptance challenges around the facilitation of onshore wind infrastructure.

- **Public Engagement Processes** - engagement needs to be fundamental to EirGrid and SONI's grid development processes.

- **Public Acceptance / Licence** – a clear need for 'public acceptance' or a 'social licence' to deliver the renewable ambition.

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INDUSTRY - KEY FEEDBACK THEMES

- **Renewable targets** – 70% renewables is a step on a journey towards a net zero energy system and this should be implicit in any plans from EirGrid and SONI.
- **Shaping Our Electricity Future Advisory Council –** many industry respondents suggested setting up of a SOEF Advisory Council like the DS3 Advisory Council.
- **Network reinforcements** – commence building the required network infrastructure to support renewables as quickly as possible.
- **Network delivery** – public acceptance is crucial for the timely delivery of new grid infrastructure.
- **Alternative technologies** – consider mature non-wires alternatives and new technology options in any future development of the network.
- **Coordinated planning** - planning for the operation and development of the transmission and distribution system must be coordinated between the TSOs and DSOs in Ireland and Northern Ireland.
- **System services -** need for electricity market design changes and incentives to ensure delivery of services to balance high-levels of SNSP.

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INDUSTRY - KEY FEEDBACK THEMES (2)

- **Market enhancements** – electricity markets must evolve significantly to support investment for new and existing market participants.
- **Security of supply** – similar to public engagement feedback, security of energy supply is an important consideration in reaching the renewables target.
- **Operations processes and tools** – must evolve to manage increased variable generation mix with a focus on facilitating increased penetration of renewable generation.
- **Costs** – many industry respondents noted that the cost included in the consultation report did not reflect the overall cost of meeting the renewable ambition.
- **Resourcing** – considered that EirGrid/SONI requires additional funding and resources to implement the proposed program of work.
- **Stakeholder engagement -** ongoing cross-societal engagement will be required throughout the energy transition to ensure stakeholders are kept informed and continue to contribute to the implementation process.

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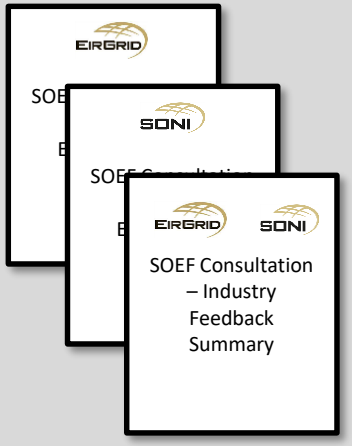
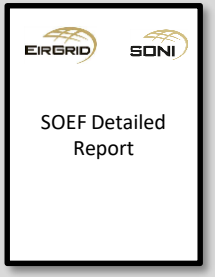
NEXT STEPS

Consultation Feedback Reports



Accessible Summary

Detailed report



- Publish suite of Shaping Our Electricity Future reports.
- Move to implementation phase.
- Dynamic plan – revision published within 24 months.

AOB

Next meeting Spring 2022

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Thank you

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