Distribution Price Review 3 Submission

2011 - 2015

ESB Networks

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1. EXECUTIVE SUMMARY

The five year Business Plan for ESB Networks (ESBN) Distribution business covers the third price review (PR3) period 2011-2015 and has been formulated against a background of unprecedented economic challenge. The plan is based on current national economic assumptions that growth will return to the economy in 2011.

ESB Networks aims to ensure no increase in the DUoS[1] price while continuing to build on the service improvements made in PR2[2]. The plan also includes new areas of investment in national sustainability projects.

The implementation of this plan will not only support economic recovery but will also act as a stimulus to the economy in terms of contributing to improved energy efficiency and reduced dependency on imported fossil fuels.

ESB Networks mission is to deliver, within the regulatory framework, 'networks infrastructure and services that support economic growth and sustainability targets and also to deliver business and value growth underpinned by excellence in safety, service, asset management and people development'. Together with the provision of continued security and reliability of supply, it is now more important than ever that this be achieved.

The plan will see a net investment of €2.7bn in the distribution network over five years. As the transmission asset owner (TAO) ESBN will also be investing €1.5bn in the transmission system during PR3; this investment is covered by a separate submission.

1.1 Key Objectives:

The key objectives of ESBN for PR3 are as follows:

- No price increase in DUoS charges while continuing to deliver key network work programmes
- The reduction of supply interruption risk through the provision of additional capacity at 38kV and 110kV, thereby reducing the number of overloaded stations
- The improvement of LV supply quality through the completion of the renewal of the Urban and Rural Low Voltage Overhead Networks
- Increased safety levels for members of the public and employees

[1] DUoS = Distribution Use of Service, i.e. the network charge.
[2] PR2 = Price Review 2, which covers the period 2006 - 2010

- Further improvements in network continuity performance and reductions in carbon emissions through reductions in network losses
- To maintain and improve the consistency of quality customer service cost-effectively delivered across the Customer Service spectrum
- The connection of a predicted additional 156,000 new customers as required
- Achievement of national renewable energy targets by the connection of significant amounts of renewable generation capacity to the distribution system within the gate processing system
- To enable an improvement in national energy efficiency through the initial roll out of a smart metering project in PR3
- To implement smart grid technologies and practices as the cornerstone of the networks business into the future
- To install an initial electric vehicle charging infrastructure to enable a reduction of the national transport carbon footprint through the use of Electric Vehicles, in accordance with Government targets

1.2 2006 – 2010: PR2 Achievements

During PR2, ESBN stayed within the overall allowances - both Opex and Capex - set by the CER, while at the same time successfully delivering a very complex suite of technical work programmes. Significant improvements to the quality and security of supply were delivered during PR2, together with improved customer service to the current excellent standards.

In order to keep up with load growth, especially during the early part of PR2, significant investment was focussed on upgrading existing assets to higher levels of capacity. However the pattern of load increases has meant that new substations also had to be built to feed new customers.

ESBN also connected high numbers of new customers to the network, including record levels of new connections in 2006 and 2007. Customer satisfaction improved in 2006 and 2007 over 2005 levels, a significant achievement considering the level of demand for new connections and testament to the extraordinary efforts which were made to satisfy demand in a timely manner.

Approximately 750MW of wind generation was connected to the transmission and distribution networks. The systems, rules and processes around connecting embedded generation have also advanced considerably through the collaborative efforts of the CER, ESBN, Eirgrid and industry, resulting in a more streamlined and efficient connection process. This is an important development in the context of the anticipated level of renewable generation to be connected to the distribution and transmission networks in the coming years.

ESBN also completed its planned renewal and maintenance programme, designed to ensure the network assets are kept in satisfactory condition for performance and safety. This included work on HV substations, 38kV overhead lines and the commencements of the LV Urban and LV Rural renewal programmes which will be continued into PR3.

The result of this investment has been a great improvement in network performance during PR2, to the benefit of all customers. The number and length of customer interruptions were both reduced to much lower levels, through focussed operations management. In addition, voltage quality on the network improved significantly during the period, and network losses also were reduced.

Operational costs throughout PR2 were kept within the CER's allowances, which were reduced significantly from PR1 levels and therefore presented a real challenge to the company. The flexible work model, with staff deployment across different work areas and increased productivity has been a key factor in achieving efficiencies and reducing costs on an ongoing basis.

Within this reduced cost base, customer service and satisfaction levels were improved year on year, to the point where, at the end of PR2, ESBN now achieves excellent customer satisfaction ratings across a wide range of customer surveys.

PR2 also saw important developments for national energy efficiency improvements. ESBN has undertaken a smart metering trial, in conjunction with industry participants, to assess the potential for the roll-out of a smart metering system that could bring improved energy efficiency across the full electrical energy spectrum. This work is being carried on into PR3.

ESBN's performance during PR2 gives an excellent base for continued cost, performance and service efficiencies in PR3. It also demonstrates that the plans put forward by ESBN are robust, pragmatic and deliverable.

1.3 PR3 - Capital Expenditure (Capex)

ESBN has made significant investment in the current Price Review (PR2), both in terms of network reinforcement to cater for unprecedented growth and network refurbishment to improve the reliability and resilience of the network. The strategy for PR3 is to reinforce and refurbish where necessary and prudent, with a decrease on PR2 expenditure levels. The capex requirement for new connections in PR3 is also expected to be lower than PR2. The Capex plan for PR3 proposes a total net expenditure of €2,655m.

In addition to the provision of capacity and to maintenance of the existing network infrastructure, ESBN is also proposing investment in the new area of sustainability, for the provision of smart meters and an electric vehicle charging infrastructure.

1.3.1 Network Reinforcement (Load-Related Capex)

Electricity demand has increased 100% since 1980. The high growth rates present until very recently have resulted in a backlog of reinforcement work. This work is now required to address the significant number of overloaded 110kV and 38kV stations. ESBN's proposal for PR3 is to address the stations that are currently overloaded and to improve supply quality and resilience, while still reducing the level of investment in network reinforcement significantly when compared to PR2.

1.3.2 Network Refurbishment (Non-load related Capex)

Investment in network refurbishment and renewal must continue in order to consolidate the gains made in terms of reliability and resilience, and to continue with improvements in continuity. ESBN's proposal is to deliver improvements in the quality of supply and resilience, while reducing investment in this area significantly when compared to PR2.

1.3.3 New Connections – Demand and Generation

Expenditure on new demand connections is expected to be at substantially lower levels than PR2 due to the reduced level of construction work in the economy. A total number of 156,000 new connections are forecast for PR3.

The forecast number of generation connections under the gate processing system will be substantial (but will have no DUoS price impact as developers pay the full capital costs). The objective in this area is the timely and cost-effective connection of all applicants under the industry guidelines approved by the Commission. The continual improvement of systems and processes, in conjunction with industry participants, is key to ensuring this objective is met.

1.3.4 Sustainability

The ESBN submission includes significant investment for the provision of smart meters and the creation of an electric vehicle charging infrastructure over the period of this price review. Both of these initiatives are critical in achieving national carbon footprint targets, improving energy efficiency and improving national competitiveness.

Anticipating a successful outcome to the smart metering pilot currently underway, ESB Networks forecasts that an investment of €500m will be needed during PR3 to move directly to a full scale roll-out at the end of the pilot, in line with Government policy.

An investment of €187m in charging infrastructure for electric vehicles is proposed in order to provide sufficient electric vehicle charging facilities to meet Government targets. This infrastructure will be open to all electricity suppliers and all vehicle manufacturing companies.

1.4 PR3 - Operational Expenditure (Opex)

The flexible work model has been a key factor in achieving efficiencies. Staff numbers have gradually decreased over PR2, while continual training and upskilling has enabled more flexible deployment across different work areas and increased productivity. Together with the use of outside contractors, these factors have contributed to the savings achieved.

ESBN will continue to focus on reducing operating costs through these and other initiatives such as business process improvement, maximum utilisation of technology and IT, and flexibility in resourcing.

Significant Opex efficiencies have been achieved during PR2. The submitted Opex costs for PR3 are based on efficient Opex levels as being incurred at the end of the PR2 period incorporating the significant efficiencies achieved. However, further significant Opex reductions are necessary to ensure no DUoS price impact. The scope of the reductions required is in the order of €60m over the PR3 period. A further €15m of miscellaneous revenues will also offset related Opex costs in PR3.

ESBN constantly reviews its operations to drive efficiencies, and while a further reduction of €60m is very challenging and specific initiatives have not yet been identified to deliver this, ESBN believes it is a challenge that can be met.

The total proposed Opex for PR3 is €1,262m (excluding new activities), with €508m being proposed for Network Operation and Maintenance. The proposed expenditure on planned and fault maintenance will continue to improve system performance and further contain and reduce the risks to public and staff safety.

1.5 PR3 - Customer Services Improvement Strategy

Through the implementation of a Customer Service Improvement Plan very significant service improvements have been achieved to date in PR2. The improvements came as a result of leadership and targeted investments in a range of technologies, systems, processes and human resource management. Customer service, as perceived by our customers across a wide range of benchmarks, is now at a very high standard. This is demonstrated by various customer satisfaction surveys which show a strong upward trend to reach the current high levels at the end of PR2.

Table 1-1: Increasing Customer Satisfaction Levels to Forecast High in 2010:

	2006	2007	2008	2009	2010
CER Satisfaction rating targets	78%	81%	84%	85%	85%
Actual Performance	82%	85%	88%	90%	N/A

Cost and the ultimate price to the customer are important for the competitiveness of the Irish economy. Delivering a quality service to the customer in a cost-effective way is a major challenge. ESBN aims to consolidate the improvements achieved during PR2 by maintaining the high levels of customer satisfaction now perceived by the customer and widening the range of service available, while at the same time driving down the cost of providing that service.

The target at the end of PR3 is for overall customer service to have improved further, but within a lower expenditure level when compared to PR2.

2. Introduction and Background

2.1 Introduction

The third Distribution Price Review (PR3), 2011-2015, is being formulated against a background of economic uncertainty and challenges. After more than a decade of sustained growth in demand for electricity, the situation reversed in 2009. Electricity consumption in 2009 fell by approximately 5%, the first time this has happened.

In previous price control periods, one of the main objectives of ESBN's submissions was to improve the performance and condition of the network to meet the needs of the economy and customers, while recognising the investment constraints required to maintain prices at reasonable levels. The substantial investment in the network resulted in marked improvements in service quality to the customer, and network safety, all the while enabling the network to withstand and accommodate the significant load growth over the period.

In formulating this PR3 submission, a very different approach has been taken. Due to the economic circumstances of the country, and the need to improve national competitiveness, the starting point of the PR3 submission was to formulate a plan that would not require an increase in the DUoS price – but still deliver key projects to support economic development while achieving performance improvements. ESBN further seeks to achieve this price objective even with the inclusion of expenditure on Smart Networks and Electric Vehicle infrastructure, which are key projects needed to address the nation's sustainability issues.

In starker terms, this has meant that on a like-for-like basis, expenditure levels will need to be reduced dramatically from PR2 levels. ESBN has therefore formulated a submission where every item of expenditure has been subjected to the most rigorous challenge. Excluding the two sustainability projects, the submitted plans would result in a real decrease of 3.2% in DUoS from 2010 levels in 2011 and held constant from there for the remainder of the 5 year period.

Notwithstanding the harsh economic climate, ESBN must continue to invest at the proposed levels in order to provide an electricity infrastructure equipped to support the national economy and also implement strategies to address the enormous global and national challenges in terms of environmental and energy sustainability. The submitted plan ensures this will be achieved, within the challenging criterion of ensuring no DUoS price increase.

2.2 Economic Outlook and Electricity Prices

Electricity sales and growth rate projections for PR3 are based on general economic forecasts. ESBN has assumed, based on up-to-date modelling and economic data from the ESRI, that there will be a small economic decline in 2010, with the country pulling out of recession in 2011 and stable growth re-established from then onwards. However, with the recent economic turbulence, it is accepted that there is less certainty than usual surrounding economic forecasts.

On this basis, network sales are projected to fall slightly in 2010, and increase by 1.6% and 3.2% in 2011 and 2012 respectively, in the "recovery" period. For the period 2013-2015 sales are forecast to grow by just over 3% per annum.

On the basis of ESBN's submitted expenditure plans (including sustainability projects) and the assumptions made on network sales, the average DUoS unit price is forecast to be unchanged from 2010 levels.

2.3 Sustainability

Electricity generation accounts for 33% of European CO_2 production. Governments and utilities everywhere recognise that addressing this issue means a major change in generation technology. Ireland has set a target of 40% of electricity from renewable sources by 2020, and has also targeted 10% of all passenger vehicles to be electrically powered by 2020.

These targets present a major challenge to Electricity Network Operators; new infrastructure needs to be built to enable these goals to be realised. Expenditure in the area of sustainability is a significant new development in PR3. Given the level of innovation and uncertainty involved, ESBN proposes to invest in various R&D programmes to support and complement the main capex projects.

In addition to the connection of renewable generation, two key capex projects come under the Sustainability heading: the Smart Meter project and Electric Vehicle Infrastructure. Both projects are important components of national energy infrastructure, are key to achieving government targets, and will enable the important long-term societal benefits to be realised:

- increased energy efficiency and cost competitiveness
- reduced national carbon footprint
- reduced dependency on imported fossil fuels
- scope for improved customer service

3. Review of 2006 to 2010 (PR2)

Overall ESBN stayed within the PR2 allowances - both Opex and Capex - set by the Commission while at the same time delivering a very complex suite of technical work programmes. The benefits that these plans were designed to deliver were also realised, through improved quality and security of supply, and improved customer service. ESBN's performance during PR2 gives an excellent base for continued cost, performance and service efficiencies in PR3. It also demonstrates that the plans put forward by ESBN are robust, pragmatic and deliverable.

3.1 Capex

There were three areas of network capex approved for PR2:

- Load related capex
- New connections (demand and generation)
- Non-Load related capex

3.1.1 Load Related Capex

The period from 2006 to 2010 has seen significant levels of investment in the Distribution Networks to catch up on the growth in demand experienced across the country over the previous decade, and to meet the additional load requirements of new connections.

Significant investment was focussed on upgrading existing assets to higher levels of capacity. However the pattern of load increases has meant that new substations also had to be built to feed new customers. The backlog of substation upgrade work therefore still remains high, as does the number of substations operating above the planning guidelines for loading. Table A below outlines the numbers of 38kV and 110kV substations that will be in breach or almost in breach of planning standards at the end of PR2. There will be seventy-two 38kV substations overloaded and twenty 110kV substations loaded above 90% by the end of 2010.

Table A: Overloaded substations

Indicator	2000	2005	2010
38kV Substations loaded above planning criteria	68	65	72
38kV Substations normally loaded above 75%	213	190	150
110kV Substations loaded above 90%	5	22	20
110kV Substations normally loaded above 75%	16	35	32

It is far from ideal to operate networks to this degree of loading, and non-transferable loads continue to be a feature of the Irish distribution networks – with the consequent greater risk of large outages. ESBN's investment proposals for PR3 aim to improve the security of supply by addressing this shortage of capacity. This will allow a greater degree of load transfer and reduce the risk of outages occurring.

Table 3-1: Load Related Capex PR2

(€m '09)	Allowance	Outturn
PR2 Total Load Related Capex - Reinforcements only	623.2	707.9

3.1.2 New Connections

Record levels of new connections were achieved in 2006 and 2007, followed by a significant dropping off in connection levels at the end of PR2. A predicted total of 326,000 connections will be completed by the end of the PR2 period.

Customer satisfaction improved in 2006 and 2007 over 2005 levels. This was a significant achievement given the level of demand for new connections and is a testament to the extraordinary efforts which were made to satisfy demand in a timely manner.

However, in order to meet the exceptional demand for new house connections during 2006 and 2007 and also to ensure that customers' expectations were met within the timeframe allowed in the Customer Charter, significant additional resources were required to carry out connection works. Consequently contractors were deployed which resulted in increased unit costs. There was also a significant escalation in commodity prices in the same period leading to additional unit costs incurred over those envisaged at the start of PR2.

ESBN will be seeking the addition of these extra costs to the Regulatory Asset Base (RAB).

Table 3-2: PR2 Connections

	Forecast	Expected Outturn
G1 - Domestic Scheme	194,100	185,727
G2 - Domestic Non-Scheme	83,170	81,481
G3 - Business	50,000	58,560

3.1.3 Generator Connections

There were significant numbers of embedded generation connections completed during PR2, with approximately 750MW of wind generation connected to the transmission and distribution networks. The systems, rules and processes around connecting embedded generation have also advanced considerably through the collaborative efforts of the CER, ESBN and industry, resulting in a more streamlined and efficient connection process.

3.1.4 Non Load Related Capex – Renewal and Maintenance

The renewal and maintenance plan divided the network assets into ten distinct asset classes and set out details of specific work programmes for each asset class.

HV sub-station works included the replacement of some of the oldest 'Siemens' type 38kV sub-stations. In almost half of these cases, prefabricated modules were used as a means of reducing costs. Other necessary programmes included the replacement of obsolete system protection relays and 38kV and MV circuit breakers.

On the 38kV overhead copper network, approximately 500km of lines were rebuilt, while the Network Renewal Programme was completed in 2006. Both the Low Voltage Urban (LVU) and the Low Voltage Rural (LVR) projects commenced during PR2 with the intention of completing these programmes in the PR3 time frame.

On the MV network, the remaining population of the outdoor oil-filled MV RMUs were replaced in addition to 1,000 Magnefix RMUs which were no longer fit for service and posed an increased risk to the safety of operators. Significant cable work was undertaken in Dublin: the Finglas – McDermott 110kV gas compression cable was replaced with a new 'city' type XLPE cable, while fluid-filled cables with severe leakage problems from the East wall Road 38kV sub-station were also replaced.

ESBN's proposals for PR3 will continue to focus on specific, poorly performing assets to ensure our networks remain in satisfactory condition and build on the work undertaken in PR2.

Table 3-3: PR2 Non Load Related Capex

('09 money,€m)	Allowance	Outturn
PR2 Total Non Load Related Capex	876.1	663.6

3.1.5 Smart Meter Pilot

During PR2 ESBN has undertaken a smart meter pilot project, in conjunction with CER and various energy industry participants. The objective was to test the feasibility of using smart meters in Ireland, and to investigate the smart meter / network from the perspectives of operations, costs, benefits, and consumer behaviour, among others.

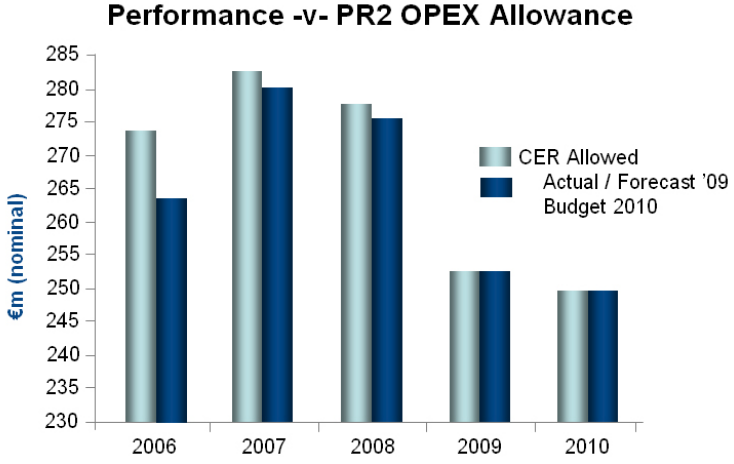
CER approved expenditure on the smart meter pilot, and the full results of the trial will be known early in PR3. This will inform the type and extent of the smart meter infrastructure that may be approved by the CER. At that stage a full costing exercise will be undertaken and submitted for approval. A figure of €500m has been used for modelling purposes as the required expenditure during the PR3 period.

3.2 Opex

The PR2 allowance imposed a 20% reduction in Opex when compared to 2005 levels – a challenging regulatory target. In addition, the unprecedented deflation level in 2009 resulted in a severe reduction in Opex allowances in nominal terms in that year. ESBN has stayed within the allowed Opex levels during the PR2 period, including the deflated allowance of 2009.

This success has been achieved by means of a significant communication process that was undertaken immediately after the PR2 CER Decision Paper in 2005 with staff through intensive briefing of how the allowances would impact on their areas. This was followed up by an annual budgeting process that has had as its core principle that ESBN operate within the regulatory allowances to achieve the challenging regulatory goals set for the business, during that year – while still achieving the planned work programmes. This approach underpins all of ESBN's budgets and business plans.

A flexible work model has been a key factor in achieving recent efficiencies. ESBN staff numbers have gradually decreased over PR2, while continual staff training and upskilling has allowed for increased flexible deployment across different work areas and increased productivity.



3.3 Network Performance and Supply Quality

Considerable network performance improvements were achieved over PR2. The quality of supply to customers improved significantly across a number of measurements.

Customer interruptions (CI) were reduced significantly during PR2, while the length of interruption also decreased, with the average Customer Minutes Lost (CML) also showing large reductions – the table below shows the pattern and scale of the improvements. Voltage quality complaints also decreased over PR2.

Table 3-4: PR2 Quality of supply: Actual vs. Targets

		2006	2007	2008	2009	2010
CML	Target	379	230	215	208	201
	Actual	393	134	155	141	N/A
CI	Target	201	178	175	173	171
	Actual	211	176	152	132	N/A

These improvements were delivered through the various capex programmes, but also through a revised operational approach from management focussed on reducing the CMLs and CI's in order to reach regulatory targets.

3.4 Customer Service

Through the implementation of a Customer Service Improvement Plan very significant service improvements have been achieved to date in PR2. The improvements came as a result of leadership and targeted investments in a range of technologies, systems, processes and human resource management. Customer service, as perceived by our customers across a wide range of benchmarks, is now at a very high standard. ESBN's excellent customer service performance was recognised in a recent presentation from the CER's research company 'The Research Perspective' :

> 'Interaction factors remain at world-class levels and are holding steady or improving slightly' –October '09

During PR2 the CER regulatory targets were met, with higher levels reached year on year. Measurement is based on customers' assessment of their contact experience with the National Contact Centre and are based on independent measurement of four key metrics:

- Accuracy of Information
- Usefulness of Information
- Politeness
- Willingness to help

Table 3-5: PR2 Performance against regulatory customer service targets:

	2006	2007	2008	2009	2010
Targets	78%	81%	84%	85%	85%
Actual Performance	82%	85%	88%	90%	N/A

In addition to the survey undertaken by CER for measuring customer satisfaction, ESBN also engages Red C/ MORI to undertake an independent survey on customer satisfaction. This survey measures a wide range of service delivery and customer perceptions. The customer satisfaction measurements rose from 68% in 2005 to 78% in the latest result. This corroborates the trend shown in the CER satisfaction measurement – a constant upward improvement in customer service, to the current high levels.

4. PR3 - Business Objectives, Strategy and Key Issues

The prime business objective of ESBN in PR3 is to deliver the required investment in the network and to build on the service improvements in PR2 while, at the same time, ensuring no increase in the DUoS price.

The connection of substantial levels of renewable generation over PR3 is also a priority. ESBN will be striving to ensure the connection process is improved further and that the increased number of connections are completed in an efficient and timely manner.

The submitted plan also includes new areas of investment in national sustainability projects, which will require interaction and co-operation with third parties to ensure their efficient delivery.

In order to achieve the challenging price objective, ESBN will need to continue to find operational efficiencies. The constant review of operations led to a number of cost-saving initiatives over PR2, and ESBN will continue to assess and review all areas of operations in order to further improve operational processes and to drive savings during PR3.

There are a number of key issues that face ESBN in the PR3 period. These have helped shape the PR3 objectives:

- Economy and Prices

The national economic situation demands a cost effective PR3 submission that does not increase network prices, while still delivering network and service improvements. A reduced demand for connections is forecast, with sales growth recovering from the significant reductions experienced at the end of PR2. The economic and sales forecasts are subject to more risk and uncertainty than in previous price control periods.

- Network Condition and Security

While expenditure levels will be reduced, the programmes included in the submission aim to continue the pattern of improvement in the network condition. The submission also aims to improve the current situation of overloading in many substations – due to the constant high growth in demand levels in previous price periods.

Under the proposed plan, by the end of PR3 the improved network condition will enable enhanced operation and performance levels. Customers will receive improved service quality and security of supply, with key security standards measurements having substantially caught up to those in the UK and Europe, countries with much more favourable network configurations. Public and staff safety will also be further improved through the proposed investments.

- Sustainability

The connection of renewable generation to the network is increasing year on year. Through the existing gate process, there is now a high volume of generation projects with connection works in progress, or detailed final connection designs now being undertaken. Beyond Gate 3, there is a further tranche of projects that are awaiting connection offers. ESBN devotes significant resources to the entire process of connecting generation to the network, and will continue to further devote resources to ensure that renewable generation is connected as quickly and efficiently as possible, thereby enabling national renewable energy targets to be met.

Two key sustainability projects, namely Smart Meters and Electric Vehicle Charging Infrastructure, are proposed for PR3. The projects are key to achieving government targets regarding the greater use of renewable energy, and the target of achieving 10% electric vehicle penetration of the car fleet by 2020. ESBN has included these projects based on their importance in meeting government targets.

5. Capex Plan 2011 – 2015

The Capex Plan for PR3 proposes a total net spend of €2,655 million. It aims to deliver further improvements in network condition, security and performance, to connect new generation and new customers, to improve the quality of supply to customers, and to deliver key national sustainability projects – all within a tight budget constraint to avoid any DUoS price increase. The implementation of this programme will enable the:

- addressing of the large number of substations currently overloaded and improving load transfer capability during faults
- reduction of supply interruption risk through the addition of further capacity at 38kV and 110kV substations
- improvement of LV supply quality through the completion of the renewal of the Urban and Rural Low Voltage Overhead Networks
- connection of a projected 156,000 additional new customers
- further reduction of interruptions (CML and CI) through maintaining investment in network continuity, performance and customer service
- reduction in unit energy costs through the continued reduction in network losses
- delivery of national renewable energy targets by the continued connection of significant amounts of renewable generation to the distribution system through the group processing approach
- satisfying voltage and security of supply criteria by operating in compliance with ESB Networks Distribution Planning Standards
- ensure network, public and staff safety through the necessary replacement of inadequately rated equipment
- improvement in public and staff safety through prudent and targeted maintenance and refurbishment practices
- improvement in national energy efficiency and customer service through the roll out of a smart metering project
- reduction in national transport carbon footprint by enabling the significant use of Electric Vehicles in accordance with Government targets, through the installation of an initial electric vehicle charging infrastructure

Capex can be broken into four main areas of expenditure:

- Load Related Capex – Reinforcement and refurbishment are the main expenditure areas, along with Capex driven by new demand and generator connections
- Non-load related capex – Capex unrelated to load growth, but required to improve the network. This includes refurbishment projects, system control and Response Capex initiated by external parties or events
- Non Network Capex – Capex not directly related to the network, such as premises, telecoms, transport and IT
- Sustainability Capex programmes related to long term national energy and environmental objectives are also listed in the table below, with Smart Networks and Electric Vehicle infrastructure falling under this category

Table 5-1: Proposed PR3 Capex vs. PR2 Forecast Outturn

	(all figures '09 money, €m)	PR3 Proposed	PR2 Forecast Outturn
Load	Reinforcement	561.8	637.5
	20kV Conversion	101.9	70.3
	New Connections (after contributions)	261.0	542.1
	Line Diversions and Dismantling	131.0	N/A
	LOAD Sub-total	**1,055.7**	**1,249.9**
Non-Load	Refurbishment	455.5	541.5
	System Control	32.7	N/A
	Supply Quality and Continuity	23.2	23.8
	Response Capex	115.8	98.3
	NON-LOAD Sub-total	**627.2**	**663.6**
Non-Network	Non-Network	284.8	178.2
	NON-NETWORK Sub-total	**284.8**	**178.2**
Sustainability	Smart Meters	500.3	N/A
	Electric Vehicle Infrastructure	187.5	N/A
	SUSTAINABILITY Sub-total	**687.8**	**N/A**
	TOTAL CAPEX	**2,655.5**	**2,091.8**

The proposed PR3 Capex programme is detailed in the following sections.

5.1 Load Related Capex

Because of the current uncertainty in how units distributed and system demand will develop in the turbulent economic climate the proposed load related expenditure requirement is based on costs of projects required to address breaches of planning criteria under 2007/08 loadings. This is the most prudent approach in the existing circumstances.

Load related capex is divided into four areas: Load related Reinforcement, 20kV Conversion programme, New Demand Connections, and New Generation Connections.

Table 5-2: Load Related Capex – Proposed PR3 Capex vs. PR2 Forecast Outturn

(all figures '09 money, €m)	PR3 Proposed	PR2 F'cast Outturn
Reinforcement	561.8	637.5
20kV Conversion	101.9	70.3
New Demand Connections (after capital contributions)	261.0	542.1
Line Diversions and Dismantling	131.0	N/A

5.1.1 Load related - Reinforcement of overloaded network

The network load related reinforcements that are being proposed for DPR3 address situations where the existing HV and MV networks are presently operating outside the planning standards. Despite significant expenditure on the networks over the DPR1 and DPR2 periods, major deficiencies that contravene ESBN distribution planning criteria and standards remain on the network. These are present due to the high load growth that occurred since the early nineties through to recent times, prior to the decline in the economy.

Examples of known breaches of planning standards include:

- Plant Overloading and lack of load (customer) transfer capability
- Non-Compliance with Voltage Standards
- Security of Supply Standards deficiencies, particularly in Dublin
- Operation standards (Equipment short circuit rating inadequacies)

New generation connections are fully paid for by the connecting party, and therefore no Capex is incurred by ESBN. However some assets relating to generation connection may ultimately be added to the RAB.

A programme of network reinforcements is proposed to address these breaches, including:

- Implementation of load transfer at 22 MV locations where existing 110kV and 38kV networks are sufficiently resilient
- Uprating of 59 existing HV substations.
- Provision of an additional 7 x 110kV and 34 x 38kV circuits
- Installation of 16 new 110/38kV, 110kV/MV, 38kV/MV Substations
- Reconfiguration of 22 existing 110/38kV and 110kV/MV substations

By addressing non-compliances with the planning standards, the programme of work will deliver the following benefits:

- Ensure equipment is operating within its design specification and affording the expected levels of service and safety to public and staff
- A reduction in the number of voltage complaints and improved customer service
- Mitigation against the possibility of major outages in urban areas due to a single contingency
- Enhancement in the security of supply in Dublin city centre toward that afforded in other major European cities
- Deferral of investments and costs from redistribution of load and assurance of load transfer capability following a network contingency

In PR2 a probabilistic approach was adopted and a significant number of the submitted projects were conditional on specific identified commercial and industrial developments proceeding. In contrast, the projects for PR3 have been limited to those which are required to resolve breaches of planning criteria that have been identified on the network without provision for any load growth. The programme is not based on a probabilistic approach but is designed to address existing and proven issues.

The approach in addressing breaches in planning criteria is consistent with the predicted growth in customer numbers and sales. It is anticipated that while the economy will recover and GWh sales will grow during PR3, the overall peak loading at the end of PR3 should be close to the peak loading at the start of 2008.

The costs of the load driven reinforcement programmes are set out below. The total requirement of €562M in PR3 is a reduction on the forecast spend for PR2. There are significant reductions in all categories of expenditure on PR2 reflecting the fact that the proposals are to cater for identified current breaches of the planning criteria.

Table 5-3: Reinforcement – Proposed PR3 Capex vs. PR2 Forecast Outturn

(all figures '09 money, €m)	PR3 submission	PR2 Expected
110kV	268.8	330.5
38kV	220.5	217.9
MV / LV	72.5	89.1
TOTAL	**561.8**	**637.5**

5.1.2 20kV Conversion

By the end of PR2, almost 40,000 km of MV Network will have been converted to 20kV operation. During PR3 ESBN proposes to convert 15,000 km of MV network to 20kV operation at a cost of €102m. This programme will deliver increased capacity and improved quality of supply to customers, and also help defer the requirement for new generation capacity.

The conversion of the 10kV network to 20kV operation was initiated in the 1990's. This strategic direction was based on the studies of that time that showed that the most economical and efficient method of addressing voltage and capacity problems on the rural MV network was to convert it to 20kV. Over 90% of the 20kV conversion required in PR3 is required due to current network being outside voltage standards based on 2008 loads.

In addition to the network capacity gains achieved through conversion to 20kV, the financial justification for this programme is augmented by the losses savings achieved. The losses savings, which are highest at time of system peak, reduce the need for generation investment. In effect 20kV conversion is an alternative to thermal generation investment. The losses saving that will be achieved through this conversion will amount to 20-25MW at the times of system peak. The losses savings will, over a 25 year period, totally offset the cost of the expenditure for the DUoS customer by reducing the energy component of the electricity bill.

The reduction in losses also results in an environmental benefit; the reduction in carbon footprint that can be achieved by extending this programme is very significant. The conversion to date has reduced system peak by approximately 65MW, delivering a carbon footprint reduction of approximately 143,700 tonnes of CO_2.

Table 5-4: 20kV Conversion – Proposed PR3 Capex vs. PR2 Forecast Outturn

('09 money, €m)	2011	2012	2013	2014	2015	TOTAL	PR2 F'cast
20kV Conversion	20.5	20.3	20.3	20.4	20.5	101.9	70.4

5.1.3 Load related - New Connections

During PR3, the total volume of new connections is anticipated to be significantly lower than in PR2 due to the current economic downturn. From a figure of 326,000 new connections in PR2 (a latest estimate), a total of 156,000 is forecast for PR3.

In line with the adopted forecast positions for the period 2011 – 2015, ESBN forecasts a sustained but slow year on year increase in the level of new domestic connections, starting from the reduced volumes of 2009/2010. This is in contrast to the very wide annual fluctuations experienced during PR2. This should mean less variation in unit costs year-on-year, avoiding extra costs associated with very high connection rates.

It is more difficult to forecast non-domestic new connections. The average annual volume predicted for PR3 is approximately 8,000 connections, a reduction from the average annual PR2 outcome of 12,000 per annum.

Table 5-5: Forecast for connections over PR3:

	2011	2012	2013	2014	2015	TOTAL
Domestic Scheme	10,180	11,360	12,541	13,721	14,901	62,703
Domestic Non-Scheme	10,110	10,352	10,594	10,836	11,079	52,971
Total Domestic	20,290	21,712	23,135	24,557	25,980	115,674
Non-Domestic	7,697	7,921	8,145	8,369	8,592	40,724

The projected cost of non-domestic connections may vary from forecast due to the wide range of connection types and associated costs.

Capex for new connections over PR3 is forecast to be €261m, after capital contributions from the connecting party (connection charges are designed to recover 50% of the total).

ESBN also proposes that Line Diversions costs, which are related to the volume of new connections, be treated as Capex. To date these costs have been treated as Opex. These costs are described in the Opex section later in this paper, along with dismantling costs. The combined total of these costs is €131m during PR3.

5.1.4 Generation Connections[4]

During PR2 ESBN has driven many improvements in the processes for the connection of generation to the Distribution System. This progress has covered all areas of the business from the technical, commercial, financial and construction perspectives.

These changes have been driven by the ongoing review and improvements of the entire connection process. This has included responding to the concerns of the wind industry to deliver a better service to the customer and ultimately better value to the end user. ESBN intend to build on the improvements made to date and to work with the industry to address issues as they arise, continually driving process improvement.

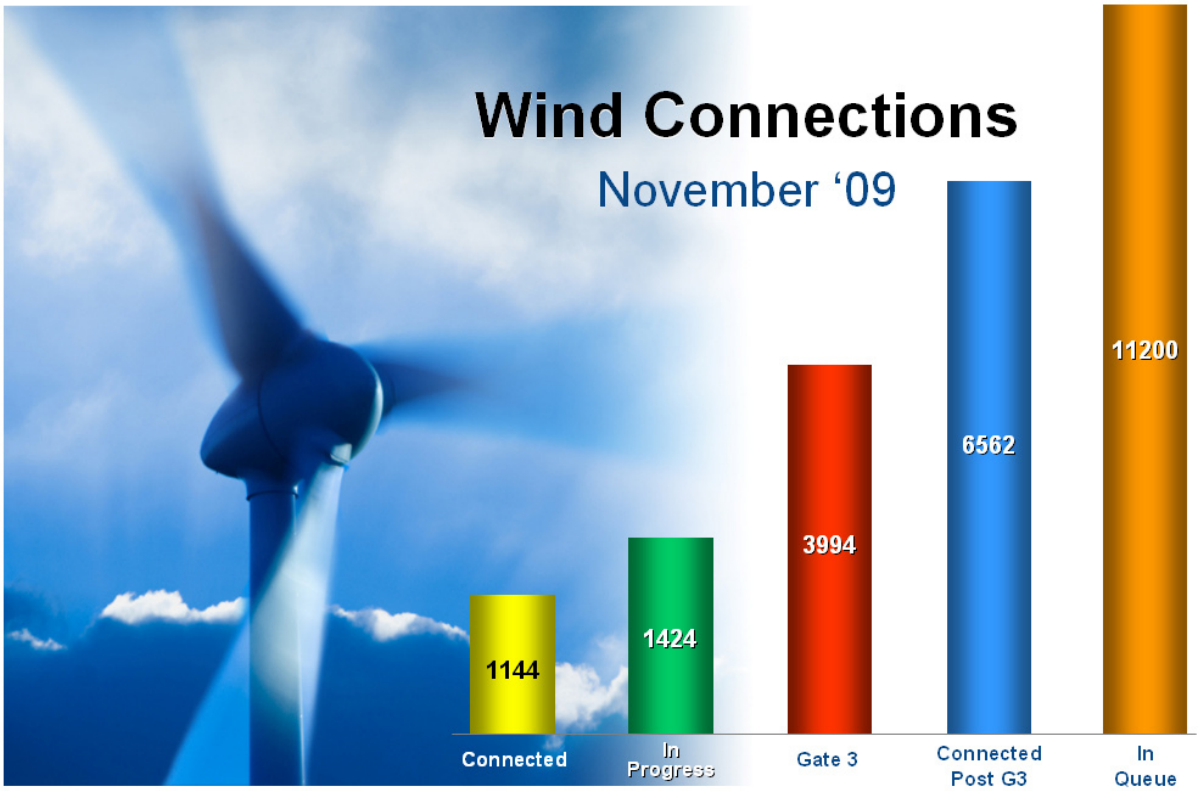
Gate 2 saw offers being issued to approx. 120 applicants for connection during 2007 and 2008 and totalled approx. 1,300MW of generation. There is take up rate of 100% for offers issued in Gate 2.

The unique nature of the current Gate 3 Programme, in national and even international terms, means that further effort and organisation will be required over PR3 to ensure quicker delivery of the connection targets. It will result in offers being issued to approx. 4,000MW of renewable generation (primarily wind and including off-shore wind). In addition offers will be issued to approx 1,600MW of conventional generation[5]. Further initiatives will likely be required in order to respond to the challenges posed by a stretching national target - around 5,500MW of renewable and conventional generation will be connected over the next 5-10 years. ESBN anticipates working closely with the Commission and looks forward to its continued support for these initiatives. Looking further forward, at the time of writing the number of renewable applications awaiting connection post gate 3 is over 11,000MW.

[4] New generation connections are fully paid for by the connecting party, and therefore no Capex is incurred by ESBN.However some assets relating to generation connection may ultimately be added to the RAB.

[5] At the time of writing the exact number has not been finalise

Figure 1. Wind Connections Present and Planned



ESBN are proposing regulatory incentives around the various stages of the connection process, to reduce the connection timelines and to bring benefits to developers and the environment through quicker connection times.

5.2 Non-Load related

Non-load related Capex is not driven by network demand, but by requirements such as:

- Maintenance and Renewal
- System Control
- Supply Quality and Continuity Programmes
- Response Capex

5.2.1 Maintenance and Renewal Plan

The distribution system currently serves over 2.2 million customers over five voltage levels, 110kV, 38kV, 20kV, 10kV and LV (230V). As the system and associated assets age, their condition deteriorates and thus instances of failure increase to a point where the asset poses an unacceptable level of risk to staff, members of the public or the environment. Carefully designed programmes of work to maintain or replace assets are required in order to manage these risks.

However there was very little asset replacement before 2000. In DPR 1 the focus was on a major refurbishment of the rural MV overhead network. Following a comprehensive risk based review of the entire distribution system targeted renewal and refurbishment programmes were instigated in PR2.

The PR3 plan includes the continuation of those programmes and also some new programmes to address actionable risks which have been identified during the DPR 2 period.

Maintenance and renewal of network assets is essential to:

- ensure a safe network, for the public and staff
- maintain and improve the quality of supply through reduced faults and outages
- reduce energy costs through reduced losses
- improve efficiencies and reduce costs through upgrading and modernising existing asset classes

The first step in planning was to conduct a review of the status, condition information and risks associated with each of the asset classes. In addition to the maintenance programmes for each asset class, this review identified candidate asset replacement programmes. The final test for a renewal & refurbishment programme was to consider the practicality and likelihood of delivering the programme within the DPR 3 timeframe. All of the proposed programmes have been examined in terms of their deliverability and programme volumes have been adjusted to match the capability to deliver.

Significant refurbishment and renewal work programmes include:

- HV: replacement of 5 of the 11 remaining Siemens HV substations, and three very old HV substations supplying Dublin and Cork cities
- HV and MV Cables: replacement of poor performing and/or environmentally damaging cables at HV and MV
- MV: Overhead line cyclic refurbishment. Inspection of poles on 5/9ths of network and replacement where necessary
- LV Urban: Continuation of LV Overhead network refurbishment commenced in PR2 with 35,000 spans refurbished in PR3
- LV Rural: Completion of refurbishment programme

To facilitate the presentation of plans and associated expenditure the system is divided into 10 asset classes. In practice these programmes are undertaken in an integrated manner with other work programmes, including Opex and other Capex programmes, to ensure all programmes are efficiently delivered.

Table 5-6: Maintenance and Renewal – Proposed PR3 Capex vs. PR2 Forecast (09, € m)

Asset Class	PR3	PR2 Forecast
HV Overhead Lines	16.9	59.9
HV Cables	21.3	25.8
HV Substations	121.6	77.2
MV Overhead Lines	76.4	11.7
MV Cables	6.0	0.4
MV Substations	25.1	50.3
LV Overhead Lines - Urban	66.2	28.6
LV Overhead Lines - Rural	98.5	145.6
LV Cables incl. Mini Pillars	17.4	8.6
LV Cut-Outs	6.0	12.8
Meters & Time Switches	-	3.8
Telecontrol/SCADA/Energy Mgt	-	3.4
NRP	-	113.6
TOTAL	**455.5**	**541.5**

5.2.2 System Control

During the period of PR2 a significant change occurred in the characteristics and operational challenges of the distribution system. The presence of embedded generation means that it ceased to be a passive, radial distribution system and has become an active, dynamic system which not only distributes power but also has power flows arising from embedded generation.

It is anticipated that embedded generation will increase to over 1,500MW by 2015 and will continue to change the characteristics of the system. To enable the operation of the network with these characteristics, investment is required in new power system management tools, as well as investment to keep the existing control systems current and supported.

The main initiatives, with at a total expenditure of €32.7 million over PR3, include:

- Purchase and implementation of a Distribution Management System (DMS) to enhance network management functionality and efficacy
- Complete transfer of control of 10kV and 20kV system to Distribution Control Centres
- Required extension of SCADA capability to all major substations
- Refresh of SCADA and OMS to maintain functionality, availability, support levels
- Replacement of the ageing and failing radio system and signal concentrator cabinets to ensure integrity of the SCADA and other control systems

As well as enabling the increased penetration of embedded generation, improved system control will benefit customer service through faster service response and through the provision of better information. These benefits will be realised through the specific programmes and systems proposed.

Table 5-7: System Control – Proposed PR3 Capex vs. PR2 Forecast (09, € m)

('09 money, €m)	2011	2012	2013	2014	2015	TOTAL	PR2 F'cast
System Control	6.6	6.5	6.5	6.5	6.6	32.7	N/A

This function was included under other headings in PR2

5.2.3 Continuity of Supply

Supply continuity is measured in terms of the average annual number of interruptions of supply per customer (CI) and the average length of time without supply per year (CML). ESBN expects to achieve a 10% reduction in overall CI and an 18% reduction in overall CML over the period 2011-15. In 2015, overall CI is forecast to be 1.33 and overall CML is forecast to be 126 minutes. This will continue the improvement achieved in Continuity performance in PR2.

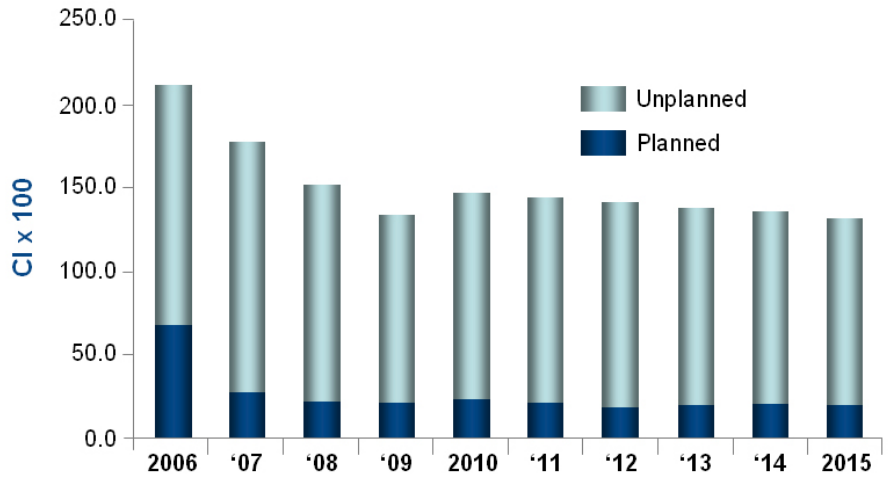


Figure 2: CI Performance : Historic and Forecast

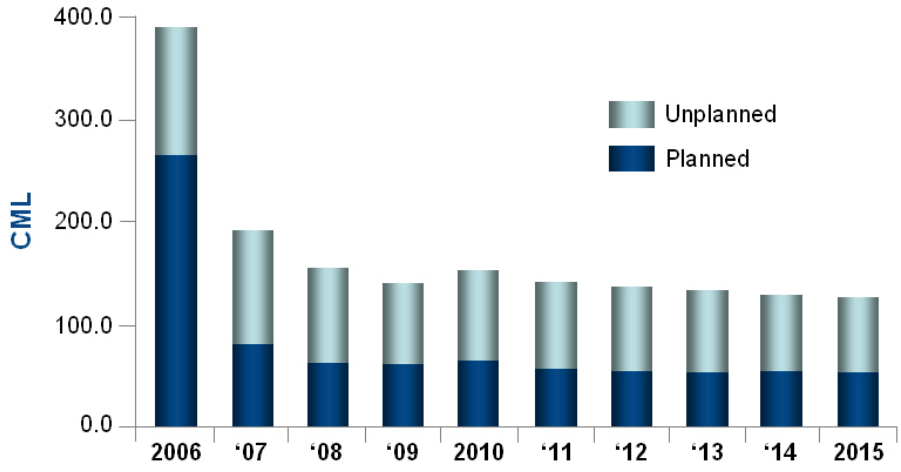


Figure 3: CML Forecast : Historic and Future

The forecast improvement in unplanned (i.e. fault) CI and CML performance is based on specific programmes including investment in remotely controllable MV network switches, central control of the MV system, and programmes for the replacement and installation of different smart devices at various parts of the network.

Table 5-8: Continuity – Proposed PR3 Capex (09, € m):

('09 money, €m)	2011	2012	2013	2014	2015	TOTAL
Continuity	4.7	4.6	4.6	4.6	4.6	23.2

5.2.4 Response Capex

Response Capex is capital expenditure initiated by external events or parties. The prime areas of expenditure are as follows:

- Resolution of Voltage Complaints
- Undergrounding of overhead lines to facilitate development
- Replacement of plant damaged by fault
- Metering – replacement of meters and timeswitches
- Replacement of fault-prone cables
- Installation of ducts during development for future use

The projected level of activity for PR3 is primarily based on the level of activity experienced by ESBN in recent years and results in an overall projected expenditure of €115.8m.

Table 5-9: Response Capex – Proposed PR3 Capex (09, € m):

('09 money, €m)	2011	2012	2013	2014	2015	TOTAL	PR2 F'cast
Response Capex	24.5	23.7	23.0	22.5	22.0	115.8	98.3

5.3 Non Network Capex

Non-Network Capex covers expenditure not directly related to the network, such as premises, vehicles, IT, Telecoms and tools.

Table 5-10: Non-Network Capex – Proposed PR3 Capex (09, € m):

('09 money, €m)	2011	2012	2013	2014	2015	TOTAL	PR2 F'cast
IT	14.0	16.0	14.7	16.7	16.5	77.9	88.9
Fleet	9.7	7.7	6.9	10.0	6.1	40.4	34.6
Telecoms	3.2	3.2	3.2	3.2	3.0	15.9	7.6
Tools	3.7	3.5	3.2	2.9	2.8	16.0	16.1
Premises & Other	7.0	7.6	7.6	6.2	6.2	34.6	26.8
Property Rationalisation	-	-	-	50.0	50.0	99.9	2.5
TOTAL	**37.6**	**38.0**	**35.6**	**89.0**	**84.6**	**284.8**	**178.3**

5.3.1 IT

Like all modern businesses ESB Networks is increasingly reliant on having the appropriate IT structures and systems in place to support the overall business strategy. IT systems act as business enablers on a number of fronts including improved safety, better investments decision making, optimisation of asset performance, more efficient working, and improved cost and service delivery.

The Networks business is dependent on the effective generation and processing of large volumes of data from a wide array of sources and the delivery of relevant information in an integrated and user friendly way. The progression to SAP based IT systems over the past five years has been instrumental in achieving a much higher level of data accuracy, consistency and integration than was previously possible. There are still a number of areas where further investment is required to properly support the delivery of business and customer benefits. Some of this investment is required to replace remaining legacy systems that have served the business well in the past.

The IT programme of work required for the PR3 period is estimated to cost €51m, as well as €18.3m for the maintenance of and upgrades to the market support IT systems, and an estimated €8.5m for SAP system maintenance and updates. The programme does not cover any IT expenditure associated with the sustainability and smart network programmes.

There are three areas with significant investment requirements over PR3:

- GIS Replacement (€11.5m): The present GIS system is now outdated
- MDM Upgrade (€16.5m): The present system needs to be upgraded to ensure continuing high performance for the 350 existing users
- SAP upgrades (€8.5m): essential standard manufacturer software updates

Table 5-11: IT Capex – Proposed PR3 Capex (09, € m):

('09 money, €m)	2011	2012	2013	2014	2015	TOTAL	PR2 F'cast
IT	14.0	16.0	14.7	16.7	16.5	77.9	88.9

5.3.2 Fleet, Telecoms, Tools and Other

ESBN made substantial improvement, modernisation and rationalisation to the fleet during PR2. A number of initiatives have been identified to further reduce the capex on fleet when compared to PR2, including:

- A further reduction of 300 vehicles from the fleet
- Standardisation of fleet
- Extending vehicle life
- Reducing staff numbers
- Unimog refurbishment programme

The above initiatives will involve significant changes to the management and use of the fleet in the business. However if they can be achieved, the fleet can be sustained with a capital spend of €29.9M, excluding electric vehicles, which will be the minimum required to support the delivery of ESBN customer service and major investment programmes. In addition, investment is needed in Electric Vehicles to reach a target of 10% penetration of the ESBN fleet by 2015. This will reduce the carbon footprint of ESBN and help demonstrate that electric transport is a viable option for Ireland. The 10% target is in line with national objectives.

Expenditure on tools will also be reduced from PR2 levels. New contracts put in place during PR2 for equipment purchase have led to better value, and ESBN proposes €16m as the minimum required to maintain the required tools and equipment over PR3.

For the Telecom work area, in addition to on-going investments in the traditional areas of power supplies, wide area connectivity, communications support for protection systems and voice systems, it is foreseen that a major project will need to be undertaken to replace obsolete Remote Terminal Units (RTUs). The proposed expenditure comes to €15.9m.

Other non-network capex over PR3 comes to €34.6m, including expenditure on environmental programmes and maintenance of premises.

Table 5-12: Other Non-Network Capex – Proposed PR3 Capex vs. PR2 Forecast (09, € m):

('09 money, €m)	2011	2012	2013	2014	2015	TOTAL	PR2 F'cast
Fleet	9.7	7.7	6.9	10.0	6.1	40.4	36.4
Telecoms	3.2	3.2	3.2	3.2	3.0	15.9	7.6
Tools	3.7	3.5	3.2	2.9	2.8	16.0	16.1
Premises	5.2	5.7	5.6	4.6	4.6	25.7	23.6
Others	1.8	1.8	1.8	1.8	1.8	9.0	3.3

5.3.3 Property Rationalisation

ESBN is engaged in an ongoing process of rationalisation and centralisation of its properties. This has resulted in significant benefits to customers through the allocation of a share of disposal proceeds and/or market value gains to reduce DUoS revenues. As part of this process, it is proposed to develop a new headquarter facilities towards the latter end of the PR3 period. The HQ development plans will help reduce operating costs and optimise the use of sites in the Dublin area. In addition, further rationalisation of small depots will be carried out nationally, to further drive operating efficiencies.

5.4 Sustainability

5.4.1 Smart Metering

Electricity generation in Europe accounts for 33% of its CO_2 production. Governments and utilities everywhere recognise that addressing this issue means a major change in generation technology, and Ireland has set a target of 40% of electricity from renewable sources by 2020. Delivering the infrastructure to enable these targets to be reached presents a major challenge to electricity network operators.

Smart networks are a key link in the integration of clean and renewable generation all along the electricity value chain to customers and their energy devices. Smart Networks can also bring cost savings to different parties across the full electricity supply chain, through various efficiency savings and operational advantages. It is therefore critical that developments in each area are advanced in an integrated way. ESBN, working with all stakeholders, has developed an integrated smart networks strategy to enable the national targets to be met.

A Smart Metering Project was set up in late 2007 in response to an ESBN commitment to the CER to establish a pilot project. In June 2008 the agreed final scope split the pilot into a Customer Behaviour Trial (CBT) and a Technology Trial (TT). Work to date has focused on the delivery of the challenging timetables for the implementation of the CBT and the TT.

ESBN has put in place the IT infrastructure, the interfaces with existing systems, the meters and the business processes to support the collection and delivery of daily profile data to support the CBT. This demanding project was delivered on time despite a challenging timeline, with the installation of almost 6,500 meters. The principal objective of the CBT is to assess the potential to influence customer demand through the use of incentive based tariffs and access to real time information. The trial has been operational since mid 2009 and is scheduled to continue to run until Qtr 1 2011.

The second trial, known as the Technology Trial (TT), is currently being deployed to a further 4,000 customers and will run for a period of approximately one year. A range of different meter solutions, communications technologies and IT systems are being employed in the TT to assess their suitability for use in Ireland taking into consideration both the physical environment and demographics of the country.

The results and conclusions generated by these trials will be used to inform a full business case analysis for a final decision on a national roll out of Smart Metering. Pending the conclusion of the ongoing pilots in this area, ESBN will work with the CER and all other industry participants to design and deliver a suitable smart metering solution which will:

- be able to integrate with existing enterprise systems and emerging smart network systems and have a lifespan of 15-20 years
- incorporate open standards and interoperability between meter and system vendors
- be capable of handling the significant volume of data flows and high levels of cyber security

It is envisaged that a full national roll out of the solution could take up to 8 years from the decision to proceed to deliver and estimates of cost vary significantly depending on the level of functionality assumed in the final design.

For the modelling of PR3 tariffs, ESBN's submission includes costs of €500m for the national installation of smart meters and associated IT infrastructure. It is critical to state that this cost is an estimate and that the actual costs will be refined in consultation with CER during the life cycle of the projects. The pilot project will also be useful in assessing the savings potential of smart meters that can be realised through operational efficiencies.

5.4.2 Electric Vehicle (EV) Infrastructure

The Irish government has targeted that 10% of all passenger vehicles should be electrically powered by 2020. Since the establishment of this target, ESB has been working closely with all stakeholders involved to develop a suitable supporting infrastructure. It is anticipated that a pilot exercise will be undertaken over the coming 12 months to establish the suitability of available technologies.

In addition, ESB has also been active in promoting EVs. In April 2009, the company entered into an agreement with both the Government and the car manufacturer Renault-Nissan, aimed at creating favourable conditions for the distribution of EVs in Ireland.

ESBN has been using EVs as part of its fleet from the beginning of 2009 and will continue to invest in EVs in 2010 as a means of reaching its objective of reducing its carbon emissions by 30% by 2013.

Assuming 50,000 electric vehicles are in circulation on Irish roads by the end of PR3, ESB Networks estimates that almost 75,000 charging points will need to be installed. These figures have been developed using a series of assumptions including the charge points required per vehicle, the cost per charge point installed, and the split of charge points between public points and domestic points.

ESBN will launch a small pilot of EV charge points in 2010 where it is hoped all the variables outlined can be properly assessed and a much more robust set of costs can be developed and submitted for consideration by CER. Similar to the smart metering pilot, ESBN proposes to discuss and agree the pilot details including the associated cost recovery with CER.

ESBN's PR3 submission includes an estimated total capital cost of €187m, which should be considered indicative only at this stage. As part of its historic submission detailing costs incurred in PR2, ESBN has also included the cost of its investments in this area and will seek recovery of same as part of the PR3 Determination.

6. Opex Plan 2011 - 2015

6.1 Introduction

ESBN has to date achieved the regulatory targets for allowed Opex set for the PR2 period and remains on course to operate within the cumulative allowed Opex targets in the years 2009-2010, despite very challenging allowances due to unprecedented deflation levels.

The submitted Opex costs for PR3 of €1,262m are based on an analysis of all the proposed Opex programmes and the current efficient cost base, as being incurred at the end of the PR2 period. While significant Opex efficiencies have been achieved during PR2, further significant Opex reductions are necessary to ensure there is no DUoS price increase. The scope of the further reduction required is of the order of €60m over the PR3 period.

ESBN will continue to focus on reducing operating costs through a wide range of initiatives in areas such as business process improvement, maximum utilisation of technology and IT, and a continued focus on a flexible resourcing model. In addition, total payroll costs will be held at constant real terms (CPI+0%) during PR3. However it is important to emphasise the challenge posed by delivering the €60m additional reduction in Opex over PR3 and to highlight that ESBN has not yet identified any specific initiatives to deliver such savings.

Opex can be broken into six main categories:

- Networks Operation and Maintenance
- Asset Management
- Metering
- Customer Service
- Provision of Information
- Other

Table 6-1: Opex Proposed PR3 vs. PR2 Forecast Outturn (09 €, m)

('09 money, €m)	2011	2012	2013	2014	2015	PR3	PR2 Forecast
Networks Operation and Maintenance	102.7	101.6	101.3	100.8	101.5	507.9	514.3
Asset Management	13.7	13.2	13.0	13.0	12.9	65.8	59.6
Metering	24.8	24.7	24.8	24.9	24.9	124.1	100.1
Customer Service	18.6	18.5	18.4	18.3	18.3	92.1	96.3
Electricity Market Support	17.4	17.7	17.5	17.4	17.3	87.3	74.9
Other	64.6	64.5	64.4	64.3	67.7	325.5	307.7
Sub Total	**241.8**	**240.2**	**239.4**	**238.7**	**242.6**	**1,202.7**	**1,152.9**
Line Diversions	(proposed capex in PR3, included here for comparison purposes only)					59.7	114.6
New Activities Sustainability / R&D						30.8	-
Restructuring Costs[6]						-	112.0
TOTAL						**1,293.2**	**1,379.5**
RAB Depreciation[7]						**1,006.6**	**768.2**

The following sections detail the cost drivers in each of these areas.

6.2 Operation and Maintenance

Network Operations and Maintenance costs are made up of:

- System Control
- Planned Maintenance
- Fault Maintenance

Table 6-2: Operation and Maintenance Opex PR3 vs. PR2 Forecast Outturn (09 €, m):

('09 money, €m)	2011	2012	2013	2014	2015	PR3 Total	PR2 Total
System Control	15.1	15.1	15.2	15.2	15.4	75.9	88.2
Planned Maintenance	48.7	48.7	49.2	49.7	50.9	247.2	228.5
Fault Maintenance	38.8	37.9	36.9	35.9	35.2	184.7	197.6
Total	**102.7**	**101.6**	**101.3**	**100.8**	**101.5**	**507.9**	**514.3**

[6] Restructuring costs were not funded through regulatory allowances.

[7] Depreciation cost is determined by past capital expenditure and the profile of the Regulatory Asset Base

6.2.1 System Control / Operations

The Operations function is responsible for the effective operational management of the distribution system. Operations staff comprises shift and day staff, assisted by a number of engineering and network technicians on on-call rotas who are called on in after-hours situations. There are short-term tasks which involve the day to day management of the system and longer-term strategic goals that impact on the effectiveness of the business.

The Operations organisation controls the distribution network and monitors the performance of the network on an ongoing basis. The Operations organisation monitors and controls switching on the network via two Distribution Control Centres – one in Leopardstown, Dublin, and one in Wilton, Cork. The rationalisation and centralisation of operations to these two control centres, from 34 area offices, commenced in PR2 and will be completed in PR3. These Operations Centres are run by shift staff who use SCADA (ABB Spider System), Operations Management System (Oracle) and back-up alarm systems to monitor the network 24 hours per day, 365 days per year, and to react to any faults which occur.

Apart from the normal corporate business systems, a number of systems specifically designed for the management and operation of distribution networks are used. A team of 7 provides development, ongoing support and fault response services on a 24/7 basis to these mission critical systems. In addition, the Operations, Safety & Projects unit, consisting of 5 staff, develops and implements operations policies and procedures to ensure the safe, effective and efficient operation of the electricity system.

Table 6-3: System Control Opex PR3 vs. PR2 Forecast Outturn (09 €, m):

('09 money, €m)	2011	2012	2013	2014	2015	PR3 Total	PR2 Forecast
System Control	15.1	15.1	15.2	15.2	15.4	75.9	88.2

6.2.2 Planned Maintenance

Planned maintenance covers all of the programmes which keep the network in a fit operational state and reduce any significant or immediate risk of serious injury or fatality from defective equipment, timber growth or third party activities that, when identified, are eliminated promptly.

The major planned maintenance programmes include hazard maintenance, timber cutting, HV sub-station inspection and overhaul, LV mini-pillar and MV substation patrol and inspection.

Hazard Maintenance consists of patrol of networks and subsequent follow-up work if required. HV overhead lines are patrolled on an annual basis mainly by helicopter. MV networks are patrolled on a three year cycle and it is proposed to maintain this cycle. As a large proportion of the urban networks will have been refurbished by the end of 2015, it is planned to relax the LV urban overhead hazard programme from the current three year cycle to a new five year cycle. This change in policy reflects the benefits to these networks from the on-going refurbishment programme.

HV sub-stations: The high level of growth since the late 1990s has resulted in a severe backlog in HV substation maintenance. Additional financial and manpower resources now need to be committed to this activity in the DPR3 period.

Timber Cutting: Vegetation conflicting with overhead lines ('timber') continues to be the most common physical hazard identified during hazard patrols. The length of timber cycle currently applied to 10kV network (4 year cycle) is now considered to be too long given the fast growth rates of the common species of trees. The mismatch between this cycle and a 3 year MV hazard programme makes effective coordination between the two programmes difficult. Currently the 20kV network is cut to a three year cycle while the 10kV network is cut every four years. It is has now become evident that all MV networks (i.e. 10kV and 20kV) should be cut to a three year cycle.

The reduction in the 10kV element of the rural MV/LV timber cutting cycle from four to three years will bring the entire MV (10&20kV) network onto a three year cycle and will in turn reduce the LV cycle from eight to six years. This will result in increased costs during DPR3 for this activity. The existing 38kV & 110kV timber cutting programmes will remain as per their current cycles.

The HV cable, MV substations and mini-pillar maintenance regimes will continue as in PR2.

This Opex part of the maintenance plan has also undergone a thorough review similar in style to the risk based approach with validation adopted in the renewal programmes. When developing this plan ESBN availed of the opportunity to reassess and simplify a number of existing maintenances intervals. There are a number of new programmes which have now been included to benefit from emerging technologies and to cater for modern equipment installed during the DPR2 period which now requires intervention. Decision support software has been utilised in many instances to validate maintenance cycles and to determine optimum maintenance cycles for new programmes.

Table 6-4: Planned Maintenance Opex PR3 vs. PR2 Forecast Outturn (09 €, m):

('09 money, €m)	2011	2012	2013	2014	2015	PR3 Total	PR2 Forecast
Planned Maintenance	48.7	48.7	49.2	49.7	50.9	247.2	228.5

6.2.3 Fault Maintenance

The initial response to faults on the distribution system rests with the local Customer Services Supervisor (CSS) during the day and reverts to either of the National Distribution Control Centres (NDCC) after 17.00.

The country is divided into 34 planner groups and each with a Customer Service Supervisor (CSS). The control centre in Leopardstown controls the Northern half of the country while the control centre in Wilton, Cork controls the South. In an after hours situation, when a fault is reported by a member of the public, the dispatch centre contacts the local on-call Network Technician who attends the site to make safe and repair the fault. The Network Technician remains in close contact with the NDCCs who - through a combination of both SCADA and the Operations Management System (OMS) can remotely operate the majority of the 38kV and a percentage of the 3-phase Medium Voltage (MV) networks.

A growing number of MV outlets now have remote down-line operational capability where an operator in a control centre can sectionalise the faulted section of network remotely and minimise the effect of a fault. The bulk of the faults however still occur on Low Voltage (LV) or single phase MV networks. The priorities of the Network Technician who attends the fault will firstly be to make the fault area safe followed by the prompt restoration of supply to the affected customers.

On the HV network there was an average of over 200 faults per annum in the period 2000 - 2007. In more recent years this figure has dropped significantly. Meanwhile the MV networks were significantly refurbished by the Network Renewal Programme (NRP) which was completed in 2006. This project delivered significant improvements in the performance of the MV OH networks and the number of faults has declined slightly despite the increase in length of the networks since 2004 and the conversion to 20kV.

LV faults make up 70% of the total number of faults. The principal fault causes include corrosion, unknown reasons, weather and third party actions. The LV system is particularly affected by third parties with 92% of all cable dig-ins occurring on the LV network. There are two programmes of work on-going at present which will improve the overall LV network condition. These are the Low Voltage Rural (LVR) and the Low Voltage Urban (LVU) refurbishment projects. The LVR Project tackles groups in rural areas that are outside current design standards or standards for asset condition while the LVU programme refurbishes urban spans.

All customers fed at LV are supplied by an overhead or underground service and a cutout and meter. There have been a number of programmes to address the deteriorating condition of these assets in recent price reviews and the current cut-out replacement programme will be completed in 2010.

Fault Saving Initiatives:

ESBN has been very pro-active in terms of implementing new initiatives in our efforts to reduce our fault OPEX spend. There is now a far greater utilisation of auto-reclosing and remote switching technology at both the 38kV and MV voltages. The extension of the SCADA system to HV stations will continue until the entire network is covered. OMS completed its first full year of national coverage in 2008 and provides a level of detail on both fault and planned outages that was never available previously. Further improvements in performance will require additional fault initiatives.

Table 6-5: Planned Maintenance Opex PR3 vs. PR2 Forecast Outturn (09 €, m):

('09 money, €m)	2011	2012	2013	2014	2015	PR3 Total	PR2 Forecast
Fault Maintenance	38.8	37.9	36.9	35.9	35.2	184.7	197.6

6.3 Asset Management

The Asset Management costs are made up of a number of areas such as Wayleaves, Forestry and Mast Interference Payments. These uncontrollable costs are forecast to increase in PR3, following the same trend as PR2. Also included here are the costs of the various Asset Managers and their teams. These are responsible for determining policies and for managing the various asset classes such as Underground Assets, HV Station Performance and Overhead Assets.

It is proposed to treat Wayleaves, Forestry and Mast Interference costs as pass through in PR3.

Table 6-6: Asset Management Opex PR3 vs. PR2 Forecast Outturn (09 €, m):

('09 money, €m)	2011	2012	2013	2014	2015	PR3 Total	PR2 Forecast
Asset Management	13.7	13.2	13.0	13.0	12.9	65.8	59.6

6.4 Metering

ESBN is responsible for providing a range of key Data services to all stakeholders operating in the electricity market, including electricity supply companies and customers. This service is conducted by a business function entitled Meter and Data Services and is specifically concerned with delivery of the following services:

- Meter Asset Management (MAM): this area is responsible for electricity metering product type, procurement, certification, in-service requirements and ensuring implementation/compliance with the Meter Code
- Meter Reading & Database: This activity is focused on the collection and aggregation of metering data and the maintenance of the ESBN customer and metering records as well as all other market based information systems. With regard to meter reading in particular, this activity is split into two categories
- Profile Data Services (PDS) is the data collector for quarter hour/ profile data for the open market. PDS also collect data for independent Generators and licensed CHP customers
- Non-profile data services provides validated readings to the market
- Revenue Protection: This is a requirement under the DSO licence and covers the investigation, documentation of suspected interference and the investigation of faulty metering and time-switch reports
- Meter Registration System Operator (MRSO): this "ring fenced" function within ESBN is responsible for the Change of Supplier process and the processing and aggregation of meter data required to support Trading and Settlement in the competitive electricity market[8]

In the area of Data Aggregation it is projected that due to volume increases there will be a small increase in costs over PR3. This will be primarily driven by an increase in the resource allocation to revenue protection where over the past 18 months there has been an increase in the number of cases of suspected/actual meter interference, particularly in commercial businesses.

ESBN believes that the costs associated with Meter Reading will also increase between 2010 and 2011. The cost increase, driven by increased contractor work years, is necessary to help delivery on all set service levels in this area. In particular ESBN has been set a target of carrying out 4 meter reads per annum on at least 97% of its customers. By the end of PR2 a level of 95% will be reached, which in itself represents substantial progress since 2006 (80%). In order to fully deliver on its target more resources will be required.

Table 6-7: Metering Opex PR3 vs. PR2 Forecast Outturn (09 €, m):

('09 money, €m)	2011	2012	2013	2014	2015	PR3 Total	PR2 Forecast
Metering	24.8	24.7	24.8	24.9	24.9	124.1	100.1

[8] Note that for regulatory purposes, MRSO costs are captured under the heading "Provision of Information".

6.5 Customer Service

Customer Service encompasses the Call Centre, Area Operations and Customer Relations.

The customer contact centre is now the prime customer interface for the DSO customer. This service has matured into a fully supported environment with improved IT and communications including enhanced IVR. In 2009 it's expected to support approx. 800,000 inward agent received calls with an additional 600,000 IVR managed contacts.

Area Operations covers all general areas of expenditure relating to distribution networks and stations, including customer attendance, voltage complaints and safety attendance. Significant improvements in this area have been achieved through improvements in work management which is supported through improved IT systems.

Customer service improvements have been prioritised through the Customer Service improvement plan. Central to this has been the implementation of a co-ordinated outage plan managed by Area Operations staff which minimises outage impacts on customers. Centralised customer contact through the NCCC ensures customer queries are cleared in an efficient and customer focused manner by the area operations teams.

Customer relations covers the cost of engagement with the customer, primarily through advertising and promotion.

Table 6-8: Customer Service Opex PR3 vs. PR2 Forecast Outturn (09 €, m):

('09 money, €m)	2011	2012	2013	2014	2015	PR3 Total	PR2 Forecast
Call Centre	7.1	7.0	7.0	7.0	7.0	35.0	36.3
Area Operations	10.7	10.6	10.6	10.5	10.5	52.9	50.8
Customer Relations	0.9	0.9	0.9	0.8	0.8	4.3	9.2
Total	**18.6**	**18.5**	**18.4**	**18.3**	**18.3**	**92.2**	**96.3**

6.6 Provision of Information

Provision of Information expenditure encompasses Market Support Systems, MRSO, and DUoS Billing.

Market system support costs are projected to increase in overall terms by €8.5m versus the forecast outcome for PR2. This increase is attributable to new activities being undertaken within the Retail Market Design Systems (RMDS) function that call for additional resources there as well as cost growth in existing IT activities driven by volume.

The costs proposed are based on the assumption that the business can continue to deliver on its market support role throughout PR3 while maintaining costs at budgeted 2010 levels. This assumption however is based on the existing scope of responsibility and activities undertaken by ESBN. Were this scope to be extended to include additional items in 2011 - 2015, ESBN would seek recovery of any additional costs associated with new activities in this area.

There has been a significant increase in the workload for MRSO since February 2009 as a result of suppliers winning more customers in the Market. To ensure the high level of performance is maintained to the Market and to meet MRSO's SLA requirements for CER and SEMO, it has been necessary to increase staffing in 2009. The increased market activity will have a continued impact on resourcing in MRSO.

Table 6-9: Provision of Information Opex PR3 vs. PR2 Forecast Outturn (09 €, m):

('09 money, €m)	2011	2012	2013	2014	2015	PR3 Total	PR2 Forecast
Market Support Systems	14.6	14.9	14.7	14.6	14.5	73.3	64.7
MRSO	2.0	2.0	2.0	2.0	2.0	10.1	6.2
DUoS Billing	0.7	0.8	0.8	0.8	0.8	3.8	4.0
Total	**17.3**	**17.7**	**17.5**	**17.4**	**17.3**	**87.3**	**74.9**

6.7 Other

"Other" costs include Corporate Centre Charges, Rates, Pension Office, Insurance, Health and Safety, Environmental, Legal, and CER Levy. The proposed costs for PR3 are as follows:

Table 6-10: Other Opex PR3 vs. PR2 Forecast Outturn (09 €, m):

('09 money, €m)	2011	2012	2013	2014	2015	PR3 Total	PR2 Total
Rates	35.4	35.4	35.4	35.4	38.9	180.5	164.3
Corporate Centre Charges	14.9	14.8	14.8	14.7	14.7	73.8	72.8
Pension	1.7	1.7	1.7	1.7	1.7	8.5	9.2
Insurance	2.9	2.9	2.9	2.9	2.9	14.4	15.1
Health and Safety	3.3	3.3	3.3	3.3	3.3	16.3	15.3
Environmental	1.5	1.5	1.5	1.5	1.5	7.4	3.1
Legal	2.3	2.3	2.3	2.3	2.3	11.5	12.8
CER Levy	1.9	1.9	1.9	1.9	1.9	9.5	9.8
Revenue	0.8	0.7	0.7	0.7	0.7	3.5	2.8
Other	-	-	-	-	-	-	1.0
Total	**64.6**	**64.5**	**64.4**	**64.3**	**67.7**	**325.5**	**306.2**

Rates:
A review of the global assets valuation was conducted by the Department of the Environment in 2008 which has dictated increased rates charges for the period from 2010 to 2014 inclusive. A further global valuation review is planned for 2015 onwards and an estimated provision of 10% has been made for further increases to the rates charge in 2015. Rates constitute a non-controllable cost.

ESB Corporate Centre Charges:
From 2006 the so called basket approach was adopted for the calculation of charging out ESB Corporate Centre charges to the various Business Lines and is calculated on a weighted mix of the following indicators:

Turnover – less upstream costs	**25% Weighting**
Net Assets	**25% Weighting**
Staff Numbers	**5% Weighting**
Normalised Profit	**25% Weighting**

The Corporate Centre basket has remained constant each year, but can increase or decrease depending on Networks own net assets, profits, turnover and headcount. Charges can also increase or decrease depending on the portion of Networks profits in the baskets compared to other Business Units. Charges will also increase or decrease based on Corporate Centre's cost base.

6.8 Capital Driven Opex

In the past, a) Non-Repayable Line Diversions costs and b) Dismantling costs were classified as Opex. The levels of costs in both of these areas are primarily driven by capital related activity. For PR2 it was agreed with the CER to treat Dismantling costs as Capex. ESBN now proposes that Non-Repayable Line Diversion also be treated as Capex.

6.8.1 Non-Repayable Line Diversions

Certain line diversions are carried out free of charge to landowners and developers, while others are chargeable[9]. There is a necessary volume of free line diversions which is carried out each year to facilitate domestic and commercial development. This volume generally tracks the volume of new connections, as underlying construction development is the trigger for both programmes. There is therefore a very strong link between new connections – particularly domestic non-scheme connections – and the number of line diversions.

In the PR2 period, the allowance for line diversions was approximately 14% of new business costs, and 11.4% is sought for PR3. Given the dramatic reduction in construction activity, the overall volume and expenditure on line diversions is not expected to equal PR2 levels.

ESBN proposes to treat Line Diversions as Capex from a regulatory perspective from 2011, with Line Diversion depreciation being the only associated Opex cost. This would result in a reduction in Opex costs over PR3.

6.8.2 Dismantling Costs (for reference only – treated as Capex)

Dismantling costs are treated as Capex for regulatory allowances purposes. They represent the costs of all dismantling associated with 110kV, 38kV and MV/LV reinforcement, and non-load related capital programmes. The driver for this cost line item is the level of capital expenditure on this activity. The estimated cost of dismantling is calculated as 10% of LVR Retirements. Dismantling costs as a percentage of the costs of reinforcement and non-load related capital expenditure are forecast to be broadly consistent over the period 2011 to 2015 with some fluctuations due to variance in work mix.

Table 6-11: Capital Driven Costs PR3 vs. PR2 Forecast Outturn (09 €, m):

('09 money, €m)	2011	2012	2013	2014	2015	PR3 Total	PR2 Forecast
Line Diversions	11.5	11.7	11.9	12.1	12.4	59.7	114.6
Dismantling	13.4	13.3	13.2	15.8	15.5	71.3	66.0
Total	**24.9**	**25.0**	**25.1**	**27.1**	**27.9**	**131.0**	**180.6**

[9] ESBN's document "Policy in Charges for Alterations to MV / LV Networks" outlines which diversions may be carried out free of charge to landowners and developers, and those that are chargeable

6.9 Sustainability – Research, Demonstration and Development (RD&D)

The continued connection of renewable generation to the network and the introduction of electric vehicles to support government targets to reduce the national carbon footprint will pose major technical challenges over the course of PR3.

Connecting significant levels of renewable generation and electric vehicles to the distribution network will change the technical characteristics of the network in ways that have not been experienced anywhere in the past. In facing these unique technical issues, it is prudent to partner with other organisations in targeted Research, Development and Demonstration in order to manage these risks.

ESBN will therefore be participating in a range of RD&D programmes in collaboration with national and international bodies, including SEI in Ireland, the Electric Power Research Institute (EPRI), and the Electricity Research Centre (ERC).

The RD&D programmes will be designed to find the solutions that are required for a sustainable and integrated smart network, including research in the areas of smart distribution network control, electric vehicle integration, network voltage control and a micro generation pilot programme.

The RD&D programme, together with the sustainability capex programmes, will help:

- Support the integration and connection of up to 6,000MW of renewable and clean generation technologies to the network
- Make the network smarter, more flexible, more accessible and more efficient over the next five years
- Achieve national environmental targets

6.10 Depreciation

Based on the proposed Capex plan the depreciation charges in the Regulatory Asset Base (RAB) over PR3 are projected to be as follows:

Table 6-12: Depreciation PR3 vs. PR2 Outturn (09 €, m):

('09 money, €m)	2011	2012	2013	2014	2015	PR3 Total	PR2 Total
Depreciation	173.6	181.8	196.9	215.3	239.1	1,006.6	768.2

7. Incentives

During PR2, ESBN faced performance targets in three areas:

- Customer Interruptions (CI and CML)
- Network Losses
- Customer Satisfaction (SATRAT)

Following an overall financial penalty in 2006, due to poor performance against the Customer Interruptions target, ESBN thereafter surpassed the regulatory targets during PR2 and gained a financial reward. The performance improvements, as shown in the tables in section 3, were a direct result of ESBN focussing attention and effort on these areas.

For PR3, ESBN is proposing a continuation of the existing incentive mechanisms, with renewed targets to be set. Within the Customer Interruptions mechanism, ESBN proposes a ring-fenced funding mechanism for Improvements to Worst Served Customers.

ESBN also proposes a new mechanism to incentivise the connection of renewable generation to the network. Connecting a higher capacity of renewable generation to the network ahead of schedule brings benefits to the connecting parties, the environment and to the general customer, and it is therefore appropriate to introduce an incentive mechanism in this area.

Finally, ESBN also proposes to report on its annual progress in reducing its carbon footprint. This is in line with ESBN's 2020 strategy, and is also a proposed requirement of Distribution Network Operators (DNO's) in the UK. This reporting has no associated financial awards or penalties.

8. Financial

8.1 Cost of Capital

ESBN engaged OXERA to independently ascertain an appropriate Weighted Average Cost of Capital (WACC). Combining all the evidence on the WACC parameters in OXERA'a analysis yields a range of cost of Capital in real, pre-tax terms of between 4.7% and 7.1%. A point estimate situated around the same position in the range adopted for PR2 would yield 6.3%.

Since the banking and financial crisis of 2007, bank financing has become scarce and expensive. ESBN and other Irish entities have suffered negatively as a result of the downgrading of credit risk rating for Irish sovereign debt. An important point for ESBN, when compared to its European counterparts is the risk premium being charged by banks and investors alike due to the significant difficulties faced by the Irish economy and the Irish government which resulted in the downgrading of Irish government debt by Moodys and S&P during 2009. Forward rates for long term debt are rising over the course of PR3.

ESBN see the debt capital markets becoming the primary external source of its future funding base. This will require ESB to obtain a credit rating from one or more of Moodys, Standard & Poors and Fitch in due course as it is the norm for companies accessing the Eurobond market to have a credit rating.

Given the continuing high-levels of capital expenditure, (ESBN has invested approximately €2.5bn in the networks over the past 5 years), achieving financial ratios equivalent to an "A" credit rating is a fundamental component of the company's overall strategy.

However, in the interest of national competiveness, ESBN is prepared to discount from the evidentially justified WACC to a level which will see no real increase in DUoS tariffs over the price control period. Notwithstanding this, ESBN must also simultaneously sustain the financial performance of the business at "A" rating level, and finance the substantial capital programme required in straitened financial markets. This in turn requires an adequate rate of return. ESBN are exceptionally prepared to accept a 6% WACC and have accordingly used this in the tariff modelling.

8.2 PR3 Revenue Stream and DUoS Tariff profile

The proposed total revenues required for the PR3 period are as follows (all figures in 2009 money, m):

(€m)	2011	2012	2013	2014	2015
Opex	231.6	231.8	231.7	231.8	232.0
Clawbacks / Deferrals	-43.8	0.0	0.0	0.0	0.0
Depreciation	173.6	181.8	197.0	215.6	238.6
Return	308.7	323.4	341.7	364.0	389.0
Total	**670.1**	**736.9**	**770.4**	**811.4**	**859.7**

The revenue requirement is €3,849m, with an NPV of €3,220m.

The following revenue profile returns the equivalent NPV, but with an annual revenue requirement that when combined with unit sales, returns a flat average unit price over the PR3 period:

		2011	2012	2013	2014	2015
DUoS (€/kWh)		0.0310	0.0310	0.0310	0.0310	0.0310
Annual Evolution		0%	0%	0%	0%	0%
Units Distributed (GWh)		23,269.0	24,013.6	24,758.1	25,525.6	26,316.8
ANNUAL ALLOWED REVENUES (€m)		720.5	743.5	766.6	790.4	814.9
NPV of ALLOWED REVENUES (€m)	3,220.1	679.7	661.8	643.6	626.0	608.9

This revenue profile results in a constant PR3 Average Unit Price of 3.10c (equivalent to the 2009/10 AUP).

Any actual outturn AUP is dependent on actual growth rates, and it is noted that there is more uncertainty around growth forecasts than usual, due to the current economic climate.

[10] Based on the allowed DUoS revenue for 2009 / 10 tariff year.

9. Conclusion

The aim of the submitted ESBN plan is to ensure no increase in the DUoS price, while at the same making required investment in the network, continuing to build on the service improvements made in PR2 and delivering required national sustainability infrastructure projects.

The implementation of this plan will address a number of current shortcomings on the network, but will also act as a stimulus to the economy in terms of contributing to improved energy efficiency and reduced dependency on imported fossil fuels.

On a like-for-like basis, overall expenditure will be reduced in PR3 when compared to PR2. This will be achieved through an ongoing process within ESBN to continually find further efficiencies across all areas of the business. The reduction in expenditure in these activities will mean that the critical long term investment in national sustainability projects can be incurred without any price increases.

By the end of PR3, network security will have been enhanced, the network condition will be further improved through the refurbishment and renewal programmes, and significant amounts of new generation will be connected to the network. In addition, achievement of national energy efficiency and environmental targets will be enabled through the delivery of required infrastructure.

The execution of this plan will mean the delivery by ESB Networks of it's mission 'to deliver networks infrastructure and services that support economic growth and sustainability targets and also to deliver business and value growth underpinned by excellence in safety, service, asset management and people development'.

APPENDIX 1 SUMMARY OF PROPOSED EXPENDITURE

		PR3 Proposed ('09 money, €m)
CAPEX	**Opening RAB**	**4,945.8**
	Load Sub-total	924.6
	Non-Load Sub-total	627.2
	Non-Network	284.8
	Sustainability	687.8
	Dismantling & Line Diversions	131.0
	Total Capex (net of contributions)	**2,655.5**
	Less Depreciation	**(1,006.6)**
	Closing RAB	**6,595.1**
OPEX	Network Opex (incl. sustainability)	1,233.0
	Proposed Efficiency Stretch Factor	-74.6
	Revenue Requirements	
	PR3 Opex Target	1,158.4
	Depreciation	1,006.6
	Return on RAB (6%WACC)	1,727.8
	PR2 adjustment	-43.8
	PR3 TOTAL REVENUE REQUIREMENT	**3,849.0**

Networks

esb.ie/networks