



NETWORKS

2018 ANNUAL PERFORMANCE REPORT

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ESB NETWORKS DAC IS THE LICENCED DISTRIBUTION OPERATOR IN THE REPUBLIC OF IRELAND. THE IRISH DISTRIBUTION ELECTRICITY SYSTEM INCLUDES ALL DISTRIBUTION STATIONS, OVERHEAD ELECTRICITY WIRES, POLES AND UNDERGROUND CABLES THAT ARE USED TO BRING POWER TO IRELAND'S 2.3 MILLION DOMESTIC, COMMERCIAL AND INDUSTRIAL CUSTOMERS. EACH YEAR WE REPORT ON OUR PERFORMANCE FOR THE COMMISSION FOR REGULATION OF UTILITIES (CRU). THE FOLLOWING REPORT DETAILS ESB NETWORKS' PERFORMANCE AS THE IRISH DISTRIBUTION NETWORK OPERATOR FOR 2018.

WELCOME TO

ESB NETWORKS' 2018 ANNUAL PERFORMANCE REPORT

At ESB Networks, our purpose is to lead the transition to a low carbon future powered by electricity. This means developing, operating and maintaining a network supporting the secure and affordable distribution of sustainable low carbon electricity. With this in mind our strategy involves working with industry partners and stakeholders to connect much more renewable low carbon generation to Ireland's electricity network.

ESB Networks maintains a strong focus on service excellence with an end-to-end customer engagement strategy, while also actively embedding a culture of safety into the business. We actively listen and engage with customers and stakeholders enabling them to input in to the development of our plans for the network and for the future. Management and employees within ESB Networks are committed to ensuring their own health and safety and that of others. ESB Networks is committed to:

- protecting the safety, health and welfare of employees, contractors, visitors and the public
- complying with legal and health and safety observations, and with codes of practice
- promoting a culture where we take responsibility for our own health, safety and wellbeing and that of those around us, and continually improving and implementing the highest health and safety management standards

ESB Networks' Innovation Strategy is designed to foster increased innovation in the areas of renewables, engagement, the electrification of heat and transport, asset optimisation, network flexibility, operational excellence, resilience and our partnership with the Transmission System operator. Under this Innovation Strategy ESB Networks saw the completion of 16 projects in 2018.

The number of new connections to the system continues to rise and in 2018 we connected nearly 26,954 (2017: 24,463) new homes and businesses. 353 MW of new renewable generation were also connected by ESB Networks to the national electricity system, with 170 MW of this being connected to the Distribution System and 183 MW being connected to the Transmission system, resulting in almost 4 GW of renewable generators now being connected to Ireland's national electricity network. The Commission for Regulation of Utilities (CRU) introduced a new Enduring Connection Policy in 2018 and implementing this new policy, in conjunction with EirGrid and industry, will enhance ESB Networks' ability to connect more renewables to the network. All of the above connections required significant reinforcement and extensions to the electricity network, in addition to considerable maintenance, vegetation management and refurbishment programmes for the established network.

The Smart Metering Programme which will see up to 2.3 million meters replaced with digital smart meters over the coming years, reached a number of milestones in 2018, such as procurement of infrastructure and the development of new safety procedures and policies.

2018 saw several major storms, Eleanor (January), Emma (March), Hector (June), Ali (September) and Callum (October) which had a serious impact on the network and our customers. The arrival of Storm Ali in particular, at a time when most trees were still in leaf, resulted in significant levels of network damage from falling timber and required an enormous restoration response from ESB Networks crews. ESB Networks would like to thank our customers for their patience and support during the restoration efforts.

2018 HIGHLIGHTS



NEW CONNECTIONS

22,568

NEW DOMESTIC CONNECTIONS

4,486

NEW COMMERCIAL CONNECTIONS

353 MW

OF RENEWABLES CONNECTED (170 MW DISTRIBUTION, AND 183 MW TRANSMISSION)

DSO ANNUAL FINANCIAL PERFORMANCE

€246

MILLION SPENT ON CAPITAL PROGRAMMES IN 2018

€282

MILLION ON OPERATING EXPENDITURE IN 2018

BY THE END OF 2018 WE HAD SPENT A CUMULATIVE 48% OF OUR ALLOWED PR4 CAPITAL EXPENDITURE ALLOWANCES ON INVESTMENT IN DEVELOPING AND RENEWING THE SYSTEM

STAY SAFE, STAY CLEAR SCHOOLS PROGRAMME

233

SCHOOLS TOOK PART IN THE 'STAY SAFE - STAY CLEAR' POSTER COMPETITION WITH 4,588 ENTRIES

110,000

HIGH VIS VESTS GIVEN OUT TO JUNIOR INFANTS

200

STAFF VISITED SCHOOLS TO DISTRIBUTE VESTS

CUSTOMER SERVICE-CONTACT CENTRE

CCA

ACCREDITATION successfully retained for 2018 and won a category award for Best Small Contact Centre

2.6M+

POWERCHECK HITS

41K+

FOLLOWERS ON TWITTER +13,284,500 Twitter impressions

1,624,293

CUSTOMER CONTACTS HANDLED

28K+

LIKES ON FACEBOOK +484K impressions

91.75%

ESATRAT (expected satisfaction rating)

ESB NETWORKS STAFF

3,497

STAFF EMPLOYED BY ESB NETWORKS

95

NEW NETWORK TECHNICIANS WERE WELCOMED TO ESB NETWORKS

APPRENTICESHIP PROGRAMME

6,460+

APPLICATIONS

72

TOP APPLICANTS SELECTED AND BEGAN THEIR APPRENTICESHIP IN SEPTEMBER

INDUSTRY AWARDS



The Freight Transport Association Technician of the Year



The Leadership in Infrastructure Transformation award at the Oracle Open World Conference



The EPRI PDU Technology Transfer Award for Leadership in Integration



The ESB Networks Apprentice Programme won the 2018 European Alliance for Apprentices (Large Company) Award for Vocational Education and Training Excellence

DISTRIBUTION SYSTEM STATISTICS

- C. 149,100km OF OVERHEAD LINES
- C. 24,700km OF UNDERGROUND CABLE
- C. 562 HV SUBSTATIONS
- C. 22,000 MV GROUND MOUNTED SUBSTATIONS
- C. 241,000 MV POLE MOUNTED TRANSFORMERS

SAFETY

NEW CONSTRUCTION SAFETY VIDEO PRODUCED FOR USE IN SOLAS SAFE PASS TRAINING, VIEWED BY 90,000 CONSTRUCTION WORKERS ANNUALLY

NEW ELECTRICITY SAFETY VIDEO FOR USE BY ALL EMERGENCY SERVICES PERSONNEL

4,555 GOOD CATCHES RECORDED BY STAFF (4,105 IN 2017)

'SAFE AND SOUND' SAFETY CULTURE TRANSFORMATION PROGRAMME

THE NEW ESB NETWORKS SAFETY CULTURE TRANSFORMATION PROGRAMME COMMENCED, WITH SUPPORT FROM FULL-TIME COACHES AND LEADERSHIP TEAMS

WELLBEING

HEALTH AND WELLBEING INFORMATION BULLETIN ISSUED EVERY MONTH TO STAFF TO RAISE AWARENESS OF HEALTH AND WELLBEING TOPICS

2018 PERFORMANCE SUMMARY

METRIC	2018 TARGET	FINANCIAL INCENTIVE 2018
Customer Minutes Lost (CML) – unplanned outages	79.4	-€4.86m
Customer Interruptions (CI) – unplanned outages*	1.04	-€4.04m
Customer Satisfaction (ESATRAT)	90%	€1.3m
Customer Satisfaction Survey (Red C poll)	81%	-€1.76
One Meter Reading per Year	98%	€0m
Avoiding Back to Back Meter Estimates	99%	€0.86m
Smart Metering	N/A	N/A
Stakeholder Engagement	10	€0.43m
Delivering New Connections (ECP-1)	All offers issued by 31st May 2020	€0.5m
No. of registered vulnerable customers	N/A	N/A
Total number of outages (planned and unplanned)	N/A	N/A
Worst Served Customers**	N/A	N/A
New Demand Connections	N/A	N/A
Capital Expenditure	Within PR allowances	Within PR allowances
Innovation	'Strong' (subject to CRU assessment)	€5m in 2018

2018 PERFORMANCE	2017 PERFORMANCE	2016 PERFORMANCE
97.43	90.34	79.05
1.23	1.21	1.04
91.75%	91.19	91.31
78.63%	79.43	80.72
97.80%	97.83%	97.83%
99.85%	99.84	99.41%
N/A	N/A	N/A
6.8	N/A	N/A
On target	N/A	N/A
46,767	45,291	41,511
38,646	37,295	36,404
65% of WSC population as a direct consequence of severe weather	58% of WSC population as a direct consequence of severe weather	45% of WSC population as a direct consequence of severe weather
26,954	24,463	20,110
€244m	€209m	€198m
€5m awarded, with €10m withheld for 2019 assessment	€20m	€20m

* CI is represented per single customer.

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

CONTENTS

In each of the following sections we have reported on our progress and performance delivering on the plans approved by the CRU for Price Review 4 (PR4), the period from 2016 – 2020.

In 2017 – 2018, the CRU proposed a move towards a more “output based” approach to how we manage and report on our performance. This means placing a greater focus on what value has been delivered to customers. The following sections have been laid out to reflect the “outputs” which we and the CRU agree reflect what we should be delivering for our customers.



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SERVICE LEVEL AGREEMENTS

Service Level Agreements (SLA) set out the target service levels that ESB Networks will operate to in providing market roles to all market participants



CUSTOMER SERVICE

Over the last 10 years we have worked hard to develop our customer communication channels and offerings. We are committed to delivering a first-class customer experience and to improving on our performance every year to ensure customers' needs are met.

CUSTOMER CHARTER

OUR CUSTOMER CHARTER IS A SET OF COMMITMENTS TO OUR CUSTOMERS:

- | | |
|--|---|
| <p>01 We aim to restore supply in less than 4 hours for 95% of fault outages</p> | <p>07 We will contact you within 10 working days if you are concerned about your supply voltage</p> |
| <p>02 We will give you at least 2 days' notice of an outage for planned work on the network</p> | <p>08 We will resolve verified voltage concerns within 12 weeks (unless major reinforcement is required)</p> |
| <p>03 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</p> | <p>09 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</p> |
| <p>04 We will install an electricity meter for you within 3 working days (for domestic customers, 5 working days for business customers)</p> | <p>10 Where we agree that you are entitled to a refund, we will make the refund within 5 working days</p> |
| <p>05 We will send you a cost quotation for your new connection within:
(A) 7 working days if no site visit is required
(B) 15 working days if site visit is required</p> | <p>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</p> |
| <p>06 We will complete your new connection within 2 weeks of receiving your RECI Completion Certificate if you apply and pay giving us 10 weeks' notice</p> | <p>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.</p> |

CUSTOMER SERVICE



CUSTOMER DEVELOPMENTS

In 2018, ESB Networks continued to develop online services to enhance the customer experience. An enhanced New Connections service was piloted in Cork and Arklow, seeking to improve the experience of any customer looking for a new connection to the network. The plan is to extend this across the network during 2019, along with an online tracking app designed to allow customers to track the progress of their new connection.

CUSTOMER INTERACTIONS DURING STORMS

Customers interact with ESB Networks across many touchpoints including the customer care centre, social media and the mainstream media. Storms result in the significant impact to customers. ESB Networks experienced peaks in social media attention with 4.4 million views on Twitter and 720,000 hits to PowerCheck. TV, radio campaigns and media interviews were also used to communicate and engage with customers in a timely and proactive manner. ESB Networks activated additional call centres to effectively manage the volume of customer calls which rose to 65,000 during Storm Ali.

CUSTOMER SATISFACTION SCORES

91.75% ESATRAT
SATISFACTION RATING OF NATIONAL CUSTOMER CARE CENTRE

78.63% RED C
NATIONAL CUSTOMER SATISFACTION RATING

BREAKDOWN OF ESATRAT INCENTIVE

	2018 Target	2018 Actual
Speed of telephone response	88%	90.31%
Call abandonment rate	4%	2.74%
Customer call-back survey results	83%	94%
Mystery caller survey results	88%	85%
First contact / Call referral	10%	8.31%
ESATRAT (Total target)	90%	91.75%

CUSTOMER SATISFACTION SCORES EXPLAINED

National Customer Care Centre

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

In 2018 our combined incentivised outturn stood at 91.75%, compared to 91.19% in 2017. 2017 had seen the country hit by Ex-Hurricane Ophelia, and resulted in the National Customer Care Centre handling 18% of its annual No Supply calls in one week across all channels including telephony, IVR and digital channels, with increased engagement by customers via our digital channels such as social media and powercheck. 2018 also brought several significant weather events, most notably Emma, Ali and Calum. Storm Emma led to heavy snowfall and produced the first nationwide RED weather alert. We coordinated our pre publicity for Emma with the National Emergency Coordination Group, and this allowed us to publicise our customer channels and self-serve options including automated Fault Logging

via IVR or via our websites, Powercheck and our Social media offering to our customers. We provided both safety messaging and real time information and updates on faults during outages which proved invaluable. ESB Networks has gained considerable experience maintaining high levels of customer services during these challenging events, and standardised the management of customer service operations and customer communications during these periods. In addition to providing customers with better information and assurance through the use of social media, this has reduced the requirement for customers to contact ESB Networks during these 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.

Customer Satisfaction

The incentivised National Customer Satisfaction Rating (Red C Survey) outturn score is the average of six Key Performance Indicators (KPI).

In 2018 our incentivised outturn stood at 78.63%, compared to 79.43% in 2017. The overall decrease from 2017 to 2018 was mainly due to the KPI for New Connections - Business. This was driven by lower satisfaction with the application process, promptness of installation and information provision. Performance was also down for Unplanned Electricity Interruptions while we saw an improvement in Planned Interruptions.

CONTACT CENTER ASSOCIATION (CCA)

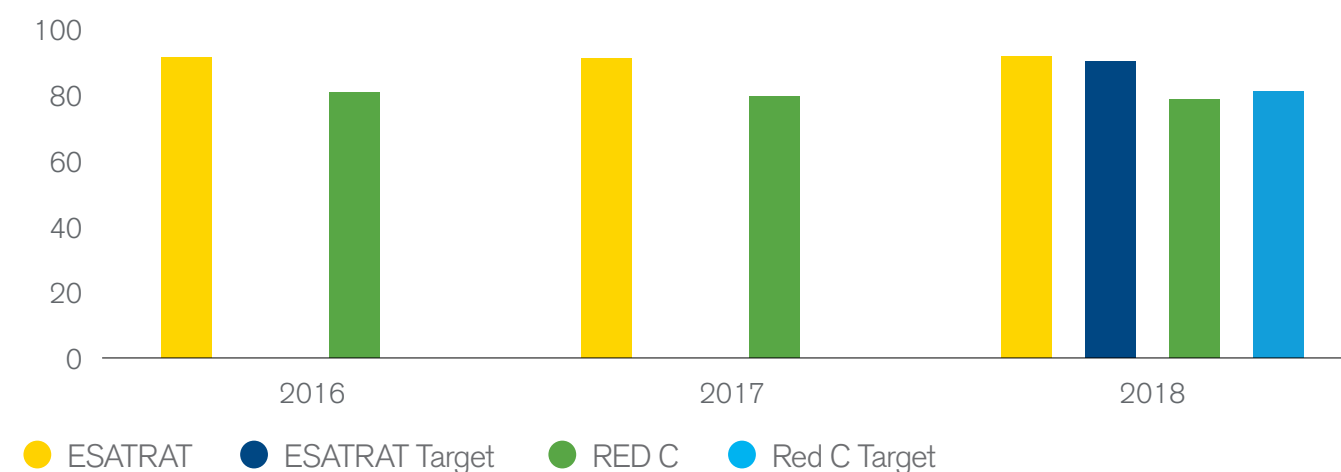
OUR CUSTOMER CARE CENTRE SUCCESSFULLY RETAINED ITS CCA ACCREDITATION FOR 2018 ALONG WITH AN AWARD FOR BEST SMALL CONTACT CENTRE, AS WELL AS THE CCMA SILVER MEMBERSHIP AWARD FOR SUCCESSFULLY ACHIEVING THE GLOBAL STANDARD FOR 10 YEARS PLUS.



CUSTOMER SATISFACTION RATING (RED C SURVEY)	OVERALL
Voltage Complaint Rectified (1y rolling due to small base size)	80.73%
Unplanned Electricity Interruption	79.72%
Planned Electricity Interruptions	85.39%
New Connection - Scheme Builders	72.82%
New Connection - Non scheme	83.04%
New Connection - Business	70.05%
Average	78.63%

There were no targets in place for 2016 and 2017

CUSTOMER SATISFACTION SCORES



CUSTOMER SERVICE

VULNERABLE CUSTOMERS

We all rely on safe, reliable electricity supplies. 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 get priority attention when there is a fault on the network, we take care to give them extra notice of upcoming planned outages.

46,767 customers were registered as Vulnerable Customers in 2018, showing an increase of 1,476 from 2017 to 2018. To register as a Vulnerable Customer, please contact your Electricity Supplier who will then notify us.



METER READING

ESB Networks schedules four meter reading visits per customer per year. In 2018, ESB Networks managed to make four scheduled visits to 99.64% of customers, and 99.99% of customers received at least two such scheduled visits compared to 99.5% and 100% respectively in 2017.

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 2018 the result achieved was 97.80% compared to 97.83% in 2017. ESB Networks also has a target that 99% of customers will not receive back to back block estimates, and in 2018 the result achieved was 99.85% compared to 99.84% in 2017.

However, these visits may not always result in an actual meter reading being obtained due to, either our meter reading staff not being able to gain access to the meter, or a meter reading has not been submitted by the customer. Where we fail to gain access we leave a card for the customer to submit a reading. 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 the targets set out above and is utilising email campaigns, text campaigns, the visiting of holiday homes during summer months etc. in order to tackle the issue of LTNA. With regards to back-to-back block estimates, reasons for a customer receiving these can range from LTNA, to adverse weather impeding scheduled meter reading, or contractor illness.



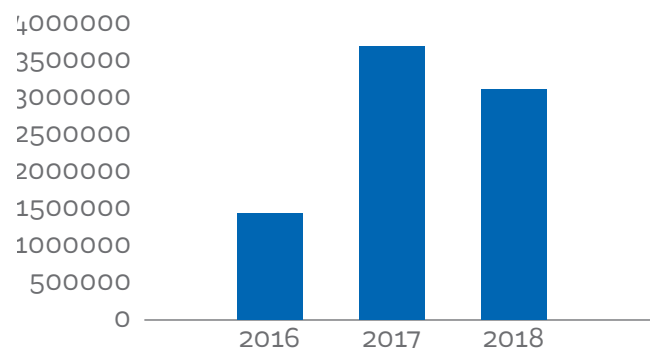
NATIONAL CUSTOMER CARE CENTRE

COMPLAINTS RECEIVED	2017	2018
Concerning low voltage	19	21
For frequent outages	1,259	1,199
Time to connect customers	38	48
Operation delays and overruns	93	148
From suppliers	0	0
On meter reading and estimated reads	292	244
Damage to property	276	297
Staff/contractor performance	306	351
Communications – Customer service issues	199	280
Others	200	614
TOTAL COMPLAINTS RECEIVED	2,682	3,202

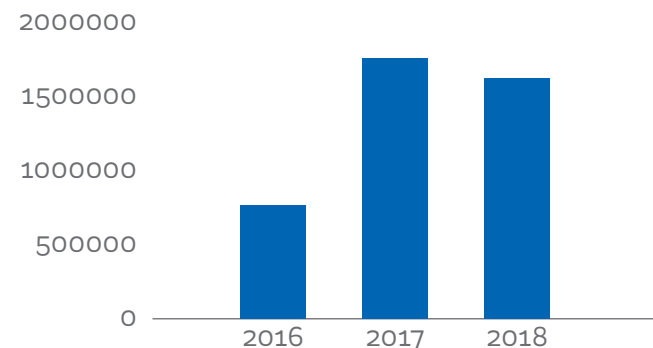
CALL HANDLING RESPONSE	2017	2018
Percentage of calls answered within 20 seconds ¹	90.9%	90.31%
Percentage of calls dropped ²	2.3%	2.74%
Networks customer calls to the call centre ³	470,333	451,494

¹ Figure is inclusive of storms, therefore reducing the percentage of calls handled
² Figure is inclusive of storms, therefore increasing the percentage of calls dropped, where the customer has terminated the call without waiting for a response
³ Calls relating to ESB Networks excluding IVR

POWERCHECK APP HITS



CALLS AND EMAILS ANSWERED



COMPLAINTS RECEIVED

The year on year rise is largely due to the increase in 'others' category which includes items such as Smart Metering, telephone and call centre response times, network charges, storm response, other metering/time switch items. The average time to close a complaint stands at 2 days.

As part of the overall Customer Experience Transformation Programme, a Complaints and Referral workstream has been established to drive valuable insights that will improve our customer delivery and service. The initiatives in progress include:

- Improved recording and categorisation of all complaints to improve reporting,
- Increase first touch resolution of customer service complaints,
- Interactive dashboards communicated across the business,
- Customer in Action Forum to take place quarterly to discuss and drive action around the root causes of complaints.

1,624,293
CUSTOMER CONTACTS HANDLED

+ 41,364
FOLLOWERS ON TWITTER

13,284,500
TWITTER IMPRESSIONS

28,145
LIKES ON FACEBOOK

2.6 MILLION
HITS ON POWERCHECK



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 Irish electricity customer has on average each year, and Customer Minutes Lost (CML) is the duration that an Irish electricity customer on average spends without supply each year. To give a more reliable report of our outage performance, "storm days" (the effects of severe weather) are removed from our normal CI and CML reporting.

In 2018, we had 149.84 CML and 1.43 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 149.84 minutes in 2018 as a result of non-storm unplanned and planned outages (storm outages are detailed later).

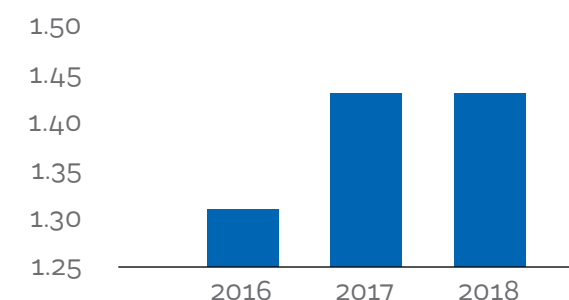
The CRU sets incentives targets for unplanned CML and CI which exclude storms. In 2018, these targets were set at 79.4 CML per customer and 1.043 CI per customer. In 2018, our performance against these unplanned outage targets stood at 97.43 CML per customer and 1.23 CI per customer.

You can find further details on our incentivised outturns in the 'DSO Annual Financial Performance' section of this report.

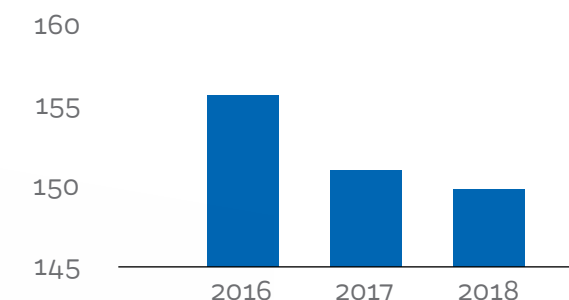
CRU CONTINUITY OUTTURN

UNPLANNED 2017			UNPLANNED 2018		
Metric	Target	Actual	Metric	Target	Actual
CML	81.5	90.34	CML	79.4	97.43
CI	1.064	1.21	CI	1.043	1.23

PLANNED AND UNPLANNED CI



PLANNED AND UNPLANNED CML



RELIABILITY AND RESILIENCE

STORM DAYS

In 2018, there were 14 storm days. A storm day in the Republic of Ireland is defined as a day when there is a weather event that is extreme or anomalous in nature (per methodology agreed with CRU) and whose occurrence is beyond the reasonable control of the DSO. The most extreme storm in 2018 was Storm Ali, which saw 186,000 customers without power at the storm's peak on September 19th 2018.

STORM CML AND CI

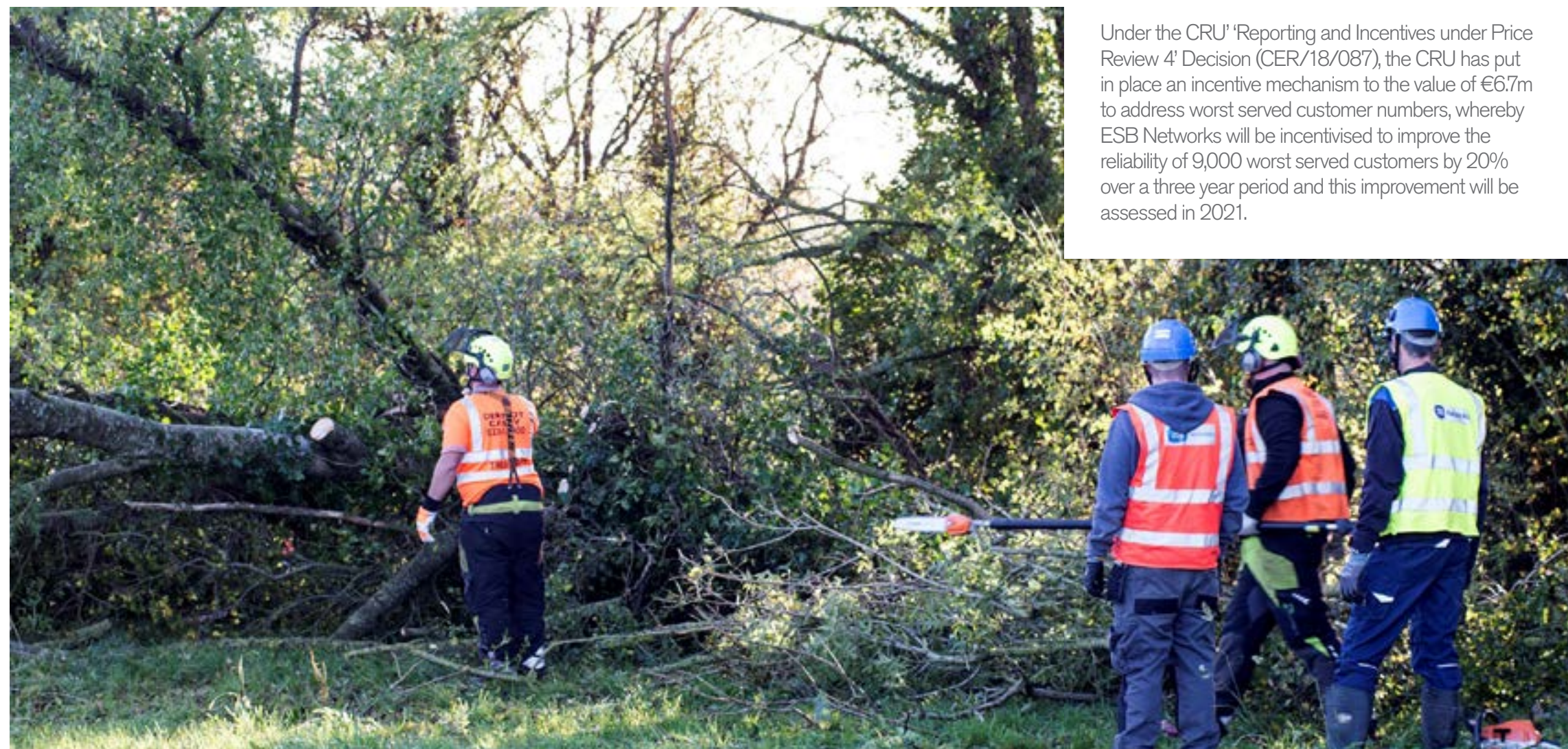
In 2018, there were 118 CML due to storms and a total of 0.5 CI per customer. Compared to 2017 where there were 353 CML and 0.6 CI per customer due to storms.

These figures show the magnitude of disruption caused by storms this year. The impact of climate change and associated weather events is evident from the increase in unplanned (fault) outages.

WORST SERVED CUSTOMERS

The worst served customer programme targets service improvement for customers who experience a large number of outages. "Worst Served Customers" are customers who have had at least 15 outages over 3 years, and at least 5 outages in the most recent year. In recent years there has been an increase in severe weather events, and this severe weather has had an impact on the electricity network, resulting in interruptions in supply to customers. In 2018, 65% of the worst served customer population was as a direct consequence of severe weather, this is an increase from 58% in 2017.

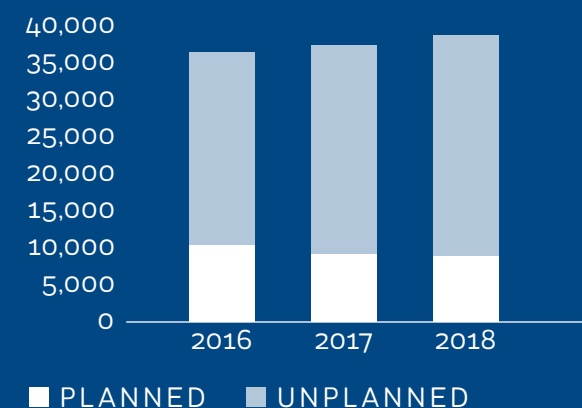
Under the CRU 'Reporting and Incentives under Price Review 4' Decision (CER/18/087), the CRU has put in place an incentive mechanism to the value of €6.7m to address worst served customer numbers, whereby ESB Networks will be incentivised to improve the reliability of 9,000 worst served customers by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



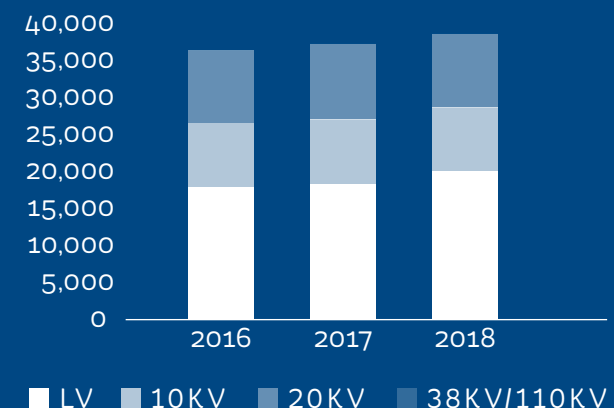
EXPLANATION FOR CHANGE IN OUTAGES

In 2018, we had major weather events in every season including a snow storm (Emma) in March, a wind storm in June (Hector), and a severe wind storm in September (Ali). Consequential fault outages from these storms continued to impact the overhead electricity network in the weeks following the storm days. It should be noted that since 2014 there has been an increase in the number and severity of weather events. Severe storms are leading to accelerated degradation of our overhead networks. Planned outage volumes have remained relatively static to date in PR4.

TOTAL NUMBER OF OUTAGES



TOTAL NUMBER OF OUTAGES BY VOLTAGE



RELIABILITY AND RESILIENCE

NETWORK RENEWAL

With over 2.3 million customers and 2.3 million wooden poles supporting the overhead electricity network, we have almost one pole for each electricity customer in Ireland. Each day highly trained and skilled Network Technicians climb these poles to operate and maintain the system, so their strength or “health” is of the utmost importance. If its condition so requires, a pole will be replaced immediately. Capture of pole inventory data for the rural MV network was completed in 2018. Data was collected for 975,747 wood poles, including public exposure and condition for each pole, which resulted in 310 poles being replaced immediately, compared to the 402 poles which were replaced in 2017. Pole replacements are a necessary part of maintaining the network, as it minimises the risk of pole failure and maximises benefits for public safety, network performance and safety of ESB Networks' staff and contractors working on the network.

The data gathered for this almost 1 million poles has been analysed to determine a pole replacement strategy going forward for 2019 and 2020, where it is planned for 14,000 poles to be replaced in this coming period.

With a customer base of 2,383,148 customers, each substation's reliability is of utmost importance and 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 2018, a complete overhaul of Glasnevin 38 kV station's MV switchgear was complete and similar projects hit major milestones in Granby Row and East Wall Road 38kV substations. The MV switchgear in place in these stations was over 70 years old and serve major commercial and urban hubs. 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 required to maintain assets in a safe and functional condition. Continued hazard patrols of MV substations

highlight substations with switchgear that might have an urgent need for replacement, with over 10,000 substations visited a year.

An integral asset type on the network that requires continued maintenance and replacement are our 160,000 minipillars. ESB Networks carries out hazard patrols on 40,000 of these every year. In 2018, we developed a new app to capture minipillar data from such inspections, with data from a total of 42,018 minipillars entered into the app in 2018. This enables us to plan replacement or maintenance works on this large asset base, with 398 minipillars being replaced in 2018, compared to the replacement of 112 minipillars in 2017.

2018 saw continued work being undertaken on our underground networks, with ongoing project management and design stage work, as well as project completions.

Design stage work was undertaken on 8.1km of 38 kV Fluid Filled Cable (FFC) in 2018. There was 0.9km of FFC replacement works completed in 2018. At the 110 kV distribution level design stage work was undertaken on 5.7km of FFC replacement in 2018.

There was also the replacement of 4km of gas compression 110 kV cable being progressed through design stage in 2018. ESB Networks also completed 4.1km of 38 kV paper cable ducting work in 2018, as well as continued design to replace 10km of 38 kV paper cable. Finally, ESB Networks had to replace 1km of 10 kV cable in 2018 as a result of water treeing.

In 2018 ESB Networks also initiated a project under the Smarter HV & MV Customer Connections innovation project to introduce a Load Indices approach for ESB Networks in order to demonstrate the network risks, effectiveness of our investments and to manage and track changes in the peak loading of stations. ESB Networks will be opening a public consultation in 2019 introducing this load indices approach and methodology.

NETWORK RESILIENCE

A number of key projects to reduce risk and strengthen the distribution network were completed in 2018. These included energisation of Garrycastle 38kV station in Athlone (with the associated retirement of Cartontroy 38kV station), Kildare 38kV station and Cherrywood 110kV station. A significant survey and review of all our wooden poles on the network was carried out to support safety and continuity of supply. 2018 was also characterised by significant development associated with new demand growth particularly in the Dublin region. Year-on-year ESB Networks carries out a cyclical timber-cutting programme, which is vital for maintaining network performance and continuity. Without this cyclical programme timber would quickly encroach on the overhead power network and would result in increased outages for our customers. ESB Networks is working to optimise our timber-cutting programme to further improve network continuity during storm events, while also investigating network design to improve the storm resilience of our overhead

network. While undertaking this work ESB Networks looks at the design of the network to minimise impact of wildlife.

MV looped automation allows for the automatic isolation of faulted network sections, and the restoration of supply to healthy network sections. This restores supply automatically to customers fed on the un-faulted sections of rural overhead networks. It also compliments an efficient approach to centralised control of the electricity distribution system. As high impact faults occur predominantly on exposed overhead MV network, automation is an important solution to this problem. In 2018 Loop automation self-healing schemes were progressed in Clare, Tipperary, Westmeath and Mayo.





NEW 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. We saw continued growth in the domestic market in 2018 with an increase of 16.78% in the volume of completed new connections on the previous year, however, business connections were down by 13.7%. Microgeneration notifications continued to rise, and we processed 85% more in the latter half of the year than we had completed in the first six months of 2018.

ESB Networks received and processed 6.74 MW of Microgeneration Notifications in 2018.

MICROGENERATION

In 2007, the CRU published "Arrangements for Microgeneration" (CER/07/208) which outlines technical and commercial arrangements for microgeneration including installation, safety and notifications to ESB Networks. As per CER/07/208, ESB Networks defines microgeneration as a source of electrical energy and all associated equipment, rates up to and including 6kW (single phase connection) and 11kW (three phase connection).

26,954

NEW CONNECTIONS

22,468 DOMESTIC CONNECTIONS , CONSISTING OF 2,840 APARTMENT CONNECTIONS, 11,914 HOUSING SCHEME CONNECTIONS, AND 7,714 RURAL DOMESTIC CONNECTIONS. WE ALSO CONNECTED 4,486 COMMERCIAL CONNECTIONS

THAT IS A 10% INCREASE IN NEW CONNECTIONS COMPARED TO THE 24,463 WE COMPLETED IN 2017

NUMBER OF TERMINATIONS AND DE-ENERGISATIONS	2017	2018
Connection points terminated	16,042	13,215
Connection points de-energised	4,827	5,054

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-energisation for non-payment ONLY.

NEW CONNECTIONS AND GROWTH

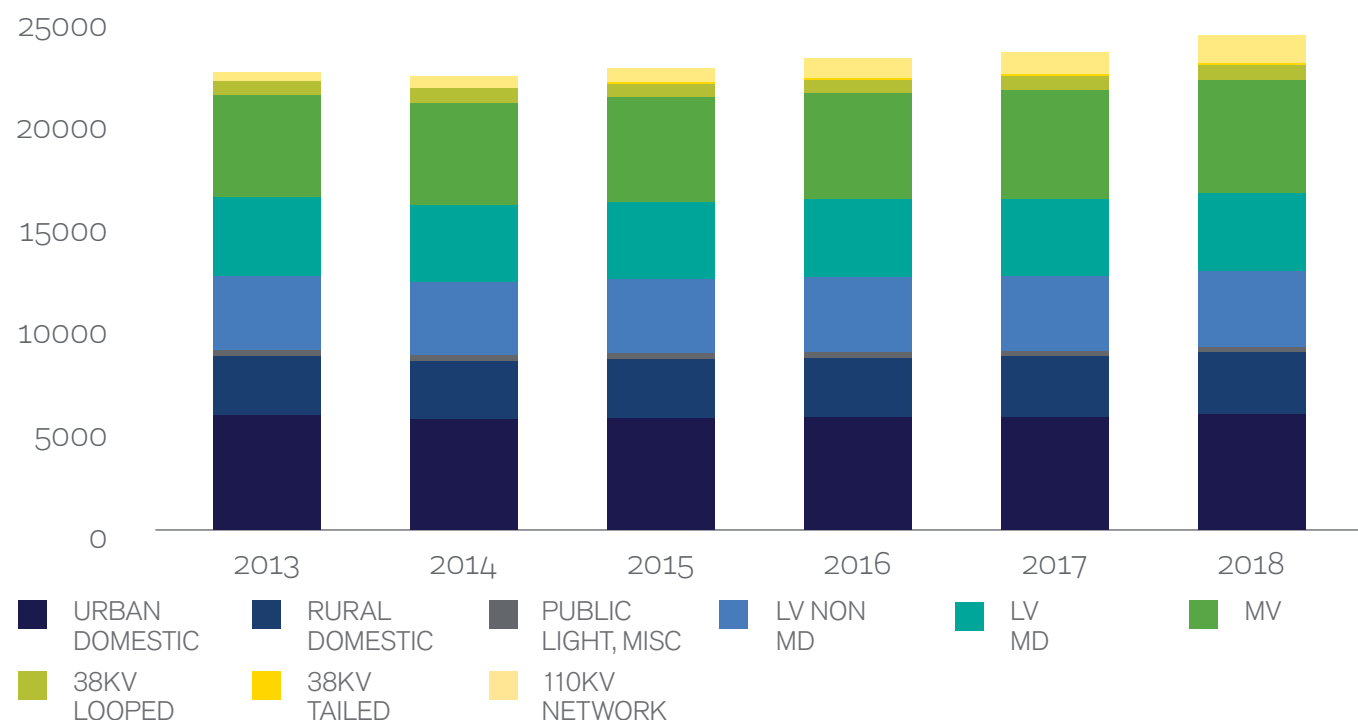
NETWORK REINFORCEMENT

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 2018. 38kV reinforcement projects continued throughout 2018, such as, Ardgeeha 38kV station re-building works. Uprating works were also carried out on a number of stations around the country, including Tullynamalra, Athenry, Ballymahon, Cashel, Malahide, Dennehy's Cross and Purcells Inch 38kV stations, as well as Castlebar and Carlow 110kV stations. Busbar works were carried out at Drybridge 38kV station, and Portlaoise 110kV station.

PR4 also saw the continuation of the long term 10kV to 20kV conversion which continues to play an important role in improving the energy efficiency of Ireland's distribution system. This initiative commenced in the early 1990's and 2018 saw a continuation of this programme whose long-term objective is to have 50,000 km of overhead network converted to 20kV in the coming years. The conversion of overhead 10kV network to 20kV network has a number of energy efficiency benefits such as:

- A reduction by the factor of four, the losses as a result of doubling the operating network from 10kV to 20kV;
- The reduction of carbon emissions as a result of the reduction in network losses;
- The reduction in consequent generation costs as a result of avoiding the need to supply these losses; and
- Increased capacity.

ELECTRICITY DEMAND



Electricity demand on the distribution system continued to grow in 2018, continuing its year on year rise since its dip in 2014. This rise is forecast to continue for the remainder of the PR4 period.



DOMESTIC CONNECTIONS CONTINUED TO RISE IN 2018. ESB NETWORKS CONNECTED 13.5% MORE HOUSING SCHEMES AND 10% MORE SINGLE DWELLINGS THAN WE FORECASTED IN OUR PR4 PLANS.



ENVIRONMENT

In line with our strategic commitment to lead the transition to a low carbon future, ESB Networks Fleet and Equipment undertook a fleet utilisation exercise, which has identified up to 100 light diesel vans which are suitable for replacement with a zero emissions fully electric alternative. 2019 will see this plan brought to fruition along with a similar exercise planned for diesel fork trucks.

During 2018, ESB Networks began the process of removing all single use plastics from all catering services in Republic of Ireland.

ESB Networks operates an Environmental Management System (EMS) which is externally certified to ISO 14001 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. We retained this certification in 2018.

FLUID FILLED CABLES LEAKAGE

In 2018, ESB Networks repaired seven leaks from the underground Fluid Filled Cables networks. You will find details on our repairs on our website www.esbnetworks.ie/acting-responsibly/environmental-information

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. In 2018, ESB Networks diverted 98% of its waste/retired materials from landfill.



ENVIRONMENT

MANAGING ENVIRONMENTAL FOOTPRINT BUSINESS CARBON FOOTPRINT

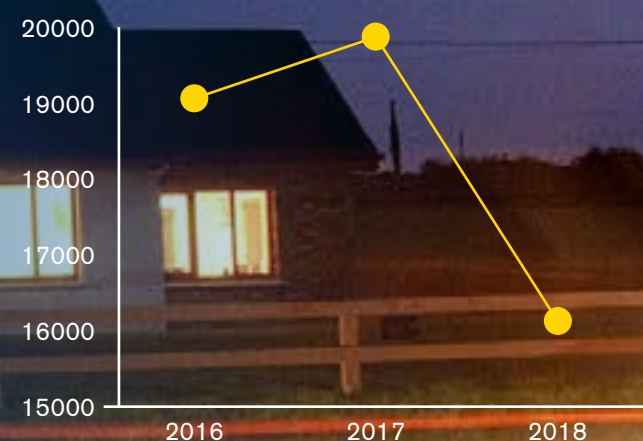
DESCRIPTION	2017 TONNES CO2	2018 TONNES CO2	2018 VS 2017 % TONNES CO2
Vehicle Fleet	13,517	13,526	0.10%
Building Emissions – Heating Gas	215	166	-23%
Indirect Emissions – Electricity	7,374	7,240	-1.80%
Waste	229	254	11%

SF6 GAS LEAKAGE

In 2018, approximately 707.44kg of SF6 was emitted due to equipment faults, representing 0.32% of the total inventory of SF6 employed (versus 0.5% in 2017).

Sulphur hexafluoride (SF6) is used in most of ESB Networks' high voltage switch gear on the Transmission and Distribution networks. It is used because of its very high electrical insulating properties and allows the switch gear to work efficiently and safely. There has been a trend of consistent leakage reduction, as we replace and repair our older switch gear. This is included in the national SF6 emission figure submitted by ESB Networks to the Environmental Protection Agency (EPA) annually.

SF6 GAS CO2 EQUIVALENT



DISTRIBUTION LOSSES

Distribution losses are losses of electricity within the electrical system. In 2018, 6.69% of the energy that was put into the distribution system is accounted for as losses, while 2017 and 2016 saw losses of 6.70% and 6.62% respectively. Losses are made up 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. While non technical losses are electricity units which are unaccounted for, for example, as a result of theft arising from unauthorised connections. It is believed that commercial losses represent approximately 0.5% of the electricity entering the electricity system in 2018.

Factors that affect the % of electricity lost include:

- The proportion of electricity that is distributed at the various voltage levels,
- Utilisation of Assets,
- Operating voltage of Lines and cables,
- Generator connection,
- Un authorised connections / Metering tampering etc.



ENVIRONMENT

MANAGING THE ENVIRONMENT DURING CONSTRUCTION

Throughout 2018, ESB Networks continued to deliver large-scale construction projects in environmentally sensitive areas – both within, and close to, areas designated under European law as areas of ecological importance, including bog lands and watercourses. The required environmental management techniques for such areas are extensive and require significant consideration at a pre development stage. Details provided in support of particular planning applications have included specifying how particularly sensitive sites are accessed – whether by helicopter, using wide tracked vehicles, temporary access roads developed using bog matting, or by foot; detailing what surface water management techniques will be implemented to protect water courses; and specifying how foundations will be initially excavated and subsequently reinstated to ensure full recovery of bog habitats. Ecological surveys immediately prior to and during construction are routinely undertaken to ensure minimum disturbance to protected species occurs. Post construction assessment provides a final evaluation of site recovery, identifying further action if required.



FACILITATING A LOW-CARBON FUTURE

ESB Networks is committed to playing a leading role in enabling Ireland’s transition to a low carbon energy future, powered by clean electricity.

In 2018, there was 353 MW of wind energy generation added onto the Irish electricity system, with 170 MW of this being added to the distribution system, compared to 194 MW of wind energy being added to the distribution system in 2017.

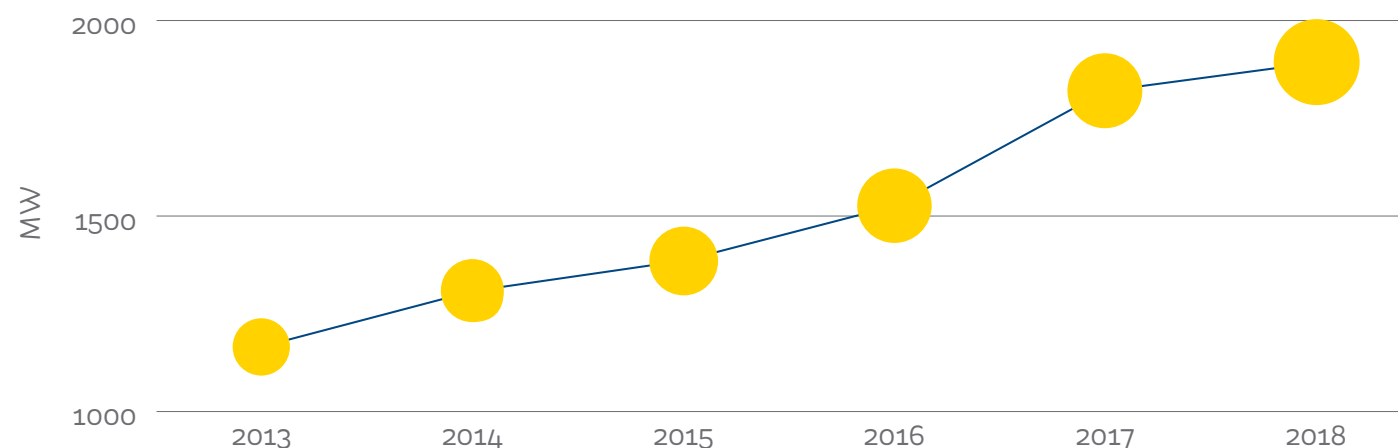
2018 also saw 100 MW of wind energy generation which had previously been temporarily connected to the distribution system back in 2017, being transferred to the transmission system.

As a result of these changes, by the end of 2018 there was a total of 1,892 MW of wind energy generation connected to the distribution system.

1,892 MW
WIND ENERGY GENERATION CONNECTED TO THE DISTRIBUTION SYSTEM TO DATE

In 2018, our flagship Dingle project provided ESB Networks with an excellent opportunity to collaborate with local communities as we explore the impact and capabilities of new low carbon and adjacent technologies and how customers and communities interact with new energy systems. In Dingle we are testing and trialling solutions which will help us to develop the decarbonised, decentralised and digitised electricity system of the future.

DISTRIBUTION CONNECTED WIND GENERATION





SAFETY

Safety is fundamental to everything we do in ESB Networks and we are committed to protecting the safety, health and wellbeing of our employees, contractors, customers, members of the public and others who may be affected by our work activities.

Throughout 2018, ESB Networks continued to make significant progress in building our capability and performance levels in Safety, Health and wellbeing with independent assurance coming from successful ISO 18001 accreditation and independent validation of our compliance with our public safety obligations.

SAFETY

Networks Work Programme

Our public safety work programmes including the cyclical hazard maintenance of overhead and underground networks and timber cutting have an important and positive impact on public safety. The delivery of these programmes is monitored and reviewed regularly to ensure delivery within agreed cycles. The Public Safety team monitor and analyse public safety electricity incidents and respond with new information initiatives and campaigns, based on risk. The internal staff monthly safety briefing is used to communicate significant public safety incidents to staff so as to continually reinforce the priority of public safety. We continued to implement critical public safety interventions by serving 'stop work notices' where we become aware of unsafe construction work near our electricity networks. Where we are notified of low or fallen electricity wires, we carried out remote disconnection of the electricity network 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.



Stakeholder Education and Awareness

In 2018, we delivered safety talks to Teagasc colleges as part of the FBD 'Champions for Change' initiative, in association with the H.S.A.

2018 was the fourth year of our 'Safe Family Farms' partnership with the Irish Farmers Journal. New online farm safety videos were added to complement regular editorial safety pages and full-page public safety advertisements to raise awareness of electrical safety on farms. We also participated in the Tullamore Show where we engaged with large numbers of the public in relation to electricity safety.

The high winds associated with Storm Ali in late September caused significant interruptions to electricity customers and meant that we were not in a position to attend at the National Ploughing Championships.

We continued to participate in the Construction Safety Partnership Advisory Committee, including the development of a joint initiative with Gas Networks Ireland as part of CIF's Construction Safety Week in October. As part of Construction Safety week, we implemented initiatives to provide safety information to the construction industry, including thousands of CIF members, and others in the construction and related industries.

In 2018, we launched the new Emergency Services video at the Chief Fire Officers national conference. We worked with Fire Services nationally and locally to develop this new training video illustrating the risks when responding to electricity related incidents.



SAFETY

Public Education and Awareness

ESB Networks distributed high visibility vests to 88,000 junior infants in September as part of our 'Stay Safe, Stay Clear' programme, in partnership with the Road Safety Authority. There were 4,600 entries to our primary school safety colouring competition. The public safety section of the ESB Networks website was updated with new content and resources to inform and educate the general public, construction, farm and leisure sectors of the risks associated electricity networks. These are accessible at www.esbnetworks.ie/education.

We developed a new electricity video for construction workers for use in the Safe Pass training programme which is provided to 90,000 workers annually.



Public Safety Information Campaign

Our Public Safety Advertising Campaigns – “Are You Sure It’s Safe?” and “Stay Safe, Stay Clear” - continued throughout 2018 to continually remind the public of the need to be aware of the dangers of electricity. The campaign targets specifically those that are at heightened risk of coming into contact with the electricity network such as Farmers, Construction Workers and children along with a General Public mass awareness TV and radio campaign to increase awareness of staying safe around the electricity network. Key messages include being aware of when you are close to the overhead electricity wires, either directly or through high masts, drones or other sport equipment and never to approach fallen electricity wires. Awareness figures for the TV campaign reached 87%, compared with 92% in 2017. Radio safety messaging with our weather sponsorship on RTÉ Radio 1 highlighted the dangers of electricity when carrying out farming, construction, leisure and gardening activities.



In response to specific public safety incidents and near misses, we provided targeted information to D.I.Y. outlets, construction and leisure bodies.

All our public safety communications remind the public to contact the ESB Networks emergency number – 1850 372 999 – where they become aware of loss of electricity supply or are concerned about electricity safety. This number is also visible to the public on all our assets, equipment and vehicles.

Staff Education and Awareness

In 2018, we continued to make significant progress in building our capability and performance levels in Safety, Health and Wellbeing. There was a 9% increase in the number of good catches reported by our staff, with 4,555 recorded.

The new OneSource document management system went live. We also focussed on health and wellbeing education for our staff with a number of initiatives throughout the year.

Analysis of the causes of the 40 Lost Time Injuries for staff and contractors identified the major causes as slips/trips/falls, and manual handling. Initiatives to address the causes of these injuries were communicated to staff.



SAFETY

STORMS AND EMERGENCY RESPONSE

During 2018, 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 wellbeing 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.

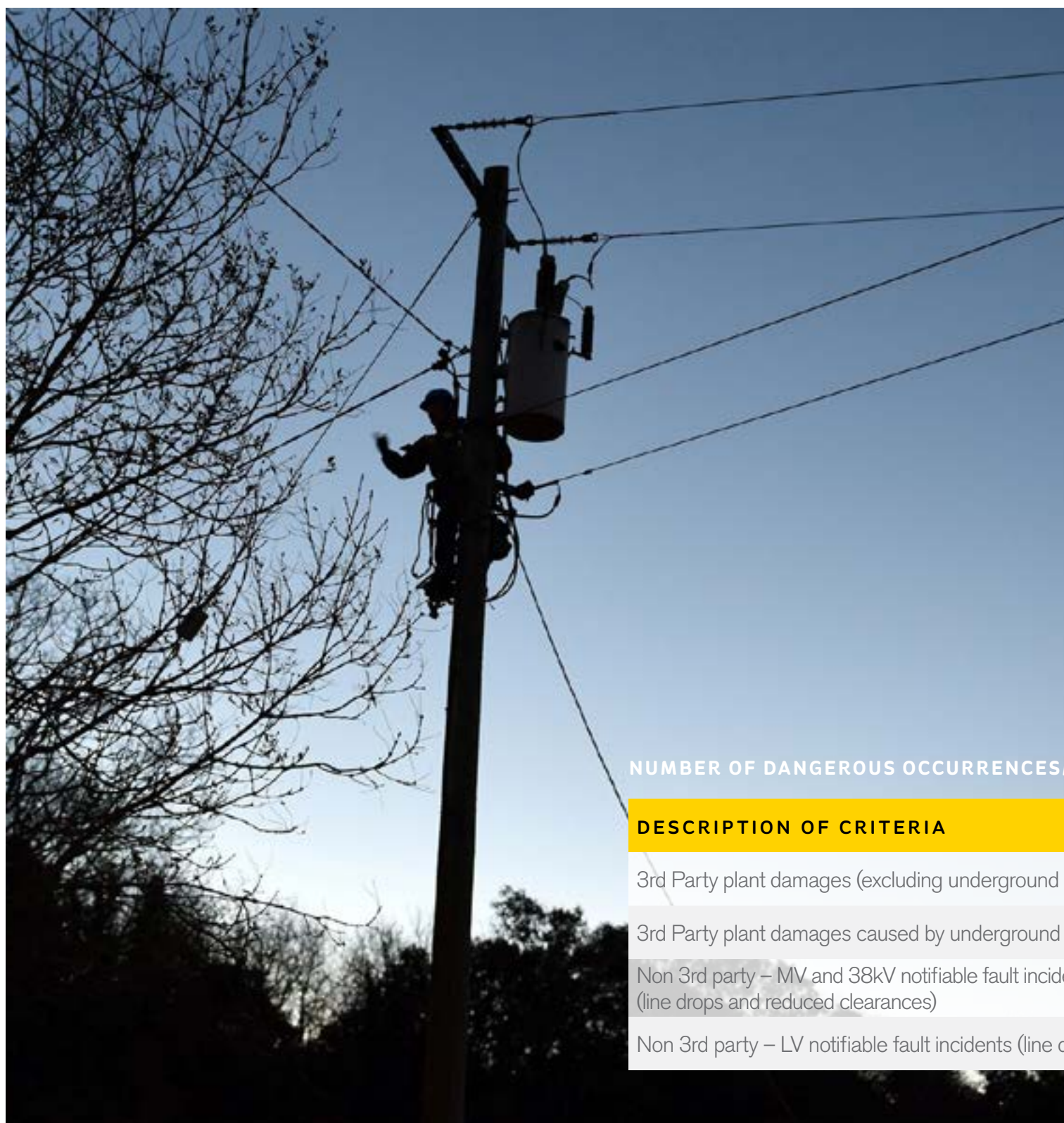
Our TV and radio public safety media campaign, including the sponsored time on RTÉ Radio 1 Weather, social media, and search advertising delivered critical public safety messages. Our new format of storm messaging generated 1,036,323 total impressions. Activity for Farm Safety Week across Twitter and Facebook generated a combined reach of 1,411,743 with total combined views of 427,138 on both Facebook and Twitter. We continued our partnership with RTÉ, The Independent, Journal Media Group, Agri-land and Accuweather totalling 10,124,421 Impressions.

In 2018, we continued our sponsorship of the RTÉ Radio 1 weather with public safety messaging relating to safety and the electricity network.

SAFE AND SOUND

ESB Networks has started on a journey to bring about a safety culture transformation where no one gets hurt and everyone feels safe. The aim of the 'Safe and Sound' programme is to create and foster a safer workplace where everyone feels valued and trusted.

A full implementation plan was put in place with workshops completed for the first implementation group of 520 staff. Full-time coaches and leadership teams were established to support the roll-out.



INDEPENDENT ASSURANCE AUDITING

The three-yearly independent public safety audit was completed and confirmed continuing compliance with our CRU public safety licence requirement.

ESB Networks continued to meet the standard for accreditation to the OHSAS safety standard.

BREAK-INS AND THEFT

2018 saw a rise in the number of security incidents where damage occurred to ESB Networks property and in many cases theft of property also occurred. There were seventeen break ins to ESB Networks properties of which 9 included theft of property, compared to 2017 when there were 18 break ins.

2018 also saw 6 incidents of damage to overhead lines out of which 4 resulted in theft of copper, and in two incidents there was an attempt to steal copper assets, compared to 2 incidents of copper theft in 2017.

This poses an extreme threat to life.

NUMBER OF DANGEROUS OCCURRENCES/THIRD PARTY DAMAGE

DESCRIPTION OF CRITERIA	2017	2018
3rd Party plant damages (excluding underground cable dig-ins)	1,244	1,040
3rd Party plant damages caused by underground cable dig-ins	715	975
Non 3rd party – MV and 38kV notifiable fault incidents (line drops and reduced clearances)	277	288
Non 3rd party – LV notifiable fault incidents (line drops and reduced clearances)	1,214	1,270

DSO ANNUAL FINANCIAL PERFORMANCE

In leading the transition to a low-carbon future powered by secure and affordable clean electricity,

ESB NETWORKS PLANS TO;

- Connect greater volumes of renewable generation
- Develop the network to support the widespread electrification of transport and heat
- Connect and respond to the changing needs of customers
- Reinforce and improve the resilience, performance and safety of the network
- Maximise networks utilisation and value for money

We are committed to delivering on price for Irish electricity customers. When we developed our PR4 network development and management proposals for PR4, the likely price impact was a key consideration.

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. 2018 was the third year of the current Price Review (PR4) which runs from 2016 to 2020. These revenues are utilised for safely operating, maintaining, and improving the distribution network.

The Price Review process facilitates yearly adjustments to these revenues using the k-Factor mechanism, for reasons such as updated forecasts, inflation, incentive outturns, additional unforeseen items (e.g. storms), and updates due to potential under or over recoveries. If there is an over-recovery, meaning that the amount recovered 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 2018 DUoS revenues of €793.91m. You can read more on the Distribution Network Allowed Revenue 2018 in the CRU's decision paper www.cru.ie/document_group/electricity-distribution-network-allowed-revenue-2018-distribution-tariffs-20172018-distribution-loss-adjustment-factors/ Electricity Distribution Network Allowed Revenue 2018, Distribution Tariffs 2017/2018 & Distribution Loss Adjustment Factors'.

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. In October 2018 our average DUoS tariff went down by 0.56% versus October 2017.

DSO ANNUAL FINANCIAL PERFORMANCE

STRATEGIC & INNOVATIVE THINKING

In line with the CER/18/087, ESB Networks makes an annual submission to the CRU on its innovation activities. There is a total of €20 million incentive available each year of the PR4 period in relation to this submission. In its Distribution Network Allowed Revenue 2020 decision the CRU allowed an award of €5 million in respect of its 2018 innovation performance with an additional €10m available in 2019 subject to ESB Networks addressing a number of points identified by CRU.

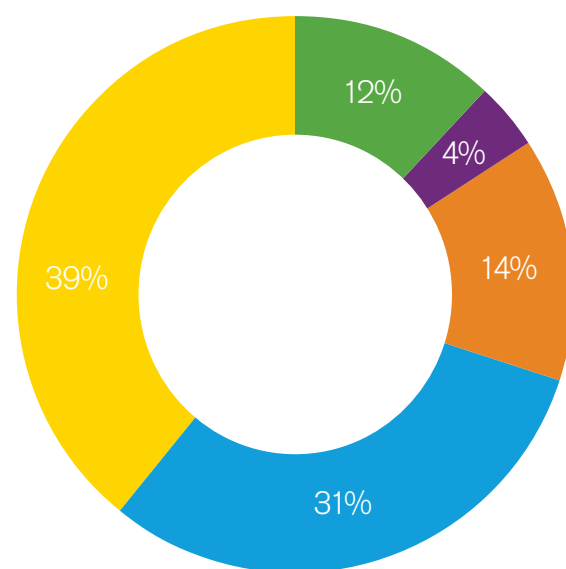
INCENTIVES OUTTURN

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 2018. More information on this can be found in the CRU's 'Electricity Distribution Network Allowed Revenue 2020, Distribution Tariffs 2019/2020 & Distribution Loss Adjustment Factors' Information Paper (CRU/19/102).

2018 DSO INCENTIVE OUTTURN			
Incentive	Target	Actual	Reward/Penalty (€m)
Customer Minutes Lost (CML)	79.4 (CML)	97.43 (CML)	-€4.86m
Customer Interruptions (CI)	104.3 (CI)	123.3 (CI)	-€4.04m
Customer Satisfaction	90%	91.75%	€1.3m
Customer Satisfaction Survey (redC poll)	81%	78.63%	-€1.76m
One Meter Reading per Year	98%	97.80%	€0m
Avoiding Back to Back Meter Estimates	99%	99.85%	€0.86m
Stakeholder Engagement	10	6.8	€0.43m
Delivering New Connections (ECP-1)	N/A	N/A	€0.5m
Total			-€7.64m

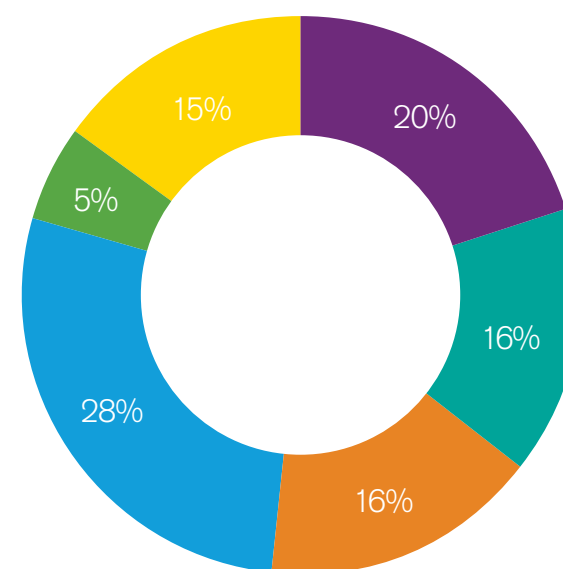
You can find more on the CRU's Delivering New Connections (ECP-1) decision here: https://www.cru.ie/document_group/electricity-connection-policy-2/

BREAKDOWN OF TOTAL DOMESTIC ELECTRICITY COSTS ¹



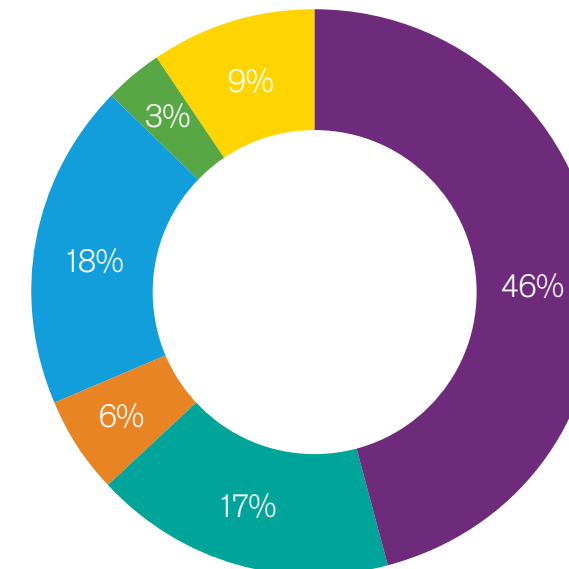
- Supply Costs
- Wholesale Costs
- PSO
- Tax
- Network Costs

2018 SUMMARY OF CAPITAL EXPENDITURE ²



- Generation Connections & Line Diversions
- Property, Tools, Vehicles, IT and Other
- Response & System Control
- Asset Replacement
- New Business

2018 SUMMARY OF OPERATING EXPENDITURE



- Telecoms and R & D
- Business Rates
- Maintaining and Renewing the Network
- Other
- Customer Service and Metering
- Environment and Health & Safety

¹ Data sourced for Breakdown of Total Domestic Electricity Costs: Commission for Regulation of Utilities, 2018 Electricity and Gas Retail Markets Annual Report, pp38

² Capital expenditure figures are stated net of customer contributions

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.

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 comprising of staff (current and retired) from both ESB and EirGrid.

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.

€1,073,180

In 2018, ElectricAid funded 125 projects in 39 countries totalling €1,073,180.



SOCIAL OBLIGATION AND ENGAGEMENT

PRIDE

ESB Networks employees, allies, family and friends participated in the 2018 Dublin Pride Parade, while our Ally Awareness Programme continues to be rolled out across the business.

ESB Networks employees also took part in the BeMe@ESB 'I Am An Ally Video' which was launched in May 2018.

Diversity and inclusion 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.



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 (Association for Higher Education and Disabilities).

ESB NETWORKS APPRENTICESHIPS

In 2018, the ESB Networks Apprenticeship Recruitment campaign led to a significant increase in female applications for participation in the programme which saw 12 out of the total number of 72 apprentices recruited in 2018 being female.

SOCIAL OBLIGATION AND ENGAGEMENT



STAKEHOLDER ENGAGEMENT

Building on our track record of engaging with our customers and stakeholders for over 90 years, ESB Networks published (in 2019) its Stakeholder Engagement Report 2018. This report provided information on all areas of ESB Networks' stakeholder engagement including continued engagement with industry, engagement on a range of key projects, customer engagement and engagement on our preparations for the next price control period PR5 (2021 – 2025). The report can be found on ESB Networks' website www.esbnetworks.ie/who-we-are/innovation/stakeholder-engagement-strategy

Under the new incentive arrangements implemented by the CRU in 2018 ESB Networks' performance in terms of Stakeholder Engagement is assessed on an annual basis by the independent Network Stakeholder Engagement Evaluation (NSEE) Panel established by the CRU.

ESB Networks was pleased to achieve a panel score of 6.8 out of a possible 10 for its performance in 2018. ESB Networks welcomes the panel's feedback and notes the recommendations of the panel and will take these matters into consideration as we continue to develop and enhance our Stakeholder Engagement. The CRU Panels Report is available www.cru.ie/wp-content/uploads/2019/08/CRU19105-The-NSEE-Panel-Report.pdf.

CHARITABLE VOLUNTEERING

In 2018, 49 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.

SCHOOL VOLUNTEERING

In 2018, a total of 26 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 ten week programme.





INNOVATION

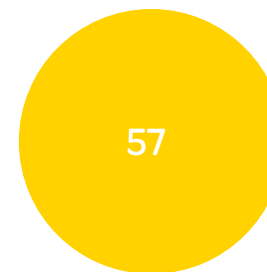
In order to realise our vision of delivering a sustainable, low carbon energy network that will serve Ireland’s future energy needs, we have an Innovation Strategy to manage every stage of the development and implementation of strategic initiatives, from setting the vision to establishing business as usual (BAU). This has generated a balanced portfolio of projects covering eight roadmaps that broadly cover our ambition to deliver new and improved services.

SUMMARY OF INNOVATION INITIATIVES AND ACHIEVEMENTS

ESB Networks is committed to leading the transition to Ireland’s lower carbon energy system which is evidenced from the large number of innovation projects taking place within our business. A summary of our innovation activities for 2018 is presented below.

Prior to PR4, ESB Networks had sought to position itself as global leader in smart networks technologies through involvement in EU research projects, international collaborations and its own innovation projects. This had continued in PR4 from 2016 onwards with ESB Networks working

SUMMARY OF INNOVATION ACTIVITIES (UP TO END OF 2018)



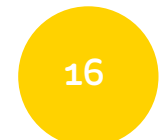
ACTIVE INNOVATION PROJECTS AT THE BEGINNING OF 2018



NEW INNOVATION IDEAS IDENTIFIED PRE-2018



NEW INNOVATION IDEAS IDENTIFIED IN 2018



INNOVATION PROJECTS COMPLETED IN 2018

on a host of innovation initiatives to help us meet the challenges of the transition to a lower carbon electricity system. In particular, we considered the convergence of the electricity industry, telecommunications and the ICT industry whereby increased control and automation is available to the distribution network. In the first two years of PR4, 2016 and 2017, our innovation projects were distributed between standalone innovation projects managed by our two dedicated innovation teams, Smart Networks and Integrated Vision of Active Distribution Networks (IVADN) and a broader range of innovation activities which were embedded amongst the respective expert teams in ESB Networks, for example relating to system operation, asset optimisation, customer services, and cooperation with the TSO.

In 2016 and 2017, ESB Networks continued to be involved in several EU part-funded projects where we collaborated with other DSOs, technology vendors, TSO's, aggregators, retail companies and leading research institutes from around Europe. Such activities included but are not limited to working on EVOLVE DSO, RealValue, Amorphous Core Transformers, facilitation of fast DS3 System Services, and the Smarter HV and MV Customer Connections project.

During these first two years of PR4, a structured approach to recording innovation project statistics was not in place. However, in late 2017, we brought those involved in innovation across the ESB Networks organisation together and with the help of consultants and in consideration of best practice innovation frameworks from other jurisdictions, developed our own dedicated innovation framework and innovation strategy.

Our Innovation Strategy and its 8 innovation roadmaps was aligned with the PR4 objectives and the Strategic Innovation Fund (SIF) Incentive Mechanism objectives. Developing the overall innovation framework gave us a much more structured approach to innovation, a consistent governance and centralised reporting mechanism by which to track our innovation activities across the 8 identified innovation roadmaps. The innovation framework allowed ESB Networks to leverage its innovation activities around the business, continue to build a sense of innovation community amongst the project managers embedded in functional teams as well as those in the dedicated innovation teams in Smart Networks and IVADN and helped us continue to drive an innovative mindset more broadly within business.

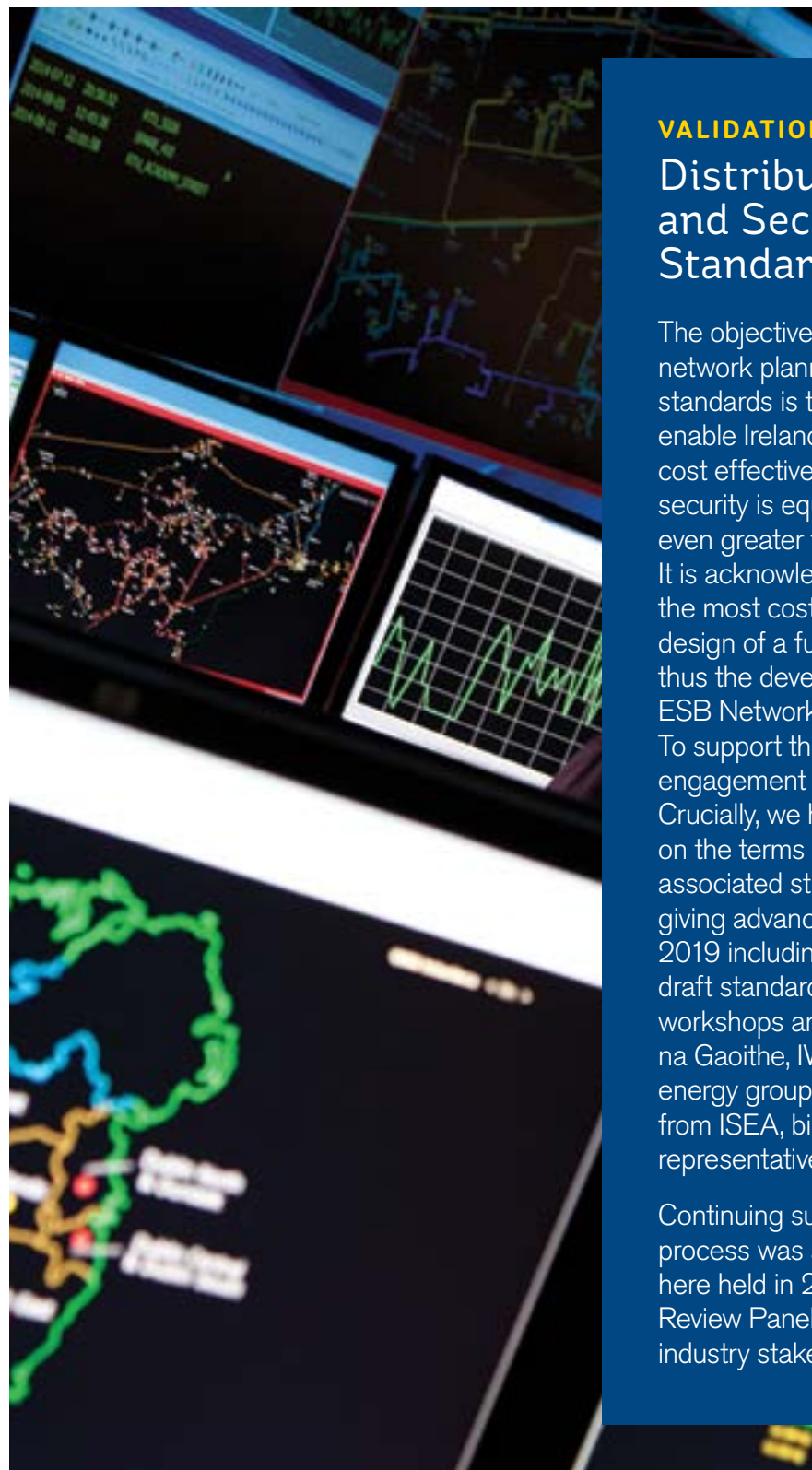
The projects that were instigated and active throughout 2016 and 2017 were classified into one of the 8 innovation roadmaps. The publication of the Innovation Strategy document in late 2017 was the first time we had shared our innovation projects publicly in a structured manner under innovation roadmaps.

In May 2018, the CRU' decision paper (CER/18/087) provided guidance as to how ESB Networks innovation activities would be evaluated and ESB Networks used that information to structure our reporting to CRU from 2018 onwards. For completeness in our initial Strategic & Innovative Thinking submission under this new structure we included information from our 2016 & 2017 innovation projects.

A number of projects whose benefits, outcomes and learnings from 2018 that have been or are being shared within ESB Networks and/or are transitioning into BAU are summarised in the following Case Studies.



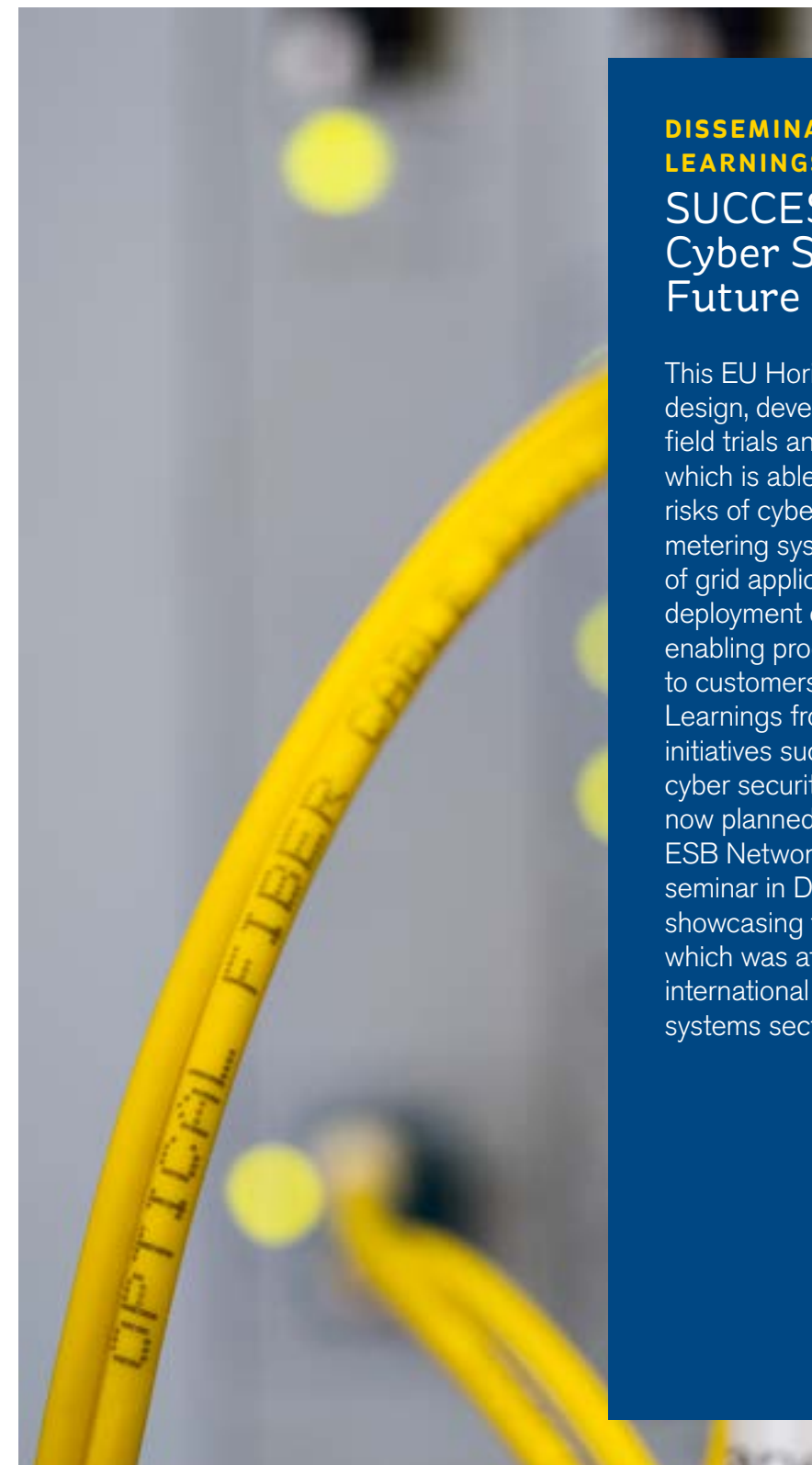
INNOVATION



VALIDATION CASE STUDY:
Distribution Planning and Security of Supply Standards Review

The objective of this review of distribution network planning and security of supply standards is to ensure that the system will enable Ireland's energy policy objectives cost effectively whilst ensuring that the security is equal to, or where appropriate even greater than what is delivered today. It is acknowledged however that delivering the most cost effective operation and design of a future distribution network, and thus the development of these standards by ESB Networks, cannot be done in isolation. To support this activity, a number of engagement activities have been instigated. Crucially, we have collaborated with industry on the terms of reference, project plan and associated stakeholder plan for the project, giving advance notice of engagement in 2019 including formal consultation on draft standards. This was achieved by workshops and meetings held with Meitheal na Gaoithe, IWFA, IWEA, DRAI, solar energy groups including representatives from ISEA, bio energy groups (including representatives from IrBEA).

Continuing support of the consultation process was achieved by regular updates here held in 2018 via the Distribution Code Review Panel (DCRP) which has a range of industry stakeholders.



DISSEMINATION OF LEARNINGS CASE STUDY:
SUCCESS— Cyber Security in Future Networks

This EU Horizon 2020 project aimed to design, develop and validate on small scale field trials an adaptable security framework which is able to significantly reduce the risks of cyber threats and attacks when metering systems are deployed as part of grid applications. The safe and secure deployment of such metering is critical to enabling products and tariffs to be offered to customers enabled by these meters. Learnings from this project have fed into initiatives such as penetrative testing / cyber security risk assessments that are now planned for the telecoms networks. ESB Networks held an international seminar in Dublin in November 2018, showcasing the results from the project which was attended by national and international stakeholders in the power systems sector.

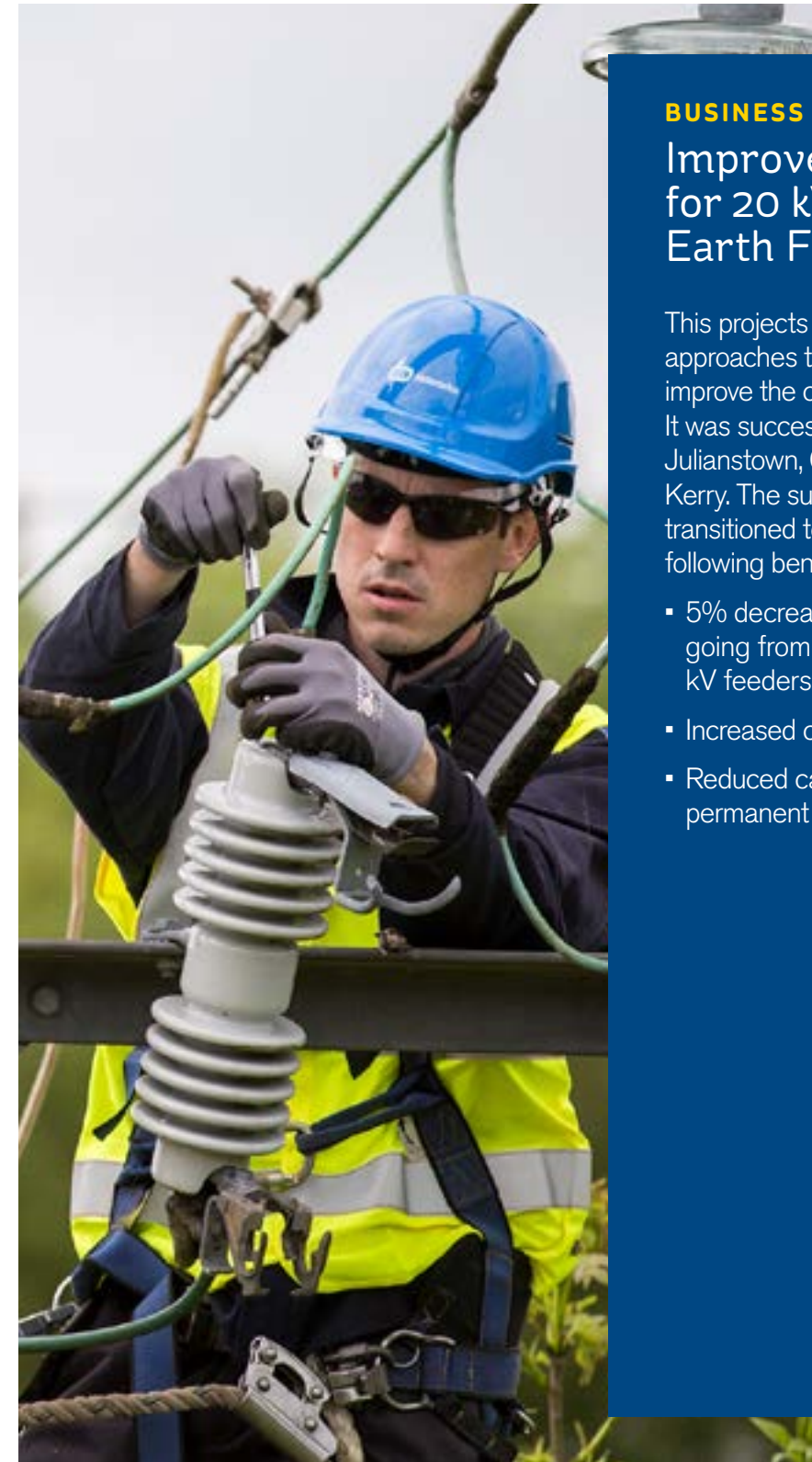
INNOVATION



ENGAGEMENT CASE STUDY: The Dingle Project

ESB Networks Dingle Project provides us with a trial location to assess new low carbon technologies and smart grid technology, consider associated consumer behaviour and uptake and understand the impact the distribution system. A number of engagement events have been held in Dingle in order to understand the requirements of the local community and share the objectives of our project particularly in encouraging active energy citizens.

We have appointed a number of ambassadors within the community through our Dingle Project Ambassadors Selection Process. This will help ESB Networks learn about consumer behaviour towards new energy technology and encourages the broader community's interest in the project. We have supported the development of the Dingle Community Engagement Group (Dingle Board/North West Kerry Development (NWKD)/Marine and Renewable Energy Ireland (MaRIE)). We have also appointed a Strategic Community Engagement Resource. Finally, we have been collaborating with UCD, UCC MAREI, Dingle Community Energy Group, Northwest Kerry Development Board, SEAI, Tipperary Energy Agency and Solo Energy to deliver on these goals. We have also held a Project Launch, Ambassador Launch Event, Dingle Food Festival, Project Information Sessions.



BUSINESS AS USUAL CASE STUDY: Improved Continuity for 20 kV Sensitive Earth Faults

This projects aim was to trial innovative approaches to Sensitive Earth Fault (SEF) to improve the continuity of supply to customers. It was successfully trialled in 2 locations Julianstown, Co. Meath and Caherciveen Co. Kerry. The successful SEF review has now transitioned to BAU and is expected to bring the following benefits:

- 5% decrease in the probability of a fault going from temporary to permanent for 20 kV feeders
- Increased continuity of customer supply
- Reduced call outs to sites to restore permanent faults



CONNECTIVITY AND DIGITALISATION

SMART METERING PROGRAMME

ESB Networks is replacing over 2.3 million electricity meters in homes, farms and businesses with next generation meters to support the transition to a low carbon electricity network. The upgrade will be delivered on a phased approach between 2019 and 2024 and will deliver benefits to the customer, economy and the environment

The programme plans to upgrade 250,000 meters by the end of 2020, but importantly also upgrades electricity retail market processes and systems so that electricity suppliers are able to offer consumer-facing smart electricity services from January 2021.

Back in 2017, ESB Networks had undertaken the development of a phased approach to delivering the Smart Metering Programme in conjunction with the CRU, Department of Communications, Climate Action and Energy (DCCAE), Gas Networks Ireland (GNI), and Suppliers, which culminated in the relaunch of the Smart Metering Programme by the Minister in September 2017.

In support of our smart metering objectives a number of critical building blocks were put in place during 2018 which will provide the foundation for later stages of the programme.

- The project completed the procurements for the Advanced Meter Infrastructure, the communications network and framework installation contracts to support the replacement of meters by ESB Networks
- In support of smart electricity services, ESB Networks initiated and led the industry review of the retail market processes required to support smart metering and collect, process and distribute customer interval data to supply companies
- Working closely with all industry stakeholders, ESB Networks facilitated the development and agreement of an industry wide Strategic Framework for Communications and Consumer Engagement designed to support the meter deployment programmes
- The Project developed multiple new safety procedures and policies to underpin the safe installation of smart meters from 2019

MARKET DEVELOPMENT / MARKET RELEASES

During 2018 ESB Networks prepared the Central Market Systems for Market Release V12.00.00. For further details please see: rmdservice.com/2019-v12-0-release/

During 2018 ESB Networks, successfully supported the implementation of I-SEM (MCR1182) and three additional MCRs:

MCR1176—Extranet Messages Ordering

MCR1179—Cessation of Eligible Customer Files on ESB Networks Extranet

MCR1190—Procedure for Supplier initiated transfer of MPRNs from one Supplier ID to another

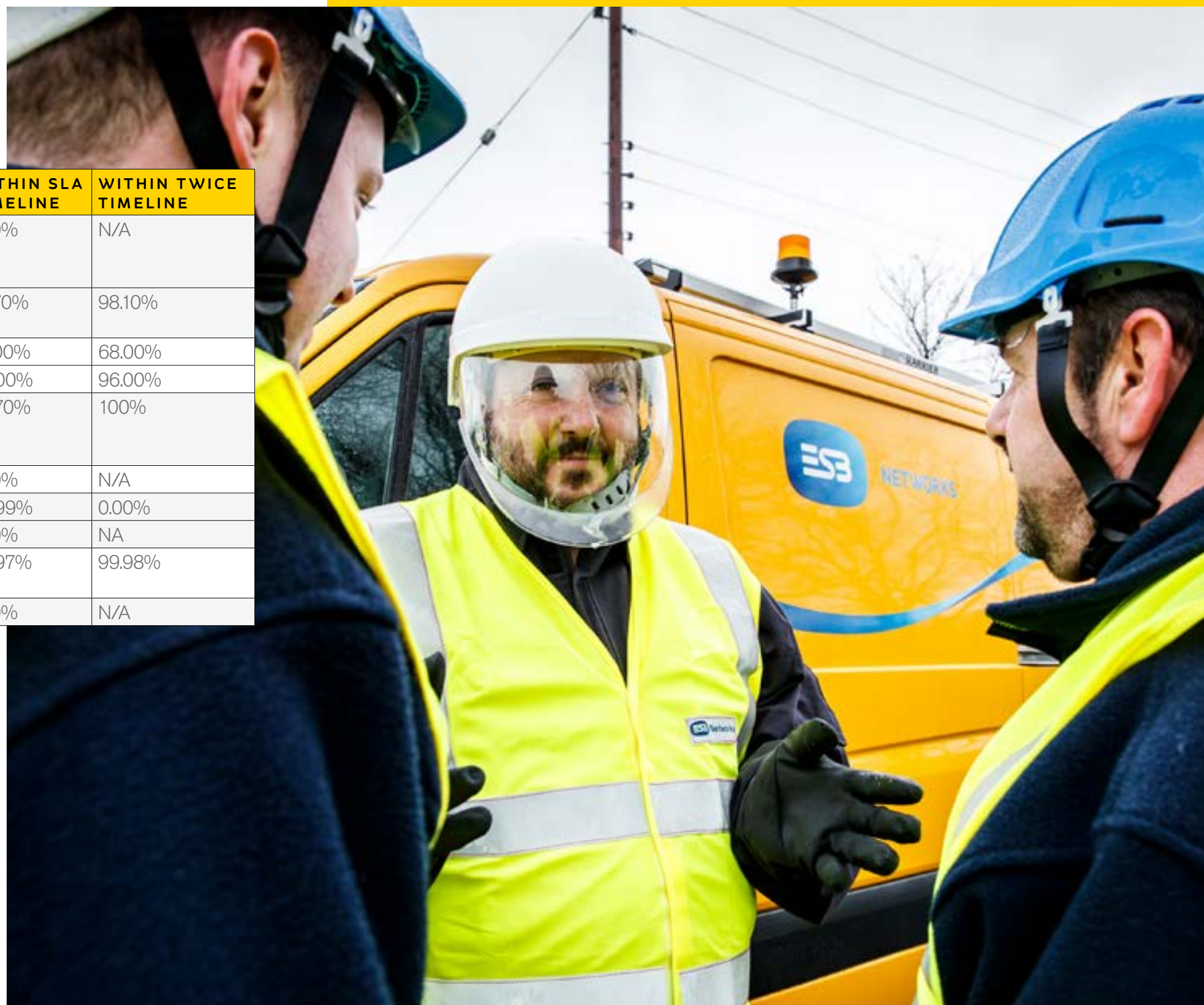
SERVICE LEVEL AGREEMENTS

DESCRIPTION	NO.	STANDARD APPROVAL TIMELINES (SLA)	WITHIN SLA TIMELINE	WITHIN TWICE TIMELINE
Change of Supplier (NQH)	1A	Validate within 5 days	99.95%	99.96%
	1B	Using customer read supplied by the customer – Complete within 3 days	99.69%	99.92%
	1B	Using a special read organised between the customer and ESB Networks – Complete within 10 days	93.31%	96.35%
	1B	Using one of ESB Networks scheduled reads – Complete within 3 days	97.07%	97.95%
Change of Supplier (QH)	2A	Validate within 5 days	99.78%	99.85%
	2B	Complete within 3 days	99.80%	0.00%
Change of Supplier Cancellation	3A	Validate supplier cancellation within 5 days	99.86%	99.88%
	3B	Complete supplier cancellation within 5 days	98.63%	0.00%
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	98.30%	100%
	5B	Complete connection – Within 10 working days of receipt of ETCI certificate	99.27%	100%
	5C	Data Processing – Issue details to Supplier within 10 Days	99.20%	99.76%
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	98.30%	100%
	6B	Complete Connection – Within 10 working days of receipt of ETCI certificate.	99.27%	100%
	6C	Data Processing – Issue details to Supplier within 10 Days	95.65%	95.65%
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	98.30%	100%
	8B	Complete change – Within 10 working days of receipt of ETCI certificate	99.27%	100%
	8C	Process Change – Issue details to Supplier within 10 Days	96.65%	98.60%

DESCRIPTION	NO.	STANDARD APPROVAL TIMELINES (SLA)	WITHIN SLA TIMELINE	WITHIN TWICE TIMELINE
De-energisation of Meter Point	9A	De-energise of meter point within 5 days	93.49%	97.22%
	9B	Issue Meter details to Supplier within 10 Days	99.07%	99.83%
Re-energisation of Meter Point	10A	Re-energise meter point within 5 days	98.72%	99.40%
	10B	Issue Meter details to Supplier within 10 Days	99.22%	99.90%
Change of Meter Configuration	11A	Reconfigure meter within 5 days after the receipt and validation of Supplier request	96.06%	98.57%
	11B	Process data within 10 days	99.03%	99.77%
Meter Problems and Reports of damage	12A	Repair or replace faulty meter within 5 days	78.30%	86.52%
	12B	When a faulty meter is Repaired or Replaced – Process Meter Data within 5 days	98.51%	99.24%
NQH Meter Reading	14A	Scheduled Read – Distribution of Reads to Suppliers within 7 workdays	98.85%	99.93%
	14A	2 Scheduled reading visits per annum	99.99%	N/A
	14A	4 Scheduled reading visits per annum	99.64%	N/A
	14A	Actual reads for scheduled meter reading visit	81.74%	N/A
	14A	Actual reads for scheduled MD meter reads	98.00%	N/A
	14A	One actual read per annum	97.80%	N/A
	14B	No Consecutive Block Estimations	99.85%	N/A
	14B	No Consecutive MD Block Estimations	100%	N/A
	14C	Out of Cycle Customer Read – Readings processed within 3 workdays	96.27%	98.01%

SERVICE LEVEL AGREEMENTS

DESCRIPTION	NO.	STANDARD APPROVAL TIMELINES (SLA)	WITHIN SLA TIMELINE	WITHIN TWICE TIMELINE
QH Data Collection	15A	D+4 QH data- Send to SEM-O / Suppliers in 1 workday	100%	N/A
	15B	QH Actual Data . Send to suppliers within 4 and 10 days**	97.70%	98.10%
Request for Special Read	18A	Site visit by 7 days	61.00%	68.00%
	18B	Issue of Meter details within 3 Days	85.00%	96.00%
Data Aggregation	16	Issue of aggregated data to SEM-O/TSO/Suppliers and Generators within 5 workdays	99.70%	100%
Change of SSAC	20	Complete process in 3 workdays	100%	N/A
De-registration	21	Auto Completion within 5 workdays	99.99%	0.00%
	21	Manual Completion within 10 workdays	100%	NA
Change Customer Details	24	Complete within 5 days	99.97%	99.98%
Change Legal Entity	25	Complete within 5 days	100%	N/A





NETWORKS