



# SUSTAINABILITY REPORT 2014

Brighter Possibilities





 BRIGHTER POSSIBILITIES 



## BRIGHTER POSSIBILITIES

Since ESB was established in 1927, it has always endeavoured to bring light and energy to the people it serves, allowing individuals and communities to fulfil their potential in every walk of life. This is achieved not only through the provision of critical energy infrastructure, but also through ESB's contribution to the economy in the form of investment, taxes, dividends and jobs; in addition ESB is committed to playing a full role in society by acting responsibly in how it conducts its business, working towards a low carbon future and supporting the communities in which it works.

The future is electric and with that comes Brighter Possibilities.

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We welcome requests and comments relating to the report and other sustainability matters via our contact mailbox: [sustainability@esb.ie](mailto:sustainability@esb.ie) or by contacting our Sustainability Coordinator: [brian.gray@esb.ie](mailto:brian.gray@esb.ie)

Follow us on Twitter: [@ESBGroup](https://twitter.com/ESBGroup)

[www.esb.ie](http://www.esb.ie)





## ABOUT THIS REPORT

Aimed at customers, investors, analysts, governments, other stakeholders and interested members of the public, this report focuses on the sustainability issues of greatest concern to our stakeholders and our business. Our reporting is guided by the principles of materiality, inclusiveness and responsiveness. We use leading standards and methodologies for measuring and reporting impacts, such as the Greenhouse Gas Protocol and the Global Reporting Initiative (GRI). Further details on GRI indicators are available in the report appendices.

This report has been independently assessed by DNVGL to meet application level Core Disclosures against GRI G4.

## SCOPE OF REPORT

This report includes data for the fiscal and calendar year 2014, which has been approved by ESB Group's Sustainability Committee at a meeting in Quarter 4 2015. This report pertains to the full activities of ESB and its subsidiary companies, including NIE, hereinafter referred to as ESB Group, and has been prepared in accordance with GRI G4 Sustainability Reporting Guidelines, as well as the Electric Utilities Sector Supplement. The report content is based on the output from a materiality process, including both operational and strategic engagements with internal and external stakeholders, and we seek to address the issues of greatest material importance to our stakeholders and to ESB. The 2014 Sustainability Report meets the commitment made to stakeholders in 2009 to report annually on our Sustainability endeavours.

ACCESS THE 2013  
SUSTAINABILITY REPORT, [HERE](#)

Where scope boundaries pertain to specific material aspects of the business, this is detailed in the specific sections of the report. Readers of this Sustainability Report 2014 may also view the ESB Group Annual Report 2014 .

TO ACCESS THE 2014 ANNUAL  
REPORT, [CLICK HERE](#)

Together these reports illustrate a coherent picture of ESB Group activity, how we are embedding sustainability and how sustainability supports the corporate strategy.



# 01 EXECUTIVE SUMMARY, STRATEGY AND PERFORMANCE



01 EXECUTIVE SUMMARY

02 ESB GROUP OVERVIEW

03 MATERIALITY PROCESS AND ENGAGEMENT

04 ISSUES OF MATERIAL IMPORTANCE TO ESB

05 APPENDICES

# 2014 PERFORMANCE HIGHLIGHTS

## EMISSIONS

■ CO<sub>2</sub> emissions from thermal generation reduced 168,000 Tonnes in 2014 over 2013. Absolute generation emissions are 37% lower since the commencement of EU Emissions Trading Scheme (EU ETS) in 2005.



[SEE SECTION 4.9](#)

## FLEET FUEL

■ Fleet Fuel consumption reduced by 10.2% in 2014 over 2013, delivering a further fuel saving of 476,000 litres of diesel, the equivalent of removing 200 passenger vehicles off the road for a year.



[SEE SECTION 4.8](#)

## HEALTH & SAFETY

■ 2014 was overshadowed by the death of our colleague, Declan Molloy, whilst at work. Safety remains a core value for the organisation and we continue to invest heavily in safety structures and the development of safety competencies to protect our staff, colleagues and members of the public.



[SEE SECTION 4.1](#)

## RENEWABLES

■ 1.46 TWh of electricity generated from renewable sources, helping to reduce our generation carbon intensity to 576gCO<sub>2</sub>/kWh, a 2gCO<sub>2</sub>/kWh reduction on 2013 and providing enough renewable energy to power 300,000 households for a year.



[SEE SECTION 4.9](#)

## FUTURE NETWORKS

■ ESB Networks and NIE continue to facilitate renewable connections. On an all island basis over 3,000 renewable generation installations (large, small and micro scale) were connected in 2014, bringing the level of renewable capacity installed across the island to 2,950MW.



[SEE SECTION 4.4 & 4.5](#)

## SUSTAINABLE INNOVATION

■ ESB Group has invested to create a national electric vehicle public charging infrastructure – in both jurisdictions in Ireland, with over 1,900 charge points installed. The next stage is commercialising this infrastructure and leveraging its capabilities to generate business opportunities elsewhere.



[SEE SECTION 4.3](#)

## IMPACT ON SOCIETY

■ ESB Group's business activity in 2014 directly contributed over €2.3 billion to the Irish economy through dividends, salaries, taxes and local procurement activities. This included active procurement of goods and services from over 6,000 Tier 1 Suppliers.



[SEE SECTION 4.6](#)

## ENERGY USAGE

■ Electric Ireland is working closely with the energy poor, domestic, commercial and industrial sectors to deliver energy efficiency improvements. Projects delivered in 2014 saved electricity users over 150GWhCO<sub>2</sub> of electricity consumption.



[SEE SECTION 4.2](#)

## OPERATIONAL EFFICIENCY

■ Under the performance improvement programme, we've delivered recurring annual savings of over €270 million. As part of this we've reduced energy consumption from our fleet and buildings by 30GWhs against our 2006 baseline.



[SEE SECTION 4.8](#)



# WELCOME FROM CHIEF EXECUTIVE, PAT O'DOHERTY

## 1.1 WELCOME

Welcome to our 2014 Sustainability Report which is our sixth annual sustainability report. The scope of sustainability as a concept has extended from a relatively narrow focus on environmental issues to a broader approach integrating economic, social, environment and governance requirements within the sustainable development framework. Since our first Corporate Social Responsibility report was published in 2003, ESB has progressed and developed in all areas of sustainability and has sought to ensure that the key elements of our sustainability strategy are embedded within our business model in all aspects of our business operations as a key driver for ESB.

We are in the second full year of our Group Strategy to 2025, which will position ESB to becoming a utility of scale, offering sustainable and competitive solutions in an integrated Republic of Ireland (ROI), Northern Ireland (NI) and Great Britain (GB) market. Under the strategy, we are investing in low carbon generation, building smart networks and maximising the efficiency of our business. During 2014, we made progress in all of these areas.

A key part of our Corporate Strategy to 2025 is to leverage knowledge within ESB to advance the low carbon agenda through sustainable innovations. Our sustainability strategy supports our corporate strategy, and reflects our determination to build a successful business in the long-term as we move to decarbonise our generation activities by 2050.

### KEY ASPECTS OF OUR PERFORMANCE IN 2014

The implementation of ESB's Group Strategy to 2025 remains on track. The strategy aims to deliver a smarter, more sustainable electricity system, which will support national decarbonisation targets and meet the future energy needs of our customers.

The construction of Carrington Power Station in the UK is a key element of the strategy and will allow ESB to compete as a player of scale in the all-islands electricity market. The plant continued



Pat O'Doherty, Chief Executive

construction during 2014 and is scheduled to begin commercial operations in 2016. On an all-island basis, ESB's share of the generation market is 43% and its share of the total supply market is 37%.

Competitive offerings and innovative products helped Electric Ireland to maintain its share of the energy supply market during 2014, despite intensifying competition from new market entrants. A price reduction on our standard electricity tariff was introduced in the fourth quarter. During the year, we received competition clearance for a joint venture with Vodafone to roll out high-speed fibre broadband and work on our new fibre broadband network began with a pilot project in Cavan in the second half of the year with the objective of reaching 500,000 customers in 50 towns by the end of 2018 using our distribution network. This is an ambitious and much needed project, which will help transform the economy of many rural Irish towns.

### SAFETY, HEALTH AND WELLBEING

2014 was overshadowed by a workplace accident which led to the death of Declan Molloy, an experienced member of staff. The accident took

**The scope of sustainability as a concept has extended from a relatively narrow focus on environmental issues to a broader approach integrating economic, social, environment and governance requirements**

place less than two years after the death of Shane Conlan who was fatally injured in a work incident in January 2013. These events have shocked and saddened the organisation. During 2014, we undertook a root and branch review of our safety processes. Safety remains a core value for the organisation and we continue to invest heavily in safety structures and the development of safety competencies to protect our staff, colleagues and members of the public.

## ENVIRONMENT AND CLIMATE CHANGE

Our generating station CO<sub>2</sub> emissions in 2014 reduced to 9.13 million tonnes, a reduction of 168,000 tonnes on 2013. The carbon intensity of our generation activity for 2014 was 576g/kWh, a reduction of 2g/kWh on 2013. In 2014 we reduced our fleet CO<sub>2</sub> emissions by 10.2% and electricity consumption in our buildings by 5.2%. While CO<sub>2</sub> emissions from car travel increased by 9.3%, our internal CO<sub>2</sub> footprint reduced by 3,300 tonnes, or 10.7%, in 2014 as compared with 2013.

## SOCIAL

ESB constantly strives to bring light and energy to the communities in which we work, not only through our physical infrastructure but also through our corporate social responsibility (CSR) and sustainability programmes. During 2014, we distributed €2 million to a range of community based initiatives through our social impact fund, Energy for Generations, with particular emphasis on projects to address suicide prevention, homelessness and educational disadvantage. We also recorded over 30,000 hours of staff volunteering during the year.

In the area of sustainability, we continued to reduce our CO<sub>2</sub> emissions and made significant strides in delivering new infrastructure to support a low carbon energy future. ESB is conscious that many of its customers are struggling to make ends meet. Through Electric Ireland, we continue to offer competitive and innovative products and services to support our customers, including Pay As You Go meters. We also reduced our standard electricity tariff by 2% during the year ahead of the winter peak when customers need it most. Electric Ireland helped to develop the new

Supplier Code on Disconnections, an industry agreed code of practice to protect vulnerable customers. We are fully compliant with the code, which consolidates many of the practices already in place in Electric Ireland and have the lowest rate of disconnections per 10,000 customers of all the major suppliers.

Electric Ireland supported the sixth year of Pieta House's (a suicide and self-harm crisis centre) Darkness Into Light fundraising walk. Electric Ireland also supported Powering Kindness Week, which is an initiative that encourages people to do a simple act of kindness and bank it in favour of one of three Irish charities, to help them share in Electric Ireland's €130,000 fund. Electric Ireland also sponsors the GAA Football/Hurling All-Ireland Minor Championships.

## GOVERNANCE

Good governance is essential to the sustainable growth of our business. ESB is committed to the highest standards of corporate governance, and transparency and accountability are at the heart of this commitment. ESB has put in place the appropriate measures to comply with the Code of Practice for the Governance of State Bodies, updated in 2009. The Code sets out the governance framework agreed by Government for the internal management and the internal and external reporting relationships of commercial and non-commercial State bodies. ESB continuously reviews and updates its policies and procedures to ensure compliance with the Code and best practice in corporate governance. ESB also conforms as far as possible, and on a voluntary basis, to the UK Corporate Governance Code. Our compliance on a voluntary basis with the Corporate Governance Code demonstrates our commitment to the highest standards of governance and corporate behaviour.

## ECONOMIC PERFORMANCE

2014 has been a more challenging year for ESB than 2013, however we reported solid profits after tax of €215 million and earned a return on capital employed (ROCE) of 6%. Operating profits were constrained by lower wholesale electricity prices, impairments of two specific generation assets, low levels of availability in parts of the generation

fleet as a result of unplanned outages and storm repair costs associated with restoring power to customers in the first quarter of the year. In addition there was a negative non-cash movement related to the mark to market of certain financial instruments.

These issues were partly offset by two positive exceptional items – a gain on the sale of ESB's 50% interest in a Spanish power station and the fair value uplift related to the establishment of the fibre joint venture.

ESB paid an interim dividend of €47.1 million and also special dividends of €260.2 million (€46.5 million in May 2014 and €213.7 million in January 2015), representing the final instalment of the one off dividend to the Government. The Board has recommended a final dividend payment of €10.4 million bringing total dividends for 2014 to €317.7 million and to almost €1.5 billion over the past ten years.

Capital expenditure was €960 million in 2014. Across ESB, we continued to invest in critical infrastructure in ROI, NI and GB, including new

**Our success is built from the hard work and dedication of our people. ESB must be a top class employer that can attract and retain high quality, highly skilled people by offering great career and development opportunities**

low carbon generation and upgrades to our transmission and distribution networks. €448 million was invested in the Irish electricity network to support new, renewable generation. In GB, we are investing over €800 million in the construction of Carrington Power Station which is on schedule to begin commercial operations in 2016. During the year, we made further operational cost savings in all areas of the business. Since 2010, we have achieved recurring annual savings in excess of €270 million against a target of €280 million. This has been a challenging process and I want to acknowledge the important role played by staff in the on-going implementation of the 2011–2015 Payroll Cost Base Reduction Agreement.

## OUR PEOPLE

We operate in a complex and increasingly competitive market where our success is built from the hard work and dedication of our people. ESB must be a top class employer that can attract and retain high quality, highly skilled people, by offering great career and development opportunities as well as competitive reward packages. I would like to thank the staff of ESB for their hard work and commitment to the organisation during 2014, particularly the front line staff in ESB Networks and NIE who, supported by colleagues from across the Group, worked tirelessly in very difficult conditions to restore power to customers following the storms in February 2014.

## CHALLENGES

The scale of change and level of uncertainty facing the electricity sector means that both our strategy and our people must be flexible enough to respond quickly to new developments and adapt to a new energy landscape. For Electric Ireland, the immediate priority will be to retain and grow market share in an increasingly competitive environment. For ESB Networks, the main challenge in 2015 will be to secure sufficient funding under the Commission for Energy Regulation (CER) (the independent regulator of the energy market in ROI) Price Review (PR4) to fund necessary investments in the network over the next five years. Meanwhile, the challenge for Generation and Wholesale Markets (G&WM) will be to ensure the operational and financial success

of the Carrington Power Station and to deliver the investment in renewables required to continue to reduce our generation carbon footprint. In these challenging times, I would like to extend my thanks to all the staff throughout ESB for their continued dedication and outstanding commitment which I am very proud to be associated with.

## OUTLOOK

Economic indicators are positive, but trading conditions remain challenging as competition intensifies from new market entrants, including international utilities and emerging technologies. We will drive forward the implementation of our Group Strategy to 2025 as the most effective way to ensure that our customers in the Republic of Ireland, Northern Ireland and the Great Britain market have access to secure, reliable and competitive energy supplies.

In the medium term, we will continue to drive the implementation of our Corporate Strategy to 2025 in order to deliver sustainable and competitive products and services to meet changing customer needs in the integrated Irish British energy market. As we look ahead, we will continue to focus on safety, cost reduction, maintaining the financial strength of ESB and the delivery of sustainable and competitive energy solutions to our customers and stakeholders. Increasingly, we are moving from being a large player in a small market to being a small but important player in a much larger market. To compete successfully and ensure the sustainability of our business, we need an engaged and agile workforce, committed to the future of ESB.

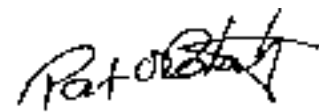
## CONCLUSION

The energy sector is going through a period of massive transition, driven by new technology and the need to balance energy affordability, energy security and decarbonisation objectives. We are making long-term investment decisions in the context of a future that is more complex and uncertain than ever before.

I am confident that our Group Strategy to 2025, which is focused on sustainable innovation to deliver a broad mix of low carbon generation technologies and advanced, smart networks, together with our ongoing emphasis on cost

reduction, is the right path for ESB and will ensure that we remain at the forefront of the energy sector in an integrated ROI/NIE/GB market.

Sustainability performance in ESB remains deeply rooted in our overall business strategy. For 2015 we plan to further assess key issues and identify links to add value to our businesses and so enhance our overall sustainability performance. I would like to acknowledge the dedication and efforts of everyone in ESB Group who continue to demonstrate full commitment to developing our performance and have enabled our many achievements in this area. We welcome feedback from all our stakeholders and we will continue to keep you informed of our sustainability progress.



Pat O'Doherty, Chief Executive

**The scale of change and level of uncertainty facing the electricity sector means that both our strategy and our people must be flexible enough to respond quickly to new developments and adapt to a new energy landscape**

# IMPACTS, RISKS AND OPPORTUNITIES

## 1.2 IMPACTS, RISKS AND OPPORTUNITIES

### HEALTH & SAFETY

ESB is subject to stringent health and safety legislation covering all aspects of its activities. Maintaining compliance with health and safety legislation and creating a safe working environment is a significant challenge given the high risk activities inherent in an electrical utility business.

ESB rigorously enforces its safety policies and standards to achieve its ultimate target of creating a zero harm environment. An extensive safety management programme, fully supported by the Board and Management, is in place throughout ESB to address key safety risks and issues and is subject to review on an on-going basis. Creating a zero-harm environment will provide an opportunity for ESB to deliver a step-change in its performance and lead to improvements in organisational culture through having a highly motivated, flexible and engaged staff.

### ENVIRONMENT & CLIMATE CHANGE

ESB is subject to stringent environmental legislation with increasing focus on climate change and environmental issues. ESB strategy is to decarbonise its generation activities by 2050 in line with European and National Energy and Climate policy. There are significant challenges associated with delivery of this strategy including the costs of financing new renewable technologies, the cost of carbon and operation of the EU Emissions Trading Scheme, energy trading arrangements, market integration through the establishment of EU Regional Energy Markets and the challenging European and Irish economic environment.

ESB ambition is to develop a low-carbon generation business of scale. This balanced portfolio includes non-renewable generation (coal, gas and peat) and an increasing amount of renewable energy (hydro, wind and other renewable energy technologies). ESB has put in place the necessary skills, competencies and expertise to deliver this ambition. The journey towards a low carbon business will also create

opportunities for ESB in terms of the assessment of new emerging technologies which will be a key part of the energy mix in future years as well as creating opportunities for future revenue growth.

### SUSTAINABLE INNOVATION

The energy market is going through a period of profound change, moving from its traditional model of large centralised generation with transmission, distribution and supply to passive customers to a new model involving smaller, distributed generation potentially eliminating the need for transmission and distribution networks and customers who are very proactive in managing their energy usage via Smart technologies in the home. The development of new ICT technologies is a key enabler for this new energy future.

ESB is heavily involved in assessing new emerging innovative technologies. There are inherent risks and challenges associated with developing new technologies and new business models which have the potential to disrupt the existing energy market.

ESB has established a dedicated business area to focus on the development of sustainable business opportunities in specific areas of Innovation including Electric Vehicles, Fibre to the Home, Ocean Energy, Solar PV as well as investment in clean-tech sectors. These teams are involved in both assessing the technologies and also the required business models to assist with our overall sustainability ambitions.

### WORLD CLASS NETWORKS

Our vision is to deliver a World Class Electricity Network for the Irish nation. ESB is heavily involved in developing the electricity network to accommodate increasing amounts of renewable energy with a strong focus on Smart grids and Smart metering, as well as building resilience into the network to adapt to climate change impacts from increasingly frequent severe weather events.

There are inherent challenges in developing the network to accommodate 40% renewable energy

by 2020. Over the last 10 years we have invested €1 billion to refurbish and upgrade the national electricity network. We have facilitated over 2950MW of renewable generation, enough to power almost one million homes.

Through building a Smart Network we have increased network reliability – power cuts have reduced by 42%. We have rebuilt over 90,000km of network, while also doubling the capacity of over 46,000km.

### CORPORATE RESPONSIBILITY

ESB is involved in all aspects of Irish life and is very involved in the community. ESB places a strong emphasis on its reputation as a strong leading player in the industry and any adverse publicity could cause harm to that reputation.

ESB works hard at all levels to being a responsible company. We are pleased to have been awarded the Business Working Responsibly Mark since 2011 as external validation of our commitment to being a responsible company. We will continue to engage with our stakeholders and the wider community and to ensuring all activities are carried out in a responsible manner.

This creates an opportunity for ESB to further engage with our stakeholders to present our vision of the future and the key role that ESB has to play as part of this future.

### PEOPLE

ESB's ambition is to build an engaged and agile organisation. While ESB has in place best practice HR policies and procedures, there remains a challenge to ensure that ESB has access to the future skills and competencies required for the new emerging energy sector post 2020.

Strategic Resource Planning is carried out on an annual basis within each business line. It involves analysing business issues, needs and drivers to develop plausible scenarios on which workforce planning is based. The resultant workforce demand is developed and compared to the supply and a strategy is put in place to address the gaps.





Upgrading of rural distribution network from 10kV to 20kV delivers a higher quality supply to the periphery of the network.

Strategic Resource Planning also assists with developing our staff and contributes towards succession planning for the business during a period of immense change.

**1.3 GOVERNANCE**

ESB is subject to appropriate governance legislation covering all aspects of its activities. Inadequate compliance with our governance framework would introduce a risk to the business. ESB has put in place the appropriate measures

to comply with the Code of Practice for the Governance of State Bodies, updated in 2009. ESB also conforms as far as possible, and on a voluntary basis, to the UK Corporate Governance Code. ESB continuously reviews its policies and procedures to ensure best practice in corporate governance.

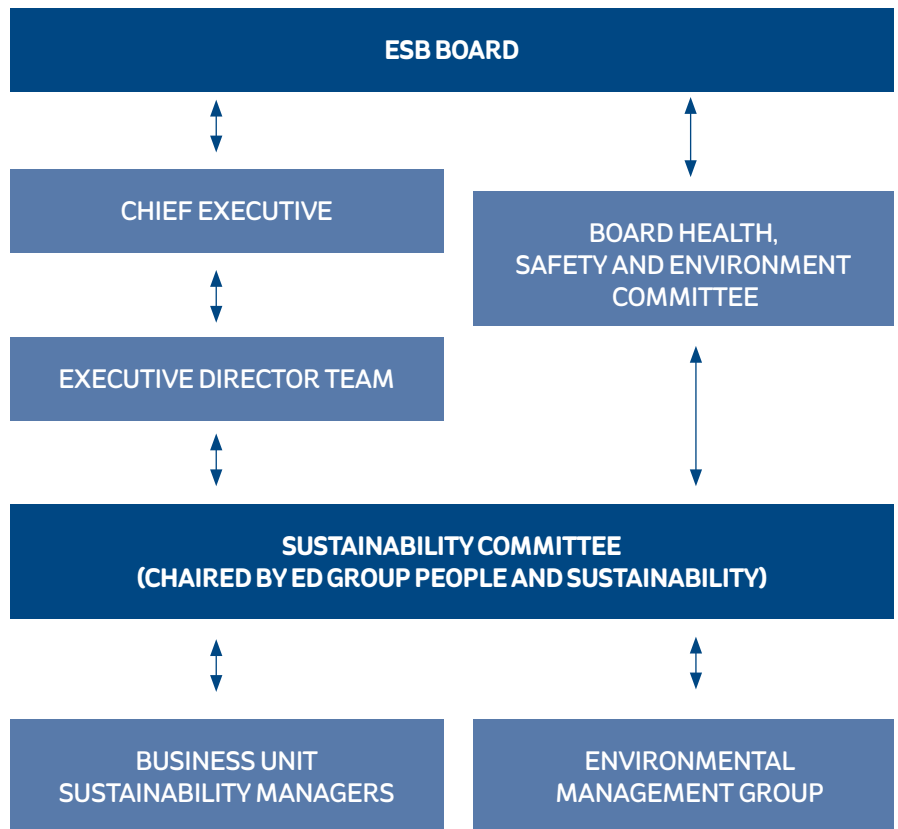
ESB values its reputation and maintaining best practise governance arrangements is an important aspect of ESB business performance.

FOR FURTHER DETAIL ON OUR ENTERPRISE RISK MANAGEMENT PROCESS, OUR PRINCIPAL RISKS AND MITIGATION STRATEGIES AND OUR RISK HEAT MAP, [PLEASE CONSULT OUR RISK REPORT SECTION HERE](#)

**GOVERNANCE OF SUSTAINABILITY**

The Board Committee on Health Safety and Environment oversee and provide governance on the implementation of the sustainability strategy and facilitate detailed consideration of sustainability matters on behalf of the Board.

A Sustainability Committee is chaired by the Executive Director Group People and Sustainability and made up of senior managers from each business unit. The Sustainability Committee is responsible for approval of the sustainability strategy and for providing leadership on sustainability in each business unit. The committee meets four times a year to review progress and overall group performance against the strategy. The committee also oversees assurance on environmental management through receiving reports from an Environmental Management Group, made up of business unit Environmental Co-ordinators, which meets four times a year.



**THE WAY WE WORK**

**THE WAY WE ARE STRUCTURED**

Our organisation is structured to allow for effective and efficient decision-making with clear accountabilities.

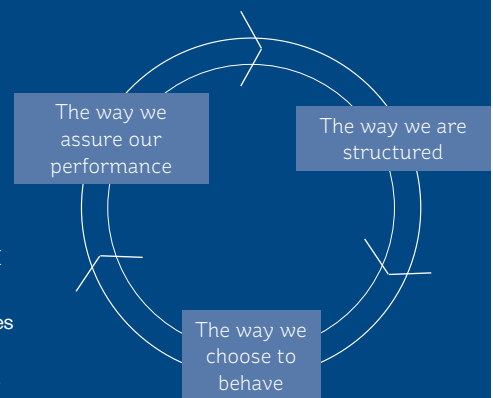
**THE WAY WE CHOOSE TO BEHAVE**

- We comply with the Code of Practice for the Governance of State Bodies (updated in 2009).
- We conform as far as possible and on a voluntary basis, to the UK Corporate Governance Code.
- Our code of ethics outlines our approach to responsible business behaviour. The

underlying principle of the code is that employees will strive to perform their duties in accordance with the highest standards of integrity, loyalty, fairness and confidentiality and that they will abide by all legal and regulatory requirements to enhance the reputation of the ESB Group.

**THE WAY WE ASSURE OUR PERFORMANCE**

- Management assurance is provided by a combination of effective management processes and risk and compliance activities.
- Independent assurance is provided primarily by internal audit and by our external auditors.



# 02 ESB GROUP OVERVIEW

## Our Vision

To be Ireland's foremost energy company, competing successfully in the all-islands market

## Our Mission

To bring sustainable and competitive energy solutions to all our customers



## GENERATION

Creating cleaner power using sustainable generation

- Wind
- Thermal
- Hydro
- Pumped storage
- Ocean

## NETWORKS

Building smarter networks that put the customer in control of their energy

- Smart grids
- Smart meters
- Power check apps





## ELECTRIC IRELAND

Bringing sustainable and competitive energy solutions to all our customers

- Supplier electricity and gas
- Smart meters
- Remote heating control (Climote, NEST)
- Energy efficiency incentive scheme
- Energy services

## OTHER SEGMENTS

Bringing leading edge energy solutions to all our customers

- eCars
- Fibre broadband
- Engineering Services
- Telecoms
- Emerging technologies



# ABOUT ESB

## 2.1 ESB GROUP OVERVIEW

### ABOUT ESB

ESB was established in 1927 as a corporate body in the Republic of Ireland under the Electricity (Supply) Act 1927. With a holding of 95%, ESB is majority owned by the Irish Government. The remaining 5% is held by the Trustee of an Employee Share Ownership Plan. As a strong, diversified, vertically integrated utility, ESB operates right across the electricity market: from generation, through transmission and distribution, to supply. In addition, ESB extracts further value at certain points along this chain: supplying gas, using our networks to carry fibre for telecommunications and more. With a regulated asset base (RAB) of approximately €9 billion, 43% of generation in the all-island market and supplier of electricity to approximately 1.5 million customers throughout the island of Ireland, ESB is a leading Irish utility focused on providing excellent customer service and maintaining our financial strength. As at 31 December 2014, ESB Group

employed approximately 7,150 people. ESB's main operations are in the Single Electricity Market (SEM), the single wholesale market pool for electricity in the Republic of Ireland (ROI) and Northern Ireland (NI). Preparations are underway for further market integration with the UK, through the establishment of a regional electricity market (REM). Whilst ESB Group operates its headquarters from Dublin, Ireland, we have a widespread presence and operations across many regions of the globe.

FURTHER DETAILS OF THE BUSINESS ENVIRONMENT CHALLENGES FACING ESB AND OUR STRATEGY FOR MEETING THEM IS GIVEN IN OUR ANNUAL REPORT 2014 [HERE](#)

**ESB's main operations are in the Single Electricity Market, the single wholesale market pool for electricity in the Republic of Ireland and Northern Ireland**

### ESB GROUP OPERATIONS AROUND THE GLOBE

Business Area	Republic of Ireland	Northern Ireland	United Kingdom	Europe	Middle East	Asia	Africa
Electricity & Natural Gas Supply							
Distribution System Operator							
Generation							
Business Support Services							
Emerging Technologies							
Engineering Consulting and Services							
Energy Services							

### ESB GROUP BRANDS AND REGIONS OF OPERATION

The table on page 13 shows the main brands that form the ESB Group and the regions in which they operate. The nature of the business area determines the type of products and services offered. Electric Ireland, the supply business of ESB, offers electricity and gas to 1.5 million domestic, commercial and industrial customers. Energy efficiency advice and services are also offered.

ESB Networks and NIE are licensed Distribution System Operators and operate under a strictly regulated framework, where they provide network maintenance, renewal and extension programmes to boost network resilience, ensure quality and continuity of supply, improve network efficiency and facilitate renewables connections.

ESB's generation business is focused on the development, operation and trading of ESB's electricity generation assets, whilst investing to reduce the carbon intensity of our generation plant and increase the role of renewable energy to deliver a decarbonisation of electricity generation by 2050 in line with other European utilities. The Innovation area acts as a focal point for new ideas and emerging technologies across the ESB Group and is the driver of new growth opportunities and transformation across the organisation, with a view to bringing new business opportunities to commercialisation.

### SCALE OF OPERATIONS



**103** NETWORK DEPOTS, YARDS, STORES AND VEHICLE WORKSHOPS



**09** THERMAL GENERATION STATIONS



**08** HYDRO AND PUMPED STORAGE STATIONS



**20** WINDFARMS



**45** OFFICES AND WAREHOUSES

FOR FURTHER INSIGHT INTO THE OPERATIONAL BUSINESS UNITS SPANNING THE ESB GROUP, PLEASE REFER TO THE OPERATING AND FINANCIAL REVIEW SECTION OF THE 2014 ANNUAL REPORT, [CLICK HERE](#)

# ABOUT ESB

## 2.2 ESB WORKFORCE

ESB Group employed approximately 7,150 staff as at 31/12/14, across its five key operational business areas outlined above. Approximately 4,200 (59%) of these staff are directly covered by collective bargaining arrangements as members of trade unions, reflecting ESB Group's position of supporting freedom of association for all staff.

Third Party Personnel means all persons (including sub-contractors of all tiers and their employees) employed or otherwise engaged by a Third Party in the provision of goods and/or Services to or on behalf of ESB are required to comply with the provisions stipulated in ESB's

Requirement for Third Parties document. These provisions extend to allowing freedom of association for all third party personnel.

The conduct of all staff in carrying out their work is subject to ESB's code of ethics.

The underlying principle of this Code is that we will strive to perform our duties in accordance with the highest standards of integrity, loyalty, fairness, and confidentiality and that we will comply with all legal and regulatory requirements.

## 2.3 ESB GROUP SUPPLY CHAIN

ESB's Supply Chain is key to our business success and meeting ESB's sustainability goals. The basis of our work with our supply chain partners is founded on ESB's Supplier Charter and Requirements for Third Parties, which establishes clear standards in relation to conduct of business, corporate responsibility, compliance with employment standards and applicable law.

ESB's supply chain supports its business operations

in generation, networks and supply – including its international activities. With an annual procurement spend (excluding fuel) of in excess of €600m (fuel spend €320m in 2014), we rely on a complex and diverse supply chain in order to provide the services necessary to meet our customers' needs. Of this spend approximately 60% is sourced from suppliers within the Republic of Ireland & Northern Ireland, 10% from the UK, 20% from other EU member states and the remainder from outside the EU.

We currently have over 6,000 active Tier 1 suppliers, ranging from local SMEs and micro companies to large multi-national corporations/contractors. Many of these suppliers have multiple sub-suppliers and in some instances there can be as many as six to 10 levels of supply between ESB and the original source of raw material.

Due to the scale, complexity and broad distribution of this contractor workforce, ESB does not consolidate numbers of contracting entities, collective bargaining coverage amongst contractors or total contractor staff employed at this time.

ESB expects all suppliers/contractors providing goods, services or works to ESB and/or on behalf of ESB to conduct their business in an honest and ethical manner, in accordance with all applicable laws, and to respect internationally recognised human rights.

ESB requires suppliers to comply with all employment legislation in all countries in which they provide goods or services to, or on behalf of, ESB, including but not limited to laws relating to the use of child, forced or compulsory labour, non-discrimination, working hours and freedom of association. Where suppliers are engaged in the provision of services on an ESB site, ESB also expects supplier personnel to conduct themselves in accordance with ESB's Respect and Dignity at Work Policy, which defines clear standards of behaviour in relation to each individual's right to be treated with respect and dignity in their working life.

To monitor compliance with contractor employment standards, ESB undertakes independent audits of contractor employee pay and conditions to ensure these standards are being upheld. In 2014, 59 such audits were undertaken, covering a representative sample of project types and sizes and the nature of the contracts in place, whilst ensuring all major

FOR MORE INFORMATION ON THE ESB CODE OF ETHICS [CLICK HERE](#)

STAFF BREAKDOWN	2013	2014
Average Number of Staff	7490 <sup>2</sup>	7150 <sup>2</sup>
42% of which are classified as skilled craft and general staff, 58% as non-craft and general.		
Female%	21.1%	23.2%
Male %	78.9%	76.8%
% Management Level Female	21%	21%
% Board Members Female	33%	33%
Permanent Contract <sup>3</sup>	89.93%	93.7%
Temporary/Other Contract <sup>4</sup>	10.07%	6.3%
Full Time (%)	89.19%	94.1%
Part Time (%)	10.81%	5.9%
Staff with Disabilities <sup>1</sup>	5.3%	5.3%
Third Party Contractor Staff	Not disclosed	3300 <sup>5</sup>

<sup>1</sup> The target set by Government is to achieve a 3% rate of employment of people with disabilities  
<sup>2</sup> Figures include Northern Ireland Electricity and ESB International overseas staff  
<sup>3</sup> Permanent Staff 23.7% Female, 76.3% Male  
<sup>4</sup> Temporary 20.5% Female, 79.5% Male.  
<sup>5</sup> Contractor staff working in the provision of facility support services (catering, cleaning etc., supporting network activities in ROI, generating station overhauls (UK & ROI) and Carrington construction (UK)

■ REPUBLIC OF IRELAND	81%	■ MIDDLE EAST	1.4%
■ NORTHERN IRELAND	17.5%	■ ASIA	0.03%
■ EUROPE	0.06%	■ AFRICA	0.01%

projects are audited.

ESB's Supplier Charter sets out the principles of these engagements and the 3rd Party Requirements further stipulates the legal requirements with regard to standards required.

FOR MORE  
INFORMATION ON  
ESB'S SUPPLIER  
CHARTER [CLICK HERE](#)

FOR MORE INFORMATION  
ON ESB'S REQUIREMENT  
FOR THIRD PARTIES  
[CLICK HERE](#)

#### 2.4 SIGNIFICANCE OF ORGANISATIONAL CHANGES

ESB successfully sold its 50% shareholding in Bizkaia Energia SL, the 755MW combined cycle gas turbine in northern Spain, during 2014. As a result of this sale, the Group's generation portfolio operates solely in the home markets of Ireland and the United Kingdom. A significant joint venture was announced with Vodafone, where ESB and Vodafone will invest €450 million to roll out a fibre to the building network to 50 regional towns across the country. This pioneering initiative will deliver fibre broadband with upload and download speeds of up to 1Gb/s to over half a million premises countrywide, enabling a revolution in internet usage for those communities. This fibre will be deployed on ESB's existing overhead and underground infrastructure.

#### 2.5 PRECAUTIONARY PRINCIPLE

ESB's Environmental & Sustainability Policy puts the precautionary principle at the heart of our approach to managing and mitigating our potential impacts. ESB recognizes that our activities comprising of electricity

FOR MORE ON THE ESB  
ENVIRONMENTAL POLICY  
[CLICK HERE](#)

generation, transmission, distribution and supply have environmental impacts and that it is our responsibility to manage these impacts in a manner that provides a high level of protection for our natural environment and contributes to the sustainable development of our economy. ESB's Corporate Strategy, supported by its sustainability strategy and objectives, seeks to deliver an efficient low carbon generation portfolio, through investment in existing, emerging and new renewable technologies, as well as leveraging further efficiencies and innovative opportunities that will reduce environmental impact.

The precautionary principle is also addressed through the consideration of environmental risk within the risk management of environmental aspects, the resulting prevention and mitigation strategies, and the widespread use of environmental impact assessments as a preventative tool in the development of new infrastructure projects.

The implementation of an ISO14001 compliant Environmental Management Systems (EMS) is also key in the application of the precautionary principle within the organisation. The EMS framework facilitates the undertaking of emergency drills, the reporting, investigation and root cause analysis of incidents, thereby preventing future reoccurrence. The delivery of training on the EMS allows these principles to be disseminated across the ESB Group.

#### 2.6 CHARTERS TO WHICH THE ORGANISATION SUBSCRIBES

- Code of Practice for the Governance of State Bodies
- UK Corporate Governance Code
- Irish Corporate Governance Annex
- The Prompt Payment Code of Conduct
- The Energy Engage Code

#### 2.7 PRINCIPAL ASSOCIATIONS TO WHICH THE ORGANISATION BELONGS

ESB plays an active role in many associations, both at a board level and as an active member. Playing an active role in such external associations is central to the development of key staff, the promotion of engineering skills, developing common approaches on national policy, promoting diversity and inclusion in society as well as broad involvement in electrical

industry associations.

- Association for Higher Education Access and Disability (AHEAD)
- Business In The Community (BITC)
- Chambers Ireland
- Chartered Institute of Professional Development
- Corporate Leadership Council
- Diversity Charter of Ireland
- Electricity Association of Ireland (EAI)
- Electric Power Research Institute (EPRI)
- Engineers Ireland
- Eurelectric
- Gay and Lesbian Equality Network (GLEN)
- Irish Business and Employers Confederation (IBEC)
- Irish Marketing Institute
- Irish Wind Energy Association (IWEA)
- National Irish Safety Organisation (NISO)
- The Mediators Institute of Ireland.

#### 2.8 AWARDS AND RECOGNITION

- ESB Networks – Response to Storm Darwin – Best Corporate Campaign 2014 – Public Relations Institute of Ireland
- Ardnacrusha Generation Station – Environmental Award - Chambers Ireland CSR Awards 2014
- ESB – The Green Public Sector Award – The Green Awards 2014
- ESB Sustainability Report 2013 – Chartered Accountants Ireland Leinster Society – Best CSR/ Sustainability Report.



Pictured at the recent CSR awards were (top photo): Ian Talbot, CEO Chambers Ireland, Louise Murphy, Martina Mannix, Kathleen McDonnell, ESB Health & Wellbeing, Alan Kelly, Minister for Environment, Community and Local Government.  
Bottom photo: Ian Talbot, Alan Bane, Senan Collieran, Billy Condon, ESB Generation and Wholesale Markets, Dr. Shane Colgan, EPA, Alan Kelly, Minister for Environment, Community and Local Government.





# 03

# MATERIALITY PROCESS AND STAKEHOLDER ENGAGEMENT

# INTRODUCTION

### 3.1 INTRODUCTION

ESB Group is transitioning from GRI 3.1 to GRI G4 with this 2014 Sustainability Report, so this is the first materiality process we have aligned with GRI G4 and we recognize that this process will evolve as we build our experience and learning and this in turn will dictate the scope and focus of our reporting on sustainability and indeed our overarching sustainability strategy.

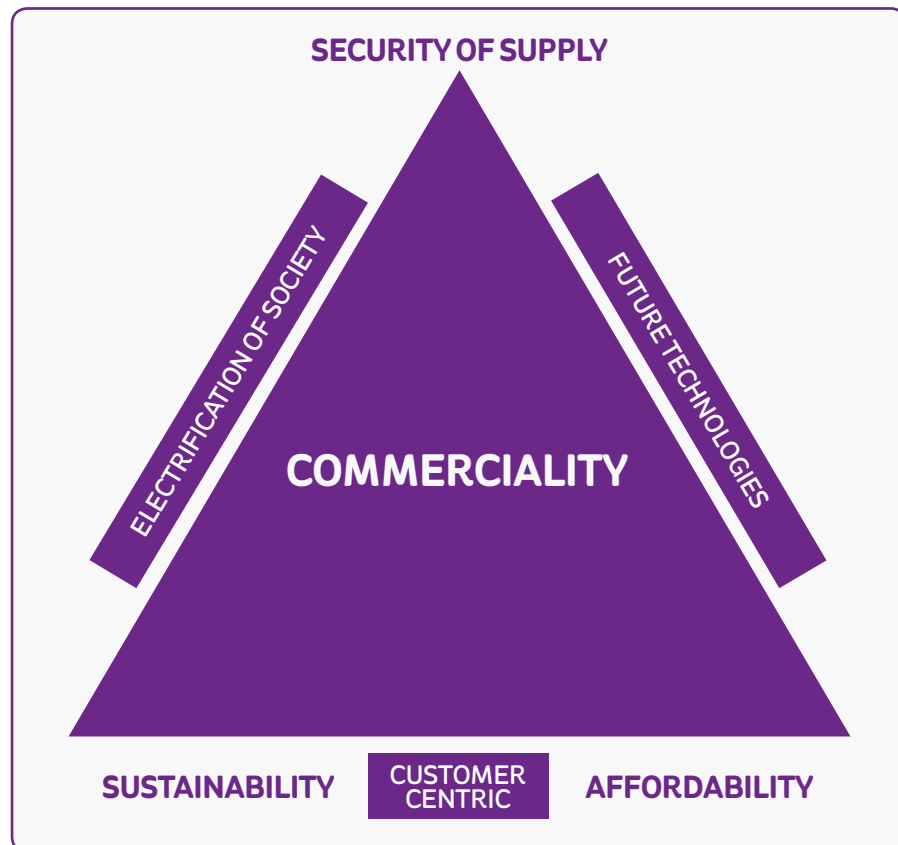
The energy sector is going through a period of massive transition, driven by new technology and the need to balance energy affordability, energy security and decarbonisation objectives. We are making long-term investment decisions in the context of a future that is more complex and uncertain than ever before.

This so called energy trilemma frames the context within which ESB Group undertook its internal materiality review process and is also a constant in our engagements with external stakeholder groups.

### 3.2 REPORT BOUNDARY

In defining the boundary of this report, taking into account all registered entities of ESB Group (see Note 32. ESB Annual Report 2014), we have focused on those entities where ESB has control and those activities that are significant for ESB Group from the economic, environmental and social standpoint.

The businesses outlined in section 2 of this report and their key activities, form the basic boundary of the contents of this report. Given the diverse nature of activities across the business areas of ESB Group, the material issues identified generally have a specific business unit focus and establish a clear aspect boundary that correlates to the business unit's operational limits themselves.



### 3.3 EXTERNAL STAKEHOLDER ENGAGEMENT

As a business we transmit and distribute electricity to every business and household on the island of Ireland. As such we have a strong and visible interface with every community to which we provide electricity. Stakeholder engagement is central to the success of our business activities.

Stakeholder engagement takes place at all levels of society, from the policy makers right down to the local community group, and ranges in focus from national to community level interests.

Externally, the materiality process is approached through a broad stakeholder engagement programme, as summarised in figure 3.1 (P.20).

Some of the key drivers that influence and determine the stakeholder groups that ESB Group engages with include: energy policy, planning and environmental policy, energy pricing, development of renewables, energy efficiency, fuel poverty, network infrastructure maintenance, upgrade and extension, development of ecar charging infrastructure, technology convergence, social and community level issues.

Maintaining good relationships with our external stakeholders to promote ESB's sustainability credentials as well as contributing to the ongoing debate about Ireland's energy future is a key ambition for ESB. As a leading player in the Irish energy sector, we have a requirement to engage extensively at a strategic and operational level with a broad range of stakeholder groups.

Our stakeholder engagement process takes place on a number of strategic, operational and compliance levels across the ESB Group of businesses. We endeavour to engage with the relevant stakeholder groups at least annually, where amongst the strategic and operational discussions, relevant sustainability issues are also discussed. Due to the broad nature of our business activities, individual businesses engage with relevant stakeholder groups via consultations, formal reporting processes, meetings, industry

fora, facilitated engagements and 1 on 1 sessions.

The objectives in engaging with our stakeholders are:

- To ensure that our key stakeholders are aware and kept up to date on ESB's progress and challenges
- To develop a shared understanding of the common issues of greatest importance to the stakeholder and to ESB, including specific sustainability issues
- To listen to the concerns and issues of key stakeholders around sustainability in order to address them through our operations
- To build confidence and trust amongst stakeholders in ESB and to demonstrate that ESB is a responsible organisation
- To further develop the relationships that we have with key stakeholders on social, economic and environmental policy issues, as well as compliance, regulatory, operational and future market challenges.

Emanating from our stakeholder engagement activities, the materiality matrix in Figure 3.2 below highlights the most material issues for ESB and our stakeholders. These issues in turn then feed into the internal process, which was convened by the Sustainability Committee at the Q1 meeting in 2015. The content of the sustainability report seeks to outline how we are addressing these issues in practice.



Dublin Fire Brigade staff carry out emergency drills with Dublin Bay Power emergency response team.



Pat O'Doherty, ESB Chief Executive, giving the keynote speech at the IWEA Conference.



A group from the Institution of Chemical Engineers (IChem E) visited Aghada CCGT during May and enjoyed a site tour as well as receiving a number of informative presentations. IChem E is the global professional membership organisation for people with relevant experience or an interest in chemical engineering. The visit was organised by Aghada staff Liz Stack, Kevin O'Donoghue and Sean Walsh and Adrian Dennehy of ESB Generation Engineering.



FIGURE 3.1 STAKEHOLDER ENGAGEMENT MATRIX

STAKEHOLDER GROUPING	MEANS OF ENGAGEMENT	SUBJECTS OF ENGAGEMENT	MOST IMPORTANT ISSUES RESULTING	CORRELATING MATERIAL ISSUE
Key Ministers & Government Departments, Policymakers (DCENR, DoE)	1 on 1 meetings, policy meetings, consultations	Energy policy, policy and regulatory issues, regulatory consultation processes, strategy	Energy policy, maintaining financial strength	Low Carbon Portfolio , Financial Performance
Regulatory Bodies (CER, UREG, OEIC, EPA, HSA, DoE, NPWS, SEAI)	Price review meetings, regular scheduled meetings, programme meetings, partnerships	Setting and compliance with licence and permit conditions, pricing and price reviews, work programmes, environment information appeals, planning issues	Electricity price, Legal compliance, delivery of work programmes, revenue levels, emissions, construction activities, land, buildings, public safety	Energy Affordability, Resilient Networks and Facilitating Renewables
Network Operators (Eirgrid, SONI, National Grid)	Scheduled meetings, planning process	Grid connections, work programmes, planning, facilitating renewables	Renewables, network stability, continuity of supply	Facilitating Renewables
Industry NGO's (Eurelectric, NEAI, IBEC, AEP, IETA, EAI)	Consultation processes, programmed meetings	National and EU Energy policy, climate and sustainability policy development, consultations	Policy positions, global climate change issues, competitiveness, security of supply	Low Carbon Portfolio
Sustainability / non industry NGO's (BITCI & NI, CDP, IIEA, IWEA, IFA, Coillte)	Scheduled Meetings, Focus Groups, Member Fora, Surveys	Land access, work programme, CR Programme, Performance Disclosures	Emissions, Corporate Responsibility, Renewables, Planning	Impact on Society, Low Carbon Portfolio, Facilitating Renewables
Environmental Authorities (EPA, SEAI, DoE)	Licensing process, ongoing dialogue, formal compliance reviews	Licence conditions and compliance, Annual Reporting, Dealing with Breaches and Complaints	Legal Compliance, Water Conservation, Energy Efficiency, Waste	Environmental Management, Operational Efficiency Low Carbon Portfolio, Facilitating Renewables
Engineering & Scientific Research (UCD, ERC, UL, DIT, TCD, NUI, EPRI, SEAI, VGB)	Industry fora, partnerships, conferences, technical collaborations, ongoing dialogue	Technology, Skills pool, research partnerships, Technology deployment	Technical Innovation, Market Disruption, Energy Efficiency, Availability of suitable skills	Emerging Technologies Energy Efficiency and affordability
Public representatives, local authorities,	Scheduled meetings, planning process, ongoing dialogue	Planning concerns, building community support	Community engagement, Legal compliance	Resilient Networks Facilitating renewables
Ratings Agencies	Scheduled review meetings	Economic performance, Performance to Plan, Strategy, Funding Rounds, Growth programme	Rating, Ability to raise debt at manageable interest rate, financial performance	Financial Performance
Staff	Team and 1 to 1 meetings, surveys Bi annual staff engagement survey	Business performance, safe working environment, fair employment and trading practices	Staff Engagement, Reward and Recognition, Development Opportunities	Health & Safety Our People
Customers (domestic, commercial, industrial)	Social media, customer contact centres, surveys, via business development team	Price, continuity and quality of supply, energy efficiency services, disconnections	Energy price, disconnections policy, energy efficiency	Affordability and energy efficiency
Suppliers (initial focus contracts > €5m)	Tender Process, Contract Review Meetings, Preliminary Market Consultations, Meet the Buyer Events	Contractual Terms & Conditions, Corporate Social Responsibility, Sustainable Procurement Opportunities / Initiatives. Contractor Employments Standards compliance	Contractor Employment Standards compliance. Sustainable Procurement Opportunities / Initiatives.	Operational Efficiency



### 3.4 MATERIALITY PROCESS

ESB's materiality process has both an internal and an external element to its implementation. Ongoing engagement that takes place with external stakeholder groups across a range of issues, including sustainability, feeds a consolidated view of the issues of concern into the internal process, which is lead by the Sustainability Committee. Internally, the process commences with a review of the external inputs, the corporate sustainability strategy and objectives through the Sustainability Committee. This considers our sustainability strategy in the context of the overall corporate strategy, the emerging challenges to the business and our progress against current objectives. The relevant elements resulting from this process are then workshopped in the relevant business areas to further explore the business response and incorporate into operational business planning.

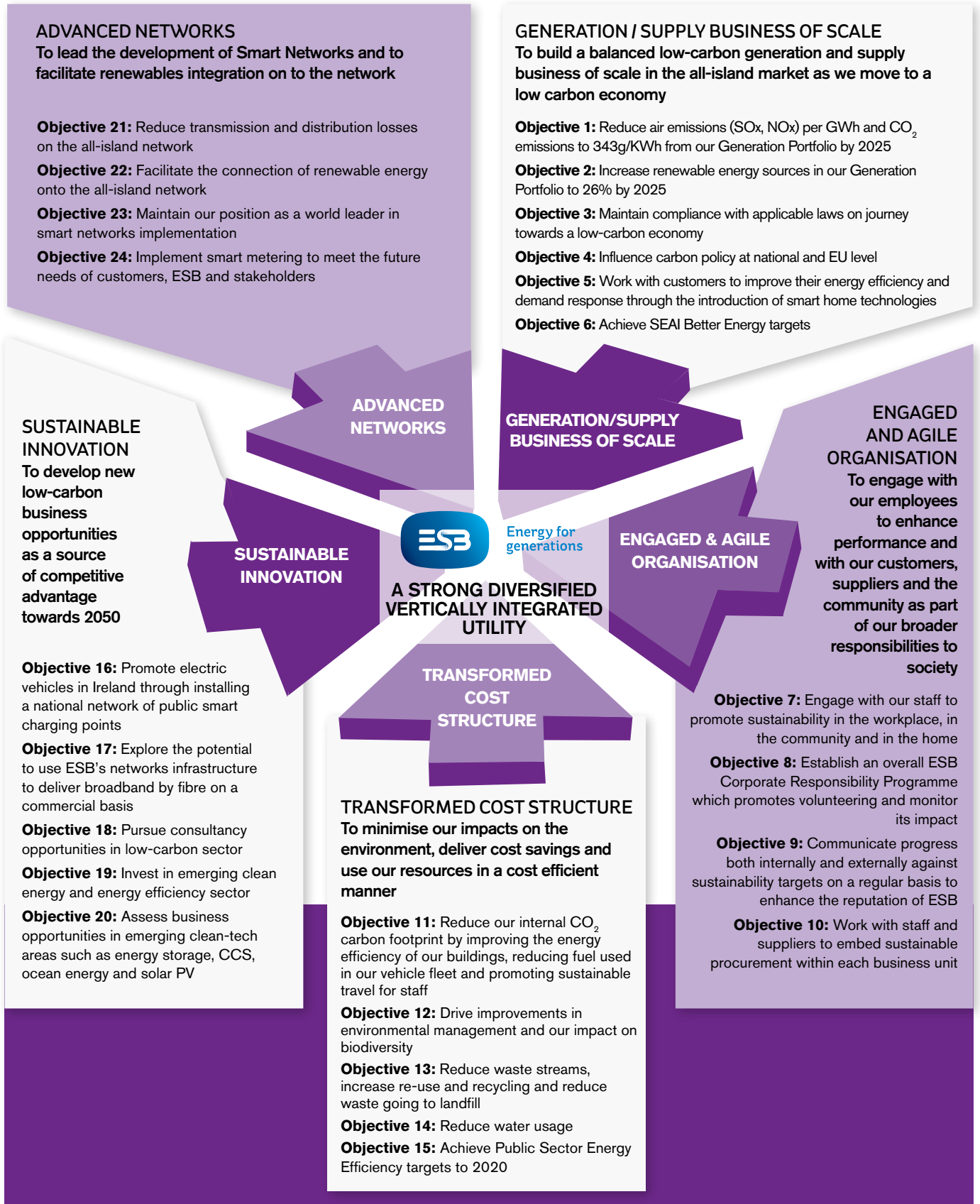
The issues identified from this process as being of greatest material importance to ESB Group are outlined below.

**FIGURE 3.2 MAPPING OF MATERIAL ISSUES**

MOST SIGNIFICANT ISSUES	SPECIFIC TOPICS OF INTEREST	RELEVANT ASPECTS AND INDICATORS	BOUNDARY OF ASPECT	SUPPORTING STRATEGIC OBJECTIVES*	ADDRESSED BY THIS REPORT IN
Development of Low Carbon Portfolio	Emissions, Fuel Sources, Security of Supply, Renewables	EU10	ESB Generation & Wholesale Markets business activities	1,2 & 4	4.9
Evolution of Emerging Technologies	Alternative sources of demand, disruptive technologies, low carbon technologies, electrification of society	G4 DMA (former EU7), G4-EN30	ESB Innovation directorate business activities	16,19 & 20	4.3
Energy efficiency and affordability for customers	Electricity Price, Disconnections, Energy Efficiency	G4-EN7, EU27	Electric Ireland business activities	5,6 & 24	4.2
Develop resilient networks and facilitate renewables	Improve the efficiency, reliability and resilience of the network including the facilitation of renewable connections to the Grid	G4-EC7, EU12, EU26, EU28, EU29	ESB Networks Ltd. and Northern Ireland Electricity Business activities	21, 22 & 23	4.4 & 4.5
Impact on Society	ESB Group broader impact on society, philanthropy	G4-EC7, G4-EC8	ESB Group activities	8 & 9	4.6
Operational energy efficiency	Energy efficiency with respect to Buildings and staff activities and generation stations	G4-EN3, G4-EN5, G4-EN30	ESB Group activities	11 & 15	4.8
Health & Safety	Health, safety and wellbeing of staff, contractors and the public	G4-PR1	ESB Group activities	7	4.1
Environmental Management	Operational compliance, access to information on environment	G4-EN34, G4-SO11, G4-EN12	ESB Group activities	12,13 & 14	4.7
Financial Performance		G4-EC1	ESB Group activities		4.10
Our People	Employee Value Proposition, Development Opportunities, Company Brand and Reputation	G4-LA10, G4-LA11	ESB Group activities	7, 8, 9	4.11

\*Strategic Objectives numbering is expanded upon in Figure 3.3 below

# SUSTAINABILITY OBJECTIVES



## PROGRESS ON SUSTAINABILITY OBJECTIVES DURING 2014

ESB Group’s sustainability objectives are based around the five priorities of the ESB Group Strategy 2025. Progress against these objectives for 2014 is detailed below;



### GENERATION / SUPPLY BUSINESS OF SCALE

- Total CO<sub>2</sub> emissions in 2014 reduced by 168K Tonnes to 9.15M tonnes in 2013. In the same period the Carbon Intensity reduced by 2g/KWh to 576g/KWh. The market conditions continue to favour coal generation.
- Woodhouse 20MW wind farm turbine erection has been completed, with the project now due to be in commercial operation in Q3 2015. In March, ESB and UK Green Investment Bank plc (GIB) made a joint commitment to invest in a new £175m renewable power facility at the Port of Tilbury, Essex. The agreement marks ESB’s first investment in the UK’s biomass sector.
- Substantial compliance with applicable environmental legislation was reported by all business units. An on-going process of engagement with the EPA and NIEA is in place on relevant environmental matters.
- On-going engagement continues with all relevant stakeholder parties on carbon policy issues in the lead up to COP21 in Paris.
- Recruitment of new participants in the Demand Side Unit scheme is on-going. A Smarter Living trial program is up and running with an initial recruitment of 600 customers.
- 100 GWh (against 3 year target of 420GWh) of Energy savings have been signed off for 2014. Particular success was achieved in the Energy poor sector where we secured credits for the three year period (2014-2016).



### SUSTAINABLE INNOVATION

- In the Republic of Ireland, 832 AC and 70 Fast chargers have been installed and in Northern Ireland, 14 Fast chargers and 350 Public AC charge points are in place. Approx. 1,900 chargepoints are in place island wide to end 2014.
- ESB Vodafone JV will see delivery of 100% fibre-to-the-building network initially to 500,000 premises in 50 towns around the country.
- ESB continues to pursue opportunities in the low carbon energy services sector, including JV and collaborative opportunities. ESB’s clean-tech VC fund, NovusModus Fund, currently manages investments in nine companies in the clean-tech sector.
- ESB has installed a 25 KW solar PV demonstration project on ESB Networks premises at Leopardstown and continues to assess performance. ESB with strategic partner, Kingspan, have developed a funded solar PV offering for NI market initially.



### ENGAGED AND AGILE ORGANISATION

- At the Annual Sustainability Awards ESB e-cars won the overall award for their 'International Green Electric Highways' project which was co-funded by the EU TEN-T agency.
- The ESB Energy for Generations Corporate Responsibility dispersed €2 million in 2014 to charities and volunteers working in the area of educational support, suicide prevention and the alleviation of homelessness. In NIE, support of The Conservation Volunteers tree-planting efforts continued in conjunction with local schools, hospitals and other volunteers, adding approximately three acres of trees.
- Progress updates issue routinely via our six monthly performance against objectives update and our annual Sustainability report.
- Ongoing rollout of sustainability workshops as part of the specification and pre tender requirements process for tenders in excess of €5 million.



### ADVANCED NETWORKS

- 567km of network was converted from 10kV to 20kV during 2014. Conversion target for 2015 is 1870kms.
- An additional 360MW of renewables were connected to the grid on an all island basis in 2014.
- The ESB RealValue project received EU Horizon2020 funding in 2014. This will see the installation of a storage solution and profile metering in 800 homes in Ireland and the installation of advanced monitoring and control capability in medium voltage substations associated with the trial.
- ESB Networks has proceeded to the detailed design and procurement phase and is actively working towards the EU target of having 80% of homes fitted with a smart meter by 2020.



### TRANSFORMED COST STRUCTURE

- 2014 delivered energy savings of 5.25% in building energy and 10% in fleet fuel over 2013.
- All business units now operate under externally ISO14001 certified environmental management systems and use their environmental programme to drive improvements.
- Recycling levels and diversion from landfill rate continue to be an area of focus across all business units, with recycling rates generally above 75% and diversion rates above 95%.
- 39 meters are now installed in ESB Networks depots, which has driven a focus on reducing water usage.
- The 2014 Public Sector energy efficiency performance reports ESB as having delivered 21% energy savings since baseline.







04

# ISSUES OF MATERIAL IMPORTANCE TO ESB GROUP

# 4.1 HEALTH & SAFETY

Pat O'Doherty, Chief Executive



“Our Performance in 2014 has been overshadowed by the tragic fatality to a member of staff in our Networks business in September. This tragedy and other staff and contractor fatalities in recent years have reinforced ESB's commitment to safety as a core value.”

member of staff. The Board has a Health, Safety and Environment Committee which monitors safety performance and reports to the Board on matters of policy, strategy and performance in relation to health and safety performance.

All ESB business units have safety management systems in place, many of which are certified to the OHSAS 18001 standard or equivalent. ESB rigorously enforces safety policies and standards to achieve the ultimate target of zero harm. An extensive Safety Leadership Strategy was rolled out during 2014, focusing on the four pillars of Leadership, Competence, Compliance and Engagement, and each business area models its local health and safety programmes on these four pillars.

### OVERVIEW

ESB is fully committed to protecting the health and safety of colleagues, contractors and the people it serves. Safety is a core value of the Group and the safety of staff, contractors, customers and the public always comes first. ESB believes that all operational processes should be designed and operated in an inherently safe manner. This belief guides the approach to safety across all business activities and is reinforced

through strong and visible leadership throughout ESB. Pride is taken in safety achievements and an open and proactive health and safety culture is promoted with the full involvement of all people.

The Chief Executive has overall responsibility for the management of health and safety in ESB. Functional responsibility is shared with all senior management and, in turn, with each manager, supervisor, team leader and, ultimately, every

### HEALTH AND SAFETY PERFORMANCE

Our performance in 2014 has been overshadowed by the tragic fatality to a member of staff in the ESB Networks business. On 22 September 2014, Declan Molloy, a Network Technician, was fatally injured while



working in Little Bray 38kV substation in Co. Wicklow. This tragedy and other staff and contractor fatalities in recent years have reinforced ESB's commitment to safety as a core value. A comprehensive investigation into the death of Declan Molloy has been carried out and the recommendations arising from the incident are being progressively implemented with regular updates to the Executive Director Team and the Board. During 2014, we undertook a root and branch review of our safety processes. Safety remains a core value for the organisation and we continue to invest heavily in safety structures and the development of safety competencies. There were no fatalities to contractors in 2014.

All injuries to members of staff or to contractors engaged by ESB involving an absence of more than one day from work (excluding day of incident) are reported to the Chief Executive within 24 hours. A full investigation is carried out on each incident to ensure all learning is captured and actions implemented. ESB also complies with all statutory obligations regarding the reporting of accidents, injuries and dangerous occurrences to Health and Safety Authority (Republic of Ireland), Health & Safety Executive (UK) or equivalent bodies in other jurisdictions of operation.

While many parts of ESB maintained an injury-free environment during 2014, regrettably there was a significant increase in the overall number of staff and contractor Lost Time Injuries (LTIs) in 2014 (78) as compared to our performance in 2013 (43) and 2012 (37). While the majority of these injuries were of low severity, nevertheless the significant increase in LTIs in recent years is a cause for concern as ESB continues to focus on reducing risks in the business that give rise to injurious incidents. The most common causes of LTIs are slips and trips, handling, lifting and use of tools and equipment.

In addition to focusing on LTIs, ESB categorises all injurious incidents and near-misses according to the severity of injury or potential severity in the case of near-misses. We particularly focus on high-potential incidents (called P1 events) that could lead to more serious outcomes. All high-potential incidents and LTIs are investigated to determine the root-causes of each incident and to implement actions arising from each

FIGURE 4.1.1 SAFETY PERFORMANCE STATISTICS

SAFETY PERFORMANCE ESB GROUP	2013	2014
Staff Fatalities	1	1
Contractor Fatalities	0	0
Staff Lost Time Injuries	29	52
Contractor Lost Time Injuries	14	26
Safety Management System coverage	100%	100%
P1s (High Potential Severity Incidents)	279	238
OHSAS 18001 or equivalent certification	>90%	>90%
Absenteeism Rate - (average days/staff)	7.77	7.71
Days lost due to occupational injury	612	740
Public fatalities		
- Customer side of meter <sup>1</sup>	1	1
- ESB side of the meter	0	0

<sup>1</sup> Where reported to ESB. Customer side of the meter incidents are only reported to ESB by the relevant authorities, where electricity has been determined to be the primary cause of death.

incident to prevent reoccurrence and minimise risk. The most significant safety risks arising from high-potential incidents for ESB remain electricity, driving and transport, working at heights and use of tools and equipment.

The system of rules applied in recording and reporting accident statistics is outlined in a Group Safety Incident Reporting Policy. This has enabled ESB to focus on and investigate through root-cause analysis high-potential incidents as another leading indicator of safety performance in the business. In recent years, ESB increased its focus on encouraging reporting and investigation of high potential incidents recognising the significant risks associated with electricity and driving. The reporting

and categorisation of safety incidents has led to improved shared learning across the business areas. In particular the implementation of a new Environmental Health & Safety System during 2014 will lead to improve assurance around reporting of environmental and health and safety incidents and events.

ALL HIGH-POTENTIAL INCIDENTS AND LTIs ARE INVESTIGATED TO DETERMINE THE ROOT CAUSES OF EACH INCIDENT

**DANGEROUS OCCURRENCES IN 2014**

The table below reports on the number of dangerous occurrences associated with the distribution network infrastructure in Republic of Ireland over the past five years. These figures are broken down as third party damages<sup>1</sup> and non-third party notifiable fault incidents<sup>2</sup>.

**FIGURE 4.1.2 DANGEROUS OCCURRENCES ON THE NETWORK**

Types of Dangerous Occurrence	2010	2011	2012	2013	2014
Safety incidents on the network <sup>3</sup>	211	205	854	1214	1909
3rd Party plant damages (excluding underground cable dig-ins)	585	627	816	980	1085
3rd Party plant damages caused by underground cable dig-ins	167	134	121	245	1043
Non 3rd party – MV and 38kV notifiable fault incidents (e.g. line drops)	552	560	844	1410	273

<sup>1</sup>Third party damages are incidents where third parties cause damage to the networks infrastructure. These are broken down into incidents that involve damage to underground electricity cables termed 'Dig-Ins' and incidents that cause damage to other plant such as overhead lines, mini-pillars and substations.

<sup>2</sup>Non-third party notifiable fault incidents are principally incidents on the overhead lines networks where an overhead line conductor / wire falls e.g. in stormy conditions or due to corrosion or other plant item failure.

<sup>3</sup>Improved reporting in recent years has led to a more complete reporting on the incidence of dangerous occurrences. Safety incidents on the network includes public safety incidents.

**HEALTH AND SAFETY POLICY**

ESB commitment to health and safety is described in our ESB Group Policy and Framework Safety Statement. This Policy Framework was updated on 27th November 2014 and is further described in individual business unit safety statements and safety policy manuals. The overall Group objective is Zero Harm and achieving this requires the full understanding by everyone in the Group of their safety responsibilities and their commitment to fostering a pro-active safety culture, based on a duty of care for themselves, their co-workers and members of the public.

**SAFETY MANAGEMENT SYSTEMS**

All ESB businesses have a safety management system in place. In the Republic of Ireland, the majority of our safety management systems are certified to OHSAS 18001 standard and are subject to annual independent audit. In Northern Ireland NIE's SMS is based on the 2014 guidance issued by HSE and the Institute of Directors. As part of each safety management system, each business of ESB Group provides the resources, systems and controls necessary to manage and conduct work activities in such a way as to ensure, so far as is reasonably practicable, the safety, health and welfare at work of all staff and any other persons at the work location.

**SAFETY LEADERSHIP**

The Safety Leadership Framework was launched in 2014 and has four key pillars: Leadership, Competency, Compliance and Engagement. It describes at a high level the areas of focus in order to maintain a safe place of work and ensure a consistent approach across ESB recognising that safety is a core value for the company. Under each of these pillars a set of 12 Guiding Principles further articulate our safety expectations. The new Safety Leadership Framework is a clear and simple way of articulating the safety responsibilities, obligations and expectations that everyone in ESB has in order to maintain a safe environment. Each business unit adopted the Safety Leadership Framework in developing their Safety Improvement Plans in 2014 and developed Safety Leadership Plans to align with the Safety Leadership Framework.

**CASE STUDY**

**NIE Safety Stand-Down Day**

NIE recorded an increase in the number of P1 Incidents between June 2014 and September 2014. These P1 incidents were categorised from Non-LTI and Near Miss Incidents. The trend indicated that potential existed for harm to occur to someone while at work, and this was against NIE's leading principle of 'Zero Harm'.

NIE's Health and Safety Management Committee, which comprises representation from all Business Units, collectively agreed a 'Stand-Down' day was required to allow everyone to pause and reflect on real attitudes to safety. The format for the day was agreed to be interactive as opposed to a series of presentations in order to capture ideas from operational staff.

Five locations were arranged with three sessions in each throughout the day. Each session was led by a Senior Manager, BU Safety Rep and Safety Engineer. The introduction



to each session was positive feedback and encouragement about the quality and honesty of Near Miss Reports that had allowed high-potential incidents to be compared and a trend identified as well as practical examples of what makes a P1 incident.

Examples of actual recent incidents were then discussed and used as a template to stimulate debate and opinion from the audience about the causes and potential preventative measures. The closing comments presented the question 'are you committed to making a difference?' All comments and questions from each session were documented and analysed. Focus Groups collated issues and developed improvement themes (these Focus Groups had been previously convened as part of the NIE Employee Survey). A communication plan was developed and implemented to ensure regular updates on progress, timescales and closure of actions.



## CASE STUDY

### SHIELD SUPPORTING A SAFER BUSINESS

SHIELD is the Environment, Health and Safety (EHS) Management solution in ESB. It is powered by enviroMANAGER, a modular IT system to record and manage Incidents, Risk, Audit, Law and monitoring EHS data. The solution was launched in July 2014 with the implementation of the Incident module. The remaining modules will be implemented during 2015.

The necessity for SHIELD became apparent when a review of safety reporting systems was conducted in 2010. This found that there were 37 separate systems used to manage safety information alone. Many of these systems recorded similar information but in different formats. There was weak oversight and validation of the information. Safety reporting was taking up a significant portion of safety specialists' time. There was little sharing of information between businesses and it was difficult to understand where the significant EHS risks lay.

ESB's goal is to have a consistent and rigorous approach to safety with safety firmly embedded as a value with the overall goal of Zero Harm. A fit for purpose integrated Environmental, Health and Safety risk management solution is needed to facilitate the business in delivering this key strategic goal.

In determining the business and technical requirements for a single solution the similarities between safety and environment reporting informed a decision to seek a solution for Environment, Health and Safety. The solution would include an IT system and changes to business processes. Following a competitive tender process for a suitable IT system, enviroMANAGER was chosen. It has been



At the SHIELD launch event: Simon Doody, Project Manager; Pat Naughton, Executive Director Group People and Sustainability; Colm de Búrca, Manager Safety and Sustainability Corporate Centre; and Ronan Collier, SHIELD Business Transition Manager.

developed and is owned by Irish company Scannell Solutions Ltd. Their contract is to supply an integrated IT platform to manage the following key EHS areas:

1. **Incidents** – including personal injuries, near miss incidents and environmental incidents
2. **Risk** – determining risks and managing these risks
3. **Audit** – planning and conducting audits of key risk areas
4. **Law** – provision of a legal register and compliance tool
5. **Data** – monitoring tool for statutory compliance and other checks.

The benefits this brings to ESB include: the active management of key environment, health and safety risks, demonstrating legal compliance and consistent and transparent reporting. This integrated SHIELD solution is aligned to the Safety Leadership Framework by demonstrating

leadership through retiring legacy systems and embracing the single solution, Compliance by transparency of information provides assurance on compliance, Competence through Incident Investigation findings, Competency risk assessments and Audits, and Engagement through active consistent use of the solution by all businesses.

The Implementation process involves matching the business requirements to the solution. Where there are gaps then either changing our business processes or making slight modifications to the IT system are undertaken. These are tested both from IT and business use perspectives. End users are then trained on the solution. This involves learning new business processes and how to apply them in enviroMANAGER. Finally, the legacy EHS reporting systems are retired so that only one solution is available for use throughout the company.

## ANNUAL SAFETY REVIEW

All ESB businesses are subject to at least annual management review of health and safety. From this review the following year's Safety Improvement Plan is developed and targets agreed. This is then monitored at regular intervals as part of the safety management system. An overall end of year safety review took place on December 18th at which each business senior management team presented on its safety performance for 2014 with all members of the Executive Directors Team in attendance. This forum enables all senior management teams to share knowledge, learning and experience on common safety challenges for ESB.

## PUBLIC SAFETY

All ESB Group operations and assets are risk assessed to minimize and mitigate risk. This is also the case where there may be potential risk to the public. Delivery of the network refurbishment programmes continued to have a significant and beneficial impact on public safety. The main focus of ESB's public safety programme concerns the management of the risk of people coming into contact with ESB's network, plant and equipment. We also rigorously address the risks arising from our generation activities, in particular head and tail races associated with hydro-electric power stations. ESB plant and equipment is operated in line with international standards and legislation, including standards dealing with the risk of harm associated with electric and magnetic fields.

Regrettably in 2014 a member of the public was fatally injured in an electrical incident involving use of a portable heater in his own home. While ESB is not responsible for public safety in people's homes, we regularly deliver public safety campaigns to alert the general public to the potential dangers posed by electricity. In addition, many of the network refurbishment programmes which continued to be delivered during 2014, have a significant and beneficial impact on public safety.

The issue of metal theft including unauthorised break-ins to ESB Networks' and NIE substations poses a significant safety risk to the individuals involved. This mirrors the overall national trend of

increased metal theft over the last number of years. In addition to the public safety risks associated with this activity there are also significant additional negative impacts and costs arising from increased security measures, damage to equipment, environmental damage and clean-up costs due to oil spillages and disruption to work programmes. ESB Networks and NIE continue to monitor closely the level of security incidents to assess the level of risk pertaining to various substation sites. This also assists in deciding on required mitigation measures for same, such as mobile monitoring systems.

Throughout 2014 ESB Networks continued to meet its obligations and responsibilities for public safety by implementing ESB Networks' Public Safety Plan (2013-2015) with initiatives aimed at the "at-risk" groups, including construction, farming, leisure and children. Public safety programmes for children included both school visits and promotion of the child-appropriate public safety content on the ESB internet site. Public safety information was also provided through the National Contact Centre, with safety booklets and other content mailed in response to specific requests.

## ADVERTISING PROMOTIONAL ACTIVITIES IN 2014

- Advertising in the national and technical press promoting awareness of the dangers from contact with ESB Networks electricity infrastructure
- TV advertising in the national agricultural livestock marts aimed at the farming community.
- Broadcasting of full range of public safety radio advertisements on local and national radio stations.
- Participation at the National Ploughing Championships in September, in conjunction with the Health and Safety Authority
- Launch of the new 'Farm Safety with Electricity' booklet at the National Ploughing Championships by the Minister for Agriculture, Food and the Marine Simon Coveney TD
- ESB Networks continued their support of the KEEP SAFE Programme for 5th and 6th Class primary school children in association with the Health and Safety Authority and other national bodies, coordinated by Junior Achievement Ireland. NIE Kidzsafe interactive safety programme

delivered to Key Stage 2 school children across Northern Ireland.

## CONTRACTOR SAFETY MANAGEMENT

Safety management of contractors remains a key area of focus for ESB to ensure that each contractor and sub-contractor, working for or on behalf of ESB is properly inducted and that each contractor operates under a safe system of work. This is supported by contractor safety management processes in each business area. Our focus is on ensuring that all large contractors working on behalf of ESB have a safe system of work with evidence available to demonstrate this.

## 4YOU PROGRAMME

The human factor component of incidents has become increasingly prevalent in the incidents reported in ESB over the past five years (e.g. communication, supervision, attention, stress and fatigue, safety culture, violations, unsafe behaviours). The 4You programme has been developed as a preventive approach designed to tackle the human factor and behavioural component of safety in ESB.

During 2014, significant work was undertaken to develop the leadership aspects of the programme, as well as continuing the roll-out of the programme in the Generation and Wholesale Markets business and extending the programme into the Networks business.

## SAFETY AUDITING

Our risk assessment and behavioural audit systems are a key part of our overall safety management systems and provide valuable learning and insights for management and staff as part of continuous improvement on safety.

During 2014, significant work was undertaken in both our Networks business and our Generation and Wholesale Markets business on refining our auditing approach to focus on the top risks in each business unit. Details of audits are recorded on a corporate safety auditing system and in 2014 nearly 5,000 audits were conducted across all areas of ESB activities.



Manchester Ship Canal was used for the delivery of oversized loads, avoiding road congestion issues and the cause of disruption to local traffic movements.

## CASE STUDY

### CARRINGTON HEALTH AND SAFETY APPROACH

Carrington is an 880MW high efficiency CCGT generating station currently under construction near Manchester, UK. The Carrington project commenced development in 2008 and from that point in time safety was a key cornerstone and central to how we progressed the project.

The ethos on the project was always to focus on how we could learn from our past and develop a project that would build from this and include new innovative ways of making our projects safer and better places to work. We always worked from the view point of getting things right from the start with a focus on people and behaviour.

ESB took the approach with the main EPC contractor that a 'partnership' philosophy

was more appropriate when managing and encouraging safe behaviour on the project. To that end ESB developed a joint safety vision for the project which sets out the key principles and behaviours to be delivered on the project. This successful approach was also implemented on our high pressure gas pipeline construction project.

To date over 3 million hours work has been completed on the construction project with a peak of over 1,000 people working on site, including construction of a high pressure gas pipeline and a 400kV substation. To put this in context our monthly hours consumed are equivalent to the time required to build a small scale windfarm. During this time we also constructed a high pressure gas pipeline and a 400kV substation. Over 35,000m<sup>3</sup> of concrete was poured during the civil works alone and the power station will produce enough electrical energy to supply over 1,000,000 homes.

ESB and Alstom/Duerra Fuego safety leadership framework is being implemented on the project and is central to all of our safety improvement plans.

Carrington was recently commended by the site workforce and is recognised as the benchmark for the UK construction industry when it comes to worker welfare and facilities. The project was also awarded the best in class Gas Turbine Safety award from Alstom. This is a global competition within the international gas turbine business as managed by Alstom. The project was also shortlisted for a UK Social Corporate Responsibility award.

We are now transitioning from the construction phase into the commissioning phase of the project so the risk profile of the works is changing. We remain fully focussed on delivering Carrington safely and will continue this approach into the operational phase of the plant over its full lifecycle.

## DRIVING

ESB's commercial fleet consists of over 2,000 vehicles and more than 2,000 of our staff drive their own cars on ESB business – the total distance travelled by these fleets in 2012 was 67 million kilometres. ESB recognises that driving for work, and other activities on our roads and workplaces, represent a significant risk. In 2014 ESB launched its 3rd Road Safety Strategy 'ESB Road Safety Strategy 2013 – 2020: Our Journey to Excellence'. This strategy builds on the previous strategies and aims to position ESB as a national exemplar in Road Safety Excellence through achieving zero at-fault incidents and collisions by 2020.

To achieve this vision, all management and staff must be advocates of safe driving practices for their work colleagues, their families and the wider community. The new strategy has the leadership of the Executive Director Team to provide direction, resources and oversight for its delivery. It will be supported and implemented by the Road Safety Steering Group, Business Line Managers and the Road Safety Bureau.

The strategy will see continued collaboration with the Road Safety Authority, the Health and Safety Authority, An Garda Síochána and the European Transport Safety Council. This strategy takes account of the extent to which the objectives of the

previous Safe Driving Strategies were achieved, and is about achieving a cultural shift in the organisation where ESB will see a move from an initiative-based programme to a culture-based programme with a longer term vision.

In 2014 ESB reduced overall collisions to the fleet to 108, a reduction of 59% since 2003. In addition, ESB has reduced the rate of serious collisions (P1 Collisions) and ESB Driver-At-Fault collisions over this time from 193 to 87, a reduction of 55%.

## SAFETY COMPETENCY

ESB is committed to establishing and maintaining appropriate safety competence in the organisation. Since establishing a dedicated Certificate in Safety and Health at Work with University College Dublin, a total of 416 ESB staff and managers have successfully completed the course.

## SAFETY COMMUNICATIONS AND ENGAGEMENT

ESB has formal agreements in place with trade unions covering all aspects of health and safety responsibilities of ESB and staff. All ESB staff are represented in formal joint management-worker health and safety committee structures that monitor, advise and respond to health and safety matters. Health and safety issues are discussed through an extensive system of safety representatives, safety committees and safety forums throughout the

business. All staff have the right to appoint a safety representative and a week-long training programme for Safety Representatives is held each year.

The Chief Executive chairs the Chief Executive Health and Safety Committee, with representatives from each business unit, Group of Unions, Board Health Safety and Environment Committee and Executive Director Team. The Committee visits different locations to engage with staff on safety matters and in 2014 the Committee visited ESB International offices, ESB Head Office and Carrington Power Station (under construction) in UK. Each business area or location has joint staff/management health and safety committees where health and safety issues are discussed and addressed in a partnership approach. Each business unit has an overall health and safety committee which is attended by the relevant Executive Director and where safety matters are discussed.

Health and Safety Conferences were held in each business unit during 2014 involving both management and staff focusing on the key risks in each business. These events are a strong engagement tool for staff around safety, health and wellbeing issues.

## PREVENTION AND RISK CONTROL

ESB places a strong emphasis on the prevention and control of risk in the workplace. ESB has an extensive range of policies and procedures in place, including detailed risk assessments covering all areas of risk, and provides information in a form, manner and language that is likely to be understood by staff and contractors. We also believe that the concept of prevention and control of risk is relevant to staff both in and outside of their work environment. We view Risk Assessment techniques as a "Skill for Life". The measures in place to prevent and control risk include hazards and risks identified through risk assessments and protective and preventive measures to be taken during each specific task to be performed at each place of work. We promote an open engagement with staff in prevention of risk through risk workshops in all locations. ESB does not have any staff involved in occupational activities where there is a high incident or high-risk of specific diseases.



The west Cork heroes from ESB Networks Kanturk. Pictured (l-r): Patrick Fleming, piling contractor; Tommy Murphy, ESB Networks Kanturk; Ger Healy, ESB Networks Kanturk; Brendan O'Donoghue, piling contractor and Dermot Conway, NIE. Photo: Neil Warner.



## CASE STUDY

### ESB INTERNATIONAL SAFETY MANAGEMENT ON OVERSEAS PROJECTS

ESB International (ESBI) have been operating safely overseas for the past 40 years. Throughout this time, the safety of our staff, contractors and those affected by our work has always been a core requirement of our activities. We recognise that we operate in very challenging environments where the local safety culture and standards are lower than that of ESB and, because of this, safety management overseas has always been a priority.

During our time working overseas we have continued to develop our safety management systems and have now introduced a central location where safety information relating to working overseas can be accessed. The staff induction before travel is a key component of this system.

For the past six years, ESBI has engaged an external security consultant, Risk Management International (RMI), to identify and assist with the control of risks to our staff overseas. This is achieved by the preparation of risk and security reports for both new and existing locations, in some cases following an in-country visit. These reports also include a detailed country risk assessment. The top risks which have been identified for most of our overseas countries are as follows:

- Driving
- Health issues (Malaria, Hepatitis, Cholera, Ebola etc.)
- Crime (mugging, car jacking & house break ins)
- Security

A 24hr manned emergency hotline is available should staff need to contact someone in the event of an emergency.



Staff of the Saudi Cable Company, an electrical cable supply and jointing contractor with ESB International.

In 2014, ESBI introduced two new safety procedures to streamline our processes and assist our management teams in implementing our overseas safety requirements. The two overseas procedures are as follows:

- Health & Safety Requirements for Staff Overseas Travel
- Managing Safety & Health in Overseas Locations

The first procedure provides guidance to all staff on what steps are required prior to travelling overseas and in many ways is a summary of our staff risk controls. This ranges from induction, inoculations, travel advice, security and risk reports and other essential information staff should be aware of.

The second procedure provides guidance to line managers on the safety systems required to be implemented in each country. Each country manager must develop a local safety management plan (mini safety statement) which details how safety management will be implemented in their location.

The risk profile varies from country to country. In some locations, political unrest has been a feature that must be closely managed. In such locations, the country manager must develop a personnel security contingency plan which details how staff are to be evacuated in the event of an in-country crisis. These countries are monitored and a security alert level ranging from 1 (normal) to 5 (evacuate) is applied accordingly. These plans also form part of business continuity exercise drills. Each in-country manager must maintain a database of staff 'in case of emergency' (ICE) details locally.

A local safety improvement plan is developed by the in-country manager on an annual basis and a quarterly safety review is undertaken with each location presenting to the head office management team on their safety performance, initiatives, challenges and updates on their country safety improvement plans.

In addition to the above, all staff travelling overseas are provided with emergency contact cards with useful emergency contact information.

**EMPLOYEE HEALTH & WELLBEING**

ESB is strongly committed to supporting staff in maintaining good health and well-being so that they can reach their full potential in the workplace and maintain a healthy and balanced life. In these challenging times, ESB believes that there is a greater need for the provision of support services and the proactive promotion of health and well-being to maintain a healthy and high-performing workforce.

ESB's Health and Well-Being Programme is focused on providing proactive health programmes that offer information and advice to staff to help them create and maintain a healthy lifestyle. The programme provides effective remedial support to employees who face ill-health and other personal life challenges through an occupational health medical service, an Employee Assistance Programme, counselling and through a range of diversity programmes. ESB's focus in 2014 has been on:

- Encouraging staff to take responsibility for their own health and well-being
- Promoting initiatives aimed at helping staff to maintain good physical and mental health

- Extensive promotion of health and well-being staff support services

In 2014 ESB launched a new health and well-being website as a communication platform for engaging with staff members on health and well-being matters. The site provides staff with quick and easy access to all the health information staff need to deal with the pressures and challenges of a busy life.

ESB's in-house Employee Assistance Programme (EAP) provides professional and confidential support to individual staff members who are experiencing personal issues. The main areas of support include: bereavement, mental and physical well-being, family relationships and financial pressures. ESB also introduced a 24/7 Confidential Support Service which is available to staff 24 hours a day, 7 days a week. Staff can discuss any issue of concern in total confidence with a qualified counsellor.

The ESB health maintenance programmes are focused on general health advice and support, with an increasing focus on stress. While it is recognised that stress may be an integral part of everyday life,

**ESB IS STRONGLY COMMITTED TO SUPPORTING STAFF IN MAINTAINING GOOD HEALTH**

the availability of active workplace stress awareness programmes are crucial to supporting staff in dealing with stress and minimising the impact on their well-being. Some of the programmes available to ESB staff during the year were:

- Monthly health and well-being bulletins on various topics, including mental health, budgeting, healthy eating, exercise, work life balance and time management
- Developing a health and well-being portal as a communications channel for staff without access to personal computers.
- Health screening programmes; cardiovascular, bowel cancer and flu immunisation
- Physical health challenges
- Smoking cessation programmes.

**CASE STUDY**

**2014 HEALTH & WELL-BEING CASE STUDY**

A health and well-being planning workshop was held in 2013. The objective of the workshop was to identify key health and wellbeing challenges and initiatives for 2013/14. Staff and managers from each of the Business Units attended and a work positive survey with a cross section of staff in ESB was conducted.

In response to the workshop and survey ESB focused on positive mental health promotion. Our mental well-being is a valuable and important part of all our lives and impacts on our physical well-being and our ability to live a happy and healthy life. Mental health is a common

feature of everyday life. It describes how we think and feel about ourselves as well as how able we are to cope with change and significant life events that we encounter. Mental Health can change as we move through different life stages or in response to difficulties in our lives. Stress and worry can affect our mental and physical health. The stress of the economic downturn or having money problems can have a different effect on each of us. Stress also results from an imbalance between demands and resources and happens when pressure exceeds our perceived ability to cope.

ESB rolled out two Health Seminars in 2014, Stress Management and Financial Awareness. The Seminars were rolled out across the five Business Units. The aim of the pro-active programme was to provide the right supports for staff and to help them in maintaining good health

and wellbeing in challenging times by giving them practical advice on how to manage personal stress levels and personal finances. The programmes also aimed to encourage self awareness, develop coping strategies and encourage staff to take responsibility for their own health and wellbeing. 2,300 staff attended the seminars and the feedback was very positive. The seminars were rolled out as part of safety awareness training days in conjunction with the safety supervisors/ managers or as part of the local managers' monthly staff briefing. At each session, a folder with leaflets /diaries and the full list of support services were provided.

ESB was shortlisted for the CSR 2014 Awards for positive mental health promotion among the staff and won the award for Excellence in the workplace section.

# 4.2 ENERGY EFFICIENCY AND AFFORDABILITY FOR CUSTOMERS



Jim Dollard, Executive Director for Business Service Centre and Electric Ireland

“Electric Ireland is aware that cost is a significant issue for all customers. Electric Ireland competes effectively in the market, as evidenced by the volumes of customers who joined Electric Ireland in 2014. In addition, in November 2014 Electric Ireland took the decision to reduce its electricity prices in the residential market by 2% for all its customers, ahead of the winter peak.”

### OVERVIEW

Electric Ireland is the retail arm of ESB, supplying electricity, gas and energy services to its customers. It operates in all market segments in the Republic of Ireland (ROI) and supplies energy and services to business customers in Northern Ireland (NI). The Electric Ireland brand was launched in 2011 and is now recognised as a leading retail brand by Irish consumers and businesses with brand awareness at 95%.

Energy Efficiency and Energy Affordability are central to Electric Ireland’s strategy to remain the leading energy supplier in the market, offering smart and innovative solutions to homes and businesses. Our Energy Efficiency focus is framed by a comprehensive set of European Union and national laws and regulations within the

2020 Climate and Energy Framework and in the continuing discussions on the Climate and Energy Policy Framework for 2021–2030. There are legally binding targets at European and national levels to decrease carbon emissions, increase the proportion of energy from renewable sources, and enhance energy efficiency. These targets are set for Electric Ireland as an Energy Efficiency Obligation, with energy suppliers nationally obligated to deliver 550GWh in energy savings annually from 2014–2016.

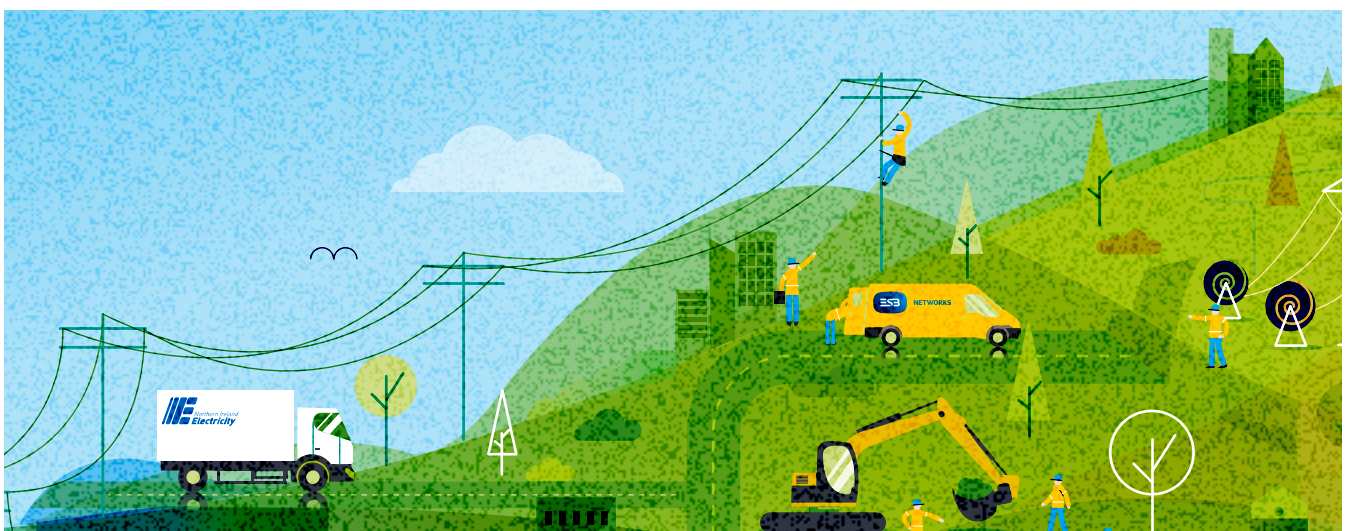
Energy Affordability is equally important to Electric Ireland’s customers. 2014 was notable for continued high levels of competitor activity in a price sensitive marketplace. Electric Ireland has competed effectively in this environment through continued focus on competitively priced products

and strong customer service and maintained its overall market share. It has also remained highly competitive in the business segment of the market and has grown its market share in the small and medium sized business segment.

This will be achieved by providing competitive offerings, excellent customer service and new and innovative products to meet customer needs. These solutions include:

- Rolling out a Pay As You Go (PAYG) product for residential customers
- Launching a Fuel Variation Tariff (FVT) gas product for business customers
- Introducing new home heating control devices (e.g. NEST) to customers
- Developing new initiatives to help customers invest in energy efficiency improvements in their home
- Maintaining the Electric Ireland brand as the leading energy supply brand in the country.

Electric Ireland works with customers to help them reduce their energy consumption and get better value from their usage through the promotion of energy efficient products and energy awareness campaigns. These campaigns include energy efficiency advice delivered directly to customers and web-based tools including the Appliance Calculator and the Energy Wizard home auditing tools.



**MANAGEMENT APPROACH TO ENERGY EFFICIENCY**

The Irish Government has enlisted the assistance of Energy Suppliers in meeting the national requirements of the EU Energy Efficiency Directive to deliver a 20% Energy saving by 2020 and has introduced an Energy Efficiency Obligation scheme (EEOS). This builds on the success of the voluntary Better Energy Programme in which Electric Ireland delivered over 220GWh of energy savings in the period 2011 through 2013. The EEOS has introduced a more challenging target of 420GWh of energy savings for the period 2014 to 2016, with this target further subdivided with 5% to come from the Energy Poor Sector, 20% from Residential and the remaining 75% from the Non-Residential sector.

Electric Ireland has developed a multifaceted approach to deliver savings across all of these sectors, with a range of tools from apps that inform customers on appliance usage, an energy wizard to highlight the best efficiency retrofit actions to take or the installation of budget energy meters. All of these assist customers in managing their energy use. Specifically the key initiatives that have been successful in delivering some 110GWh of Energy Savings in the course of 2014 in the various subsectors are outlined below.

**ENERGY POVERTY SECTOR**

In the Energy Poverty area Electric Ireland has worked with the Department of Environment, Community and Local Government in upgrading the energy efficiency of Local Authority Housing stock. Some 7,178 houses were upgraded over the course of 2014 under this scheme.

In addition Electric Ireland worked with the SEAI Better Energy Communities programme on 22 projects, delivering upgrades ranging from insulation upgrades to heating control replacements on a further 3,712 homes.

**RESIDENTIAL SECTOR**

In the residential sector the existing Home services offering was refocused on the delivery of Smart heating control products and the gas boiler repair replacement and servicing segments with over 3,000 jobs delivered.

To supplement direct sales activity a new Energy Efficiency Incentive scheme was introduced for customers who undertake energy efficiency works in their own homes with a panel of external contractors. The incentive, which offers customers a credit off their energy bill related to the measures undertaken, proved to be a great success with 1,210 measures covered and it has been extended and expanded for future years.

**NON-RESIDENTIAL SECTOR**

The SEAI Better Energy Community project also delivers significant energy savings in commercial and community premises with 15 different projects, ranging from hotels and restaurants to a particular initiative with sports clubs which assisted 14 clubs save energy through a combination of training and mentoring and the retrofit of lighting, heating and cooling.

In addition Electric Ireland worked with a number of its larger energy users to introduce savings in their industrial and commercial energy usage in areas such as lighting, HVAC and minimisation of process energy consumption.

**CASE STUDY**



From left: Stevie Donnelly, Energy Officer DAA; John McKiernan, Head of External Collaboration ESB; Kevin Tolland, CEO DAA; Martin McGonagle, Campus Manager DAA; Catherine O'Brien, Project Manager ESB International; Peter Chambers, Group Head Asset Care DAA; Pat O'Doherty, Chief Executive, ESB; Hilco Hakman, Manager Energy Consulting, Electric Ireland and Brian Ryan; Manager Energy Services, Electric Ireland at the launch event at Dublin Airport.

**ESB LANDS ENERGY PILOT AT DUBLIN AIRPORT**

ESB and Dublin Airport Authority (DAA) have signed an innovative energy agreement which will see the two organisations collaborate to achieve 33% energy savings at Dublin Airport and the piloting of innovative technologies. The agreement is the first full energy spectrum collaboration of its kind in Ireland and aims to make the airport an international energy exemplar airport complex by 2020.

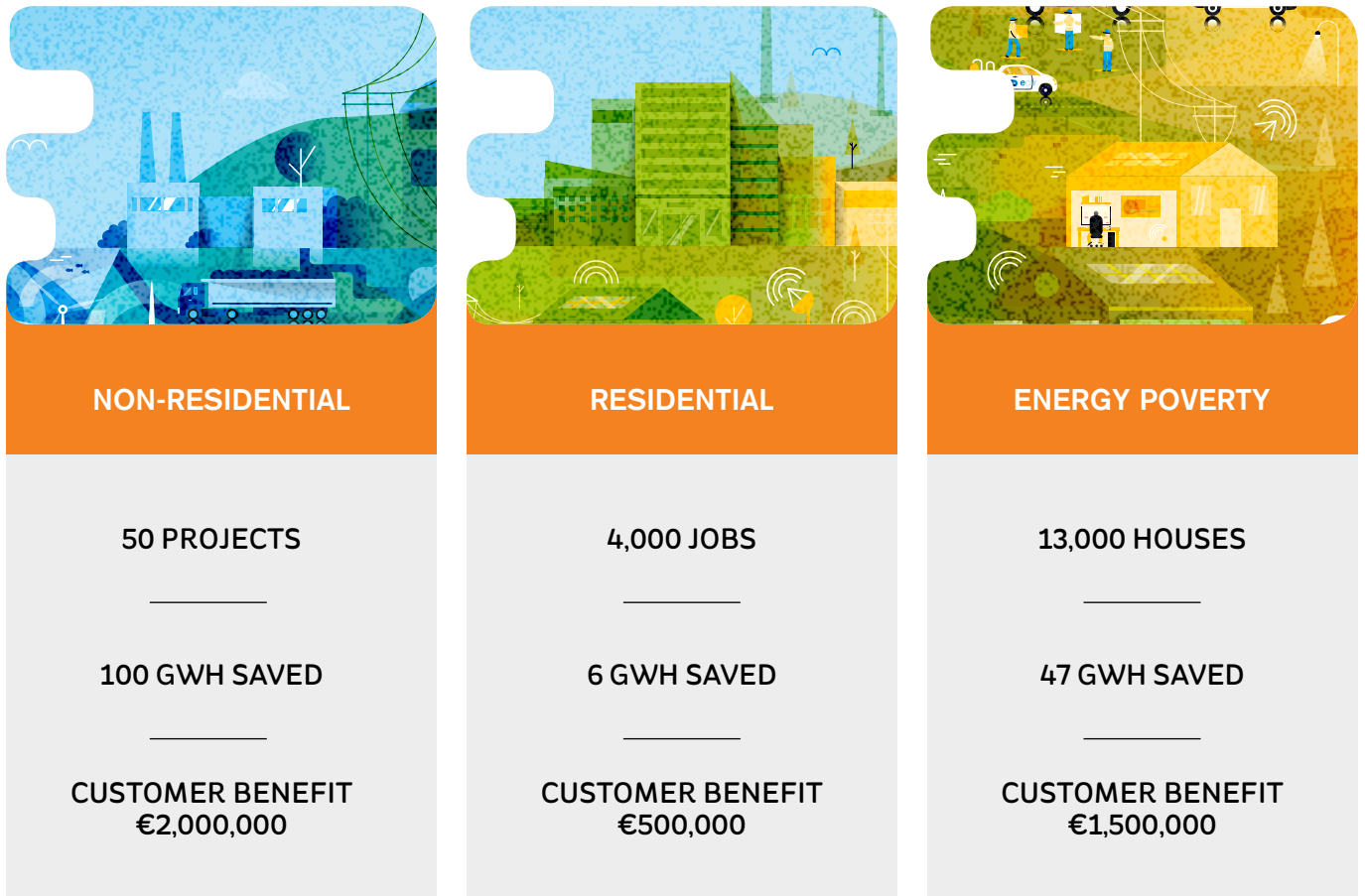
ESB will provide DAA with access to a broad range of power sector expertise from optimised load management to zero emission transport solutions. In return, ESB will secure Better

Energy scheme credits from the SEAI. ESB and DAA together will identify opportunities to use low carbon technologies to improve energy performance at the airport.

"DAA will benefit from our expertise across the full energy spectrum from electric cars and smart grids to renewables and will position Dublin airport internationally as a leading low carbon airport facility. In turn, ESB will secure valuable credits from the SEAI under the Better Energy Scheme. Meanwhile, we will together contribute to meeting the Government's mandated EU Energy Targets and showcase Ireland's leadership in the area of cleantech and renewable energy," said Pat Doherty, ESB Chief Executive.



## BENEFITS OF THE ENERGY EFFICIENCY SCHEMES FOR CUSTOMERS IN 2014



### AFFORDABILITY OF ENERGY

The current economic environment presents significant challenges for debt management. While proactively working to ensure that debt is collected, Electric Ireland has responded to customers experiencing serious hardship by:

- Identifying as early as possible when customer payments are in arrears and contacting them to discuss the options available, Electric Ireland made circa. 200,000 tailored payment arrangements with customers in 2014
- Electric Ireland aim to further reduce disconnections by continuing the roll out of Pay As You Go meters and offering convenient payment arrangements.

During 2014 Electric Ireland played a key role, alongside the Electricity Association of Ireland (EAI)

and other suppliers, in the development of the Energy Engage Code, which sets out how energy suppliers should help their customers manage their energy use and costs.

Electric Ireland welcomed the opportunity to work with EAI and other suppliers in the development of the Energy Engage Code which was launched in May 2014. Electric Ireland fully endorse the core principle of the code that we will never disconnect an engaging customer.

The code emphasises Electric Ireland’s commitment to work with our customers in managing arrears and through ongoing engagement to guarantee continuance of supply while solutions are put in place with individual customers. Electric Ireland continues to work with the Money Advice and Budgeting

Service (MABS) and St. Vincent de Paul (SVP) and other agencies to support and assist customers in financial difficulty.

Electric Ireland is proud to have delivered a 20% reduction in the rate of disconnections in the electricity market in 2014 and are confident that the Energy Engage Code will assist us in our aim to further reduce domestic disconnections levels. In 2014 over 40% of properties disconnected for non payment of account were vacant.

For the remainder of accounts disconnected for non payment the supply is reconnected once agreement is reached on payment of the amount or the installation of a PAYG meter within a maximum of 48 hours as per the ESB Networks SLA. The majority are reconnected same day.

## CASE STUDY



“ While we have seen a significant reduction in electricity and gas disconnections over the last year, Electric Ireland recognises that we must continue to engage with customers that are experiencing financial hardship to assist them in managing their energy usage and promote mutually acceptable payment plans or the installation of PAYG meters where appropriate.”

Jim Dollard, Executive Director, BSC & Electric Ireland.

### ENERGY ENGAGE CODE

Irish Energy Suppliers have launched a new voluntary code that aims to keep domestic customers connected to their energy supply. The Energy Engage Code comes into effect on June 1, 2014 and sets out a programme of measures that suppliers will take to encourage customers in arrears and at risk of disconnection to ensure that they remain connected to their energy supply.

The Energy Engage Code was officially launched by Pat Rabbitte TD, Minister for Communications, Energy and Natural Resources, along with managing directors of

the participating Energy Supply companies: Bord Gáis Energy, Electric Ireland, Energia, Flogas Natural Gas and SSE Airtricity. The launch, which took place at the Society of Saint Vincent de Paul, Sean MacDermott Street, Dublin 1, was also attended by Tom McSweeney, National Vice Chair, Saint Vincent de Paul, and Owen Wilson, Chief Executive, Electricity Association of Ireland (EAI).

The Energy Engage Code is a coordinated industry-led approach to further assisting customers in arrears and at risk of disconnection. The key principle underpinning the Code is a firm commitment by suppliers that they will never disconnect an engaging customer.

Currently all suppliers have their own individual approaches to address arrears. For all companies the disconnection of energy supply for non-payment is used only as a last resort. To date suppliers have so far succeeded in installing over 140,000 Pay-As-You-Go meters for electricity and natural gas customers. The combined effect of supplier measures has been to reduce electricity and gas disconnections by 31% and 16% respectively in 2013 compared with the previous year.

In 2014, there were 3,930 disconnections, a 30% reduction on 2013. Over 30% of disconnections were of vacant properties. Over 90% of disconnections were reconnected within 48 hours.

### THE COORDINATED ENERGY ENGAGE PRINCIPLES WILL HELP CUSTOMERS RESOLVE THE DIFFICULTIES THAT ARISE WHEN THEY BEGIN TO ACCUMULATE ARREARS AND INCLUDE A FIRM COMMITMENT FROM PARTICIPATING SUPPLIERS TO:

1. Never disconnect an engaging customer
2. Provide every opportunity to customers to avoid disconnection
3. Establish new early ways of identifying customers at risk and targeting communication with these customers to encourage early engagement
4. Treat customers as individuals, recognising no two customers face the same circumstances
5. Offer a range of debt repayment options in order to find the most appropriate solution for a customer in arrears including realistic and achievable payment plans
6. Always offer a customer in arrears a PAYG meter as an alternative to disconnection, where a network solution is available
7. Introduce a new individual case review in advance of any customer being disconnected
8. Put in place clear processes for interaction with customer representatives and support agencies acting on behalf of a customer, such as the Money Advice and Budgeting Service (MABS).

## 4.3 EVOLUTION OF EMERGING TECHNOLOGIES INCLUDING ALTERNATIVE SOURCES OF DEMAND

Paul Mulvaney, Executive Director, Innovation



“ Innovation in new products and services will drive growth for ESB Group in the coming years and Innovation is working with all parts of ESB and its external partners to identify and invest in those opportunities. 2014 has been a significant year with the establishment of the joint venture with Vodafone (SIRO), to deliver Fibre to the Building and the success in securing NER300 funding for the ESB WestWave energy project.”

The energy sector is undergoing substantial change and moving from its traditional model of large-scale centralised generation, transmission and distribution networks and passive customers, to a new model based on distributed renewable generation potentially reducing the need for increased investment in additional transmission and distribution capacity and the advent of pro-active consumers who actively manage their consumption.

Traditional utilities like ESB face disruption from a combination of energy technology, IT enabling and leading technologies, energy efficiency and demand-side management, business models, customer behaviour and expectations. While the scale of disruption poses a fundamental challenge for utilities, it also presents opportunities for ESB in areas such as energy efficiency and demand-side management, new sources of renewable energy generation technologies, electricity use in heating and transport sectors, providing new products and services and delivering cost efficiencies. ESB has significant expertise to address these challenges and is active directly and indirectly in many areas of disruption and there are a range of initiatives within individual business units focused on addressing disruptive forces.

ESB Group’s view is that climate change is best tackled at a societal level by the simultaneous process of decarbonising the generation of electricity and then using this carbon-free

source of energy to decarbonise other sectors of society through electrification. In support of this objective, ESB Group has an active programme of engagement with the evolution of those emerging technologies that can be used to decarbonise the electricity sector. This programme includes four main elements:

- Working with policymakers and other stakeholders to ensure that policy and regulatory supports are in place such that these low carbon technologies are developed and deployed in our markets
- Trialling new technologies with a view to facilitating their development and assessing their suitability for use in our markets
- Innovating and investing to create and take advantage of new commercial models that emerge from these new technologies
- Establishing networks of collaboration between ESB and other commercial, governmental and social stakeholders.

### EMERGING TECHNOLOGIES

The Innovation business acts as a focal point for new ideas across the ESB Group and is the driver of growth opportunities and transformation across the organisation and has a group-wide role in promoting an innovative culture throughout ESB. Right across ESB staff are developing solutions to business and technical problems as showcased in the ‘Little Big Things’ campaign whereby staff are encouraged to generate new ideas to add value to the organisation. Innovation is examining

new ways to tap into people’s capability, seeking to implement new thinking across the business. Innovation will continue to develop an environment and a structured approach to ensure that value-adding ideas and solutions are brought to fruition for ESB and its customers.

A key part of the role of Innovation is to examine the opportunities in the evolving energy sector and to develop solutions in areas such as energy efficiency. In particular, Innovation is conducting trials to examine the effectiveness of solar photovoltaic generation in ROI as well as completing significant reviews of developments in energy storage and data applications.

### FIBRE TO THE BUILDING

ESB established a joint venture company called SIRO with Vodafone to explore opportunities to deploy high speed fibre optic cable, leveraging the Irish electricity networks in order to meet a societal need for broadband connectivity. SIRO technology is the first of its kind in Ireland.

Using ESB’s existing infrastructure, SIRO will deliver a 100% fibre-to-the-building network directly into homes and businesses right across Ireland. The open access network, which will be available to all authorised broadband operators in the country, will help to propel Ireland into the ranks of the world’s fastest broadband countries and open up a new world of possibilities for Irish consumers and businesses. ESB and Vodafone are investing €450M in the joint venture, which will utilise ESB’s existing electricity infrastructure to deliver the fibre-to-the-building network across the country. The 100% fibre-to-the-building network will offer broadband speeds from 200 Mbps to 1000 Mbps, initially reaching 500,000 premises in 50 towns.

### DEMAND-SIDE MANAGEMENT

Neither energy efficiency nor demand side management are new elements to utilities.

However a combination of factors are likely to increase the disruptive affect of these elements. These include energy supplier obligations

under the Energy Efficiency directive, adoption of SMART technologies, generation which is increasingly distributed bi-directional and intermittent, and expected market changes such as greater purchases of system services by system operators. The combined effects of these factors is that we are likely to see an increase in the scale of initiatives with a number of new players looking to reduce, manage or aggregate demand on behalf of suppliers, their customers or the system operators.

Novusmodus, ESB's clean technology fund, is developing its portfolio of investments, including a recent €6.5 million investment in Cylon Controls, an Irish company that manufactures equipment to control the efficiency of space heating and cooling systems, which acts as an enabling technology for demand side management.

The ESB RealValue project received EU Horizon2020 funding in 2014. This project will see the installation of a storage solution and profile metering in 800 homes in Ireland and the installation of advanced monitoring and control capability in medium voltage substations associated with the trial.

ESB's supply business Electric Ireland operates a demand response scheme for larger customers and has been active in securing energy efficiency credits through working with customers such as the Dublin Airport Authority.

Electric Ireland has developed a multifaceted approach to deliver energy savings across all of these sectors with a range of tools, from apps that inform customers on appliance usage, an energy wizard to highlight the best efficiency retrofit actions to take or the installation of budget energy meters. All of these assist customers in managing their energy use.

### SMART ENERGY TECHNOLOGIES

SMART refers in general to advanced use of communications and information technology and can be broken into three broad categories.

SMART Networks includes integration of renewables and electric transport and enabling improved grid and

demand management.

SMART Metering, where electronic time-of-use meters are installed in c.80% of all homes, is being developed under the National Smart Metering programme and is proposed to be delivered by ESB Networks in accordance with CER's requirements. SMART homes where a range of new internet-enabled services provide comfort, control, convenience or peace of mind to domestic customers is a nascent but uncertain market. Electric Ireland is currently undertaking a series of Smart Home trials including the availability of the Google Nest smart meter as part of their offering.

### ELECTRIFICATION OF TRANSPORT

ESB has invested to create a national electric vehicle public charging infrastructure in both jurisdictions in Ireland. At the end of 2014 a network of 1,900 public charge points are in place across the island consisting of 832 AC and 70 Fast chargers in Republic of Ireland and 350 AC and 14 Fast chargers in Northern Ireland. This business unit is now in the process of commercialising this infrastructure and leveraging its capabilities to generate business opportunities elsewhere.

### DECARBONISATION OF HEATING

ESB is playing an active role in this area and has initiated a project to promote and support an energy policy framework and commercial environment that would enable mass adoption of renewable heat solutions in Ireland.

### COLLABORATION AND STRATEGIC PARTNERSHIPS

ESB is developing relationships and collaborations with external partners to develop new commercial products and services that can be deployed by ESB.

### BATTERY STORAGE

The primary benefit of battery technology is that it will smooth out the intermittency inherent in current renewable energy technologies and in particular wind energy. A pilot project with a Japanese consortium using both main types of battery is currently underway with ESB involvement including use of one of our wind-farm sites. At a domestic level the

deployment of battery technology with a distributed generation option such as solar panels creates the possibility of an "off grid" solution. The role of electric vehicles in this area is also under study.

### GREENCOAT CAPITAL

ESB established the Novus Modus Greencoat Capital venture capital fund which has a target to invest €200 million in emerging cleantech technologies. During 2014, Novusmodus made a €6.5 million investment in Cylon Controls, an Irish company that manufactures equipment to control the efficiency of space heating and cooling systems.

### WESTWAVE

The ESB Westwave project is a 5MW wave energy project currently being developed on the west coast of Ireland near Doonbeg in Co. Clare. In 2014 the project was awarded €23 million of NER300 funding and has the potential to be the first wave farm in Ireland, paving the way for future developments in this exciting area.

### SOLAR PV

Despite our cloudy weather, solar can play a significant part in Ireland's future energy mix. ESB has launched a commercial-scale Solar Photovoltaic (PV) offering with Kingspan and we are exploring other opportunities for Solar PV in the wider market.

To date Solar PV has enjoyed the most rapid growth of the distributed generation technologies and has enjoyed significant year-on-year cost reductions. ESB has direct involvement in solar through the Kingspan joint venture and indirectly through Greencoat's investment in the TenK Solar company.

### ESB METRO EXPRESS

The ESB Metro Express is an exclusive high capacity Dark Fibre route linking all of the major Data centres in Dublin. This new cross city open access fibre route was developed using ESB's existing duct network.

### NATIONAL BROADBAND PLAN

A team has been set up within ESB to explore how current ESB assets can be leveraged to assist with the implementation of this national plan.



## CASE STUDY



### LEADING THE CHARGE TOWARDS ELECTRO-MOBILITY

ESB has installed a comprehensive electric vehicle charge point network throughout Ireland. The network is almost complete and now provides electric vehicles owners and potential owners, with the security that there is widespread charge point availability. This investment allows for the transition of the Irish fleet to electric and zero tail pipe emission motoring, providing an important method for Ireland to reach its 2020 targets and the eventual decarbonisation of the transport sector.

A mixture of charge point infrastructure - standard AC, fast and home charge points ■ have been installed at locations such as car parks, on street, filling stations, shopping

centres and hotels. Others have been situated at intermodal sites such as train stations, airports and ferry terminals which allow for the seamless switching between modes for commuters and travellers. Furthermore, as an incentive, ESB has been installing a free home charge point for purchasers of a new electric vehicle bought in Ireland, this will continue for a limited time.

Fast charge points can recharge a battery up to 80% in as little as 25 minutes and give electric vehicle drivers the freedom to travel longer distances quickly, for this reason these are mainly located at service stations on major inter-urban routes.

All charge points are "smart" with built-in communication capabilities. This allows them

to be monitored remotely and potential issues identified proactively. Furthermore, in order to provide an integrated system for customers a range of additional services have been developed. These include:

- 24hr service centre for customers to log queries and receive assistance when operating charge points
  - User videos to demonstrate to customers how to quickly and easily use a charge point correctly
  - A mobile app gives customers quick and easy access to information on the location and type of charge points available to them
  - In future, online personalised account will enable customers to follow their charging history.
- Below is an outline of the type and number of electric vehicle charge points installed in the Republic of Ireland to date:

TYPE	NUMBER	CHARGING TIME	LOCATIONS
Standard AC 22kW	832	1-6 hours	On-street, car parks, shopping centres
Fast DC 50 kW	75	80% in 25 mins	Service stations, shopping centres
Fast AC - 43 kW	34	80% in 25 mins	Service stations, shopping centres
16 amp	1200	1-6 hours	Homes, hotels, work places

### THE GREAT ELECTRIC DRIVE

ESB ran a campaign to promote electric vehicles in the community by giving members of the public the opportunity to trial electric vehicles for either four months or a year. From over 20,000 applications 32 members of the public were chosen from across the country. The trial proved to be very successful – the combined savings on fuel amounted to over €18,000 eliminating over 34 tonnes of carbon dioxide in the process. Four of the trial participants purchased an electric vehicle once their trial was complete.

Furthermore, the provision of an electric vehicle charge point in a community provides an extra facility for the local residents and those visiting the area. Electric vehicles themselves create many benefits for communities and society as a whole, including:

**AIR QUALITY:** Electric vehicles have zero tail pipe emissions meaning that they help to improve local air quality particularly in urban areas. Improved air quality helps to reduce disease and reduce premature deaths in communities and society as a whole.

**CLIMATE CHANGE:** Electric vehicles provide a low emission transport solution and as electricity generation decarbonises it will provide a zero emission solution. By decarbonising this sector it will help to mitigate against the effects of climate change such as flooding and changing weather patterns.

**NOISE POLLUTION:** Despite the fact that sound is added to electric vehicles by car manufacturers they still remain very quiet compared to traditional vehicles. This helps to reduce noise from road transport and in doing so creates a more enjoyable environment for communities.

### What the Great Electric Drive participants said:

“It drives well and it works for me and I like technology and the idea of it. Replacing combustion engines is not a bad thing.”

“The experience was good and more economical.”

“Because I love the car, I love everything about it, driving it and the silence.”

“It was a good and positive experience. It builds more confidence in the e-car movement.”



ESB ecars ambassadors who participated in the Great Electric Drive.

# 4.4 ESB NETWORKS – IMPROVING THE EFFICIENCY, RELIABILITY AND RESILIENCE OF THE NETWORK AND FACILITATING RENEWABLE CONNECTIONS TO THE GRID



Marguerite Sayers, Managing Director, ESB Networks Ltd

“A strategic priority for ESB Networks continues to be the efficient delivery of critical infrastructure required to support the ongoing growth of the Irish economy.”

As the Distribution System Operator, ESB Networks serves all electricity customers to ensure a safe, efficient and high quality supply of electricity to meet the needs of all customers.

Access to electricity is a prerequisite to the success of a modern economy and Ireland is ever more dependent on secure, high-quality electricity infrastructure and ESB Networks plays a vital role in ensuring network infrastructure is planned and developed to meet these evolving needs of the nation.

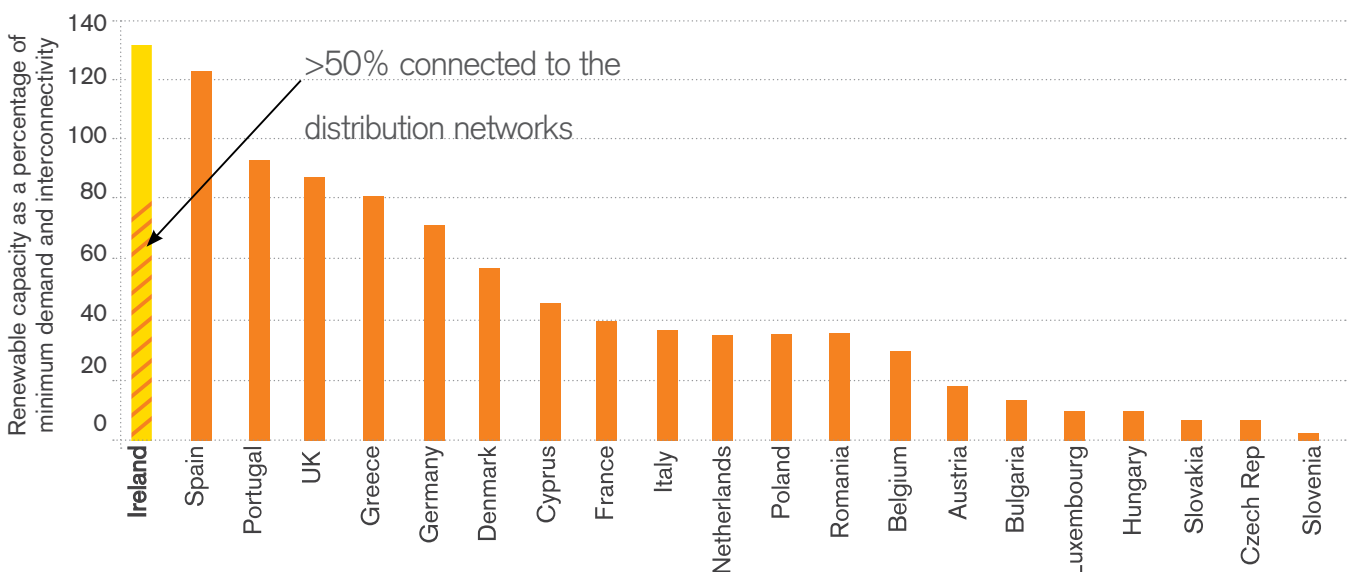
Ireland is already a world leader in its effort to harness potential renewable resources – particularly wind. ESB Networks are a core partner in this endeavour; facilitating reliable and efficient connections, while progressing world leading research to advance connection methods and management of variable generation on the distribution system.

ESB Networks are the Distribution System

Operator (DSO) and Transmission Asset Owner (TAO) in the Republic of Ireland, where they operate capital and maintenance programmes to reinforce, upgrade, extend and maintain the network all subject to the regulatory oversight of the Commission for Energy Regulation (CER). ESB Networks aims to construct and maintain a safe, reliable and affordable electricity network of 183,200 kilometres in the Republic of Ireland (ROI).

The Irish Government has formally committed at European level to have a higher penetration of renewables than any other country in the EU by 2020 [see Figure 01]. Over half of the renewable capacity will be connected to the distribution system. For distribution connected generation, ESB Networks is responsible for the connection design and subsequent operation on the distribution network and plays a key role in facilitating the connection of these new

**FIGURE 4.4.1: TOTAL WIND CAPACITY ACCORDING TO NREAPS, AS A PERCENTAGE OF MINIMUM DEMAND AND INTERCONNECTIVITY IN SUMMER 2020 (SOURCE: EURELECTRIC/PÖYRY STUDY 2011)**



renewables to deliver our national target in a timely and cost efficient manner.

To facilitate our high and growing wind penetration, new and innovative approaches are being implemented to manage and operate distribution connected wind. The power flows from wind connections can lead to system constraints being hit – voltage variability and rise outside standard, loading beyond the thermal limit of the lines (without costly network reinforcement), variation in frequency (controlled by TSO), high reactive power demands and other operational challenges.

The very distributed rural population in Ireland is reflected in the size and scale of an electricity distribution system that is unique. Ireland has four times the European average of length of network per capita, approximately 66% of Irish medium voltage networks are single-phase, and a ratio of over 6:1 overhead to underground networks exists – on an island at the edge of the Atlantic.

All these factors contribute to the significant challenges ESB Networks contend with in maintaining networks to ensure customers receive

a top quality electricity supply and that the lights are always on.

Notwithstanding these challenges, 100% of the population have access to an electricity supply. ESB Networks programmes for 10kV to 20kV conversion also enables an improved quality of supply to the rural peripheries of the network.

ESB Networks operates a renewal programme to progress the upgrade and replacement of these assets, to secure continuity of supply and ensure the

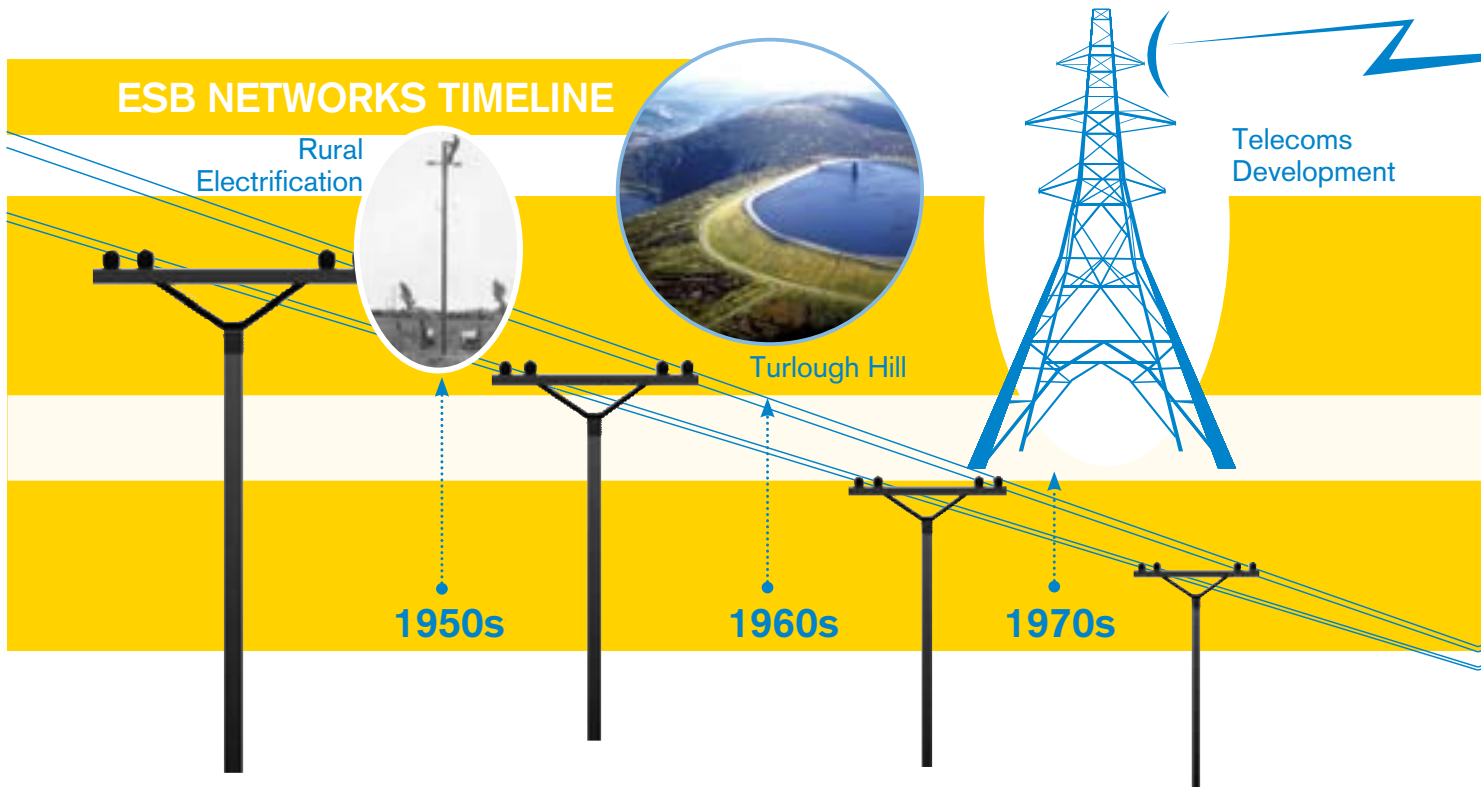
network remains resilient to the forces of nature. ESB Networks programme of works to manage the network is subject to a regulatory price review process, where ESB Networks engages with the Commission for Energy Regulation (CER) to undertake a price review, which determines the programme of works and budgets approved by the CER for the following 5 year period.

**EFFICIENCY**

ESB Networks, MV network policy has determined that the most economical and efficient method of

**FIGURE 4.4.2 LENGTH OF NETWORK IN ROI**

TYPE	VOLTAGE	KMS OVERHEAD LINE	KMS UNDER-GROUND CABLE	TOTAL
Distribution	LV	38107.1	13209.6	51316.7
	10KV	38306.8	8082	46388.8
	20KV	44704.5	1523.5	46228
	38KV	5739.4	1062.3	6801.7
Transmission	110KV	619.5	45.9	665.4
	220KV	4026.8	298.3	4325.1
	400KV	1819.4	134.9	1954.3
		437.8	2.5	440.3







Preparation works for a 20kV conversion of an MV network.

to be carried on individual feeders over a longer distance.

Due to the dispersed nature of the rural population in Ireland, with requirement for significant distributed load, this offers the opportunity to maximise the use of existing networks rather than having to extensively expand the 38kV network and also significantly increase the amount of 10kV lines.

ESB Networks began this conversion programme in the late 1990s and has continued to invest in this conversion throughout the last 15 years. At the end of 2014, ESB Networks, had a total of 49% of the MV network operating at 20kV. This conversion programme has taken place on a nationwide scale.

ESB Networks' mission is to provide safe, reliable and efficient networks. By changing the voltage on the MV rural network from 10kV to 20kV the efficiency, reliability and resilience of the MV network is improved.

By the end of PR3 (to end 2015) over 47,000km or 52% of MV will be operating at 20kV.

addressing voltage and capacity problems on the rural 10kV network is to convert it to 20kV rather than reinforcing the network by implementing 10kV & 38kV solutions.

There are multiple benefits to be secured from converting 10kV network to 20kV operation which include:

- Volt drop is reduced by a factor of four
- Network losses are reduced by a factor of four

■ The strength of the network to accommodate disturbing loads (Short Circuit Level) is increased by a factor of four

■ Capacity is increased by a factor of two; however, in long rural networks where voltage is the limiting criteria that determines circuit capacity. Consequently circuit capacity is effectively increased by a factor of four, when a line is converted to 20kV.

ESB Networks is committed to the conversion of network to 20kV as it enables larger loads

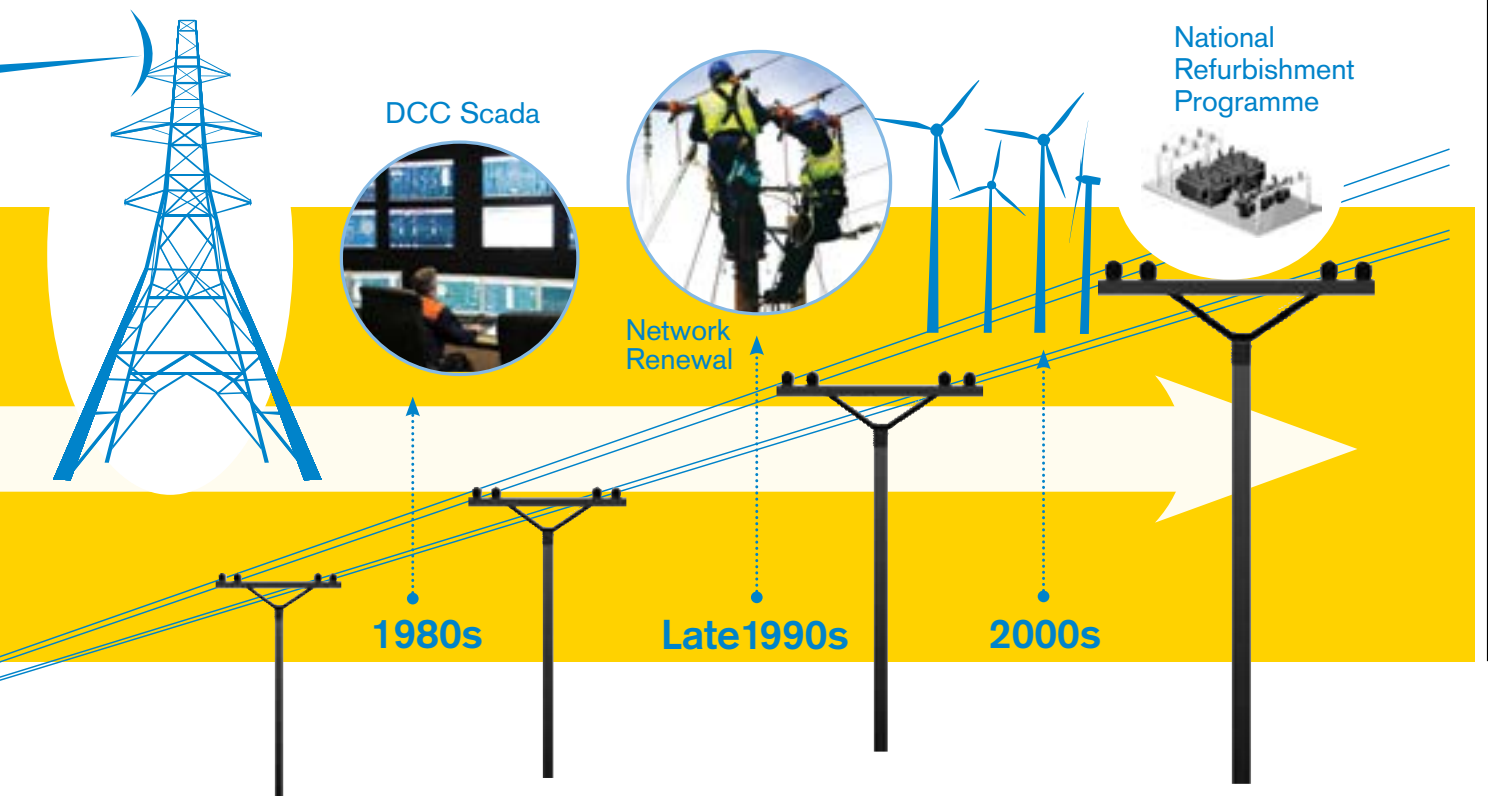
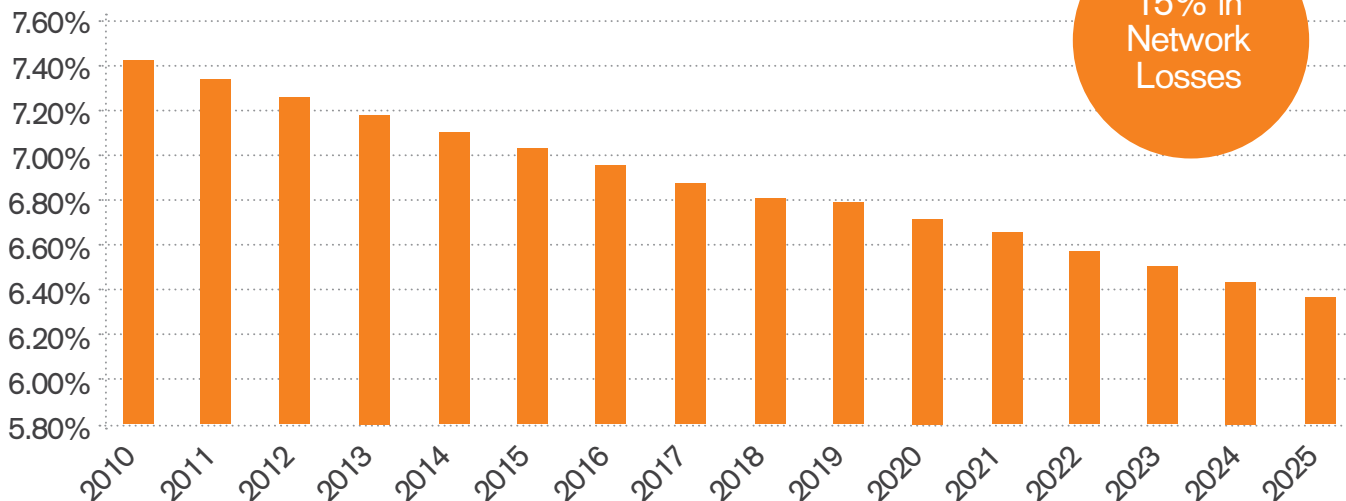


FIGURE 4.4.3 – NETWORK LOSSES REDUCTION TARGETS



2014 Distribution System efficiency 6.73%, Technical Losses 6.35%, Commercial Losses 0.38%



Interface Transformer (IFT) used to step up voltage from 10kV -20kV

As part of the PR3 work programme ESB Networks must ensure that over 10,000 km of MV network is converted to 20kV standard. This will ensure a better standard of electricity to ESB's rural customers.

20kV operation has a number of advantages in terms of sustainability and customer satisfaction. Network Losses are reduced by 75% and the capacity of the existing line is increased by a factor of four. This ensures that the cost per kVA capacity is significantly lower at 20kV than at 10kV. This enables rural customers with a large load requirement (i.e. milking machines, large motors, heavy duty welders and other electrical equipment) to operate more effectively.

**LOW CARBON ECONOMY**

» deliver one of the most environmentally sustainable systems in the world, reducing distribution losses to below

**6.35%**

of end user load, delivering massive savings in CO<sub>2</sub> each year. The environmental and economic sustainability of this is key to ESB Networks strategy as a modern DSO.

ESB Networks will continue its investment in the MV Network to enable over 90% of MV network to operate at 20kV. This will give savings in the region of 350,000 tons of CO<sub>2</sub> per annum when completed.

ESB Networks made an infrastructure investment of €448 million (net of customer contributions) in 2014, which brings the investment in critical electricity network infrastructure over the last five years to €2.4 billion. During 2014, €129 million

was spent on maintaining the existing network.

The focus of the investment in the transmission network was on continuing the reinforcement of the transmission system to facilitate and enable new, renewable electricity generation.

Capital investment programmes are agreed with the Commission for Energy Regulation as part of the Price Review Process. A comprehensive consultation with key stakeholders informs the details of plans agreed with the CER.

**RELIABILITY AND RESILIENCE**

Network assets have a planned operational life of 40-50 years. As well as the upgrading of lines and cables, many assets fall due for renewal and replacement to ensure continued quality of supply and the improved resilience on the network. This renewal work, coupled with the 20kV upgrade programme, serve to improve the resilience of the network, reduce customer minutes lost and provide a better quality supply to all electricity customers.

The three main areas for asset renewal to improve reliability, safety and resilience of the network are:

- Siemens substations: upgrading of old sub-stations, some of which date back to the 1920s and 1930s
- Wood pole stations: upgrading of wood pole stations built between the 1950s and 1970s
- Switchgear replacement: replacement of old switchgear.

These programmed works are an essential part of the ongoing modernising of the network, the improvement of network reliability and quality of electricity supply as well as building a resilience within the network to help withstand the increasing likelihood of extreme weather events.

**FACILITATION OF RENEWABLES**

Ireland has committed to delivering 40% of its electricity from renewables by 2020, as part of the Irish Government’s commitments to EU wide actions on climate change. ESB Networks plays a key role in facilitating the connection of these new renewables to deliver our national target in a timely and cost efficient manner.



The All Island Generation Capacity forecast statement from 2014-2023 published by SONI / EirGrid (System Operators in Northern Ireland and Republic of Ireland) notes that ‘taking into account the electricity demand forecasts, it is estimated that between 3,200 and 3,700 MW of wind power needs to be installed by 2020 to meet the 40% Renewables target in Ireland.’

ESB Networks and EirGrid figures at the end of 2014 indicated that there was over 2,000 MW of installed wind capacity and 3,100 MW of contracted wind in the Republic of Ireland. On the basis of these figures, Ireland is on track to have sufficient renewable generation connected by 2020 in order to facilitate meeting its Renewable Energy Supply – Electricity (RES-E) target of 40% of electricity consumption from renewable sources by 2020.

345MW of renewables were connected in 2013 while over 200MW of renewable generator connections were energised in 2014.

Currently, the level of renewable generator connections energising in 2015 is likely to be about 150MW while connections will be expected to ramp up considerably in 2016 and 2017 (over 1,000MW for two years).

**RENEWABLES**

» Enable over 5,000MW of wind generation capacity to supply the Irish grid – with over

**2,500MW**  
on the distribution system

» Help Irish industry develop

**OCEAN & TIDAL**  
energy projects, enabling technology development, connection and demonstration



Supply reliability is an essential aspect of distribution system performance. The number of interruptions of supply is given in Figure 4.4.5.

The impact of outages on customers across the entire distribution system is measured by two parameters: average number of interruptions per customer connected in the year (CI) and the average number of minutes without supply per customer connected in the year (CML). The CER has set targets for Customer Interruptions (CI) and Customer Minutes Lost (CML) for the period 2011-2015. As the effects of severe weather can cause wide variations in these measures and are outside ESB Networks' control, there is an adjustment for storms days.

**FIGURE 4.4.4 – NUMBER OF OUTAGES BY CONNECTION VOLTAGE**

DESCRIPTION OF CRITERIA	VALUE		
	Unplanned	Planned	Total
<b>Voltage</b>			
<b>LV</b>	19,137	2,708	21,845
<b>10kV</b>	5,245	3,222	8,467
<b>20kV</b>	7,999	2,338	10,337
<b>110kV/38kV</b>	83	0	83
<b>Unknown</b>	4	5	9
<b>Total (excl. Storm Days and Major Renewable Programmes)</b>	<b>32,468</b>	<b>8,273</b>	<b>40,741</b>

Short interruptions lasting less than three minutes are not included.

**FIGURE 4.4.5 – CUSTOMER MINUTES LOST (CML) AND CUSTOMER INTERRUPTIONS (CI)**

DESCRIPTION OF CRITERIA	VALUE					
	Unplanned Target	Unplanned Target	Planned Target	Planned Actual	Target Actual	Target Total
<b>CUSTOMER MINUTES LOST</b>						
<b>Total (including Major Renewal Programmes)</b>	<b>72.2</b>	<b>97.67</b>	<b>55.8</b>	<b>49.78</b>	<b>128.0</b>	<b>147.45</b>
Major Renewal Programmes				19.40		19.40
Total (excluding Major Renewal Programmes)		97.67		30.38		128.05
<b>CUSTOMER INTERRUPTIONS</b>						
<b>Total (including Major Renewal Programmes)</b>	<b>1.096</b>	<b>1.2444</b>	<b>0.226</b>	<b>0.1795</b>	<b>1.322</b>	<b>1.4239</b>
Major Renewal Programmes				0.0544		0.0544
Total (excluding Major Renewal Programmes)		1.2444		0.1251		1.3695

Figure 4.4.5 shows CML and CI for 2014 broken down between unplanned and planned.

Major Renewal Programmes are programmes such as the LV overhead network refurbishment programme where planned outages are required to carry out the work. The planned CI and CML arising from these programmes in a given year depends on the nature and volumes of renewal works carried out in that year.

The percentage of faults exceeding four hours' restoration time was 39% in 2014.

**FIGURE 4.4.6 – CONNECTIONS TO THE DISTRIBUTION AND TRANSMISSION SYSTEM IN REPUBLIC OF IRELAND**

MARKET SEGMENT	DISTRIBUTION CONNECTED	TRANSMISSION CONNECTED
<b>Domestic</b>	2,029,196	-
<b>Small Business</b>	185,107	-
<b>Small Business with embedded generation</b>	24	-
<b>Medium Business</b>	25,772	-
<b>Medium Business with embedded generation</b>	15	-
<b>Large Electricity User (LEU)</b>	1,490	13
<b>Large Electricity User (LEU) with embedded generation</b>	182	58

Note: Small Business includes non-interval metered connections. Medium Business includes low voltage max-demand and public lighting connections. LEU includes connections at medium and higher voltages.



## STORM DARWIN



Storm Darwin in February 2014 was one of the worst storms on record in ROI. With sustained wind speeds of 120 km/hr and damaging gusts up to 177 km/hr over a 3–4 hour period, the storm severely damaged the network in the south and resulted in loss of supply to 280,000 customers. ESB Network’s response was two-fold.

- The initial storm response focused on repairing immediate storm damage and restoring supply to over 280,000 customers in a timely manner, this included replacing over 2,000 poles, 411,000 kilometres of electricity conductor and 4,200 transformers, answering over 200,000 customer calls and involved 2,700 people
- A follow-on public safety survey and hazard rectification programme of the network most severely affected by the storms was completed.

Following the major storm on Wednesday, February 12th, when 280,000 customers lost supply, the call for assistance went to NIE (Northern Ireland Electricity) who immediately sent down 70 staff who reported on Thursday morning to the training centre in Portlaoise for induction.

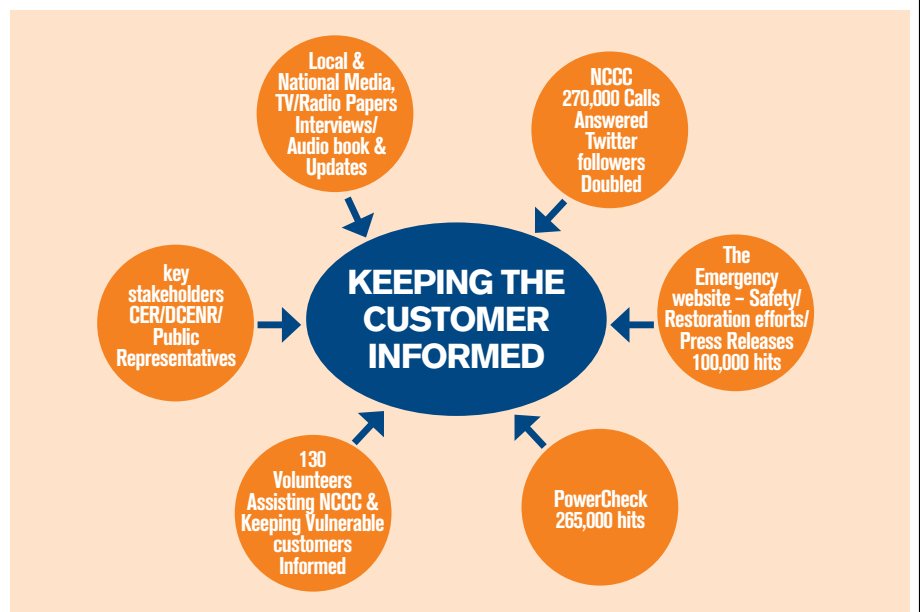
The scale of the repairs required became

apparent as patrollers assessed the damage and a call for further assistance was made. Over the following few days, further assistance was received from NIE and ENS (Electricity Network Solutions) who are contractors for NIE and many of the UK utilities, CIET (contractors working for and released by Scottish Power) and Western Power Distribution.



ESB workers go the extra mile during storm.

### HOW ESB KEPT CUSTOMERS INFORMED THROUGHOUT THE STORM.



Matt Baker and Liam Vanstone, two of Western Power’s Distribution crew who came to assist ESB Networks in the restoration, pictured leaving Rosslare for Fishguard following the stand-down.



# 4.5 NIE NETWORKS – IMPROVING THE EFFICIENCY, RELIABILITY AND RESILIENCE OF THE NETWORK, INCLUDING FACILITATING RENEWABLES



Jerry O'Sullivan,  
Deputy Chief Executive

“The Competition and Markets Authority's final determination on NIE's price control in April has enabled capital investment programmes to be scaled up and provides closer alignment with the regulatory framework in Great Britain (GB).”

NIE is required to develop, maintain, and, in the case of the distribution system, operate an efficient, co-ordinated and economical system of:

- electricity transmission - the bulk transfer of electricity across its high voltage network of overhead lines, underground cables and associated equipment mainly operating at 275kV and 110kV;
- and electricity distribution - the transfer of electricity from the high voltage transmission system and its delivery to consumers across a network of overhead lines and underground cables operating at 33kV, 11kV and lower voltages.

NIE is subject to periodic reviews in respect of the prices it may charge for use of the transmission and distribution networks in Northern Ireland. NIE's price control in respect of the fifth regulatory period since privatisation (RP5) commenced on 1 April 2012 and will apply for the period to 30 September 2017.

NIE's emphasis during RP5 will be on the delivery of specified outputs particularly regarding asset replacement. The price control also provides for additional capital expenditure relating to large transmission projects which may be approved by the Utility Regulator on a case-by-case basis.

Northern Ireland Electricity Networks (NIE) owns the electricity transmission and distribution network and operates the electricity distribution network which transports electricity to over 840,000 customers across Northern Ireland, representing full access (i.e.100%) to electricity supply.

FIGURE 4.5.1 ELECTRICITY CUSTOMERS IN NORTHERN IRELAND

Number of connected customers in Northern Ireland	849,589
Residential	92.7%
Commercial	7%
Industrial	0.3%

The reliability and quality of this electricity supply is central to the daily needs of homes and businesses across Northern Ireland. NIE invested €102 million in 2014 to further develop the network. Acquired by ESB in December 2010, NIE Networks remains an autonomous organisation with its own Board and management teams and separate regulation via the Utility Regulator.

NIE's transmission and distribution network consists of:

- 45,000 kilometres of overhead lines and underground cables
- 75,000 pole mounted transformers
- 258 major substations

NIE's principal activities are:

- constructing and maintaining the electricity transmission and distribution networks in Northern Ireland and operating the distribution network;
- connecting demand and renewable generation customers to the transmission and distribution networks; and providing electricity meters in Northern Ireland and providing metering data to suppliers and market operators to enable wholesale and retail settlement.

Responsibility for transmission network planning was transferred to SONI Limited, the transmission system operator in Northern Ireland, with effect from 1 May 2014 in accordance with the European Commission decision in respect of the transmission arrangements in Northern Ireland.

NIE derives its revenue principally through charges for use of the distribution system and Public Service Obligation (PSO) charges levied on electricity suppliers and charges for transmission services (mainly for use of the transmission system) levied on SONI.

NIE is regulated by the Northern Ireland Authority for Utility Regulation (the Utility Regulator) and the Department of Enterprise Trade and Investment (DETI). NIE's operations are regulated under its Participate in Transmission Licence (Transmission Licence) and Electricity Distribution Licence (Distribution Licence).

Under its Transmission and Distribution licences

# 1,618

» Renewable generation sites connected to the Network across Northern Ireland

FIGURE 4.5.2 OVERHEAD AND UNDERGROUND NETWORK IN NORTHERN IRELAND

VOLTAGE	TYPE	LENGTH KM
275kV	Overhead	800
110kV	Overhead	1,272
33kV	Overhead	3,190
11kV	Overhead	20,800
LV Mains < 11kV*	Overhead	5,550
		<b>31,612</b>
275kV	Underground	4
110kV	Underground	95
33kV	Underground	1,178
11kV and 6.6kV**	Underground	4,052
Low voltage	Underground	10,992
		<b>16,321</b>
<b>Total NIE network 47,933km</b>		

\*This does not include service cables

\*\*6.6kV is mainly found in Belfast

275kV and 110kV are Transmission voltages, Remainder are Distribution

Network losses in 2014  
 103,078 GWh entered the distribution network  
 95,186 GWh exited the distribution network  
 Average losses in 2014 7.66%

FIGURE 4.5.3- RATE OF RENEWABLE CONNECTIONS PER CUSTOMER

DNO	CUSTOMERS (million)	GENERATION CONNECTED TO DATE (kW)	GENERATION CONNECTED (kW)/CUSTOMER	RANK
NP	3.9	410,242	0.11	6
UKPN	8.1	622,000	0.08	7
ENW	2.4	1,024,000	0.43	3
SP	3.5	2,700,000	0.77	2
SSE	3.7	1,200,000	0.32	4
<b>NIE</b>	<b>0.84</b>	<b>652,000</b>	<b>0.78</b>	<b>1</b>

Connection of small scale renewable generation includes single wind turbines, anaerobic digesters, hydro turbines and domestic solar PV microgeneration projects.

#### FACILITATING RENEWABLES CONNECTIONS

Very good progress has been made on connecting renewables so far in Northern Ireland. NIE has in fact connected more renewable generation per customer than any other Distribution Network Operator (DNO) in the UK (based on ENA Networks Report, July 2014)

The 40% target requires circa 1,600MW of renewable generation capacity to be connected. Over 1,260MW of this is either already connected or in progress and other connections in the queue are likely to bring the total towards and beyond 1,600MW figure.

Transmission system reinforcements designed to enable up to 27% penetration versus the 40% target are advancing to plan.

Further connection of renewables beyond the 27% level will require a very sizable investment in the transmission system. Also significant investment will be required in the distribution system to enable further penetration of small scale generation.

Apart from the investment required, there will be difficult technical challenges to overcome due to the levels of renewable penetration in Northern Ireland.

In March 2014 the installation limits for this microgeneration were reduced which resulted in a huge surge in applications at the start of 2014 ahead of this change. The rate of applications for the connection of small scale generation continued at a high level due to developers' anticipation of the current incentives arrangements, based on renewable obligations certificates, ceasing from March 2017 and being replaced with new arrangements, which are expected to be less attractive to developers. The high level of activity has resulted in severe congestion on the distribution network.

NIE continues to work with industry stakeholders including the Utility Regulator, Ulster Farmers Union, DETI and the NI Renewables Industry Group to establish arrangements to enable further small scale generation to connect to the distribution network. This has included consideration of lower cost conventional 33kV investment and the potential for managed connections, which would involve some level of output restriction. Progress has been made and NIE expects to be in a position to offer managed connections, subject to this approach being proven workable, in early 2016.

**SYSTEM PERFORMANCE**

Within the UK, electricity distribution companies report on the performance of their networks, for both planned and unplanned interruptions, using a number of standard measures including:

- Customer Minutes Lost per Connected Customer (CML/CC)
- Customer Interruptions per 100 Connected Customers (CI/100CC)
- Faults per 100 km of Distribution System (unplanned outages only)
- Percentage of Customers Restored Within 3 Hours (unplanned outages only)
- Percentage of Customers Restored Within 24 Hours (unplanned outages only)

These figures, which are submitted each year to the Utility Regulators, provide a means of comparing the performance of the distribution companies.



NIE staff respond to winter storms.

**FIGURE 4.5.4 NUMBER OF SUPPLY INTERRUPTIONS PER 100 CONNECTED CUSTOMERS DUE TO:**

PERFORMANCE CRITERIA	13/14		14/15	10 YEAR AVERAGE	% DIFF.
(a) Distribution Faults					
-LV	3.2	2.7	4.1	4.2	-2%
-HV	53.1	46.9	48.2	52.4	-8%
-EHV	16.0	13.6	21.2	15.2	+39%
-Total	72.3	63.2	73.5	71.7	+3%
(b) Planned Outages	13.6		14.8	17.0	-13%
(c) Other Systems	2.2		0.3	6.9	-96%
(d) Total (a)+(b)+(c)	88.1	79.0	88.6	95.6	-7%

**FIGURE 4.5.5 SUPPLY MINUTES LOST PER CONNECTED CUSTOMER DUE TO:**

PERFORMANCE CRITERIA	13/14		14/15	10 YEAR AVERAGE	% DIFF.
(a) Distribution Faults					
-LV	9.3	6.0	9.1	8.9	+2%
-HV	52.7	43.5	48.5	50.8	-5%
-EHV	4.1	3.0	6.5	5.0	+30%
-Total	66.1	52.5	64.1	64.7	-1%
(b) Planned Outages	47.6		52.3	54.9	-5%
(c) Other Systems	0.2		0.03	3.2	-99%
(d) Total (a)+(b)+(c)	113.9	100.3	116.4	122.7	-5%



## CASE STUDY



Ben Cupples Project Technical Manager with one of the participants Karen Armstrong.



NIE project team at the launch.

### SHIFT AND SAVE

The Shift & Save trial, supported by Coleraine Borough Council, was launched in January 2012 and ended in May 2014. The main aim of the trial was to investigate how smart meters and smart grid technology could change home energy usage patterns to reduce demands on our network, particularly at times of peak demand.

#### What did we do?

200 customers in Coleraine had new smart meters installed as part of the Northern Ireland Electricity (NIE) 'Shift & Save' trial, the first trial in Northern Ireland that combined smart meters and smart network technology.

#### Phase 1

Over the first 9 months, NIE collected base data from the meter. After that, the 200 participants were divided into two groups:

- The Test Group - 175 participants who were incentivised to change their electricity usage patterns
- The Control Group - 25 participants who were not incentivised to change their electricity usage patterns.

#### Phase 2

During Phase 2, test group participants were encouraged to use their high energy appliances during the low tariff times and use minimal load at times of peak cost. This worked by providing each test group participant with In-Home Electricity Displays and rewarding them with a financial saving based on a 'shadow tariff' up to the value of £75.

#### Did we shift the peak?

Shifting or flattening the peak was our number one goal - so how did we get on?

- We reduced the average tea-time peak by **11.6%**. ■ The total units used between 4pm and 7pm reduced by **7.3%**.
- Overall electricity usage decreased by **2.3%**, a significant reduction in waste by the test group.
- The average saving made by test group was **£67.73** during the year.
- The minimum saving was **£8** during the year.
- **90%** of trial participants told us that they had become more careful with energy use during the course of the trial.
- **94%** of participants understood how shifting electricity usage away from peak periods could enable NIE to delay investments to the electricity network.
- **Money Talks** - Our survey results indicated that **80%** of test group participants preferred using the display in the cost mode (pounds and pence), with 2% preferring CO<sub>2</sub> mode and the other 18% preferring Watts.

## 4.6 ESB'S IMPACT ON SOCIETY



Pat Naughton, Executive Director, Group People and Sustainability

“Our objective is to be a positive and effective partner for each of our stakeholders, our staff, our customers, the communities in which we operate and for our environment.”

### OUR PURPOSE

The desire to empower the communities we serve and enable people to reach their full potential has always been the central purpose of ESB. We believe that electricity is critical to people's wellbeing and that it is in the interests of society and economy for all citizens to have access to secure, affordable and sustainable power supplies.

This belief set has always defined our thinking and informed the decisions we take at ESB. Thomas McLaughlin, the engineer who conceptualised and initiated ESB's first project – the Shannon Scheme at Ardnacrusha, Co. Clare, recalled for example how he was driven by a “passionate desire to do all in his power to assist in national reconstruction, and in the building up of the country by development from within...this ideal never for a moment left me until it brought me home again to see the Shannon Scheme realised”.

### SUPPORTING THE COMMUNITY

With business operations in every community in Ireland, ESB has always seen itself as a full and active citizen in the communities we serve. We work in partnership with communities to promote the values we stand for, including safety, integrity and respect, reliability and competitive service, sustainable innovation and teamwork.

Our commitment to playing a positive role in Irish life is evident in our contribution to communities

across Ireland through the Energy for Generations Fund and the Wind Farm community fund, our partnership with the Road Safety Authority to distribute high visibility vests to all Junior Infants, and through our partnership with the GAA as Official Energy Partner.

### Energy for Generations Fund

Since its establishment 10 years ago, ESB's Energy for Generations Fund has disbursed approximately €10million to community based projects around Ireland, working in the areas of educational disadvantage, suicide prevention and homelessness. In the area of educational disadvantage, organisations supported include: TechSpace, an initiative that encourage young people to express themselves through technology; An Cosan's virtual community college; Fighting Words, a creative writing centre for children; and Business in the Community's Time to Read Programme.

### Wind Farm Community Fund

ESB's wind farm community aims to encourage stronger interaction and engagement with communities living in the vicinity of ESB wind farms by providing supports that are clearly aligned with local needs and opportunities. The fund builds on existing programmes to involve local communities in the ongoing operations of the wind farm. Approximately €1million is awarded annually.

### Official Energy Partner to the GAA

ESB are the Official Energy Partner of the Gaelic

Athletic Association (GAA), one of Ireland's largest amateur sporting organisations, and this partnership between ESB and the GAA has resulted in a series of new initiatives designed to promote energy efficiency across GAA clubs. Energy is an important part of every GAA club and ESB works closely with Energy Fit to help GAA clubs across Ireland manage their energy consumption and to promote energy efficiency.

### Road Safety Authority

ESB has had a successful partnership with the Road Safety Authority (RSA) through the support of distributing a high visibility vest to all junior infants starting school.

To date, almost 500,000 Electric Ireland/ESB branded high visibility vests have been distributed to children starting school as part of the “Be Safe Be Seen” initiative. This gives children the message of the importance of wearing a high visibility vest going to and from school and also while playing outside and helps promote ESB's commitment to road safety in Ireland.

### Equality and Diversity

ESB strongly advocates equality and diversity in



Pictured (l-r): Sandra Hoey, Manager Number 29, with Pat O'Doherty, ESB Chief Executive, and Brid Horan, ESB Deputy Chief Executive, reviewing material on the new information kiosks recently installed in Number 29.

the workplace and demonstrates this through a wide range of internal initiatives and programmes. Externally, we promote equality through our 'Women in Engineering' Programme, International Women's and Men's Day events and sponsorship of Dublin Pride 2015 and Silicon Republic's Women Invent Tomorrow programme.

### **PRESERVING OUR ENVIRONMENT AND HERITAGE**

ESB's commitment to preserving and maintaining our environment and heritage is demonstrated through our relationship with The Tree Council during ESB Tree Week, and through our patronage of Number 29, Dublin's Georgian House Museum. We also maintain an important national archive charting the history of electricity in Ireland.

#### **ESB Tree Week**

ESB is the title sponsor of ESB Tree Week and work in connection with Coillte and The Tree Council of Ireland to promote the planting, care and conservation of trees. ESB Tree Week is a week long celebration of trees and the aim of this is to raise awareness of and promote the planting of trees while also encouraging individuals, families, communities, schools and businesses to actively organise and engage in tree initiatives at a local level. Local authorities and tidy town committees get involved from a grass roots level organising tree planting, walks and hikes through woodlands and educating the community in general on the heritage of trees.

#### **Number 29**

Number 29 Fitzwilliam Street Lower is Dublin's Georgian House Museum, which is owned and operated by ESB in partnership with The National Museum of Ireland. The Museum was opened to the public in 1991 and is a valuable educational resource which informs, entertains, and makes accessible the social, decorative, cultural, and political history of the late Georgian capital. The house highlights life in Georgian Dublin during the period 1790 to 1820. Visitors take a tour from the basement to the attic, through rooms which have been furnished with original artifacts, as they would have been at that time. Approximately



Science Gallery Makeshops – fun for all the family.

30,000 people visit the museum annually (between February and December).

#### **Archives**

ESB maintains one of the most important private archives in Ireland, documenting the history of electricity in the State. The archive includes material relating to a number of major milestones in Irish history, including the Shannon Scheme in Ardnacrusha, and the rural electrification programme from the 1940s to the 1970s. ESB's archives department supports hundreds of researchers, authors and academics each year, helping to build up a comprehensive overview of Ireland's history and heritage. The archives team has recently embarked on a project to digitize the archives in order to increase their accessibility and reach.

#### **SUPPORTING INNOVATION**

Supporting innovation and creative talent in science, technology and engineering are core values for ESB. Encouraging experimentation at the cutting edge of science and technology ultimately fulfils our desire to engage with communities as a positive agent of change in

Irish society. Our support for innovation, invention and entrepreneurship can be seen through sponsorships with Spark of Genius at the Web Summit, Science Gallery and City Spectacular.

#### **ESB Spark of Genius**

The ESB Spark of Genius competition started in 2011 and is a chance for the most promising and high potential Irish tech start-ups to pitch in front of a distinguished panel of judges with an opportunity to appear at the Web Summit and win a €25,000 prize fund. ESB are committed to embracing innovation and new technologies and are delighted to be able to sponsor this inspiring initiative at a time when the technology sector can play a leading role in our economic recovery.

#### **Science Gallery**

In 2014, ESB announced a three-year partnership with the Science Gallery, aimed at encouraging the next generation to develop skills in the area of Science, Technology, Engineering and Maths. Science Gallery excels at engaging 15 – 25 year olds in a way that is inspiring and creative, which is fully aligned with the objectives of ESB. For further information please see <https://dublin.sciencegallery.com/>



**City Spectacular**

ESB is a gold sponsor of the Laya Healthcare City Spectacular event which takes place in Dublin and Cork every year. ESB's Spark Your Imagination area is the children's culture & creativity centre of the City Spectacular festival and features innovative collaborators who provide fun, excitement and inspiration for children of all ages.

**SUPPORTING THE ARTS**

For generations, ESB has been a supporter of the arts, recognising that a vibrant arts culture can drive innovation and creativity and play a key role in community engagement. Our tradition continues today and can be seen, heard and enjoyed through our partnerships with ESB Feis Ceoil, ESB Centre for Study of Irish Art in The National Gallery and ESB Live at the National Concert Hall. ESB is a multi-annual corporate sponsor of the Abbey Theatre, Business to Arts and the Dublin Theatre Festival. Our flagship arts

sponsorships include:

**ESB Feis Ceoil**

The Feis Ceoil Association promotes excellence in the learning and performance of Classical music across all ages, levels and disciplines in Ireland.

ESB Feis Ceoil is an annual festival before Easter each year in Dublin which comprises almost 200 competitions, attracting over 5,000 participants from all over the island of Ireland. ESB Feis Ceoil provides a platform for ESB to reach communities throughout Ireland.

**ESB Centre for Study of Irish Art**

Established in 2002, the National Gallery of Ireland's ESB Centre for Study of Irish Art has firmly established its role in promoting and supporting the study of Irish art. Its library and archive collections are now an essential resource for anyone interested in the history of visual art

in Ireland. The ESB CSIA's primary collection comprises over 50 individual collections of original archive material relating to Irish artists, groups and institutions from the eighteenth century to the present.

**Visual Arts**

Throughout our history ESB has commissioned artists to capture important movements in our history. Within our collection, we have the largest and most significant collections of the artist Sean Keating's contemporary history paintings in the world.

Since 2007 ESB has identified and celebrated excellence in the visual arts at the Royal Hibernian Academy's annual exhibition through the 'ESB Keating Awards for Outstanding Art Work' and the ESB Moran Award for Outstanding Sculpture'. In 2014, ESB commissioned Martin Gale to paint a number of oil paintings and watercolours to celebrate the 40th Anniversary of Turlough Hill Power Station.



Pictured are parents and children who have in the past or currently competed in the Feis.



## CASE STUDY



ESB Chief Executive Pat O'Doherty with pupils from St. Patrick's School Ringsend, who participated in the Time to Read programme.

### ENERGY FOR GENERATIONS FUND

ESB's new Energy for Generations Corporate Responsibility Fund of €2 million (which replaces the previous ElectricAid Ireland Fund) supports charities and volunteers working in the areas of educational support, suicide prevention and the alleviation of homelessness.

### Suicide and Homelessness

ESB has been supporting suicide prevention and the alleviation of homelessness since 2005, as selected by staff as areas where they wanted to see the Group focus its activity.

### Education

ESB added educational focus as a theme in 2013 because, as a leading Irish employer, it

is conscious of its need to have access to a highly skilled workforce. Also, ESB recognises that its staff group has been the beneficiary of a good quality education and wants to support a similar investment in the next generation.

The Fund disburses direct grants to applicant organisations throughout the country. This is managed by a cross-company Committee, who meet on a quarterly basis. In addition to this ongoing work, the Group is continuing with two significant educational partnerships:

- An Cosán, the Adult Education Centre in Tallaght in Dublin. ESB is An Cosán's national partner in its strategy to virtualise its learning platform, creating a virtual community college, accessible throughout the country. This project is now entering its second year, and ESB was very pleased to see the first 27 students from the programme graduate in November 2014.

- With Business in the Community ESB supports the Time to Read literacy initiative, working with children in second class in primary school to build their enjoyment of and confidence in reading. It has four school partnerships through the programme (in Dublin City, Santry, Cork City and Whitegate, Cork). It also supports a number of post-primary schools with mentoring and interview skills training.

### SUSTAINABLE POSITIVE OUTCOMES

In 2014 ESB played a significant role in Engineers' Week. 140 engineers from all parts of the Group got involved with the STEPS programme, and participated in enjoyable and rewarding visits to post-primary schools to talk to Leaving Certificate students about engineering as a career. This is something ESB intends to build on in 2015.

As part of the renewal of its Fund in 2014, ESB introduced a new element with formal support for staff volunteering. Any staff member who

has volunteered over 20 hours with a charity can request that ESB donates €250 to that organisation. It's a way of ensuring that their contribution, as a volunteer, is augmented and that an amount of ESB Corporate Responsibility Funds are dedicated to causes that are of concern to staff. There has been a very good response to the initiative, with donations being made to a wide range of charities, including Down Syndrome Ireland, the Jack and Jill Foundation, Scouts and Guide Groups, Age Action among many others. To the end of December 2014, almost 30,000 volunteered

hours have been recorded by staff applying to the fund.

ESB believes in being a responsible member of the community by actively supporting communities in the vicinity of its wind farms. In 2014, ESB committed over €400,000 to enable communities to develop sustainably by funding community initiatives. During 2014, ESB assisted a diverse range of community projects in the Republic of Ireland (ROI), Northern Ireland (NI), and Great Britain (GB).

## CASE STUDY



Talent building in NIE: Chris Huntley; Martin Howell, Business in the Community; Joan Henderson, Solas; and Tom Doran at the launch of the Solas website.

### BUSINESS ON BOARD

In 2014 NIE participated in the BITC Business on Board Scheme, as a means to develop staff with management potential, whilst also providing much needed skill set support to charity organisations across Northern Ireland. Providing valuable resource and skills to local community, enterprises and charity boards all across Northern Ireland, it used the "BITC" Business in the Community "BOB" Business on Board Scheme as the vehicle to deliver this support. In the first nine months, via BOB, staff provided 980 hours sitting on boards on over 30 organisations.

### OFMDFM Social Investment Fund South East Zone. Budget £8.3m

The aim of the SIF is to reduce poverty, unemployment and physical deterioration in areas. We have supported management of huge economic impact on areas of unemployment through investment, education and employment opportunities. Using BOB we identified new opportunities

that not only supported community engagement but equally staff learning and development. Supporting our vision and values by feeding our personal experience and skills back into the community groups that adopted us, they transferred that learning back into NIE, supporting, developing and growing the CSR objectives of all the stakeholders. We provided specific skills in Finance, HR, Operations Strategy to the various groups. Some examples are:

#### Additional needs

Providing information in various formats on dyslexia, ASD and ADHD and supporting children's literacy and numeracy.

Orchardville Society – training and employment for people with disabilities  
SEELB School Board of Governors (Education Board Representative).

#### Bytes Project

Hostelling International Northern Ireland (HINI), formerly known as the Youth Hostel Association of Northern Ireland (YHANI), is a not-for-profit

organisation founded in 1931.

Bytes Project provides an invaluable service to young people (aged 15-25) to help them overcome extreme social deprivation and economic and educational disadvantage – engaging them at local level in initiatives which are proven in their ability to assist their progression to training, further education or work.

#### Clubs for young

Leading voluntary youth organisation – work alongside local youth groups, supporting young people – supporting and facilitating personal development and social education.

In order to offer NIE employees the opportunity to maximise existing skills and to help out their local community, a number of opportunities were made available through Business in the Community to sit on the boards of charitable organisations. We communicated this to all staff via our in-house news sheet, Intranet and Team meetings. Applications were matched with specific skills requirements, meetings set up and places secured.

# 4.7 ENVIRONMENTAL MANAGEMENT



Pat Naughton, Chief Executive

“ESB is focused on maintaining the highest levels of environmental management and sustainability in all aspects of our operations.”

Committee and Board HSE Committee in relation to the embedding of Sustainability in each business area. The Environmental Management Review Boards / Environmental Management Group / Environmental and Sustainability Committees in each business area are responsible for monitoring Business Unit performance on sustainability and environmental management against business area goals and targets outlined in Annual Environmental Plans and Sustainability action plans. They are also responsible for highlighting any issues to their relevant Executive Director and the Group Compliance, Risk and Environment Manager.

The Sustainability Managers are responsible for promoting sustainability within each business area. They are responsible for establishing robust reporting mechanisms within each business to monitor and report on progress against each of the relevant Sustainability Objectives.

The Environmental Co-ordinators are responsible for promoting good environmental management in their business areas and for implementation of the Annual Environmental Plan as part of the Environmental Management System in their area of responsibility. Line Managers and Supervisors are responsible for driving Sustainability and Environmental management as an integral part of all ESB activities to ensure they are embedded in each business area. All staff are responsible for compliance with environmental policies and procedures and for adopting sustainability practices within their business area.

### RECOGNISED MANAGEMENT STANDARDS

All ESB Networks and NIE operations and ESB generation activities and many office locations within ESB Group operate under Environmental Management Systems (EMS) certified to ISO14001.

### INTRODUCTION

As a major Irish utility with significant presence in the All-Island (Republic of Ireland and Northern Ireland) market and a growing presence in the Great Britain energy market, ESB is focussed on maintaining the highest levels of environmental management and sustainability in all aspects of our operations in order to minimise our impacts on the environment and enhance the reputation of ESB as an exemplar organisation.

The ESB Group Policy for Environmental Management and Sustainability sets out the high-level principles and context for the management and oversight of environmental and sustainability issues in ESB Group. This Policy is a statement of the commitment of ESB Group to conducting our activities and those of our subsidiary companies in an environmentally responsible manner. This policy statement commits ESB Group to comply with all statutory and regulatory environmental legislation pertaining to our business operations.

The ESB Group policy on Biodiversity sets out the context in which ESB endeavours to manage its activities to avoid significant impact on habitats, species or other aspects of national heritage, and where feasible, work to enhance biodiversity.

ESB also complies with the European Communities (Access to Information on the Environment) Regulations 2007 – 2014.

### ENVIRONMENTAL GOVERNANCE

Responsibility for environmental management in ESB proceeds from the Board through the Chief Executive, to all senior management and in turn to each manager, supervisor, team leader, and member of staff.

The Board Health Safety and Environment Committee are responsible for oversight of company strategy, policy and compliance in health, safety and environmental matters and for advising the Board on health, safety and environmental matters. The Executive Director Team (EDT) are ultimately responsible for embedding sustainability and the implementation of effective environmental management within their areas of responsibility. The Sustainability Committee are responsible for reporting to the EDT and Board on progress on sustainability and for reviewing and monitoring ESB Group performance on sustainability against strategic targets. The Committee provides assurance on environmental risk management and compliance by assessing the adequacy of processes and procedures in place in each BU. The Committee is responsible for approval of the Sustainability Strategy and the Annual Sustainability Report.

The Group Compliance, Risk and Environment Manager is responsible for providing oversight and assurance to Sustainability Committee and Board HSE Committee in relation to Environmental Compliance in each business area.

The Manager Safety and Sustainability is responsible for providing oversight and assurance to Sustainability



Michael Ahern, Project Sponsor, Louise Murphy, Project Executive, Sean Balfe NSAI, Executive Director, Jim Dollard, Adrienne Eacrett, Implementation Group Member and Peter Morgan, Project Manager.

This provides a structured basis from which to ensure all the environmental aspects of our operations are considered, all impacts assessed and work programmes established to mitigate and minimise our impact.

<p>Under the auspices of our environmental management systems ESB is committed to:</p> <ul style="list-style-type: none"> <li>■ Adopting appropriate management structures, management systems and targets to manage sustainability and environmental issues</li> <li>■ Complying with all regulatory, planning and environmental legislation pertaining to our business activities</li> <li>■ Conducting our activities and those of our subsidiary companies in an environmentally responsible manner</li> <li>■ Developing and maintaining effective</li> </ul>	<p>environmental management systems (EMS) suitably certified to the requirements of ISO14001</p> <ul style="list-style-type: none"> <li>■ Acting responsibly in our use of environmental resources</li> <li>■ Contributing to environmental and sustainable policy development at national and EU level</li> <li>■ Maximising energy efficiency and conservation in all our activities and encouraging our customers and suppliers to use natural resources in a prudent and efficient manner</li> <li>■ Identifying the environmental impacts associated with our activities and managing them appropriately</li> </ul>	<ul style="list-style-type: none"> <li>■ Identifying and managing significant environmental risks and having emergency response plans in place</li> <li>■ Reducing our internal CO<sub>2</sub> carbon footprint by improving the energy efficiency of our buildings, reducing fuel used in our vehicle fleet and promoting sustainable travel for staff</li> <li>■ Reducing water usage, reducing waste streams and increase reuse and recycling in all of our locations.</li> </ul>
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The environmental aspects of ESB's thermal power stations within the Republic of Ireland are controlled through Integrated Pollution Prevention and Control Licences and Greenhouse Gas Permits which are issued and monitored by the Environmental Protection Agency (EPA). These licences and permits are audited by the EPA and a third party verifier on at least an annual basis. In addition annual emission reports are submitted to the EPA and are available through the Agency website. ESB's Hydro Stations are subject to environmental control through discharge licences issued and monitored by the relevant Local Authority. Information regarding planning permissions (including associated application documentation) for individual wind farms in the

Republic of Ireland, Great Britain and Northern Ireland can be accessed directly from the relevant local authority websites.

**PROGRAMMES AND TARGETS**

ESB has established a number of objectives in the Environmental area as part of its Sustainability Strategy which is aligned with our overall Corporate Strategy. In addition each business area maintains an annual environment and sustainability management programme detailing plans and objectives specific to that area. These are reported on and reviewed as part of the management review cycle and external assurance audit under their ISO14001 assurance process.

**PERFORMANCE WASTE**

There has been a concerted focus on waste management, which has led to improved segregation on site, resulting in higher levels of reuse and recycling, including the identification of new streams of reuse for waste products. Staff commitment and involvement in appropriate segregation, waste reduction and improved reuse is central to our improving waste management performance. Framework contracts with key waste services providers have also increased our level of oversight and assurance of proper and legally compliant disposal methods being employed by waste contractors and ensuring the maximum possible levels of waste are diverted from landfill.

Consolidated waste totals from the ESB Business Units for 2014 is presented in Table 4.7.1 below. The table excludes ash and excavation waste from capital works.

**TABLE 4.7.1: CONSOLIDATED WASTE TOTALS IN ESB ORGANISATION 2014**

TREATMENT	ESB NETWORKS	NIE	G&WM	ELECTRIC IRELAND	BSC	ESBI	TOTAL 2014	TOTAL 2013
Recycled (tonnes 2014)	9,604.69	2,771.16	1,955.64	21.05	234.65	65.40	14,652.58	13,956.90
Disposal (tonnes 2014)	198.88	66.27	762.42	7.05	15.81	5.16	1,055.59	1,000.00
Total (tonnes 2014)	9,803.57	2,837.43	2,718.06	28.10	250.46	70.56	15,708.17	14,956.80
Recycling rate %	98.0%	97.7%	71.9%	74.9%	93.7%	92.7%	93.3%	93.3%



TABLE 4.7.2: CONSOLIDATED HAZARDOUS AND NON-HAZARDOUS WASTE TOTALS IN ESB ORGANISATION 2014

WASTE TYPE	ESB NETWORKS	NIE	G&WM	ELECTRIC IRELAND	BSC	ESBI	TOTAL
Non-Hazardous (tonnes 2014)	7,924.73	1,666.55	1,955.64	21.05	234.65	65.40	14,652.58
Hazardous (tonnes 2014)	1,878.84	1,170.88	762.42	7.05	15.81	5.16	1,055.59
Total (tonnes)	9,803.57	2,837.43	2,718.06	28.10	250.46	70.56	15,708.17

TABLE 4.7.3 : TOTAL WEIGHTS BY TYPE AND DISPOSAL METHOD

The table includes ash waste arising in Moneypoint, Lough Ree Power and West Offaly Power.

DISPOSAL METHOD	TONNES 2014						TOTAL 2014
	ESB NETWORKS	NIE	G&WM	ELECTRIC IRELAND	BSC	ESBI	
Reuse	344.58	0.00	0.00	0.00	0.00	0.00	344.58
Recycling	9,198.71	2,771.16	9,906.80	13.76	102.87	33.06	22,026.36
Composting	61.39	0.00	37.84	7.29	33.77	5.59	145.88
Recovery, including energy recovery	0.00	0.00	0.00	0.00	98.01	26.75	124.76
Incineration (mass burn)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Deep well injection	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landfill	198.88	66.27	134,413.42	7.05	15.81	5.16	134,706.59
On-site storage	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other (to be specified)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Disposed of directly by the organization or otherwise directly confirmed			141,640.00				141,640.00
Information provided by the waste disposal contractor	9,803.57	2,837.43	2,718.06	28.10	250.46	70.56	15,708.17
Organizational defaults of the waste disposal contractor							

#### WASTE - ASH

Emissions abatement technology to reduce greenhouse gas emissions from Moneypoint coal-fired generating station has been installed. The abatement technology includes Flue-gas desulphurisation (FGD) equipment to reduce sulphurous oxide (SO<sub>x</sub>) emissions and selective catalytic reduction (SCR) equipment to reduce nitrous oxide (NO<sub>x</sub>) emissions. The FGD and SCR equipment is installed individually on each of the three generating units at Moneypoint, with the further addition of common plant to serve all three units. A FGD waste by-product is produced through the abatement process.

Overall annual ash totals from 2013 and 2014 are summarised in Table overleaf.

TABLE 4.7.4: ANNUAL ASH TOTALS GENERATION & WHOLESALE MARKETS 2013 & 2014

Station	Tonnes per year	
	2013	2014
Moneypoint	136,300	121,090
Lough Ree	38,782	31,950
West Offaly	30,786	42,866
Total Ash	205,868	195,906
FGD By product	46,700	61,183

In past years coal ash had been sold for use as an additive in cement, however, demand in the market had weakened during the recession resulting in a collapse of the ash resale market. Recent recovery in the construction industry has seen a recovery in the market for fly ash.

## CASE STUDY

### FROM BOTTOM ASH TO BUILDING BLOCKS

Burning coal at Moneypoint produces three main residues: desulphurisation by-product, fly ash and boiler bottom ash. The station sells fly ash to the



Tony Darcy inspects a Moneypoint Block in Liverpool

cement production industry, where it's used as a primary ingredient. The rest is stored on site – so far, there are over 5 million tonnes, which means future landfill capacity is always a high priority. With the building industry downturn over recent years, the resulting drop-off in fly ash sales meant Moneypoint had to look for other markets to reduce the burden on its by-product storage areas.

The team found a market for the furnace bottom ash – it can be used to make building blocks, which have several advantages over traditional blocks:

- They are 28% lighter and 50% more thermally efficient but with the same strength.
- There's no need to spend time/money on quarrying and other processes to make them.
- They have a lower carbon footprint.

There is great demand for bottom ash in the UK, where they use around 500,000 tonnes each year in manufacturing. During 2014, Moneypoint launched a trial export, loading 5,000 tonnes of ash on to a vessel and sending it to a brick manufacturer in Liverpool.

The trial was successful and the team have identified process improvement opportunities, meaning Moneypoint will be able to sell all its bottom furnace ash – around 60,000 tonnes/year, helping to reduce its landfill challenges.

## WATER

Generation activities account for the vast bulk of our utilisation of water and our aqueous discharges. A number of our generation stations have been undertaking water conservation programmes to reduce overall water usage through monitoring and changes in practice and to recycle water into the process where appropriate.

In other locations (offices and depots) across the business we have installed AMR (automated meter reader) technology in main premises, to monitor water consumption levels and help in leak detection. In the case of ESB Networks 39 AMRs had been installed at the end of 2014.

By affixing pulse output water meters and data loggers to the installed infrastructure meters – or “piggybacking” on them – we have been able to track our consumption easily and effectively. In addition to the regular monthly reporting, the system raises an alarm where it identifies abnormal water usage levels or possible leaks that would otherwise go undetected for lengthy periods. Pre-determined alarm thresholds are set for each depot and when thresholds are exceeded a text warning message is sent to the nominated ESB person for their investigation and follow up.

In spite of this good progress, many of our facilities remain unmetered and a consolidated view of water consumption across ESB Group is not currently available. Water metering is in the process of roll out across Republic of Ireland and with this we plan to develop a group level view on water consumption as well as continuing the roll out of AMR systems to enable specific local monitoring and management of water consumption.

On foot of the roll out of AMR technology in ESB Networks, that business unit has set a 30% water reduction target by 2020. The application of AMR in ESB Networks and its consumption level alarms has to end 2014 helped avert over 1.2 million litres in water leakages.

**BIODIVERSITY**

The EU Birds and Habitats Directives set out procedures and obligations in relation to nature conservation management in member states in general, and of the Natura 2000 sites and their habitats and species in particular.

The Natura 2000 network in the Republic of Ireland is made up of sites, which include Special Areas of Conservation (SAC), Special Protection Areas (SPA), candidate Special Areas of Conservation (cSAC) and proposed Special Protection Areas (pSPA).

**TABLE 4.7.5 ESB ASSETS WITHIN DESIGNATED SITES (ROI)**

	TOTAL	INSIDE SAC	INSIDE SPA	INSIDE NHA	INSIDE PNHA
Lands under the control of ESB (km <sup>2</sup> )	90.7	23.4	36.5	5.1	45.6
Low Voltage Stations (No.)	249,000	2504	1793	102	2312
38kV to 400kV Overhead Lines (km)	12,330	291	186	38	254
38kV to 400kV Cable (km)	1,319	16.9	20.0	0	29.0

A number of initiatives have been developed to address biodiversity, including incorporating biodiversity aspects into existing environmental management systems, the adoption of biodiversity guidelines for HV substations, biodiversity action plans, the preparation of Networks job aids addressing design work in close proximity to Natura 2000 sites and National Monuments and the preparation, with EirGrid (Transmission System Operator), of draft

ecology guidelines for electricity power lines. The estimated extent of ESB assets within designated sites in Republic of Ireland is set out in table above. ESB continues to assess the impact of its operations in accordance with its obligations. Since 2012 ESB has incorporated biodiversity requirements into the Environmental Management Systems for all ESB businesses.

**CASE STUDY**

**ESB FISHERIES CONSERVATION PROGRAMME**

ESB continues to invest significant resources, both financial and people, in its fisheries conservation programme. The fisheries conservation programme includes the operations of three salmon conservation hatcheries, comprehensive river restoration work, the juvenile and silver eel trap and transport programme as well as the issuing of certain fishing and boating permits. ESB also invests in scientific research projects aimed at informing and directing ESB fisheries conservation efforts.

To deliver ESB Fisheries conservation programme, 20 staff are employed across five different locations in Ireland as well as a number of contractors. In addition some fisheries are leased to Inland Fisheries Ireland (IFI).

There is a complex and diverse range of stakeholders with particular interests in ESB fisheries who are managed on an ongoing basis. The stakeholders include Department of Communications, Energy and Natural Resources (DCENR), IFI, Marine Institute (MI), Department

of Culture and Leisure (NI), eel fishermen and many local angling groups and associations. Shannon Fisheries partnership group which has been in place for the last 4 years is an example of effective collaboration between ESB, IFI and Shannon Fisheries Preservation and Development Co. Ltd and is focused on utilising available resources to best assist in rebuilding and protecting fisheries.

**ESB SILVER EEL TRAP & TRANSPORT**

In compliance with the 2007 NEMP Directive, ESB develops, funds and manages a trap and transport programme to ensure the safe capture, transport and release of live adult eels downstream from the dams. ESB uses contracted eel fishermen (former commercial eel fishermen) to catch silver eels at various locations in each catchment, and land the eels at specified locations. ESB Fisheries staff then collect, transport and release the eels downstream from the dams so that they can continue their journey to the sea. This programme runs between August and January each year and is monitored by IFI.

The trap and transport programme has been a success and ESB has exceeded the programme targets set by the Marine Institute over the last 3 years. ESB are now the leading exponents of trap



Frank Barry, Manager, Lee Hydro Stations, Michael Quinlan, GWM and Paddy Hayes, Executive Director, GWM pictured on Coachford Greenway, a 3km walkway which was developed by ESB along the Iniscarra reservoir, for use by locals, visitors and fishermen.

and transport in Europe with approximately 70% of the entire trap and transport within Europe being completed by ESB.

**ELVER TRAPPING - INCIDENT AT BALLYSHANNON 2014**

Elvers (young eels) return to European rivers each

year from their spawning grounds in the North Atlantic to make their way upstream into the rivers and lakes of Europe. On the river Erne, the elvers make their way through the elver traps at the hydro station at Ballyshannon. The hydro station at Ballyshannon has a long record of successful elver trapping over 50 years and it is estimated that ESB has trapped, collected and transported approximately 1.5 billion elvers into the Erne in this time.

During Easter 2014, there was a sudden large influx of elvers into one of the traps at the Ballyshannon Hydro station which overwhelmed the capacity of the tank and resulted in the loss of 112kgs of elvers (circa. 336,000 elvers) The loss

equated to approximately 17% of the Erne elver run for that year.

Under the 2007 EU Directive, the Erne is classified as a trans-boundary catchment, it covers the two states of Northern Ireland and the Republic of Ireland. Following the incident ESB worked with officials on both sides of the border to complete a report into the cause of the incident and agree an updated trapping protocol. Measures to mitigate the loss of elvers have also been agreed and are being implemented.

An additional trap has been installed at the hydro station and the existing traps were refurbished before the start of the 2015 season.

**THE FUTURE FOR ESB FISHERIES**

ESB Fisheries will continue to invest in scientific research; €200k is committed to scientific research for 2015. This investment includes the continued support of the ESB Scientific Advisory Group.

This group includes scientists from various bodies such as NUIG, MI, UCC as well as an external consultant. The group provides advice to ESB Fisheries on the management and operation of the hatcheries as well as oversight of the eel programme. ESB Fisheries will also continue to work closely with governing bodies, IFI and DCENR to explore opportunities for greater co-operation and synergies into the future.

**HANDLING OF GRIEVANCES**

As set out in ESB’s Group Policy Statement on Environmental Management and Sustainability, ESB recognizes that our activities comprising of electricity generation, transmission, distribution and supply have environmental impacts and that it is our responsibility to manage these impacts in a manner that provides a high level of protection for our natural environment and contributes to the sustainable development of our economy.

ESB Group requires robust and responsive methods for handling any grievances that may arise from the general public or any other societal stakeholder, be they general complaints or complaints of an environmental nature.

ESB’s website (www.esb.ie), sets out a variety of channels for reporting directly to the main customer facing businesses in the ESB Group; to ESB Networks and Electric Ireland, as does Northern Ireland Electricity’s website (www.nie.co.uk). The process for each of these public-facing business units is underpinned by a customer charter and code of practice, a complaints handling procedure, all with clear performance expectations stated publicly, as well as a regulatory obligation to report in certain circumstances:

- ESB Networks Ltd. ESB Networks has a customer charter outlining 12 customer distribution service guarantees. A National

Customer Care Centre also acts as a first point of contact.

FOR CUSTOMER HELP LINE, [CLICK HERE](#)

- NIE Networks NIE aims to provide a first-class service and value for money to all its customers. Its customer charter, code of practice and customer care helpline are accessible via the company website: Customer Charter.

FOR CUSTOMER CHARTER, [CLICK HERE](#)

- Electric Ireland Electric Ireland is committed to offering a quality service. Their service commitment is to treat all customers with courtesy and respect, to try and clearly understand customer needs and to act as quickly as possible. Electric Ireland’s service standards are based on five Customer Codes:
  - The Code of Practice on Customer Billing and Disconnection.
  - The Code of Practice on Vulnerable Customers.
  - The Complaints Handling Code of Practice.
  - The Code of Practice on Marketing and Sign Up.

- The Code of Practice on Pay As You Go Metering.

FOR CODE OF PRACTICE, [CLICK HERE](#)

Other avenues to register complaints or environmental complaints include:

- Reporting to local authorities and the Environmental Protection Agency for IPPC licensed generating stations.
- Directly to ESB Corporate Affairs for all other complaints and grievances.

Each business unit operates an independent Environmental Management System (EMS), which is certified to ISO14001 and subject to external verification auditing. A management process is established within each EMS to manage the organisational response to complaints of an environmental nature.

**ACCESS TO ENVIRONMENTAL INFORMATION**

European Communities (Access to Information on the Environment) Regulations 2007 to 2014 (S.I. No. 133 of 2007, S.I. No. 662 of 2011 and S.I. 615 of 2014) (hereafter referred to as the AIE Regulations), give legal rights to those seeking to access information on the environment from public authorities.

Under these regulations, information relating to the



environment held by, or for, a public authority must be made available on request, subject to certain exceptions. The AIE regulations also oblige public authorities to be proactive in disseminating environmental information to the public. The AIE Regulations provide a definition of environmental information, outline the manner in which requests for information may be submitted to public authorities and the manner in which public authorities are required to deal with requests e.g. timeframes for response. The regulations also provide for a formal appeals procedure in the event that a person is unhappy with a decision on their request.

**DURING 2014, 12 AIE REQUESTS WERE SUBMITTED THROUGH THE FORMAL CHANNELS TO ESB**

Received	Granted	Part Granted	Refused	Internal review received	Review upheld	Review partially upheld	Review Revoked	OCEI Appeal
12	2	2	8	6	5	1	0	3

\*OCEI – Office of Commissioner for Environmental Information

**ENVIRONMENTAL COMPLAINTS**

**TABLE 4.7.6: ENVIRONMENTAL COMPLAINTS AND INCIDENTS IN NIE DURING 2014**

ENVIRONMENTAL INCIDENTS SEVERITY CLASSIFICATION		NUMBER OF INCIDENTS IN 2014
0 - None	No environmental damage	18
1 - Minor	Minor local pollution with short-term environmental damage. Limited pollution response by NIE and / or NIEA	36
2 - Moderate	Moderate local pollution with medium-term environmental damage. Significant response by NIE and / or NIEA	0
3 - Major	Major local pollution but recoverable (in the medium-term) environmental damage over a local area. Significant pollution response by NIE and / or NIEA	0
4 - Severe	Severe but recoverable (in the medium to long-term) environmental damage over a large area. Significant pollution response by NIE and / or NIEA	0
5 - Catastrophic	Persistent and severe non-recoverable (in the long-term) environmental damage requiring long-term response from NIE and / or NIEA	0
	Total Environmental Incidents Reported and Resolved	54
	Total Incidents Resulting Action Notice from NIEA	0

**COMPLAINTS HANDLING**

Please note, complaints specifically relate to queries which cannot be resolved in the area in which they have arisen, but instead have to be referred to another party – either within ESB Networks, or an outside party.

Staff in our Customer Contact Centre, and local management, are empowered to resolve complaints promptly and our target is to respond to 92% of all complaints received through these channels within five working days.

The ESB Networks complaints facilitator produces a monthly management report to monitor both the volume of complaints received and our response performance in relation to these complaints.

**TABLE 4.7.7: ESB NETWORKS COMPLAINTS PROCESSING 2014**

DESCRIPTION OF CRITERIA NUMBER	NUMBER
<b>Complaints received</b>	<b>NUMBER</b>
Concerning low voltage	49
For frequent outages	1,223
Time to connect customers	14
Operation delays and overruns	37
From suppliers	0
On connection costs and budget quotations	30
On meter reading and estimated reads	242
Others	793
<b>Total complaints received in 2014</b>	<b>2,388</b>

## 4.8 OPERATIONAL ENERGY EFFICIENCY



Pat Naughton,  
Executive Director,  
Group People and  
Sustainability

“Energy efficiency is the foundation of a sustainable economy and is at the heart of many of the efforts being undertaken across the ESB Group.”

### INTRODUCTION

Energy efficiency makes our economy more competitive, whilst helping to lower our greenhouse gas (GHG) emissions and maximising our economic competitiveness.

Energy efficiency is the foundation of a sustainable economy and is at the heart of many of the efforts being undertaken across the ESB Group to address aspects of energy efficiency, be it from the network perspective, at customer end use or through the development of new high efficiency CCGT plant. ESB Group recognises the importance of being exemplary in this space and leveraging the connection we have with communities where we work to bring the energy efficiency discussion centre stage in the thoughts and actions of people at a domestic, community, industry and national level.

Within ESB Group, energy efficiency is identified as a strategic priority within the sustainability strategy and is cascaded into business unit business plans, factored into long term asset planning, incorporated into our customer facing energy services offerings, included in our regulatory price review submissions, as part of the multifaceted approach across the breadth of the business, many of which are detailed in other sections of this report.

For staff, energy efficiency is brought to life

through our focus on energy efficiency within our operations and how behavioural change can contribute to energy efficiencies in both building energy and vehicle fuel consumption. There are a number of key focal areas to drive energy efficiencies in these areas:

### STAFF TRAVEL

A number of measures are in place to encourage staff to seek alternatives to travelling for work. These include: the availability of online and teleconferencing facilities across the company; the promotion of public transport as an alternative, where available. Where staff use their private vehicle for work purposes, this mileage is tracked and reported on and an emphasis is placed on an overall reduction in the context of business activity levels.

### BUILDING ENERGY

Much of ESB's building stock is relatively old and inefficient from an energy standpoint, having been built 30-50 years ago. Over the past number of years, a concerted effort has been made to undertake feasible upgrades and retrofits to improve the energy performance of buildings. Use of passive infrared sensor (PIR) lighting is now widely in use, building management and heating control systems have been upgraded and energy performance is monitored.

Much of our building related energy consumption is driven by our organisational

Information Technology requirements, including data centres.

### FLEET FUEL

ESB operates one of the largest vehicle fleets in the country with approximately 2,000 vehicles in the 'yellow' fleet. Over the past number of years we have been implementing a phased 'Green Fleet Plan' to improve the fuel efficiency performance of the fleet.

A Fleet Management system has also been installed, which enables improved vehicle maintenance and driving behaviours feedback. In 2013, fleet procurement adopted a life cycle cost approach to new vehicle procurement, which has helped the procurement of more efficient vehicles. The electrification of auxiliary equipment, such as hoists, as well as 50 electric vehicle in the fleet, also combine to reduce fuel requirements.

### DRIVER BEHAVIOUR

ESB has focused on the driving skills of its staff for the last number of years. Whilst the primary focus on developing advanced driving skills through training has been to improve staff safety on the roads, a secondary benefit of the advanced driver training is improved vehicle sympathy and economic driving style.

All of the above issues combine to deliver real energy savings and reduce costs of energy within the business.



Electric auxiliary equipment reduces fuel consumption.

## CASE STUDY

### SERVER VIRTUALIZATION

Computer Servers are used to provide a performant, resilient platform for hosting applications such as email, e-billing, meter reading and trading which are among 1,000 plus applications that are hosted on our servers. All of these applications are hosted on an operating system such as Windows 2008 or Red-Hat Linux. The traditional approach would be to install one operating system instance on a physical server and then install the required application on top on the operating system. Moving on to a virtualised environment, on the physical server we install what is called a hypervisor. This is software which enables the creation of multiple virtual machines which are independent of each other, each with their own operation system and application. The hypervisor allows the physical resources to be divided and allocated to each virtual machine as required. In ESB's environment, we are typically

running 20 virtual machines on a physical server. Before virtualization, we would need 20 physical servers each with a power requirement of 400 watts, giving a total power draw of 8 Kilowatts. Through virtualization, we use a higher specification server to provide the required resources to host those 20 operating systems and applications, however the power draw is just 630 watts – a power reduction of over 90%.

Previously, we had almost 900 physical servers with more being demanded. We were coming to the limits of available space and power. Thanks to virtualization, we now have 1,400 virtual servers hosted on just 80 physical machines. In total, the energy savings to ESB through virtualising 1,400 servers is almost 3.5 gigawatt hours per year. To put that in perspective, that's an annual saving of almost 2,300 metric tonnes of carbon emissions or 1,800 acres of trees. In

monetary terms, this equates to a saving of over half a million euro. In addition, we will be reducing our datacentre footprint by half, from 4000 sq. ft., to 2,000 sq. ft., when the current datacentre leases expire in 2016. Virtualisation has been a major step in the journey towards more sustainable server computing for ESB.



Billy Crowley and Stephen Walsh (both BSC) receiving an award for their work on server virtualisation from Pat Naughton, Executive Director, Group People & Sustainability.

FIGURE 4.8.1 TOTAL PRIMARY ENERGY REQUIREMENT (TPER), REPUBLIC OF IRELAND OPERATIONS

ENERGY	ENERGY CATEGORY	ENERGY TYPE	UNIT	BASELINE (2006-2008 AVERAGE)	2014	2013	%IMPROVEMENT SINCE BASELINE
Electricity	Total		kWh	95,785,331	63,368,216	67,399,547	29.70%
Thermal	Total		kWh	1,437,331	1,460,696	1,530,502	
Thermal	Gas		kWh	1,058,228	1,436,165	1,505,968	
	Heating Oils		kWh	379,103	24,531	24,534	
Transport	Total		kWh	69,913,830	49,245,733	53,229,993	23.90%
	Transport Fuels (Mineral Oil Fuels)		kWh	69,460,830	47,700,528	51,559,772	
	Transport Biofuels		kWh	453,000	1,545,205	1,670,221	
Total Primary Energy Requirement (TPER)			kWh	<b>167,136,491</b>	<b>114,074,645</b>	<b>122,160,042</b>	27%

\*Total Primary Energy Requirement - Total primary energy requirement or TPER is a measure of all of the energy consumed by the organisation and accounts for the energy that is consumed and/or lost beyond the boundary of the organisation – in energy transformation, transmission and distribution processes, e.g. electricity generation transmission and distribution.

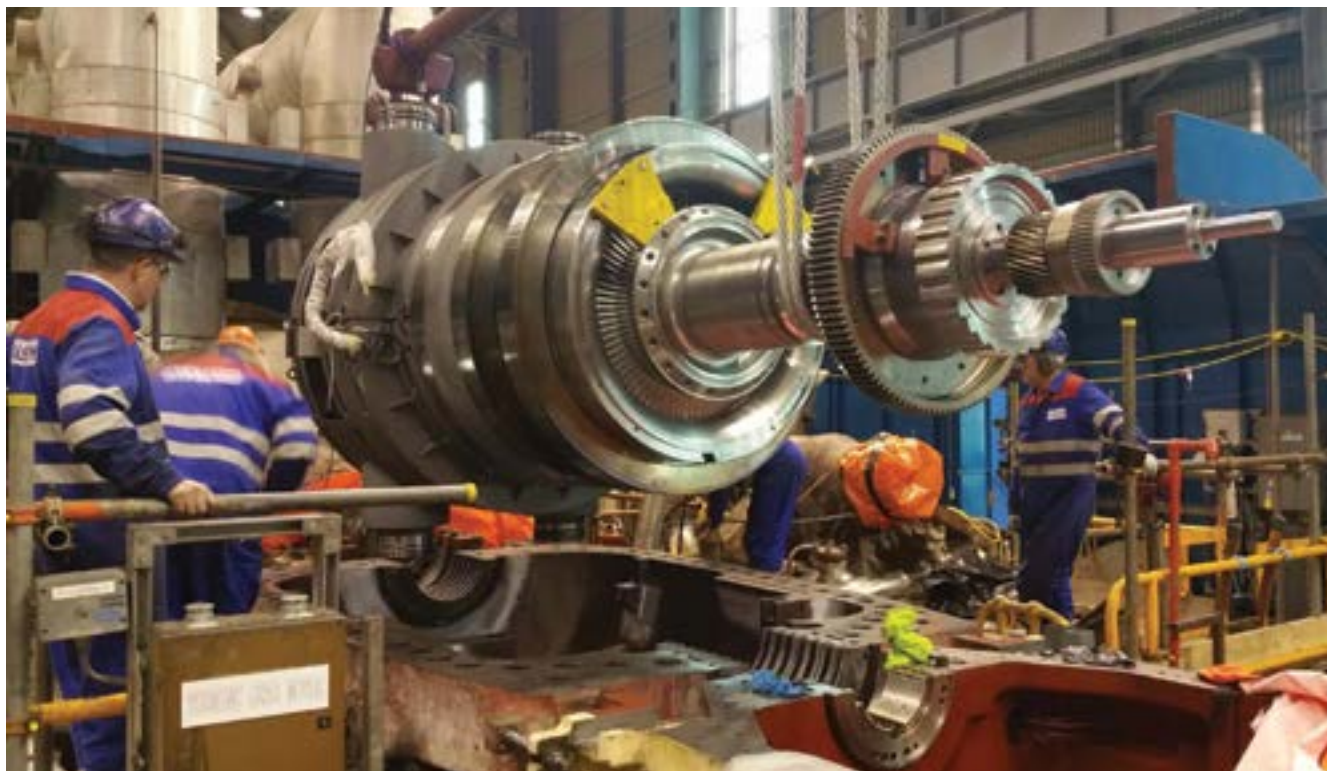
**PUBLIC SECTOR TARGET**

As a commercial semi-state owned entity (95% state owned), ESB is committed to supporting and being exemplary in the delivery of Ireland’s 2020 public sector targets. Under this legislation, Irish public sector bodies and commercial semi state bodies are required to deliver a 33% reduction in their Total Primary Energy Requirement by 2020. The strategies and actions outlined above are helping ESB deliver this obligation.

**FIGURE 4.8.2 ENERGY PERFORMANCE INDICATORS**

NORMALISED ENPI	%	BASELINE	2014
Electricity EnPI	kWh/FTE Employees	17,432	12,901
Thermal EnPI	kWh/FTE Employees	262	297*
Transport EnPI	kWh/length of MV Network	789	533

\* Due to increased number of leased premises using natural gas heating



**Moneypoint Overhaul - High pressure module installation.**

**EFFICIENCY OF GENERATION ASSETS**

Competitive market drivers, which include ever-increasing integration of renewable energy into the electrical network, place increased demands on conventional thermal generation units both in terms of requirements for increased operational flexibility, and reduction of operating costs. As a result, ESB G&WM places significant importance on the efficiency of portfolio of generating units for commercial and social responsibility reasons. As such, Generation

has an ongoing programme of monitoring the performance of its units, which was augmented by the trial installation of a state-of-the-art monitoring and diagnostics system across its three coal fired units at Moneypoint power station in 2014. This system enables real time tracking of the performance of the plant and its associated subsystems, and early detection of process anomalies, which allows prompt intervention to be taken. The high efficiency, gas-fired combined cycle

gas turbine power at Aghada generating station undertook its first scheduled major overhaul in 2014, which has allowed the unit to return to service, maintaining its high availability and performance. This outage included the installation of higher class air filtration on the gas turbine air intake system, which will sustain the performance of the unit into the future. This approach to upgrading the air filtration system has been rolled out to other combined cycle gas turbine units in the G&WM portfolio.



# 4.9 DEVELOPING A LOW CARBON GENERATION PORTFOLIO



Paddy Hayes, Executive Director, Generation and Wholesale Markets

“Our focus is on construction of additional renewable projects supporting the reduction in the carbon intensity of generation and continuing to develop diverse renewable and thermal growth options.”

own. The electrification of other sectors of the economy has been acknowledged as one of the crucial elements on this path to decarbonisation.

Developing a low carbon generation portfolio is a key part of ESB strategy in order to build a profitable and sustainable generation business of scale by 2025. The key objectives of the strategy are to deliver a balanced low-carbon generation portfolio of approximately 7,000 MW with 26% of the capacity accounted for by renewables such as on-shore wind, solar PV and biomass. This will include growth in the UK as well as asset renewal in Ireland and the strategy envisages an All-Islands generation market share of 7% by 2025. ESB is also actively participating in commercialising other forms of renewable energy such as wave energy.

### MANAGEMENT APPROACH TO DEVELOPING A LOW CARBON GENERATION PORTFOLIO

The Generation & Wholesale Market Business of ESB is tasked with developing a low carbon generation business of scale. During 2014, ESB made significant progress in the development of our low carbon portfolio. The strategy is based around three key areas:

### DEVELOPING NEW HIGH-EFFICIENCY GENERATION

During 2014 G&WM continued with the construction of its 881MW gas-fired combined cycle gas turbine (CCGT) plant at Carrington near Manchester, which will deliver clean and flexible power to customers in the UK electricity market.

The project is a flagship project for ESB and will be one of the newest CCGT plants to enter into commercial operation within the UK energy market. The plant will be one of the most efficient CCGT power plants in the UK with a net efficiency of 58% using the latest gas turbine technology. In line with best industry practice, we anticipate that Carrington CCGT will deliver a low carbon intensity of approximately 350g/kWh.

### INTRODUCTION

Climate change is a major global threat which requires urgent action at the international level. ESB alongside other European utilities is committed to delivering carbon-neutral electricity in Europe by 2050, and to ensuring a competitively priced, reliable electricity supply throughout the integrated European energy market.

We believe that it is essential that EU climate change policy supports competitiveness by promoting reductions of greenhouse gas emissions in a cost-effective manner through the use of the EU ETS market mechanism as the key

instrument to deliver the EU's greenhouse gas emission reductions target. For this reason, ESB supports a strong EU ETS system, which we see as the best way to provide affordable, reliable and sustainable electricity to the EU economy.

Electricity is a clean energy vector: users do not emit any carbon when they consume electricity, while carbon emissions at the point of generation are capped and progressively being reduced under the EU ETS. In its ability and commitment to become carbon neutral by 2050, the electricity industry can lead the drive to decarbonise Europe. However, the electricity industry cannot reach the objective of a low carbon economy on its



Turbine shaft installation in Carrington 881MW CCGT.

During 2014 ESB continued to progress the CCGT development project at Knottingley in the UK. This is a site option for a future CCGT of up to 1500MW capacity which will be a follow-on project from Carrington. Development consent for the proposed Knottingley Power Project was granted by UK Secretary of State in March 2015. Subject to further development, financing and construction, this project will deliver efficiency clean and flexible power to UK energy customers by 2020.

**IMPROVEMENT IN EFFICIENCY OF OUR EXISTING GENERATION PORTFOLIO**

Competitive market drivers, which include ever-increasing integration of renewable energy into the electrical network, place increased demands on conventional thermal generation units both in terms of requirements for increased operational flexibility and reduction of operating costs. As a result, ESB places significant importance on the

efficiency of our existing portfolio of generating units for commercial and social responsibility reasons.

ESB has an ongoing program of monitoring the performance of its units which was augmented by the trial installation of a state-of-the-art monitoring and diagnostics system across its three coal fired units at Moneypoint power station in 2014. This system enables real time tracking of the performance of the plant and its associated sub-systems and early detection of process anomalies which allows prompt intervention to be taken.

The high efficiency, gas-fired combined cycle gas turbine power at Aghada generating station undertook its first scheduled major overhaul in 2014, to ensure the unit maintains its high availability and performance levels. This outage included the installation of higher class air filtration on the gas turbine air intake system which will

sustain the performance of the unit into the future. This approach to upgrading the air filtration system has been rolled out to other combined cycle gas turbine units in the G&WM portfolio.

**INCREASING OUR RENEWABLES COMPONENT OF OUR GENERATION PORTFOLIO**

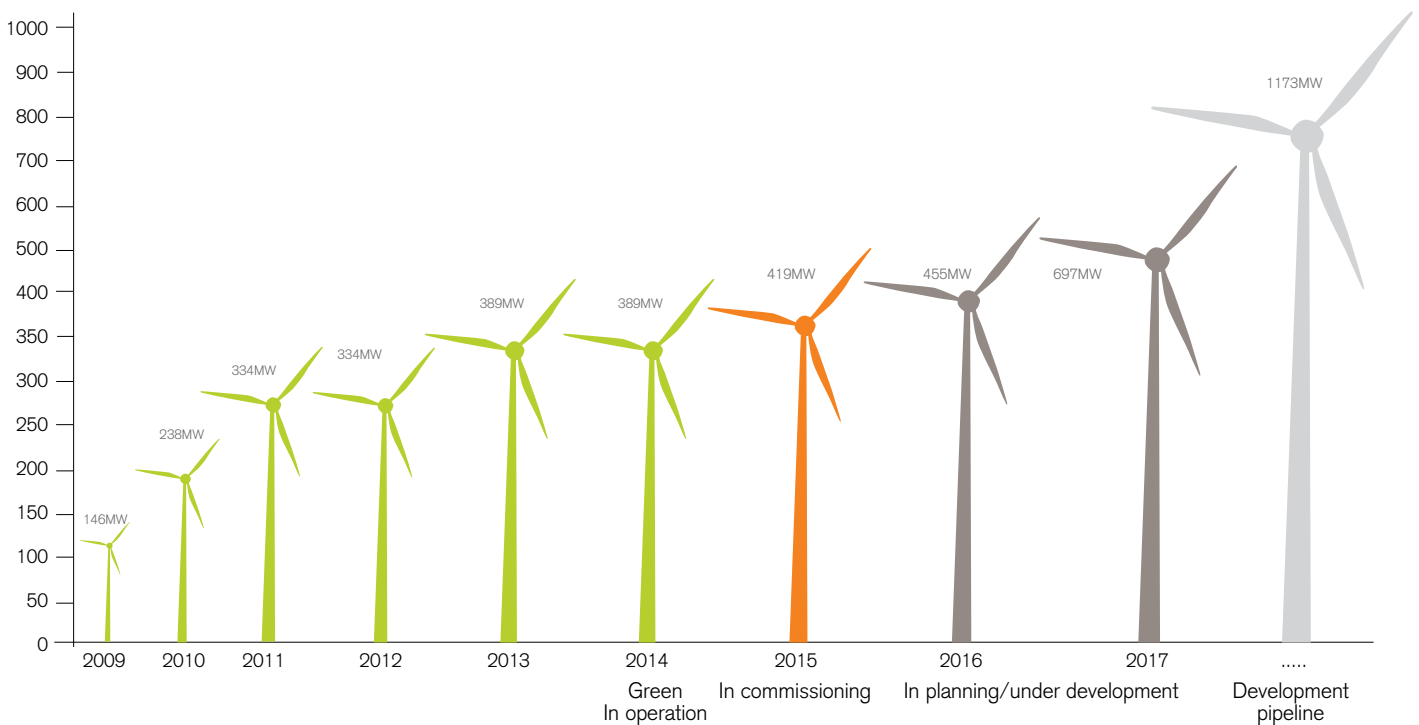
ESB continues to grow its renewables portfolio with significant investment in on-shore wind generation as well as other forms of renewables. In 2014 all turbines were erected on the 20MW Woodhouse wind farm project in Co. Wexford.

This project entered commercial operation in 2015, delivering clean, renewable energy to customers and bringing ESB's wind portfolio to over 400MW.

The 35MW wind farm at Raheenleagh, a joint venture project with Coillte made significant progress and is on schedule for commercial

**FIGURE 4.9.1 ESB'S WIND GENERATION INSTALLED BASE AND DEVELOPMENT PIPELINE**

**ESB'S WIND GENERATION INSTALLED BASE**



operation in 2016. Located west of Arklow, Co. Wicklow, the Raheenleagh Wind Farm will generate enough power for approximately 22,500 households using 11 wind turbines. We also continued to progress a 52MW project at Cappawhite Co Cork. We entered into a long term development agreement with a Scotland based developer, Coriolis, aimed at delivering between 200MW and 400MW of wind farms capacity in the early 2020s and continue to progress a development pipeline of other wind farm projects in Ireland and the UK. We advanced the Tilbury 40MW biomass project in the UK during 2014 with our partners the Green Investment Bank. Construction started on-site in early 2015 in what will be ESB's first biomass project in Ireland or the UK. We worked closely with our partner Kingspan to create a joint venture company that will install solar photovoltaic

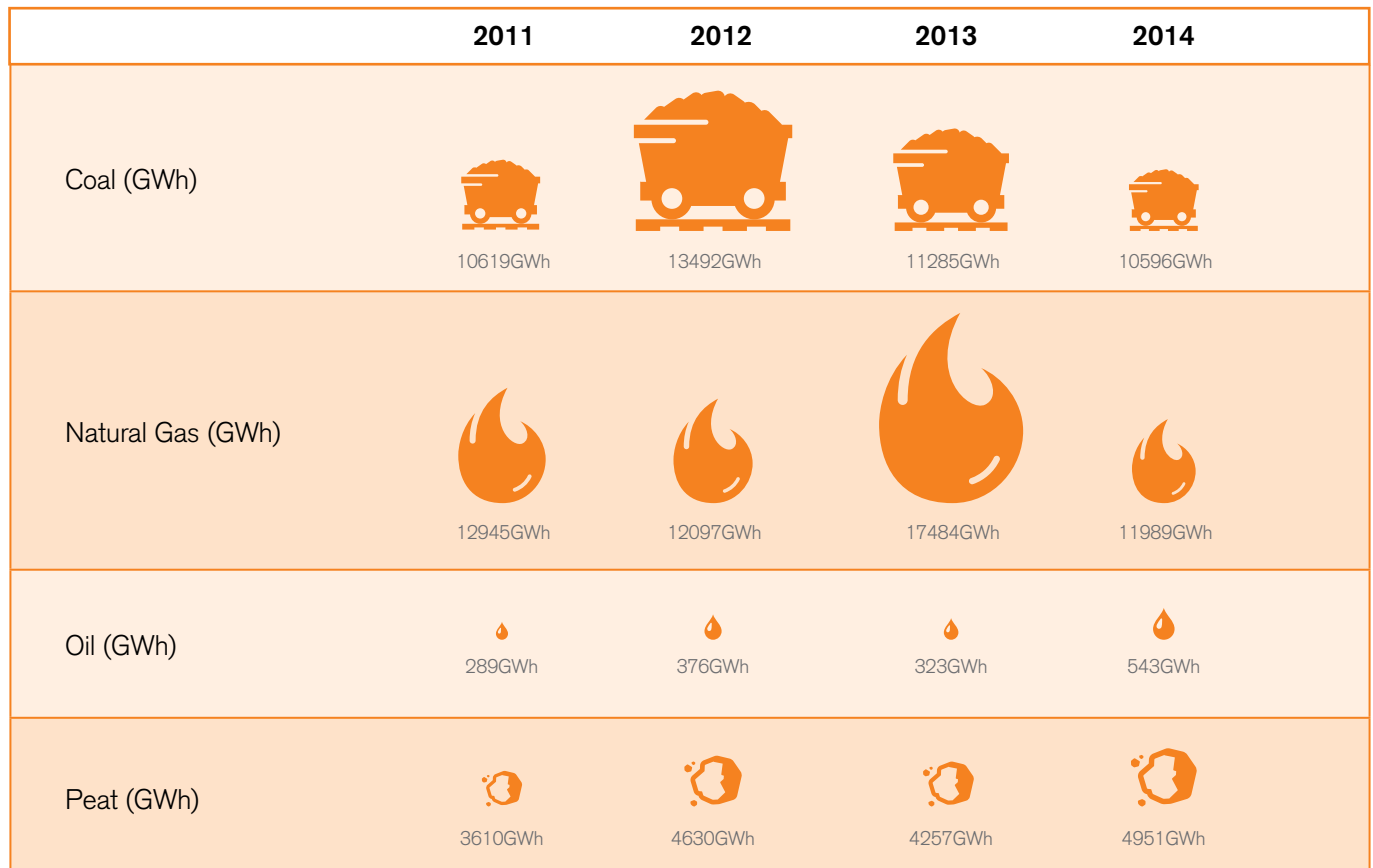
generation systems on customer rooftops in 2015 focused initially on the Northern Ireland market. ESB is actively exploring additional investment opportunities in both wind and alternative renewable technologies, including solar and biomass in order to grow a diverse renewable portfolio. G&WM continues to invest in existing generation assets with major overhauls in 2014 at a number of power stations including Moneypoint and Aghada. The long-term programme of renewing hydro assets continued with significant work at Erne and the completion of a major refurbishment at Ardnacrusha.

**DIRECT GREENHOUSE GAS EMISSIONS FROM OUR EXISTING PORTFOLIO**

ESB's thermal generation portfolio operates within the confines of the EU Emissions Trading Scheme

(ETS) and Scope 1 generation emissions are subject to an operating licence, external verification and reporting to the Environmental Protection Agency (EPA). The overall GHG emissions of CO<sub>2</sub> from our generating stations are detailed in the graphs below. The baseline year chosen for reporting of the CO<sub>2</sub> emissions is 2005 as this was the year when the formal reporting for the EU Emission Trading Scheme (ETS) commenced. Each installation operates in accordance with a Greenhouse gas permit which grants authorisation for each site to emit greenhouse gases (CO<sub>2</sub>). This permit is issued by the Environmental Protection Agency once they are satisfied that an operator can comply with the legislation and is capable of monitoring and reporting of the emissions. The monitoring and reporting of the CO<sub>2</sub> is carried out in accordance with the Commission regulation (EU)

FIGURE 4.9.2 GENERATION FUEL MIX - INPUTS IN GWH



601/2012 and is verified by an accredited external verifier, which must also comply with Commission Regulation 600/2012. The methodology used for determining the CO<sub>2</sub> emissions is based on a calculation approach which primarily uses fuel usage and fuel analysis. The source of the emission factors is derived from Ireland's Specific Emission Factors or back calculated from the CO<sub>2</sub> calculation.

Since 2005 ESB has achieved a 36.4% reduction in CO<sub>2</sub> emissions. This has been achieved through a combination of plant divestment, plant closure, investment in renewable portfolio (e.g. wind), plant upgrades and improvements in the efficiency of the fleet. In the past three years we have reduced our carbon intensity by just over 6% to 575g CO<sub>2</sub>e/kWh.

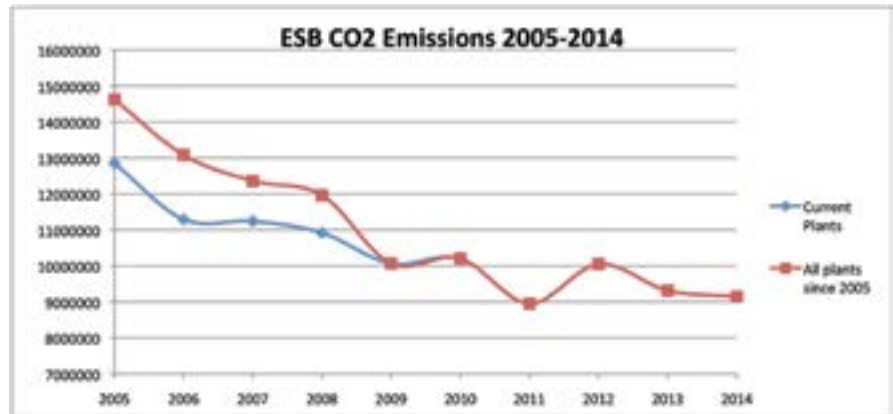
Scope 1 Emissions – ESB Group CO<sub>2</sub> Emissions from Thermal Generating Stations  
 For CO<sub>2</sub> Emissions from Thermal Generating Stations within the ROI, the EPA operates the Greenhouse Gas Emissions Allowance Trading System and the associated Registry governed by EU Directive 2003/87/EC. This framework is governed by the Environmental Agency in UK and NIEA in Northern Ireland.

Within the Republic of Ireland, the EPA operates the Greenhouse Gas Emission Allowance Trading System and the associated Registry as governed by European Directive 2003/87/EC. This framework is governed by the Environmental Agency in UK and NIEA in Northern Ireland.

Other Scope 1 emissions include: emissions from ESB Networks Vehicle Fleet, emissions from Generation and Wholesale Markets, Vehicle Fleet Direct emissions from ESB owned or occupied Buildings (heating boilers and diesel generators).

The Scope 2 category as defined in the GHG Protocol deals with indirect electricity GHG emissions and covers emissions from purchased electricity consumed by the company. This comprises the electricity consumed in the premises owned or occupied by ESB.

FIGURE 4.9.3 SCOPE 1 CO<sub>2</sub> EMISSIONS FROM GENERATION 2005-2014.



EMISSIONS FROM GENERATION	2006 (BASELINE) (*2005 FOR CO <sub>2</sub> )	2013	2014	CHANGE SINCE BASELINE (ABSOLUTE)
NO <sub>x</sub> (ktonnes)	20.38	7.81	6.74	-73%
SO <sub>x</sub> (ktonnes)	25.36	8.01	4.87	-76%
Dust (ktonnes)	1.13	0.243	0.156	-99%
CO <sub>2</sub> (mtonnes)	12.4*	9.3	9.15	-36.4%

Generation emissions are externally verified annually prior to being reported into the national licencing and regulatory authorities. CO<sub>2</sub> emissions for NI, 790 ktonnes; UK, 154 ktonnes.

EMISSION SOURCE	ESTIMATED 2006 TONNES CO <sub>2</sub>	ESTIMATED 2014 TONNES CO <sub>2</sub>	CHANGE FROM 2006 TO 2014
Scope 1 Vehicle Fleet All ESB	16,788	11,517	-31.4%
Scope 1 Building Emissions	289	275	-4.8%
Scope 2 Indirect Emissions All ESB - Electricity usage	22,993	11,826	-48.6%
Scope 3 Car travel	4,951	3,562	-28.1%
<b>TOTAL</b>	<b>45,020</b>	<b>27,179</b>	<b>-39.6%</b>



Scope 3 is an optional reporting category which addresses all other indirect emissions. The reporting of Scope 3 emissions is discretionary and practice varies from company to company. In the Scope 3 figures, this represents ESB employee business travel by car.

Information provided by the Sustainable Energy Authority of Ireland (SEAI) is used to convert the consumption totals to an equivalent quantity of CO<sub>2</sub>. SEAI undertakes an annual assessment of energy trends in Ireland. These reports are based on data, compiled by SEAI's Energy Policy Statistical Support Unit. In relation to electricity, the SEAI report considers generation fuel mix, transmission and distribution losses to derive an annual relationship between CO<sub>2</sub> emissions and electricity supplied.

Estimates of vehicular CO<sub>2</sub> emissions are generated using the UK Department of Energy and Climate Change and the Department for Environment, Food and Rural Affairs (Defra) standard car conversion factors.

For fleet fuel consumption, the most accurate means of converting fuel values to carbon emissions is through the assignment of each fuel purchase to vehicle or vehicle type. Since this is not possible, standard conversion factors are applied to estimate the fleet CO<sub>2</sub> emissions for 2014.

**FREIGHT TRANSPORT CONVERSION AND EQUIVALENCE FACTORS**

Fuel Type	kg CO <sub>2</sub> per litre 2014
Diesel	0.0026304
Green Diesel	0.0026304
Unleaded/Petrol	0.0023154

2006 has been widely adopted across ESB as the baseline year against which we measure our emissions and energy performance. The EU ETS scheme commenced in 2005 and ESB's formal sustainability programme began in 2006.

**Emissions Trading**

ESB's power generation activities fall within the scope of the EU ETS, under which CO<sub>2</sub> emissions

from power generating stations give rise to a liability to surrender allowances (EUAs). In addition, ESB's power generation activities in Great Britain are subject to the carbon price support mechanism. This takes the form of a Climate Change Levy, assessed on the quantity of fuel used in the power station. Emission allocations and emission reduction targets are not applicable to operations within the EU ETS.

ESB does not receive any free allocations in Phase III of the ETS. ESB purchases allowances (EUAs) at

market price in the secondary OTC market. ESB does not receive any free allowances and has not so far purchased any at auction. All of ESB's EUAs are purchased at market price from third-party participants.

ESB operate generation plant in the ROI under CER, NI under UR and GB under Ofgem, so the following chart breaks down capacity along those lines. Single Electricity Market (SEM) data (ROI and NI together) is also reported.

**FIGURE 4.9.4 INSTALLED CAPACITY, BROKEN DOWN BY PRIMARY ENERGY SOURCE AND BY REGULATORY REGIME**

CAPACITY IN MW	RoI	NI	SEM	GB	Total
Gas	2,025	402	2,427	350	2,777
Coal	855	0	855	0	855
Peat	226	0	226	0	226
Oil	0	53	53	0	53
Wind	206	73	279	125	403
Hydro	220	0	220	0	220
Solar	0	1	1	0	1
<b>TOTAL</b>	<b>3,532</b>	<b>529</b>	<b>4,061</b>	<b>475</b>	<b>4,535</b>

**FIGURE 4.9.5 NET ENERGY OUTPUT BROKEN DOWN BY PRIMARY ENERGY SOURCE AND BY REGULATORY REGIME**

GENERATION VOLUME IN GWH FOR 2014	RoI	NI	SEM	GB	Total
Gas	6,208	2,121	8,328	322	8,650
Coal	3,934	0	3,934	0	3,934
Peat	1,716	0	1,716	0	1,716
Oil	0	1	1	0	1
Wind	451	178	629	302	931
Hydro	653	0	653	0	653
Solar	0	0	0	0	0
<b>TOTAL</b>	<b>12,961</b>	<b>2,300</b>	<b>15,261</b>	<b>625</b>	<b>15,885</b>

**FUTURE OUTLOOK**

Forecast studies of generation adequacy, forecast demand and capacity are undertaken by the System Operators in ROI, NI and UK. ESB Group is guided by these studies in its strategy development and future portfolio development planning. Currently ESB Group

has approximately 4800MW capacity, with an ambition to grow that capacity to 7000MW, including 1800MW of renewables by 2025 on an all island basis.

Delivering this capacity growth will require a mix of technologies. Currently Carrington 881MW CCGT

is under construction near Manchester (UK), a further 1500MW of CCGT is consented. 800MW of wind development is in planning, 40MW of biomass under construction at Tilbury, UK. ESB Group is also pursuing options in emerging technologies, solar PV, battery storage and energy from waste.

**CASE STUDY**



The Terra Merique delivered over 8000 tonnes of plant and equipment to site via the Manchester Shipping Canal (Gas Turbines, Generators, HRSGs, Condensers).

**BARGE DELIVERIES AT CARRINGTON POWER**

Carrington Power station is located on the Manchester ship canal south west of Manchester. Over the decades commercial use of the Manchester ship canal has steadily decreased. Carrington Power's proximity to the ready made ship canal made barge transport the most sustainable option for the abnormal loads and utilises the existing inland water infrastructure. The ship canal links Manchester to the Irish sea

via the river Mersey. Equipment for the Carrington site was transported to Ellesmere Port, Liverpool from all over the world including China, Indonesia, Germany, Poland and Spain. The 40 kilometre trip from Ellesmere to Carrington site was undertaken a total of 20 times. Across the 800 kilometres of waterways travelled, approx. 8000 tonnes of equipment was transported. Research shows that barge transportation is 50% more efficient than road transport. It also eliminates the need for abnormal load

escort and potential traffic disruptions on road routes used.

The distance by barge is 33% shorter that the road journey. The initiative to transport via the ship canal rather than by road saved an estimated 20 tonnes of carbon dioxide emissions. Utilising the existing ship canal and avoiding road closures through the surrounding villages from over 100 abnormal sized deliveries has helped to build a good relationship with local residents and communities.

## 4.10 FINANCIAL PERFORMANCE



Donal Flynn,  
Group Finance  
Director

“2014 has been a more challenging year than 2013 for ESB. Operating profits are down €132 million to €552 million. Despite the challenges in 2014 we paid €318 million in dividends to our shareholder and earned a ROCE of 6% in line with other European utilities. We contributed over €2 billion to the Irish economy and were the first supplier to reduce prices for our customers in November. ESB finished 2014 with a strong liquidity position.”

In ESB, since our foundation, we've always been driven by the sense of delivering for Ireland. We recognise that electricity is not an end in itself but

an enabler of societal and economic wellbeing and we are committed to using our resources in the best way possible to help communities in Ireland,



Trading works on behalf of ESB to maximise the value of the output of the generation fleet over a two-year horizon. It trades 24 hours a day, across multiple markets with unique characteristics, which in turn means handling different currencies and regulatory regimes.

and indeed around the world, to develop and progress, and to reach their full potential. To do that, we think and act in creative and innovative ways, supporting customers, developing infrastructure and using scarce resources as efficiently as possible. This sense of trying to improve the way we do things is in our DNA – it is part of our core purpose as an organisation.

The proof of this lies in the way we behave as a company – not only in our track record in delivering critical national energy infrastructure projects, but also in the way we respond to storm damage, our commitment to supporting communities through our CSR programmes, and the support we provide for customers who may find themselves in difficulties. Our ethos and the decisions we take are underpinned by a sense of public service and a commitment to the social good.

The policy based decisions that derive from these values ensure that ESB is focused on its home markets, supporting and using local supply sources (90% of all supply chain sources are within EU states, 60% within ROI and NI), delivering electricity infrastructure upgrades that enable local businesses and through the support of local community programmes through CSR and sponsorship supports.

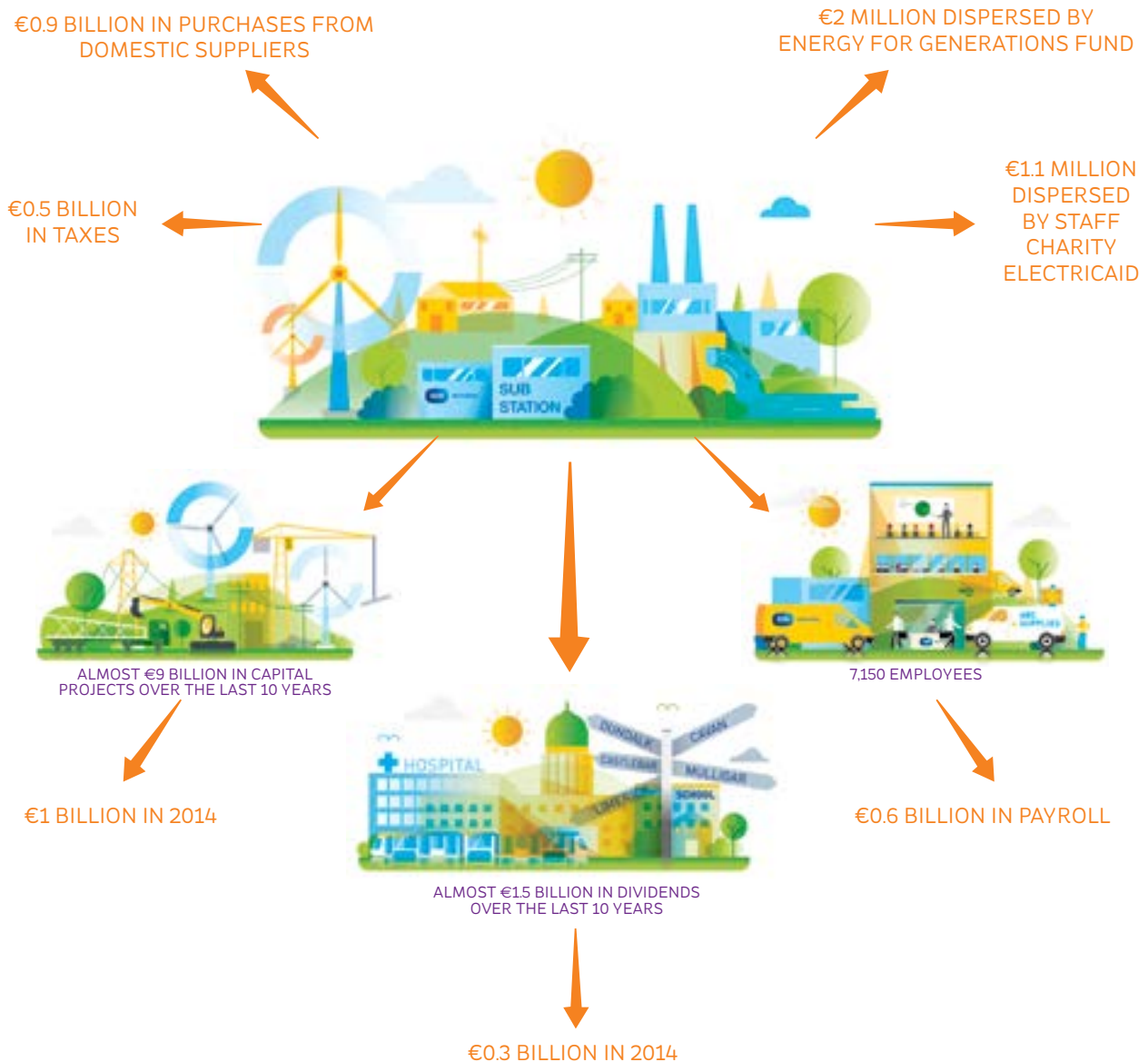
The context of the home markets within which the majority of our operations focus is outlined in our annual report section, outlining our operating environment:

TO SEE OUR ANNUAL REPORT, [CLICK HERE](#)

A FULL REVIEW OF OUR FINANCIAL PERFORMANCE IS SUMMARISED IN THE ANNUAL REPORT HERE; [CLICK HERE](#)

The direct economic value that was generated and distributed across our home markets in 2014 is detailed in Figure 4.10.1 below. The principal activities of the ESB Group are the operation, transmission, distribution and supply of electricity in the Republic of Ireland, Northern Ireland and Great Britain. The Group also operates internationally. ESB demonstrates its commitment to these economies through its contribution in the form of investment, taxes, dividends and jobs.

# ESB'S CONTRIBUTION TO THE ECONOMIES IT OPERATES IN





## 4.11 OUR PEOPLE



Pat Naughton,  
Executive Director,  
Group People and  
Sustainability

“Our team is focused on leading the organisation in effective resource planning. ESB is entering a period of organisational renewal and having the appropriate recruitment, retention and succession strategies is critical for us to move forward. We must ensure that we continue to have access to the skills and capabilities we need to realise our ambition.”

### A COMMITMENT TO CONTINUOUS PROFESSIONAL DEVELOPMENT

The 'ESB People Strategy 2017' is aimed at delivering enhanced performance through engaged and valued employees while containing costs. The importance of Continuous Professional Development (CPD) is recognised in the renewed focus on Learning & Development in the company.

ESB acknowledges the role CPD can play in ensuring the continuous learning of staff as well as ensuring the business remains engaged, agile and competitive. Encouraging professional development is regarded as an essential pillar in the establishment of ESB as a learning organisation. The development of our people is acknowledged as a strategic imperative to enable ESB to attract, retain and continuously develop our professionally qualified staff. To achieve this objective, ESB provides a structured support system for all employees who wish to develop their technical, business and personal skills. In ESB we use CPD to ensure that our professionally qualified employees are kept abreast with technological developments in their discipline, to complement our existing training and development processes.

### OVERVIEW

We operate in a complex and increasingly competitive market where our success is built from the hard work and dedication of our people. ESB must be a top class employer that can attract and retain high-quality, highly skilled people by offering great career and development opportunities as well as competitive reward packages. Another challenge facing our people strategy is age. With an average age of 49 and over 40% of staff over 50, ESB will need to attract, recruit and retain a large number of staff over the next decade.

The nature and scale of the challenges and opportunities facing the energy sector requires new thinking and innovative solutions. New technologies, increased competition and an increasingly sophisticated consumer mean that ESB must innovate faster to remain competitive and to deliver on our strategy and objectives.

The changing pace of the industry requires an engaged and agile workforce that can adapt and innovate in this operating environment. ESB's people strategy is gearing the organisation and its staff to rise to this challenge.



ESB International senior managers welcome new staff members.

ESB supports employees with membership of professional bodies and in the attainment of professional Titles. ESB also encourages and actively supports our professional employees who take an active part in the activities of professional bodies, including events relating to continuing professional development. In addition to running graduate training programmes, ESB has a strong record in supporting employees in their pursuit of academic qualifications in engineering and other disciplines.

Every employee in ESB is encouraged to take responsibility for their own development, with support from their Line Manager and the HR Learning & Development specialists. CPD is integrated into our HR processes and systems, and these include Performance & Development (My Goals & My Development), Graduate Development and the various Knowledge Management platforms across the company. To reflect the importance of CPD in the company, a CPD Committee has been established to oversee the consistent implementation of the 'ESB CPD Policy' across the ESB Group.

As part of the CPD Policy, ESB will provide a workplace committed to learning, development and continuous improvement with:

- Active support for CPD from management, mentors and colleagues
- Systems and processes which facilitate knowledge sharing and ease of access to information / subject-matter experts
- A climate which is conducive to fostering innovation and learning from both successes and failures
- Clarity regarding required key skills and competences, in line with our strategy
- Readily available mentoring and coaching as per ESB's coaching and mentoring policy
- Funding and other supports for CPD and professional memberships which clearly add value.

#### STRATEGIC RESOURCE PLANNING

ESB ensures it has the staff numbers and capabilities it requires to deliver business success by taking an integrated approach to Resource Assurance by engaging resource

planning, succession management and capability development.

Resource Planning in ESB has two elements. Operational Resource Planning (ORP) which looks at the short term resource / capability gaps while Strategic Resource Planning (SRP) focuses on identifying longer term requirements. Succession Management is mainly concerned with ensuring sufficient succession depth for business critical roles.

The combined outputs from these processes is used to develop Business Unit action plans to address any numbers/capability gaps identified.

#### MY GOALS, MY DEVELOPMENT

ESB uses SAP as their integrated business system for HR and Finance functions. Most employees have their own individual HR Portal which allows for the recording of working time, leave and expenses. The SAP portal also has a function which allows an employee to record their CPD time.

The ESB Recruitment and Staff Development team provide support to employees who require assistance with CPD issues.

ESB also provides a continuous framework for all employees to utilise their skills and experience. On joining the company Graduate Engineers and Technicians are introduced to the "My Development" as part of the Graduate Development Programme. ESB provides opportunities for employees to continually develop their technical, commercial and interpersonal skills throughout their careers.

The 'OneHR Project' was created in 2012 to centralise the HR functions of ESB. The project included the consolidation of the various Performance Management and development processes in each Business Unit using the SAP system. These processes are known as 'My Goals' and 'My Development'. These formal processes are reinforced by informal conversations between the manager and the

employee to help develop a high performance culture. ESB is committed to having an authentic performance and development culture that contributes to the building an agile and engaged workforce. This objective is a key pillar of the ESB 2025 Strategy, the ESB 2017 People Strategy and the ESB CPD Strategy.

#### 'MY GOALS':

The Performance Management process requires a manager and employee to have three formal conversations each year:

1. Goal setting (January)
2. Mid-year review (June)
3. Performance review (November).

As part of the 'My Goals' process, the employee is assigned six Performance Goals each year, with two Organisational Goals (one Corporate and one Business Unit) and four individual goals being set. The Corporate Goal is set by the Chief Executive and cascaded through the company. The Business Unit goal is set by the respective Executive Director and cascaded to all employees in the Business Unit.

The purpose of the 'My Goals' process is to:

- Ensure alignment of Corporate Goals and Business Unit goals
- Contribute to improved communication and engagement across ESB
- Create an environment to maximise individual performance
- Contribute to the establishment of a high performance culture
- Assessing performance in a consistent and objective manner using the ESB Single Evaluation Scale (for further information see Appendix for Criterion 3B)
- Identify development needs that are relevant to the business and the individual.

The benefits to the employee include:

- Linking business objectives and the contribution of the individual to achieve these objectives
- Clarifying performance expectations
- Creating a shared ownership of the objective setting process

- Providing real performance feedback to the employee on a regular basis
- Establishing a commitment from the manager to provide support to the employee
- Discussing developmental requirements/ opportunities through the 'My Development' process.

**MY DEVELOPMENT':**

The development process requires a manager and employee to have two formal conversations each year:

1. Identify and agree development solutions (January)
2. Review development (November).

'My Development' is the learning and development process to formalise the development of individual and collective capability in ESB. Development solutions are identified and jointly agreed between the manager and the employee. 'My Development' may be related to the employee's current role, or it may focus on future career development. The development solutions may include both Behavioural and Technical competencies.

The purpose of the 'My Development' process is to:

- Ensure that employees have the skills necessary to perform their current role in a safe manner and to the highest standard
- Develop the organisational capability to support the achievement of business objectives
- Identify and develop new skills which are required by the business or the individual
- Contribute to improved communication and engagement across the business
- Ensure that ESB is recognised as a dynamic organisation with highly capable people.

The benefits to the employee include:

- Identifying development needs through a structured process and discussion with their manager
- Creating a shared ownership of the developmental process
- Providing an opportunity to discuss

development needs for future roles

- Supporting the individual in achieving their full potential.

All staff in ESB, regardless of role and/ or seniority have access to a performance and development process, such as the one outlined above.

**CAPABILITY DEVELOPMENT**

In 2014, the ESB People Strategy continued to provide the focus and direction for many human resource initiatives and actions. It is designed to support the overall corporate objective of developing an engaged and agile workforce. In 2014 initiatives in human resource development included:

**Manager development:** A Management Development Framework was introduced. This will become the Group's guide for the development of its managers during the next few years, with a focus on building the People Management capability of line managers. A number of Manager Development initiatives in 2014 included a development programme for newly appointed managers to assist them in their transition and, in particular, with their people management responsibilities. In addition, ESB continued its investment in developing the skill set of its managers in building a high performance culture. During 2014, the focus shifted from the Senior Manager level to the Middle and Front Line / Team Leader / Supervisor levels.

**Staff development:** Building staff capability continues to be a strategically important activity as ESB seeks to manage its different business environments and the challenges each poses. The Group's annual Performance and Development Process has been re-engineered and re-launched and provides the platform for the identification and delivery of targeted learning and development solutions. Effective development is based on specified competencies that align with the needs of the Group and each individual.

**Graduate development:** After a number of

years where graduate recruitment had significantly reduced and tended to be business specific, in 2014 ESB Group recruited an increased number of graduates, from a wide range of disciplines, and involving a greater number of ESB businesses. Those graduates recruited commenced a structured three-year Development Programme that includes a centrally managed induction event, work assignments, off-the-job business-specific training, personal skills development and mandatory training, supported by a mentoring relationship.

**A COMMITMENT TO DIVERSITY AND EQUALITY**

As a leader in the area of equality, diversity and inclusion, ESB's commitment is to continually promoting a diverse and inclusive work environment through positive engagement and innovative awareness-raising programmes, supported by robust policies and procedures.

Respect and Dignity in the workplace is at the core of our business relationships. With a focus on awareness raising initiatives, training and development of managers and staff to fostering positive work environments from Induction to Line Manager Training.

Some of the key initiatives during 2014

- Launch of GLEN's Diversity Champions
- Harnessing Generational Diversity in the Workplace
- Maternity Positive Programme – Successfully Managing Maternity Transitions
- Positive Parenting Programme
- International Women's Day – Inspiring Change Through Leadership and Innovation
- International Men's Day – Working Together with our Men and Boys
- Internal Panel of Workplace Mediators.

ESB recognises the challenges facing working parents. One of the areas of focus for 2014 was ESB's Maternity Positive Programme which supports both females and Line Managers to successfully manage maternity transitions. ESB Positive Parenting Programme continues to



provide practical supports for all working parents from New Parents to Parents of Exam Year Students.

In 2014, ESB launched its membership of GLEN's Diversity Champion Programme, a further commitment to working to make our workplaces and businesses LGBT inclusive from recruitment to the services we deliver.

ESB's Traineeship Programme for People with Disabilities, now in its 10th year and in Partnership with AHEAD, continues to be a success – for each of the participants, the mentors, managers and teams involved.

There are over 60 trained Dignity at Work Contact Persons in ESB whose role is to act as a confidential support for employees.

**ANNUAL ESB SUSTAINABILITY AWARDS**

Our annual Sustainability Awards recognise significant achievements by teams and individuals in delivering on the organisation's sustainability goals. In 2014 the submission format continued as video. The medium of video was chosen to enable the submissions to be shared and used as exemplary case studies as to how sustainability is being embedded across the ESB Group. 32 awards entries presented powerful stories about energy efficiencies, cost savings and water savings, covering the reuse of equipment and materials and showcasing new ideas, technologies and solutions. In all cases there was a clear demonstration of embedded sustainable thinking and staff going the extra mile to deliver tangible benefits to the business and the environment.

With the need to recognize and promote sustainability and innovation across the breath of the ESB Group, there is planning in place to broaden the scope of these awards to recognize efforts across all the business in a variety of categories. Building on the success of the sustainability awards, in 2015 a new platform will be established to ensure the traditions of sustainable innovation continues, accelerates and deepens across the group.



**Brian Sheehan, Director GLEN, Sarah Claxton, Employee Engagement, Communications and Diversity LEAD ESB, Pat O'Doherty, ESB Chief Executive, Davin Roche, Director of Workplace Diversity GLEN, and Pat Naughton, Executive Director, Group People and Sustainability, ESB.**



**Chief Executive Pat O'Doherty, members of the EDT, Sustainability Managers and recipients of the 2014 Awards.**

**Pat O'Doherty with Deirdre Arthur of eCars, overall winners of the 2014 Sustainability Awards.**





# 05 APPENDICES



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**5.1 INDEPENDENT ASSURANCE STATEMENT**

**GRI G4 In Accordance Level Check**

DNV GL Business Assurance Services UK Ltd (hereafter DNV GL) was engaged by the Electricity Supply Board (hereafter "ESB") to carry out an independent review of the GRI Application Level for ESB's 2014 Sustainability Report (hereafter 'the report'). Following a review of the report against the GRI G4 requirements, DNV GL confirms that the report is in accordance with GRI G4 'Core' level.

DNV GL's independent review confirms that the required set and number of disclosures for 'Core' level have been addressed in ESB's reporting. The GRI Table of Disclosures within the report's appendix demonstrates a valid representation of the disclosures, in accordance with the GRI G4 requirements.

This statement does not provide an opinion on ESB's sustainability performance in 2014 nor on the quality of information in the report. DNV GL has not been engaged by ESB on any other commitments in 2014 which could compromise the independence of our statement.

18 December 2015, London

**For and on behalf DNV GL Business Assurance Services UK Ltd**



**Tracy Oates**  
Principal Consultant

## 5.2 GRI G4 CROSS REFERENCING TABLE

GENERAL STANDARD DISCLOSURES				
General Standard Disclosures	Disclosure Requirements	Location	Disclosure	ESB Notes to Disclosures
<b>STRATEGY AND ANALYSIS</b>				
G4-1	Statement from the most senior decision-maker of the organization	1.1	Compliant	
<b>ORGANIZATIONAL PROFILE</b>				
G4-3	a. Report the name of the organization.	2.1	Compliant	
G4-4	a. Report the primary brands, products, and services.	2.1	Compliant	
G4-5	a. Report the location of the organization's headquarters.	2.1	Compliant	
G4-6	a. Report the number of countries where the organization operates, and names of countries where either the organization has significant operations or that are specifically relevant to the sustainability topics covered in the report.	2.1	Compliant	
G4-7	a. Report the nature of ownership and legal form.	2.1	Compliant	
G4-8	a. Report the markets served (including geographic breakdown, sectors served, and types of customers and beneficiaries).	2.1	Compliant	
G4-9	Report the scale of the organization	2.1	Compliant	
G4-10	Workforce detail disclosure	2.2	Compliant	
G4-10 Sector Specific	Report on total contractor workforce (contractor, subcontractor, independent contractor) by employment type, employment contract and regulatory regime.	2.2 & 2.3	Compliant	Contractor workforce numbers are not gathered for all contracts at present. Numbers reported reflect regular contractors working on ESB Networks sites, major construction and overhaul projects and facility service providers. ESB will endeavour to develop the reporting framework required to disclose fully on this indicator for the next reporting cycle.
G4-11	a. Report the percentage of total employees covered by collective bargaining agreements.	2.2	Compliant	



G4-11 Sector Specific	Report on percentage of contractor employees (contractor, sub-contractor and independent contractor) working for the reporting organization covered by collective bargaining agreements by country or regulatory regime.	2.2 & 2.3	Compliant	Under the obligations outlined in ESB's 3rd Party Requirements, all contracting entities are required to allow their staff freedom of association. This is monitored as part of the Contractor Employment Standards (CES) audits which are undertaken across all major contracts each year. In essence 100% of contractor staff should have freedom of association, as long as their employer is abiding by the ESB 3rd Party Requirements, however, this data is not reported on as part of CES. ESB will consider expanding on this process in the future to report on actual levels of access to collective bargaining.
G4-12	a. Describe the organization's supply chain.	2.3	Compliant	
G4-13	a. Report any significant changes during the reporting period regarding the organization's size, structure, ownership, or its supply chain,	2.4	Compliant	
G4-14	a. Report whether and how the precautionary approach or principle is addressed by the organization.	2.5	Compliant	
G4-15	a. List externally developed economic, environmental and social charters, principles, or other initiatives to which the organization subscribes or which it endorses.	2.6	Compliant	
G4-16	a. List memberships of associations (such as industry associations) and national or international advocacy organizations in which the organization: <ul style="list-style-type: none"> <li>▪ Holds a position on the governance body</li> <li>▪ Participates in projects or committees</li> <li>▪ Provides substantive funding beyond routine membership dues</li> <li>▪ Views membership as strategic</li> </ul> This refers primarily to memberships maintained at the organizational level.	2.6, 2.7	Compliant	
<b>IDENTIFIED MATERIAL ASPECTS AND BOUNDARIES</b>				
G4-17	a. List all entities included in the organization's consolidated financial statements or equivalent documents. b. Report whether any entity included in the organization's consolidated financial statements or equivalent documents is not covered by the report.	3	Compliant	

G4-18	a. Explain the process for defining the report content and the Aspect Boundaries. b. Explain how the organization has implemented the Reporting Principles for Defining Report Content.	3	Compliant	
G4-19	a. List all the material Aspects identified in the process for defining report content.	3	Compliant	
G4-20	a. For each material Aspect, report the Aspect Boundary within the organization	3	Compliant	
G4-21	a. For each material Aspect, report the Aspect Boundary outside the organization, as follows:	3	Compliant	
G4-22	a. Report the effect of any restatements of information provided in previous reports, and the reasons for such restatements.	3	Compliant	
G4-23	a. Report significant changes from previous reporting periods in the Scope and Aspect Boundaries.	3	Compliant	
<b>STAKEHOLDER ENGAGEMENT</b>				
G4-24	a. Provide a list of stakeholder groups engaged by the organization.	3	Compliant	
G4-25	a. Report the basis for identification and selection of stakeholders with whom to engage.	3.3	Compliant	As a business we transmit and distribute electricity to every business and household on the island of Ireland. As such we have a strong and visible interface with every community to which we provide electricity. Stakeholder engagement is central to the success of our business activities. Stakeholder engagement takes place at all levels of society, from the policy makers right down to the local community group and ranges in focus from national to community level interests.
G4-26	a. Report the organization's approach to stakeholder engagement, including frequency of engagement by type and by stakeholder group, and an indication of whether any of the engagement was undertaken specifically as part of the report preparation process.	3	Compliant	We endeavour to engage with all stakeholder groups at least annually. In practice much of our engagement is on an ongoing basis and is very issues based in nature. The outputs of these engagements are summarised as a stakeholder engagement matrix in section 3 of the report.
G4-27	a. Report key topics and concerns that have been raised through stakeholder engagement, and how the organization has responded to those key topics and concerns, including through its reporting. Report the stakeholder groups that raised each of the key topics and concerns.	3	Compliant	

REPORT PROFILE				
G4-28	a. Reporting period (such as fiscal or calendar year) for information provided.	1.1	Compliant	
G4-29	a. Date of most recent previous report (if any).	1.1	Compliant	
G4-30	a. Reporting cycle (such as annual, biennial).	1.1	Compliant	
G4-31	a. Provide the contact point for questions regarding the report or its contents.	1.1	Compliant	
G4-32	a. Report the 'in accordance' option the organization has chosen. b. Report the GRI Content Index for the chosen option. c. Report the reference to the External Assurance Report, if the report has been externally assured. GRI recommends the use of external assurance but it is not a requirement to be 'in accordance' with the Guidelines.	3.1	Compliant	
G4-33	Report the organization's policy and current practice with regard to seeking external assurance for the report.	1.1	Compliant	
GOVERNANCE				
G4-34	a. Report the governance structure of the organization, including committees of the highest governance body. Identify any committees responsible for decision-making on economic, environmental and social impacts.	1.3	Compliant	
ETHICS AND INTEGRITY				
G4-56	a. Describe the organization's values, principles, standards and norms of behavior such as codes of conduct and codes of ethics.	1	Compliant	
SECTOR SPECIFIC GENERAL STANDARD DISCLOSURES				
EU1	INSTALLED CAPACITY, BROKEN DOWN BY PRIMARY ENERGY SOURCE AND BY REGULATORY REGIME	4.9	Compliant	
EU2	NET ENERGY OUTPUT BROKEN DOWN BY PRIMARY ENERGY SOURCE AND BY REGULATORY REGIME	4.9	Compliant	
EU3	NUMBER OF RESIDENTIAL, INDUSTRIAL, INSTITUTIONAL AND COMMERCIAL CUSTOMER ACCOUNTS	4.4, 4.5	Compliant	
EU4	LENGTH OF ABOVE AND UNDERGROUND TRANSMISSION AND DISTRIBUTION LINES BY REGULATORY REGIME	4.4, 4.5	Compliant	
EU5	ALLOCATION OF CO <sub>2</sub> E EMISSIONS ALLOWANCES OR EQUIVALENT, BROKEN DOWN BY CARBON TRADING FRAMEWORK	4.9	Compliant	

## 5.3 SPECIFIC STANDARD DISCLOSURES

SPECIFIC STANDARD DISCLOSURES						
Category	Aspect	Standard Disclosure	Standard Disclosure Title	Location	Level of disclosure	ESB Notes to Disclosure
ECONOMIC	Economic Performance	G4-DMA	Generic Disclosures on Management Approach	4.10	Compliant	
ECONOMIC	Economic Performance	G4-EC1	Direct economic value generated and distributed	4.10	Compliant	Notes to Financial Statements in Annual Report 2014; Direct economic value generated: Revenues - See Page 98 Note 1 - segment reporting. Economic value distributed: Operating costs - See Page 98 Note 1 - segment reporting. Employee wages and benefits - See Page 101 Note 7 - Employee costs. Payments to providers of capital - See Page 113 Note 17 for Dividends, See Page 98 Note 1 - segment reporting for net finance costs by business units. Payments of taxation to individual governments by country is not disclosed separately in the Annual Report due to confidentiality reasons.
ECONOMIC	Indirect Economic Impacts	G4-DMA	Generic Disclosures on Management Approach	4.4 & 4.5; 4.9; 4.6	Compliant	Community needs assessment is undertaken as part of the broader regulatory engagement process, which culminates with a price review determination, incorporating specific asset development programmes.
ECONOMIC	Indirect Economic Impacts	G4-DMA	Aspect Specific Disclosures on Management Approach	4.4 & 4.5; 4.6	Compliant	
ECONOMIC	Indirect Economic Impacts	G4-EC7	Development and impact of infrastructure investments and services supported	4.4 & 4.5; 4.6	Partially Compliant	
ECONOMIC	Indirect Economic Impacts	G4-EC8	Significant indirect economic impacts, including the extent of impacts	4.10; 4.4 & 4.5; 4.6	Compliant	
ECONOMIC	Availability and reliability	G4 DMA	Sector Specific	4.4; 4.5; 4.9	Compliant	



ECONOMIC	Availability and reliability	EU 10	Sector Specific	4.9	Compliant	Electricity demand projections and capacity studies are undertaken by system operators and ESB utilises these studies in ROI, NI and UK to input into portfolio development planning.
ECONOMIC	Demand-Side Management	G4 DMA	Sector Specific	4.2; 4.3	Compliant	
ECONOMIC	System Efficiency	EU12	Sector Specific	4.4 & 4.5	Compliant	ESB Networks and NIE Networks are the licenced Distribution System Operators and are not responsible for operation of the transmission system. Losses reported reflect the same.
ENVIRONMENTAL	Energy	G4-DMA	Generic Disclosures on Management Approach	4.2; 4.8	Compliant	
ENVIRONMENTAL	Energy	G4-DMA	Aspect Specific Disclosures on Management Approach	All report	Compliant	
ENVIRONMENTAL	Energy	G4-EN3	Energy consumption within the organization	4.9; 4.8	Compliant	As part of the process of business integration and reporting in ESB Group, not all data is as yet available. Energy consumption relates to metered premises in ROI, fleet to ESB Networks and G&WM fleets. Data for NIE is not disclosed. ESB will endeavour to integrate reporting to address this gap for the next reporting cycle. Current electricity supply in ROI does not differentiate between renewable and non renewable sources at end use. Conversion factors used are set annually by SEAI and Defra.
ENVIRONMENTAL	Energy	G4-EN5	Energy intensity	4.8	Compliant	
ENVIRONMENTAL	Energy	G4-EN7	Reductions in energy requirements of products and services	4.2	Compliant	
ENVIRONMENTAL	Biodiversity	G4-DMA	Generic Disclosures on Management Approach	4.7	Compliant	

			Aspect-Specific Disclosures on Management Approach	4.7	Compliant	
ENVIRONMENTAL	Biodiversity	G4-EN11	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	4.7 (previously 4.4 & 4.5)	Compliant	
ENVIRONMENTAL	Emissions	G4-DMA	Generic Disclosures on Management Approach	4.9	Compliant	
ENVIRONMENTAL	Emissions	G4-EN15	Direct greenhouse gas (GHG) emissions (Scope 1)	4.9	Compliant	No biogenic CO <sub>2</sub> , this will become relevant when Tilbury 40MW biomass commences generation. 2005 base year for emissions from generation coincides with the commencement of EU ETS. Non generation baseline is 2006, marking the commencement of formal sustainability programmes in ESB Group. SEAI and Defra are the main sources of conversion factors and the GHG protocol guidelines are followed.
ENVIRONMENTAL	Emissions	G4-EN16	Energy indirect greenhouse gas (GHG) emissions (Scope 2)	4.9	Compliant	CO <sub>2</sub> is only gas included in Scope 2 calculations. SEAI and Defra provide emissions factors. Reporting of Scope 2 is for Republic of Ireland only, for metered premises. As part of business integration we will endeavour to include NIE Scope 2 emissions in future reporting.
ENVIRONMENTAL	Emissions	G4-EN17	Other indirect greenhouse gas (GHG) emissions (Scope 3)	4.9	Compliant	Scope 3 emissions pertain to private car business mileage in ROI. As part of business integration and reporting, we will seek to broaden the data set for Scope 3 reporting to NI and UK in future reporting cycles.

ENVIRONMENTAL	Effluents and Waste	G4-DMA	Generic Disclosures on Management Approach	4.7	Partially compliant	ESB does not produce, gather or store nuclear waste. In any event where Non destructive testing (NDT) is required, an external specialist contractor undertakes this activity, which also includes the approved specialist disposal of any radioactive components or waste.
ENVIRONMENTAL	Effluents and Waste	G4-EN23	Total weight of waste by type and disposal method	4.7	Compliant	ESB does not produce, gather or store nuclear waste.
ENVIRONMENTAL	Transport	G4-DMA	Generic Disclosures on Management Approach	4.3; 4.8	Compliant	
ENVIRONMENTAL	Transport	G4-EN30	Significant environmental impacts of transporting products and other goods and materials for the organization's operations, and transporting members of the workforce	4.3; 4.8	Compliant	
ENVIRONMENTAL	Environmental Grievance Mechanisms	G4-DMA	Generic Disclosures on Management Approach	4.7	Compliant	
ENVIRONMENTAL	Environmental Grievance Mechanisms	G4-EN34	Number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms	4.7	Compliant	
SOCIAL - LABOR PRACTICES	Training and Education	G4-DMA	Generic Disclosures on Management Approach	4.11	Compliant	
SOCIAL - LABOR PRACTICES	Training and Education	G4-LA10	Programs for skills management and lifelong learning that support the continued employability	4.11	Partially Compliant	ESB policy provides for a pre retirement planning course for planned retirees and their spouse, including financial and pensions advice. Any terminations to contracts follow a rigorous performance management process.
SOCIAL - LABOR PRACTICES	Training and Education	G4-LA11	Percentage of employees receiving regular performance and career development reviews, by gender and by employee category	4.11	Compliant	Staff breakdown is given section 2. All staff (100%) are part of the annual performance management, goal setting and career development process, which is deployed.

SOCIAL - LABOR PRACTICES	Occupational Health and Safety	G4-DMA	Generic Disclosures on Management Approach	4.1	Compliant	
SOCIAL - LABOR PRACTICES	Occupational Health and Safety	G4-LA5	Percentage of total workforce represented in formal joint management-worker health and safety committees that help monitor and advise on occupational health and safety programs	4.1	Compliant	
SOCIAL - PRODUCT RESPONSIBILITY	Customer health and safety	G4-DMA	Generic Disclosures on Management Approach	4.1	Compliant	
SOCIAL - PRODUCT RESPONSIBILITY	Customer health and safety	G4-PR1	% of significant product and service categories for which health and safety impacts are assessed for improvement	4.1	Compliant	ESB employs a risk assessment approach to activities, 100% of categories are risk assessed.
SOCIAL - PRODUCT RESPONSIBILITY	Customer health and safety	EU25	Sector Specific	4.1	Compliant	Safety Incidents on the Network, reported in Figure 4.1.2, include public safety incident numbers and are not reported separately. The implementation of SHIELD, Environment, Safety and Health Management IT system in late 2014, will allow for separate reporting of public safety incidents from 2015. Public liability claims have decreased over the past 10 years, however, disclosure on the number of incidents is commercially sensitive and is not disclosed.
SOCIAL - PRODUCT RESPONSIBILITY	Access	G4 DMA	Sector Specific	4.2	Compliant	
SOCIAL - PRODUCT RESPONSIBILITY	Access	EU26	Sector Specific	4.4 & 4.5	Compliant	
SOCIAL - PRODUCT RESPONSIBILITY	Access	EU27	Sector Specific	4.2	Compliant	
SOCIAL - PRODUCT RESPONSIBILITY	Access	EU28	Sector Specific	4.4 & 4.5	Partially compliant	Sec. 4.4 Reported as CML in ROI, as required by the CER. In NI SAIFI reporting methodology is employed.
SOCIAL - PRODUCT RESPONSIBILITY	Access	EU29	Sector Specific	4.4 & 4.5	Partially compliant	Sec. 4.4 Reported as CML in ROI, as required by the CER. In NI SAIDI reporting methodology is employed.



Abbreviated Term	Explanation
BWR	Business Working Responsibly Award
CCGT	Combined Cycle Gas Turbine
CDP	Carbon Disclosure Protocol
CER	Commission for Energy Regulation
Coillte	Coillte is a commercial company operating in forestry, land based businesses, renewable energy and panel products and owns over 1 million acres of forest on behalf of the Irish Government
Colleges	UL – University of Limerick, UCD – University College Dublin, TCD – Trinity College Dublin, NUI – National University of Ireland, DIT – Dublin Institute of Technology
DCENR	Department of Communications, Energy and Natural Resources
DoE	Department of Environment
EAI (NEAI)	Electricity Association of Ireland
Eirgrid	Republic of Ireland System Operator
EPA	Environmental Protection Agency
EPRI	Electricity Power Research Institute
Eurelectric	The Union of the Electricity Industry - EURELECTRIC is the sector association which represents the common interests of the electricity industry at pan-European level
EV	Electric Vehicle
HSA	Health and Safety Authority
IBEC	Irish Business and Employer Association
IFA	Irish Farmers Association
IPPCL	Integrated Pollution Prevention and Control Licence
IWEA	Irish Wind Energy Association
LTI	Lost Time Injury (in ESB defined as being absent from work on the next planned shift/day)
NO <sub>x</sub> , SO <sub>x</sub>	Nitrous Oxides, Sulphur Dioxides
NPWS	National Parks and Wildlife Service
RAB	Regulated Asset Base
SEAI	Sustainable Energy Authority of Ireland
SONI	System Operator Northern Ireland
UREG	Utility Regulator of Northern Ireland
VGB	European technical association for power and heat generation - a voluntary association of companies for which power and heat generation is the basis of their business.