

Multi-year DSO/TSO Work Plan Covering 2022 - 2026

Joint System Operator Programme
Summary of Responses Received
to Consultation - April 2022

DOC-230921-GYW



NETWORKS

Contents

1.	Executive Summary	3
2.	Joint System Operator Programme Overview	5
3.	Feedback Received on Stakeholder Engagement	8
4.	Feedback Received on Delivery of Plan and Transparency of Approach	12
5.	Feedback Received on Whole-of-System Approach	16
6.	Feedback Received on Facilitating New Technology	20
7.	Feedback Received on Reducing Dispatch Down	28
8.	Feedback Received on Security of Supply	33
9.	Feedback Received on Additional Activities	35
10.	Feedback Received on Balanced Scorecard Proposal	40

Executive Summary

Multi-Year DSO/TSO Work Plan
Covering 2022 - 2026



Executive Summary

In October 2021, ESB Networks and EirGrid published a joint programme of work for public consultation (ESB Networks ref. DOC-230921-GYW). The published document was prepared by the System Operators (SOs) for consideration by stakeholders to align with the requirements in CRU/20/154 (PR5 Regulatory Framework Incentives and Reporting).

Contained in the document was a multi-year plan to be delivered in partnership, to further develop the electricity system and its secure and reliable operation. The proposals included a detailed 3-year plan for 2022-2024 and a high-level plan for 2025-2026. The proposed joint programme of work was underpinned by the need to enhance current and future TSO-DSO working arrangements, collaboratively supporting, and enabling, the transition to Ireland's ambitious targets for renewable electricity and electrification of heat and transport.

Following closure of the public consultation on 19 November 2021, and in response to the feedback received, ESB Networks and EirGrid are now jointly publishing this detailed consultation response, acknowledging, and reflecting on, the full range of respondents' feedback. The multi-year programme of work was submitted to the CRU in October; we are keen to outline the System Operators' proposed next steps to address immediate, actionable feedback received that is within the scope of the Multi-Year Work Plan. We acknowledge additional, less immediate feedback contained in the responses received; this feedback has not been disregarded or overlooked and will be addressed in this document.

The full range of respondents' feedback has been grouped, themed and summarised in subsequent sections, structured as follows:

- **Feedback Received on Stakeholder Engagement**
- **Feedback Received on Delivery of Plan and Transparency of Approach**
- **Feedback Received on Whole-of-System Approach**
- **Feedback Received on Facilitating New Technology**
- **Feedback Received on Reducing Dispatch Down of Renewable Generation**
- **Feedback Received on Security of Supply**
- **Feedback Received on Additional Activities**
- **Feedback Received on Balanced Scorecard Proposal**

We would like to take this opportunity to thank – and acknowledge the inputs and constructive feedback of – the 11 consultation respondents as follows:

- (i) Bord Gáis Energy,
- (ii) Bord na Móna,
- (iii) Demand Response Association of Ireland,
- (iv) EDF Renewables Ireland,
- (v) ESB Generation and Trading,
- (vi) Píclo, (vii) Spatial Outlook,
- (viii) The Electric Storage Company,
- (ix) Transport Infrastructure Ireland,
- (x) UCD Energy Institute, and
- (xi) Wind Energy Ireland.

We welcome the positive feedback and engagement contained in the responses and note the specific points to be addressed.

Joint System Operator Programme Overview

2

Multi-Year DSO/TSO Work Plan
Covering 2022 - 2026

The Joint System Operator Programme has been established to reflect how EirGrid, in its role as Transmission System Operator (TSO), and ESB Networks, in its role as Distribution System Operator (DSO), are jointly addressing electricity system and customer needs through whole-of-system solutions, in a collaborative and effective manner.

The programme objectives are:

- 1 Support societal and economic growth in a sustainable and secure manner, consistent with our license obligations, through further development of the transmission and distribution systems.
- 2 Support the delivery of Ireland's 2030 and longer-term climate and energy policy objectives through collaboration between the TSO and DSO
- 2 To address the Commission for Regulation of Utilities' (CRU) objectives for TSO/DSO coordination as set out below:
 - The management of dispatch down and curtailment
 - Addressing security of supply and constraint management especially in the Dublin region
 - A whole of system approach to the optimisation and meeting of system and customer needs.
 - Jointly developing effective processes for the deployment of new technology on the grid and in operations
 - Optimisation of the existing grid to reduce the requirement for new build where possible
 - Where the need for new infrastructure is identified, the collaborative development of same
 - Enabling the provision of system services from new technology introduced on the transmission and distribution network

To meet the ambition of the Climate Action Plan 2021 – and any future increased ambition – the TSO and DSO will need to work in collaboration with market participants, overcome various challenges and develop new sources of system services on the transmission and distribution systems; this will help to ensure an efficient use of the network by maximising its utilisation while improving its resilience and robustness. To solve the challenges that will present themselves and secure the necessary services, both the TSO and DSO are committed to working in partnership to ensure that the end customer will continue to receive a high quality, and reliable, supply of electricity.

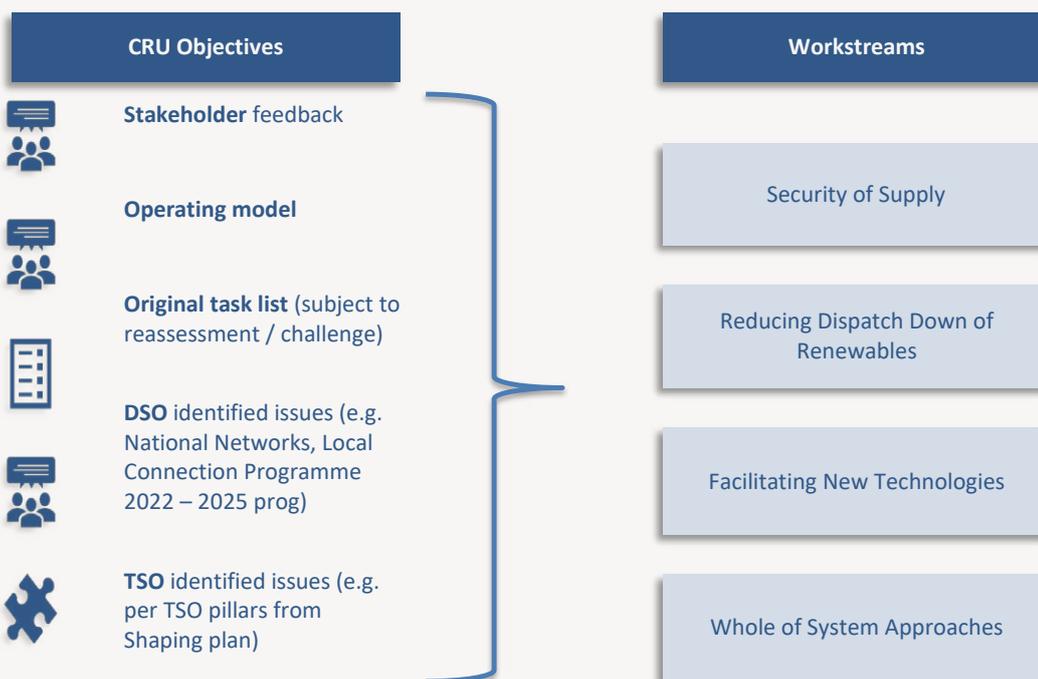
This joint programme of work addresses the points where both organisations have identified that a whole-of-system, or joint, approach is needed to further enable the development of the electricity system through our respective work programmes, in our respective roles. The plan reflects areas where the TSO and DSO must work in partnership to enable new technologies (on the transmission and distribution systems) participate in new solutions, apply whole-of-system approaches to resolving system needs, and work collaboratively to reduce dispatch down of renewable generation and improve security of supply.

A variety of components fed into the development of the multi-year DSO/TSO work plan 2022-2026, including the (i) Climate Action Plan 2019, (ii) regulatory framework as set out under PR5, (iii) legal and policy framework at an EU and Irish level, and (iv) regular engagement with our stakeholders. Based on initial feedback, we consolidated objectives set out by the CRU for TSO/DSO coordination into four workstreams, focused on four core outcomes.

The proposed approach within the plan is an iterative one, allowing us to learn what works and what needs to be adapted. We will endeavour to pilot activities with our customers and communities early and often in the programme. We will adapt the multi-year plan in response to changing customer needs, changes in technology maturity, stakeholder input and pilot learnings.

Customer participation and engagement will be a critical component to ensure that pilots and activities deliver enduring outcomes. We will engage actively with our customers, industry and community stakeholders to ensure that we address barriers to entry and shape incentives to maximise participation within the limits of our funding.

The initiatives contained within each workstream focus on the points where TSO-DSO coordination is vital. Each organisation will have its own unique initiatives under the different licence obligations, which will progress in parallel with this programme and, in many instances, interact with it.



Feedback Received on Stakeholder Engagement

Multi-Year DSO/TSO Work Plan
Covering 2022 - 2026

Many respondents have requested additional stakeholder engagement, and the System Operators recognise this need to engage with stakeholders, and communicate to industry, on a regular basis. Below, we summarise the feedback received and set out how we propose to address the key points raised.

Theme	Feedback Received	System Operators' Response
Stakeholder Engagement	In relation to selective co-ordinated demand management, we urge that, in addition to developing a consistent systematic business process between the SOs, there is comprehensive consultation with impacted customers and service providers, including aggregators, so that they can mitigate potential adverse impacts in terms of site energy consumption and market participation, where applicable.	The System Operators have Grid Code and Distribution Code obligations to implement, managing demand management schemes, accordingly; any changes to these codes will be progressed in line with the normal code modification process. Moving forward, the SOs will consider the most appropriate way to engage with customers impacted by changes to demand management schemes.
Stakeholder Engagement	Access to more reliable forecasts will enable better decision making. Defining the needs of market participants in this work is important.	We would point to Tasks RDD1, RDD2 and WOS3 around enhanced forecasting and data exchange. As part of WOS1 – and, indeed, WOS3 – there will be a central focus on what forecast information is relevant to market operations and market participation.
Stakeholder Engagement	Strong research experience across all these areas and would welcome the opportunity to share our research findings with you.	We recognise the breadth of existing, and ongoing, research - across third-level institutions in Ireland - in the areas outlined in the multi-year programme of work; we welcome engagement with academia and research institutes to capture their perspectives and understand their findings.
Stakeholder Engagement	It is essential that EirGrid and ESB Networks work together - along with other players in the industry - to best understand how to utilise services provided by renewable generators to ensure that the electrical system in Ireland remains secure	We recognise the importance of utilising services which can be provided safely and securely by all resources, including renewable generators, to ensure that the electrical system in Ireland remains secure. We would point to more generation-focused tasks included in the plan, such as facilitating services from all technology types under the Whole-of-System Approach and Facilitating New Technology workstreams; in addition, the tasks outlined in the Security of Supply workstream seek to address the challenges associated with - and opportunities afforded by - high renewables penetration

Theme	Feedback Received	System Operators' Response
Stakeholder Engagement	Where a target is likely to be delayed, or missed, this should be flagged to the industry as well as the CRU. If there are mitigation measures that could keep a work item on track these should be implemented.	<p>We recognise the need to engage with stakeholders, and communicate to industry, on a regular basis; in this regard, we have proposed to the CRU that we will coordinate a to-be-agreed cadence of stakeholder checkpoints. Where possible, we will leverage existing forums – for example, the National Network, Location Connections Consultative Stakeholder Group and the Shaping Our Electricity Future Advisory Council – and, as required, organise standalone events (jointly hosted by the system operators) dedicated to Joint System Operator Programme stakeholder engagement</p> <p>To facilitate increased transparency and visibility, we have proposed to the CRU that – once the proposed balanced scorecard has been agreed – we will publish a dashboard that will (i) outline the progress of each task and any changes to the plan resulting from the change control process, and (ii) summarise the results of the most recent audit on delivery of each task versus plan. We will propose a cadence around the updating and publishing of this dashboard, noting, however, that quality of outcome will be prioritised over reporting and measurement</p>
Stakeholder Engagement	We emphasise the need for accountability and meaningful stakeholder involvement in initiatives outlined in the Joint System Operator Programme, as well as the other activities that will be undertaken by the SOs, in order to ensure that outcomes are fit for purpose and delivered successfully.	
Stakeholder Engagement	It should be acknowledged that the wider end-to-end process which will operate in future will involve a range of parties, e.g. customers, suppliers, and aggregators, and there is a need to consult with and keep informed a wide range of stakeholders in order to develop robust future processes.	
Stakeholder Engagement	It is imperative that future design takes account of technology and service provider expertise in order to develop processes that will facilitate the greatest level of flexibility participation possible.	
Stakeholder Engagement	We would welcome further engagement on the assessment to be carried out on joint TSO and DSO practises to reduce constraints on the transmission and distribution systems and continue to ensure a fair and equal treatment of all parties.	
Stakeholder Engagement	We reiterate our request for broad stakeholder engagement with customers, suppliers, technology providers, equipment manufacturers, aggregators and other demand side service providers over the lifetime of the Joint System Operator Programme.	
Stakeholder Engagement	These deliverables are highly detailed with several milestones concentrated in H2 2022. We would ask that the SOs engage with industry through workshops to ensure that work in these areas is understood and that outputs are informed by feedback from market participants.	
Stakeholder Engagement	We would also urge that, as well as co-ordination between SOs, future initiatives are inclusive of broad stakeholder engagement from customers, suppliers, technology providers, equipment manufacturers, aggregators and other demand side service providers, among others.	
Stakeholder Engagement	It is essential that the views of Energy Producers, Suppliers and Flexible Service Providers are also included as TESC believe that these contributions are essential in achieving the objectives set out in this consultation.	

Theme	Feedback Received	System Operators' Response
Stakeholder Engagement	It is essential that the views of Energy Producers, Suppliers and Flexible Service Providers are also included as TESC believe that these contributions are essential in achieving the objectives set out in this consultation.	
Stakeholder Engagement	We ask that industry and customers are sufficiently involved in any such decisions that could impact stakeholders before being finalised, so stakeholder views are appropriately considered.	
Stakeholder Engagement	We would also welcome a more joined up approach across the industry, with relevant stakeholders including representatives from industry, key policy makers, the regulator, planners and members of the public.	
Stakeholder Engagement	These milestones will be a focus point for industry. If they are likely not to be met, the DSO and TSO should be required to notify the market as soon as possible rather than this emerging during the price control process.	
Stakeholder Engagement	We would be happy to assist with proven data and power flow models to assist in accelerating a shared understanding of how emerging technologies can enhance the development of the distribution network.	We acknowledge, and welcome, the offer of assistance with proven data and power flow models; if these are readily available for sharing, please email engagement@esbnetworks.ie and info@eirgrid.com
Stakeholder Engagement	We would again signal that an emphasis on piloting as a mechanism for developing new processes and facilitating new technologies is excessively narrow. There is a need to facilitate consultation with stakeholders and representative organisations as well as the parties who are taking part in particular pilot activity.	While pilots will provide valuable operational learnings to inform our process development, we recognise the value of stakeholder input in shaping solutions and will structure wider stakeholder input and insight into specific task development.

Feedback Received on Delivery of Plan and Transparency of Approach

Multi-Year DSO/TSO Work Plan
Covering 2022 - 2026

Feedback Received on Delivery of Plan and Transparency of Approach

Many respondents have provided feedback around the delivery of the multi-year programme of work and transparency of such. The System Operators recognise the need to provide visibility of progress of the plan; below, we summarise the feedback received and set out how we propose to address the key points raised.

Theme	Feedback Received	System Operators' Response
Delivery of Plan and Transparency of Approach Feedback	There seems no prioritisation between different objectives and where they may be in conflict or complementary.	<p>In section 7.9 of the CRU's PR5 Regulatory Framework, Incentives and Reporting decision paper (CRU/20/154), the following joint incentive, multi-year programme of work priority areas are identified:</p> <ul style="list-style-type: none"> (i) dispatch down and curtailment, (ii) security of supply/constraints, and (iii) whole-of-system approach. <p>In addition, in section 8.12 of the same decision paper, the following TSO-DSO priority areas are identified:</p> <ul style="list-style-type: none"> (i) the trialling, piloting, deployment and use of new technology, (ii) optimising existing grid to minimise the need for new infrastructure, by using new technology where appropriate, (iii) enabling the provision of system services through new technology, and (iv) addressing whole-system challenges, such as dispatch down of renewable generation and security of supply. <p>We have developed the multi-year programme workstreams based on these CRU priority areas (and in line with maintaining the SOs' respective licence obligations). The tasks included are those which we have assessed as the most likely to have a material impact on achieving these priority objectives.</p>
Delivery of Plan and Transparency of Approach Feedback	We suggest that a core focus area of the Plan should be the goal to enable as much as 5 GW of offshore wind by 2030. We believe that the SOs should aim to deliver the capacity targets in the CAP and PFG of 8.2 GW of onshore wind and 5 GW of offshore wind by 2030 rather than just achieving 80% RES-E by 2030.	We recognise the importance of delivering on all CAP and Programme for Government targets.
Delivery of Plan and Transparency of Approach Feedback	We believe that the electricity system must be able to operate with zero carbon system services by 2030 and a roadmap to delivery should be set out by EirGrid and ESB Networks as part of this joint Multi-Year Work Plan.	<p>It is important to note that many zero-carbon resources are connected to the distribution network. The continued evolution of System Services (as per SEMC's System Services Future Arrangements consultation SEM-21-069), and the introduction of local services on the distribution system, will provide a greater range of services to support customers' needs.</p> <p>Whole-of-system services need to be developed in a manner which is operationally compatible; this will be essential to enabling the wider electricity system to operate with zero-carbon system services. As such, given the work needed (as outlined in the Whole-of-System Approach workstream), we feel that the current timelines are realistic; should opportunities arise to accelerate dates and milestones, however, we will endeavour to bring timelines forward.</p>

Feedback Received on Delivery of Plan and Transparency of Approach

Theme	Feedback Received	System Operators' Response
Delivery of Plan and Transparency of Approach Feedback	It would be useful to have milestones and tasks within the workstreams more specifically aligned and using a common nomenclature throughout the document, as well as more granular timelines	We acknowledge the importance of detailed - yet digestible - milestones and tasks. In future multi-year programmes of work, we will ensure that a common nomenclature is utilised throughout.
Delivery of Plan and Transparency of Approach Feedback	Workstreams seem to operate in silos. We would like to see what is planned for coordination with workstreams developing systems for the TSO alone and the DSO alone, and between workstreams and tasks within this Work Plan, and with other actors such as SEMO, and with stakeholders who may need to adapt their systems.	<p>There are extensive interdependencies and interactions between the multi-year plan workstreams; at a high level, the Facilitating New Technology workstream is where concepts developed in the Whole-of-System Approach and Reducing Dispatch Down workstreams can be piloted and tested. However, detailed interdependencies were not included in the published document, with a view to ensuring that the information provided was readily consumable.</p> <p>Workstreams are managed within an overall TSO-DSO framework and governance structure, with oversight and coordination from a centralised project management function; this facilitates efficient cross-workstream interaction, with dependencies (and any potential overlap) identified. For the multi-year programme of work, we have transitioned from 10 action sets (in 2021) to 4 workstreams (2022-2026), thus minimising the potential for silos.</p> <p>The Joint System Operator Programme builds on - and complements - TSO-only, DSO-only and TSO-DSO workstreams, projects and initiatives in flight.</p> <p>Where operational policies or systems are changed that impact specific users or categories of users, the System Operators - or the appropriate regulatory authorities - will engage with stakeholders and representative bodies.</p>
Delivery of Plan and Transparency of Approach Feedback	It is important that initiatives in the Joint System Operator Programme which impact active demand response and flexibility are delivered in a timely manner, enable increased participation in the various markets, and do not hinder timelines for the delivery of much-needed immediate developments to further demand side participation in energy and services markets.	We agree that it is important to progress the shorter-term initiatives in the programme that address the needs of demand response and flexibility. It also important, however, for us to focus on delivering the initiatives that will make a real difference in enabling demand side to fully participate in meeting the needs of the system - with high levels of renewables - in the long term. We will continue to engage with industry and the regulatory authorities to ensure the system needs are met in the long term.

Feedback Received on Delivery of Plan and Transparency of Approach

Theme	Feedback Received	System Operators' Response
Delivery of Plan and Transparency of Approach Feedback	Adopting an open and transparent approach to managing the delivery of the plan objectives should lead to a more constructive outcome for all market participants. A collaborative approach between industry, the system operators and the CRU will be necessary to achieve success in the energy sector.	To facilitate increased transparency and visibility, we have proposed to the CRU that – once the proposed balanced scorecard has been agreed – we will publish a dashboard that will (i) outline the progress of each task and any changes to the plan resulting from the change control process, and (ii) summarise the results of the most recent audit on delivery of each task versus plan. We will propose a cadence around the updating and publishing of this dashboard, noting, however, that quality of outcome will be prioritised over reporting and measurement.
Delivery of Plan and Transparency of Approach Feedback	This seems not to include transparency for customers and system users.	
Delivery of Plan and Transparency of Approach Feedback	<p>What is the DSO/TSO programme likelihood of achieving the workstream aims within the timeframe 2022 to 2024? Might be an idea to address this concern in this work plan document.</p> <p>We also encourage that there is an ongoing transparent view of the status of tasks within the programme and clear expectation setting for stakeholders in terms of involvement and outcomes, particularly where there are dependencies with other programmes being delivered.</p>	

Feedback Received on Whole-of-System Approach

Multi-Year DSO/TSO Work Plan
Covering 2022 - 2026

As part of the Joint System Operator Programme work plan, one of the key objectives is the development of a whole-of-system approach to system operation between the TSO and DSO.

This Joint System Operator workstream focuses on optimising the system as a whole rather than focusing on the transmission and distribution systems in isolation. Improved co-ordination between the DSO and TSO is important to deliver more efficient markets and a more resilient system.

Key areas identified for co-ordination in this workstream include operational visibility and monitoring of respective network conditions, co-operation on forecasting of generation and demand, and operational compatibility of respective system services in terms of planning, scheduling, dispatch and re-dispatch.

Stakeholders' input is incredibly important to ESB Networks and EirGrid and, thus, we sought your views on the tasks and activities set out in this document. With respect to the development of a whole-of-system approach to system operation, we asked:

What are stakeholders' views on the proposed joint activities within the proposed work programme for whole-of-system approach?

Theme	Feedback Received	System Operators' Response
Future TSO-DSO Operating Model	TSO on its side is planning on updating its operating model every two years and we ask that ESNB aligns its reviews with EirGrid's to ensure alignment in operations management planning and thinking.	The main purpose of operational policy is to ensure the safe and secure operation of the electricity system for all customers; operational policies for the transmission and distribution systems are set by the respective license holders. We will endeavour to ensure that all operational policy reviews are underpinned by the need to align - where possible and appropriate - in operations management planning and practice.
Future TSO-DSO Operating Model	It would be helpful from an industry perspective if a document akin to the Balancing Market Principles Statement was included for development over the course of this initiative also. That Statement could include scheduling and dispatch and constraints/curtailment management plans and ideally should cover both SOs' models. This would also bring some transparency around alignment of operating processes and how duplication of systems will be minimised.	The development of the to-be operating model is in the early stages; the agreed future operating model will cover off a number of different aspects, including scheduling and dispatch and constraints/curtailment management. We recognise the need to engage with stakeholders, and communicate to industry, on a regular basis; in this regard, we have proposed to the CRU that we will coordinate a to-be-agreed cadence of stakeholder checkpoints, with a focus on progress in the development, and shaping, of the future TSO-DSO operating model. Where possible, we will leverage existing forums - for example, the National Network, Location Connections Consultative Stakeholder Group and the Shaping Our Electricity Future Advisory Council - and, as required, organise standalone events (jointly hosted by the system operators) dedicated to Joint System Operator Programme stakeholder engagement.

Theme	Feedback Received	System Operators' Response
Future TSO-DSO Operating Model	We would also note that the timing of delivery of the future operating model outlined for the workstream would seem to conflict with the acknowledgement that System Services Future Arrangements will go live in 2024.	We acknowledge the SEM Committee's impending decision around System Services Future Arrangements. The SOs recognise the importance of the to-be TSO-DSO operating model in facilitating System Services Future Arrangements; we expect that the necessary elements of the future operating model will be in place to support Future Arrangements Go-Live, though we would foresee augmented, and more streamlined, processes in the enduring solution as augmented DSO operational systems are commissioned.
Future TSO-DSO Operating Model	We have concerns regarding the robustness of the proposed new joint framework for a future TSO-DSO operating model. We would point out that that critical to the success of the future grid will be the successful coordination of the programme between SO's. While we support the joint programme, we would welcome transparency on the proposed implementation process and governance structure which should ensure successful programme delivery	The proposed new joint framework for a future TSO-DSO operating model is guided by the CRU's PR5 Regulatory Framework, Incentives and Reporting decision paper (CRU/20/154), which prioritises a collaborative approach to addressing whole-of-system challenges, such as dispatch down of renewable generation and security of supply. We have developed the multi-year programme Whole-of-System Approach workstream (with a focus on the to-be TSO-DSO operating model) based on CRU priority areas and in line with maintaining the SOs' respective licence obligations. We recognise the importance of accurate, and timely, evaluation of tasks and workstream delivery. In Section 9 of DOC-230921-GYW, the SOs propose that measurement of the quality of the implementation plan should be based on delivering the 2022 milestones; a scoring proposal is put forward, with the criteria for measurement based on a continuum of achievement.
Future TSO-DSO Operating Model	The operational model should mandate real time and forecast data through an API as this will enable flexible service providers to provide a response to network and market needs automatically.	The development of the to-be operating model is in the early stages; the agreed future operating model will cover off a number of different aspects, including data exchanges (e.g. the sharing of forecast data) and interfaces.
Future TSO-DSO Operating Model	WOS1 involves a whole set of new protocols. It is not clear whether any of these will affect market participants, and this should be made clearer.	We recognise the importance of early engagement around any potential impact to market participants. Where it is identified that market participants or processes are impacted by changes to protocols the SOs will manage any changes through engagement with stakeholders and through the appropriate regulatory process where applicable.
Aggregation Structures and Market Framework Development	The review of aggregation structures should not be limited solely (as seems to be inferred in the description of the WOS2 task) to learnings from pilot activities. Participants who currently operate in wholesale markets, as well as broader stakeholders and those operating in other jurisdictions and markets can provide information which compliments the potential learnings from pilot activities. It is critical that the full suite of potential inputs and learnings is harnessed rather than exclusively relying on pilot experience.	While pilots will provide valuable operational learning to inform our process development, we recognise the value that stakeholder input can bring to solutions developed, and we will consider how to structure wider stakeholder input and insight into specific task and solution development

Theme	Feedback Received	System Operators' Response
Aggregation Structures and Market Framework Development	It is not clear why WOS4 is separate from aggregators providing services (as per WOS2)	We recognise that WOS2 is a subset of WOS4. It was decided to call out WOS2 as a separate task given the importance of addressing potential barriers for customers to provide services to both SOs (and, hence, allow service providers to aggregate assets). WOS4 will develop, and deliver, the overall framework for operational compatibility between services.
Aggregation Structures and Market Framework Development	WOS2 seems to involve aggregation services for customer participation in both TSO and DSO services – this seems to involve common standards for aggregator registration and information; it is not clear how customers and aggregators can participate in defining those standards	We recognise that existing aggregation structures are in place which have been developed to support wholesale energy and system-wide service provision (such as operating reserves). We recognise that, in defining future services, new forms of aggregation may be necessary to manage localised issues and interactions. We will work with customers and aggregators to examine current structures and their applicability to new service types.
Operational Policy Quarterly Review	WOS6 seems to be all about transmission services. It is not clear where DSO participation in the process comes in other than as a consultee.	The Operational Policy Quarterly Review outlined in WOS6 is facilitated through a joint SO forum; operational policies of either SO may have an impact on the other's operations and customers. This forum will review the impacts of changes in operational policy on both systems - transmission and distribution - and their respective customers.
Operational Policy Quarterly Review	Consultation and transparency in terms of operational policy review and development is critical, both in terms of informing future service provision, and also ensuring that future policy takes account of stakeholder and technology needs. Structures put in place to develop future policy should be accessible to representative organisations and indeed new innovative technology providers who might not yet be service providers.	The main purpose of operational policy is to ensure the safe and secure operation of the electricity system for all customers; operational policies for the transmission and distribution systems are set by the respective license holders, in line with our respective licences, legal and regulatory obligations. Where significant changes to operational policy are identified, industry will be consulted and/or informed through the existing structures, including the DCRP, GCRP, DS3 Advisory Council etc.
Operational Policy Quarterly Review	We would also welcome more detail on the Operational Policy Quarterly Review Process. Is this workshop or forum to be opened up to industry? The types of operational policies discussed such as SNSP, MinGen units, priority dispatch etc. are very important areas for industry and we would welcome the opportunity to engage on them.	

Feedback Received on Facilitating New Technology

Multi-Year DSO/TSO Work Plan
Covering 2022 - 2026

The widespread adoption of low-carbon technologies (LCTs) in the period to 2030 offers the potential for customers to become more engaged with the electricity system. LCTs could play a role in providing the demand side flexibility needed to manage the distribution and transmission systems in a secure, reliable, and cost-effective manner into the future. Additionally, coordination between different technologies – for example battery, wind, and solar generation – in hybrid arrangements has the potential to derive greater value from existing network infrastructure.

To realise this potential, processes, and systems to support the co-ordination of transmission and distribution operations and markets are needed. The TSO-DSO Joint System Operator Programme will build and develop these processes and systems, actively progressing cooperative solutions through the pilot programmes being led by the DSO or the TSO over the life of this programme.

Both System Operators are looking to pilot new technologies and processes and facilitate the integration of new technologies, e.g. hydrogen-based technology and grid forming technology. Both System Operators will work together to enable hybrid connections and support arrangements to optimise the use of existing infrastructure.

Stakeholders’ input is incredibly important to ESB Networks and EirGrid and, thus, we sought your views on the tasks and activities set out in this document. With respect to facilitating the adoption of new technology, we asked:

What are stakeholders’ views on the proposed joint activities within the proposed work programme for facilitating new technology?

Theme	Feedback Received	System Operators’ Response
Flexibility Pilots and Services	We would like to see outcomes and learnings from each pilot and how they will feed into operations at the TSO and DSO level being simply laid out and explained at the end of each pilot. This should for example help stakeholders better understand what enduring products and where, are required.	We recognise the importance of transparency in outcomes and learnings from each pilot. We will endeavour to publish a close-out report at the end of each pilot/trial and, in parallel, will ensure learnings are reflected in subsequent pilots and the design of the future TSO-DSO operating model.
Flexibility Pilots and Services	Consideration of single procurement platforms for both SOs for local flexibility.	The development of the to-be operating model is in the early stages; the agreed future operating model includes a range of facets, including data exchanges and interfaces. Irrespective of the platforms which host our respective procurement and operational activities, we will endeavour to optimise the flow of data between systems to ensure the robust management of flexibility services. Notwithstanding this, a range of factors must be accounted for in determining what procurement platforms are employed, including – but not limited to – ensuring proportionate requirements for different kinds of service providers and services, avoiding disproportionate entry barriers, encouraging open and liquid markets, and maintaining secure system and market operations.

Theme	Feedback Received	System Operators' Response
<p>Flexibility Pilots and Services</p>	<p>In developing a Joint System Operator approach, the type of interoperable 'spatial data infrastructure' (as proposed in ESBN's National Network Local Connections programme) would be suitable to inform flexible energy infrastructure rollout.</p>	<p>ESB Networks' 2030 Power System Requirements – published in September 2021 – provides projections of network needs on a locational/spatial basis over the coming decade, based on extensive scenario analysis undertaken in partnership with a range of organisations, including the SEAI, EPRI and WEI. The National Network, Local Connections Programme Data Platforms and Dashboards Roadmap sets out an intent to provide ongoing network visibility into the future. We welcome continued stakeholder engagement on the forms and methods for making this data available to stakeholders (while also leveraging to inform the roll out of flexible energy infrastructure).</p>
<p>Technology Enablement - Alternative Network Solutions</p>	<p>We recommend that alternative network solutions such as storage, demand side response and smart wires would be developed, to free up additional capacity or alleviate some of the need for network reinforcement. If private wire were allowed by EirGrid and ESB Networks, developers would be enabled to create their own connections. This could potentially help the System Operators to release some of the consented projects. Building the foundations of the network that will be required beyond 2030 will mean building some backbone infrastructure projects and the introduction of innovative technologies which enable smart use of the grid.</p>	<p>Both the DSO and TSO are committed to the introduction of new alternative solutions – including the use of flexibility from demand storage and generation – across the Irish electricity system. This drives many of the tasks in the multi-year programme of work, including FNT2, FNT3, FNT4 and FNT5.</p> <p>Independent of the Joint System Operator Programme, both organisations – in our roles as DSO, DAO, TSO and TAO – are already considering alternatives in the physical development of the transmission and distribution networks. For example, please see the Joint TAO/TSO Multi-Year Balanced Scorecard here for further information; the TSO and TAO are working collaboratively to review new technologies for use in the Technology Toolbox for future transmission network planning and development.</p> <p>The DSO's National Network, Local Connections Programme sets out ESB Networks' vision and approach as it relates to the introduction of flexibility on the distribution system. The DSO would also point to progress made in the spaces of contestability and lean connections; since 2010, developers of generation connecting to the distribution system have been allowed build their shallow connection works on a contestable basis. This contestable option – combined with more recent work aimed at streamlining the overall connection process – facilitates more efficient development of the network.</p> <p>The TSO's inaugural Shaping Our Electricity Future Roadmap identifies a number of technology enablers and network solutions as fundamental for infrastructure delivery within the required timeframes out to 2030.</p> <p>With regard to private wires, the SOs do not have the powers to create licence exceptions or regulations, this role sits with the DECC and the CRU.</p>

Theme	Feedback Received	System Operators' Response
Technology Enablement - Battery Storage	The provision of flexible services from emerging technologies such as battery storage connected at domestic and commercial customer premises should be considered as it can reshape the network load profile and is a means of removing or limiting the dispatching down of renewable generation.	Insofar as possible, we will endeavour to be technology neutral while taking care to investigate ways for all technologies to be facilitated, including those which are not currently operating on the system (and may require dedicated initiatives to prove).
Technology Enablement - Battery Storage	We would recommend that Domestic Battery Storage be incorporated in future evaluations. Battery Storage offers the required Flexible Services needed to assist in addressing the challenges faced by both TSO and DSO operators.	
Technology Enablement - Connections	As energy citizens are being asked to invest in more sustainable technologies such as heat pumps and electric vehicles, it is important that the connections are future proofed to ensure early adopters can participate in any future market arrangements that will be introduced.	The Signals and Data Exchange Guidance for DER outlines the proposed standard technology requirements for microgeneration inverters, electric vehicle chargers and heat pumps. The guidance provides transparency of future signals exchange architecture of these connections for local flexibility management. This work has been benchmarked using international insights and current best practice.
Technology Enablement - Connections	We believe that a range of renewable technologies will be critical to Ireland meeting the 2030 RES-E targets. We would urge the SOs to facilitate the connection of a wide range of renewable technologies to the grid, including both on- and offshore wind and solar PV generation, hydrogen and other supportive technologies, such as interconnection and battery storage.	Insofar as possible, we will endeavour to be technology neutral while taking care to investigate ways for all technologies to be facilitated, including those which are not currently operating on the system (and may require dedicated initiatives to prove). Initiatives including the TSO's Qualification Trial Process (QTP), the pilots run throughout the National Network, Local Connections Programme, and the R&D trials run by ESB Networks on an ongoing basis ensure frequent calls for potential projects, facilitating (as appropriate) the integration of a range of new technologies.
Technology Enablement - Hybrids	No 'go-live' date is including for implementing hybrid technology changes.	We recognise the importance of certainty around a Go-Live date for the implementation of hybrid technology changes; there will be several CRU decisions required as part of this work, and these will influence the finalisation of the timeline (subject to regulatory approval). The plan has been submitted to the CRU and we await detailed feedback.
Technology Enablement - Hybrids	While it is acknowledged that CRU approval is required prior to making changes, given that "tradable MEC" is a core element in technology enablement and maximises the value of customer investment in grid infrastructure, we believe an additional milestone for 'go-live' of these changes. should be included.	
Technology Enablement - Hybrids	The proposals in this plan do not provide sufficient confidence to industry that the changes needed are being prioritised given that a proposal on multiple legal entities was consulted on over a year ago but clarity on this matter is not expected until H1 2022. This is too vague a timeline and greater transparency and expediency are needed to bring this matter to a close as early as possible in 2022.	

Theme	Feedback Received	System Operators' Response
Technology Enablement - Hybrids	It is a similar case for the over-install policy where it is evident that the policy is no longer fit for purpose, and where there is a relatively simple fix to remove it, but a timeline of H2 2022 for a recommendation on this policy is too long.	We are currently progressing the work on assessing changes to the current over-install policy. We need to assess the potential implications of increasing the current 120% limitation and the impact this may have on the future power system; this necessitates a thorough technical evaluation to determine the potential of future curtailment, constraint and fault levels from increasing over installation. Although an indicative timeline is specified, we will endeavour to make recommendations to the CRU in advance of this deadline.
Technology Enablement - Hybrids	It is essential that task FNT9 (tradable MEC) aligns with the RESS 2 auction timetable.	We recognise the importance of certainty around tradable Maximum Export Capacity in the context of the second competition under the Renewable Electricity Support Scheme. However, there is a high likelihood that, for reasons beyond the control of ESB Networks or EirGrid, a policy for trading of MEC behind a single connection point (that enables hybrid connections sharing MEC) will not be in place prior to the RESS 2 auction. Notwithstanding this, cognisant of its importance, we will complete all activities to progress this, which are within our control, in a timely manner.
Technology Enablement - Hybrids	We would be strongly opposed to any such approach as it is important that all technologies are treated equally and that the approach is non-discriminatory (in distinguishing between onshore and offshore projects as part of MLE).	We have not indicated that off-shore projects will be treated differently to on-shore projects, however it is true that off-shore projects require further consideration (given the different regulatory arrangements applying to off-shore versus on-shore). Under the Facilitating New Technology workstream, we have defined a hybrid site to be any project that has multiple power generating modules; these utilise multiple primary energy sources (or technology types) in generating/storing electricity and are electrically connected behind a single defined connection point to a licensed System Operator.
Technology Enablement - Hybrids	We understand that MEC flexibility may be needed to accommodate renewables earlier than could otherwise be accommodated but we would like to understand what, if any, SO collaboration is planned to minimise such active management of connections on an enduring basis.	We recognise that MEC flexibility might, in some cases, accommodate renewables earlier than would otherwise be the case. We also note that there is some customer appetite at the distribution level for actively managed connections on a longer-term basis, where it facilitates a lower overall cost of connection or maximises the utilisation of existing infrastructure. Where customers' preference is for firm access connections, initiatives to reduce dispatch down are addressed in a dedicated workstream within the multi-year programme of work. To note, in this context, non-firm access in distribution connection access refers to the physical firmness to export at the connection point at all times (and is specific to the customer's distribution connection method and distribution system constraints); it has a different meaning to Firm Access Quantity (FAQ) currently defined in I-SEM, which relates to market settlement and compensation on the application of transmission system constraints.

Theme	Feedback Received	System Operators' Response
Technology Enablement - Hybrids	There has been little progress on removing the barriers to hybrid connections under the FlexTech initiative and it is not clear how these workstreams will be properly resourced and progressed now that that initiative has been wound down.	<p>To clarify, the Joint System Operator Programme has been designed to contribute to the original objectives of the FlexTech programme.</p> <p>The relevant activities endure as key activities under the (i) Joint System Operator Programme, (ii) TSO Operations pillar of the TSO Shaping Our Electricity Future Roadmap, (iii) DSO's National Network, Local Connections Programme, and (iv) respective innovation programmes (as appropriate).</p> <p>In April 2021, we published a joint response to the consultation on Multiple Legal Entities for hybrid connections; in addition, in 2021, work began on the review of over-install limits and assessing options around the trading of MEC behind a single connection point.</p> <p>Further, and significant, progress around hybrid connections is planned in 2022 as per the milestones set out against the Facilitating New Technology workstream. The key actions for hybrids also form part of the Climate Action Plan 2021, available here, providing detailed timelines around deliverables.</p>
Technology Enablement - Hybrids	There should be sufficient engagement with industry on the FNT7, FNT8 and FNT9 tasks to ensure the outcome of each task is in line with the needs of the industry.	We recognise the need to engage with stakeholders, and communicate to industry, on a regular basis; in this regard, we have proposed to the CRU that we will coordinate a to-be-agreed cadence of stakeholder checkpoints. Where possible, we will leverage existing forums – for example, the National Network, Local Connections Consultative Stakeholder Group and the Shaping Our Electricity Future Advisory Council – and, as required, organise standalone events (jointly hosted by the system operators) dedicated to Joint System Operator Programme stakeholder engagement.
Technology Enablement - Hydrogen	We are concerned that there is no hydrogen framework strategy as of yet. We would welcome a roadmap for hydrogen in Ireland by the System Operators.	We recognise the role of hydrogen in supporting the realisation of Ireland's ambitious targets out to 2030. Insofar as possible, our multi-year programme of work endeavours to be technology agnostic; we do acknowledge, however, that there will be cases where a technology-specific focus is useful or necessary. On a broader point, the development of a roadmap for hydrogen in Ireland is outside the scope of the Joint System Operator Programme.
Technology Enablement - Hydrogen	It is not clear whether the SOs would consider a hydrogen project given the nascent nature of the technology in the Irish market and its absence from the existing regulatory framework. If the SOs were in a position to procure specific technologies to manage dispatch down, such as hydrogen, which could be produced using curtailed electricity through an electrolyser at the same connection point, developers would respond to that signal.	We recognise the role of hydrogen in supporting the realisation of Ireland's ambitious targets out to 2030. We will commit to scan for - and keep abreast of - the latest developments in the hydrogen space, keeping a watching brief on policy and technical developments. However, insofar as possible, we will endeavour to be technology neutral while taking care to investigate ways for all technologies to be facilitated, including those which are not currently operating on the system (and may require dedicated initiatives to prove).

Theme	Feedback Received	System Operators' Response
<p>Technology Enablement - Demand Side Flexibility</p>	<p>We would also note that some recent initiatives such as the FlexTech programme have failed to deliver promised outcomes and to progress activity in relation to demand side flexibility.</p>	<p>As stated above, the Joint System Operator Programme has been designed to contribute to the original objectives of the FlexTech programme.</p> <p>The relevant activities for Ireland endure as key activities under the (i) Joint System Operator Programme, (ii) TSO Operations pillar of the TSO Shaping Our Electricity Future Roadmap, (iii) DSO's National Network, Local Connections Programme, and (iv) respective innovation programmes (as appropriate).</p> <p>In 2021, as part of the joint plan, a proof-of-concept development of a module in the Network Management System was progressed; this module will facilitate operational piloting of a more dynamic approach to capacity allocation for demand side unit participation in TSO and wholesale markets. In addition, the DSO developed flexible products and services for congestion in which demand side response can participate (including technology-neutral definitions).</p> <p>In 2022, the DSO will publish a residential demand side response roadmap.</p> <p>Independently, we are also progressing activities in relation to demand side flexibility. The TSO, as part of Shaping Our Electricity Future, will work collaboratively with stakeholders to develop a demand side management strategy covering the participation of demand side resources in the energy, capacity and system services markets. As part of the National Network, Local Connections Programme, the DSO is investing in network visibility, monitoring and control systems to enable greater demand side flexibility.</p>
<p>Technology Enablement - Network-Based Technologies</p>	<p>The QTP should also consider network-based technologies which can help improve system security or reduce dispatch down also.</p>	<p>We recognise the need to consider network-based technologies; while the as-is Qualification Trial Process (QTP) is focused on system services provision – and does not account for network-based technologies – the regulatory framework provides a range of other routes for ESB Networks and EirGrid to trial the use of new technologies, e.g. through the PR5 Innovation and R&D Mechanism and as part of our ongoing work programmes (where there is the potential for an innovative, network-based solution to deliver a cost benefit relative to a conventional one). For example, please see the Joint TAO/TSO Multi-Year Balanced Scorecard here for further information; the TSO and TAO are working collaboratively to review new technologies for use in the Technology Toolbox for future transmission network planning and development</p> <p>The TSO's inaugural Shaping Our Electricity Future Roadmap identifies a number of technology enablers and network solutions as fundamental for infrastructure delivery within the required timeframes out to 2030.</p> <p>ESB Networks recently published its Innovation consultation Innovation to Connect A Clean Electric Future, outlining the DSO's pipeline of network innovation projects (including network-based technologies).</p>

Theme	Feedback Received	System Operators' Response
Technology Enablement - Tech-Specific Calls	<p>The DSO/TSO should consider whether issuing technology-specific calls would be helpful in providing a signal for the right technologies to come forward.</p>	<p>In general, we are looking to present technology-neutral incentives in line with Clean Energy Package directives. Where technology-specific calls to develop nascent or innovative technologies are warranted, this will be considered in DSO-led pilots and the QTP process.</p> <p>The Qualification Trial Process (QTP) tasks against the Facilitating New Technology and Reducing Dispatch Down workstreams will ensure an annual call for potential projects, facilitating (as appropriate) the integration of a range of new technologies. We would point to the Qualification Trial Process (QTP) Call for Information on 21 December 2021; the TSO asked: Are there particular technology areas that you think the TSOs should focus on for future QTP trials?</p>
Technology Enablement - Timeline	<p>Efforts should be made to bring this timeline forward where possible, to enable faster and more efficient roll out of the technologies and services that will be required to meet our targets. There is greater risk associated with backloading these technologies towards the end of the decade.</p>	<p>We recognise the need to enable a timely and efficient rollout of the technologies and services required to meet our targets. While the current timelines, in themselves, will prove challenging – given the degree of complexity and risk involved – where opportunities arise to accelerate dates and milestones, we will endeavour to bring timelines forward.</p>

Feedback Received on Reducing Dispatch Down

Multi-Year DSO/TSO Work Plan
Covering 2022 - 2026

Feedback Received on Reducing Dispatch Down

Renewable generation may be dispatched down at times to manage local transmission or distribution system constraints and/or curtailed at times to manage system-wide limits. Minimising this dispatch down of renewable generation is critical to ensuring the efficient use of renewable generation and achieving renewable energy targets in an economic manner.

Ensuring the appropriate transmission and distribution infrastructure build-out to minimise constraints is a key planning activity for both the TSO and DSO. Evolving operational policies in areas such as the System Non-Synchronous Penetration (SNSP) limit and Rate of Change of Frequency (RoCoF) limit to reduce curtailment are a focus for the TSO. These are ongoing activities for the TSO and DSO in seeking to reduce the dispatch down of renewable generation.

In terms of this joint TSO-DSO work plan, there are initiatives across workstreams that will contribute to reducing dispatch down of renewables. For example, in the Whole-of-System Approach workstream, the TSO and DSO will examine processes, interfaces and data exchange to enhance the communication between the National Control Centre (TSO) and the National Distribution Control Centre (DSO); enabling hybrids and trialling other generation as part of the Facilitating New Technology workstream should also facilitate reducing dispatch down of renewables.

Stakeholders' input is incredibly important to ESB Networks and EirGrid and, thus, we sought your views on the tasks and activities set out in this document. With respect to reducing dispatch down of renewable generation, we asked:

What are stakeholders' views on the proposed joint activities within the proposed work programme for reducing dispatch down of renewable generation?

Theme	Feedback Received	System Operators' Response
Congestion, Constraint and Curtailment Management	We ask that consideration is given to drawing out more explicitly in this plan the focus and milestones to ensure that constraints of issue on both grids are quantified, and projects of greatest impact prioritised during the PR5 period.	The focus of this programme of work are areas of coordination and partnership between the TSO and DSO. The underlying transmission and distribution system topology planned and forced outages of assets will drive constraints / congestion at times. An activity has been identified (RDD5) that will see the TSO and DSO reviewing operational practices related to constraint/congestion management and to make improvements where possible.
Congestion, Constraint and Curtailment Management	We do not see the level of collaboration and coordination between both SOs that we expected to see in this multiyear plan when it comes to constraints alleviation.	Separately each SO plans and develops its respective system according to approved standards and consideration of constraints/congestion forms part of these planning processes. Generally, these planning activities are managed separately as they address distinct transmission and distribution system issues.

Theme	Feedback Received	System Operators' Response
Congestion, Constraint and Curtailment Management	When dispatching down, for whatever reason, e.g. constrained or curtailment, will small to medium generators - such as PV generators in or around 500KWp exporting to the grid - be expected to be constrained or curtailed or does dispatching down only apply to larger generators?	<p>We recognise generators' concerns regarding periods of dispatch down; where generation is subject to priority dispatch, this will be respected. The definitions of dispatch, re-dispatch and market based/non-market-based re-dispatching are a matter for the RAs as per Article 12 'Dispatching of generation and demand response' and Article 13 'Re-dispatching' of the new Electricity Regulation EU2019/943; we will respect these definitions of dispatch, redispatch and market based/non-market-based re-dispatching (and the outcome of SEM Committee's current consultation process on Articles 12 and 13).</p> <p>The Distribution Code sets out the MW thresholds for controllability of units on the distribution network.</p>
Congestion, Constraint and Curtailment Management	Constraint and curtailment continue to be an issue for renewable generators. An effective management plan to minimise dispatch down needs to be developed in order to remove this risk for renewable units. We believe that this should be a core focus of the Plan.	<p>We recognise the importance of TSO-DSO collaboration and coordination in managing constraints and curtailment. In the multi-year programme of work, there are initiatives across workstreams that will contribute to reducing dispatch down of renewables, e.g. in the Whole-of-System Approach workstream, the TSO and DSO will examine processes, interfaces and data exchange to enhance the communication between both Control Centres; enabling hybrids and trialling other generation as part of the Facilitating New Technology workstream should also facilitate reducing dispatch down of renewables; the Reducing Dispatch Down of Renewable Generation workstream, itself, outlines a number of additional tasks that build on these other activities in seeking to reduce the dispatch down of renewable generation.</p>
Congestion, Constraint and Curtailment Management	We are not clear from the MYP how the SOs propose to coordinate, or what steps are planned, around mitigating and preventing market inefficiencies which lead to security of supply issues and high costs for consumers that are largely driven by congestion or constraint issues.	
Congestion, Constraint and Curtailment Management	We ask that the SOs outline clearly what collaboration they will take on the matter of constraints, to avoid under-achieving on both of these strategic objectives. If the strategic objectives are not addressed in this MYP the MYP also risks undermining achievement of the other two strategic objectives for PR5 network companies in our view.	
Congestion, Constraint and Curtailment Management	Suggest that, as a starting point, constraints and congestion issues around Dublin are prioritised.	<p>We recognise the importance of addressing constraints and congestion issues around the Greater Dublin Area. The multi-year programme of work is shaped by the CRU's PR5 Regulatory Framework, Incentives and Reporting decision paper (CRU/20/154); in sections 7.9 and 8.12 of this paper, addressing security of supply/constraint issues and whole-system challenges (such as dispatch down of renewable generation) in the Dublin region are called out as areas of priority.</p> <p>Separately, both the TSO (through Shaping Our Electricity Future) and DSO (through the PR5 reinforcement programmes and the National Network, Local Connections Programme) are addressing the respective transmission and distribution challenges in Dublin and other regions.</p>

Theme	Feedback Received	System Operators' Response
Congestion, Constraint and Curtailment Management	<p>As part of our ask around explicit plans and milestones to address constraints during PR5 collaboratively on the distribution and transmission systems, we suggest that in assessing service needs at transformers and bulk supply points that ESBN together with EirGrid uses that workstream (PSR) to help quantify which congestion areas are the biggest potential blockers to local flexibility markets, what is their root cause (e.g. technical scarcities) and which constraints could be addressed in order of priority to simultaneously address barriers to broadening local flexibility market areas while helping to alleviate the constraints that are resulting in negative market outcomes in energy, capacity and system services markets at the transmission level.</p>	<p>We would point to the work being undertaken as part of the Power System Requirements (PSR) workstream of the National Network, Local Connections Programme. PSR scenario mapping - which is accounting for rapid increases in demand from EVs, heat pumps and microgeneration installations - and power system studies are identifying capacity shortfalls based on unmanaged load growth; the identification of locations with forecasted capacity shortfalls affords the opportunity to introduce flexible solutions - where flexibility is deemed to be the optimal solution over network reinforcement - to address the challenge.</p> <p>In addition, task WOS4 in the Whole-of-System Approach workstream seeks to develop an overall framework for DSO-TSO services coordination, including agreement around prioritisation rules and settlement rules for dual service providers.</p> <p>We expect that these developments will bring greater clarity on the relative costs and benefits of market-based approaches to resolving constraints versus conventional reinforcement solutions.</p>
Congestion, Constraint and Curtailment Management	<p>Ideally the coordinated TSO/DSO action plan around constraints alleviation for efficiency of market outcomes and optimal costs for consumer reasons would include simultaneous collaboration with ESB Networks as the TAO and the DAO to ensure sufficient data flows are occurring that best enable system assessments around constraints to help determine prioritisation of projects and bring them to fruition.</p>	<p>We recognise the importance of collaboration with the Asset Owners - both TAO and DAO - around constraints alleviation to ensure efficiency of market outcomes and optimal costs to the consumer.</p> <p>The TSO and DSO work closely with the TAO to ensure that operational security of the transmission and distribution systems is maintained. Please see the joint TAO/TSO multi-year balance scorecard here for further information. In addition, there are existing, business as usual processes to ensure that DAO information is available in the DSO's decision-making process.</p>
Congestion, Constraint and Curtailment Management	<p>The type of collaboration we envisage is an approach whereby the SOs establish concrete milestones and plans around (i) identifying constraints and congestion relevant to both systems, (ii) quantifying the impact of those constraints which encompasses market efficiency and consumer cost impacts on local and national levels, (iii) determining plans for solutions - ideally flexibility services over grid build where optimal - to address those constraints of most impact in priority order, and (iv) implementing these solutions during PR5 period.</p>	<p>We recognise the importance of TSO-DSO coordination in managing congestion and constraints to mitigate/prevent market inefficiencies that lead to security of supply issues and high costs for consumers. Future, refreshed versions of the multi-year programme of work will seek to quantify the impact of those constraints which encompasses market efficiency and consumer cost impacts on local and national levels (subject to CRU review and target setting).</p>
Reactive Power	<p>The plan would benefit from more detail on next steps and timelines to rollout these opportunities [nodal controller] to more renewable generators on the distribution system.</p>	<p>Following COVID-related and technical issues that came to light during the trial, the nodal controller trial resumed in Q4 2021 and will conclude in Q1 2022; both System Operators will submit a close-out report to the CRU once completed. Acknowledging the keen interest that industry has in progressing opportunities to participate, we would point to tasks RDD4 and FNT4 as key to addressing next steps and enabling reactive power ancillary services.</p>

Theme	Feedback Received	System Operators' Response
Factor in Calculations	Is there a factor that EirGrid/ESBN can provide that customers can apply to their calculations to allow for periods of dispatching down e.g. 5% or 10% of their generating capacity or time?	At present, the best available information in this regard is the TSO's 12 regional reports produced to fulfil the requirement of the CRU's Enduring Connection Policy Stage 2 (ECP-2) decision, CRU/20/060; the generation reduction values calculated are subject to the study assumptions which are described in detail in the reports found here .
Knowledge Share and Learnings	Initiatives in this area should also seek to capture learnings which can be applied more broadly, e.g. for small, decentralised or technically complex unit or service provider types. There may be additional use cases and considerations which can benefit from the resource and effort dedicated to the tasks and which could yield additional benefits for future system operation and co-ordination.	We are looking at multiple use cases for these services, both under the Reducing Dispatch Down of Renewable Generation workstream and across other multi-year programme workstreams. There will be a change in the strategies available to develop the distribution system to meet the challenges presented – and opportunities afforded – by the Climate Action Plan; we are particularly focussed on the services which could be provided by smaller customers – right down to residential customers – whose impact can be beneficial to the system as a whole.

Feedback Received on Security of Supply

8

Multi-Year DSO/TSO Work Plan
Covering 2022 - 2026

Feedback Received on Security of Supply

High renewables penetrations, high volumes of distributed energy resources (DER) and widespread demand side flexibility presents a number of challenges and opportunities. Given the changing characteristics of the transmission-distribution interface as a result of these, the immediate priority for the Joint System Operator Programme must focus on preparing to address the longer-term operational requirements for managing and maintaining security of supply.

To ensure that we have the capability to securely manage this transition, we need to fully understand the characteristics of how these technologies – including their protection, their dynamic response, and how they are embedded across the system – will interact with system operation. We also need to ensure that our mechanisms to manage and recover from security of supply events are adapted to these new demand characteristics and capabilities.

In the short to medium term, the system adequacy position in Ireland will be challenging. The TSO is working with CRU and DECC on a security of supply programme across a range of areas to manage this situation and mitigate the risks that controlled outages would have on homes and businesses. One aspect of the security of supply programme will see the TSO and DSO working together to enhance operational processes to manage supply shortfalls (should they arise). This activity is being coordinated as part of TSO-DSO ongoing operational coordination activity, whereas this work programme is focused on long-term coordination for a secure system.

In the future, with high penetrations of embedded renewables and new technologies, it will be important to adapt our processes and systems for responding in the event of a security of supply issue arising. It is important that our tools and processes allow for management of the event so that the minimum amount of disruption occurs, and that the integrity of the overall power system is maintained. Reviews of the range of market and non-market-based actions available, the parameters of automatic response, and the conditions under which different solutions are activated will be required to ensure that the changing characteristics of demand on the system are accounted for.

Stakeholders’ input is incredibly important to ESB Networks and EirGrid and, thus, we sought your views on the tasks and activities set out in this document. With respect to maintaining and managing the security of supply, we asked:

What are stakeholders’ views on the proposed joint activities within the proposed work programme for improving security of supply?

Theme	Feedback Received	System Operators’ Response
Addressing Security of Supply	The milestones appear to be solely focused on the co-ordination of just demand side to address security of supply and very little on both the distribution and transmission generation side.	We recognise the importance of including both distribution and transmission generation in the multi-year programme of work. Though capacity investment for generation - and reform of capacity markets - is outside the scope of this consultation, we note that there are also more generation-focused tasks included in the plan, such as facilitating services from all technology types under the Whole-of-System Approach and Facilitating New Technology workstreams, e.g. the coordination between different technologies, for example battery, wind, and solar generation, in hybrid arrangements, to derive greater value from existing network infrastructure.

Feedback Received on Additional Activities

9

Multi-Year DSO/TSO Work Plan
Covering 2022 - 2026

The Joint System Operator Programme work plan reflects identified areas where the TSO and DSO must work in partnership to enable new technology on the transmission and distribution systems participate in new solutions, apply whole-of-system approaches to resolving system needs, and work collaboratively to reduce dispatch down of renewable generation and improve security of supply.

A variety of components have fed into the development of the TSO-DSO 2022-2026 work plan. This includes the national Climate Action Plan, the regulatory framework including as set out under PR5, the legal and policy framework at an EU and Irish level, and regular engagement with our stakeholders. We recognise, however, that there may be additional activities overlooked that could be brought into scope of the multi-year plan.

Stakeholders’ input is incredibly important to ESB Networks and EirGrid and, thus, we sought your views on the tasks and activities set out in this document. With respect to identifying additional activities that could be considered for the scope of the multi-year plan, we asked:

Are there other activities that stakeholders believe that the DSO and TSO should be jointly working together during the term of the multi-year plan?		
Theme	Feedback Received	System Operators’ Response
All-Island Approach	Potential impacts from or on Northern Ireland seem to be ignored as do trade-offs between requirements on the TAO as opposed to the TSO, and trade-offs and prioritisation between the objectives where effects may conflict.	The TSOs and DSOs in Ireland and Northern Ireland work in partnership to meet the needs of both distribution and transmission systems (and, ultimately, ensure the needs of consumers are met). The TSO and DSO work closely with the TAO to ensure that operational security of the transmission and distribution systems are maintained; please see the Joint TAO/TSO multi-year balance score card here for further information.
All-Island Approach	Is there a need for coordination with SONI or other Northern parties.	We recognise the importance of collaboration with the Asset Owners - both TAO and DAO - to ensure an optimal, whole-of-system outcome for consumers
Asset Owner – System Operator Collaboration	We also envisage that the TAO and DAO should collaborate with the SOs to ensure the necessary data and support needed to achieve an optimal whole of systems outcome for consumers is shared with the SOs.	The TSO and DSO already work closely with the TAO to ensure that operational security of the transmission and distribution systems is maintained. Please see the joint TAO/TSO multi-year balance scorecard here for further information. In addition, there are existing, BAU processes in place to ensure that DAO data and information is available to inform the DSO’s decision-making process.

Theme	Feedback Received	System Operators' Response
Grid Investment	A resilient grid is essential to meeting our 2030 RES-E targets and longer-term decarbonisation goals. The CAP sets out a vision of how we can decarbonise Ireland's energy system which is unlikely to be achievable without parallel development of the transmission and distribution systems to accommodate the large volumes of renewable generation that will be required. Significant investment is necessary to reinforce and upgrade the grid infrastructure, to accommodate the increased future demand and to strive towards a zero-carbon system that can operate with 100% System Non-Synchronous Penetration.	We recognise the importance and timing of significant investment to reinforce/upgrade grid infrastructure, thus enabling the accommodation of increased future demand; however, grid investment is outside the scope of this consultation.
Grid Investment	We note that the activities planned to incorporate new technologies as outlined in the plan are heavily weighted towards DSO projects. The transmission technology initiatives should be reviewed to ensure that the at-scale transmission investments that will be needed to achieve our targets quickly are also facilitated.	
Grid Investment	We encourage the TSO to invest ahead of need in some cases and consider the nature of these projects as 'strategic infrastructure projects'.	
Grid Investment	Network reinforcements are needed to improve power transfer from the northwest of the country, where a large amount onshore wind is located, and from locations on the east and south coasts where the first offshore wind farms will be located, to demand centres such as Dublin.	
Grid Investment	EDF Renewables recommend developing plans for a complete grid which would include both on- and offshore infrastructure. We further recommend that the plan focuses on investigating further interconnection with the wider European and UK grids.	
Grid Investment	We recommend that the SOs would investigate mechanisms whereby they could accelerate their programme timelines in the context of the relatively short timeframe between now and 2030, to ensure that the RES-E targets can be met. There may be ways for example, to accelerate and compress the six-step Grid Development Process to several overlapping stages operating in parallel. This would enable the faster delivery of projects.	
Impact on Existing Systems	The description of the context of the Work Plan lacks discussion of what has been done to accommodate the new structures required for I-SEM implementation and we are concerned that you have ignored the existing functionality built to allow DSUs to interface with the TSO for the BM, CRM and DS3.	Existing structures were developed to resolve earlier challenges and, while this functionality can (and will) be used and adapted, where appropriate, new and broader requirements will be necessary to address challenges out to 2030. The SOs' considerations within the multi-year programme of work are broader than what is currently available; the plan sets out to fulfil the potential of demand side by implementing future procedures and practices in an efficient manner.

Theme	Feedback Received	System Operators' Response
Market Participation	A key prerequisite for further development is that all participants are capable of exploiting digitalisation. Distribution and Transmission System Operators should be actively encouraging participants who are fully committed and properly equipped to operate in a digitalised power network.	We recognise the roles of digitalisation and automation in enabling market participation across the power network. We are committed to encouraging, and facilitating, participation in all markets and will seek to remove any potential barriers to entry to participants exploiting digitalisation.
Outage Management	More transparency on outage planning and engagement, particularly at the distribution level, would be welcome. There are interactions with transmission outages, and we believe this should be a joint work area that is addressed to reduce outage periods or allow interim measures during outage periods which enable turbines to remain generating or at least connected.	<p>Each year, EirGrid's Transmission Outage Programme (TOP) is developed in collaboration with ESB Networks (in its capacity as TAO and DSO). The alignment of transmission and distribution system outages, where possible, is a key part of this process. While we highlight that outages are a natural part of operating and maintaining a healthy electricity system, we are cognisant of the impact that such outages can have on our distribution-connected generation customers.</p> <p>Through the Distribution Outage Programme (DOP), ESB Networks has significantly increased the quality of communications with our distribution-connected generation customers. Each customer/portfolio receives a customised version of the DOP, which includes all transmission and distribution outages that affect their plant during the year. We recognise the value of engagement with the wind industry, portfolio managers, owners and contractors and are continuing to develop our systems and processes to streamline the communications.</p> <p>ESB Networks has recently focused on implementing measures to mitigate the impact of outages to distribution-connected wind. An example of this is the trialling of means to keep wind farms connected as demand customers during outages of their primary export assets. We will continue to explore - and, ultimately, where possible, implement - measures such as these, working with the relevant stakeholders to ensure that, within the global constraints described above, our customers stay connected to the system as much as possible.</p>
Resourcing	It is essential that the implementation of the workplan is adequately resourced.	We recognise the importance of adequate resourcing to ensure the timely, and successful, implementation of the multi-year programme of work.
Resourcing	We recommend that both EirGrid and ESB Networks would be sufficiently resourced to deliver the multiple workstreams required, in terms of grid development, renewable connections, system operations and electricity markets.	

Theme	Feedback Received	System Operators' Response
System Services	We note that development of the DS3 System Services future arrangements is underway with an anticipated go-live in H1 2024 and we stress that the necessary systems need to be in place at this time to allow distribution service providers access to market and system information to participate in these arrangements on a level playing field.	We recognise the need to facilitate distribution service providers access to market and system information to participate in these arrangements. The SOs would point to the SEM Committee's impending decision around System Services Future Arrangements.
System Services	Where possible, TSO and DSO services should be stackable (independent of other services) to maximise participation and revenues for emerging technologies. Services that cannot be stacked should be prioritised and this should be reflected in their market price.	We recognise the importance of enabling stackable services. Task WOS4 in the Whole-of-System Approach workstream seeks to undertake an impact assessment around value stacking where services needs are aligned and/or conflicting. In addition, task FNT2 in the Facilitating New Technology workstream focuses on the initial flexibility pilot; we will be able to assess the impacts of distribution customers providing services to both transmission and distribution systems. It is our intention that, where possible, customers may be able to stack the revenue they are earning from both transmission and distribution SOs for industrial-/commercial-scale demand side flexibility.

Feedback Received on Balanced Scorecard Proposal

10

Multi-Year DSO/TSO Work Plan
Covering 2022 - 2026

As part of the regulatory framework outlined in the CRU’s PR5 Regulatory Framework, Incentives and Reporting Decision (CRU/20/154), the CRU has introduced an annual balanced scorecard on Joint TSO/DSO coordination.

The CRU has mandated that the SOs shall submit to the regulator (in September each year) – aligning with their consultation with stakeholders – a detailed multi-year plan covering the three following years (and the two years after at high level). In the multi-year plans, the SOs will set out their planned activities to enable deployment of new technology, which will account for technical scarcities or challenges identified by the DSO and/or TSO. 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 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 The quality of the plan and actions (20%)
- 2 The quality of implementation (40%)
- 3 The effectiveness of the aplan and demonstrable actions (40%)

The assessment will be informed by an independent audit to be procured by TSO/DSO as part of the overall process.

Stakeholders’ input is incredibly important to ESB Networks and EirGrid and, thus, we sought your views on the tasks and activities set out in this document. With respect to the balanced scorecard proposal, we asked:

What are the stakeholder’s views on the proposed balanced scorecard for calendar year 2022?

Theme	Feedback Received	System Operators’ Response
Review Process and Assessment	We request that the review process and assessment is transparent and open to industry to view and comment on SO performance. We believe the reports that the balanced scorecard assessment is based on should be open for industry comment before the incentive is finalised.	Section 8.12 of the CRU’s PR5 Regulatory Framework, Incentives and Reporting decision paper (CRU/20/154) sets out how TSO-DSO performance will be assessed, i.e. quality of the plan and defined actions (20%), quality of implementation of the plan (40%), and effectiveness of the plan and demonstrable impacts (40%). The CRU’s assessment will be informed by an independent audit that will objectively evaluate the SOs’ performance To facilitate increased transparency and visibility, we have proposed to the CRU that – once the proposed balanced scorecard has been agreed – we will publish a dashboard that will (i) outline the progress of each task and any changes to the plan resulting from the change control process, and (ii) summarise the results of the most recent audit on delivery of each task versus plan. We will propose a cadence around the updating and publishing of this dashboard, noting, however, that quality of outcome will be prioritised over reporting and measurement.

Theme	Feedback Received	System Operators' Response
<p>Review Process and Assessment</p>	<p>We would also like to comment on lack of proposals for evaluation of tasks and workstream delivery, which seems to ignore any framework for how such tasks contribute to objectives. Evaluation lacks cost benefit analysis. You seem to want to judge a task purely on percentage completion without any quality metric.</p>	<p>We recognise the importance of accurate, and timely, evaluation of tasks and workstream delivery. In Section 9 of DOC-230921-GYW, the SOs propose that measurement of the quality of the implementation plan should be based on delivering the 2022 milestones; a scoring proposal is put forward, with the criteria for measurement based on a continuum of achievement of milestones and a quality metric based on new capabilities delivered which are tabulated in each workstream.</p>