NETWORKS

ESB NETWORKS RESPONSE TO STAKEHOLDER FEEDBACK RECEIVED FROM CONSULTATION ON INNOVATION FOR THE NETWORK OF THE FUTURE

ESB Networks' Response Paper

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1. Introduction

ESB Networks' published an update on innovation activities entitled "Innovation for the Network of the Future" in February 2020 and invited feedback from interested parties via a public industry consultation. Stakeholder feedback was received from 19 respondents in the following sectors.

SECTOR	
RES Wind	✓
Flexibility - Demand Response	✓
Flexibility - Storage	✓
Academia/Research	✓
Utility / TSO	✓
Equipment/Systems Manufacturers	✓
Electricity Suppliers	✓
Government Dept /Agency	✓
Industry Consultants	✓

Table 1: Summary of innovation consultation responses

We received positive feedback and support from the respondents in relation to many of our ideas, pipeline projects and active projects. We also received support in relation to some changes that were made in 2019 such as the consolidation of our eight roadmaps to three, the broadening of our definition of the term prosumer, the launch of our Innovation Forum, the new section on Innovation Projects on our website, the strengthening of our governance structure and framework, and the introduction of an enhanced CBA tool. Many respondents welcomed ESB Networks' plan to issue calls for expressions of interest to seek potential partners for specific innovation projects.

The stakeholder feedback received from the public consultation fell within four broad categories below and ESB Networks' has prepared initial summary responses to the feedback in the tables overleaf based on the four categories.

1. Suggestions to improve the **Innovation Strategy Framework** employed by ESB Networks'.
2. Suggestions to improve ESB Networks' **approach to dissemination, engagement & collaboration**
3. Suggestions to enhance innovation **projects currently being conducted** by ESB Networks'.
4. **New ideas/proposals** for innovation projects which are not in the current innovation portfolio.

ESB Networks' innovation team will offer an individual meeting with each of the respondents to the 2020 consultation as there were a number of topics that warrant further engagement with specific respondents to:

(i) better understand their feedback and how we might incorporate it into our activities;
(ii) follow-up on specific offers of collaboration and/or proposed solutions that are aligned to ESB Networks' priorities and that may offer an opportunity for ESB Networks' to leverage innovation capacity;
(iii) follow-up on specific offers of collaboration and/or proposed solutions that have not been on ESB Networks' radar and innovation pipeline.

2. Innovation Strategy Framework

Several consultation responses focused on the Innovation Strategy Framework employed by ESB Networks' and suggested modifications to the innovation process and governance, and the scope of projects considered. A summary of the feedback and initial ESB Network response is included in the table below:

Feedback Received	ESB Networks' Response
'Customer' Suggestion to avoid the term 'customer' and instead use the more accurate and outreaching term 'end-user' (basically producer, consumer, including the prosumer).	The term used, depends on the context – in some cases 'end-user' is best as it is wider and more inclusive in scope, whereas in other contexts the terms may need to be more specific. ESB Networks' has a range of customers that include end users (e.g. domestic, SMEs, larger industrial and commercial), prosumers, generators, EV charge point operators, flexibility providers and demand customers. In future documents, ESB Networks' will remain cognisant of the appropriate use of these words to better reflect the type of customer we are referring to.
Technology Readiness Level Responses from academic and research bodies suggest that we reconsider our focus on projects of TRL 7 and above, as lower TRL research is also essential to ensure continued fundamental research which can then be brought to these higher TRLs in the future. Also, it was suggested that roadmaps should have a balanced portfolio across the TRL levels. One respondent suggested that ESB Networks' would benefit from a consideration towards System Readiness Level.	We will continue to prioritise Technology Readiness Level (TRL) 7 or higher in ESB Networks' led innovation projects, as we believe this level of ambition is appropriate to give best value to all our customers in view of the scale of resources available within a utility of our size. ESB Networks' is in a position to leverage research carried out in academic/research institutions, which includes research at lower TRL levels, and we will continue to support academic research in Ireland through funding and sponsorship such as our support of UCD's ESIPP programme. We are aware that this research has a role in the transition to a low carbon system and is key to building the necessary skills in Ireland. While we prioritise innovation projects with a TRL 7 or higher this does not preclude other levels should a relevant project be proposed. As part of a best practice investigation, we will review the suggestion of the concept of a System Readiness Level (SRL) that incorporates the current TRL scale and will report back on this topic in the Autumn Innovation Forum.
Initial Assessment Criteria - Weighting It is not clear in the initial assessment criteria whether there is any weighting	Yes, there are weightings applied to the assessment criteria. The criteria are weighted 1 – 5 as per below: • Lifecycle Savings - 4 • Potential Time Frame / Complexity - 1 • Core Competencies - 3 • Strategic Fit and Innovation Type - 4 • Risk - 4

applied to the different criteria. The evaluation appears to give a lot of weighting to the financial benefits to ESB Networks' (and hence the customer). We would suggest that more weighting needs to be given to what is strategically important in terms of what is required to decarbonise electricity.	• Customer Need and Demand 5 The decarbonisation of electricity is a key strategic objective of ESB Networks' and is required by our customers. The weighting above illustrates the priority we place on customer needs and strategy.
Initial Assessment - Timeline The assessment criteria also focus on a time duration of 5 years, however some projects may need to be assessed in terms of decarbonisation to 2030 and beyond.	The screening process is an initial evaluation of projects to quickly assess their alignment with key criteria for innovation projects. Our overall innovation and business strategies have been developed cognisant of the 2030 Climate Action Plan targets. We believe a focus on 5 years is appropriate given the level of change anticipated within the energy sector in the coming years and this assists in delivering tangible results on the path to 2030. However, we still consider the longer-term trends within the energy sector, and this is captured in our future horizon scanning activities and the broader benefits assessment at later stages in the innovation project lifecycle.
Initial Assessment – Criteria Core competencies: 'nationally' (from the network of stakeholders) might be better than 'internally'. Strategic Fit and Innovation Type. What does Horizon mean, how is it used in decision processes?	It had not been our intention for this criterion to be a limiting factor in selecting projects as it has always been our approach to go external to augment our capabilities. This feedback triggers an interesting perspective and we will have a bilateral with the specific respondent to explore how we might incorporate this feedback. The standard definitions used by ESB Networks' are: Horizon 1: Incremental Innovation: the innovation builds on existing products or processes Horizon 2: Breakthrough Innovation – the project potentially provides new products or processes Horizon 3: Radical Innovation – Business altering innovation.
Recommendation to include the impact assessment criteria in the project prioritisation step.	ESB Networks' believes that it has adopted best practice in the identification, prioritisation and evaluation phases based on an assessment of approaches adopted elsewhere. Given the potential number of project areas and the reality of available resources, it is essential to have an efficient initial assessment process, i.e. a first cut screening.

	Following this the Impact Assessment provides a more comprehensive and holistic assessment of the value of a project. The Impact Assessment is not a prioritisation tool but rather categorises the strategic areas of impact of the projects, e.g. 'Facilitating Growth and New Connections'. We are not convinced that bringing the impact assessment criteria stage forward to the initial screening stage will be efficient however given the interest in this topic we will have a session at the Spring 2020 Innovation Forum our project identification, prioritisation and evaluation process to explain our approach, discuss feedback and examine whether we can improve the process.
Governance Do the same governance procedures apply to projects in which ESB Networks' is the (main) sponsor, than projects in which ESB Networks' is a partner?	Innovation projects which are collaborations with multiple other parties are managed by a lead partner or project co-ordinator. Such a partner assumes additional duties regarding the overall application, co-ordination and validation of governance procedures as set out in the relevant project contract documents, e.g. EU Horizon processes. These duties tend to vary depending upon the rules set down by the relevant project funding agency. Whilst project co-ordinators and partners are subject to the same governance rules, the duties on the co-ordinator tend to be more onerous because of ensuring compliance of all other project partners in relation to governance requirements. Project identification and approval is done in a similar way to other projects but in these cases the elements of the innovation project that are relevant to ESB Networks' form the basis for the assessment and approval processes. For example, the EU Horizon 2020 innovation project, +CityxChange, would have been assessed in ESB Networks' governance process in terms of its capability to deliver learnings about the operation of the distribution network in future smart cities rather than aspects of urban renewal and refurbishment of the Georgian Quarter in Limerick that would likely be of more interest to other partners.
Governance - External Advisors/Advisory Group Responses from academic and research bodies reiterated the importance of having a member(s) of the academic community as an external advisor or on the external advisory group. This would increase the innovation capacity by using	ESB Networks' has appointed external advisors to the Innovation Implementation Steering Group and while we have not included a representative from academia, we have sought specific advice in Q1 2020 from an academic innovation expert from NUI Maynooth. In addition to input at the Steering Group level, work has begun, as mentioned in our consultation, to put an external stakeholder advisory group in place in 2020 to provide input across a range of ESB Networks' activities, not just innovation. All classes of stakeholders including academics will be included in the membership. We note the request for the ability for stakeholders

a wider network and would also increase trust by all stakeholders that the framework services society and the wider supply chain, and not just ESB Networks'. A request was also received to allow customers and stakeholders apply for inclusion to the external advisory group.	and customers to apply for representation on these group and will share this request with the ESB Networks' stakeholder team responsible for establishing the groups. Details of the approach we are taking will be made public when the decision is finalised.
Benefit Assessment/CBA While we recognise the importance of ensuring value for money for the customer through continuous assessment and cost benefit analysis, it is important to recognise that in many cases it is difficult to monetise the benefits associated with trialling new technologies or investigating how different types of consumer behaviour might impact the electricity system, but this knowledge is essential for secure operation of the electricity system as we move towards decarbonisation. Will there be opportunities for collaboration, or at least, for the sake of transparency, a consultation on ESB Networks' CBA methodology?	Based on the requirements set out in the SIF incentive mechanism, the CRU have emphasised the importance of ESB Networks' applying a clear, objective and robust process for the identification of expected benefits of a project at the outset, at key milestones during the project, and at the conclusion of the project. The measures of success must be established at the outset and evaluated against relevant metrics. CBAs are used by project managers for our innovation projects where possible. However, as noted in stakeholder feedback, a well-documented challenge for innovation is the ability to monetise the learnings and benefits from innovation projects. ESB Networks' recognises that its central role as DSO in the electricity sector brings the responsibility to engage in innovation activities that offer broader industry learnings that may be difficult to monetise. In such situations ESB Networks' considers qualitative assessments only and success is measured by clearly defined project outputs and benefits recorded at investment appraisal stage. These defined outputs and benefits are then used as the baseline metric to measure success throughout the project lifecycle. In relation to our CBA methodology, this type of approach has been tried and tested in other jurisdictions. It is similar in structure and components to the UK industry-approved CBA tool (Ofgem RIIO EDI CBA template) used by UK DNOs to undertake CBAs in a consistent and transparent manner. ESB Networks' has adapted the CBA tool to reflect Ireland's context and its industry's characteristics. In the interests of transparency, we have shared our approach on quantitative and qualitative benefit analysis in this consultation and have sought to explain the rationale behind our approach. Give the interest in this topic we will have a dedicated session at the Spring 2020 Innovation Forum on our project identification, prioritisation and evaluation process.

Open Data Policies Request for ESB Networks' to develop an open data policies for proprietary information. The rationale for this request appears to be that third parties are interested in using this data for research and development purposes and would welcome a more structured approaches to data sharing.	ESB Networks' acknowledges that the development of structured Open Data policy would be beneficial. We will develop a plan to progress this request and will directly engage with relevant stakeholders to inform the policy. We will give an update on this issue at the Spring Innovation Forum. In the absence of a policy, ESB Networks' already makes some system data available e.g. the Special Load Readings (SLR) Annual Report, available transformer capacity data for all our stations and responds to ad hoc requests for data in compliance with our regulatory and legal obligations.
Roadmaps The one to one mapping of projects to roadmap seems a bit rigid, can a project only serve a single roadmap?	ESB Networks' agrees that many of the projects fit into more than one roadmap. The roadmap selected is usually the one to which it aligns to the most and it gives clarity to the reader to present it as such. The cross over is often highlighted when describing the merits of a roadmap or the benefits of a project. For ease of classification and project management, we propose to continue to categorise a project in one roadmap only even if the project has benefits across multiple roadmaps.
ESB Networks Strategy 2020 - 2030. ESB Networks' should develop a forward-looking plan to 2030 that would outline the actions, milestones and timelines required to move the network from its current form to the future state needed to 2030.	Our ESB Networks' strategy for 2020 to 2030 will be published in April 2020. It is framed by the Climate Action Plan and is driven by ESB Networks' central role in leading the transition to a secure and affordable low-carbon future using clean electricity to drive carbon in the form of fossil fuels out of heat, transport and the economy. It is expected that regular updates on progress against the strategy will be provided in our stakeholder engagements.

3. Feedback on ESB Networks' Approach to Dissemination, Engagement and Collaboration

Several consultation responses focused on the how ESB Networks' could improve the way it engages and collaborates with stakeholders and how it disseminates learnings from innovation activities to the wider industry A summary of the feedback and initial ESB Network response is included in the table below:

Feedback Received	ESB Networks' Response
Engagement and Collaboration	Engagement and collaboration on projects and information sharing allows ESB Networks', our stakeholders and customers to leverage from a network of knowledge, expertise and

ESB Networks' received numerous offers for enhanced engagement, suggestions for collaboration on various projects and opportunities for information sharing with ESB Networks'. Respondents also requested more active engagement by ESB Networks' with external stakeholders during the initial stages of project development and even before project prioritisation has started.	experience to efficiently deliver relevant innovation projects that enable the transition to a low-carbon economy. There are a number of topics in this response paper that will require further engagement with specific respondents to (i) better understand their feedback and how we might incorporate it into our activities.; (ii) follow-up on specific offers of collaboration and/or proposed solutions that are aligned to ESB Networks' priorities and that may offer an opportunity for ESB Networks' to leverage innovation capacity; (iii) follow-up on specific offers of collaboration and/or proposed solutions that have not been on ESB Networks' radar and innovation pipeline. To that end, ESB Networks' innovation team will offer an individual meeting with each of the respondents to the 2020 consultation. In 2020, we will be building on the step change in the level of innovation-related engagement that ESB Networks' did in 2019 in response to specific feedback from stakeholders. Our engagements through the Innovation Forum saw specific opportunities for stakeholders to expand on feedback provided in the 2019 consultation through dedicated workshops on project areas such as electrificaiton of heat and transport, peer-to-peer trading, and smarter and more flexible distribution connections. We will continue with this approach in our 2020 Spring and Autumn Innovation Forums and will include workshops to facilitate more in-depth discussion with stakeholders on key topics highlighted in the feedback we have received from our public industry consultation. When ESB Networks' observed that it had limited engagement from electricity suppliers at the Autumn 2019 Innovation Forum, it arranged through support from the Electricity Association of Ireland (EAI) for a supplier-focused innovation meeting in December 2019 with the purpose of increasing engagment from this sector. Representatives from the CRU were also invited to attend. A number of follow-up actions emerged including ESB Networks' extending an invitation to each supplier to meet on an individual basis to discuss innovation activities and to continue to have dedicated round-table engagements with the supplier sector on innovation in 2020. Individual invitations have been issued and some have yet to be taken up by all suppliers and this remains an ongoing action for ESB Networks'. The objective of these sessions is to share information about the innovation projects that ESB Networks' is working on, to hear about the challenges suppliers are facing and the solutions they are working on, and to look at potential areas we may work together in the future. The purpose of these types of focussed sessions, the workshops at our Innovation Forums, and public consultations

	are designed to get early input from our stakeholders on our innovation ideas and pipeline projects. ESB Networks' engages with a significant number of partners and collaborators as a result of its involvement in research and innovation projects. Project partners are often selected as part of a procurement exercise. Throughout 2020, ESB Networks' will be issuing several calls for expressions of interest from potential partners on specific projects, e.g. peer-to-peer on the Dingle Project, flexibility solutions as an alternative to conventional distribution reinforcement and the provision of public fast chargers in Dingle for our EV trial. The functional design of the peer-to-peer trading trial will likely include billing and settlement of the trades, and hence a partner with experience, systems, and residential customers, will be required for this. We are open to the idea of our trial partner operating as a JV or proposing a sub-partner for the trial. In recognition of this public call for expressions of interest and the fact that the peer-to-peer workshop at our Autumn Innovation Forum was over-subscribed, we will hold another dedicated peer-to-peer workshop at the 2020 Spring Forum to continue the discussion with stakeholders. In October 2019 we issued a community call for an EV trial in Dingle which closed in February 2020. We are currently reviewing the applications and successful respondents will be selected and published shortly.
Horizon Europe and Similar Projects Greater participation in Horizon 2020/Europe projects with a large portfolio of international partners would be valuable, as would broadening cooperation with non-EU partners.	We note the feedback encouraging ESB Networks' to reconsider its position on EU Horizon 2020/Horizon Europe projects. However, we do not propose to change our position at this time and do not see us partnering in any new projects over the next 18 months. To deliver best value for our customers given the resources a utility of our size has at its disposal, we believe it is still correct to prioritise projects that are TRL7 and above. Horizon projects tend to consider and evaluate concepts at a lower TRL so we will continue to focus our resources on the more immediate and higher priorities. We believe an appropriate compromise given recent stakeholder feedback and our published position, is the provision of Letters of Support to Irish-led consortia bidding for such EU projects (aligned with our innovation roadmaps) where we will agree to participate in the project Advisory Board. We recognise that there is value to both ourselves and these projects in sharing our distribution utility perspectives and learning about the projects' recommendations and outcomes. We acknowledge the significant role that social engagement and customer engagement will have in decarbonising the energy

Horizon Europe will have a major focus on social engagement for energy and particularly with the New Green Deal. ESB should actively seek out social engagement research and demo projects.	sector and acknowledge that our role is to ensure the distribution electricity system facilitates the customer of the future. We welcome opportunities from those responsible for behind-the-meter activities (e.g. suppliers, aggregators etc.) to understand how we can design the network of the future to support and engage with their customers. In relation to the apparent concern that ESB Networks' is focusing only on technology projects at the exclusion of social engagement research and demonstration projects, we would like to highlight that a number of our innovation projects have an active energy citizen component/local community element, e.g. Dingle, +City Xchange, REACT, which we believe is proportionate given our role in the industry sector and remain open to other collaborations.
Community Engagement ESB Networks' is proving to be highly innovative in its approach to community engagement on the Dingle Peninsula. This should be given more emphasis in ESB Networks' Innovation Strategy.	ESB Networks' welcomes the praise for our approach in the Dingle Electrification Project. We understand that customers and communities will play an important part in whether services like flexibility and peer-to-peer energy trading might truly become a reality. The way the energy sector engages and educates the customer is important and will determine whether active energy citizens and energy communities play a major role. Given our position as DSO with no formal role in behind-the-meter activities, ESB Networks' through our Future Customer Roadmap welcome collaboration opportunities from those responsible for behind-the-meter activities (e.g. suppliers, aggregators etc.) to explore how we can innovatively, cost effectively and efficiently design the network of the future to support increased community engagement. Our involvement in innovation projects that have an active energy citizen component/local community element, e.g. Dingle, +City Xchange, REACT provide us with useful opportunities to engage with future customers and learn from the projects.
ESB Networks' Website A request to ESB Networks' to publish a simple yet robust reporting programme/dashboard on its website using specific metrics to demonstrate how the projects in the innovation programme are delivering the benefits for the customer, how system costs to industry are being minimised, and	We are carrying out further improvements to our website in 2020 and we will look at what options are available in terms of a summary dashboard for ongoing projects. Based on stakeholder feedback from our meetings with electricity suppliers, we also intend to publish updated lists of our pipeline projects on our website. In the consultation document we outlined our strengthened approach to project reporting and benefit analysis. Reports on projects that from now on have adopted this enhanced approach will provide this extra level of detail.

how projects are being delivered in an efficient and effective manner. More detailed project information is needed in the published reports including explanations of the methodology used in each project.	
Retrospective Offering The offering to stakeholders remains retrospective in nature as ESB Networks' have already decided the projects (with some close to closing out) that make up the innovation project portfolio for the network.	ESB Networks' disagrees with the assertion that the innovation offering to stakeholders is retrospective in nature. The very nature of the public industry consultations we have conducted in 2019 and 2020 is to seek views on what we have being doing to date and on our future plans particularly the pipeline of projects that are being proposed and from which we must choose the next ones to progress and whether there are priority areas we have missed out. The purpose of our enhanced engagement over the last 18 months has been to increase the level of innovation-specific interactions with stakeholders in order to help inform our innovation activities. We do have legacy innovation projects that are in progress at various stages from our original 2017 Innovation Strategy and we have welcomed feedback from stakeholders in the 2020 consultation on those in an effort to inform future choices and priorities from the project pipeline. It is worth noting that while the 2017 Innovation Strategy was developed without formal public industry consultation, it was informed from learnings from other relevant jurisdictions, from feedback received from stakeholders through a number of channels and from directions from policy makers. In our latest public consultation, we gave details of pipeline projects and ideas and have specifically sought feedback from stakeholders on those projects, asking stakeholders whether they agree with those projects or whether there are other project areas we should consider that stakeholders believe may offer greater potential benefits, or for which there is a more urgent requirement. This has given stakeholders a proactive opportunity to input into the proposed projects at an early stage. Our engagements through the Innovation Forum saw specific opportunities for stakeholders to expand on feedback provided in the 2019 consultation through dedicated workshops on project areas such as electrificaiton of heat and transport, peer-to-peer trading, and smarter and more flexible distribution connections. We will continue with this approach in our 2020 Spring and Autumn Innovation Forums. When ESB Networks' observed that it had limited engagement from electricity suppliers at the Autumn 2019 Innovation Forum, it arranged through support from the Electricity Association of

	Ireland (EAI) for a supplier-focused innovation meeting in December 2019 with the purpose of increasing engagment from this sector. Representatives from the CRU were also invited to attend. A number of follow-up actions emerged including ESB Networks' extending an invitation to each supplier to meet on an individual basis to discuss innovation activities and to continue to have dedicated round-table engagements with the supplier sector on innovation in 2020. Individual invitations have been issued and some have yet to be taken up by all suppliers and this remains an ongoing action for ESB Networks'.

4. Suggested Enhancements/Commentary on Current Innovation Projects

Several consultation responses focused on the how ESB Networks' could improve and enhance innovation projects currently underway. A summary and initial ESB Network response is included in the table below:

Feedback Received	ESB Networks' Response
Peer-to-Peer Clarity was requested in relation to ESB Networks' vision for peer-to-peer trading in our networks (e.g. regulatory changes and the provision of test beds).	ESB Networks' aims to facilitate future active energy citizens and their changing relationship with the energy system. We do not envisage a situation where ESB Networks' has responsibility for peer-to-peer trading as we expect this will be a market-led initiative and not within scope for the DSO. Our consultations and ongoing stakeholder engagements have clearly indicated that there is significant interest in the topic of peer-to-peer energy trading and diversity of views on how it might be achieved in Ireland. In the absence of an active peer-to-peer trial in Ireland, ESB Networks' looked to develop a trial of the concept in Dingle to both help us understand what we need to do in the future to enable these activities for our customers and facilitate a discussion amongst industry stakeholders. The oversubscribed, dedicated peer-to-peer workshop that ESB Networks' held at the Autumn Innovation Forum in 2019 demonstrated to industry the variety of views that exist. This was evidenced by the diversity of views on fundamental aspects of peer-to-peer concepts including the geographical proximity of peer-to-peer participants, definition of a local energy community and the economic case and societal benefits. The aim of our peer-to-peer trial in the Dingle Electrification Project is to undertake one of several possible peer-to-peer trading concepts. Through demonstration, we aim to consider the regulatory changes which might be required, and the benefits and challenges which these concepts might offer. We

	will look to share these learnings with industry, regulatory and policy makers in a transparent manner. The functional design of the peer-to-peer trial is being drafted currently. ESB Networks' will work closely with the CRU prior to the commencement of any trial as well as during and following completion of the trial, to optimise the development and learnings from any proposed activity. Notably, since the beginning of the Dingle Electrification Project, ESB Networks' has also become a partner on the +CityxChange and REACT projects both of which may have a peer-to-peer element. We will look to share learnings from those projects with industry, regulatory and policy makers.
LV Visibility Request for support for LV network model and enhanced LV monitoring projects. Advanced analysis and decision-making tools for LV networks can be developed to aid network planning and operation.	ESB Networks' is engaged on a number of innovation initiatives to develop advanced LV visibility, monitoring and control particularly to support microgeneration and the electrification of heat and transport. Several parties have advised of their willingness to support our efforts and provide services, some on a commercial basis, in this area. As indicated earlier, ESB Networks' innovation team will offer an individual meeting with each of the respondents to the 2020 consultation and will explore such offers of help through that channel.
Smarter HV and MV Customer Connections Project There is a need for further work on this project to enhance the flexibility of the system and allow for smarter, more effective customer connections and management of the system. There is merit in adopting a fast follower approach in this area as there is much international experience from other DSOs that can be taken advantage of.	The Smarter HV and MV Customer Connections project output will include initial concrete proposals for more flexible network development options and customer connections (for demand load and distributed generation) and will also include a roadmap outlining further enhancements of these initial proposals, which will involve more active management approaches, and a move towards a more actively managed distribution system. ESB Networks' remains in close contact with UK DNOs and others to keep itself informed of their ongoing work in this space. ESB Networks' is also represented on the Steering Group of ENA's Open Networks project and actively participates in the workstreams, e.g. Workstream 3 – Future DSO. Learnings from other DSOs and DNOs will be key to our deliberations for future developments.
Network Heat Maps Will ESB Networks' be making available network heat maps with information such as substation capacities? Will this be	It is worth noting that the Station Configuration and Load Data (SLR Report) (https://www.esbnetworks.ie/tns/publications/-in-category/categories/publications/freedom-of-information) report is available on the ESB Networks' website and provides information such as substation transformer rating, summer valley load and winter peak load etc. to assist customers in

considered under projects such as DistriHost?	determining potential available capacity at our distribution substations. ESB Networks' also published information relating to existing connected and contracted generators (https://www.esbnetworks.ie/new-connections/generator-connections/generator-connection-statistics). The combination of this type of data read together with the planning standards provide developers with the opportunity to potentially screen project locations. Available transformer capacities for all ESB Network's controlled 10kV, 20kV, 38kV and 110kV stations for demand customers have already been published on ESB Networks' website over the last number of years (https://www.esbnetworks.ie/power-outages-updates/search-results?indexCatalogue=site%2Dsearch&searchQuery=capacity+enquiry+2017&wordsMode=0 (this information is calculated at a point in time and is based on certain defined assumptions so cannot be used definitively as a basis for investment decisions but is a useful screening tool for customers looking at where to site their projects on the system). ESB Networks' will publish a heat map in 2020 which will further assist customers by displaying this information in a graphic representation for each ESB Network's controlled 10kV, 20kV, 38kV and 110kV stations. This heat map project had input on customer expectations and requirements from the IWEA Grid Committee via both a discussion at one of the regular IWEA/ESB Networks' session and a survey issued to IWEA Grid Committee members. DistriHost is a project based on an EPRI innovation to provide an additional software tool for ESB Networks' planners with the aim of ultimately reducing the time taken to conduct a customer connection power system study. It is not related to the heat map project.
"Development of Robust Low Voltage (LV) models for the Future Network Planning and Operations required to facilitate active energy citizens.": It is hoped that these models would break down each customer by both scale (amount of energy usage) and technologies employed?	Internally within ESB Networks' the LV models developed will use whatever customer aspects are known about the customer which are relevant to LV network modelling. This could include energy usage although peak demand would be more useful if available. However, individual customer data will not be available outside ESB Networks' as it is confidential to the customer. As mentioned in response to the feedback on requesting that ESBN Networks develops an Open Data policy, we will look to develop such a policy and in doing so will consider what type of aggregate data might be made available externally subject to our regulatory and legal obligations.

FlexTech Initiative Use the FlexTech initiative to progress innovative projects and solutions to existing policy barriers for storage and other technologies.	ESB Networks' is a partner in the TSO-led Flextech initiative and support the use of this platform to progress innovative projects and solutions.
Nodal Controller More information requested on the nodal controller trial and how this can be rolled out further to unlock the potential from additional renewable generators on the distribution system.	ESB Networks' will share the feedback from the innovation consultation with the TSO and CRU. If the TSO approves the technical acceptability of the solution (note that additional TSO testing is ongoing of the pilot Nodal Controller system in Cauteen, Co. Tipperary), discussions between ESB Networks', the TSO and CRU would take place around next steps. This discussion would be informed by the TSO's assessment of the solution and the reactive power requirements of both system operators. Further engagement with industry would follow. In the interim, Type B windfarms greater than 5MW, continue to be tested for implementation of the mandatory direct reactive power/voltage control distribution code requirements. Workshops have been held with IWEA on the implementation of these tests and the outcome is being fed back into the process.
Microgeneration ESB Networks' needs to increase its focus on the facilitation of microgeneration, there is very little in the current portfolio promoting microgeneration.	Facilitating microgeneration is very much front and centre of ESB Networks' plans as much of our preparatory LV network readiness work and ongoing initiatives to support the electrification of heat and transport also support the anticipated increase in microgeneration. It is accepted that we ought to communicate this better to alleviate concerns. As part of the National Climate Action Plan Action 30, ESB Networks' submitted a technical report on microgeneration to DCCAE in Q4, 2019 on the topic of "Determination of appropriate grid connection policy to facilitate renewable self-consumers and access for microgeneration". It is expected that a publication summarising the findings of this report will be published by Q2 2020.
e-Cars Interactive Map Interactive live mapping of the ESB ecars network would be an important resource for current and future EV consumers and will help to support confidence in the public recharging network	ESB Networks' as the regulated DSO for Ireland do not own operate or install EV charge points. We are developing our network to facilitate the electrification of heat and transport. It is our responsibility to provide the electricity network connections for electric vehicle charge points however we have no role in the operation and maintenance of EV charge point infrastructure. Live mapping of the EV charge point network would be an issue for the charge point operator industry and policy makers. eCars is not part of ESB Networks' and is only one of a number of ESB Networks' charge point operator customers.

and consequently support EV uptake.	
Hybrid Connections Support expressed for hybrid RES distribution network connection trials. It was noted that the FlexTech initiative has a hybrids workstream and suggested that projects could be progressed via this mechanism, with industry and System Operator collaboration.	ESB Networks' and the TSO are working within the framework of the FlexTech programme and consultation process to progress hybrids in 2020. We have no immediate plans for a hybrid trial however ESB Networks' will share the specific feedback received on this topic with the TSO. The FlexTech consultation responses by ESB Networks' and the TSO are due to be published shortly. It is also worth noting Action 18 of the National Climate Action Plan which is to "Facilitate additional hybrid connections operating in the electricity market to increase RES-E penetration" and the fact that ESB Networks' is working with the TSO to assist the CRU with this action.
Lean Connections Project Support expressed for the Lean Connections project. This project should take into account TSO/DSO interactions and improvements in the current modifications process too.	The Lean Connections project is an ESB Networks' process improvement initiative. ESB Networks' innovation team will share the specific feedback received on this topic with the Lean Connections project team.

5. Feedback on New Ideas and Proposals for Innovation Projects

Several consultation responses provided feedback to ESB Networks' on new ideas and innovation project proposals. A summary of the feedback and initial ESB Network response is included in the table below:

Proposals Received from Stakeholders:	ESB Networks' Response:
Demand-Side Flexibility and Non-wire alternative solutions of commercial and industrial customers of ESB Networks', and the potential for local, DSO-led flexibility markets.	The Electricity network Association in the UK through its Open Networks Future Worlds (www.energynetworks.org) initiative developed possible models for DSOs in the future. ESB Networks' sees its future being more aligned with *World B: Coordinated DSO-ESO Procurement and Dispatch*. As detailed in the ENA report, "In World B, flexibility resources can provide services to multiple SOs and are able to stack revenues from these differing SOs. It is recognised that, on occasion, the needs of different SOs will conflict and it will be the joint responsibility of these SOs to coordinate service procurement and dispatch

	activities. This will be done in a transparent manner which creates the most efficient outcome for the end consumer." In light of the potential World B role and the changes needed in the transition to a lower carbon system, ESB Networks' recognises the significant potential of demand side flexibility to assist the operation of the distribution system and will be exploring what innovations we can take. For example, we have started scoping an innovation project (that was detailed in our pipeline list in the consultation document) that will trial a non-wires solution by procuring flexibility from a local flexibility market to solve a network system constraint rather than using conventional network reinforcement. We would hope to receive responses from the market from both demand side and storage flexibility providers. The network flexibility approach as recommended by the Smarter HV and MV Customer Connections project (an approach which was separately consulted on in 2019 and discussed at one of the Autumn 2019 Innovation Forum workshops) will be used on this project. In addition to testing the market response, the trial will be used to consider what will be required across the ESB Networks' business to implement this new approach to reinforcement including procurement, economic assessment, and operational requirements. As part of this project the costs and benefits of deploying these systems will be evaluated to ensure that as these systems transition to BAU they will be deployed in a way that gives best values for our customers both now and in the future.
Second-Life Batteries Project on the use of second-life batteries to promote distributed energy resource integration and improvement of grid flexibility.	ESB Networks' is participating in several projects where low carbon technology (e.g. EV charge points, heat pumps, microgeneration, battery storage) is being deployed. Our interest lies in how active energy citizens and other customers behaviour may change when they use the technology. We want to understand the implications of changing behaviours and the impact on the electricity network. The learnings will be used to inform how we design the network of the future. Given our ultimate role in the electricity market as DSO and the fact that under EU market rules we are essentially prohibited from owning battery storage, we are agnostic as to whether batteries used on the system are first or second life. Our interest lies in how the network can facilitate their use by future customers and how batteries might support network operations. A flexibility provider responding to our non-wires reinforcement flexibility trial may choose to offer a second-life battery option but ESB Networks' has no plans at this stage to instigate any specific battery technology projects to examine the performance of second life versus others.

Long-Term Storage Projects to support increased integration of renewable energy.	As the penetration of renewable generation and the requirement to decarbonise flexibility services increases, the electricity market is expected to consider a range of energy storage projects as alternatives to fossil fuel-based flexibility. Several long-term energy storage approaches exist, with thermal, mechanical, chemical, and electrochemical methods either currently being deployed (including pumped hydro) or under development (molten salt, compressed air). We anticipate this technology to emerge when the market evolves to make compelling business cases for the deployment of these technologies. Given our role in the electricity market as DSO and the fact that under EU market rules we are essentially prohibited from owning battery storage, we do not envisage instigating innovation projects to test the viability of various technology storage solutions. We anticipate our involvement in this innovative area to be linked to when the DSO explores how flexibility from demand side or storage solutions may be used to provide system services. We would envisage flexibility providers responding to procurement calls from ESB Networks' to offer solutions to specific network issues rather than ESB Networks' instigating storage-specific innovation projects. For example, we have started scoping an innovation project (that was detailed in our pipeline list in the consultation document) looking to trial a non-wires solution by procuring flexibility to solve a network system constraint rather than using conventional network reinforcement. The network flexibility approach as recommended by the Smarter HV and MV Customer Connections project (an approach which was separately consulted on in 2019 and discussed at one of the Autumn 2019 Innovation Forum workshops) will be used on this innovation project. In addition to testing the market response for possible solutions that may be proposed, the trial will be used to consider what will be required across the ESB Networks' business to implement this new approach to reinforcement including procurement, economic assessment, and operational requirements. We would hope to receive market responses from both demand side and storage flexibility providers.
Localized Generation and Demand Forecasting using machine learning/artificial intelligence.	With increased penetration of local distributed generation and microgeneration, forecasts of localised generation within specific areas may become more important. ESB Networks' is engaged on a number of innovation initiatives to develop advanced LV visibility, monitoring and control as a priority. While localised generation and demand forecasting may not necessarily be an urgent requirement for system operations at this stage, this may form part of the next stage of investigations. The ESB Networks' innovation team will explore this further with the respondent.

Neutral Market Facilitator with third party solutions facilitated where possible via measures such as locational signalling, market structures, including long term contracting mechanisms, and other commercial incentives.	We acknowledge the role of the DSO is evolving and as mentioned above, ESB Networks' sees its future being more aligned with ENA Open Worlds - W*orld B: Coordinated DSO-ESO Procurement and Dispatch*. We will be exploring how ESB Networks' role evolves and what it needs to put in place to facilitate the changes. We anticipate a number of innovation projects and initiatives in this regard including close cooperation with the TSO. ESB Networks' currently provides instruction sets to the TSO and consent letters to DSUs and other system service providers to enable provision of DSR to the wholesale energy market and DS3 system services to the TSO. One of our pipeline projects for 2020 is 'Congestion Management and Capacity Allocation using Operational Management Systems' which will trial a Distributed Energy Resource Management System (DERMS) module to significantly enhance the granularity of the instruction sets issued to the TSO and onward to DSUs and also greatly increase our visibility of the distribution system. We are committed to facilitating these services and are constantly reviewing how we can best facilitate these going forward. The learning we will get from the pilot and possible deployment of this system will help to inform how we can best perform our role as neutral market facilitator.
Flexible Tariffs A project to consider the integration of 'flexible tariffs'. In the future, the market may need to move away from the day and night approach to 'Peak' and 'Off Peak'.	Our meter replacement programme where we are installing smart meters is a key enabler to the provision of flexible tariffs in the future. We acknowledge that more complex tariff systems may form part of the suite of customer propositions into the future. We have no specific projects ear-marked at present but will explore this further with the respondent.
EV Charging Solutions A sidewalk transformer with EV charging or discreet EV charging stations could help to overcome barriers such as for houses that only have 'on street' parking.	It is ESB Networks' responsibility to provide the *electricity network connections* for EV charge points and we acknowledge that there will be a suite of EV charge point options in Ireland in the future. We have a range of network innovation initiatives ongoing to support these options as well as other aspects of increased electrification of heat and transport. We are aware that our charge point customers (i.e. EV charge point developers and operators) and local authorities are examining options for on-street charging and will look to support their proposed solutions wherever possible. ESB Networks' as the regulated DSO does not own, operate or install EV charge points and it does not seem appropriate that we would develop an EV charge point integrated with our substations or assets. However, we welcome proposals from

	EV charge point owners/operators who wish to trial new solutions for the provision of EV charge point infrastructure. As we look to support EV charging developments, there will be further engagement in 2020 with EV charge point developers/operators and local authorities.
European Jurisdictions Recommendation that ESB Networks' extends its review of UK DNO Innovation Projects and the Fast Follower approach to include other European jurisdictions.	For its initial tranche of its Fast Follower review, ESB Networks' chose to focus on the UK innovation outcomes given our involvement with the Electricity Networks Association (ENA), and the level of activity/availability of project information on the UK Low Carbon Network Fund (LCNF) and Low Carbon Network and Innovation (LCNI) programmes. We will look to expand that beyond the UK projects in the next stage. While not identical and acknowledging each network has its own characteristics, the nature and topology of UK distribution networks, climate and renewable resource has much in common with the Irish distribution network and therefore our challenges tend to be similar. This means that UK DNO innovation projects are useful to inform the development of the innovation project programme in this jurisdiction. It is worth noting however that ESB Networks' does not restrict its review of innovative concepts and technologies to the UK only. We seek international perspectives from a number of channels ranging from our work with Eurelectric, EDSO, EU Horizon partners, an innovation MoU that ESB Networks' and EirGrid have with New York Power Authority, our involvement with EPRI, our participation in the international Free Electrons programme and collaboration with other continental European utilities such Enedis and EDP. Nevertheless, we invite stakeholders to advise ESB Networks' of any specific European innovation projects that they believe would have relevance to the Irish distribution system and we will of course follow-up directly with the respondent.
Smarter Outage Management and the co-ordination of same between both DSO and TSO.	We have shared similar feedback from the 2019 innovation consultation with the relevant system operations teams who are working with the TSO on ensuring better coordination on outage management. We will share any further specifics on this and any subsequent follow-up with the respondent with the system operations teams.

For any additional information, please contact the innovation team via email: innovationfeedback@esbnetworks.ie