



NETWORKS

# ESB NETWORKS ENVIRONMENTAL PERFORMANCE REPORT 2020

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# EXECUTIVE SUMMARY

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Welcome to ESB Networks' 2020 Environmental Performance Report. In this report you will find information on the environmental and sustainability aspects of our business which we hope you find useful.

**During 2020 progress was made to ensure we continue to effectively manage the environmental and sustainability aspects of our business.**

As well as connecting more and more clean renewable generation at all voltage levels, ESB Networks actively supported the increased adoption of e-heat and e-transport, where this clean electricity will drive carbon out of society. Our Active System Management (ASM) Project launched in 2020 will put in place the systems, processes and capabilities needed to allow industry, customers, and communities to participate actively and securely in transmission, distribution, and market activities.

ESB Network's Environmental Change Programme continued to strengthen environmental awareness in the Networks organisation. Specific programme areas were advanced, and associated improvements made, particularly in relation to SF<sub>6</sub> Gas Management and Fluid Filled Cables Management.

During the year ESB Networks Internal Environmental Strategy 2021 to 2025 was also developed.

In 2020, ESB Networks enabled the connection of renewable energy with Maximum Export Capacity (MEC) of 208 MW onto the Irish electricity system, with 71 MW of this being connected to the distribution system. Overall, by the end of 2020, ESB Networks had enabled the connection of 4,657 MW of renewable energy to the electricity system, 2,464 MW connected at distribution level and 2,193 MW connected at transmission level.

During 2020 ESB Networks continued the replacement of over 2.3 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 at the end of March 2020. Despite this, by the end of the year, 240,000 smart meters had been installed.

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.

Overall Carbon Emissions from our Fleet, SF<sub>6</sub> Gas, and Buildings reduced by 24% when compared to 2019.

During 2020 ESB Networks continued to resolve a number of compliance issues as detailed later in this report.

There was a 62% decrease in the number of environmental incidents during the year.

When compared to 2019, ESB Network's reduced the leakage of Sulphur hexafluoride due to equipment faults by 56%, and leakage from its underground High Voltage Cable network by 61%.

During the year ESB Networks disposed of 8,580 tonnes of waste and achieved a landfill waste diversion rate of 99%.

ESB Networks maintained ongoing external certification to ISO: 14001 Standard for its Environmental Management System in 2020, subsequent to two independent external assessment audits.

#### Environmental and Sustainability Performance at a glance...

↑	Distribution Connected Wind Generation   Waste Tonnage
↔	External EMS Certification to ISO 14001 Standard   Landfill Diversion of Waste
↓	Carbon Footprint   Cable Fluid Leakage SF <sub>6</sub> Gas Emissions   Energy Usage Environmental Incidents





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# INTRODUCTION

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## ESB Networks has a number of licence obligations relating to the environment contained in the Distribution System Operator (DSO) licence and the Transmission Asset Owner (TAO) licence.

Condition 30 of the DSO licence and condition 22 of the TAO licence require the respective licence holders to:

- > Comply with all current and future European Union and Irish Environmental Laws, as well as directions by the Commission for Regulation of Utilities in respect of its duties relating to the Environment
- > Maintain an Environmental Policy setting out how it will comply with its duties and obligations under these laws and directions
- > Report annually to the Commission for Regulation of Utilities on its environmental performance

This report has been prepared by ESB Networks on behalf of the DSO and TAO for the year ending December 2020.

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. Where any gaps in procedures or processes were identified corrective action has been taken.

In February 2020 the Environmental Protection Agency (EPA) published a report on an investigation carried out into ESB Networks' fluid filled underground electricity cable leaks and this is addressed in the section on fluid filled cables below.

The Commission for Regulation of Utilities (CRU) carried out an investigation on foot of this report by the EPA. CRU concluded that ESB Networks DAC was in breach of Condition 30 (1) of its electricity distribution system operator licence while noting that since the publication of the report ESB Networks has introduced new protocols and taken actions to remedy non-compliance.

In July 2020 ESB Networks DAC was served with notice of a prosecution by the Environmental Prosecution Agency (EPA) in relation to fluorinated greenhouse gases (SF<sub>6</sub>) and this is addressed in the section on SF<sub>6</sub> below

In 2020 EY Consultants, who were engaged by ESB Networks to undertake an independent external review of the management of ESB Networks' activities and environmental impacts, finalised their report. EY concluded that good governance of environmental performance was observed and ESB Networks demonstrates a significant level of structures and processes in place to manage and improve environmental performance. A number of recommendations were identified in areas where there is opportunity to enhance and further the work that has already been undertaken in managing environmental impacts and performance. These recommendations are currently being implemented.

In 2020, twelve requests for information under the European Communities (Access to Information on the Environment) Regulations 2007 – 2018 were received and decisions issued by ESB Networks. Of these twelve decisions, five were appealed to the Commissioner for Environmental Information. ESB Networks has dedicated staff involved in the management of these requests to ensure all requests are responded to within the statutory time lines.

## ESB NETWORKS – WHO WE ARE

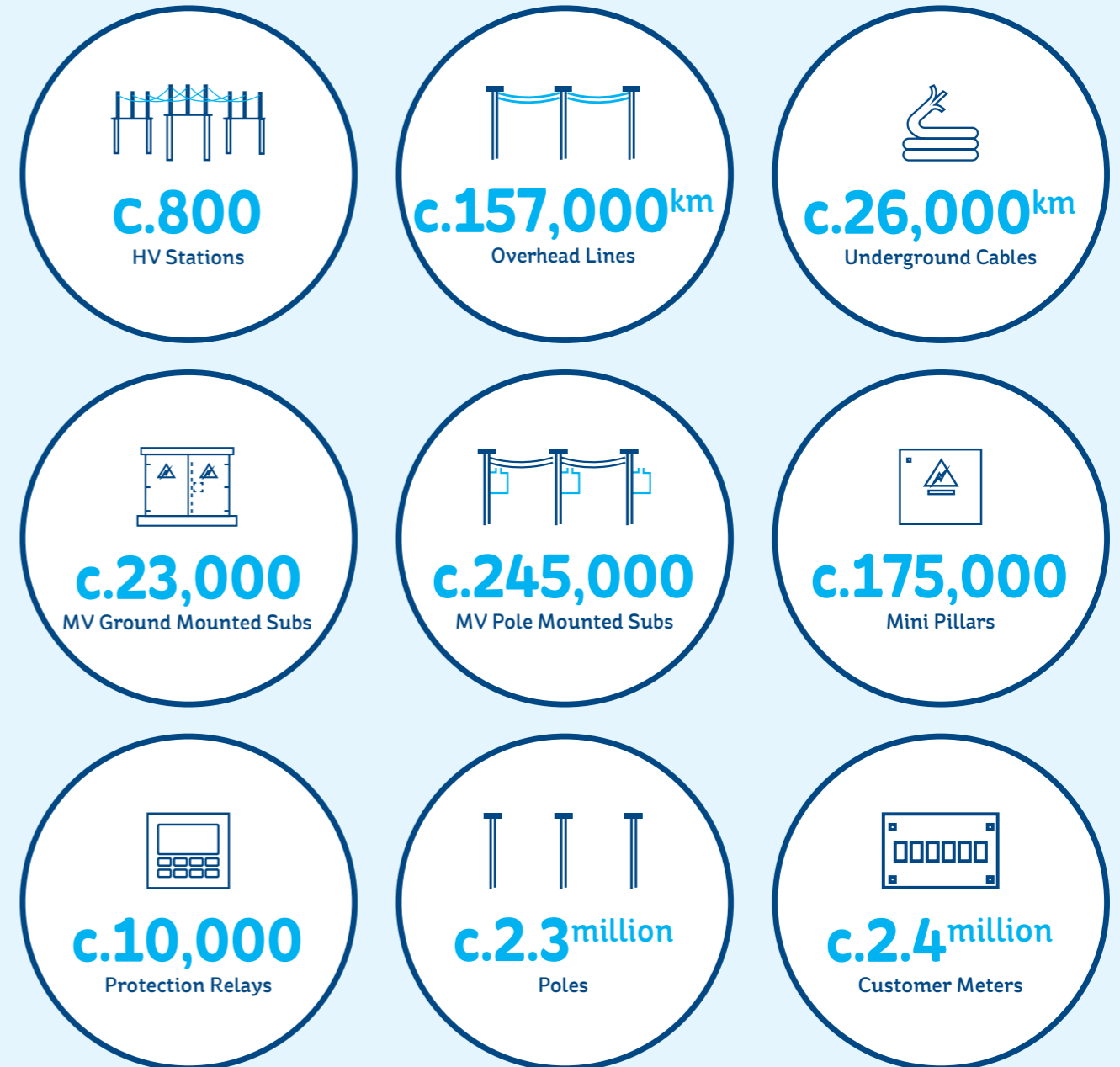
ESB Networks provides the electricity infrastructure that transports electricity to all customers in Ireland through both the Distribution and the Transmission system

Our assets include overhead lines, underground cables and associated technical equipment, to safely convey electricity to more than 2.3 million customers. We have served Irish customers for over 90 years and have provided the electrical infrastructure on which our society has developed.

We carry out all the functions relating to the electricity distribution system. This includes asset management, planning, construction, maintenance, and operation of the high, medium, and low voltage distribution networks. Through the Metering and Registration System Operator (MRSO) function, we are responsible for providing meter registration, data processing and data aggregation services.

ESB Networks build and maintain the high voltage transmission system. At the end of 2020, ESB Networks had facilitated the connection of over 4.66GW of renewable energy generation to the Distribution and Transmission system.

## Our Network



Customer service is at the heart of everything we do at ESB Networks. We provide services to every electricity customer irrespective of their electricity supplier. Our countrywide staff are committed to making excellence the hallmark of all aspects of our dealings with our customers. We are committed to facilitating the move towards low carbon technologies and want to support our customers to enable them to participate in the energy market.

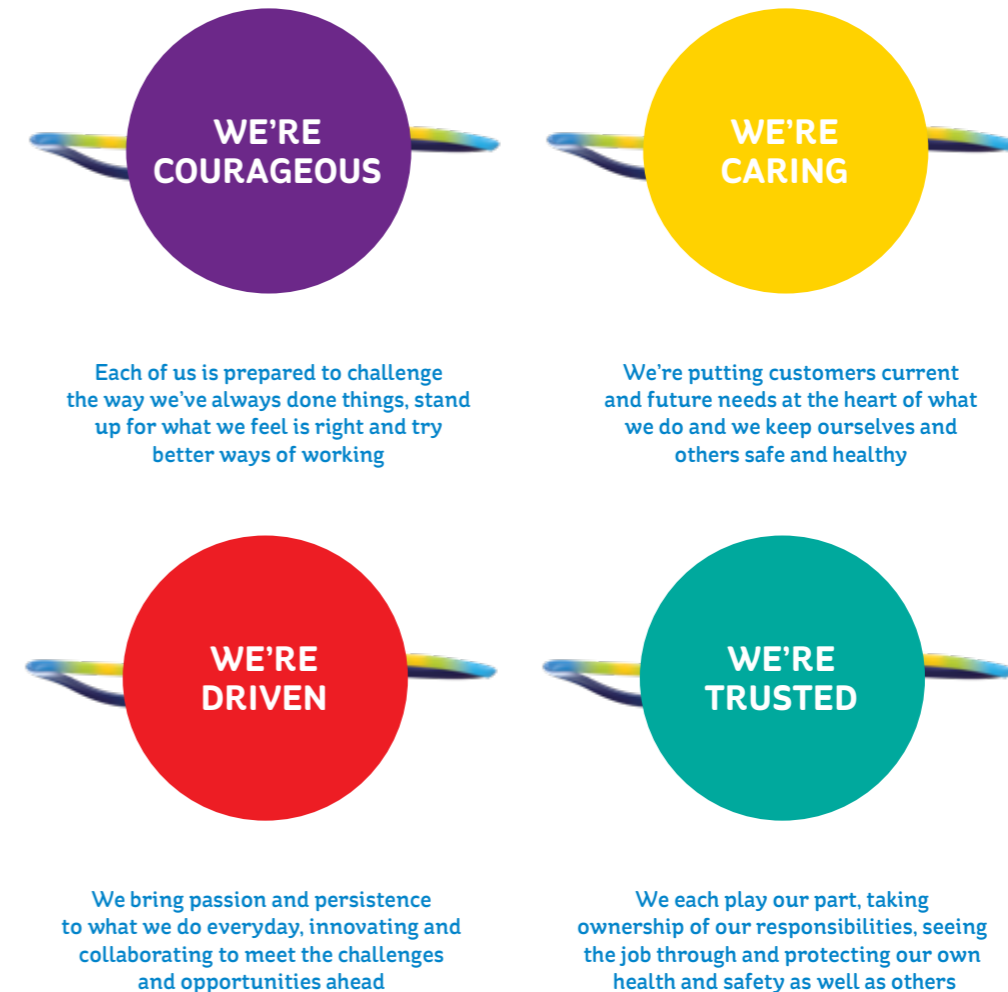
ESB Networks is committed to leading the transition to a low carbon future. The Climate Action Plan identifies electrification of heat and transport as central to transitioning to a low carbon society. ESB Networks will work to develop and adapt our networks in innovative ways to support this goal.

The ability of electricity networks to adapt and innovate in this changing and uncertain environment will be crucial to their future success. This changing environment provides us with challenges but also provides great opportunities for innovation. By 2030 our network will support, through the identification of innovative opportunities, huge changes in electricity generation and consumption.

ESB Networks' vision is that by 2030 our Network will:



### Our Values



### ESB Networks Strategy 2020 – 2030

At ESB Networks we will operate our business so that we can be proud of our environmental performance and sustainability.

#### This means

- > Transforming our environmental performance across all our operations
- > Reducing the carbon footprint of our operations and delivering on our commitment to the [E.DSO Sustainable Grid Charter](#)<sup>1</sup> The Charter consists of 13 articles covering Environmental, Social and Governmental commitments respectively. This underlines ESB Network's commitment to sustainability in all its forms, from environmental concerns to social fairness and responsible corporate operations
- > Ensuring that action and reporting is open, transparent, and consistent with our values

<sup>1</sup> European Distribution System Operators (E.DSO)

Our strategy in ESB Networks for the next ten years is framed by the Climate Action Plan. It 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.

## Environmental Performance Report 2020

Our purpose in ESB Networks has always been to connect and distribute electricity - safely, securely, and affordably. Now, acknowledging the central role that electricity plays in climate action, our purpose has evolved.

So, while we continue to connect and distribute electricity - safely, securely, and affordably - our purpose now also embraces connecting and accommodating high levels of renewable generation and enabling comprehensive and whole scale electrification - so that clean electricity can drive the carbon out of heat, transport, and our economy.

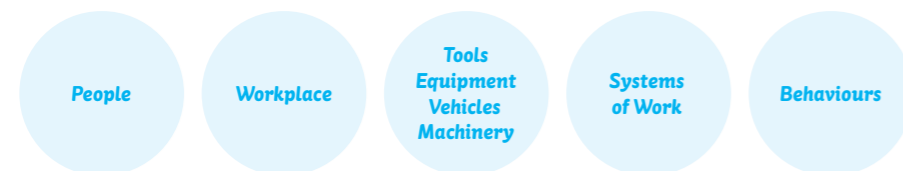
Delivering this is going to require a challenging transformation of our network, our systems, and our approach.

The sustainable social and economic development of communities, businesses, Ireland's climate action response and transition to zero carbon, are all dependent on Networks delivering our purpose through to 2030 and beyond.

### ESB Networks Internal Environmental Strategy - 2021 to 2025

During 2020, ESB Networks' Internal Environmental Strategy - 2021 to 2025 was developed. It aligns with the Environment and Sustainability objective outlined in ESB Networks Strategy 2020 - 2030 "At ESB Networks we will operate our business so that we can be proud of our environmental performance and sustainability"

The strategy is based on the following 5 commitments as these relate to Environment:



This means having environmentally responsible People, who work in an environmentally friendly Workplace (including Asset integrity), use environmentally compliant Tools, Equipment, Vehicles and Machinery, adopt documented Systems of Work which place an emphasis on the environment and where environmentally responsible Behaviours are the norm.

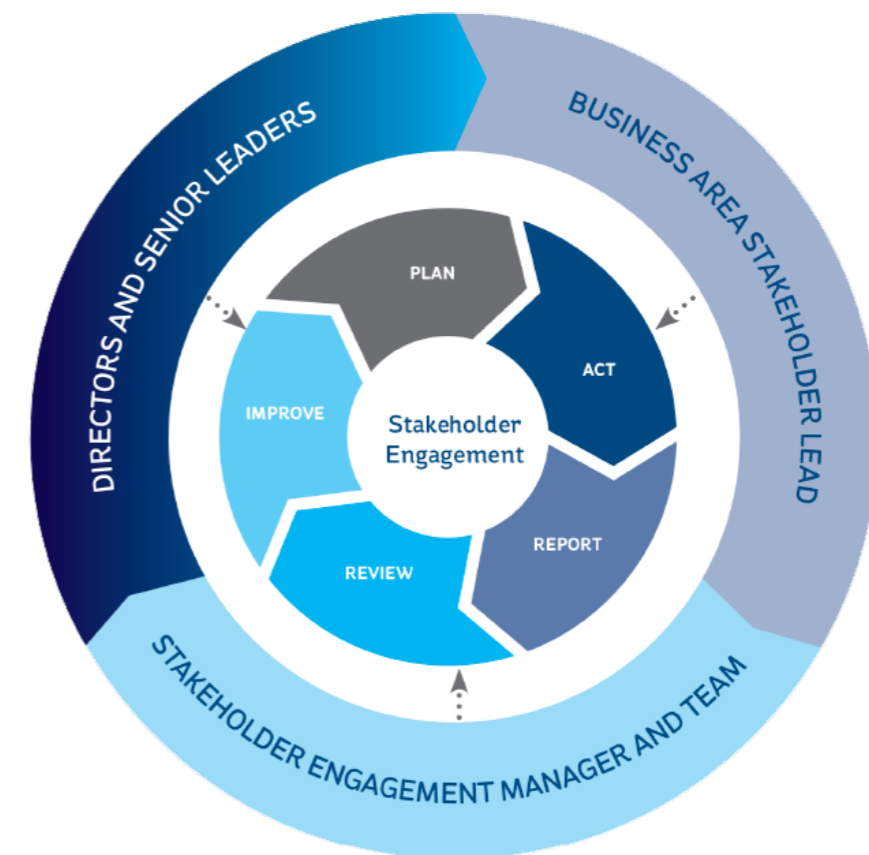
The Strategy was developed by a cross section of Networks staff who identified Seven Strategic Enabling Priorities which will help move us towards environmental excellence.

The Strategy is our commitment to being environmentally responsible and will enable ESB Networks to move to be one of the most environmentally progressive utilities in Europe. The Strategy was launched in Q1 2021.

## Stakeholder Engagement

We value the trust that has developed with our customers and stakeholders over many years. As the distribution system evolves to support Ireland's transition to a low-carbon economy we will ensure that customers and stakeholders remain at the centre of our business. Listening to and engaging with customers is key to understanding their needs and preferences as to how we develop the network and deliver services.

ESB Networks' [Strategic Stakeholder Engagement Framework](#), sets out our enduring engagement strategy to enable an open and ongoing dialogue with all our stakeholders. The framework identifies our stakeholders and the principles that guide our engagement, together with our proposed engagement methodology and our governance and control processes.



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

If you would like to learn more about ESB Networks' stakeholder engagement you can find out more on our Stakeholder Engagement pages on our website <https://www.esbnetworks.ie/who-we-are/stakeholder-and-public-engagement/stakeholder-engagement>

# DELIVERING THE LOW CARBON FUTURE

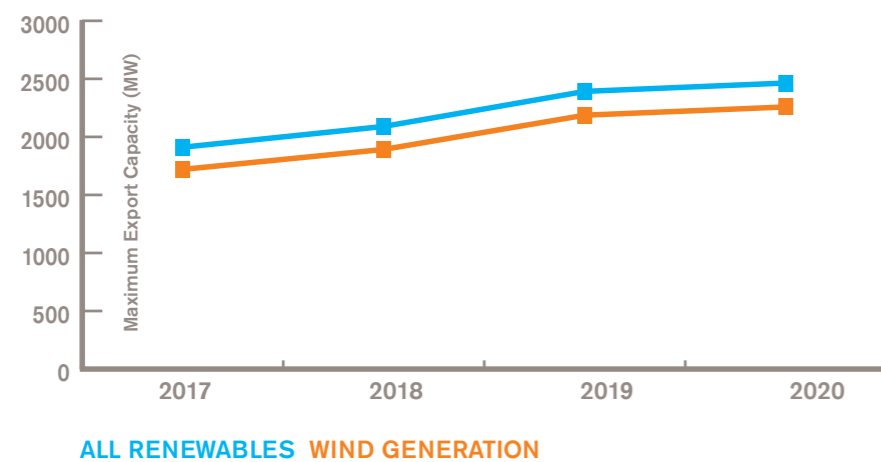
## Connecting Renewable Energy

ESB Networks' mission is 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 2020, ESB Networks enabled the connection of renewable energy with Maximum Export Capacity (MEC) of 208 MW onto the Irish electricity system, with 71 MW of this, being connected to the distribution system.

By the end of 2020 there was a total of 2,464 MW (MEC) of renewable energy generation (2,258 MW (MEC) of wind energy generation) connected to the distribution system.

Figure 1: Distribution Connected Renewable Energy



Overall, by the end of 2020, ESB Networks had enabled the connection of 4,657 MW of renewable energy to the electricity system. 2,464 MW connected at distribution level and 2,193 MW connected at transmission level.

In addition, 2020 saw ESB Networks facilitate the connection of 135.1 MW of battery storage, with 8.5 MW of this being connected to the Distribution System and 126.6 MW being connected to the Transmission System. This will provide system support services to the electricity system operators to enable increased penetration of renewable energy on the grid.

ESB Networks is committed to facilitating microgeneration connection applications to the distribution network. Consumers who wish to install microgeneration and export excess electricity onto the electricity network are referred to as prosumers. As Distribution System Operator (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. To date, ESB Networks has facilitated over 17,000 microgeneration connection applications to the electricity network.

In 2020, ESB Networks continued to support innovative ways of connecting more renewables through its standards and policies. We published new Distribution Security of Supply and Planning Standards which were a key deliverable from one of our innovation projects and were developed in collaboration with stakeholders. These new Standards are effectively the rules by which we determine how to connect our customers to the electricity distribution network. The new rules have the potential to positively impact c.80% of the MV network renewable connection applications we expect to receive enabling more cost effective and faster connections to the grid. The new rules also include a provision for the expected future growth in microgeneration (domestic Solar PV) connections.

### Innovation

In ESB Networks, we are very clear that the challenge of enabling a low carbon Ireland powered by clean electricity cannot be delivered without extensive and collaborative innovation. To that end our Innovation Strategy sees us delivering on a portfolio of over 30 innovation projects across 3 pillars:

- > Future Customer - Empowering and Supporting Customers and the Economy
- > Climate Action - Decarbonising Electricity, Heat and Transport
- > Network Resilience - Efficient, Secure, and reliable electricity

Across our industry, there is a significant wave of innovation downstream where customers interact with the electricity system. New microgeneration technologies like solar PV are available making it possible for future customers to potentially sell power back to the grid; the Internet of Things is connecting everything from energy assets to sensors in the home and digitally connected customers are able to manage their energy use remotely through smart controls. Battery storage and electric vehicle are opening up the potential of large scale storage for electricity that could support increased penetration of renewable energy on the grid.

The possibilities are interlinked and extensive. In 2020 over 276 innovation ideas were examined in ESB Networks: we have 30+ projects underway where we are collaborating with over 80 external organisations on innovation concepts with estimated potential benefits of €60m. Further details are available on our website: [Innovation in ESB Networks](#)



## Electrification

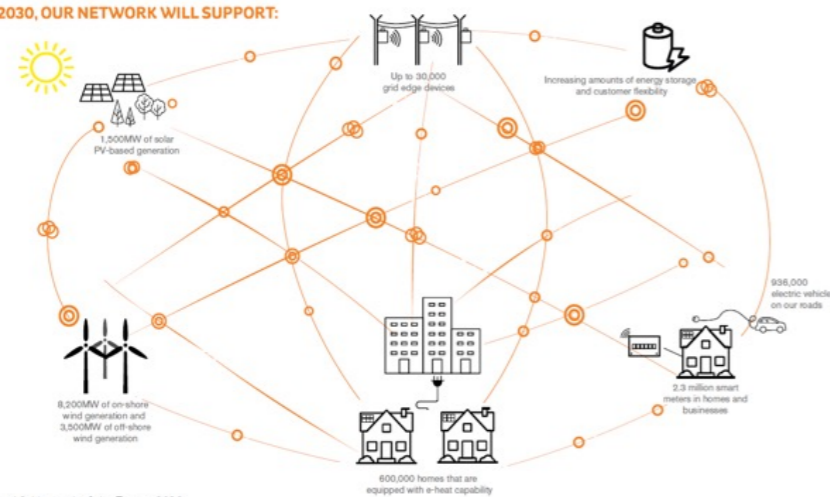
Increased electrification of heat and transport is a key policy aim of the Government's Climate Action Plan and ESB Networks vision is to facilitate our customers to connect at least 1,000,000 electric vehicles and at least 600,000 heat pumps on the distribution system by 2030.

ESB Networks recently published its Strategy for the Electrification of Heat and Transport [2020 electrification-of-heat-and-transport-strategy-updated.pdf \(esbnetworks.ie\)](#) following extensive collaboration and engagement with stakeholders, including a public consultation in October 2020.

As the electricity network owner and distribution system operator, we need to ensure our network is ready for the electrification revolution and in particular we need to re-purpose our low voltage passive network which was designed for different times to an active system to allow us to support increased electrification and the transition to a lower carbon energy system. Our overarching electrification strategy signposts our direction of travel and is based around three main themes:

- > Removing ESB Networks Policy barriers
- > Engage, Enable and Empower our Customers to Electrify
- > Ensuring Network Readiness

### BY 2030, OUR NETWORK WILL SUPPORT:





### Smart Metering Project

During 2020 ESB Networks continued the replacement of over 2.3 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 at the end of March 2020. Despite 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 upgrade to smart meters will bring many benefits to customers, the environment, and the economy.

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, Dublin, Kildare, Laois, Louth, Meath, and Wicklow, and plans to move to counties Limerick, Sligo, and Leitrim in early 2021. A total of 240,000 meters have been successfully installed by the end of December 2020
- > 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

# a greener more sustainable Ireland



Every **smart meter** will help us all become more energy efficient and environmentally friendly as we work towards a **low-carbon** future.

**Smart meters** are helping to facilitate the development of Ireland's growing renewable generation, **smart grids** and the **electrification of transport and heat**



## 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 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.





### 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 of 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.





# CLIMATE ACTION AND SUSTAINABILITY

## Overall Carbon Emissions

Table 1. Overall CO<sub>2</sub> Emissions

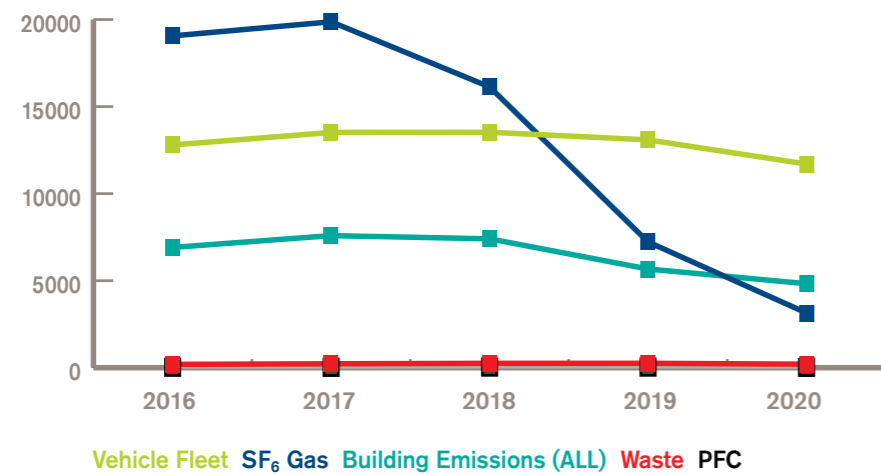
Description	CO <sub>2</sub> Tonnes Per Year				
	2016	2017	2018	2019	2020
Vehicle Fleet	12,796	13,517	13,526	13,088	11,700
SF <sub>6</sub> Gas	19,061	19,870	16,130	7,225	3,145
Building Emissions - ALL	6,910	7,589	7,406	5,672	4,827
Waste	196	229	254	256	206
PFC <sup>2</sup>	30	25	38	38	23
<b>Total</b>	<b>38,993</b>	<b>41,230</b>	<b>37,354</b>	<b>26,279</b>	<b>19,901</b>

<sup>2</sup> PFC is Perfluorocarbon Gas emitted as part of the Fluid Filled Cables Leakage detection process.

Note: Overall CO<sub>2</sub> Equivalent figures compiled using relevant DEFRA and SEAI CO<sub>2</sub> Conversion Factors

\*The equivalent 11% reduction in Fleet fuel CO<sub>2</sub> emissions in 2020 resulted from a lower fuel to CO<sub>2</sub> conversion factor used by ESB Networks fuel provider.

Figure 2: CO<sub>2</sub> Emissions





## 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.

In ESB Networks, sustainability improvement works are a feature of all current and future building upgrade works and include lighting, insulation, energy efficient heating systems, windows, and other works.

A reduction in energy consumption is being progressed via several initiatives as follows:

- > LED Lighting Upgrade Project: A total of 11 major energy using locations are being upgraded with LED lighting. This includes internal and external lighting upgrades. These works commenced in 2020 with the completion of work at Dundalk, Ballycoolin and Rosbrien Depots. Locations planned for completion in 2021 include Portlaoise National Training Centre, Portlaoise Depot, Letterkenny, Athlone, Inchicore, Tralee, Wilton, and Waterford Depots
- > Two major refurbishment projects commenced in Q3 2020 in Finglas and Leopardstown and both have a significant sustainability improvement emphasis, which includes low energy lighting, use of natural ventilation, energy efficient heating systems, roof and wall insulation works. Both buildings will have a B energy rating post completion of works

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 and there were 65 Electric Small Vans on the fleet 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.

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.



## Distribution Losses / 20 kV Conversion Project

ESB Networks initiated a programme of converting its 10 kV network to 20 kV in the 1990's. This strategic direction was based on the studies of that time which showed that the most economical and efficient method of addressing voltage and capacity problems on the rural MV network was to convert it to 20 kV.

One of the primary benefits of converting the electricity network to 20 kV is that the Thermal Capacity is increased by a factor of two and voltage drop performance is increased by a factor of four. Voltage drop is the limiting criteria that determines circuit capacity of ESB Network's typical rural networks. Consequently, circuit capacity is effectively increased by a factor of four. In effect, 20 kV is a vital enabler of demand growth that is anticipated as a result of Low Carbon government initiatives in relation to eHeat and eTransport. In addition, as conversion to 20 kV reduces losses by a factor of 4, the reduction in Carbon Footprint that can be achieved by extending this programme is highly significant. The conversion programme continued in 2020.



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# MINIMISING OUR IMPACT ON THE ENVIRONMENT

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

We 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

[ESB Networks Policy Statement on the Environment](#) approved by the Executive Director, Network Customer Delivery, commits us to:

- > Conduct our activities and those undertaken on our behalf in an environmentally responsible manner and in compliance with all legal and other requirements and company policies and standards related to our environmental aspects
- > Develop and maintain an effective environmental management system
- > Protect the environment and prevent pollution by identifying, managing and regularly reviewing the environmental aspects and impacts associated with our business activities, services and processes
- > Review our environmental programme regularly to ensure continual improvement in environmental performance and to provide a framework for setting and reviewing environmental objectives and targets
- > Act responsibly in our use of natural resources
- > Consider environmental matters in all planning and decision making
- > Make continuous efforts to maximise the energy efficiency of our networks, buildings and fleet
- > Minimise the production of all wastes as far as practicable, promptly recover all litter found at Networks locations and dispose of all residual wastes in a safe and responsible manner
- > Record and respond swiftly to all environmental incidents and complaints
- > Promote environmental and sustainability awareness among our staff, contractors and suppliers and embed these values in our investment and expenditure decisions

- > Provide the necessary training and support to staff on environmental matters relating to our business activities
- > Make this Policy Statement available to all our staff, contractors and interested stakeholders

## Environmental Management System

ESB Networks first achieved ISO 14001 certification for its Environmental Management System in December 2010. The Environmental Management System provides a framework to effectively address all relevant requirements as outlined in the ISO 14001 standard, including environmental risk assessment and emergency response plans.

In 2019 following a detailed recertification audit, ESB Networks successfully achieved certification to the updated ISO 14001: 2015 version of the Standard. Regular bi-annual external surveillance audits are a feature of certification.

In 2020, two external surveillance audits were carried out by ESB Networks external certification body, against the requirements of the ISO 14001:2015 standard.

These audits were carried out virtually due to Covid-19 restrictions. Audits sampled a range of activities within the scope of ESB Networks certification including:

- > Environmental Management Systems
- > Oil and Fluid Filled Cables
- > SF<sub>6</sub> Gas Management
- > Construction Works in Natura 2000 Sites (Special Areas of Conservation and Special Protected Areas)
- > Construction Waste Management
- > External Stakeholder Engagement
- > Environmental Change Programme

During the two external audits, no major non-conformances were noted by the Auditors, from the sampled range of activities within the scope of ESB Networks certification.

The external EMS surveillance audit programme was complemented by a restricted internal EMS audit programme due to Covid-19 restrictions. This focussed on a representative range of activities and operations within scope of certification. Activities and operations with potentially higher environmental risk and where Covid-19 safety protocols could be observed were prioritised as part of this programme.

During the year, ESB Networks continued to use a Register of Environmental Legislation and Compliance Tool to evaluate the associated implications of relevant environmental legislation.

The EMS continued to be supported by OneSource, ESB Network's Document Management System, and a specific SharePoint site containing other relevant information that management and staff require to comply with the requirements of the ISO 14001 standard.

During 2020 ESB Networks continued to use the EMS Internal Audit Module functionality on Shield, an Environmental Health & Safety IT System, to complete scheduled EMS Internal Audits. Shield's Incident Module continues to be used to record all reported environmental incidents and complaints.



### Environmental Monitoring and associated Improvement Works

During 2020 regular ground water and surface water monitoring continued at ESB Networks national wood pole storage facility in Killeel, Co Kildare. RSK were appointed to progress the next stage of the Conceptual Site Model (CSM) approach to overall site management in accordance with the Environmental Protection Agency guidance document "Guidance on the Management of Contaminated Land and Groundwater at Environmental Protection Agency Licenced Sites".

During 2020 there was engagement with the Environmental Protection Agency in relation to ESB Network's PCB Management Plan requirements and associated updates on EDEN, the Agency's online reporting system.

In 2020, in addition to bunding all new transformer installations in HV substations, ESB Networks retrofitted bunding to 28 existing legacy transformers, and up-graded 8 legacy separators to European Norm 858 and Class 1 performance.

ESB Networks Oil Storage and Transportation Improvement Project continued in 2020. Oil and diesel storage infrastructure upgrades were completed at a number of ESB Networks HV Stations for Back Up Generators and at Depots and Fleet & Equipment Garages. New storage tanks were installed at Maynooth, Carrickmines and Inchicore 220 kV Stations, at Dundalk, Finglas, Mullingar, Tullamore, and Wilton Depots and at Galway Fleet & Equipment Garage.

Bunded shelters, bunded pallets, bunded shelving and transformer oil containment bags were procured for storage of damaged oil filled plant and equipment, chemicals, and other identified hazardous materials. Mobile oil spill containment kits and consumables were provided at Depots, HV Stations, Fleet and Equipment Garages and in relevant ESB Network's fleet.

### 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 are concerned with ensuring 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 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.





### Biodiversity

ESB Networks is cognisant of the importance of biodiversity in the Irish landscape, and to ensure its activities are managed in a sustainable manner in relation to biodiversity. It is also aware of the requirements to identify potential impacts on biodiversity with the aim of avoiding or mitigating these impacts, and where feasible, work to enhance biodiversity.

A number of ESB Networks documents have been developed to advise staff on biodiversity matters, including procedures for designing and undertaking work in designated sites and the identification of and response to invasive species in proximity to ESB Networks infrastructure. 2020 saw the start of a review process of these documents to update them in line with recent guidance and legislation.

ESB Networks staff regularly engage on various biodiversity-related issues, including Screening for Appropriate Assessment, biosecurity, and mitigation measure implementation with ESB's ecology staff (based in Engineering and Major Projects).

The ecology staff also deliver training to ESB Networks staff in relation to biodiversity and ecology-related legislation.

As a key partner in the second All-Ireland Pollinator Plan for 2021-2025 ESB Networks has committed to take up opportunities for more pollinator-friendly management of landscapes within its property portfolio, where this fits with the needs of safety, business operations and property management.



### SF<sub>6</sub> Gas Management

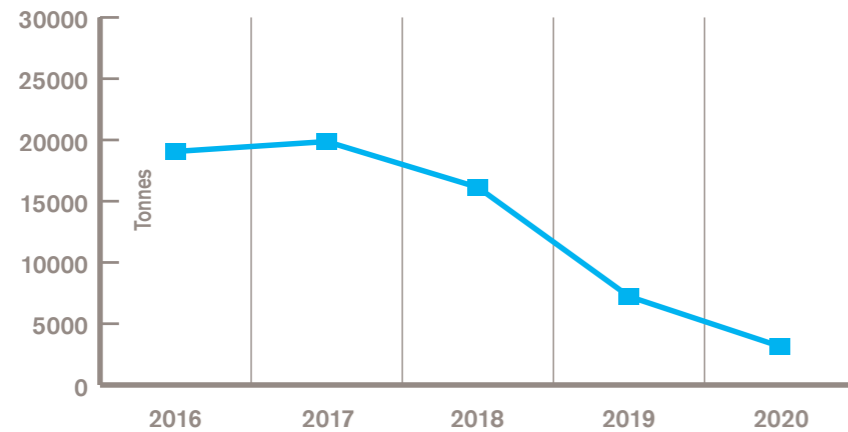
Sulphur hexafluoride (SF<sub>6</sub>) is used in a significant portion of ESB Network's high-voltage switchgear assets on the transmission and distribution networks.

It is used because of its very high electrical insulating properties which facilitate efficient and safe operation of the switchgear. Emissions rates for SF<sub>6</sub> 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 SF<sub>6</sub> was emitted due to equipment faults, representing 0.08% of the total installed inventory of SF<sub>6</sub>. The comparable 2019 leak quantity was 316.9 kg, representing 0.18% of inventory. This represents a significant reduction in annual emissions for ESB Networks. This overall downward trajectory of SF<sub>6</sub> emissions over the last five years can be seen in Fig. 3



Figure 3: Tonnes - CO<sub>2</sub> Equivalent



Note: There has been a 5-year trend of consistent leakage reduction, as we replace and repair our older switch gear

The improvement is attributable to significant steps taken within the Networks Business to continually develop and improve compliance with EU Regulation 517/2014. These steps include:

- > Implementation of revised SF<sub>6</sub> policy and procedures across the ESN Business, addressing:
  - > Labelling
  - > Transport
  - > Gas Handling & Recording
  - > Leak Response
  - > Training & Certification
- > Continued training and certification for those involved in handling SF<sub>6</sub>
- > Technology Improvements related to mobile app-based recording of SF<sub>6</sub> gas usage
- > Further work to improve accuracy of SF<sub>6</sub> Gas Inventory across all assets
- > Nationwide project to rationalise locally held SF<sub>6</sub> gas bottles
- > Enhanced monitoring/closeout of SF<sub>6</sub> Leaks on a systematic basis
- > Renewed nationwide communication of key requirements of EU Reg 517/2014 as part of rollout of revised procedures

### Engagement with statutory authorities & associated reporting protocols

ESB Networks engages with a number of key stakeholders, in relation to SF<sub>6</sub> emissions reporting in its High Voltage Stations, namely Local Authorities and the Environmental Protection Agency (EPA).

### Local Authorities

Where a leak has been identified on a piece of equipment in a High Voltage Station, ESB Networks reports this leak to the relevant local authority. This reporting requirement is implemented in accordance with the Air Pollution Act (1987)

The reporting structure adopts the following approach:

- > A Stage 1 notification is issued when an SF<sub>6</sub> leak has been identified
- > A Stage 2 notification is issued when the SF<sub>6</sub> leak has been stopped

### Environmental Protection Agency

ESB Networks reports on an annual basis to the EPA on its cumulative SF<sub>6</sub> emissions for the previous year on/before 31st of March each year. This reporting is undertaken as part of ESB Networks responsibilities in relation to the Pollutant Release and Transfer Register Regulations (2011).

ESB Networks reports all SF<sub>6</sub> emissions to the associated license holder where there are emissions from ESB Networks owned equipment on EPA licensed sites.

### Process Improvements

**Technology Utilisation** all SF<sub>6</sub> handling & recording is now implemented via a mobile device based SF<sub>6</sub> App. This simplifies site recording and enables prompt and accurate reporting of gas utilisation. Critically, it will also drive a more efficient review and calculation of inventory on an ongoing basis.

**Policy & Procedures Enhancement** existing documentation has been extensively reviewed to ensure consistent and concise information is available for staff, thus driving ongoing awareness and compliance in the business with regard to SF<sub>6</sub> regulations.

**Rationalisation of existing SF<sub>6</sub> gas quantities** reductions have also been achieved with regard to utilisation and holdings of SF<sub>6</sub> gas in different geographic regions. This will facilitate the business in retaining an optimum holding of SF<sub>6</sub> gas.

**SF<sub>6</sub> Leak Monitoring & Repair Programme Review** enhanced procedures and IT Tools are in place to ensure prompt reporting, capture and closeout of SF<sub>6</sub> leaks through a robust process involving Network Assets, Environmental and frontline High Voltage Station staff.

**SF<sub>6</sub> Prosecution.** In July 2020 ESB Networks DAC was served with notice of a prosecution by the EPA. The summons sets out six alleged offences relating to the failure of ESB Networks DAC to carry out repair without undue delay following detection of leaks of fluorinated greenhouse gases (SF<sub>6</sub>) in switchgear in ESB Networks' sub-station in Carrowdotia, Co Clare during the period June 2018 to June 2019. The relevant equipment was decommissioned prior to the commencement of this prosecution and it no longer contains SF<sub>6</sub> gas. The Summons was initially returnable to the District Court in November 2020. However, all regulatory prosecutions in the District Court are on hold under the present public health restrictions.



### Fluid-Filled Cables

#### Fluid Filled Cables - 2020 Update

During 2020, 5,222 litres of cable insulating fluid leaked from ESB's High Voltage Cable network. This is a decrease of 8,115 litres on the 2019 fluid leakage figure of 13,337 litres.

The breakdown of the fluid leaks was as follows:

- > 220 kV Cable Network = 635 litres
- > 110 kV Cable Network = 1,287 litres
- > 38 kV Cable Network = 3,300 litres

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.

Our 2020 leakage figure represents a reduction of approximately 61% on our 2019 leakage figure. Target reduction is part of our overall life cycle 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.

New Local Authority notifiable leaks that occurred on the 38 kV Cable Network in 2020:

- > Bedford Row – Francis Street
- > Deansgrange – Sallynoggin
- > Marrowbone Lane – Newmarket
- > Fairhill – Kilbarry
- > Dennehy's Cross – Togher

New Local Authority notifiable leaks that occurred on the 110 kV Cable Network in 2020:

- > Harold's Cross – Ringsend

New Local Authority notifiable leaks that occurred on the 220 kV Cable Network in 2020:

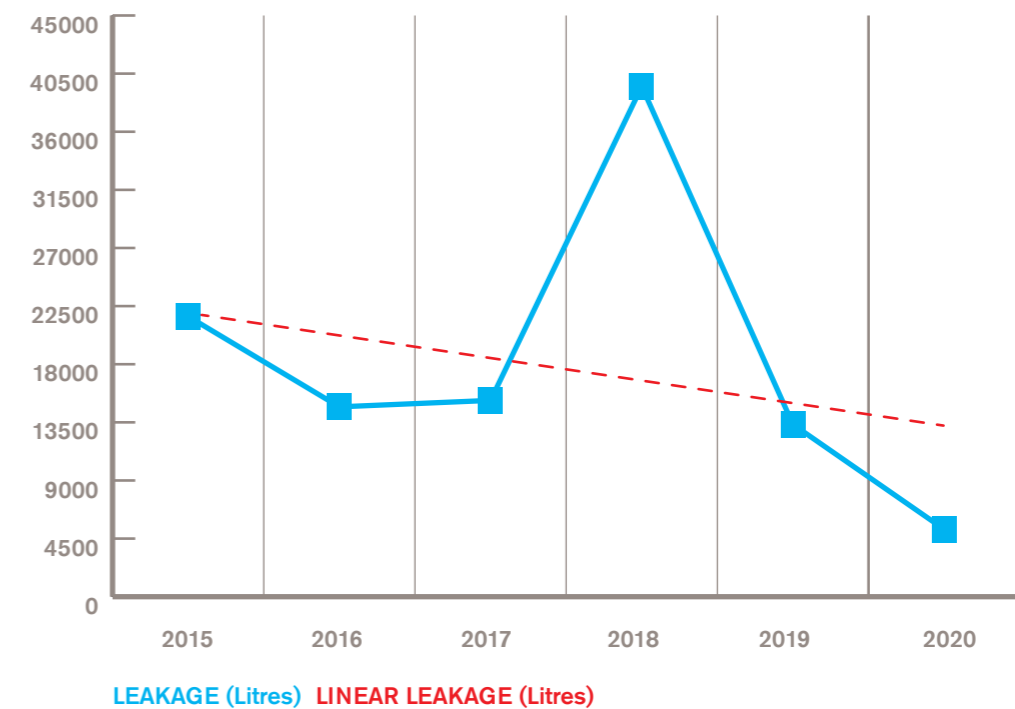
- > Carrickmines Poolbeg

Fourteen circuits had Local Authority notifiable leaks in 2020 with ten cable leaks repaired.

Circuits with repaired leaks in 2020 were:

- > Bedford Row – Sherriff Street
- > Bedford Row – Francis Street
- > Clontarf – East Wall Road
- > Deansgrange – Sallynoggin
- > Dennehy's Cross – Togher
- > Fairhill – Kilbarry
- > Harold's Cross – Ringsend
- > Kingsbridge – Watling Street
- > Pembroke – Ringsend S52
- > Poolbeg – Ringsend TF4

Figure 4: Fluid Filled Cables Leakage Trends 2015 to 2020





### Fluid Filled Cables - Environmental Assessments

In February 2020 the EPA published a report on an investigation carried out into ESB Networks' fluid filled underground electricity cable leaks. The report concluded inter alia that in some instances ESB Networks failed to notify Local Authorities of the cable leaks and failed to screen the impact of the fluid leaks. The EPA made a number of recommendations in the report which are now being implemented.

In 2019, ESB Networks engaged the services of five specialist companies with chartered expertise to undertake a risk-based assessment of the potential risks arising from historic FFC leaks. The risk-based approach applied is consistent with the EPA's "Guidance on the Management of Contaminated Land and Groundwater at Environmental Protection Agency Licenced Sites" This addresses the requirements of relevant environmental legislation and this approach was deemed appropriate by the EPA in their February 2020 report on this matter.

In 2020, ESB Networks completed Preliminary Site Assessment (PSA) reports for all 68 cable leak sites. The consultant's PSA recommendations in 22 of these sites is that no further site assessment is necessary. For the remaining sites, the consultant recommended further site investigations, for example, trial pits and slit trench excavations at or around a leak site to facilitate collection of relevant samples. In 2020, works were progressed on a number of these 46 sites as we continue to progress all to a conclusion with the relevant authorities.

All leak location information is now published on our website <https://www.esbnetworks.ie/acting-responsibly/environmental-information>. The outcomes of preliminary site assessments are discussed in detail with the relevant Local Authority, in line with relevant protocols, to ensure transparency and clarity on recommendations and plans.

### Fluid Filled Cables - Incident Management

Since 2019, ESB Networks has FFC incident protocols in place dealing with both historic and current FFC leaks with relevant Local Authorities. The protocols ensure all relevant authorities are notified of incidents as they arise and are kept up to date with incident response. Regular communication is maintained with relevant Local Authorities to ensure close collaboration regarding road opening licences, drainage maps and other aspects relevant to our work in cable leak location, environmental assessment, and repair.

We continue to have experienced Network Technicians specially trained in FFC maintenance, leak identification and repair techniques to ensure that we manage these incidents promptly when they occur. ESB Networks' tracer detection equipment has significantly improved our ability to identify leak sites and implement repairs. We continue to implement this state-of-the-art leak detection methodology along with other leak detection methods as required.

ESB Networks' leakage rate in 2020 was approximately 30 litres per kilometre. The current leakage rate equates to 0.5 % of the total installed cable fluid volume per annum, equivalent to or lower than the leakage rates reported by a number of peer network companies in other countries. While the total fluid leakage in any year can depend upon several factors associated with the cables' condition, route and location, the significant reduction in 2020 indicates the protocols and ESB Networks enhanced life cycle management processes are effective.

### Fluid Filled Cables - Replacement Programme

Recognising the environmental challenges in operating and maintaining FFCs, ESB Networks started a fluid-filled cable replacement programme in 2005. So far, 20 % of FFCs have been replaced, removing the source of 40 % of the previous cable fluid leaks from the system. At present, there is approximately 177 km of FFCs on the Transmission and Distribution Electricity Networks. We have a number of active FFC replacement projects at construction stage and additional projects at route selection stage.

Such major infrastructural projects involve:

- > Scheduled outages for which businesses and families adjacent to these works must be informed and given adequate notice
- > Securing temporary road opening licences
- > Traversing third party infrastructure, services and major road, rail, waterway crossings
- > Temporary extended road closures
- > Significant trench excavations for new plastic insulated cable and cable replacement
- > Jointing works

The projects will be undertaken on a phased basis in populated urban areas with significant traffic volumes. Ongoing engagement with relevant stakeholders is vital to ensure efficient and successful delivery of these cable replacement projects.

ESB Networks has now committed to an accelerated investment programme with the Commission for Regulation of Utilities (CRU). An environmental assessment informs both the schedule and the timing of individual cable replacements.

As part of the Price Review Five (PR5) determination, CRU approved Distribution and Transmission FFC Replacement projects totalling 98 km. The remaining FFCs are planned to be replaced over subsequent Price Reviews subject to CRU approval.

## Waste Management

During 2020, suitable arrangements were maintained and further enhanced where appropriate, for the compliant and effective management of waste arising at depots, stores, HV stations and sites nationwide. An appropriate infrastructure exists to facilitate the segregation and safe temporary storage of waste pending its removal for recycling, treatment, or disposal. ESB Networks works with all waste management contractors to ensure that appropriate permits and licences are in place.

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, significant progress continued in this regard, some of the key achievements/initiatives being:

- > Ongoing effective management of contracts for non-hazardous and hazardous waste management service provision, scrap metal, oil filled equipment, and empty cable drum disposal nationwide
- > Continued targeted management reporting on waste volumes and costs to support recycling and landfill diversion of waste
- > Landfill diversion rate of 99% achieved for overall waste generated when service provider post collection recovery/recycling is taken into account
- > Depot recycling rate of 70% achieved for municipal solid waste. The overall waste recycling rate for the year which includes waste collected from technical facilities, was 65%
- > Standardised office waste management systems maintained to facilitate the proper segregation of associated wastes
- > Continued focus on raising awareness regarding waste management legislative requirements, recycling targets, and the need to maximise landfill diversion of waste
- > Memorandum of Understandings 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
- > Engagement of ESB Network's appointed waste management companies as necessary to compliantly clean up and dispose of waste illegally dumped at ESB Network's facilities

## Waste Statistics (classification and quantities)

In 2020, ESB Networks generated 8,580 tonnes of waste from its business operations, a 15% increase when compared to 2019. Statistics are compiled based on management information provided by all contracted waste service providers. Over the course of the year, 93% of waste collected was diverted from landfill. When we take into consideration contracted waste service provider's post collection further processing recycling and recovery, the overall landfill diversion rate increases to 99%.

The following figure and table provide a breakdown of the overall waste generated during 2020 and make comparison with the corresponding figures for 2019 where relevant.

### Note:

- > Statistics do not include construction and demolition waste generated from major construction projects where appropriately permitted and licenced operators are appointed for waste disposal as part of overall project management
- > 2018 figures are included for statistical continuity purpose only
- > Percentages are rounded to nearest whole figure

Figure 5 presents a breakdown of the various categories of wastes generated by the ESB Networks business in 2020. Scrap metals, wood poles, oil filled equipment, and wooden cable drums, accounted for 70% of all waste collected during 2020. 90% of general waste was subsequently recovered by waste management service providers as part of post collection further segregation/recovery at their facilities, and diverted from landfill, thereby reducing the overall waste sent to landfill to less than 1%.

Figure 5: 2020 Waste Generated

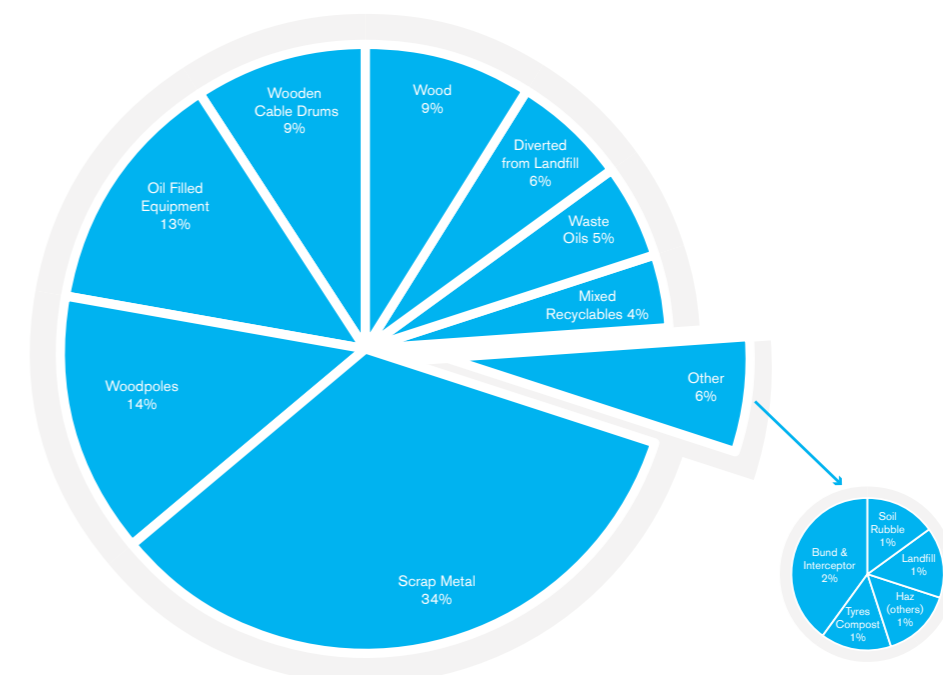

















Table 2. Waste Tonnage Quantities

Waste Stream	Tonnes Per Year		
	Description	2018	2019
Scrap Metals	2,542	2,641	2,913
Woodpoles		167	1,220
Oil Filled Equipment	1,074	1,523	1,111
Wooden Cable Drums	649	668	789
Wood	596	599	762
General Waste	602	549	569
Waste Oils	229	259	407
Mixed Recyclables	398	350	313
Wastewater Bund & Interceptor Waste	217	252	210
Hazardous Waste (Others)	146	136	125
Soil & Rubble	328	233	80
Tyres	44	46	48
Compost	79	50	33
<b>Total</b>	<b>6,904</b>	<b>7,473</b>	<b>8,580</b>

Hazardous Waste Others: Creosote Contaminated Consumables, Contaminated Soil, Oil Filters, Solid Oily Waste, Batteries, WEEE, Chemicals, Paints, Empty Paint Containers, Mixed Fuels, Resins, Silica Gel, Inorganic and Organic Waste

## Waste Disposal Trends

-  Oil Filled Equipment
-  Mixed Recyclables
-  Wastewater, Bund & Interceptor Waste
-  Hazardous Waste (Others)
-  Soil & Rubble
-  Compost
-  Scrap Metals
-  Woodpoles
-  Wooden Cable Drums
-  Wood
-  General Waste
-  Waste Oils
-  Tyres

### Environmental Incidents

ESB Networks' environmental management systems are designed to minimise, prevent, and mitigate the occurrence of environmental incidents. However, some environmental incidents occur in the course of ESB Networks business operations and these are appropriately managed and dealt with. During 2020 there were 170 environmental incidents. We have further refined and enhanced our incident reporting systems during the year.



Table 3. Environmental Incidents

Reported Environmental Incidents	Incidents Per Year		
	2018	2019	2020
SF <sub>6</sub> Gas Handling/Storage/Leakage	2	186 *	112*
Oil Spill	12	27	20
Waste & Illegal Dumping	16	21	6
Litter/Graffiti	8	11	1
Fluid Filled Cable	4	10	14
Contaminated Soil	3	4	6
Fire resulting in Environmental Incident		4	
Oil Filled Equipment Management	1	3	1
Equipment	1	2	1
Bad Smell/Odour		2	
Workplace	3	1	1
Environmental Complaint	2	1	1
Chemical spill	1	1	
Fuel Spill	1	1	
Impact on Conservation Area/National Monument Site	1	1	3
Air pollution, including Dust and Gaseous Emission	1	1	
Noise Nuisance	3		4
Timber Cutting	1		
<b>Total</b>	<b>60</b>	<b>276</b>	<b>170</b>

\*Since 2019 ESB Networks introduced changes to our recording system which has enabled a finer breakdown of individual SF<sub>6</sub> Gas leak occurrences. This has resulted in a perceived significant increase in the number of incidents listed in comparison to previous years.

ESB Networks uses appropriately licenced and permitted environmental incident response contractors, and environmental consultant services, and liaises with relevant regulatory authorities in connection with environmental incident management as necessary. Spill response training is delivered to staff engaged in oil and oil filled equipment handling and a range of related ESB Networks Guidelines have been developed and are available.

Spill kits and associated consumables are also available in depots, stores, HV stations and in fleet and equipment vehicles as required.





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