UCD ENERGY INSTITUTE

UCD Energy Institute response to the ESB Networks Public Consultation on Innovation for the Network of the Future

28th February 2020

UCD Energy Institute welcomes the opportunity to response to the ESB Networks Public Consultation on Innovation for the Network of the Future. The decarbonisation of our energy system will have significant consequences for the electricity distribution network and the need for innovation is stronger than ever.

UCD Energy Institute has a strong collaborative relationship with ESB Networks and looks forward to continuing this relationship as we decarbonise our energy system. In particular we have seen a step up in engagement with more structured interactions throughout 2019 which is a welcome development. UCD Energy Institute is a multidisciplinary institute where the focus of our research is on the decarbonization of the energy system including the electrification of heat and transport. The inclusion of additional aspects such as meteorology, consumer behaviour and policy implications makes us uniquely placed to carry out research looking at the real-world implications of technology solutions.

Comments on the Consultation Document

The "Innovation for the Network of the Future" consultation document provides a very comprehensive overview of the innovation activities underway in ESB Networks. This provides useful clarity to the industry and stakeholders of the areas being addressed.

Technology Readiness Levels: We recognise that ESB Networks prioritise TRL 7 or higher for their innovation projects within the business in terms of giving value to customers. It should be highlighted that lower TRL research is also essential to ensure continued fundamental research which can then be brought to these higher TRLs in the future. The continued support from ESB Networks for academic research plays an essential role in continued fundamental research which will still be required as we transform our electricity system.

In relation to higher TRLs, the Energy Integration Laboratory, developed in partnership with Electric Power Research Institute (EPRI), is part of the UCD Energy Institute. It has been set up with the concept of bridging the gap between academia and industry to facilitate the assessment of TRL4 or higher technology interactions between different energy vectors such as electrical, thermal, gas, and their management in the system. Facilities in the lab include, real time simulation with HiL (Hardware in-the-Loop) capability, temperature controlled room for thermal tests, gas (incl. Hydrogen) and electrical test facilities.

Roadmaps: We welcome the consolidation of the previous eight roadmaps into three focussed roadmaps which includes flexibility to cater for changing requirements. The pace of change within

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the energy industry is increasing all the time and it is essential for ESB Networks to be able to respond to this in a flexible manner.

Innovation Process: The structured approach to the innovation process provides a clear outline of the requirements for an innovation process and the stages where stakeholders can expect to interact and to learn more. The dissemination of learnings is essential to keep stakeholders informed of progress across different projects, and events such as the Innovation Forum are useful for disseminating information and providing opportunities for engagement with the project teams.

External Advisory Group: We note that ESB Networks are not considering members that receive funding as part of the Innovation Steering Group. We believe that an advisory role for the academic community would provide important input into the innovation process from time to time. This is something that could feed into the external advisory group which is expected to be implemented in Q2 2020. We would welcome an opportunity to be involved in this.

Capacity Building: As noted on the consultation document there is an opportunity for leveraging existing partnerships to provide relevant training. This is something we are actively looking at within the Energy Institute. Given the pace of change expected in the coming years there is a need for the existing and emerging workforces to be able to update their knowledge and expertise and we are looking at ways in which we can help meet that need.

Multidisciplinary innovation initiatives: We strongly support the multidisciplinary approach referred to in the consultation document. At the UCD Energy Institute we have seen that a multidisciplinary approach is essential to understanding the different aspects of the energy transitions including technological and engineering challenges, financial frameworks, meteorological aspects through to understanding customer behaviour in relation to technology adoption and use. For ESB Networks, partnerships (including with UCD Energy Institute) can help support this multidisciplinary approach.

Project Evaluation and Benefit Assessment: 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 might not be straightforward to quantify the benefits. In the coming years we expect to see significant changes to the electricity system and, with increased customer participation on the distribution network, it will be essential for ESB Networks to be prepared for changes in how the system might be used. Examples include trialling new technologies (e.g. EVs and batteries) or investigating how different types of consumer behaviour might impact the electricity system. It is difficult to monetise the benefits associated with this, but this knowledge is essential for secure operation of the electricity system as we move towards decarbonisation.

Strategic Validation through Collaboration with Stakeholders and Third Parties: Regular interaction with stakeholders helps ensure that the innovation projects being pursued are the right ones and remain relevant to customers and to society.

Assessment Criteria and Impact Assessment Framework: The assessment criteria seem to be appropriate and help to ensure consistency and clarity of approach. It is not clear whether there is any weighting applied to the different criteria. For example something that has strong strategic fit and meets customer need and demand might have limited lifecycle savings potential in terms of monetary value, but might be essential in delivering a decarbonised electricity system. 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.

Understanding the areas of impact is critical for any innovation project. The table in the consultation document outlining the results of the impact assessment framework highlights that a number of these projects have a range of impacts and helps to identify projects which are most likely to deliver high impact.

Pipeline Projects: There are a number of areas of overlap between the pipeline projects identified in the consultation response and the research areas of the UCD Energy Institute. These areas have been explored through recent workshops and we will continue to engage on areas of mutual interest. We are also in the process of identifying future research challenges and this engagement, along with the consultation document, will assist in formulating the relevant research questions.

Impact Assessment Framework: It is important to understand the impact of the projects which are underway, and to understand the range of impacts associated with particular projects. We would also recommend that these impact criteria are included in the project prioritisation step.

Roadmaps/Projects: We welcome the publication of the ongoing projects as this provides useful insights into the development of the distribution network and operational processes. This helps reduce duplication in these research areas and provides information to allow increased engagement in areas of relevance.

Collaboration, Engagement and Dissemination: There is increasing recognition of the importance of engagement in relation to the innovation activities. Understanding the changing demands of the network and plans for innovation and development is essential for the energy community and customers as we move to decarbonisation of our energy systems. Increased collaboration and engagement allows optimisation and cost reduction as we are able to combine efforts to address these challenges. This collaboration can only really be explored when there is an understanding of the ongoing efforts through dissemination and engagement. From a UCD perspective, ongoing engagement helps support the pipeline of students coming through the university as they have an increased understanding of how their research can be applied. It also helps to create networks and contacts. Events such as the Innovation Forum provide a useful platform for sharing information and ideas, as well as being able to engage with the project teams. Collaboration on the energy challenges helps all parties and we welcome the improvement in engagement we have had with ESB Networks over the past year.