



NETWORKS

ESB Networks Innovation Project Portfolio

Q4 2020 Summary Report

Introduction



These slides give a high level overview of our ESB Networks' innovation project portfolio across our three pillars; Future Customer, Climate Action and Network Resilience. They illustrate the progress and status of our innovation projects and where they are within the three main stages of our innovation process as outlined below.

1) Project Identification and Evaluation

ESB Networks conducts horizon scanning for the latest practices and technologies that could benefit the customer, climate and / or the network. Projects at this stage are ideas or pipeline projects.

2) Delivery of Innovation Projects

Projects identified, are firstly proposed to our governance board and once approved, are resourced by an experienced project manager or assigned to that part of our business best placed to deliver it. Projects are then delivered in accordance with Project Management best practice.

3) Transition of Projects to Business as Usual

Projects that are completed successfully, are transitioned (when appropriate) to the relevant business unit to be incorporated into business as usual. The learnings from all projects are disseminated internally and externally to our stakeholders.

For more detailed information on these projects, please visit the innovation section of ESB Networks website:

<https://www.esbnetworks.ie/who-we-are/innovation/innovation-in-esb-networks>

ESB Networks - Innovation KPIs



300
Innovation Ideas

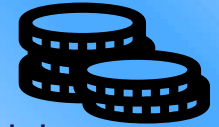


**ESB Networks
Innovation KPIs**

30
Active Projects



€52M
Potential Financial
Impact of Ideas



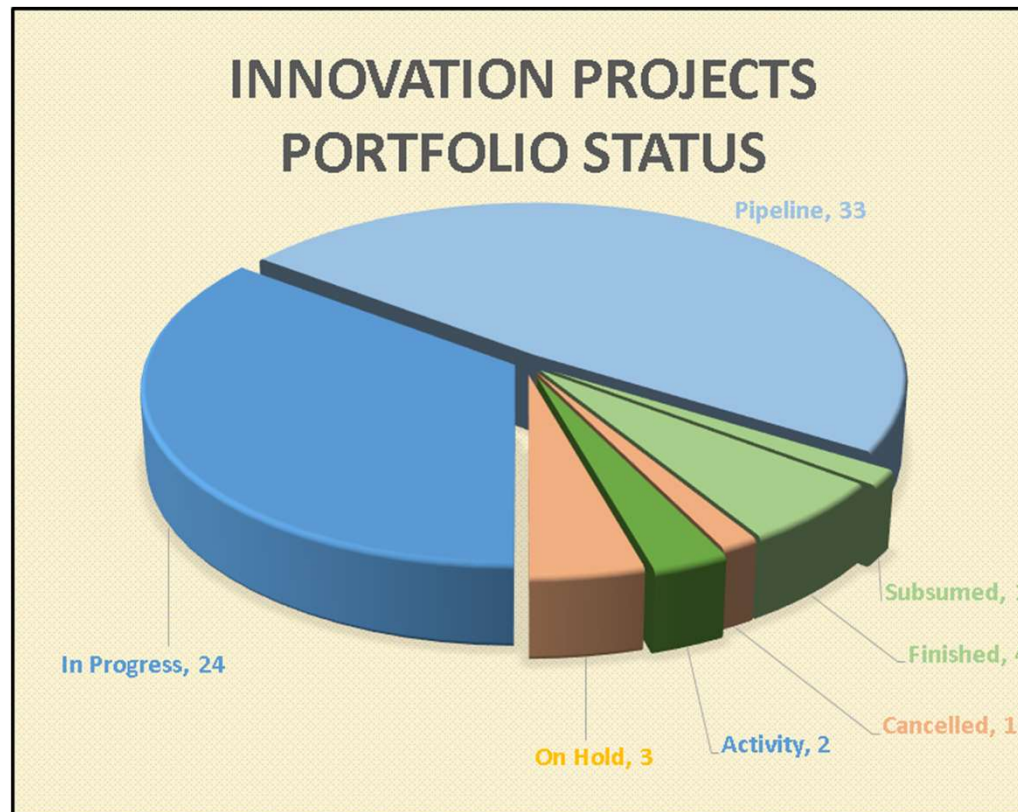
81
External Company
Collaborations



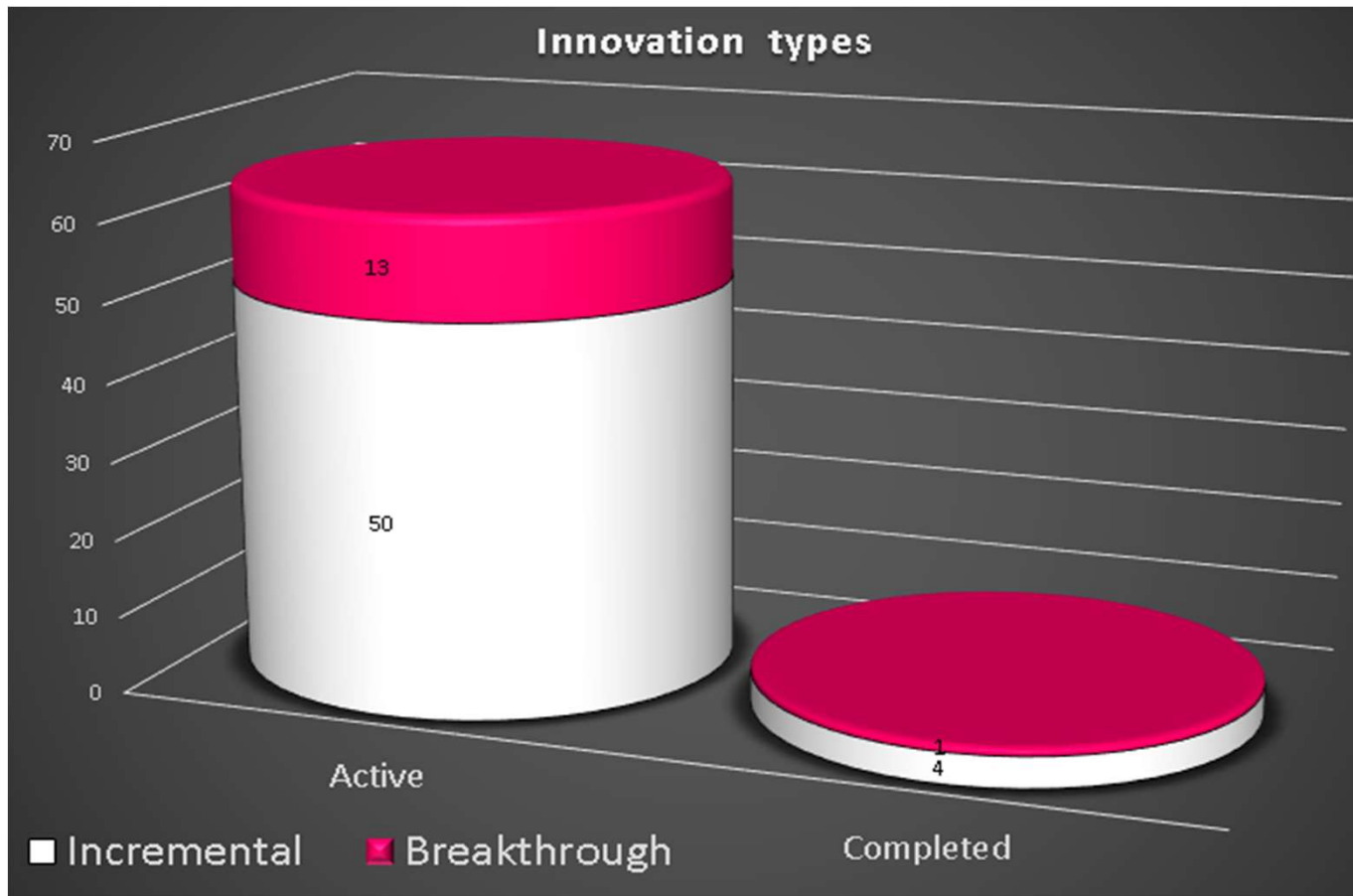
94
Staff Working on
Innovation Projects



Innovation Project Status

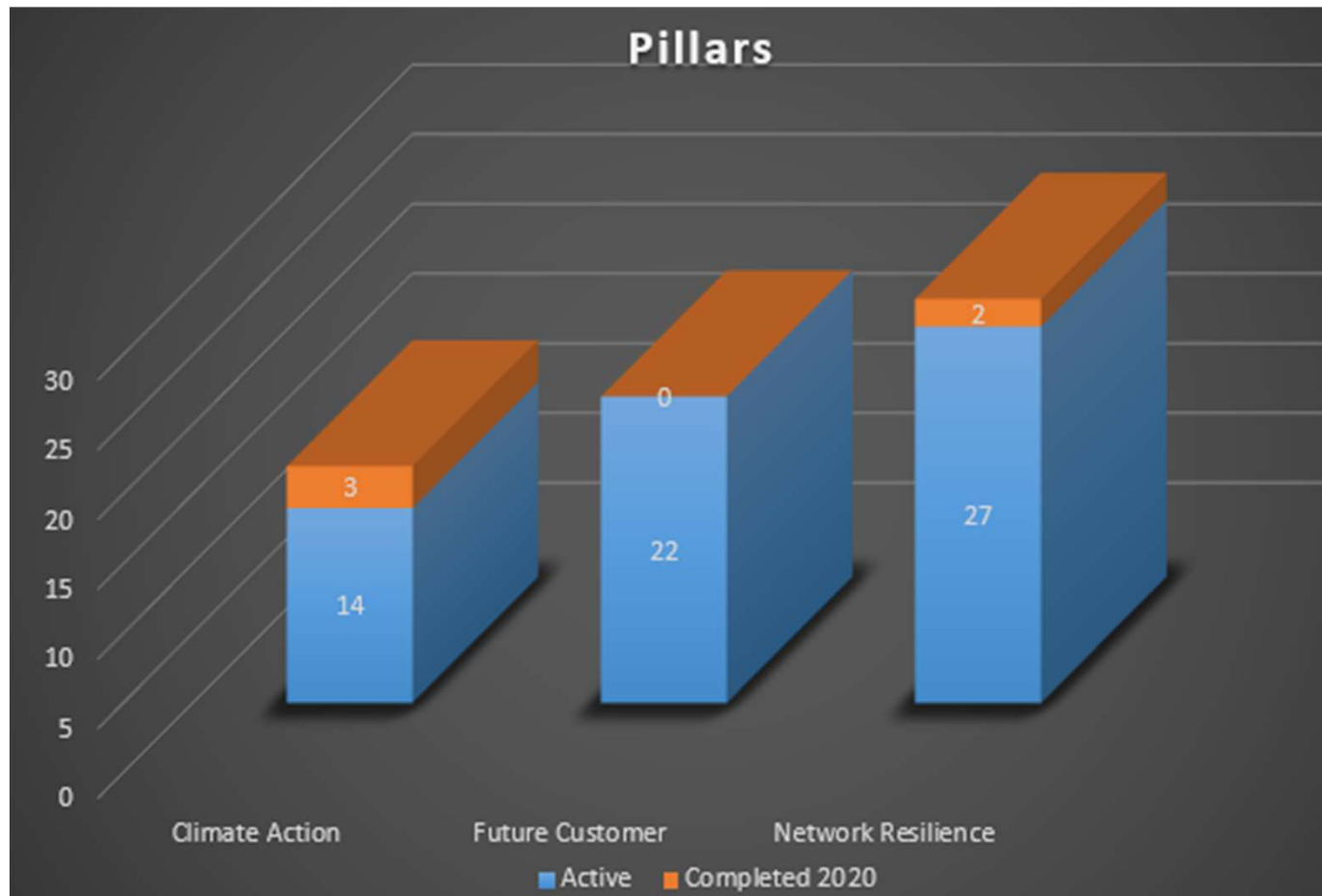


Innovation Projects – Innovation Types



**Active – includes approved pipeline projects*

Innovation Projects – Split per Pillar



Innovation Projects - Climate Action Pillar



Climate Action - Decarbonising Electricity, Heat and Transport



NETWORKS

Ref	Project Title	Innovation	Delivery
22	Introduction of Ester & MV.LV TapChanging Transformers	Incremental	Q3'21
24	Introduction of Alternatives to Creosote Wood Poles	Breakthrough	Q4'22
35	Variable Access Connection Trials (NonFirm)	Incremental	Q1'21
41	Introduction of Sidewalk Transformers	Incremental	Q4'21
51	Smarter HV and MV Customer Connections - New Approaches to Distribution Planning	Incremental	Q1'21
55	Further Development of Nodal Controller	Incremental	Pipeline
62	Unit Substation to 1MVA	Incremental	Q2'21
77	Prevention of Contact between Wildlife and OHL	Incremental	Q1'21
82	Big Data for Wind Farms	Breakthrough	Q4'21
83	Wind Farm - Reactive Power Optimisation (Blackbox)	Incremental	Q3'21
107	Transformer Loss Load Factor Calculation	Incremental	Pipeline
133	Tesselo - LiveEO vegetation survey system	Incremental	Pipeline
157	Development of optimised LV design framework to enable a unified mobile support application	Incremental	Pipeline
202	Modelling and Impact Assessment of Innovative Microgen Op Scenarios	Incremental	Pipeline

Innovation Projects – Future Customer Pillar



Future Customer - Empowering and Supporting Customers and the Economy



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Ref	Project Title	Innovation	Delivery
23	SERVO	Breakthrough	Q2'21
45	StoreNet Customer Side Energy Storage	Breakthrough	Q4'20
59	Dingle Electrification Project	Breakthrough	Q3'22
70	In-Line LV fused plug-in socket for Public Lighting LED programme	Incremental	TBA
74	Exploration of ASHP for Ireland's Residential Heating Needs	Incremental	Q2'21
75	+CityXChange	Breakthrough	Q4'23
81	Development of Modularised Metering and Control for RES Connections (HV and MV std modules)	Incremental	Q4'21
88	Customer Switch in Meter Box	Incremental	Q1'22
98	Innovation – EV 300kVA Pole Mounted Transformer	Incremental	Q4'21
99	5G Docklands \ 5G PID Rev5.docx	Incremental	Pipeline
101	Microgrids	Breakthrough	Pipeline
103	P2P and System Wide Economic Analysis	Breakthrough	Pipeline
104	Real Option Pricing of Flexibility	Breakthrough	Pipeline
106	Three Winding Transformer	Incremental	Pipeline
152	Development of Robust Low Voltage (LV) models for the Future Network Planning and Operations required to facilitate active energy citizens (Volt Drop Calculator SP)+AX43	Incremental	Pipeline
158	Developing 400MHz Spectrum Use for Smart Grid Applications	Incremental	Pipeline
160	Electrification Uptake Data Analytics Forecasting Tool - ESRI / UCD	Incremental	Pipeline
169	Improved ADMD estimates for Domestic Customers	Incremental	Pipeline
170	Using Real Options for establishing investment justification for change in ADMD	Breakthrough	Pipeline
171	IA Use of Temperature Sensors with Sigfox to Assess Substation Loading	Incremental	Pipeline
172	Estimation of allowable loading on 15 and 33kVA single phase transformers based on annual kWh throughput	Incremental	Pipeline
209	Flexibility Access Rights for Customers - Trials of Active Network Management - See 51	Incremental	Subsumed (51)

Innovation Projects – Networks Resilience Pillar



Network Resilience – Efficient,
Secure, Reliable Electricity



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Ref	Project Title	Innovation	Delivery
3	Nodal Controller for Reactive Power	Incremental	Q2'21
9	Leveraging Fibre Infrastructure for Smart Network Management	Breakthrough	Q4'20
11	Arc Suppression and Fault Phase Earthing Hybrid	Incremental	Pipeline
19	Inspection of Overhead Lines Using Drones and Image Processing Analytics	Incremental	Q4'21
28	DistriHost Mapping Network Capacity	Incremental	Q2'22
38	Data Analytics to Temperature Correct Loads	Incremental	Q2'22
39	Storm Resilience for Overhead Networks	Incremental	Q1'21
42	Assessment of LV Infrastructure Needs for Upgrade to 1000V	Incremental	Q2'22
49	New Core and Aggregation IP Network	Incremental	Q1'22
54	Weather Forecasting and Network Damage Prediction	Incremental	Q4'22
56	Development of Dynamic Line Ratings	Incremental	Q4'22
69	HV Stations Health Index	Incremental	Q4'21
71	Climate Change Adaptation Approaches (flooding)	Incremental	Pipeline
78	Smart Securing of Strategic Assets (Electronic Locks)	Incremental	Pipeline
86	Mapping GIS CSO Small Area Statistic onto ESB Network	Incremental	Pipeline
87	Arc Suppression Coil Tuning at 38kV	Incremental	Pipeline
96	Short circuit Level Assessment - MV and LV	Incremental	Pipeline
97	Net-Flex - Market Support for Network Challenges	Breakthrough	Q3'19_Q1'22
100	Import Export Limitations	Incremental	Pipeline
102	MV LV Voltage Allocation	Incremental	Pipeline
150	Novel Use of Drone Technology and Artificial Intelligence for Fault Location and Line Patrolling	Incremental	Pipeline
151	Identification of network configurations for ANM - ASM - see 55	Incremental	Pipeline
153	Leveraging enhanced LV monitoring to optimise targeted network reinforcement	Incremental	Q4'21
154	Developing and trialling novel approaches to manage LV flexibility	Breakthrough	Pipeline
156	Congestion Management and Capacity Allocation using Operational Management System	Incremental	Pipeline
164	Optimised design for 38kV Arc Suppression Coil (ASC) to support RES connections	Incremental	Pipeline
205	Framework for optimal Coordination of NMS and DER	Incremental	Pipeline