



NETWORKS

DISTRIBUTION ANNUAL PERFORMANCE REPORT 2020

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esbnetworks.ie



Forward

Welcome to ESB Networks' 2020 Distribution Annual Performance Report. The purpose of this report is to detail ESB Networks' progress and performance during 2020, delivering on the plans approved by the CRU under Price Review 4 (PR4).

The year 2020 was a most difficult and extraordinary year for everybody, together facing the impact of the Covid-19 global pandemic on our families and our society. As an essential service provider, ESB Networks focussed on ensuring the continuity of a safe and reliable electricity service for our customers and communities, whilst safeguarding the health and well-being of our employees and customers. I would like to take this opportunity to thank all our customers and stakeholders for continuing to positively engage with us throughout the year and enabling us to continue with our core business activities. I also appreciate the tremendous commitment and response of all ESB Networks teams in continuing to support all electricity customers through the pandemic.

At ESB Networks, we are leading the transition to a low carbon future powered by clean electricity. This means developing, operating and maintaining a network that supports the secure and affordable distribution of sustainable low carbon electricity. Our strategy involves working with customers, stakeholders and industry partners to connect more renewable low carbon generation to Ireland's electricity network. 43% of Ireland's electricity came from renewable sources during 2020. Working together, we can reduce the carbon intensity of our network still further and transform our distribution network to enable clean electricity to drive carbon out of heat, transport and the economy.

In 2020 we, together with our stakeholders and customers, had to adjust to new ways of working, communicating and living. Through the year, ESB Networks has continued to deliver on service excellence, connecting new customers and actively investing in the network to ensure it is safe and reliable. We continued to work on reducing our impact on the built environment and developing into a leading business in the area of sustainability by improving our business operations. We also stepped up our external engagement activities, reaching out and listening to customers and stakeholders, so as to get their input into the development of our plans for the network and for our continued investment in a low carbon future powered by clean electricity.

This report speaks to ESB Networks' performance during the exceptional year that was 2020. I hope you find it interesting and useful.



PADDY HAYES
Managing Director
ESB Networks

Executive Summary

ESB Networks remained focused on our core purpose of ensuring the continuity of a safe and reliable electricity service for our customers and communities, despite the extraordinary impact of the Covid-19 pandemic in 2020.

ESB Networks is planning for the future in enabling Ireland's transition to a low-carbon economy and energy system. Throughout 2020 we continued to support the objectives of the government's Climate Action Plan (CAP) and we recognise our role in its delivery. ESB Networks successfully delivered all of its 2020 CAP actions. We are fully committed to connecting greater amounts of renewable generation and to supporting the electrification of heat and transport, thus facilitating Ireland's transition to a low carbon energy future, powered by clean electricity.

In 2020, our teams connected 208 MW of renewable energy generation to the Irish electricity system, 71 MW of this being connected to the distribution system, bringing the total volume of renewables connected to the national electricity system to 4.66 GW. We issued a total of 95 ECP-1 connection offers totalling 809MW by May 2020 to a mix of wind, solar, battery, CHP and biomass projects.

The number of new demand connections to the system in 2020 fell slightly as a due to the impact of Covid-19, with 29,024 new homes and businesses connected (a decrease of 4% on 2019). Our focus on the customer was recognised by successfully achieving the Customer Contact Association (CCA) Global Standard for Contact Centre performance for over ten years.

In terms of Environmental Performance, ESB Networks continued to operate an Environmental Management System (EMS) which is externally certified to the ISO 14001 Standard. The business continues to actively reduce its environmental footprint while driving towards becoming a leading business in the area of sustainability.

ESB Networks increased its annual investment in the distribution network in 2020 with €336 million of capital expenditure incurred on development and renewal, in addition €216 million of operating expenditure was incurred on operation and maintenance activities.

Throughout 2020 ESB Networks continued its ambitious and active innovation programme by progressing a portfolio of innovation projects. Many of these innovation projects are focussed on paving the way to a low carbon society. We also continued to develop expertise and innovation capacity across the organisation and increased our level of third-party engagement and collaboration in the innovation process.

ESB Networks' Dingle Project made significant progress throughout 2020, albeit Covid-19 restrictions introduced delays to the commencement of specific project trials and preparation activities. The learnings from these trials, some of which are rescheduled to commence in 2021, will help inform the design of the electricity network to support a low carbon energy system.

By the end of 2020 the Smart Metering Programme had installed 240,000 smart meters, with ESB Networks on track to replace up to 2.3 million meters with digital smart meters over the coming years.



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ESB Networks DAC is the licensed Distribution System Operator (DSO) in the Republic of Ireland. The Irish distribution electricity system includes all distribution stations, overhead electricity lines, poles and underground cables that are used to bring power to Ireland's 2.4 Million domestic, commercial and industrial customers.

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2020 Highlights

New Connections

24,698 new domestic connections

4,326 new commercial connections

Connecting More Renewable Generation

4.66GW of renewables connected to date to the national electricity system with over 4.2 GW wind generation

208MW of renewables connected in 2020 (71MW Distribution, and 137MW Transmission)

135.1MW of new large scale battery storage connected in 2020 (8.5MW Distribution, and 126.6MW Transmission)

95 connection offers issued by May 2020, totalling 800 MW as part of ECP-1

Climate Action Plan

All ESB Networks-led actions delivered on time

Delivering on Price

Approved DUoS revenues of €839.3m

> €336m invested in capital programmes in 2020

> 94% of PR4 allowances invested by end of 2020

Innovation

30 active innovation projects delivering a smarter distribution system

Safety

ESB Networks was successfully certified to the new ISO 45001 Occupational Health and Safety Management System standard

There were 3,500 entries from 177 primary schools in ESB Networks, Stay Safe, Stay Clear primary school competition

Smart Metering

240,000 Smart Meters had been installed by the end of 2020

Extreme Weather

17 major storms in 2020. Notably Storm Ellen, which resulted in 180,000 customers losing supply. Our teams worked to restore power to 140,000 of these customers on day one

Customer Engagement

ESB Networks successfully achieved the Customer Contact Association (CCA) Global Standard for Contact Centre performance via first online audit assessment by CCA

> Online Customer applications launched

> Customer Action Forum established

> New complaints management portal

> 1.6m customer contacts handled

> 54k+ followers on Twitter

> 34k+ followers on Facebook

> 10k followers Instagram

> 3 million pageviews on PowerCheck

Kindness Matters

Camara Tech2Students saw 600 laptops delivered to Leaving Certificate Students in lock down by Networks staff

Approx. 10,000 items of vital PPE to HSE, nursing homes, hospitals around Ireland

Community sponsorships with The Irish Heart Foundation and Schools programme

Distribution System Statistics

c. 151,000 km of overhead lines

c. 25,000 km of underground cable

c. 546 HV Substations

c. 22,614 MV ground mounted substations

c. 244,696 MV pole mounted transformers

c. 91 MW of HV transformer capacity added

2020 Performance Summary

	2020	2020	2020	2019	2018	2017	2016
Metric	Target	Performance	Financial Incentive	Performance	Performance	Performance	Performance
Customer Minutes Lost (CML) – unplanned outages	75.1	94.9	-€5.3m	87.47	97.43	90.34	79.05
Customer Interruptions (CI) – unplanned outages	1.001	1.26	-€5.6m	1.23	1.23	1.21	1.04
Customer Satisfaction (ESATRAT)	90%	90.53%	€0.4m	91.17%	91.75%	91.19%	91.31%
Customer Satisfaction Survey (Red C)	81%	82.16%	€0.9m	80.82%	78.63%	79.43%	80.72%
One Meter Reading per Year	98%	96.15%	€0m	97.82%	97.80%	97.83%	97.83%
Avoiding Back to Back Meter Estimates	99%	81.53%	€0m	99.94%	99.85%	99.84%	99.41%
Smart Metering Delivery	250,000 Meters	239,347	€1.3m	15,000 Meters	N/A	N/A	N/A
Smart meter - Go Live	31st Dec 2020	Target Achieved	€2m	N/A	N/A	N/A	N/A
Stakeholder Engagement	10	7.2	€0.5m	7.5	6.8	N/A	N/A
Delivering New Connections (ECP-1)	All offers issued by 31st May 2020	Target Achieved	€0.51m	On Target	On Target	N/A	N/A

	2020	2020	2020	2019	2018	2017	2016
Metric	Target	Performance	Financial Incentive	Performance	Performance	Performance	Performance
No. of registered vulnerable customers	N/A	52,818	N/A	48,855	46,767	45,291	41,511
Total number of outages (planned and unplanned)	N/A	52,682	N/A	38,930	38,646	37,295	36,404
Worst Served Customers	6,000 WSC improved by 20%	9,041 WSC improved by 20% (2018 – 2020)	€6.7m	N/A	N/A	N/A	N/A
New Demand Connections	N/A	29,024	N/A	30,206	26,954	24,463	20,110
Capital Expenditure	Within PR allowances	€336m	Within PR allowances	€267m	€244m	€209m	€198m
Innovation	'Strong' (subject to CRU assessment)	€20m	€20m	€20m, plus €10m retrospectively awarded for 2018 improvements	€5m	€20m	€20m

01. Customer Service

Customer Charter

We work hard to deliver a first-class customer experience, developing our customer service channels, touch points and offerings. We are committed to improving on our performance every year to ensure customers' needs are met.

Our Customer Charter is a set of commitments to our customers.

1. We aim to restore supply in less than 4 hours for 95% of fault outages
2. We will give you at least 2 days' notice of an outage for planned work on the network
3. If your main ESB Networks fuse has failed, we will call out free of charge, within 3 hours if you call us between 8.30am and 11.00pm, or before 11.30am the next morning if you call after 11.00pm
4. We will install an electricity meter for you within 3 working days (for domestic customers, 5 working days for business customers)
5. We will send you a cost quotation for your new connection if you are building a new house or farm building, setting up a small business or renovating an older property, within:
 - > 7 working days if no site visit is required
 - > 15 working days if a site visit is required
6. We will complete your new connection to your new house or premises within 2 weeks of receiving your RECI¹ Completion Certificate if you apply and pay giving us 10 weeks' notice
7. We will contact you within 10 working days if you are concerned about your supply voltage
8. We will resolve verified voltage concerns within 12 weeks (unless major reinforcement is required)
9. If you request a visit from an ESB Networks Network Technician, we will visit at an agreed time, or contact you the day before if we cannot make the agreed appointment
10. Where we agree that you are entitled to a refund, we will make the refund within 5 working days
11. If you use the Commission for Regulation of Utilities (CRU) complaint resolution service, we will honour any financial settlement they direct within 10 working days
12. If we fail to meet a Charter commitment, or (for 1 and 2) receive a valid claim, we will send you a cheque within 10 working days or pay you an additional €35

1,485 Charter Payments were made to our customers in 2020 versus 1,924 in 2019

¹ RECI are the present holders of the "Safe Electric" licence from CRU. "Safe Electric" is the brand name for the Electrical Safety Supervisor Board



HOW CUSTOMERS INTERACT WITH ESB NETWORKS

> National Customer Contact Centre

ESB Networks National Customer Care Centre (NCCC) is an award-winning contact centre with 12 years accreditation from the UK Contact Centre Association. The 24/7 facility based in Cork is the gateway for all 2.4 million electricity customers who make queries relating to their electricity supply, faults, new connections, emergencies or general queries. Customers have many forms of communication to contact us on a 24/7 basis, for example: phone; email; social media apps.

IN 2020 1,687,019 CUSTOMER CONTACTS WERE HANDLED, COMPARED TO 1,489,756 IN 2019.

The contact breakdown is as follows:

451,000

Telephone Calls

436,000

Emails, Meter Reading, Social Media Management

799,000

Automated Responses

(No Supply, Meter Reading, Fault Logging)

Performance in the customer contact centre over PR4 are as follows:

Call handling response	2016	2017	2018	2019	2020
Percentage of calls answered within 20 seconds ¹	91.4%	90.9%	90.31%	90.83%	84.20%
Percentage of calls dropped ²	2.3%	2.3%	2.74%	2.57%	4.6%
Networks customer calls to the call centre ³	469,195	470,333	451,494	429,589	451,147

¹ Figures are inclusive of storms, which involve much higher call volumes during these events. This results in challenges regarding the call handling and percentage-of-calls-dropped performance metrics.

² Where the customer has terminated the call without waiting for a response.

³ Calls relating to ESB Networks excluding IVR



> Website and Social Media

Where ESB Networks now has 54,687 Twitter and 34,273 Facebook followers, achieving +46 million combined impressions in 2020. ESB Networks included a further customer communications channel, with the launch of ESB Networks' LinkedIn profile in November 2019 with over 5000 followers gained by the end of 2020. Our website is seen by our customers as one of the most important touch-points, in particular Powercheck.ie which gives real-time information on planned outages, faults and estimated restoration times

SOCIAL MEDIA

54,687 Followers on Twitter

34,273 Followers in Facebook

2,385 Followers Instagram

12,697,600 Impressions on Twitter

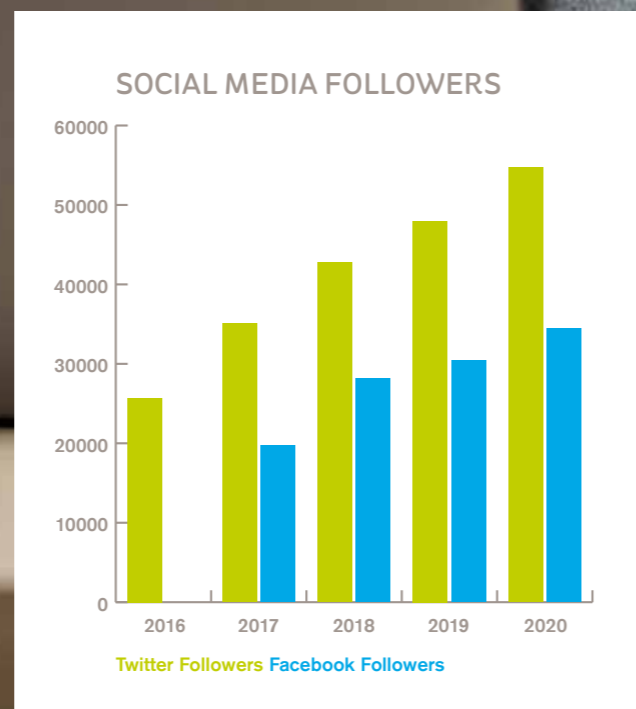
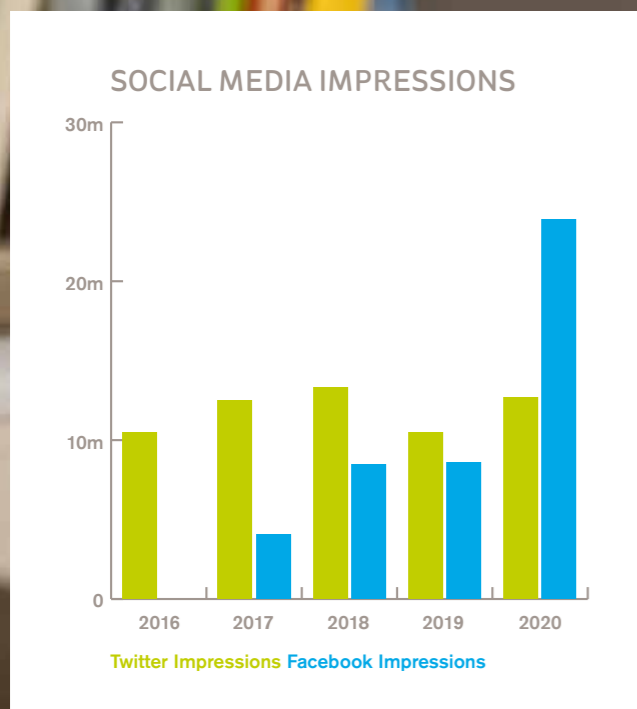
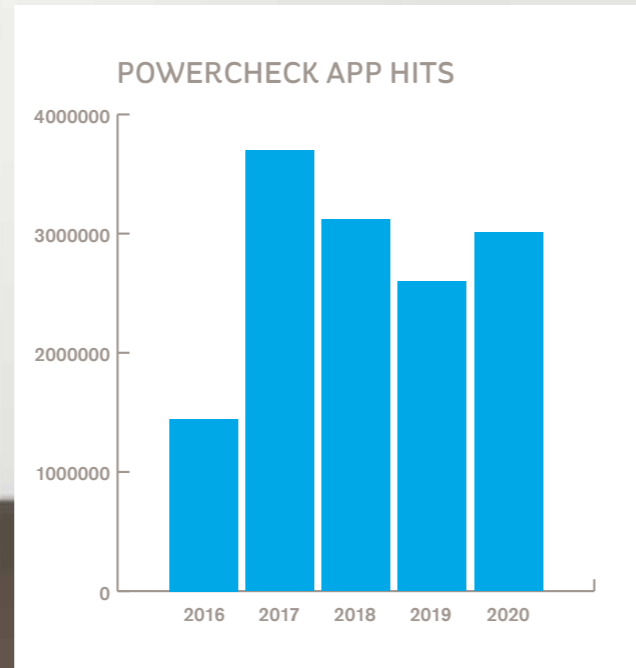
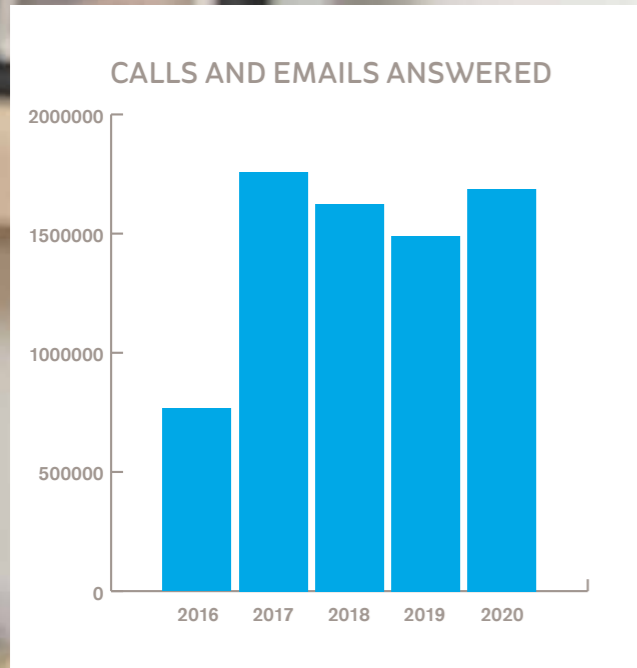
23,905,939 Impressions on Facebook

10,055,713 Impressions on Instagram

46,659,252 Combined impressions

+3 million Page views on PowerCheck

In addition to providing customers with better information and assurance, the use of social media has reduced the requirement for customers to contact the Customer Care Centre during fault events. The advancement of our social media channels provides real-time fault update information to customers, thus reducing fault-related call volumes and enabling effective call handling where customers need to speak to ESB Networks.



CONTACT CENTRE ACHIEVES INDUSTRY AWARD

In 2020, ESB Networks successfully achieved the Customer Contact Association (CCA) Global Standard for Contact Centre performance via first online audit assessment by CCA.

CUSTOMER INTERACTIONS DURING STORMS

Weather related outages or damage cause significant disruption to ESB Networks customers. During such incidents customers contact ESB Networks via a variety of engagement channels including telephone, Interactive Voice Response (IVR), web/ PowerCheck, email and social media resulting in peaks of activity across all channels. Mainstream media, TV and radio campaigns are used to communicate and engage with customers in a timely and proactive manner. ESB Networks also has a support service with an external partner to provide additional support for no supply/ emergency calls, particularly during periods of severe weather and large electricity outages.

During 2020 the National Customer Care Centre (NCCC) maintained access to all customer contact channels and working arrangements during the move to full remote working arrangements for much of the year. Customer service during outages related to weather events in May and August were maintained to previous high standards including engagement with vulnerable customers throughout.

VULNERABLE CUSTOMERS

We all rely on safe reliable electricity supply, however, some customers are more vulnerable to loss of electricity supply. A 'vulnerable customer' is a household which depends on electrical devices, such as medical equipment, or which is particularly vulnerable to power outages during the winter. Vulnerable customers receive priority attention when there is a fault on the network, furthermore we take care to give them extra notice of upcoming planned outages.

In 2020, 62,818 customers were registered as vulnerable customers, an increase of 13,963 from 2019. To register as a vulnerable customer, please contact your electricity supplier who will then notify ESB Networks.

CUSTOMER SATISFACTION SCORES 2020

90.53% ESATRAT

(Satisfaction rating of National Customer Care Centre)

82.16% RED C

(National Customer Satisfaction Rating)

CUSTOMER SATISFACTION SCORES EXPLAINED

(1) NATIONAL CUSTOMER CARE CENTRE

The incentivised satisfaction rating of National Customer Care Centre (ESATRAT) out turn score is derived from five Key Performance Indicators (KPI).

In 2020, our combined incentivised out-turn stood at 90.53%, compared to 91.17% in 2019. The NCCC benefited from strong performance in Q1 and Q2 across all elements of ESTRAT. The combination of increased customer contact activity across all customer contact channels in Q3 and Q4 arising from backlogs during the ongoing Covid-19 pandemic, and as a result of Storm Ellen in August (19th – 23rd), impacted negatively on service level and abandonment rate performance, however performance on mystery shopper and customer call back KPIs remained strong throughout 2020.

(2) CUSTOMER SATISFACTION

The incentivised National Customer Satisfaction Rating (Red C Survey) out turn score is the average of six KPI.

In 2020, our incentivised out-turn stood at 82.16%, compared to 80.82% in 2019. This was mainly driven by service improvements for New Connections Scheme Builders and Voltage Complaints Rectified but we also saw an improvement for Planned Electricity Interruptions. KPI was down slightly for Unplanned Electricity Interruptions.

Breakdown of National Customer Contact Centre ESATRAT Incentive	2018 Target	2018 Actual	2019 Target	2019 Actual	2020 Target	2020 Actual
Speed of telephone response	88%	90.31%	88%	90.83%	88%	84.23%
Call abandonment rate	4%	2.74%	4%	2.57%	4%	4.59%
Customer call-back survey results	83%	94%	83%	90%	83%	89%
Mystery caller survey results	88%	85%	88%	85%	88%	95%
First contact/Call referral	10%	8.31%	10%	9.31%	10%	9.54%
ESATRAT (Total target)	90%	91.57%	90%	91.17%	90%	90.53%

Customer Satisfaction Rating (Red C Survey)	Overall 2020
Voltage Complaint Rectified (1yr rolling due to small base size)	85.40%
Unplanned Electricity Interruption	81.03%
Planned Electricity Interruptions	87.01%
New Connection - Scheme Builders	80.10%
New Connection - Non scheme	84.80%
New Connection - Business	74.64%
Average	82.16%

Customer service performance for 2020 is explained in detail in this report. The changes in previous years can be summarised as follows.

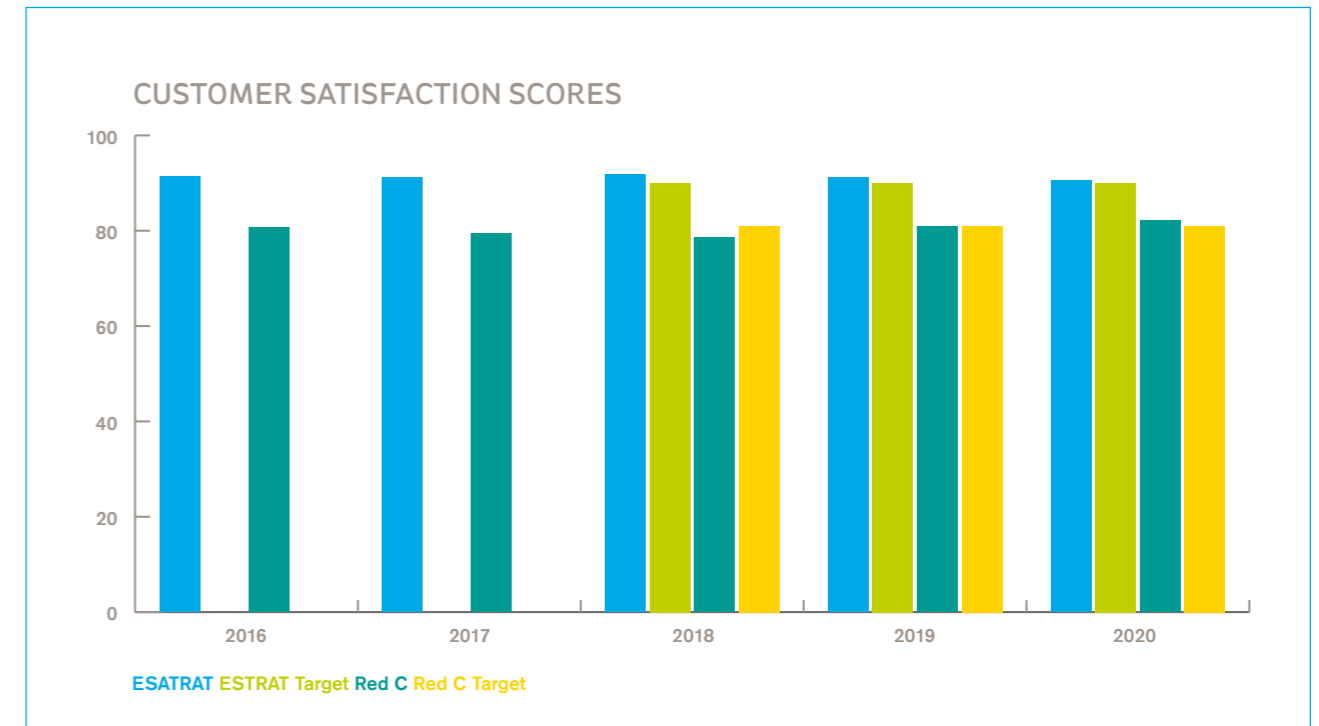
- > 2016 saw both our ESATRAT and Customer Satisfaction (Red C) scores improve on the previous year due to a number of reasons such as improved customer satisfaction with our handling of voltage complaints and our new connections process for scheme builders and businesses. While 2016 also saw the introduction of an automated fault logging option for customers to log No Supply calls directly in IVR without speaking to an agent
- > 2017 saw both scores reduce slightly as a result of the effects of severe weather e.g. Ex-Hurricane Ophelia, as well as decreased satisfaction with planned interruptions and the new connections process for scheme builders
- > In 2018, the ESATRAT score improved despite several significant weather events including snow storm Emma. The advancement of our social media channels, which provide real time fault information, played a significant role in some of this improvement. While on the other hand our Red C score reduced slightly due to a drop in satisfaction with the new connections process for businesses and for unplanned interruptions. However, satisfaction with planned interruptions and new connections has since improved

- > In 2019, the ESATRAT score decreased slightly despite seeing less storm related calls to the Customer Care Centre than in 2018 it did see a rise in new house completions, which in turn drove an increase in calls relating to new connections, as well as an increased number of queries around micro generation, solar panels and external insulation with new house completions as a driver for increased calls on the General Enquiry line. While on the other hand our Red C score rose in 2019 due to notable improvements in the KPIs for New Connection – Scheme Builders, and New Connection – Business. This was especially driven by improved satisfaction with the application process and information provision, but we also saw notable improvements in results for prompt installation and speed of quotation. The KPIs were also up for New Connection - Non-Scheme and Unplanned Interruptions

In 2020 ESB Networks saw a rise in complaints regarding outages, both planned and unplanned. This is mainly due to the large number of customers working from home due to the pandemic. Throughout the year the programmes of work were limited to reduce the number of planned outages experienced per customer, and to reduce the duration of such outages from 4 to 8 hours, where possible.

We continue to establish and analyse insights on a monthly basis in order to address the concerns raised by our customers through the complaints process and endeavour to close complaints with a meaningful response within 5 working days.

In 2020, there were 45 complaints from customers which were referred to the CRU. All of these complaints had previously completed the ESB Networks complaints process. 13 of these complaints were upheld and 32 were not upheld.



(Note, there were no targets in place for 2016 and 2017)

Complaints Received	2016	2017	2018	2019	2020
Concerning low voltage	26	19	21	28	20
For frequent outages	1,066	1,259	1,199	1,655	1,931
Time to connect customers	31	38	48	33	17
Operation delays and overruns	117	93	148	186	171
From suppliers	0	0	0	0	0
On meter reading and estimated reads	356	292	444	247	138
Others	1,144	981	1,542	1,616	1,811
Total complaints received	2,740	2,682	3,202	3,765	4,088

Meter Reading Performance	2016 Performance	2017 Performance	2018 Performance	2019 Performance	2020 Performance
2 scheduled reading visits per annum	100%	100%	99.99%	99.99%	99.95%
4 scheduled reading visits per annum	99.07%	99.52%	99.64%	99.60%	55.72%
One actual read per annum	97.83%	97.83%	97.80%	97.82%	96.15%
No back to back meter estimations	99.41%	99.84%	99.85%	99.94%	81.53%

METER READING

ESB Networks schedules four meter reading visits per customer per year. Where we fail to gain access we leave a card for the customer to submit a reading. However meter reading visits may not always result in an actual reading being obtained for reasons such as our meter reading staff not being able to gain access to the meter, with no meter reading subsequently submitted by the customer. ESB Networks also sends a letter if a customer approaches 12 months without a reading. This can also be followed up with an email if we have a customer's email address. Cases where ESB Networks are not able to gain access to the meter, and no reading is received from the customer, are referred to as Long Term No Access (LTNA).

ESB Networks continues to endeavour to obtain as many meter readings as possible each year in line with targets and is utilising email campaigns, text campaigns, the visiting of holiday homes during summer months etc. in order to tackle the issue of LTNA.

The Covid-19 pandemic had a major impact on the meter reading activity in 2020 as all meter reading visits were completely suspended from mid-March to mid-May. Meter reading did take place for the second half of 2020 but only for outdoor meters, as meter readers were instructed not to enter premises to read any meters. As a result of this, out of our almost 2.4 million customers, ESB Networks only managed to make the targeted four scheduled visits to 55.72% of customers, but 99.95% of customers received at least two such scheduled visits, compared to 99.60% and 99.99% respectively in 2019.

In addition, ESB Networks aims to obtain 1 actual meter read per year from 98% of all customers (either from Networks meter reading staff or from the customer themselves), and in 2020 the result achieved was 96.15%, compared to 97.82% in 2019. ESB Networks also has a target that 99% of customers will not receive back to back meter estimates, and in 2020 the result achieved was 81.53%, compared to 99.94% in 2019. This lower performance was directly related to Covid-19 restrictions in 2020.



02. Reliability and Resilience



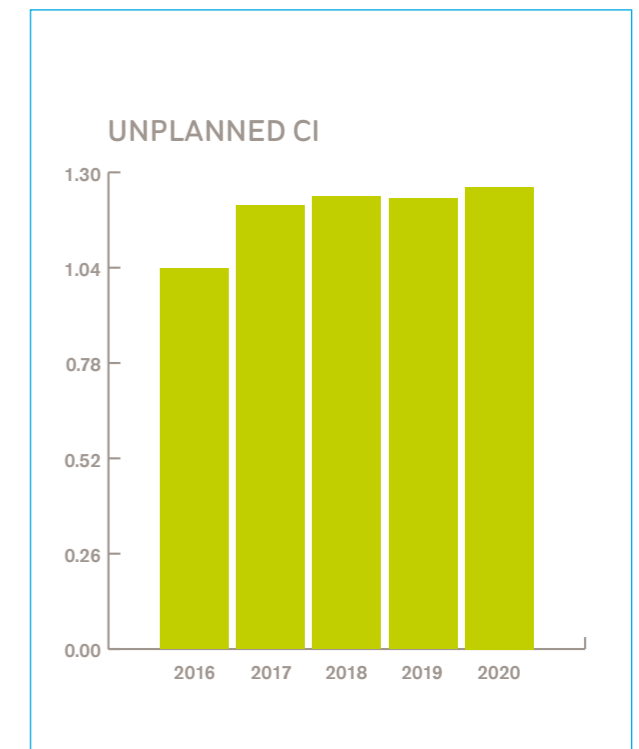
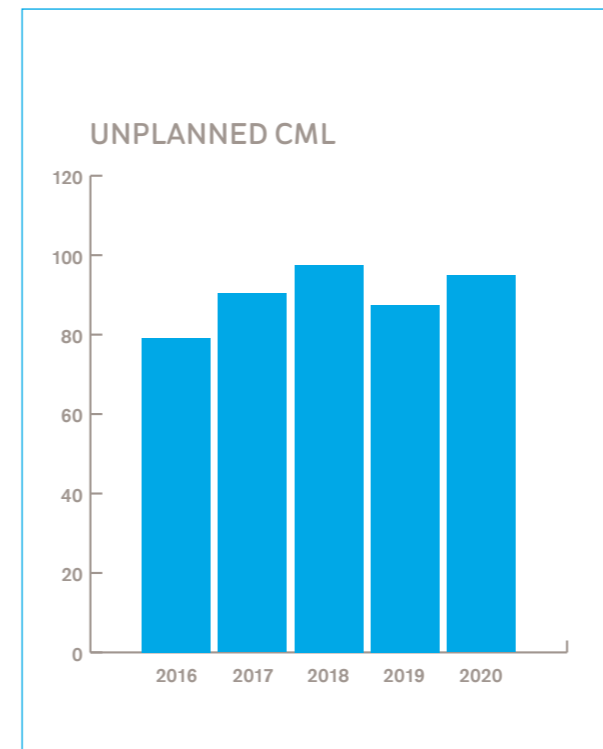
Ensuring our customers have access to a reliable and quality supply of electricity is crucial. We are committed to improving our network each year to ensure that we can continue to supply a reliable service to our customers.

Customer Interruptions (CI) represents the number of interruptions greater than 3 minutes that an electricity customer has on average each year, and Customer Minutes Lost (CML) is the duration that customers on average spend without supply each year. To give a more accurate report of our outage performance, "storm days" (the effects of severe weather) are removed from our normal CI and CML reporting.

In 2020 we had 174.7 CML and 1.6 CI per customer as a result of both planned and unplanned outages, excluding storm related outages. This means that on average Irish electricity customers were without power for 174.7 minutes in 2020 as a result of non-storm unplanned and planned outages.

UNPLANNED OUTAGES

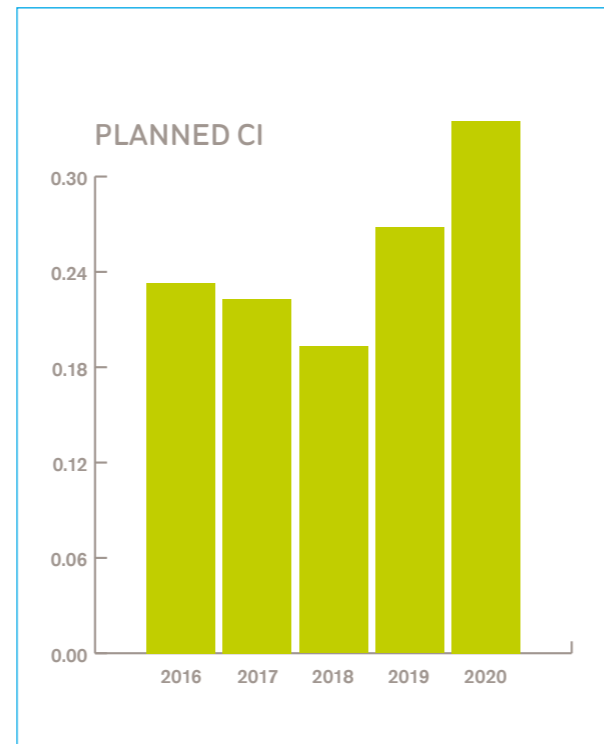
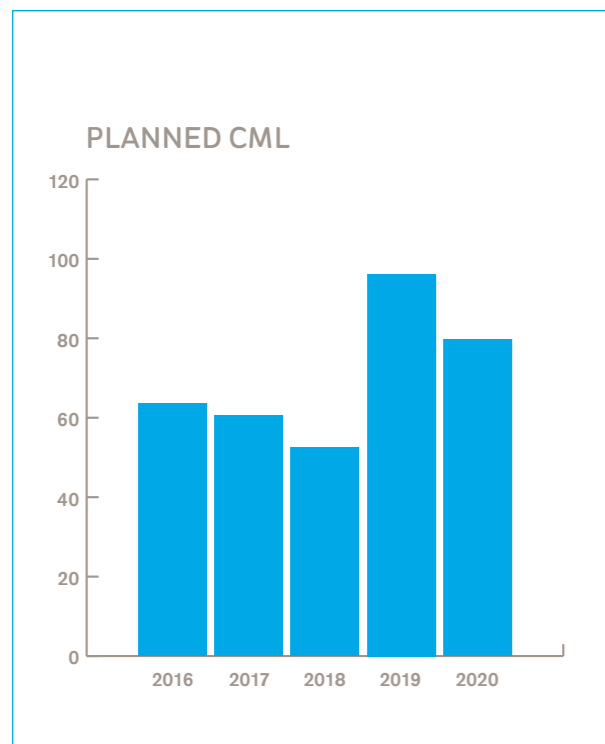
The CRU sets incentives targets for unplanned CML and CI (which exclude storms). In 2020 these targets were set at 75.1 CML per customer and 1.001 CI per customer. Our performance against these unplanned outage targets stood at 94.9 CML per customer and 1.26 CI per customer. You can find further details on our incentives out turns in the 'DSO Annual Financial Performance' section of this report.



	2016 Unplanned	2017 Unplanned	2018 Unplanned	2019 Unplanned	2020 Unplanned
Metric	Actual*	Actual*	Target	Actual	Target
CML	79.05	90.34	79.4	97.43	77.2
CI	1.04	1.21	1.043	1.23	1.022

* There was no incentive target set by the CRU for 2016 and 2017

Every year ESB Networks also has to carry out planned works such as new connections, and maintenance, which result in planned outages to customers, these outages are notified to customers in advance.



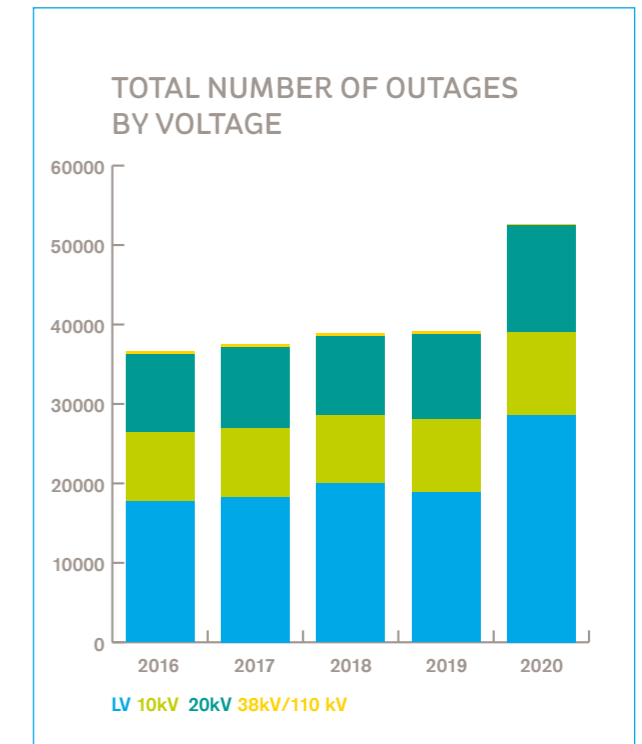
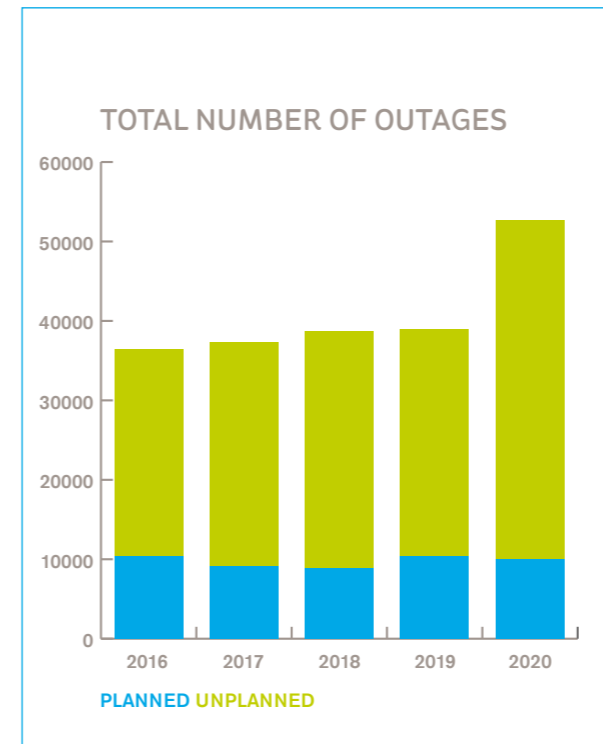
EXPLANATION FOR CHANGE IN OUTAGES

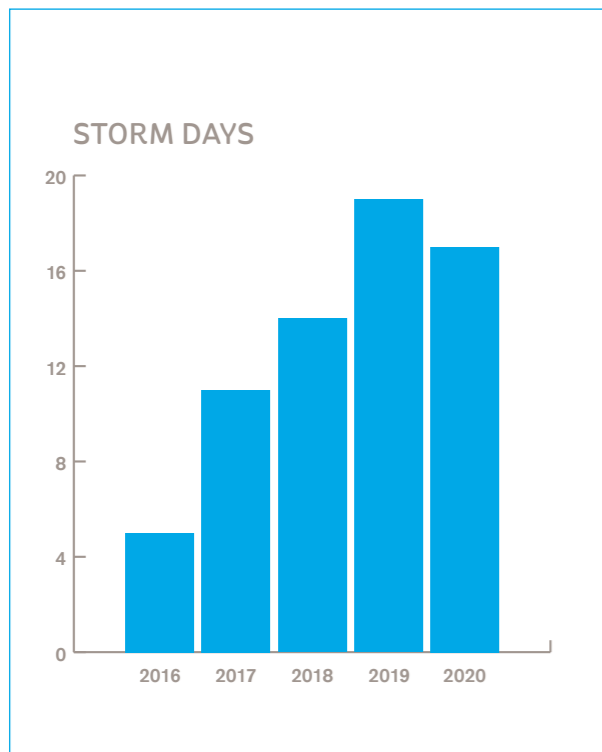
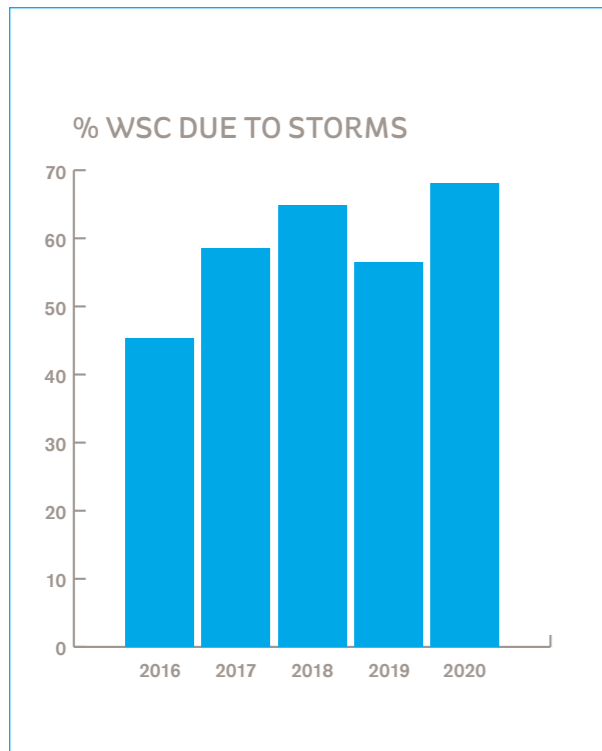
Inclement weather conditions associated with climate change are occurring more frequently in a manner that is likely to present challenges to ESB Networks.

Increased wind speeds and more frequent storms are causing damage to the overhead network. Wind in particular creates network reliability challenges, as overhead network damage is caused by fallen trees, debris and branches. Climate change is leading to longer growing seasons, increased rainfall and rising temperatures all of which increase vegetation growth. The majority of faults during wind storms are caused by fallen timber and associated

debris. In more recent storms, the damage to overhead power lines has been predominately caused by fallen trees.

In 2020 there were 17 storm days, compared to 19 storm days in 2019. The most extreme storms in 2020 being Storm Ellen followed by storm Francis in August 2020. Storm Ellen was a red weather alert and caused extensive structural damage due to fallen trees and branches (with trees in full leaf at that time of the year). The increasing frequency of weather events is shown below. The impact of climate change and associated weather events on our network continuity is evident from the increase in unplanned (fault) outages. ESB Networks is increasing its fleet of automated devices, remotely controlled switches, smart sensing devices, etc. to mitigate the impact of unplanned outages.





WORST SERVED CUSTOMERS

Worst Served Customers (WSC) are customers whom have had at least 15 outages over 3 years, and at least 5 outages in the most recent year.

Under the CRU 'Reporting and Incentives under Price Review 4' Decision (CER/18/087), the CRU put in place an incentive mechanism to the value of €6.7m to address WSC numbers. Under this ESB Networks was incentivised to improve the reliability of 9,000 worst served customers by 20% over a three year period (2018-2020), with performance to be assessed in 2021.

The CRU's objective in putting in place an incentive mechanism for worst-served customers is to improve outcomes for those households and businesses who would otherwise have a sustained and materially lower standard of supply reliability.

Worst Served Customers (WSC) are customers who have had at least 15 outages over 3 years, and at least 5 outages in the most recent year.

The consequence of more frequent severe weather events and their cumulative impact over time has resulted in more supply interruptions to rural customers and WSC. In 2019, 68% of worst served customer population was as a direct consequence of severe weather, compared to 56% in 2019.

In order to best ensure that an outcome of 9,000 customers could be achieved, a quantity in excess of 9,000 was targeted by ESB Networks. This approach ensured a broad geographic spread for this programme. ESB Networks has taken the opportunity presented by the WSC allowance to improve supply reliability to those most affected by frequent unplanned outages. By the end of 2020 the programme had seen the improvement of 20% in reliability to 9,041 customers.

The delivery of WSC capital projects in 2020 was challenging due to the impact of the Covid-19 pandemic and associated restrictions. In line with government guidelines, taking due regard for public health concerns and large numbers of customers working from home, the programme was adjusted with a large volume of the WSC program of work being completed in Q4 2020.

Many of these projects were challenging due to remote terrain and environmental considerations. In PR5 it is planned to continue with an enhanced worst served customer investment programme for WSCs in order to reduce the volume of outages they experience.

NETWORK RENEWAL

HV SUBSTATIONS

The distribution system includes 546 high voltage (HV) stations across Ireland. This is comprised of 2 no. 220kV stations, 110 no. 110kV stations and 434 no. 38kV stations. To provide the best service to all of our customers, each substation's reliability is of utmost importance. With a life expectancy of 50-60 years for major equipment, strategic replacement before failure is key to providing uninterrupted supply to our customers.

In 2020 several 38 kV modular substations installations were completed. Seventeen circuit breakers were replaced in 2020 in a number of additional 38 kV stations. Replacing this switchgear with modern equipment removes the risk of unplanned failures which would have had a significant impact on customer continuity of supply, while also serving to reduce maintenance costs and resources.

A 110 kV transformer in Knockerahgh station was also replaced along with two more 38 kV transformers in Ballinderry and Moat stations.

OVERHEAD NETWORK

The overhead Distribution electrical infrastructure in Ireland is made up of approximately 60,000 km of LV network, 84,000 km of MV network and 6,000 km of HV network. The fundamental components of this infrastructure are support structures (poles or steel towers), conductors, insulators and electrical equipment for operational switching. The operating voltage will dictate the conductor and insulator type to be used and the support structures used are predominantly wood poles. Wood poles account for over 98% of all overhead line support structures. Network Technicians climb these poles to operate and maintain the system, so the strength or "health" of these poles and the material and equipment supported is of the utmost importance.

2020 saw the continuation and expansion of the asset health project in overhead lines. Essential for these asset health data models is the data gathered both in terms of technical requirements and the ability to analyse and present the results. Collaboration between the ESB's digital mobile team and overhead line specialists has ensured mobile apps will soon become available across all voltages facilitating targeted mitigation, asset health scoring and planned future network renewal works.

There was a continued focus in 2020 on delivery of safety and continuity focused programmes i.e

- > Public safety hazard patrols and rectification of identified hazards across all voltages
- > Continued delivery of the pole replacement programmes at MV from PR4 i.e., replacing the 15,000 poles in worst condition
- > Ongoing refurbishment of the 38kV overhead network
- > To further improve asset health, and thereby continuity we have progressed our Triple Pole Switch (TPS) refurbishment programme

UNDERGROUND NETWORK

There are approximately 170,000 low voltage (LV) minipillars on the distribution system. ESB Networks carries out public safety hazard patrols on approximately 42,000 of these every year. In 2018, we developed a new software application to capture minipillar data from such inspections. By the end of 2020 survey data for approximately 126,000 minipillars was inputted into this system. Once the patrol data for 2021 is inputted we will have full asset population patrol data. This enables ESB Networks to plan asset replacement and/or corrective maintenance on this significant asset base.

In our Medium Voltage (MV) network we continue to progress planned asset replacement programmes on our cast resin type MV unit substations. To replace these MV unit substations in urban environments is difficult, particularly where the space allowed for the existing substation is too small for our currently supplied standard MV unit substation. To ensure this important asset replacement programme progressed, ESB Networks secured several alternative MV unit substation types from our equipment suppliers. These slimline substation design types have been successfully employed at sites where width, depth and height space can be limited.

METERING ASSETS

ESB Networks owns and maintains 2.4 million customer meters. In 2020 ESB Networks carried out the replacements as required of low voltage (LV) meters and medium voltage (MV) meters. A number of HV current transformer (CT) meter replacements/refurbishments were also completed. A number of non-customer Bulk Supply Metering points (TSO/DSO interface metering) were also replaced and inspected in 2020. A number of Power quality (PQ) metered sites were inspected in 2020 to support planned replacement of PQ meters in the forthcoming PR5. In 2020 ESB Networks also carried out surveys on a number of 10kV and 20kV metering cubicles to support planned replacement of metering cubicles and supported advanced planning for PR5.

NETWORK RESILIENCE

Network resilience in overhead lines is directly related to the delivery of the asset replacement and maintenance programmes and ongoing improvement and refinement to overhead line components.

Review of internal safety and fault monitoring databases resulted in targeted inspections on sections of overhead line with a view to reducing the likelihood of conductor failure.

Considerable progress in the future use of composite and concrete pole technology was made in 2020, with on-site trials schedule for 2021 and 2022. It is anticipated that these alternative technologies will provide improved resilience in areas exposed to harsh environmental conditions.

Timber cutting programmes have a significant impact on the resilience of our overhead network. A review of our current work practice was completed in 2020 with trials

for suggested improvements currently being implemented on site. Alongside this, a trial on the use of digital mobile technology was completed which will facilitate a more efficient work management process and allow for more effective quality checking of work completed. The use of LiDAR for vegetation management purposes progress significantly in 2020. This work in 2020 is further being developed in 2021 to include digital processing of routine maintenance clearance checks.

Wildlife protection for overhead networks was also reviewed to minimise impact on wildlife and to improve network performance.

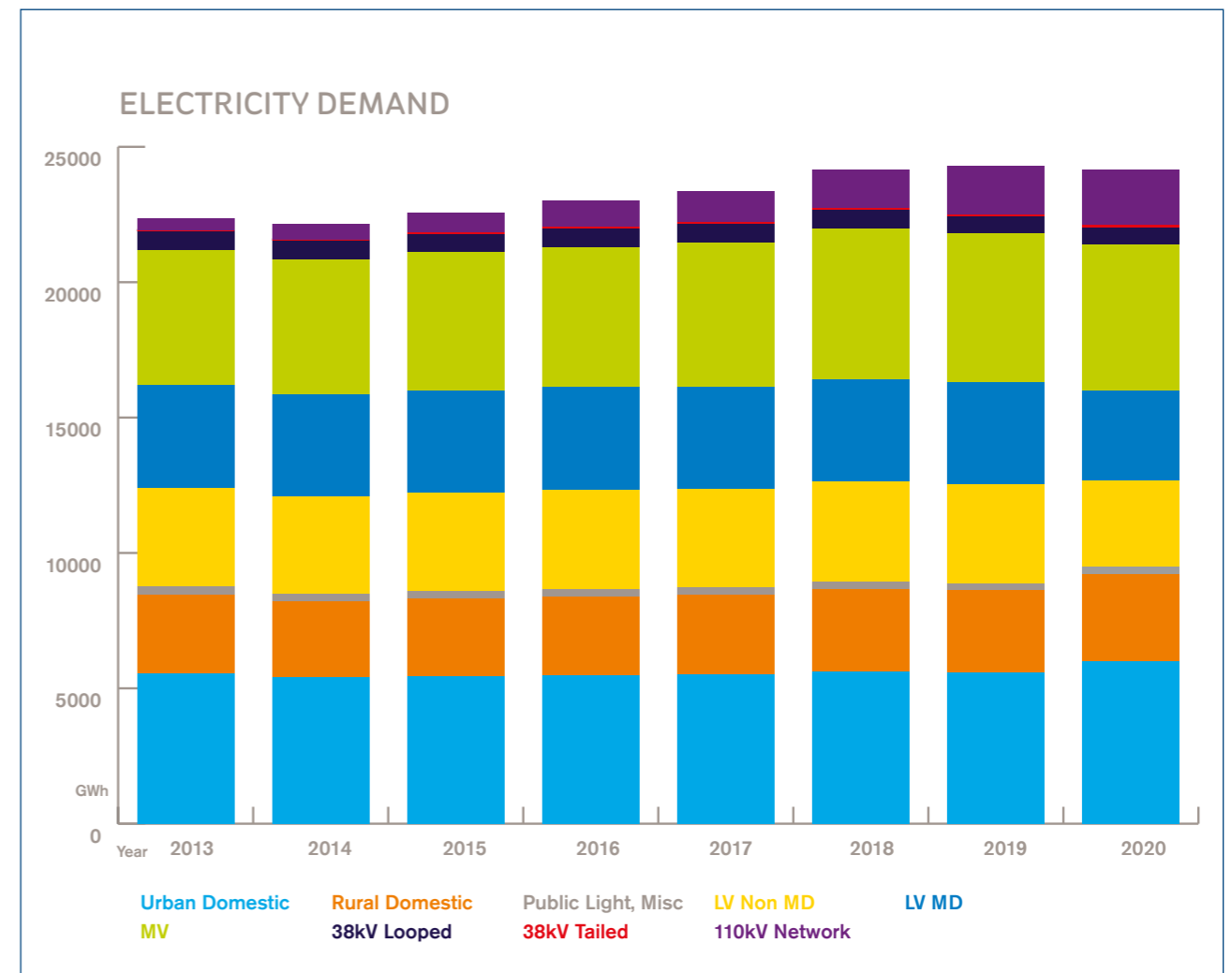
Continuing to improve network resilience is also a key driver for delivering asset replacement and maintenance in HV Stations. In 2020 ESB continued to move towards a condition-based maintenance approach with increased condition assessment and further developing its Asset Health Index for all HV Stations.



03. Connections and Growth



Efficient and economic connections are vital for our customers. We consistently strive to reduce the time from request to connection. Our focus is to enhance customer relationships through the design of a better experience, turning Common Field Service Challenges into Customer Engagement Opportunities, increasing efficiencies to reduce the time from application to connection and the proactive provision of timely information to our customers.



NEW DEMAND CONNECTIONS

The pandemic had a discernible impact on the number of new connections completed in 2020 versus 2019. While there was an overall decrease of 4%, the volumes were actually up in Q1 and Q4 2020 with an increase of 11% and 13% respectively on the Q1 and Q4 2019 figures. However, there was a substantial decrease of 34% in Q2 2020 versus Q2 2019 and a decrease of 9% in Q3 2020 versus Q3 2019.

2020 saw 29,024 total new demand connections, comprised of 8,060 single domestic dwellings, 4,445 apartment connections, 12,193 housing scheme connections, and 4,326 commercial connections (2,715 business connections and 1611 unmetered connections, e.g. public lighting, bus shelters etc.)

Compared with 2019, there was a marginal increase of 0.15% in connections to single domestic dwellings, whilst we connected 7% more apartments. There was a decrease of 8% in housing schemes connections. Business connections decreased by 11% and unmetered business connections decreased by 7%.

	2016	2017	2018	2019	2020
Connection points terminated	18,601	16,042	13,215	14,303	18,092
Connection points de-energised	7,312	4,827	5,054	5,267	1,645

Terminated: This includes connection points in vacant premises that have been terminated following previous de-energisation and de-registration, it also includes MPRN's associated with housing scheme quotations that have not progressed

De-energised: for non-payment only

PUTTING THE CUSTOMERS AT THE HEART OF WHAT WE DO

In 2019 we embarked on a customer experience transformation programme. We carried out extensive internal and external engagement about how we can strengthen the customer experience and increase customer satisfaction by focusing on the quick wins and opportunities across our key customer journeys. In 2020, we focused on those key customer journeys to streamline and introduce digital online self-serve options to make it more convenient and simple for customers to interact with us. Some examples listed below:

- > New Connections Online Portal and Tracker for Domestic and Small Business, 70% customer adoption by year end 2020
- > Outage Management - Introduced new user centric design
- > Improved Customer Complaints & Referrals Process

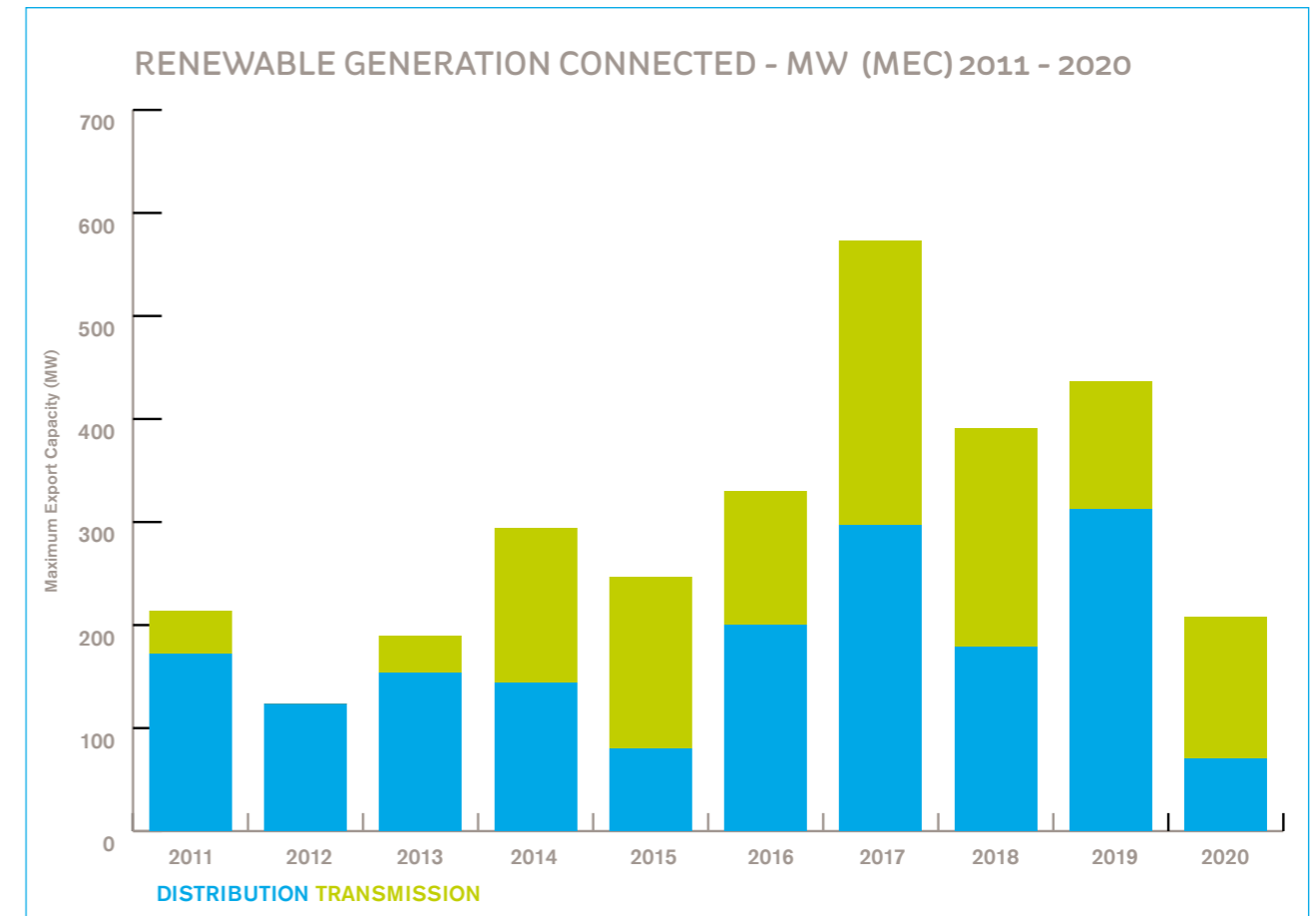
In addition, there were a number of internal initiatives implemented to highlight our customer performance, critical customer issues and areas for improvement:

- > Development of Customer KPI and Customer Complaints dashboard to share key insights across ESB Networks to feed into action and areas for improvement
- > Customer Action Forum, held every 2 months with senior management

CONNECTING RENEWABLE GENERATORS

ESB Networks is proud to play a leading role in Ireland's transition to a low carbon economy and to provide secure, sustainable, reliable electricity in an affordable manner for all customers. With the Government's Climate Action Plan having ambitious targets for increased penetration of renewable energy by 2030, ESB Networks has continued its key role of enabling the decarbonisation of electricity.

In the 10-year window, 2011 to 2020, the connected renewable generation has increased by 148% from 1,876MW (MEC) in 2011 to 4,657MW (MEC) in 2020.



With the establishment of the new Renewable Energy Support Scheme (RESS) and the closure of the previous Renewable Energy Feed In Tariff (REFIT) scheme, 2020 saw the anticipated slowdown in customer projects coming forward for connection to the electricity network. The emergence of the battery energy storage industry marked a new and exciting addition to technologies connected to the network, which over time will allow for a greater penetration of non-synchronous renewable generation. In 2020 work continued successfully on renewable generation connections, although some projects experienced short connection programme interruptions due to necessary management of localised Covid-19 events.

2020 RENEWABLE STATISTICS

- > In 2020, ESB Networks connected 208 MW of renewable generation (71 MW Distribution, and 137 MW Transmission) all of which was wind generation
- > 4.66 GW total of renewables connected to the national electricity system by the end of 2020 (2,464MW Distribution, and 2,193MW Transmission) with over 4.2 GW of this being wind generation
- > A total of 135.1 MW of Battery Energy Storage was connected to the electricity system (8.5MW Distribution, and 126.6MW Transmission).
- > 95 connection offers issued by May 2020 - totalling over 800MWs as part of Enduring Connection Policy (ECP-1)

2020 ENERGY STORAGE STATISTICS

2020 saw ESB Networks connect the first two dedicated standalone Battery Energy Storage projects to the system. Furthermore, two renewable energy generators have developed hybrid sites where wind generation is combined with on-site battery energy storage at their facility. These new battery energy storage schemes augment the 292 MW of pumped storage hydro at Turlough Hill. The addition of Battery Energy storage is an exciting technical enabler for absorption of high penetrations of both wind and solar renewable generation expected to be connected to the Network in the near future. The total energy storage connected to the Network in 2020 is 420 MW.

ECP-1 Connection Offers issued by May 2020

Technology	Connection Offers	MW
Wind	20	205
Solar	61	406
Battery	11	187
CHP	2	9
Biomass	1	1.9
Total	95	809

In 2020 ESB Networks developed the ECP-2 rule set in collaboration with EirGrid: https://www.esbnetworks.ie/docs/default-source/default-document-library/ecp-2-ruleset.pdf?sfvrsn=98f401f0_0

- > Initial early engagement meetings are offered to applicants
- > Further connection method meetings are offered to applicants to ensure that projects have a higher likelihood of moving forward successfully
- > Projects will also have an opportunity to submit a preferred connection method

- > Applicants now also have an option to re-optimize their MW capacity application or withdraw from the process for a partial refund of application fees
- > ECP-2 Projects will have a point of contact within ESB Networks who will manage queries from the applicants throughout the connection offer process
- > ESB Networks are now also providing more detailed network information (e.g. network capacity heat maps) to allow projects where possible the opportunity to optimize their Maximum Export Capacity, potentially increasing their viability. Available on the ESB Networks website, the heat-maps provide customers with a high-level overview of available transformer capacity at HV & MV distribution stations throughout the country

COMMUNITY ENERGY

2020 saw a large amount of work undertaken on Community-Led Renewable Energy Projects.

ESB Networks appreciates that the process for establishing a community-led renewable project could seem quite complex. In order to aid customers in this process we have developed a dedicated web page on the ESB Networks website for Community-led Renewable Energy Project applicants, as a repository and link to the necessary information.

We also established a Community-Led Renewable Energy Liaison Panel to act as the focal point of our engagement with communities around the country in relation to how ESB Networks can support the connection of community-led renewable energy projects to the distribution system. Customers can contact this panel via email at communityenergy@esbnetworks.ie

In December 2020 the panel published a 20-page brochure Connecting Your Community-Led Renewable Energy Project to the Electricity Network to help support and explain the steps involved in connecting a community-led renewable energy project to the distribution system.

MICROGENERATION

The Government's Climate Action Plan has a dedicated section on microgeneration where the Government "strongly supports enabling people to sell excess electricity they have produced back to the grid". Consumers who wish to install microgeneration and export excess electricity onto the electricity network are referred to as prosumers. As DSO, ESB Networks has an important role to play in facilitating this transformation. We aim to support our customers along each stage of the process as they adopt small-scale low carbon technologies and make the transition towards being active participants in the energy system. As such, to date, ESB Networks has facilitated over 17,000 microgeneration connection applications to the electricity network.

As part of assisting our customers on their decarbonisation journey, during 2020 ESB Networks developed a Microgeneration Framework. This purpose of this document was to provide our customers with the relevant information to assist them in understanding what is involved in the transition from consumer to prosumer and to further kick-start a discussion on the topic of microgeneration. We are committed to facilitating the move towards low carbon technologies and want to support our customers, not only through the process of installing microgeneration but also strive to enable them to participate in the energy market.

This Microgeneration Framework document was published for public consultation in May 2020. The consultation aimed to provide an overview of ESB Network's role in facilitating microgeneration on the distribution network. The consultation provided a lot of relevant information to assist consumers understand what's involved in the transition from consumer to prosumer and aimed to kick-start a discussion on the topic of microgeneration whilst seeking input from a wide range of stakeholders. The framework seeks to identify and examine the building blocks in the microgeneration process in further detail. The grid connection process, legislative basis and existing microgeneration support schemes are outlined to try and provide a comprehensive, single source of relevant information for the reader. This consultation was particularly important for our business, as we strive to deliver on our value of putting our customers at the centre of everything we do. The issue of this

microgeneration consultation represented the completion of a key element of the Climate Action Plan project which is a part of ESB Networks' Powering the Change Programme.

While the public consultation period is now closed, the document is still available to view at www.esbnetworks.ie/who-we-are/stakeholder-and-public-engagement/public-consultations

The consultation was positively received by customers and several responses from a wide array of industry groups were received. To further aid our customers' understanding of microgeneration, in Q3 2020, ESB Networks also published a document outlining the technical impacts of microgeneration on the distribution network. We hope that these documents provide a useful tool to our customers in furthering their understanding of microgeneration.

https://www.esbnetworks.ie/docs/default-source/publications/assessment-of-the-scope-for-higher-penetrations-of-distributed-generation-on-the-low-voltage-distribution-network.pdf?sfvrsn=d2d501f0_0

The consultation contained several questions where we sought feedback from our customers. This feedback could then be studied and incorporated into further refinement of possible solutions to enable the transition from energy consumer to energy prosumer. In Q4 2020, ESB Networks published a document which summarised the responses received to the microgeneration consultation and also provided an update on ESB Networks next steps in relation to these topics. www.esbnetworks.ie/docs/default-source/publications/0156-mg-summary---dec-2020.pdf?sfvrsn=757201f0_0

ACTIVE SYSTEM MANAGEMENT (ASM) PROJECT

Historically DSOs have designed and managed distribution networks through a top down approach and extensive management and monitoring tools were not required to analyse predictable electricity flows. As increasing numbers of active consumers and distributed energy sources connect to the distribution system, this will result in more unpredictable networks flows, greater variations in voltage and different reactive power characteristics.

In 2020 ESB Networks' Active System Management (ASM) project was established. The ASM Programme is about enabling Ireland's journey to low carbon through delivering a safe and secure electrical distribution system which supports the new energy landscape where electricity is generated, stored, consumed in more localised marketplaces.

Ireland's Climate Action Plan is the roadmap to reduce our greenhouse gas emissions and tackle the climate crisis. Central to our success will be accommodating significantly increased renewables, meeting rapidly rising demand driven by the electrification of heat and transport, while continuing to deliver a safe, secure electricity supply.

In this dynamic environment, ESB Networks' Active System Management Project (ASM) is a multi-year project that will transform how energy on Ireland's electricity distribution network is managed. In the decade ahead, all customers, from renewable generators to large energy users, to home, farm and business customers will adopt new technologies, products and services changing how they generate, store, or consume electricity. With more renewable generation and more consumption of electricity, ASM is needed to ensure that the distribution system could monitor, forecast, and manage power at a local level.

In this new energy landscape, customers and communities across the country will become more active in managing and controlling their electricity usage. Through active participation by all in the ASM process, we can develop a distribution system that is safe and secure, introducing new localised marketplaces which are responsive to new local and regional needs, and make a positive impact in the fight against climate change.

In late 2020 a project team was established, with further recruitment ongoing through 2021. The initial phase of the project is a period involving engagement with key stakeholders and customers to better understand their strategies, capabilities, and requirements. This will enable detailed design of the future power system and ensure consistent standards are used as new technologies are adopted in the coming years.

NETWORK REINFORCEMENT

Continued network reinforcement is of vital importance to the distribution system. ESB Networks has delivered and will continue to deliver large HV projects that facilitate economic growth, provide new connections and improve security of supply for customers.

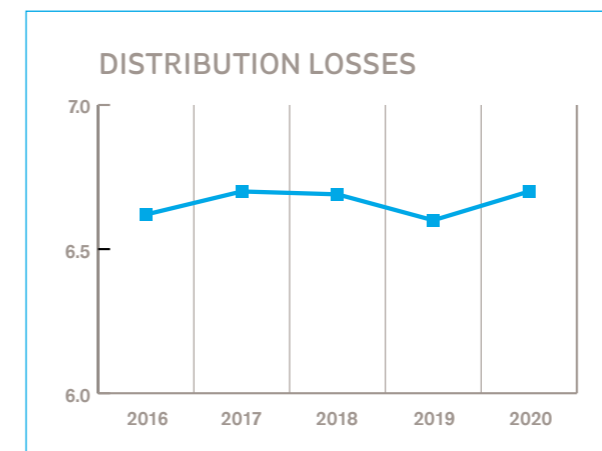
Important projects to improve resilience, increase capacity and strengthen the network were completed in 2020. A total of 14 HV transformers were replaced across 12 stations, increasing capacity by 79 MVA. While three new HV transformers were installed in two stations with an increased capacity of 25 MVA. 13.2 MVA of capacity was removed at two stations. This brings the total net additional transformer capacity added to the network to 90.8 MVA in 2020 compared to 337.5 MVA in 2019.

Net Increase in 110 kV and 38 kV Transformer capacity:

Year	2018	2019	2020
110 kV MVA	177.5	303.05	63
38 kV MVA	75	34	27.8

DISTRIBUTION LOSSES

Electricity losses are inherent losses within an electrical system. In 2020, approximately 6.7% of the energy that was put into the distribution system was accounted for as losses, compared to 6.6% in 2019, while 2017 and 2016 saw losses of 6.70% and 6.62% respectively.



Losses are comprised of 'technical' and 'non-technical' losses. Technical losses are heat losses arising from the passage of electricity through lines, cables and transformers. Technical losses depend on the volume of electricity flowing in the system and the characteristics of the lines cables and transformers. Non-technical losses on the other hand are electricity units which are unaccounted for, for example as a result of theft arising from unauthorised connections. It is believed that these commercial losses represent approximately 0.5% of the electricity entering the electricity system in 2020.

Factors that affect the % of electricity lost include:

- > The proportion of electricity that is distributed at the various voltage levels
 - > Electricity distributed to customers connected at higher voltages incurs less system losses than electricity connected at lower voltages. In recent years, the addition of data centres connected at 110kV has caused a reduction in losses as a % of GWh distributed
- > Utilisation of Assets
 - > If the loading of transformers, lines and cables increases losses will also increase. As networks are naturally reinforced, this will normally result in a reduction in losses
- > Operating voltage of Lines and cables
 - > The higher the operating voltage of lines and cables the lower the losses for a given electricity throughput
- > Generator connection
 - > As more generation is connected to the distribution network there is an impact on losses. There is additional losses on the connecting lines and cables to wind farms and other large generation sites. Some losses may be avoided due to supply of electricity locally displacing electricity supplied via the transmission system particularly for generation connected at low voltage e.g. photo voltaic generation
- > Un-authorized connections / Metering tampering etc.
 - > The propensity for unauthorised connections and meter tampering in the customer base and the effectiveness of measures to reduce it

04. Environment



At ESB Networks we are committed to operating our business so that we can be proud of our environmental and sustainability performance.

ESB Networks recognise that our activities have environmental impacts and that we have a responsibility to manage these impacts in a manner that prevents pollution and provides a high level of protection for the natural environment. ESB Networks Policy Statement on the Environment https://www.esbnetworks.ie/docs/default-source/publications/esb-networks-policy-statement-on-the-environment.pdf?sfvrsn=164533f0_34

Our strategy in ESB Networks is driven by ESB Networks' central role in leading the transition to a secure & affordable low-carbon future, using clean electricity to drive carbon, in the form of fossil fuels, out of heat, transport and the economy.

The PR4 5 year regulatory period finished at the end of 2020. During PR4 progress was made to ensure we continue to effectively manage the environmental and sustainability aspects of our business:

- > Carbon Emissions from our Fleet, SF6 Gas, and Buildings reduced by 49%
- > Sulphur hexafluoride (SF6) emitted due to equipment faults reduced significantly
- > There was an overall downward trend in fluid filled cable leakage
- > We achieved a 99% landfill diversion of waste rate from our business operations at the end of 2020
- > We maintained external certification of our Environmental Management System (EMS) to the international standard ISO 14001, and successfully transitioned to the revised ISO 14001:2015 Standard
- > We commenced the replacement of over 2.4 million electricity meters in homes, farms, and businesses with next generation smart meters to support the transition to a low carbon electricity network. By the end of 2020, 240,000 smart meters had been installed
- > The Dingle Project proceeded, facilitating planning for the future in terms of how we are going to support Ireland in transitioning to a low carbon energy system

- > ESB Network's Environmental Change Programme strengthened environmental awareness in the Networks organisation. Specific programme areas were advanced, and associated improvements made, particularly in relation to SF6 Gas Management and Fluid Filled Cables Management

During 2020, a number of investigations were completed into environmental issues raised by a staff member as part of a Protected Disclosure made to the Minister. Each of the matters raised with the Minister was examined and, where the issues raised had not already been investigated, an investigation was commissioned. And where any gaps in procedures or processes were identified corrective action has been taken.

ENERGY USAGE – BUILDINGS AND FLEET

Compared to 2019, electricity usage in our buildings was down by 8% and natural gas usage in our buildings was down by 38%. The Covid-19 pandemic had a significant impact on energy consumption in our buildings. From mid-March 2020 through to the end of the year there was a significant reduction in energy consumption at our premises which are primarily office accommodation, due to significantly reduced occupancy levels. Premises with multiple functions such as depots with workshops, garages and stores facilities showed a relatively minor reduction in energy consumption due to ongoing essential activities.

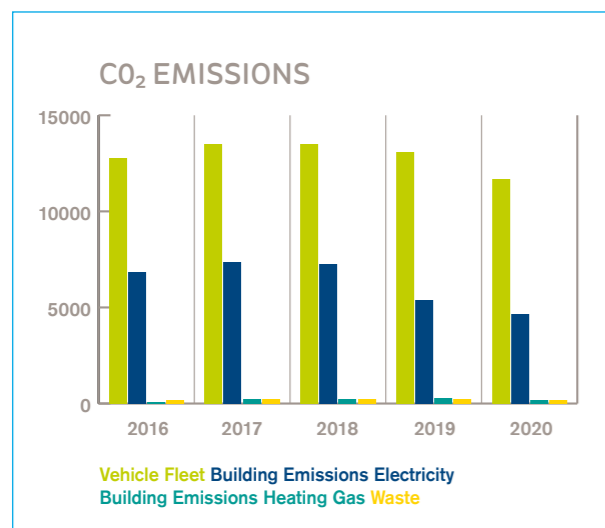
Vehicle fleet fuel consumption was lower by 1% in 2020 than 2019. This reduction is attributable to newer and more efficient vehicles being brought onto the fleet and an expansion of our electric vehicle fleet. The reduction may have been more significant had the response to the Covid-19 pandemic not required some older, less efficient vehicles to be kept in the fleet, plus additional small lease vans being introduced, in the implementation of a single occupant per vehicle policy to allow for social distancing while carrying out essential network activities.

The ongoing expansion of our electric fleet continued in 2020 with proof of concept trials of other EV's for medium and large vans ongoing. Significant work has been put into the associated charging infrastructure with 100 charge points being installed nationally across 53 depot locations during 2020. A contract was awarded for up to 40 electric forklifts in 2020, and 11 of these were delivered in Q1 2021.

Overall CO ₂ Emissions	2016 Tonnes CO ₂	2017 Tonnes CO ₂	2018 Tonnes CO ₂	2019 Tonnes CO ₂	2020 Tonnes CO ₂	2020 v 2019 Tonnes CO ₂ - (%)
Vehicle Fleet	12,796	13,517	13,526	13,088	11,700	-11% ²
Building Emissions - Electricity	250	215	166	292	4,647	-14%
Indirect Emissions - Heating Gas	6,854	7,374	7,240	5,380	180	-38%
Waste	196	229	254	256	206	-16%
Total	38,993	41,230	37,354	26,279	19,901	-24%

Note: Overall CO₂ Equivalent figures compiled using relevant DEFRA and SEAI CO₂ Conversion Factors

Energy consumption in our buildings and fleet is also typically impacted by the weather. The Met Eireann Summary Report for 2020 notes that Ireland received above average rainfall, temperatures, and sunshine at most locations in 2020. There were eight named storms and five months in which storm force winds were recorded.



* The equivalent 11% reduction in Fleet fuel CO₂ emissions in 2020 resulted from a lower fuel to CO₂ conversion factor used by ESB Networks fuel provider

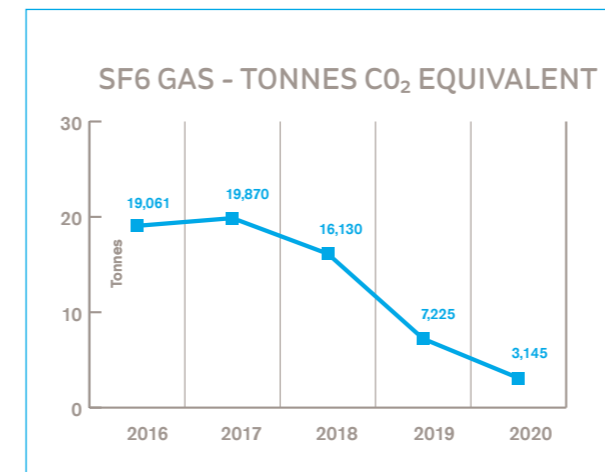
SF6 GAS MANAGEMENT

Sulphur hexafluoride (SF₆) is used in a significant portion of ESB Network's high-voltage switchgear assets on the transmission and distribution networks.

It is used because of its very high electrical insulating properties which facilitate efficient and safe operation of the switchgear. Emissions rates for SF₆ gas are reported to the Environmental Protection Agency (EPA) on an annual basis in line with Regulation (EC) No 166/2006.

In 2020, 137.96 kgs of SF₆ was emitted due to equipment faults, on distribution and transmission switchgear, of which 53.27 kgs related to distribution switchgear. Overall emissions represented representing 0.08% of the total installed inventory of SF₆. The comparable 2019 leak quantity was 316.9kg, representing 0.18% of inventory. This represents a significant reduction in annual emissions for ESB Networks.

As we replace and repair our older switch gear, we can see a downward trajectory of SF₆ emissions which can be seen in the following graph:



FLUID-FILLED CABLES

Target reduction is part of our overall lifecycle management of Fluid Filled Cables (FFCs). ESB Networks intends to reduce its annual leakage by continuously improving upon leak identification and repair times; and progressing our FFC replacement program.

Thirteen distribution circuits had Local Authority notifiable leaks in 2020 with nine distribution cable leaks repaired. You will find details on our repairs on our website <https://www.ESBNetworks.ie/acting-responsibly/environmental-information>

ESB Network's "Management of Fluid Filled Cables" Company Standard set a target maximum cable leakage volume objective of 8,000 litres per annum in 2020. During 2020, 5,222 litres of cable insulating fluid leaked from ESB Networks' High Voltage Cable network. Our 2020 leakage figure represents a reduction of approximately 61% on our 2019 leakage figure.

WASTE MANAGEMENT

ESB Networks is committed to becoming a leading company in the area of sustainability. The effective management of waste is seen as a key environmental management objective in supporting this strategy. During 2020, ESB Networks diverted 99% of its waste from landfill, compared to 98% in 2019.

During 2020, suitable arrangements were maintained and further enhanced where appropriate, for the compliant and effective management and disposal of waste arising at depots, stores, HV stations and sites nationwide.

Memorandum of Understandings were in place with Dublin City Council, South Dublin City Council and Dun Laoghaire-Rathdown County Council on the management of illegal dumping of waste, litter, and graffiti at unoccupied ESB Network's facilities.

ENVIRONMENTAL MANAGEMENT SYSTEM

ESB Networks operates an Environmental Management System (EMS) which is externally certified to ISO 14001:2015 Standard. The EMS provides a framework for the operational control of risk, performance management and continuous improvement and is independently audited against the ISO 14001 standard each year. In 2020, two external surveillance audits were carried out by ESB Networks external certification body, against the requirements of the ISO 14001:2015 standard.

MANAGING THE ENVIRONMENT DURING CONSTRUCTION

ESB Networks has continued to adapt and make continuous improvements within the challenging environment of project planning and consenting while maintaining a focus on timely and cost-effective delivery of projects.

At planning stage multi-disciplinary technical teams work to develop projects and site-appropriate construction methodologies in order to deliver connections to customers while protecting sensitive receiving environments. Detailed construction packs, capturing all of the requirements of planning consents, are provided to our external contractors who are increasingly important to project delivery. Project support through document review processes (e.g., inputs to Construction Environment Management Plans, Traffic Management Plans, Waste Management Plans, etc.) is key to ensuring delivery on planning permission condition requirements. Oversight of construction teams is achieved through the appointment of specialists such as Project Ecologists, Ecological Clerks of Works, Project Archaeologists etc.

In 2020 ESB Networks provided WERLA (Waste Enforcement Lead Authorities) with information on ESB Networks Construction Projects that had the potential to generate Construction and Demolition Wastes. WERLAs ensure the proper management of construction and demolition waste nationally. This information is communicated by WERLAs to local authority waste enforcement officers across the country who, in turn, will undertake inspections (remote or otherwise depending on Covid-19 restrictions) in relation to auditing/verification of the proper management of waste and materials at sites. This work forms part of the strategic approach to the management of construction and demolition waste within the State.



05. Safety



ESB Networks responded to COVID-19 pandemic in line with government measures, continuously balancing the provision of essential supplies with the need to keep our staff and contractors safe and healthy.

KEEPING OUR CUSTOMERS AND EMPLOYEES SAFE

In March 2020, measures were put in place to allow most employees to work from home. For staff that need to attend sites and offices, a range of procedures were developed, approved, and trained out. These included a Covid-19 Health and Safety Site Plan, Covid-19 Risk Assessment, and new Covid-19 work procedures. Just before the HSE Covid-19 tracker app was made available in July, ESB Networks developed an app "MyContactLog". All staff are encouraged to log their daily close and casual contacts on this app. This tool has proved invaluable in helping to minimise transmission and therefore help keep our staff, families and our customers safe. Several alerts and communications were issued to staff to ensure that everyone was informed of relevant Covid-19 updates and reminded of the importance of continued adherence to controls. Reporting structures were put in place to monitor the Covid-19 status of our staff. This was monitored daily and managed at senior level.

MAINTAINING ESSENTIAL SERVICES

ESB Networks provides an essential service and continued to work through the Covid-19 pandemic. Continuity plans were developed across the business to ensure network functions operated as normally as possible even if some colleagues were restricting movements / self-isolating.

TRAVELLING TO IRELAND DURING THE PANDEMIC

ESB Networks continued to monitor national public health advice. National guidance on travel was translated into ESB Networks procedures. This ensured that ESB Networks only brought contractors into the Republic of Ireland for essential purposes and that all arrangements were in compliance with national requirements.

ESB Networks continues to ensure that Covid-19 procedures reflect both government guidelines and industry best practice.

EXTERNAL VALIDATION OF SAFETY MANAGEMENT SYSTEM

In keeping with our aim to continuously improve and develop our capability and performance levels in Safety, Health and Well-being, ESB Networks was successfully certified to the new ISO 45001 Occupational Health and Safety Management System standard. This was a significant safety milestone for ESB Networks on our safety journey and further validates ESB Networks efforts and commitment to drive safety performance improvements.

NETWORKS WORK PROGRAMMES AND CRITICAL SAFETY PROCESSES

The delivery of our public safety work programmes including cyclical hazard patrols and maintenance of overhead & underground networks, and timber cutting continued to be prioritised to ensure public safety. The delivery of these programmes is monitored and reviewed regularly to ensure delivery within agreed cycles. Our incident recording system recorded and actioned all public safety incidents and provided important information that led to focussed public safety initiatives and campaign targeting key 'at risk' groups. The internal staff monthly safety briefing which is communicated to all staff in ESB Networks provided information on significant public safety incidents to emphasise the importance of public safety and recognise the contribution of staff and contractors in keeping the public safe as well as to continually reinforce the prioritisation of public safety actions. We continued to

implement critical public safety interventions by serving 'stop work notices' where we became aware of unsafe construction work near electricity networks. A Mobile App for 'stop work notices' was launched to allow staff to easily log these positive safety interventions and to indicate if the H.S.A. should be notified if appropriate. As part of our emergency response, where we are notified of low or fallen electricity wires, we continued to implement the remote disconnection of the electricity network, where appropriate, to safeguard the public. The 'dial before you dig' service provided maps of the overhead and electricity networks to construction companies to support compliance with H.S.A. Codes of Practice in relation to electricity.

STAKEHOLDER EDUCATION AND AWARENESS

In 2020 ESB Networks continued to implement the Public Safety Strategy and Action Plan (2017 – 2020), including engagement initiatives across the farm, construction, leisure and DIY sectors.

Our 'Safe Family Farms' partnership with the Irish Farmers Journal continued into its sixth year, with further additions to the library of general farm safety videos as well as the regular safety pages and full-page public safety advertorials to raise awareness of electrical safety on farms. We delivered safety talks to the Teagasc colleges as part of the FBD 'Champions for Change' initiative, in association with the H.S.A.

Our partnership with CIF resulted in a strong focus on electricity for Construction Safety Week with electricity recognised and promoted as one of the five key construction risks. This was supported by our partners in the ESB Networks-led 'Joint Utility Forum', including Gas Networks Ireland, Irish Water and EIR.

ESB Networks launched its Strategic Stakeholder Engagement Framework and 2020 Action Plan in recognition of the value we place on working collaboratively with all our customers and stakeholders.

ESB Networks participated in the An Garda Síochána - led 'Metal Theft Forum' which met during the year to share information and co-ordinate responses to break-ins and

metal theft. This impacted ESB Networks with interference and theft of critical electricity equipment with significant implications for public safety. 2020 saw a significant drop in the number of break-in and metal theft incidents. 5 events were recorded in 2020 compared to 45 in 2019. These break-ins and metal theft incidents pose a serious risk to life. Our staff continued to provide an excellent emergency response service in all situations, including major storms, emergency calls from the public and from the other emergency services.

PUBLIC EDUCATION AND AWARENESS

Our partnerships with the Irish Farmers Journal, the Farm Contractor bodies and with CIF resulted in the publication of a regular series of electricity safety articles in their publications and across their digital and social media channels which covered both overhead high-reach risks and underground cable dig-in risks. During construction safety week, ESB Networks delivered a live webinar to CIF members in partnership with Gas Networks Ireland and manned a virtual stand at the CIF annual conference.

ESB Networks, Stay Safe, Stay Clear primary school competition relaunched in 2020 targeting primary school children to create posters with electricity safety poster tips. There were 3,500 entries from 177 primary schools. Targeting primary school teachers and parents of primary school children we reached over 490,000 people on social media with our safety tips.

The Secondary Schools programme continued with winners selected in the National Safety Challenge for Agriculture Safety in conjunction with the Irish Farmers Journal who featured the finalists in their publications.

We also issued several press releases on topics covering transporting of high loads, election posters and working near electricity wires which resulted in opportunities to engage with large audiences through both national and local radio.

Our Public Safety Advertising Campaigns – "Are You Sure It's Safe?" continued throughout 2020 to inform the public of the need to be aware of the dangers of electricity. The campaign targeted those at increased risk of coming into

Number of Dangerous Occurrences / 3 rd Party Damage	2016	2017	2018	2019	2020
3rd Party plant damages (excluding underground cable dig-ins)	1,086	1,244	1,403	2,637	2,620
3rd Party plant damages caused by underground cable dig-ins	994	715	1,131	1,035	778
Non 3rd party - MV and 38kV notifiable fault incidents (line drops and reduced clearances)	183	277	277	263	132
Non 3rd party - LV notifiable fault incidents (line drops and reduced clearances)	969	1,214	1,270	948	1,012

contact with the electricity network, including farmers, construction workers, children, leisure pursuits and the general public. This campaign ran across TV, Radio, Video-on-Demand, Native Content, Social Media, Display Marketing and Paid Search.

ESB Networks Social Media Channels continued to target key at-risk audiences with safety messaging throughout 2020 achieving a combined result of 5.6million impressions and 534,000 engagements.

SAFETY, CULTURE & LEADERSHIP PROGRAMME – "SAFE & SOUND"

During 2020, the internal safety culture transformation programme, Safe & Sound, continued to deliver improvements across all areas of ESB Networks. Safe & Sound is an employee-centred programme based on changing attitudes and perceptions to safety, health & well-being. The objective is to build and embed a world class values-based safety culture that is sustainable over time and where safety, health and well-being is central to everything we do.

STORMS AND EMERGENCY RESPONSE

During 2020, storms resulted in significant interruptions to the electricity supply and damage to the overhead electricity networks. During these times of emergency response, the safety and well-being of our staff and customers was our primary concern with daily morning safety briefings for front line staff, and a text alert system pushing key safety information out to field staff. Tailored briefings were provided for all contact centre staff. Our TV and radio public safety media campaign, including the sponsored time on RTE Radio 1 Weather, social media, and search advertising delivered critical public safety messages.

INDEPENDENT ASSURANCE AUDITING

The Competence and Assurance team continued to provide auditing assurance to the Networks business. Their focus in 2020 centred around embedding construction standards through continuous compliance inspections and behaviour assessments. Their competence assessments focused on improving operator knowledge. All auditing engagements were conducted in a coaching style resulting in a steady improvement in safety across compliance and quality performance.

06. Delivering on Price



Every 5 years the CRU determines the revenue price control, which sets out the amount of Distribution Use of System (DUoS) revenues that ESB Networks can recover through tariffs from the DUoS customers. These revenues are utilised for safely operating, maintaining, and improving the distribution network.

2020 was the final year of the current Price Review (PR4) covering the five-year period from 2016 to 2020. On 18 December 2020, the CRU published its final determination for Price Review 5 (PR5), setting the allowed revenue for ESB Networks for the five-year period starting in January 2021. The final determination provides allowances for capital and operating expenditure totalling €4.5 billion (in 2019 prices), over the 5 year period 2021 – 2025, to allow ESB Networks to provide the infrastructure needed to meet Irish Governments Climate Action Plan and the EU Clean Energy Package. The determination also includes a significant investment (€0.88bn) in Ireland's smart metering programme, which aims to roll out 500,000 smart meters per year between 2021 and 2024.

The Price Review is a robust process where all capital and operating costs are assessed and benchmarked against peer utility companies. This ensures that costs are efficiently and effectively managed so that the customer receives the maximum value for money.

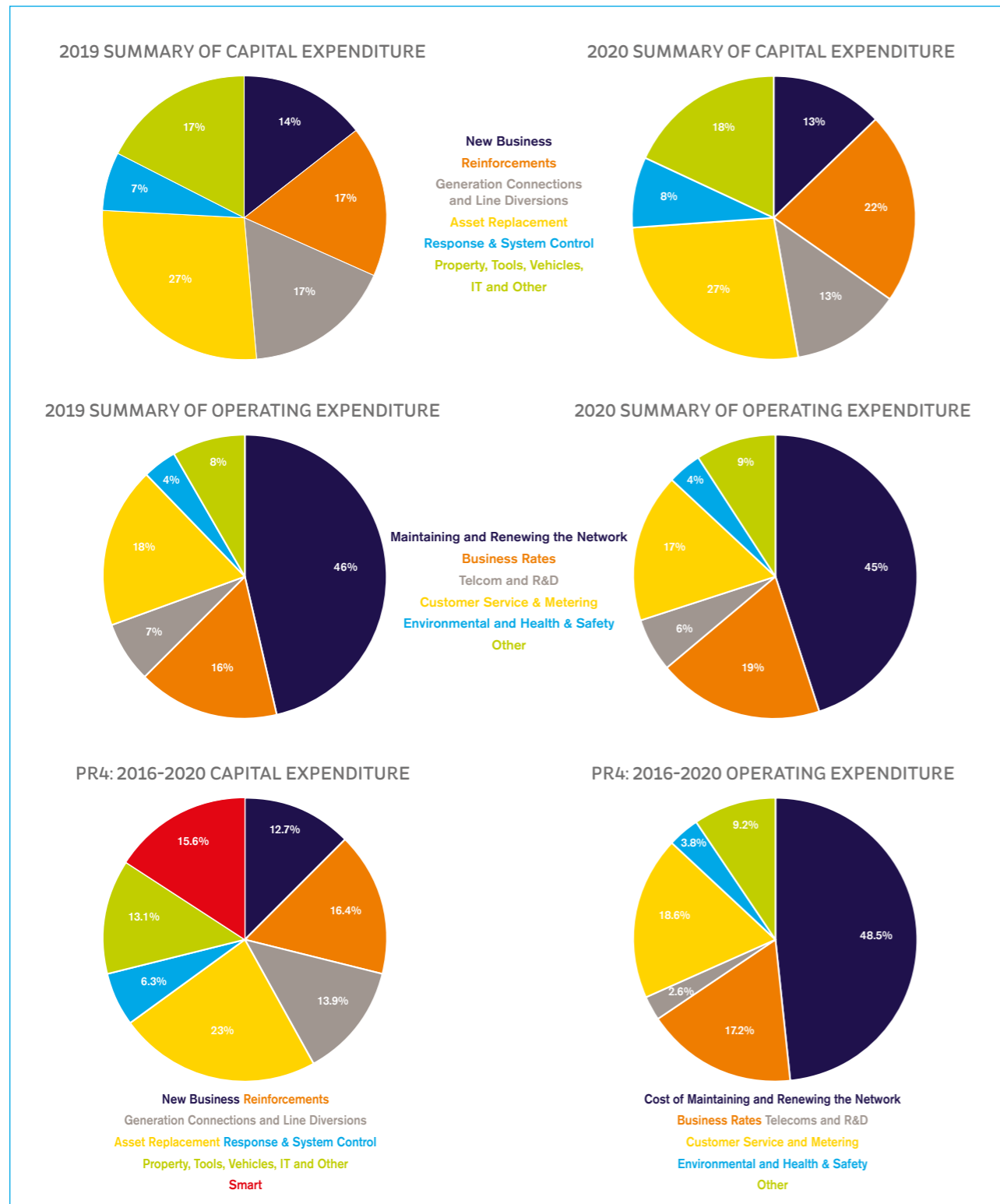
The Price Review process facilitates annual adjustments to these revenues using the k-factor mechanism for reasons such as updated forecasts, inflation, incentive out-turns, additional unforeseen items (e.g. storms) and updates due to potential under or over recovery of revenue. If there is an over recovery, meaning that the revenue recovered from customers was more than required, this is deducted from the following year's revenue allowance. Likewise, if there is an under-recovery, this is added to the next year's revenue allowance via the k-factor. The CRU approved 2020 calendar year DUoS revenues of €839.3m. You can read more on the Distribution Network Allowed Revenue in the CRU's decision paper 'Electricity Distribution Network Allowed Revenue 2021, Distribution Tariffs 2020/2021 and Distribution Loss Adjustment Factors <https://www.cru.ie/wp-content/uploads/2020/08/CRU20084-The->

Electricity-Distribution-Network-Allowed-Revenues-for-2021-and-the-DUoS-Tariffs-DLAFs-for-2020-21-1.pdf

DUoS tariffs are the proportion of a unit of electricity which pay for distribution system development and operation. These tariffs are updated in October each year, based on changes in demand, inflation and other decisions made by the CRU. Based on the CRU's Average Unit Price (AUP), the AUP for the 1 October 2020 to 30 September 2021 period was 3.75c/kWh, which was an 11.6% increase relative to the AUP of 3.36c/kWh for the 1 October 2019 to 30 September 2020 period.

The portion of our allowances we spend each year varies upwards and downwards, depending on our planned work programme for the year. In 2020, ESB Networks invested €336 million of capital expenditure in the development and renewal of the distribution network (2019:€267m), plus €316 million of operating expenditure (2019:€295m).

This means that by the end of 2020, a cumulative 94% of our allowed net PR4 capital expenditure allowances on investment in developing and renewing the system, compared to the cumulative 69% by the end of 2019. ESB Networks are committed to delivering on price for Irish electricity customers while investing in a safe, reliable network and leading the transition to a low carbon future.



Note: Capital expenditure figures are stated net of customer contributions and exclude investments in Smart metering

Note: PR4 Capital Expenditure figures are stated net of customer contributions

INCENTIVES OUT TURN

The CRU updated the incentives arrangements for ESB Networks in 2018 in the 'Reporting and Incentives under Price Review 4' decision (CER/18/087). This document sets out areas in which ESB Networks is either rewarded or penalised based on our performance. The below table shows ESB Networks' performance against these incentives for 2020.

Incentive	2019 DSO Incentive Out-turn			2020 DSO Incentive Out-turn		
	Target	Actual	Payment/ Penalty (€m)	Target	Actual	Payment/ Penalty (€m)
Customer Minutes Lost (CML)	72.2 (CML)	87.47 (CML)	-€2.79m	75.1 (CML)	94.9 (CML)	-€5.3m
Customer Interruptions (CI) ⁵	1.02 (CI)	1.23(CI)	-€4.42m	1.001 (CI)	126.11(CI)	-€5.6m
Customer Satisfaction	90%	91.17%	€0.87m	90%	90.53%	€0.39m
Customer Satisfaction Survey (RedC poll)	81%	80.82%	-€0.14m	81%	82.16%	€0.85m
One Meter Reading per Year	98%	97.82%	€0m	98%	96.15%	€0m
Avoiding Back to Back Meter Estimates	99%	99.94%	€0.86m	99%	81.53%	€0m
Smart Metering	10k meters	15k meters	€0.51m	250k meters	239k meters	€1.3m
Worst Served Customers	NA	NA	NA	6,000	9,041	€6.7m
Stakeholder Engagement	10	7.5	€0.56m	10	7.2	€0.5m
Delivering New Connections (ECP-1) ⁶	All offers issued by 31st May 2020	On target	€0.51m	All offers issued by 31st May 2020	On target	€0.51m
Innovation	'Strong' (subject to CRU assessment)	Strong	€20m, plus €10m retrospectively awarded for 2018 improvements	'Strong' (subject to CRU assessment)	Strong	€20m
Total			€25.96m			€19.35m

⁵ CI is represented per single customer

⁶ You can find more on the CRU' Delivering New Connections (ECP-1) decision here: https://www.cru.ie/document_group/electricity-connection-policy-2/

07. Social Obligation and Engagement



We are proud to have served customers and communities for over 90 years. As the energy industry changes, we will ensure that our customers remain at the centre of everything we do, as we support the transition to a low carbon future.

INCLUSION & DIVERSITY AT ESB NETWORKS 2020

Inclusion and Diversity are important to us in ESB Networks and we aim to foster an environment that enables everyone to bring their whole self to work, every day. ESB Networks has a clearly defined Inclusion and Diversity Strategy, supported by a comprehensive implementation plan to sustain an inclusive workplace. The Inclusion and Diversity Strategy speaks to ESB Networks values of Caring, Courageous, Driven and Trusted, and is aligned to the culture change programme underway at the organisation,

Each year, ESB Networks supports a range of events that help to foster an inclusive working environment such as International Women's Day, International Men's Day, Diwali, BeMe@ESB Ally Awareness Programme and Pride as well as Health and Well-being Programme of events. Throughout 2020, each programme of events was delivered virtually enabling a broader, increased participation across the business.

PRIDE

ESB Networks employees, allies, family and friends engaged in 2020 BeMe@ESB Virtual Event and also in Dublin Virtual Pride Parade. Our Ally Awareness Programme continues to be rolled out across the business, along with webinars from BeLongTo and Involve.

TRAINEESHIP PROGRAMME FOR PEOPLE WITH DISABILITIES

Each year ESB Networks supports traineeship placements for People with Disabilities. ESB Networks is a leading employer of people with disabilities in partnership with AHEAD, who also provide training for mentors, disability awareness and assistive technology awareness training.

MANAGING SUCCESSFUL PARENTING TRANSITIONS

ESB Networks supports the commitment to working towards a more consciously inclusive workplace and provides a coaching based programme which supports parents, managers and extended teams. This programme evolved throughout 2020 to support working parents facing with additional challenges throughout the year.

ELECTRIC AID

Established in 1987, ElectricAid is an independent, standalone charity set up and run by volunteers from ESB and EirGrid. As a registered charity, with its own constitution, it is administered and directed by an elected volunteer Committee, which includes staff from ESB Networks.

ElectricAid contributes to the development of people at home and abroad through co-funding of projects that aim for long-term sustainable improvement and relief of poverty and, where relevant, supports emergency appeals.

Since its foundation, ElectricAid has provided funding for small development projects in Ireland, as well as projects in 91 different countries and territories across Europe and the Developing World. Projects are monitored over the course of their lifetime and have been shown to have huge impacts on the lives of the poorest people. In addition, ElectricAid responds to disasters such as the Haiti earthquake and Cyclone Idai by providing funds from its own Disaster Relief fund and Special Appeals to our members, friends, and supporters.

In 2020, ElectricAid funded 122 projects in 33 countries totalling €1,065,240 compared to 119 projects in 36 countries totalling €1,133,781 in 2019. In 2020 ElectricAid launched an emergency appeal which saw staff donate a total of €22,500 towards projects responding to Covid-19. 36 ElectricAid projects responded directly to Covid-19 and received €266,822 from ElectricAid in 2020.

CHARITABLE VOLUNTEERING

In 2020, 12 ESB Networks staff submitted volunteering support applications under an initiative where staff volunteer for a minimum of 20 hours per year with a qualifying charity, and where staff can apply to the 'Energy for Generations Fund' for a donation of €250 for their chosen charity. A total of €3,000 was raised and donated in 2020.

SCHOOL VOLUNTEERING

In 2020, a total of 4 ESB Networks Staff took part in Time to Read and Time to Count programmes.

The aim of Time to Read is to improve literacy rates with 2nd class children by increasing the enjoyment of reading, improving confidence and encouraging self-discovery among children during the 20-week programme.

The aim of Time to Count is to help 3rd class children build their confidence around numbers and help develop their problem-solving ability by playing fun numeracy-based games during the 10-week programme.

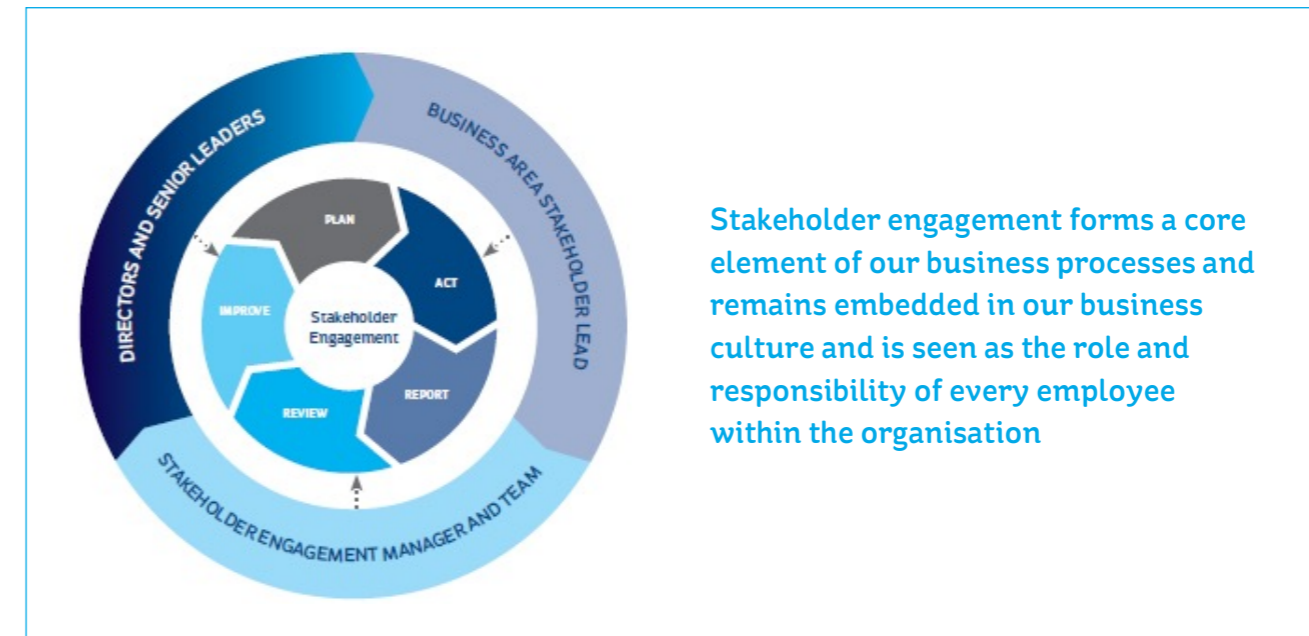
COVID-19 PANDEMIC VOLUNTEERING

During the Covid-19 pandemic ESB Networks has enabled employees to volunteer within their own communities for up to one day a week during Covid-19. With employees located in communities right across Ireland, we knew we could make a difference by making this possible.

As part Camara Ireland' Tech2Students, which aims to distribute laptops to students in DEIS schools who need access to technology at home to continue their education during these challenging times. A nationwide appeal was also launched for the public to donate older laptops to be refurbished. A group of volunteer drivers from the ESB Networks yellow van fleet volunteered to collect and deliver laptops as part of the campaign to help students with their move to online learning.

STAKEHOLDER ENGAGEMENT

We recognise that effective stakeholder engagement is essential for the successful management of our business. ESB Networks' 'Strategic Stakeholder Engagement Framework', sets out our enduring engagement strategy to enable an open and ongoing dialogue with all our stakeholders. As a strategic priority, it is led by the Directors and the senior leadership team and is seen as a vital activity at every level of the organisation. An internal Stakeholder Engagement Steering Group made up of stakeholder leads from across the business meets regularly to discuss planned engagement activities, review stakeholder feedback and agree proposed improvements and adjustments based on recommendations. This group which is led by the Stakeholder Engagement Team and chaired by the Managing Director, provides overall direction to the stakeholder engagement process for ESB Networks.



Stakeholder engagement forms a core element of our business processes and remains embedded in our business culture and is seen as the role and responsibility of every employee within the organisation

ESB Networks Stakeholder Engagement Governance and Control mechanism

Our **Strategic Stakeholder Engagement Plan for 2020** was published for public consultation from December 2019 until end January 2020. It identified the key areas of engagement for 2020 such as the price review period PR5 (2021-2025), Smart Metering, Connecting Renewables, Safety and Innovation which we believed to be of strategic importance to both our stakeholders and business alike. For example, the major engagement involved in the National Smart Metering Programme is vital to the successful delivery of this major investment initiative and will help build awareness among consumers of the benefits enabled by smart meters, while the engagement supporting the PR5 planning process is key to the future sustainable development of the network, which reflects the needs of all stakeholders.

However, 2020 was to be a most difficult and extraordinary year for us all as we faced the impact of the Covid-19 global pandemic on our society, our economy and our workplaces. As an essential service provider, ESB Networks focussed on ensuring the continuity of a safe and reliable electricity service for our customers and communities, whilst most importantly safeguarding the health and well-

being of our employees and customers. Following the initial announcement of government restrictions in March 2020, we reached out to critical infrastructure stakeholder groups by providing dedicated points of contact in case of emergency. Having dedicated stakeholder leads across the business via our "Stakeholder Engagement Steering Group" has been key to helping ESB Networks liaise with its stakeholders during this uncertain time.

2020 was a year in which we together with our stakeholders and customers had to adjust to new ways of working, communicating and living. Together we successfully adopted new channels to enable us to work effectively and to continue to collaborate and share ideas, while also supporting each other through this unprecedented period. More than ever we are dependent on virtual tools and new ways of connecting with our stakeholders in the absence of face to face interactions.

During 2020 we have undertaken many new initiatives to improve our pathways to engagement such as the introduction of the our Strategic Webinar Series "Powering the Change" to replace a physical annual conference, the

rollout of a Stakeholder Newsletter to feature information on key developments and initiatives across the ESB Networks business and the creation of two new external panels (Innovation and Customer & Society) to enable open discussion and feedback with stakeholders to help guide us on areas that are changing in industry, the economy and broader society (perhaps emerging concerns) and that may influence our thinking and planning.

We also initiated improvements to our dedicated Stakeholder and Public Engagement section of our website, where we have added a new consultations/publications section and a forward-looking list of proposed consultations, publications and events to help provide clarity to our stakeholders on the areas for potential interaction over the year. We continued our day to day stakeholder engagements (meetings, workshops and surgeries) through virtual means. We successfully delivered our Innovation Forum through a webinar series and issued on-line surveys, to garner stakeholder feedback, to help inform our engagement approach and to help us explore new and innovative means and tools of keeping us all connected through these difficult and uncertain times. We published a report [How Stakeholder Feedback is Shaping our Engagement](#) showing how feedback received from our stakeholders together with the impact of Covid-19 restrictions, shaped our engagement approach and activity throughout 2020.

During the final quarter of 2020, we developed (taking on board stakeholder feedback received throughout 2020) our forward-looking [Stakeholder Engagement Strategy & Plan for 2021](#). It was published for public consultation in December 2020 to allow our stakeholders to help further shape our strategy and plans for 2021 and beyond.



08. Innovation

Throughout 2020, we strengthened and improved our Innovation Strategy Framework by building on the robust innovation foundation created in the years previous and incorporating feedback received from CRU, industry, academia, partners and international contacts. From March 2020 onwards, innovation projects needed to react to the limitations placed on them by the Covid--19 pandemic and new ways of working were introduced in order to ensure progress. This included the replacing of our Innovation Forum with a series of webinars in which projects selected by stakeholders were presented.

During 2020, ESB Networks continued to propose and approve innovation projects, ensuring the embedding of innovation throughout the organisation. Projects such as the Dingle Electrification project delivered and continue to deliver better outcomes for customers by understanding their energy usage profiles and behaviour in the context of new technologies and tariffs. The 'Replacing Existing Unit-Sub Design with Smaller Footprint for Magnefix' project ensured that services continue to be delivered efficiently by providing an upgrade path for older substation types, meaning that capacity remains available in preparation for the electrification of transport and heat. Identifying capacity on our network to accommodate renewable generation was also facilitated by developing and publishing Renewables Heat Maps which allow developers to target locations where there is capacity available on the network for both generation and demand.

ESB Networks is actively collaborating with 81 organisations across a wide range of industry sectors. During 2020, ESB Networks remained both active in and committed to the delivery of collaborative projects where it was anticipated that learnings from interaction with national and international partners would deliver new and improved services and technologies to our customers. Some of these projects included the StoreNet, REACT, +CityxChange and SOGNO.

From 2016 to 2020, ESB Networks drove its innovation programme forward, completing 28 important projects and sharing the learnings from these projects with stakeholders.

These projects introduced new technologies such as Ester fluid-filled transformers, new substation designs and introduced new communications systems. Savings estimated at €60m were identified from a programme of 83 innovation projects over the period.

PERFORMANCE HIGHLIGHTS FOR 2020

Key improvements and achievements that were delivered on in 2020 included:

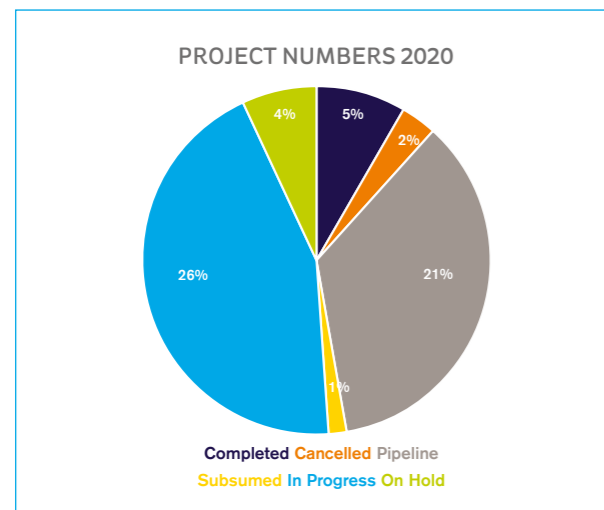
- > Finding new ways to disseminate information and liaise with our stakeholders during the Covid--19 pandemic, this included our Spring & Autumn Innovation Webinar Series in place of our Innovation Forum
- > Evolving our Roadmaps into Pillars. It is felt that the term better captures the idea that pillars remain constant and supporting, even though the constituent projects are dynamic. The pillars continue to reflect our efforts to
 - > tackle the sizeable challenges associated with the transition to a low-carbon energy system
 - > accommodate distributed and microgeneration and storage; and
 - > accommodate more active management of demand
- > Developing and augmenting the content of our website in order to satisfy stakeholder requests for information in the absence of face-to-face contact
- > We embarked on an innovation process improvement initiative involving an external audit being carried out, resulting in a broad range of recommendations being made and four working groups from our innovation team being established to implement these recommendations as appropriate.
- > Collaboration with several national and international organisations including the TSO and industry representative groups
- > Continuous and active horizon scanning for innovative technologies and processes including involvement in The Innovation Academy, our X-Potential programme, increasing social media exposure, Free Electrons

programme and our Fast-Follower programme

- > Completing five innovation projects
- > Published ten public consultation documents including 'Innovation for the Network of the Future' as well as an associated response paper
- > Establishment of an Innovation Stakeholder Panel with its first meeting in November 2020 opened by ESB Networks Director, Paddy Hayes. Publication of its Terms of Reference to ESB Networks website

PROJECT DETAILS FOR 2020

At the beginning of 2020, 30 innovation projects were active. Of these, four were completed during 2020, two were cancelled, and six more were set into progress:



⁷ One other project was introduced and completed during the year. Therefore, the total number of projects completed during the year is five.

Four projects completed in 2020

- > Intelligent Secondary Substation Monitoring (WinterPeak)
- > SOGNO – a Horizon 2020 project
- > Replacing existing design with a smaller footprint for Magnefix
- > Renewable Heat Maps

There were six new projects identified and introduced in 2020

- > EV Pole Mounted Transformer to 300kVA
- > Improved ADMD estimates for domestic customers
- > Using Real Options for ADMD
- > Using Sigfox Temperature Sensors to Assess Substation Loading
- > Net-Flex
- > Leveraging enhanced LV monitoring to optimise targeted network re-enforcement

During 2020, our dissemination programme evolved to include:

- > Bilateral meetings with stakeholders
- > Continuous improvement and updating of our website including revamped sections on ESB Networks' innovation projects including the Dingle Electrification Project, and a new section on electrification. Eight additional innovation project reports along
- > With two project-specific videos on the RESERVE and SOGNO Projects were uploaded. Page views were up 148% from last year
- > Social media presence. ESB Networks LinkedIn Channel that was launched in late 2019 now has over 4k followers
- > Ten public consultations
- > Our newly formed Innovation Stakeholder Panel with 19 members across 10 stakeholder sectors
- > Spring and Autumn Innovation Webinar Series
- > 13 academic and conference papers, scholarly articles and ezine contributions published by several of our staff involved in our innovation projects during 2020

Following the webinar series in Autumn, a stakeholder survey conducted in October revealed that 93% of its 45 respondents indicated that their understanding of ESB Networks' innovation projects and activities had improved over the previous 12 months.

THE DINGLE PROJECT

ESB Networks' Dingle Project, made significant progress throughout 2020, albeit Covid-19 restrictions introduced delays to the commencement of specific project trials and preparation activities. The learnings from these trials, some of which are rescheduled to commence in 2021, will help inform the design of the electricity network to support a low carbon energy system.

Preparation for the deployment of clean energy enabling technologies, at trial participant premises, progressed well throughout the year. The three deep retrofits at project ambassador premises were completed successfully and fully certified by the contractors. At these three ambassador premises, heat pump technology has now replaced the former fossil fuel-based heating sources.

Agreement was reached for the supply of 15 electric vehicles under lease, for use by those individuals selected to participate on the EV Trial. An additional 2 two electric vehicles have also been leased and will be made available to Dingle peninsula residents, on a managed basis, so that others, in addition to those participating on the EV trial, may also be able to experience electric motoring.

As part of efforts to enhance the electricity network in the trial area, activities continued on the upgrading of devices on the Medium Voltage electricity network enabling improved quality of supply at key times. This also reduced vehicle fleet emissions by reducing the need for Network Technicians to travel to these sites to perform operational tasks.

Throughout 2020, work progressed significantly on the procurement and configuration of additional technologies to minimise outages on the network and to identify the location of outages, should they occur, in order to restore supply as soon as practicable. This will become ever more important into the future with increased reliance on the electricity network to enable mobility and heating. Smart Fault Passage indicators have been installed on a number of circuits. Single Phase Recloser / Fusesaver devices, which reduce the impact of transient faults, have also been configured to enable integration with the SCADA system.

Engagement with citizens and community groups continued throughout 2020, through a combination of local radio pod-casts, interviews, print media articles and webinars, to provide information on the renewable energy and clean energy enabling technologies that are being implemented by ESB Networks as part of the Dingle Project.



09. Connectivity and Digitalisation



NATIONAL SMART METERING PROGRAMME (NSMP)

During 2020 ESB Networks continued the replacement of over 2.4 million electricity meters in homes, farms and businesses with next generation smart meters to support the transition to a low carbon electricity network.

To comply with Covid-19 restrictions, the deployment programme was paused for seven weeks during Q2 2020. In spite of this, by the end of the year 240,000 smart meters had been installed. Subject to ongoing Covid-19 guidelines, the programme plans to replace over 400,000 meters during 2021.

The programme is a key enabler of the government's Climate Action plan, specifically with regard to micro-generation and the electrification of heat and transport. In support of these objectives a number of critical blocks have been delivered during 2020 which will provide the foundation for later stages of the programme.



- > Safety of customers, staff and contractors is key to the success of the programme and enhanced safety precautions and customer journey have been implemented as a result of Covid-19
- > The programme continued to safely install smart meters in counties Cork, Kildare, Laois, Dublin, Meath and Louth A total of 240,000 meters have now been successfully installed by the end of December 2020
- > ESB Networks is committed to ensuring that the NSMP is delivered in compliance with all applicable data privacy laws and that all customer personal data is safe and secure. ESB Networks has ongoing engagement with the Commission for Regulation of Utilities (CRU), Department of Environment, Climate and Communications (DECC) and the Data Protection Commission (DPC) and during 2020 ESB Networks published a comprehensive set of Data Protection Assessments (DPIAs) which outline how ESB Networks manage and protect customer data, the DPIA's are available on our website at <https://www.esbnetworks.ie/existing-connection/meters-readings/smart-meter-upgrade/data-protection-impact-assessments>
- > ESB Networks has commenced remote meter reading of smart meters, this will result in a significant reduction in estimated bills and improved billing accuracy for customers with smart meters
- > ESB Networks has led industry forums and working groups ensuring alignment with Supplier system and process development and provided on-going support for Supplier queries during 2020
- > ESB Networks continues to lead the implementation of the agreed industry wide Strategic Framework for Communications and Consumer Engagement designed to support the meter deployment programme
- > Based on customer feedback the smart meter upgrade section on the ESB Networks website has been updated to include expanded FAQs, additional information on smart meter benefits and a how to read your smart meter video has been developed

- > ESB Networks has undertaken a public information campaign across local radio, press and social media channels, developed branding in order for the public to easily identify the contractors' association with the ESB Networks programme, created media assets and stakeholder packs and has delivered briefings to national and local stakeholders
- > Consumer surveys conducted during 2020 demonstrate that customer awareness is rising and that sentiment towards the programme is positive. This is further supported by the 99% success rate of planned exchanges

SMARTGRID

ESB Networks' distribution and transmission electricity networks rely on resilient, highly available telecommunications to centrally control and operate the grid. This connectivity is provided by an expansive telecoms network within ESB Networks, covering a range of solutions including fibre optics, microwave and satellite radio, as well as active data networking systems.

During 2020, these telecom networks continued to be developed and extended to support the growth of the electricity system and the control centres operating them. The active data networks carried on these media were further enhanced. Telecommunication links and infrastructure to support connectivity and control of new IPPs being brought onto the electrical system were also provided.

As the Smart Grid extends across the HV and MV networks, the requirements for telecommunications connectivity is growing. Throughout Price Review 4, projects were progressed to deliver a secure operational IP telecommunications network. A high-speed core network connecting 10 core sites at STM-64 (10 Gbits/sec) was completed and a new active IP data network using SONET and IP infrastructure was also installed in these core sites, concluding in 2020. The provision of services and connections from this new telecoms network commenced toward the end of the year and will continue through Price Review 5 and beyond.

To enable reliable connectivity to MV and LV equipment, a new wireless radio network is being constructed. ComReg have supported the work to develop an Irish Smart Grid and awarded a 15-year licence for spectrum in the 410 – 414 MHz band paired with 420 – 424 MHz, which this radio network will be built on. In 2020 the project was established, and the procurement process commenced to build a nationwide service.

With the impact of the pandemic in the first quarter of the year, there was an urgent need to provide telecoms solutions to enable staff work from home. The telecommunications infrastructure for the National Customer Contact Centre (NCCC) was upgraded during PR4 and was capable of being rapidly reconfigured to support remote working for all agents. With the support of ESB Networks' mobile and fixed Telco suppliers, additional services and equipment was sourced to deliver a near seamless changeover of operation to remote working.

With the support of ESB Networks' mobile and fixed Telco suppliers, additional services and equipment was sourced to deliver a near seamless changeover of operation to remote working, which continued for the remainder of the year.

MARKET DEVELOPMENT

MARKET RELEASES

During 2020, ESB Networks worked collaboratively with our partners in Northern Ireland, NIE Networks, and the Market Participants to deliver the V13.00.00 retail market release. Work on the V13.00.00 retail market release was coordinated by the Retail Market Design Service (RMDS).

The V13.00.00 retail market release was an extensive market release which facilitated the introduction of 'smart services' by electricity suppliers in the retail market. Originally intended to 'go live' in December 2020, the target date was extended by a number of weeks to allow for more testing between Market Participants.

This was an important milestone in to the 'Phased Approach' delivery of the National Smart Metering Programme (NSMP) <https://www.cru.ie/wp-content/uploads/2016/11/CER17279-NSMP-Info-Note.pdf>. The suite of market change requests delivered as part of the V13.00.00 retail market release was as follows:

Market Change Request	Title
1157	Data Aggregation and Data Processing
1158	Customer Data
1159	Change of Supplier
1160	Meter Works
1161	New Connections
1135	MPRN Enquiry Webservice
0176	Email Validation

MCR 1135 MPRN Enquiry Webservice' and 'MCR0176 Email Validation,' although not facilitating the introduction 'smart services,' both MCRs were included in the V13.00.00 retail market release.

'MCR 1135 MPRN Enquiry Webservice' was introduced to allow electricity suppliers to access customer data on demand from the Central Market Systems which would assist electricity suppliers in their interaction with customers e.g. in cases of change of supplier.

'MCR 0176 Email Validation' introduced new functionality which validates the format of email addresses.

MCR1205 PSO FOR COMMERCIAL STORAGE

CRU's Information Paper 'Application of the PSO to Commercial Storage' outlined that commercial storage units will be considered only a final customer (for the purpose of calculating their PSO levy charge) when consuming electricity for its normal house load when it is offline. ESB Networks, in order to give effect to CRU's Information Paper, introduced and obtained approval for 'MCR1205 PSO for Commercial Storage.' This MCR set out ESB Networks process for invoicing and collecting PSO money relating to Commercial Storage units. An accompanying Working Practice was also developed by ESB Networks to assist Market Participants with this new process.

COVID-19 ACTIVITIES

The onset of the Covid-19 pandemic and the introduction of public health measures by Government to combat same in March 2020, resulted in a curtailment of services provided by ESB Networks at times throughout 2020. This was done in the interests of the health and safety of both our customers and our staff. ESB Networks, working closely with CRU and Market Participants, monitored closely the development of public health measures and advice issued by Government and tailored our services accordingly throughout 2020. Regular updates were provided to CRU and Market Participants through a series of weekly extraordinary Industry Governance Group meetings throughout the Spring and Summer of 2020.

ESB Networks mapped our services and our activities to the Government's own 'Plan for Living with Covid-19' and issued updates to Market Participants periodically on same.

COVID-19 SUPPLY SUSPENSION PROCESS

In May 2020, CRU published its 'Covid-19 Supply Suspension Due to Temporary Closure' ⁸ decision paper. This decision paper sought to provide assistance to those small-medium sized enterprises (SME) which were shuttered due to the onset of the Covid-19 pandemic and subsequent restrictions introduced by Government.

ESB Networks, working closely with the RMDS, Market Participants and CRU, developed 'MCR 1206 Covid-19 Supply Suspension Process' to give effect to CRU's decision paper. This MCR sought to:

- > Reduce estimated readings used for Use of System charges and Settlement, and
- > Redit suppliers for certain charges for those eligible customers

The Covid-19 Supply Suspension Process went live in May 2020 and ceased in July 2020. Approximately 9,500 customers availed of the Covid-19 Supply Suspension Process.

⁸ <https://www.cru.ie/wp-content/uploads/2020/05/CRU20054-Decision-Paper-on-Temporary-Covid-19-Supply-Suspension-Scheme-003.pdf>

10. Service Level Agreements

The Service Level Agreement (SLA) Report in the following table contain the complete set of results for 2020. The report provides a description of each SLA and the measure against which its level of performance is reported. The actual performance is measured as the percentage of transactions that were completed within the agreed SLA time-line and the percentage completed within twice the SLA time-line during 2019.

Description	No.	Standard Approval Time Lines (SLA)	Within SLA Time-Line	Within Twice SLA Time-Line
Change of Supplier (NQH)	1A	Validate within 5 days	100%	NA
	1B	Using customer read supplied by the customer- Complete within 3 days	99.93%	100%
	1B	Using a special read organised between the customer and ESB Networks- Complete within 10 days	99.45%	100%
	1B	Using one of ESB Networks scheduled reads - Complete within 3 days	98.98%	100%
Change of Supplier (QH)	2A	Validate within 5 days	99.86%	100%
	2B	Complete within 3 days	98.90%	100%
New Connection and registration with supplier (QH)	3A	Validate supplier cancellation within 5 days	99.91%	100%
	3B	Complete supplier cancellation within 5 days	99.95%	100%
New Connection and registration with supplier (NQH)	5A	Prepare Quote - Within 7 working days where no site visit required. Within 15 working days where site visit required	96.60%	100%
	5B	Complete connection - Within 10 working days of receipt of ETCI certificate.	98.22%	100%
	5C	Data Processing - Issue details to Supplier within 10 Days	98.28%	99.72%
New Connection and registration with supplier (QH)	6A	Prepare Quote - Within 7 working days where no site visit required. Within 15 working days where site visit required	96.60%	100%
	6B	Complete Connection -Within 10 working days of receipt of ETCI certificate.	99.22%	100%
	6C	Data Processing - Issue details to Supplier within 10 Days	89.28%	89.28%
Change to meter point characteristics	8A	Prepare quote - Within 7 working days where no site visit required. Within 15 working days where site visit required	96.60%	100%
	8B	Complete change - Within 10 working days of receipt of ETCI certificate.	99.22%	100%
	8C	Process Change - Issue details to Supplier within 10 Days	97.30%	98.48%

Description	No.	Standard Approval Time Lines (SLA)	Within SLA Time-Line	Within Twice SLA Time-Line
De-energisation of Meter Point	9A	De-energise of meter point within 5 days	92.13%	96.56%
	9B	Issue Meter details to Supplier within 10 Days	99.16%	99.89%
Re-energisation of Meter Point	10A	Re-energise meter point within 5 days	97.49%	98.67%
	10B	Issue Meter details to Supplier within 10 Days	99.13	99.88%
Change of Meter Configuration	11A	Reconfigure meter within 5 days after the receipt and validation of Supplier request	95.942%	97.97%
	11B	Process data within 10 days	99.39%	99.86%
Meter Problems and Reports of damage	12A	Repair or replace faulty meter within 5 days	76.37%	83.18%
	12B	When a faulty meter is Repaired or Replaced – Process Meter Data within 5 days	98.35%	99.07%
NQH Meter Reading	14A	Scheduled Read – Distribution of Reads to Suppliers within 7 workdays	99.89%	99.95%
	14A	2 Scheduled reading visits per annum	99.97%	NA
	14A	4 Scheduled reading visits per annum	76.75%	NA
	14A	Actual reads for scheduled meter reading visit	73.62%	NA
	14A			
	14A	Actual reads for scheduled MD meter reads	86%	NA
		One actual read per annum	96.15%	NA
	14B	No Consecutive Block Estimations	81.53%	NA
	14B	No Consecutive MD Block Estimations	90%	NA
	14C	Out of Cycle Customer Read – Readings processed within 3 workdays	97.65%	98.89%
QH Data Collection	15A	D+4 QH data-Send to SEM-O / Suppliers in 1 workday	100%	NA
	15B	QH Actual Data. Send to suppliers within 4 and 10 days**	96.99%	97.64%
Request for Special Read	18A	Site visit by 7 days	52.20%	61.02%
	18B	Issue of Meter details within 3 Days	63.58%	68.21%
Data Aggregation	16	Issue of aggregated data to SEM-O/TSO/ Suppliers and Generators within 5 workdays	100%	NA
Change of SSAC	20	Complete process in 3 workdays	100%	NA
De-registration	21	Auto Completion within 5 workdays	100%	NA
		Manual Completion within 10 workdays	100%	NA
Change Customer Details	24	Complete within 5 days	100%	NA
Change Legal Entity	25	Complete within 5 days	99.96	100%



11. Register of Assets

The following is a register of all relevant Distribution System assets on the system at the end of 2020.

Register of Distribution System Assets at end of 2020		
Asset	Units	Volume
220kV		
220kV Substations	Sub	2
220/110kV Transformer Capacity	MVA	2,500
110kV		
110kV Overhead Lines	km	417
110kV Underground Cable	km	225
110/38kV Substations	Sub	70
110kV/MV Substations	Sub	40
110/38kV Transformer Capacity	MVA	6,859
110kV/MV Transformer Capacity	MVA	1,558
38kV		
38kV Overhead Lines	km	5,642
38kV Underground Cable	km	1,240
38kV Substations	Sub	434
38kV Transformer Capacity	MVA	5,337
MV		
20kV 3-ph Overhead Lines	km	15,161
20kV 1-ph Overhead Lines	km	31,688
10kV 3-ph Overhead Lines	km	13,272
10kV 1-ph Overhead Lines	km	24,029
20kV Underground Cable	km	1,843
10kV Underground Cable	km	8,483
3-ph Pole mounted Transformers	Trafo	21,786
1-ph Pole mounted Transformers	Trafo	222,910
MV Ground Mounted Substations	Sub	22,614
LV		
LV 3-ph Overhead Lines	km	4,651
LV 1-ph Overhead Lines	km	55,835
LV Underground Cable	km	13,669
Mini-Pillars	MP	176,540

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