



NETWORKS



# SMARTER HV AND MV CUSTOMER CONNECTIONS INNOVATION PROJECT PROGRESS REPORT

PROJECT OWNER: Ivan Codd

DATE OF UPDATE: 14/12/2020

DOCUMENT NO.: DOC-201210-FMU Ver: R2.0

PROJECT START DATE: (e.g. Q1, 2017).

PROJECT END DATE: (e.g. Q1, 2021)

Contributors: Neassa McCabe

## 1. PROJECT OVERVIEW AND EXPECTED BENEFITS

Under the Smarter HV and MV Customer Connections Innovation Project – New Approaches to Distribution Planning & Security of Supply Standards, the methods used by ESB Networks to determine how to connect our customers to the distribution system, namely the Distribution System Security and Planning Standards, were fundamentally reviewed in collaboration and consultation with stakeholders and consultants to establish how the standards needed to evolve to meet the changing needs of our customers in a lower carbon future. The new standards take account of the requirements of binding National and EU Energy Directives and Network Codes, whilst cost effectively maintaining a safe, secure and reliable distribution system.

Expected benefits include:

The publication of further and more detailed information on the applicable planning criteria to allow for a greater understanding of the planning process and rules used in assessment of customer applications and network development.

The inclusion of the introduction of Non-Firm Access (NFA) connection arrangements for Distribution Connected Distributed Generators (DG) which will facilitate increased DER on the network supporting Ireland's 2030 targets.

The inclusion of the introduction of Non-Wires Alternatives (NWA) or 'Flexibility' services to maximise the use of existing network assets, reducing the levels of network reinforcement required wherever possible, while also facilitating the lowering of connection charges and costs, and the shortening of connection times.

The introduction of a Load Indices approach as a measure for asset utilisation at HV Stations, and for first use as part of the PR5 submissions.

## 2. PROJECT SCOPE

The project scope included:

- Undertaking a review of ESB Networks' Distribution System Security and Planning Standards.
- Appointment of consultancy support to assist with the review project and to ensure the provision of an industry independent perspective.
- Engagement with Stakeholders and gather stakeholder opinion and suggestions to establish how standards needed to evolve to meet the changing needs of our customers in a lower carbon future.
- Carrying out a peer review comparison of other Distribution Network Operators / Distribution System Operators in other relevant jurisdictions considering their Planning and Security of Supply Standards and best practice methods.

Also included in this scope was the development of a Load Indices approach for use by ESB Networks which provides a loading level profile for HV Stations allowing ESB Networks to use this as an indicator for identifying and prioritising work for Price Review Periods going forward.

### 3. MILESTONES REACHED TO DATE

In 2019:

- Issued Project Terms of Reference, Project Plan and Stakeholder Engagement Plan for Public Consultation in January 2019.
- Approval of Project Terms of Reference, Project Plan and Stakeholder Engagement Plan.
- Opening of a tender enquiry and subsequent appointment of consultancy support in February 2019. The successful tenderer was EA Technology.
- Ongoing collaboration with EA Technology throughout 2019 consisting of workshops, meetings and calls.



**FIGURE 1: PROJECT WORKSHOP WITH EA TECHNOLOGY (7 MARCH 2019)**

L-R: Conor Molloy, PR5 Technical Lead, ESB Networks; Paul Morris, EA Technology; James Brennan, Strategic Planning Manager, ESB Networks; Mark Sprawson, EA Technology; Ivan Codd, Distribution Planning Standards Manager, ESB Networks; Neassa McCabe, Distribution Planning Standards, ESB Networks

- Completion of the development of a Load Indices approach.
- Issued Load Indices Approach Proposal for public consultation in August 2019.
- Introduction of Load Indices approach embedded into BAU, and first use in the PR5 submission.
- A paper entitled ‘Stakeholder Engagement in the Revision of ESB Networks’ Planning & Security of Supply Standards’ (Ivan Codd & Neassa McCabe) was accepted for the CIRED 2019 Conference, (Madrid, 3-6 June 2019). This paper described the project overview and objectives, highlighting the interaction with stakeholders, including stakeholder engagement workshops, meetings and public consultations. The paper was included and presented in Poster Session 5 (Planning of Power Distribution Systems) at the CIRED 2019 Conference, and published in the conference proceedings: <https://www.cired-repository.org/handle/20.500.12455/305>



**FIGURE 2: CIRED 2019 PAPER & POSTER PRESENTATION (JUNE 2019)**  
L-R; Ivan Codd, Neassa McCabe, ESB Networks, with CIRED 2019 Conference poster

- Public consultation launched in November 2019 on Smarter HV and MV Customer Connections – New Approaches to Distribution Planning & Security of Supply Standards seeking feedback and comments on the proposed new content and new proposals for non-firm access to network capacity for distribution connected distributed generation and non-wires alternative (flexibility) solutions for investment delay or deferral.

In 2020:

- Following completion of the public consultation period and the review of feedback and submissions received, the Distribution Security of Supply and Planning Standards (DSSPS) document and associated guide documents providing information on the non-firm access approach and the flexibility approach were compiled and submitted to the CRU for approval.
- Ongoing interaction with CRU throughout 2020 during their review of the revised Standards.
- The updated ‘Distribution System Security and Planning Standards’ along with the ‘Non-Firm Access Connections for Distribution Connected Distributed Generators’ Guide and the ‘Non-Wires Alternatives to Network Development’ Guide were approved by the CRU and published on ESB Networks website in September 2020.

## 4. PROJECT TIMELINES

A key deliverable from the Smarter HV and MV Customer Connections Innovation Project was the development of new standards, and their implementation into BAU. The new standards were approved by the CRU in September 2020 and are published on the ESB Networks website and the changes have been briefed out to all Planners.

Some changes are already in BAU, while others will require an implementation phase or trial before fully implementing into BAU.

See Section 8 for further information on the next steps.

## 5. PROJECT BUDGET

No CAPEX costs. Time and expenses for ESB Networks Staff and Consultants.

## 6. RESULTS TO DATE

### Load Indices:

Completion of the development of a Load Indices approach, developed by ESB Networks' through research and analysis, and supported by recommendations from EA Technology.

The Load Indices approach was issued for Public Consultation in August 2019.

The Load Indices proposal was approved and is now in use as BAU, with first use in the PR5 preparation and submission.

### Planning Standards:

Completion of the Planning Standards Review with the following documents issued for Public Consultation in November 2019, prior to approval by the CRU in September 2020.

1. [The Distribution System Security and Planning Standards;](#)
2. [Non-Firm Access Connections for Distribution Connected Distributed Generators Guide; and](#)
3. [Non-Wires Alternatives to Network Development Guide.](#)

All three documents were published on the ESB Networks website in September 2020.

The new Standards have been briefed out to Planners and are now being implemented into BAU.

## 7. LEARNINGS / BENEFITS REALISED TO DATE

### Planning Standards:

A key deliverable from the innovation project was the development of new Planning Standards, and their implementation into BAU. The new standards were approved by the CRU in September 2020 and are published on ESB Networks' website and the changes have been briefed out to all Planners. Some changes are already in BAU, while others will require an implementation phase / trial before fully implementing into BAU.

List of changes to the Planning Standards and their benefits:

1. Among the changes to the Standards are increased transparency through the inclusion of more detailed distribution network planning criteria and information, such as security of supply standards, asset loading levels, voltage regulation standards and network development policies. This provides a greater understanding for stakeholders of the planning process and rules used in assessment of customer applications and network development.
2. The inclusion of an introduction to Non-Firm Access for Distribution Connected Distributed Generators will help facilitate more renewable energy on the network enabling 2030 targets to

be reached. Non-firm access will allow generators to have more cost-effective and faster connection to the distribution system where the generator's network connection will have reduced access to export during network outages, and in return require less conventional network reinforcement. This concept could be available to approximately 80% of the renewable generation connection applications to the distribution system. This will be part of BAU under the upcoming ECP 2.1.

A separate guide document entitled "Non-Firm Access for Distribution Connected Distributed Generators" was developed to provide more information on the Non-Firm Access approach. This was approved by the CRU in September 2020 and is published on the ESB Networks website.

3. The inclusion of the introduction to Non-Wires Alternatives or Flexibility Services (e.g. demand-side response, energy storage, etc.) as an alternative to conventional network reinforcements will maximise the use of existing network assets, reducing the levels of network reinforcement required wherever possible, while also facilitating the lowering of connection charges and costs, and the shortening of connection times. A new innovation project (NetFlex) to trial a non-wires solution has commenced this year. Results from this trial will contribute to the future development of NWA for BAU.

A separate Guide document entitled "Non-Wires Alternatives to Network Development" was developed to provide more information on the Non-Wires Alternatives approach. This was approved by the CRU in September 2020 and is published on the ESB Networks website.

4. The inclusion of the technical criteria applied to the assessment of Energy Storage facilities (e.g. Battery Facilities) when such sites are used to provide System Services. This has moved to BAU.
5. The inclusion, as an interim measure in planning studies, of provision in HV Station capacity for the expected future growth in microgeneration connections. Under the Climate Action Plan 2019, the connection of further microgeneration is strongly supported, including the formalisation of a support scheme for electricity exports, which will also contribute to the achievement of the 2030 targets. This interim measure will be subject to further consultation with industry stakeholders, to issue in Q4 of 2020.

#### Load Indices:

Another key deliverable from the project was the development of a Load Indices Approach which has transitioned to BAU and was used to inform the Price Review 5 submissions to the CRU relating to HV reinforcement.

This approach allows heavily utilised HV Stations to be identified, which can be used as an indicator for prioritising work programmes and investment plans.

It is now established as an informative measure for the relative loading levels for HV Stations and will be used in planning activities, updated annually and changes in Load Indices will be tracked over each Price Review Period.

The Load Indices approach was developed in consultation with stakeholders and approved by the CRU.

The Load Indices Process will be further developed and enhanced as improved IT systems become available.

### Summary of Benefits:

These changes and innovative approaches to network planning will ensure that the networks designed today and into the future will facilitate increased Distributed Energy Resources on our network and flexible Non-Wires Alternative solutions for distribution network development while catering for the changing needs of our customers. This should assist in enabling Ireland's energy policy objectives to be reached in a more cost-effective manner, while ensuring that the security of supply is equal to, or where appropriate even greater than, what is delivered today.

## 8. NEXT STEPS

As mentioned above, some of the recommendations and changes in the Planning Standards are already embedded in BAU, while others will require an implementation phase with further development or a trial before fully implementing into BAU.

A trial to test NWA is currently underway through the NetFlex innovation project. Results from this trial will contribute to the future development of NWA for BAU.

A Public Consultation on the provision in HV Station capacity for the expected future growth in microgeneration connections is due to be launched in Q4 of 2020.

Work is ongoing to enhance the Load Indices process and this is expected for completion in 2021.

The revision of the Disturbing Load Policy is due for completion in Q2 of 2021.

Additionally, there were a number of other related recommendations from EA Technology and these have been split into three categories - short, medium and long-term. A forward plan will be developed to ensure that these recommendations will be considered and further explored in 2021.

If you would like further information/data from this project, please contact us at [innovationfeedback@esbnetworks.ie](mailto:innovationfeedback@esbnetworks.ie)