

Transmission Performance Report

2016/17



Scottish & Southern
Electricity Networks

About us

Front Cover: NKT Victoria
is a specialist cable laying vessel
that has been deployed on SHE
Transmission's flagship Caithness
Moray investment project

We are Scottish Hydro Electric Transmission (SHE Transmission), part of the SSE Group, responsible for the electricity transmission network in the north of Scotland. We operate under the name of Scottish and Southern Electricity Networks, together with our sister companies, Scottish Hydro Electric Power Distribution (SHEPD) and Southern Electric Power Distribution (SEPD), who operate the lower voltage distribution networks in the north of Scotland and central southern England.

As the Transmission Owner (TO) we maintain and invest in the high voltage 132kV, 275kV and 400kV electricity transmission network in the north of Scotland. Our network consists of underground cables, overhead lines on wooden poles and steel towers, and electricity substations, extending over a quarter of the UK's land mass crossing some of its most challenging terrain.

We power our communities by providing a safe and reliable supply of electricity. We do this by taking the electricity from generators and transporting it at high voltages over long distances through our transmission network for distribution to homes and businesses in villages, our towns and cities.

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Key performance indicators

Total Recordable Injury Rate (TRIR)*

N/A**	0.81	0.28	0.54
2014/15	2014/15	2015/16	2016/17

Environmental enforcement notices and formal warnings

1	0	0	0
2013/14	2014/15	2015/16	2016/17

Generation MW connected in year***

217	148	118	486
2013/14	2014/15	2015/16	2016/17

Capital expenditure in year (£m)****

£169.9	£332.6	£514.6	£437.5
2013/14	2014/15	2015/16	2016/17

Number of network incidents resulting in customers having a supply interruption

3	4	0	1
2013/14	2014/15	2015/16	2016/17

Customer satisfaction

6.5/10	7.7/10	8.2/10	8.7/10
2013/14	2014/15	2015/16	2016/17

Post tax real annual return (forecast eight year average***)

5.15%

* TRIR includes SHE Transmission staff and contractors

** Prior to 2014/15, TRIR data was recorded at Networks level

*** Excludes small embedded generation

**** Excludes Transmission Investment for Renewable Generation (TIRG)

The electricity industry



Electricity generators

Turbines convert energy from sources such as water and wind to generate electricity.

Transmission motorways



Generators connect to the high voltage transmission network. Transmission lines and cables transport electricity over long distances at high voltages.



Local grids

The transmission network ends and the local grids distribute low voltage electricity onwards to homes and businesses.

Energy supply

Energy is sold to customers in homes and businesses by suppliers in a competitive market place.

Managing Director's statement



I'm pleased to introduce SHE Transmission's Performance Report for 2016/17. As we reach the midpoint in delivery of our 2013-2021 Business Plan, this year's report is a timely opportunity to reflect on our progress and look ahead.

"Our core purpose is to provide the energy that people need in a reliable and sustainable way."

Whilst we continue to make excellent progress in delivering our Business Plan outputs and meeting our targets, this sadly pales into insignificance following the tragic loss of life of one of our contractors at Blackhillock substation in October 2016. Safety is the responsibility of us all and our safety licence, 'if it's not safe, we don't do it', is firmly embedded throughout our business. But actions speak louder than words and we will continue to work closely with our staff and contractors to ensure everyone can return home safely after a hard day's work.

Reliable supply of electricity

Our core purpose is to provide the energy that people need in a reliable and sustainable way. The GB transmission system has an outstanding record for reliability and, despite intense construction activity, we have maintained an impressive reliability of over 99.999% in the last year.

To achieve this we have a relentless focus on the management and maintenance of our existing assets and on safely integrating newly constructed assets across our network. We also continue to target investment on areas of our network where reliability could be improved, such as our recently completed programme of work on the circuit connecting Skye and the Western Isles which has reduced faults by one third. In addition, during the past year we have worked closely with Governments, public bodies and other transmission companies on our emergency planning procedures and business continuity plans.

"Over the eight year Business Plan, we forecast that we will have invested over £3 billion in the supporting infrastructure and connections required for the transition to a low carbon economy."

Contributing to a low carbon economy

Our main strategic driver over the past decade in transmission has been the timely delivery of large scale capital investment in new infrastructure to accommodate increasing levels of renewable electricity generation across the north of Scotland. In the last financial year alone our capital expenditure totalled £450* million bringing our total investment since April 2013 to just under £1.9 billion*. Including that connected at a distribution level, our network now supports over 5GW of clean, renewable electricity generation enough to power over four million homes.

In order to meet the timescales for connection of renewable generation customers, we have developed innovative solutions. This includes technological innovations – such as our flagship Caithness Moray HVDC link – as well as techniques to extend and enhance the operational life and capability of existing assets.

Over the eight year Business Plan period, we forecast that we will have invested over £3 billion in the supporting infrastructure and connections required for the transition to a low carbon economy.

Working closely with our supply chain partners we are pleased to be able to report our strong track record of delivering on time, to budget and with the right quality – meeting the needs



SSEN Managing Director, Colin Nicol and Alistair Phillips Davies, Chief Executive of SSE Plc visit the Stronelairg Wind Farm connection project

and expectations of our customers. All of this contributes to delivering value for money to GB bill payers by keeping costs in line with our Business Plan forecast.

Our greatest asset, our people

It is rightly said that our people are our greatest asset and I am extremely proud to lead a skilled and dedicated workforce. One of the most enjoyable aspects of my job is to get out and speak to staff and in 2016/17 this took me from Thurso in the far north of our network to Kintyre in the southwest. To ensure we continue to meet the needs of our customers now and in the future we continue to invest in our people, from transformative technologies to training and skills, with a particular focus on operations and the introduction of HVDC technology on our network.

“It is rightly said that our people are our greatest asset and I am extremely proud to lead a skilled and dedicated workforce.”

Outlook

The past decade has been a period of rapid change in the energy sector and, for transmission, huge growth against a backdrop of political and economic uncertainty. Over the past year we have seen a slowdown in the rate of growth in

renewables following changes in Government energy policy, particularly impacting on onshore wind.

As we look ahead to 2021 and beyond there is no doubt that the electricity industry will continue to evolve. This includes new technologies such as Electric Vehicles and Battery Storage along with changes in customers’ requirements as we move to a smart, flexible energy system.

Over recent years we have successfully demonstrated that we can adapt to change and deliver the critical national infrastructure that the low carbon economy needs. I am confident that we can continue to develop and change in the future.

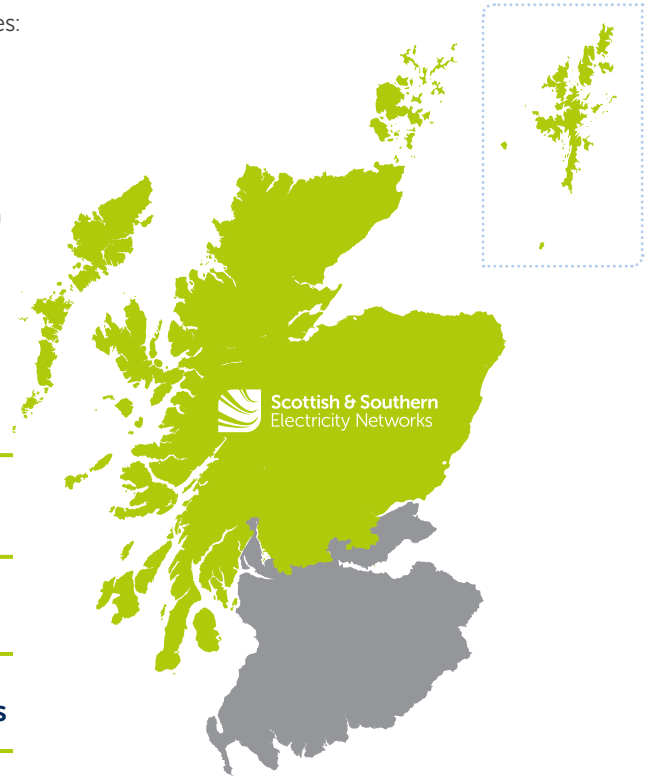
Colin Nicol
Managing Director, SSEN

Our purpose

Our core purpose is to provide the energy that people need in a reliable and sustainable way.

To achieve our core purpose we focus on three key business activities:

1. Planning ahead for the future needs of generators and consumers of electricity, and making timely, cost effective investments in network infrastructure.
2. Looking after the existing transmission network to maintain reliable supplies of electricity to homes and businesses in the north of Scotland.
3. Operating in a safe, sustainable manner that protects the interests of current and future generations.



767,082 homes and businesses

5,149MW of generation

5,042km of overhead lines and underground cables

126 substations

Average cost to customer of less than **10p/day**

Our values

We have a longstanding set of core values that are applied to everything that we do. These values are consistent with achieving our core purpose.



Safety



Sustainability



Service



Excellence



Efficiency



Teamwork

Business Plan 2013-2021

In January 2012 the energy industry regulator, Ofgem, accepted our Business Plan proposals for the RIIO-T1 price control period from 1 April 2013 to 31 March 2021. This report describes our progress in delivering the outputs that we committed to in that Business Plan.

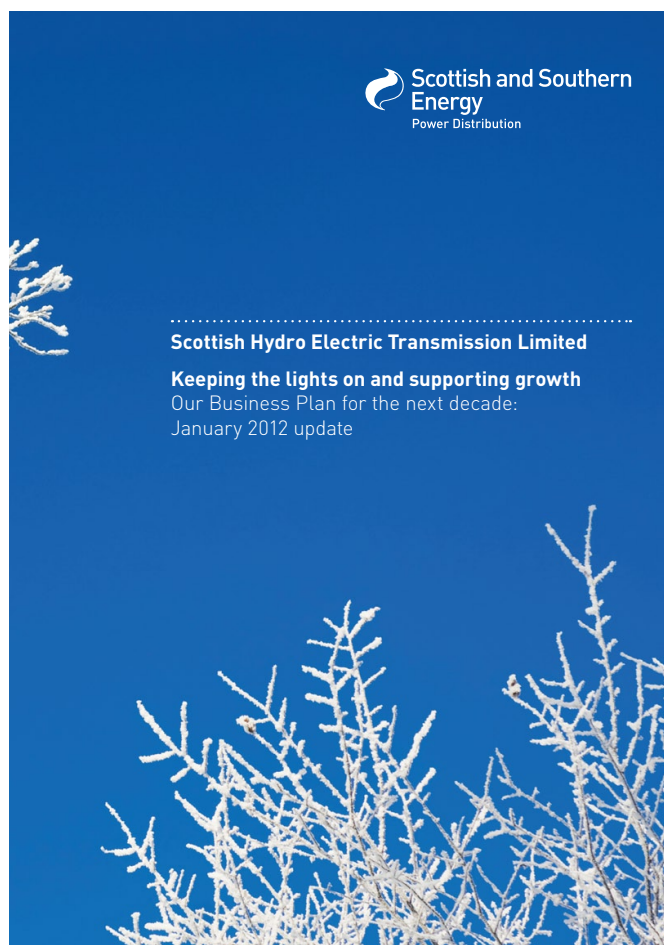
Our **strategic priority** for the RIIO-T1 period has been enabling the transition to a low carbon economy through building the transmission infrastructure necessary to connect and transport renewable energy in the north of Scotland. In April 2013 there was around 3,300MW of renewable generation connected to the network in the north of Scotland, largely hydro. By March 2021 we forecast that this will have increased to around 6,300MW with the new generation being predominately wind. In order to transmit the new renewable electricity being generated, we are investing to upgrade the high voltage network in the north of Scotland. By Regulated Asset Value (RAV), we forecast that the network will have grown from £1 billion in April 2013 to to £3.6 billion in March 2021 (nominal prices).

Our investment plans have been driven by the needs of our network users which, in turn, have been driven by Government policy objectives. There have been, and continues to be, developments in national energy policy within the framework of the energy trilemma: affordability, security of supply and sustainability. These have included the closure of the Renewables Obligation and Feed in Tariff schemes, and the introduction of the Capacity Market and Contracts for Difference. In late 2016, the Government invited views on the changes necessary to support a smarter, flexible energy system. We continue to engage and support these changes recognising our essential role as a provider of critical national infrastructure.

Throughout this period of unprecedented growth and change, for transmission we have maintained, as our core purpose, the provision of a reliable and sustainable supply of electricity. Our customers want electricity that is available 24 hours a day, seven days a week at a reasonable cost. The communities where we have infrastructure want us to be sensitive to their environment. As we enter the second half of our Business Plan period, we are committed to better understanding and meeting the expectations of our customers, communities and stakeholders.



Caithness Moray project manager Brian Mitchell inspects the HVDC cable



Ofgem accepted our 2013-2021 Business Plan in January 2012

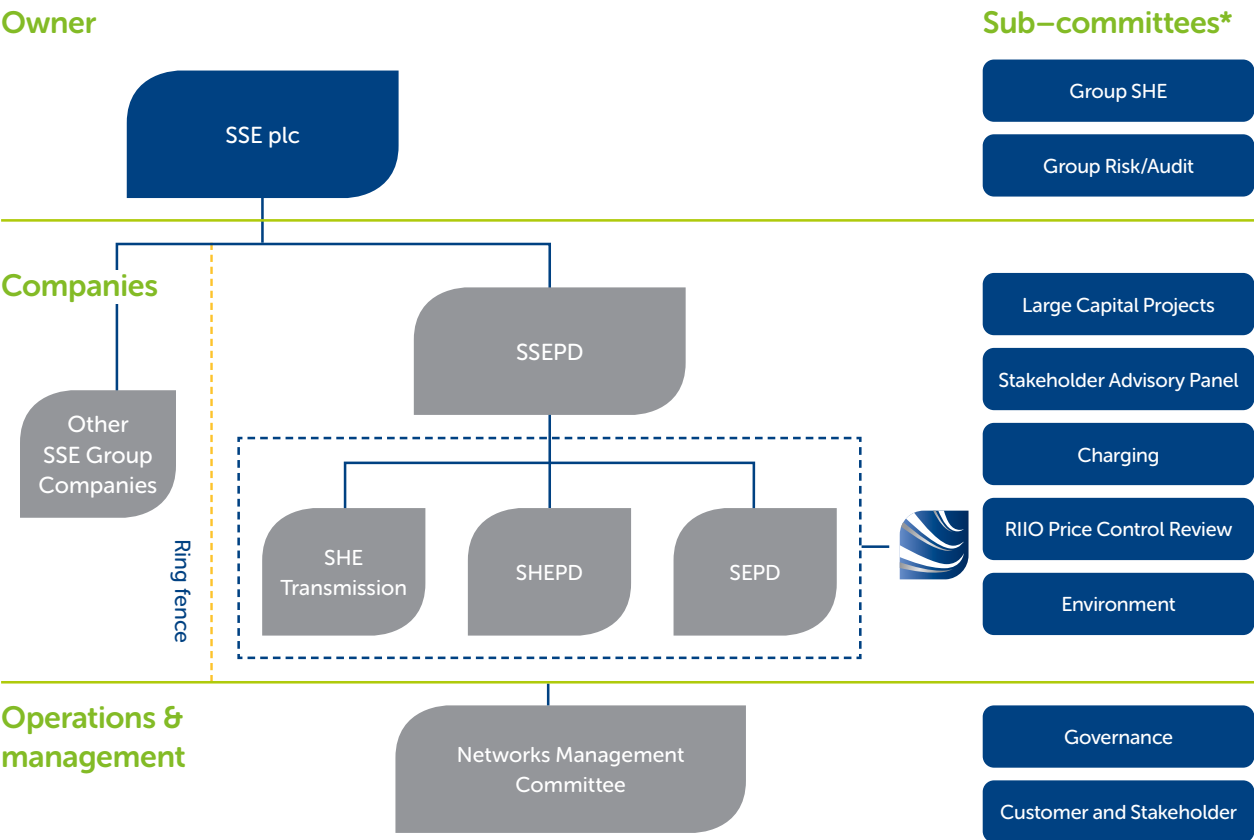
Please visit the following link to view our Business Plan - <https://www.ssen-transmission.co.uk/information-centre/industry-and-regulation/transmission-price-control-review/>

Our organisation

SHE Transmission is owned by SSE plc. SSE plc produces, distributes and supplies electricity and gas, and operates in GB and Ireland. It is publically listed on the London Stock Exchange and its headquarters are in Perth, Scotland.

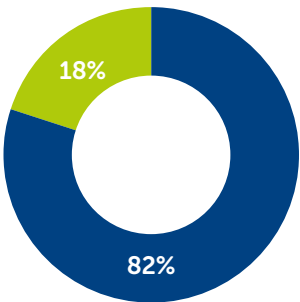
SSE plc owns three electricity networks: one electricity transmission network - SHE Transmission; and two electricity distribution networks - Scottish Hydro Electric Power

Distribution (SHEPD) and Southern Electric Power Distribution (SEPD). The three networks are jointly owned by Scottish and Southern Energy Power Distribution (SSEPD) which operates under the name Scottish and Southern Electricity Networks. SSEPD is managed separately from other SSE plc businesses.

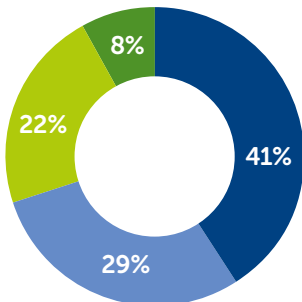


Transmission has around 450 directly employed staff. The majority of our people are qualified engineers and professionals working on the operation, maintenance and

construction of the north of Scotland transmission network. We have an ongoing programme of training and development including for school leavers, apprentices and graduates.



Staff numbers (%)
Men 82% Women 18%



Staff numbers (%)
Operations 41% Capital Delivery 29%
Engineering 22% Planning & Performance 8%

9.5 years

Average length of service

Understanding and managing our principal risks

No business is risk-free and risk management is essential to successful operations. We use the SSE Group's system of internal control which has risk management and assurance at its centre.

Following a review during 2016/17, the SSEPD Board has identified the following as the principal risks facing SHE Transmission:

Safety, health and environment due to operations in hazardous environments with high voltage electricity. The Safety Management System supports people at work, and the Board has emphasised crisis management and business continuity as key areas of business focus.

Regulation, legislation and compliance being complex and fast-moving. Dedicated staff manage these areas and engage constructively with key stakeholders.

Network resilience and integrity to ensure continuity of supply. This is underpinned by robust asset management and quality assurance. For the planned energisation of HVDC circuits, specific training and handover plans are in place.

Networks Transformation programme to implement new IT systems and operational practices. Appropriate governance processes at Board-level monitors progress.

Supply chain and contractor performance of capital investment on time, on budget and to a high quality standard. The Large Capital Projects Governance framework is designed to mitigate this risk.

Price control governance and management to deliver the outputs agreed under the RIIO-T1 settlement.

Cyber security where incidents might impact upon operations or data. Investment in a long term security programme includes external engagement and staff awareness.

Alternative technologies including changes in consumer behaviour. A dedicated 'future networks' team are engaged in technological developments and work on timely deployment.

For more details see:



SSE plc Annual Report 2017 and Group Risk Report 2017 - <http://sse.com/investors/reportsandresults/>
SHE Transmission plc Directors report and regulatory financial statements 2017 - <https://www.ssen.co.uk/Library/FinancialInformation/>

System of internal control



Q&A with Gregor Alexander and David Gardner



Gregor Alexander
Chair of SSEPD Board

As members of the SSEPD Board, what are your thoughts on the performance of SHE Transmission in 2016/17?

GA – Performance over the last financial year has been very strong and the Board is pleased that the financial and output targets have been met. The delivery of large capital projects is inherently high risk and the transmission business continues to successfully complete large projects, building on the success of Beaully-Denny and Kintyre-Hunterston, and delivering for its customers.

DG – Performance is overshadowed by the tragic fatality at Blackhillock in October 2016. A big focus since then has been building on our close working relationship with our supply chain and the re-doubling of our efforts to ensure that colleagues and contractors all return home safely.

From a business performance perspective, the unsung heroes of the transmission business are the operations team who have played a critical role in the success of the capital delivery programme. Safely adopting these new assets on to our network has been achieved at the same time as delivering huge improvements in the reliability and performance of the network for our customers.



David Gardner
Director of Transmission

What are the key areas of Board focus for SHE Transmission?

GA – In addition to safety, there are two key priority areas for the Board.

First, continued discipline in capital delivery from project inception through to energisation. Our independent governance scrutinises this, reporting to the Board on a regular basis, and we expect continued strong performance in the delivery of our large capital projects throughout the remainder of the 2013-2021 Business Plan and beyond.

Secondly, operating cost control. High growth businesses can be notorious for inefficiency and the Board will continue its relentless focus on efficiency thus providing value for electricity bill payers, our customers and shareholders. The Board is looking to the transmission management team to maintain its focus on efficiency and productivity of the underlying cost base.

Looking at the 2013-2021 Business Plan overall, how do you think SHE Transmission is getting on?

GA – Progress against our Business Plan remains solidly on track. Capital expenditure is forecast to outturn at

around £3.2 billion including higher than predicted, but necessary, expenditure on the maintenance of existing assets. We are also on track to exceed output targets for reliability and connections, and I am pleased that operational focus means that some of our key environmental outputs are now exceeding performance baselines.

DG – I would highlight two things. I am disappointed in our stakeholder engagement scores. We strive to build close working relationship with our stakeholders, and I think this has been very successful with our generation customers. However we recognise there is more to be done particularly as we start to look beyond the current Business Plan and consider the role of stakeholders and customers in shaping transmission in the 2020's.

One aspect that we perhaps didn't fully anticipate in our Business Plan was the central contribution of innovation – both in technology and operations – in delivering low carbon connections. Finding new ways of doing things has allowed us to meet the challenging timescales that our customers have set us in response to the evolving policy framework. A great outcome.

How does the Board identify and manage the strategic risks that face SHE Transmission?

GA – The SSEPD Board uses the SSE Risk Management Framework. During 2016/17 there was a comprehensive review of the principal risks facing SHE Transmission and the associated mitigation plans for each risk. Against the backdrop of continued political uncertainty, political and regulatory risk continues to be one of the main focuses of the Board and we remain confident we can successfully manage and adapt to political and regulatory change in the future.

What is the future outlook for SHE Transmission?

GA – As a business built for the long term, providing critical national infrastructure, the investment over the past decade in renewing the transmission network in the north of Scotland will continue to serve our customers for many decades to come. With a strong, skilled workforce embedded in the communities we serve, the Board remains confident that the future will bring even more successes for customers, stakeholders and shareholders.

DG – Over recent years we have built a strong platform for future success, from our committed and experienced workforce to our strong and successful partnerships with our supply chain, and we are proud of our contribution to building a sustainable economy. We have successfully demonstrated our ability to deliver large-scale capital projects, whilst continuing to safely operate essential national infrastructure, standing us in good stead for the future.



September 2017 meeting of the SSEPD Board

Top: David Gardner, Colin Nicol and Mark McLaughlin

Bottom: Rachel McEwen, David Rutherford and Dale Cargill

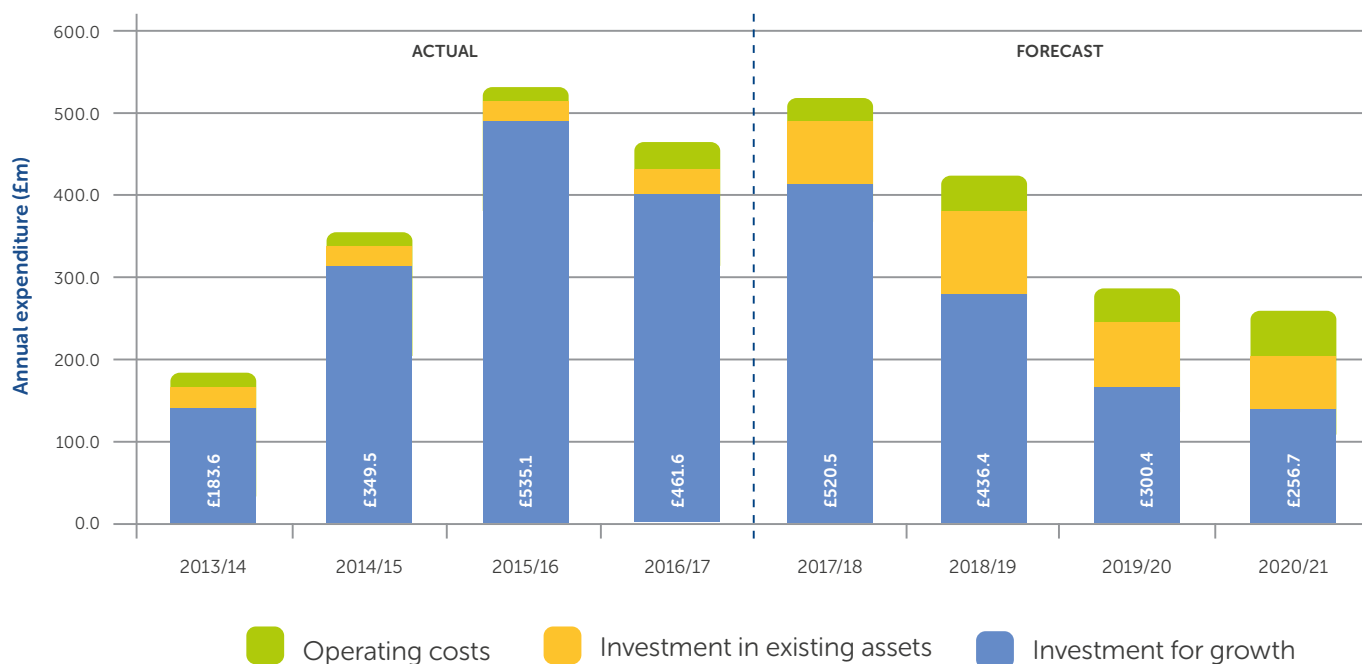
Main responsibilities of the SSEPD Board	To set the strategic aims of SHE Transmission, supervise the management, to monitor and report on performance, approve investment and all statutory and regulatory approvals
Number of meetings in 2016/17	8
Key topics discussed during 2016/17	Safety and Environment; Review of principal risks; Customer satisfaction and stakeholder engagement; Performance against Business Plan outputs and targets; Government policy; Efficiency and performance in capital delivery; Managing operational growth.
Members of the SSEPD Board	Gregor Alexander (Chair), Dale Cargill (Director of Customer Operations, SHEPD), David Gardner (Director of Transmission), Stuart Hogarth (Director of Networks Business Transformation), Steven Kennedy (Director of Finance, SSEN), Rob McDonald (Managing Director, Corporate and Business Services), Rachel McEwen (Director of Sustainability), Colin Nicol (Managing Director, SSEN), David Rutherford (Non-Executive Director), Gary Steel (Non-Executive Director)

Regulatory performance overview

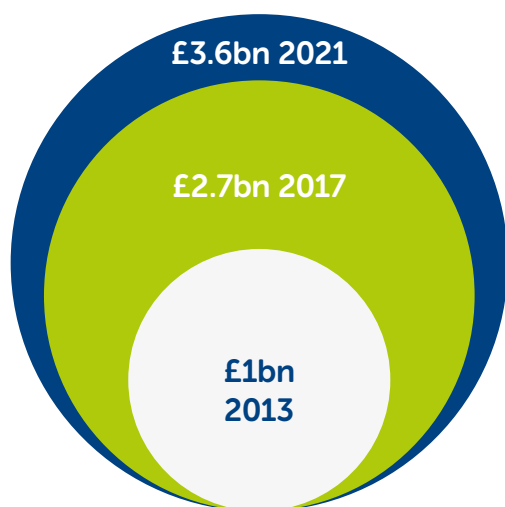
SHE Transmission operates under a licence granted and monitored by the energy industry regulator Ofgem. As part of its ongoing regulation, Ofgem sets the prices that SHE Transmission is allowed to charge customers and sets minimum performance standards. SHE Transmission provides detailed reports to Ofgem each year on its expenditure and performance.

A summary of our performance against the main regulatory targets that Ofgem sets are shown on this page, and explained in more detail in the following pages.

RIIO-T1 Expenditure*



Regulated Asset Value (RAV) at 31 March**



Return on Regulated Equity (RoRE)*

9.57%
8 year annual average.

* Excluding Transmission Investment for Renewable Generation (TIRG) scheme.

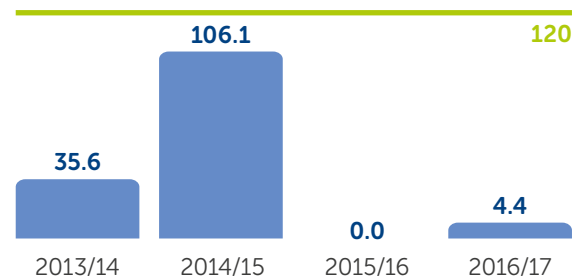
** Nominal prices

Reliability

The energy not supplied to customers (in MWh) due to an incident on the transmission system. Our target is for this to be less than 120 MWh each year.

Actual Target

Energy not supplied (MWh)



Timely connections

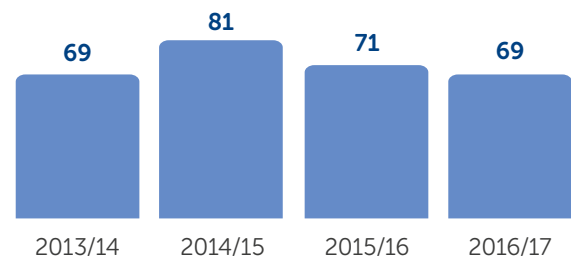
Our target is for all offers for connections to the transmission network to be made to customers within the time periods set out in the industry codes. In 2016/17, we made 59 offers all of which meet our target.

Stakeholder satisfaction*

While we do not have a regulatory target for the score, our ambition is to exceed 80%. We recognise that there is improvement needed.

* The graph opposite includes cumulative performance against the four components of the Stakeholder Satisfaction Output incentive.

Stakeholder Satisfaction Scores (%)

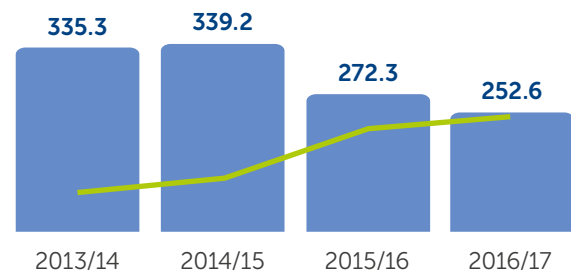


Environment

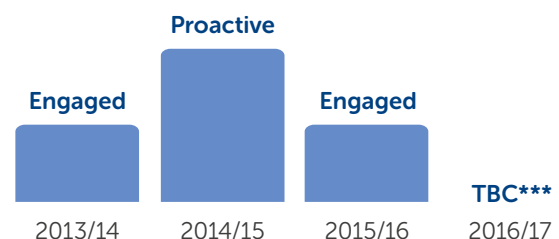
Our two main measures are leakage of sulphur hexafluoride (SF₆) gas from switchgear and the Environmental Discretionary Reward score given by Ofgem's expert panel.

Actual Target**

SF₆ leakage (kg)



Environment Discretionary Reward Score



** The target for SF₆ leakage increases as the number of assets on our network using SF₆ increases.

*** EDR score for 2016/17 will be known in October 2017.

Investing in the low carbon economy

The energy landscape in GB has undergone significant change in the past decade as the decarbonisation of electricity generation, driven by renewable energy targets and government subsidies, has resulted in the rapid growth in renewable energy generation. In parallel, the country has seen overall reductions in the electricity and gas used by end consumers. Government policy and legislation have been the key drivers in the changes to energy generation and demand in GB as the government seeks to ensure energy security, affordability, and the decarbonisation of electricity generation – collectively known as the energy trilemma.

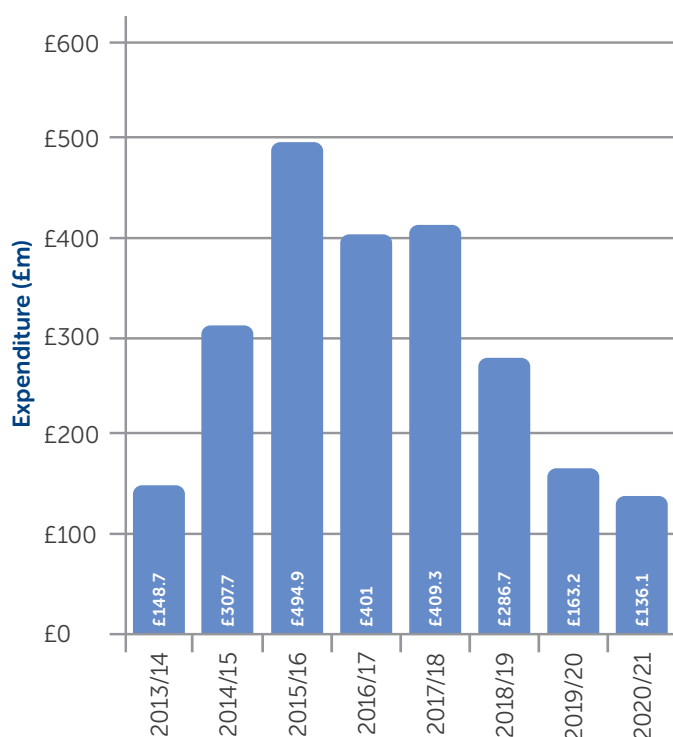
Our strategic priority for our 2013-2021 Business Plan has been to enable the transition to a low carbon economy. The abundance of renewable energy resources in the north of Scotland – wind and water – has led us to embark on an extensive programme of capital investment in our network so that new low carbon generation can connect and the energy produced be transported to homes and businesses. Since 2005, generation connected in the north of Scotland has more than doubled. Onshore wind has been the dominant generation technology, with 2,406MW added. Over 90% of the new generation is low carbon.

The investments made in the transmission network comprise the local (or sole-use) connections infrastructure that join a low carbon generator to the grid, as well as the large-scale national infrastructure investments that allow the bulk transfer of electricity over long distances. In total, we forecast expenditure of over £2.3 billion on this investment between 2013 and 2021.

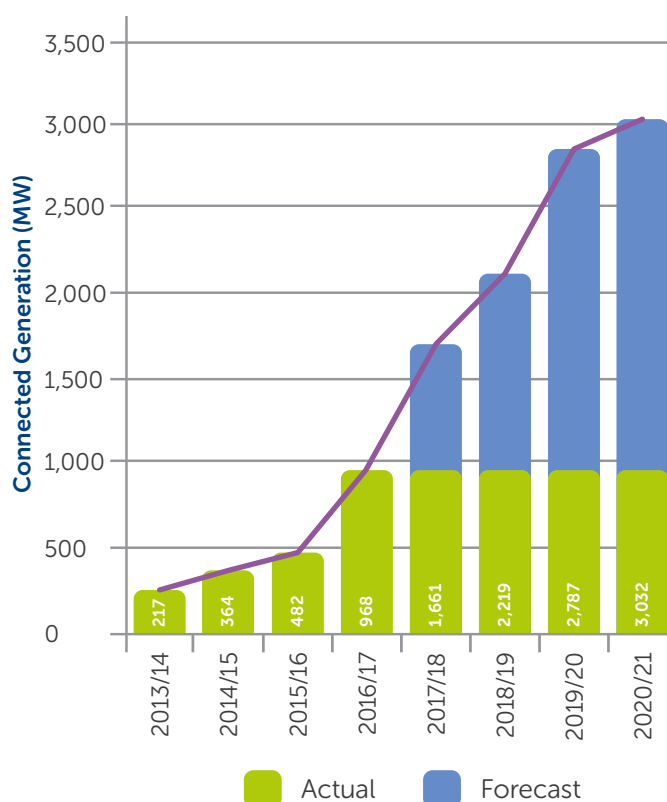
The past two years have seen a number of subsidy changes for renewable technologies as part of the UK Government's Electricity Market Reform. These include the replacement of the Renewables Obligation (RO) scheme with other financial support mechanisms, such as Contracts for Difference and a Capacity Market. One of the big impacts of these changes has been a focus from low carbon generators on the date and cost of connection.

As we look forward to 2021 and beyond, we continue to actively assess customers' needs, and the effects that this would have on the transmission network, to determine the scale and timing of future investment.

Investment for growth



Cumulative new generation MW connected



Pre Construction

Significant progress made during RIIO-T1 to date:

- Three Strategic National infrastructure schemes developed through to construction
- Significant preconstruction activities progressed for three islands schemes – Orkney, Western Isles & Shetland
- £60.9m expenditure to date, forecast £113.0m by 2021
- Significant preconstruction activities progressed for future Strategic National Infrastructure schemes
- Six Strategic Local Infrastructure schemes developed through to construction
- Ten Strategic Local Infrastructure schemes currently being progressed in the preconstruction stage
- 75 stakeholder consultation events in 2016/17
- Contributed to National System Planning framework



Connections

Connections Infrastructure
(Connected 486 MW in 2016/17)

- Baseline Output: 1,168 MW
- Cumulative 2016/17: 809 MW
- RIIO-T1 Forecast: 1,861 MW

Forecast to exceed baseline target by 693MW*

Strategic Local Infrastructure
(Connected 330 MVA in 2016/17)

- Baseline Output: 1,006 MVA
- Cumulative 2016/17: 976 MVA
- RIIO-T1 Forecast: 2,518 MVA

Forecast to exceed baseline target by 1,512MVA*



Strategic National Infrastructure

Four projects approved to date:

- Beaulieu Denny – 850MW, complete
- Beaulieu Mossford 132kV OHL – 252MW, complete
- Kintyre Hunterston – 280MW, complete
- Caithness Moray – 795/850MW, on schedule to complete Q2 2018

Key highlights:

- 613.3km overhead lines, 194.6km subsea cables & 101.4km underground cabling installed
- £2bn investment for all schemes
- Innovation at the forefront – Caithness Moray develop with multi terminal HVDC capability



Other Projects

- Two offshore wind connection schemes delivering over 1GW in total (Moray Firth Phase I schedule to complete 2020 and Beatrice schedule to complete 2018)
- Three Reactor Projects – Peterhead 132kV, Kintore 132kV and Tealing 132kV
- Delivered one large regional projects (Beaulieu Blackhilllock Kintore reconductoring scheme)
- Commence programme to upgrade telecommunication networks
- Flood prevention work carried out at three existing sites



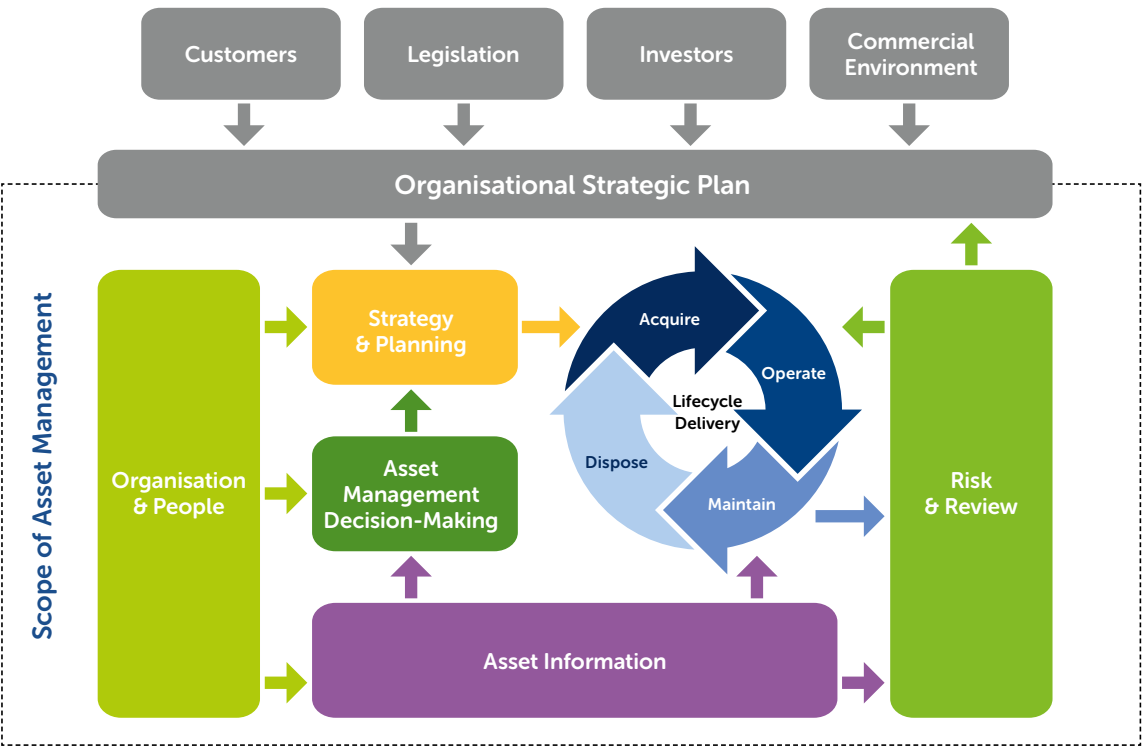
Power to our customers

Electricity transmission networks are designed to reliably carry power over long distances. Although these networks are expensive to build, most of the equipment will be operational for many decades serving many generations of electricity customers. Our network includes some overhead lines that were constructed over 70 years ago.

To keep the network operating safely and sustainably, we have an ongoing programme of maintenance, inspection

and testing. As a consequence, faults on the transmission network are very rare.

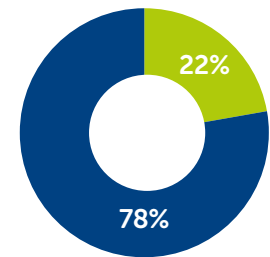
Asset management is an analytical approach to getting best value from assets throughout their lifetime from design to decommissioning. Good asset management will minimise the whole life costs of equipment, while meeting expected performance outcomes. We are accredited under ISO 55000 in good practice and application of asset management.



Activity in this Business Plan period to repair or replace equipment

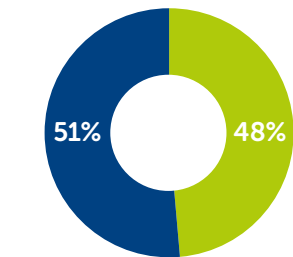
We have a detailed plan of maintenance and replacement of equipment in order to keep the transmission network in good working order. By the end of 2016/17 we are around halfway through that plan.

Expenditure



Spent Forecast

Schemes



Complete Forecast

Network Output Measures

The Network Output Measures (NOMs) methodology is a risk-based approach to manage the condition and performance of the transmission network. Using this methodology will help us make targeted interventions to eliminate the risk our assets present to network operations, health and safety, and the environment. In June 2017, Ofgem gave us instruction to proceed with the implementation of our NOMs methodology.

The GB transmission system is very reliable

In 2016/17, there were 98 incidents on our network. Of these, one resulted in the electricity supply to customers being interrupted. The single incident, which lasted 25 minutes, occurred in Argyll in south west Scotland due to high winds and heavy rain.

SHE Transmission is the only transmission company in GB that makes financial payments to customers affected by a power cut on the transmission network that lasts more than six hours. No such power cuts occurred during 2016/17.

Reliability of Supply

The Overall Reliability of Supply for the SHE Transmission System during 2016-17 was:

99.999925%

compared with 99.999987% in 2015-16
and 99.99452% in 2014-15.



Skye and the Western Isles

Customers on these remote Scottish islands get their electricity supply via an overhead line that runs from Fort Augustus on the west of Scotland through Skye and then on to Stornoway on the Isle of Lewis via a subsea cable. This overhead line is subject to extreme weather conditions and hence vulnerable to faults. By reviewing the operation of the long overhead line that takes electricity to customers on the islands, we reduced the number of faults by one third.

Dunvegan Substation, Isle of Skye



Emergency planning

One of our roles as the provider of critical national infrastructure is to have in place plans to safely restore electricity supplies as quickly as possible in the event of a national emergency. During 2016/17, we worked closely with Government, National Grid and SP Energy Networks to study potential emergencies and our response plans so that we remain at a high state of readiness for such an event.

Our transmission control room monitors our network 24 hours a day, 365 days of the year



Managing construction activities

When we undertake construction to grow or maintain the transmission network we sometimes have to take parts of the network out of service so that the construction can be completed safely. This can mean changes to the way that electricity is supplied during the construction period, or short interruptions to the connection for some generating stations. During 2016/17, we have significantly improved our planning for construction outages and worked with National Grid and end customers on earlier planning to reduce the impact of these activities.

Members of our outage planning team ensure planned maintenance can go ahead

Working together

Focused on our customers' needs

Our strategic priority for the 2013-2021 Business Plan period has been enabling the transition to the low carbon economy. To achieve this, it has been essential that we work closely with all the parties involved in the low carbon transition including policy makers, statutory authorities and the developers of renewable generation schemes.

As the policy framework supporting the low carbon transition has evolved, in particular with the closure of the Renewable Obligation (RO), the needs of our customers have evolved. During 2016/17, the main issue raised by our customers was providing timely connection to the transmission network to meet the eligibility criteria for the subsidy regime. We have worked closely with our customers and other stakeholders to develop innovative, accelerated connections to meet that need. This has included the use of new technologies, existing the use of existing network infrastructure and collaboration with supply chain partners to work faster.

As a result of these changes, over 500MW of renewable energy connected to our network in 2016/17, the highest figure since privatisation.

Engaging communities

In order to provide the connections for renewable generation, we have to build or replace transmission network infrastructure (overhead lines, cables and substations) in some of the most remote and beautiful parts of the country. We aim to undertake all of our work sensitively to the needs of the environment and the local communities that live and work in that landscape.

Our dedicated Community Engagement Team coordinates all project events and early planning consultations. These engagement events provide an opportunity for dialogue with communities and local stakeholders, enabling their concerns and ideas to be considered and incorporated into our designs.

In 2016/17 the Community Engagement Team organised 75 community meetings; a further 60 days of engagement events for 26 projects; and hosted eight visits to live project sites to provide a deeper knowledge of how our projects are built.

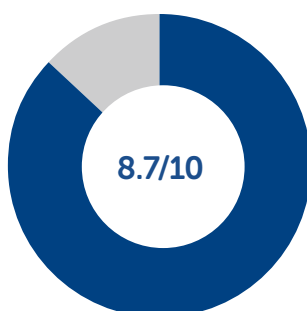
Broadening our stakeholder engagement

As we look forward to the second half of our 2013-2021 Business Plan period, we are widening the range of our engagement with customers, communities and affected stakeholders.

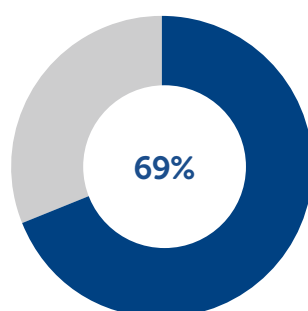
During 2016/17 we sought to expand our engagement with our staff through the establishment of formal Staff Advisory Panels. We also launched a Stakeholder Advisory Panel made up of independent voices with expertise in construction, vulnerable customers, the low carbon transition and local government. The Panel are tasked with making sure that the range of stakeholders' interests inform and influence the way we make decisions. The Panel is constituted to advise our Board and is chaired by Board member Rachel McEwen.

The two panels will review and provide advice on business plans and performance, with a specific contribution around deliverability and ensuring that our business has the capabilities to provide the service that our customers' need.

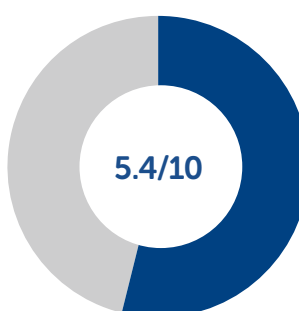
Stakeholder Satisfaction Outputs



Stakeholder satisfaction survey



Stakeholder satisfaction KPIs



Stakeholder engagement reward



External assurance



1. Toppling a tower in Cairngorms National Park as part of the Beaulieu Denny project
2. David Gardner (second from right) with our Stakeholder Advisory Panel
3. Project Vista: Stakeholders discuss improvements to visual amenity in National Parks and National Scenic Areas
4. Opening the HVDC centre in Cumbernauld
5. Caithness Moray consultation event
6. Members of our environment team pay a visit to Kintore Nursery and Primary School







Working sustainably

Sustainability is one of our six core values. To deliver on this value our aim is:

"Our actions are ethical, responsible and balanced, helping to achieve environmental, social and economic well-being for current and future generations."

We recognise that our environmental, social and economic impacts can be significant and we have a responsibility to actively manage these impacts.

Environmental contribution to a low carbon economy

 <p>More than 500MW of renewable generation capacity connected in the north of Scotland in 2016/17 making it a record year, equivalent to 250 turbines</p>	<p>Zero</p> <p>environmental prosecutions or major incidents in 2016/17</p>	 <p>10</p> <p>hectares of substation sites seeded to support rare Great Yellow Bumblebees</p>
<p>Over 400 staff participating in the CARE (Commitment Awareness Rigour and Engagement) programme to deliver the sustainability value in large capital investments</p>	 <p>24.5%</p> <p>the reduction in SF6 leakage from our assets since targets were set in 2014, meeting our reduction target for the first time</p>	<p>100+</p> <p>stakeholders consulted about plans to improve visual impact of transmission assets</p>
 <p>Scottish Green Energy Awards</p>	<p>Judges Award for Beaulieu Denny for its contribution to decarbonising electricity generation</p>	
 <p>32.5%</p> <p>Reduction in our Business Carbon Footprint from 2013/14 to 124,173.19 tCO₂e</p>	 <p>35%</p> <p>Reduction in our electrical losses from 2013/14 to 110,004.30 tCO₂e</p>	

Social contribution to our people, customers and communities

0.54

Total Recordable Injury Rate
Meaning our employees go home safe



Male



Female

Action on

33.4% gender pay gap

2 years

of accreditation under British Standard
for inclusive service provision (BS18477)



anti-slavery

clauses in ALL contracts
and New Modern
Slavery Statement



Two considerate constructors scheme
awards on Caithness Moray



Fair Tax

SSE achieved the
Fair Tax Mark for the
third consecutive
year in October 2016,
achieving a score of
41.5/45

Economic contribution

£38.4m

Tax in 2016/17



Living wage
accredited
since 2013

£265.5m

The contribution to the Scottish economy of
the £1.1bn Caithness-Moray transmission link

Also supporting the equivalent of

4,975

full-time years of employment in Scotland

Innovating for a smarter network

Our innovation activities are helping us deliver the networks of the future. These innovations extend beyond technology and hardware, with innovative processes and approaches delivering value in all areas of our business. Our innovation activities are focussed on:

Accelerating network development and connections – including increased renewable energy generation

Improving safety, environmental and network performance

Informing decision making

Minimising cost

Some of our innovation projects are funded through the Networks Innovation Competition and the Network Innovation Allowance.

Network Innovation Competition For large projects	Network Innovation Allowance For smaller innovations
3 projects worked on in 2016/17	13 projects worked on in 2016/17
£2.8m Our spend on the HVDC Centre project in 2016/17	3 new projects started
£1.1m Our spend on other Network Innovation Competition projects in 2016	5 old projects closed
£1.4m Our spend on other Network Innovation Competition projects in 2016	£1.4m spend on our Network Innovation Allowance projects in 2016/17
£2.4m The funding returned to customers due to the early closure of a project due to lack of suitable trial sites	More info on our NIA projects can be found here: http://www.smarternetworks.org/Files/NIA_&_NIC_170731153114.pdf

Accelerated Connections

Through innovative planning approaches and new technical solutions 239MW of renewable energy generation was connected in 2016/17 ahead of the completion of enabling works.

In February 2017 we successfully connected Beinneun wind farm to our network, almost two months ahead of its contracted connection date and two years ahead of the initial date proposed. The accelerated connection date ensured the wind farm qualified for the ROCs subsidy before it closed, and the early connection meant the developer could start exporting to the grid two months before schedule, providing an earlier than expected return on investment.

The accelerated connection to the grid was achieved by utilising an innovative ACCC (Aluminium Conductor Composite Core) Monte Carlo conductor. The use of this conductor, the first time on our network, allowed SSEN to reduce costs, timescales, and the visual and environmental impact of the connection as the innovative, higher capacity conductor allowed for the reuse of existing steel towers, avoiding the erection of a new trident wood pole line.

Informing decision making

The National HVDC Centre is the first of its kind in the UK. Officially opened in April 2017, the centre provides an industry-wide collaborative testing facility for electricity Transmission Owners and Operators, suppliers, developers and academic institutions to simulate the use of HVDC technology on the GB electricity network.

The centre will use powerful computers to combine real-time simulation capability with replicas of the control systems from HVDC schemes and perform in-depth analysis. This will enable us to anticipate and resolve issues before deployment on the network, allowing timely connections of low carbon generators whilst ensuring the integrity and security of the GB transmission network.

The Caithness-Moray HVDC project will introduce HVDC technology onto our network for the first time and the opening of the HVDC Centre is an important step in the development of this technology.

Future focus

With increasing distributed generation and new sources of demand developing, we are playing our part to ensure the successful delivery of a smart grid that will meet the needs of our future customers.

Through the Energy Networks Association's (ENA) 'Open Networks Project' we're working with all seven of GB's electricity grid operators, respected academics, NGOs, Government and Ofgem to develop industry-wide plans as the UK's energy networks adapt to enable the new energy technologies that generate, consume and manage electricity at a local level.



Our HVDC Centre is the first of its kind in the UK

Costs & financial performance

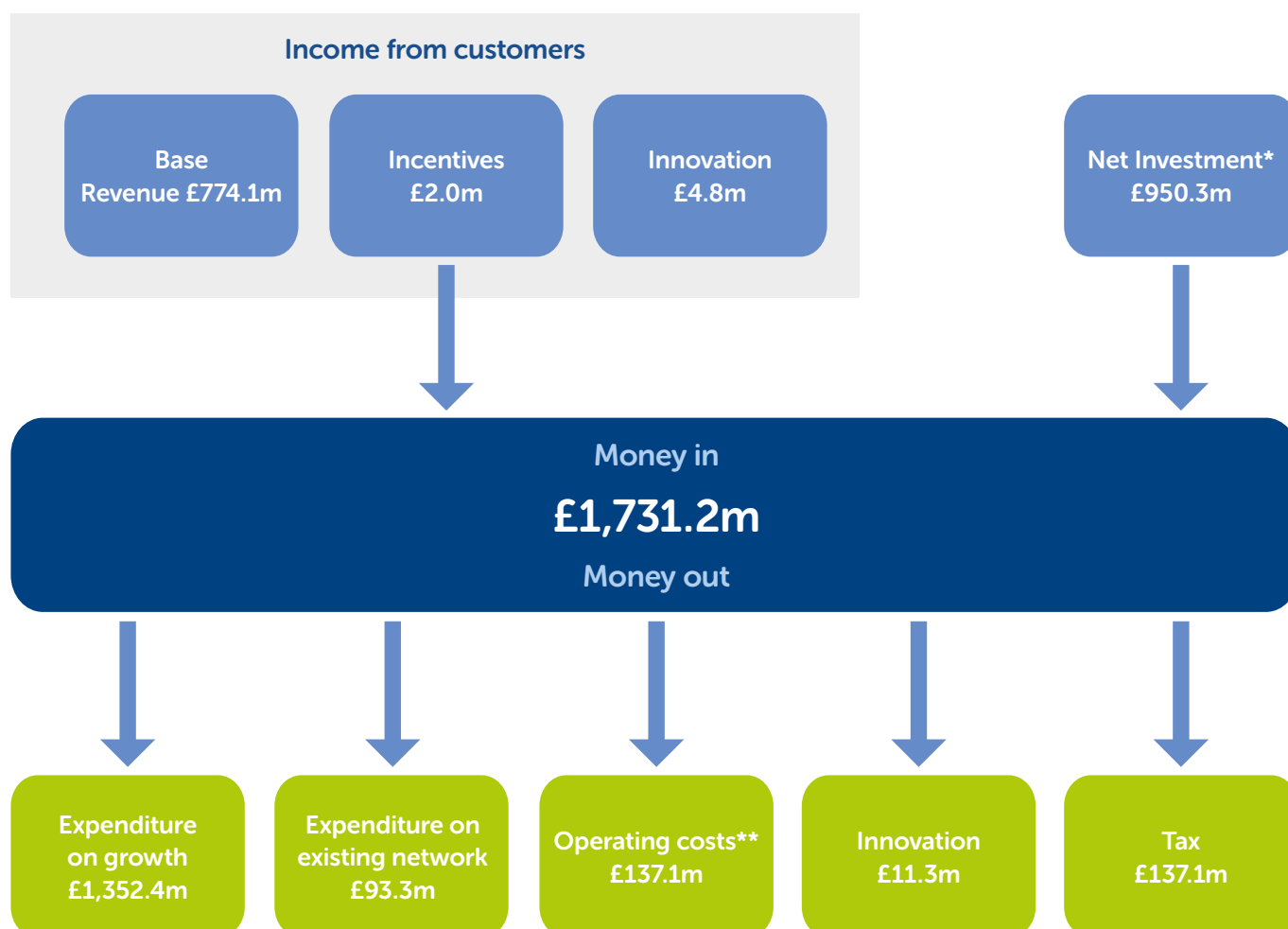
SHE Transmission is forecasting to spend over £3 billion during the 2013-2021 Business Plan period. This expenditure, and the outputs from it, has been agreed with the energy industry regulator, Ofgem, for the RII0-T1 price control period.

Ofgem also regulates the prices that we can charge customers to pay for this expenditure. As the investments that we make in the network serve customers in the current year and many years into the future, the charges to customers for these investments are spread over the expected lifetime of the asset. For this reason, SHE Transmission has received much less in income from customer charges than it has spent.

Our charges, calculated using Ofgem's financial model, are billed to National Grid, the GB system operator. National Grid combines our charges with those of other GB transmission owners and bills generators and electricity supply companies. For more information about this please click the logo below:



Summary of the income and costs so far, from 1 April 2013 to 31 March 2017



* Borrowings and equity investment less any dividends.

** Includes non-op capex and uncontrollable operating costs.

Note: the above excludes the income and costs related to TIRG and also contains indexation differences.

The two tables below provide a summary of our actual and forecast expenditure for the 2013-2021 Business Plan period (top table) against the allowances from our original Business Plan (bottom table). Differences between these two tables can be explained by many factors such as changes in customers' requirements (for example in new connections), changes in prices (for example in the price of copper and aluminium) or project-specific requirements (for example as mandated by planning or environmental authorities). The figures in these tables do not reconcile with the summary on page 24 as these tables include regulated costs only.

Total Expenditure (£m, 2016/17 Prices)

	Actual	Actual	Actual	Actual	Forecast	Forecast	Forecast	Forecast	Forecast
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Load Related Capex (Baseline)	97.78	79.03	82.20	87.06	221.34	202.96	162.64	135.59	1,068.61
SWW approved - Kintyre Hunterston	28.32	100.71	40.79	5.73	1.81	0.00	0.00	0.00	177.36
SWW approved - Beaully Mossford	15.05	19.95	11.40	0.65	0.21	0.00	0.00	0.00	47.27
SWW approved - Caithness Moray	7.58	108.06	360.46	307.58	185.95	83.78	0.58	0.50	1,054.48
Asset Replacement Capex	20.16	20.14	13.33	21.06	48.37	69.46	46.52	57.14	296.18
Other Capex	0.68	2.76	4.74	10.44	26.05	29.64	41.31	12.81	128.43
Non Operational capex	0.32	1.98	1.69	4.94	6.33	9.78	4.30	2.52	31.86
TOTAL CAPEX	169.89	332.63	514.62	437.45	490.05	395.62	255.36	208.57	2,804.19
OPEX									
Faults	0.11	1.12	0.70	0.48	0.69	1.11	1.45	1.65	7.31
Planned Inspections and Maintenance	2.74	2.49	3.56	4.34	5.07	8.94	9.58	9.64	46.36
Other direct costs	0.11	0.77	1.04	0.88	1.28	1.74	2.09	2.40	10.30
Closely Associated Indirect Costs	4.63	5.39	6.51	9.37	13.26	16.57	18.87	21.24	95.83
Business Support	6.10	7.11	8.66	9.07	10.14	12.46	13.10	13.20	79.83
Adjustment for IAS 19 pension accrual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL CONTROLLABLE OPEX	13.68	16.88	20.46	24.14	30.45	40.81	45.08	48.13	239.64
TOTEX	183.57	349.51	535.08	461.59	520.51	436.43	300.44	256.69	3,043.83

Total Allowances (£m, 2016/17 Prices)

	Actual	Actual	Actual	Actual	Forecast	Forecast	Forecast	Forecast	Forecast
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Load Related Capex (Baseline)	138.91	155.47	285.10	195.40	158.80	148.99	77.42	75.05	1,235.14
SWW approved - Kintyre Hunterston	23.10	59.17	111.49	17.96	0.00	0.00	0.00	0.00	211.72
SWW approved - Beaully Mossford	15.04	24.61	13.02	2.58	0.00	0.00	0.00	0.00	55.27
SWW approved - Caithness Moray	5.27	117.76	385.72	420.00	210.33	12.94	0.00	0.00	1,152.03
Asset Replacement Capex	20.17	17.10	19.78	25.83	27.29	27.74	30.75	26.61	195.27
Other Capex	6.51	7.61	8.60	8.06	10.82	24.46	41.64	15.63	123.33
Non Operational capex	0.87	3.50	3.41	0.26	0.26	0.26	0.27	0.27	9.09
TOTAL CAPEX	209.87	385.24	827.12	670.07	407.50	214.40	150.08	117.56	2,981.83
Faults	0.86	1.23	1.47	1.47	1.47	1.35	1.23	1.23	10.32
Planned Inspections and Maintenance	2.06	2.48	3.40	3.87	3.96	4.30	4.40	4.51	28.99
Other direct costs	0.12	0.20	0.43	0.80	1.61	8.74	9.41	10.95	32.25
Closely Associated Indirect Costs	6.82	8.04	9.12	10.94	12.13	12.45	13.22	14.11	86.83
Business Support	5.73	7.05	8.12	8.77	10.07	14.38	14.98	15.58	84.67
TOTAL CONTROLLABLE OPEX	15.60	18.99	22.54	25.86	29.24	41.22	43.25	46.38	243.06
TOTEX	225.47	404.22	849.66	695.93	436.74	255.62	193.33	163.93	3,224.90



Media enquiries should be directed
to SSE's Press Office on
+44 (0)345 0760 530



Investor enquiries should be emailed to
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