Scottish and Southern Energy
Power Distribution

Technical Appendix 04.1

Getting connected to our network

This Technical Appendix is part of the RIIO-ED1 Business Plan of Southern Electric Power Distribution plc ("SEPD") and Scottish Hydro Electric Power Distribution plc ("SHEPD"), together Scottish and Southern Energy Power Distribution ("SSEPD").

A map of the full Business Plan can be found at http://www.yourfutureenergynetwork.co.uk

All costs are shown in 2012/13 prices unless indicated otherwise.

Summary

Our objective is to facilitate an open and competitive market by providing new and modified connections in a safe, timely, efficient and innovative way.

This section of our business plan summarises our approach to connecting customers to our network. Our stakeholders have confirmed to us that offering safe, timely and cost effective connections to our electricity distribution networks is one of the most important services we provide. In this paper we explain how we intend to meet our connection customers' expectations during the RIIO-ED1 period.

Our stakeholders have indicated that during the ED1 period and beyond they are likely to require us to facilitate even more and different types of connections. Our forecasts support this view, taking into account the uptake of Low Carbon Technologies (LCTs), the increase in renewable generation connecting to our network and the impact of smart meters. In addition to this, our domestic customers have told us that they want easier access to useful information, a quicker quotation process and more timely connections; and they want prices to stay competitive. Finally, we are committed to ensuring that we facilitate an open and competitive market, particularly for our major customers.

Three of our 12 Commitments for the RIIO-ED1 period relate to our connections activities:

Commitment 7 – If you apply for an electricity connection and a team member has not been in touch within three working days then we will pay you £20.

Commitment 8 – We want to make it easy for you to fill out a form by giving you the option of doing it online, by post, by phone or LiveChat.

Commitment 9 – We'll keep asking you how we could do better and publish a report every year on what we're doing about it.

In addition to these commitments, and based on our stakeholder feedback and our forecast level of connections over the RIIO-ED1 period, we have developed the following package of proposals.

For our Minor Customers, we intend to make a number of improvements to the service that we provide. We will improve the availability and usefulness of information relating to the provision of connections. This will include improving our website: a smart online application form for new connections; an online payment system; and online project tracking. We will also expand our new connections call centre and carry out a

training programme to ensure that our connections' teams are able to provide helpful assistance to anyone wishing to find out about getting connected to our network. We forecast that progressing with these proposals will cost £3m across both of our network areas.

In addition to the improvements in information provision, we also commit to reducing the average number of working days we take to provide a connection offer by 10% (based on 2012/13 performance) and the average number of days we take to provide a connection following acceptance by 10% (again based on 2012/13 performance). We will achieve this through a number of different ways including actively helping customers with the application process and site visits to some of our customers. We have not included any costs associated with meeting these targets as we expect the efficiency savings that we make to cover the majority of the costs.

An important part of this element of our Business Plan has been to look at readying our network for the increased levels of Low Carbon Technologies that we expect to see over the RIIO-ED1 period. More detail on this area is provided in our Domestic Low Carbon Technology during RIIO-ED1 justification paper. Our forecast shows that we can expect to see over 1000 LCT connections per year by 2018. We expect that ensuring our network is capable of responding to this changing nature of connections will cost £11.1m across both of our networks.

Our final proposal for minor connections' customers is to produce an Annual Connections Report that sets out our performance in relation to the above targets. This will be published on our website.

Further details on our proposals for minor customers can be found in **Part 2 Minor Connections**.

For our Major Customers, our overarching aim is to facilitate an open and competitive market. We will do this in a number of ways, including an improvement in the information that is publicly available such as the provision of heat maps and continues improvements in our website. We will also provide a named Connections Account Manager for each major connection customer. We have included costs of £4.88m across both of our networks to allow us to make these important changes. In addition to this we will offer a choice in our major connection offers to allow customers to select alternative providers and will provide support to customers that wish to appoint an alternative provider.

We will produce a plan each year setting out how we will continue to improve our service to Independent Connection Providers and make it easy for large customers to choose alternatives.

Finally, an important part of our plan has been to assess the level of expected connection of Distributed Generation (DG) to our network over the RIIO-ED1 period and ensure that our network is able to facilitate these connections. Overall we forecast that the upgrades to our network that will be required to ensure that we meet the needs of our DG customers will be £29.1m across our networks.

Further details on our proposals for Major Customers can be found in **Part 3 Major connections.**

Summary of our plans…

Our **objective** is... to promote an open and competitive market by providing new or modified connections in a safe, timely, efficient and innovative way.

During the RIIO-ED1 period our **targets** are...

Minor Connections	If you apply for an electricity connection and a team member has not been in touch within three working days then we will pay you £20.
	A 10% reduction in our current performance for the average time we take to quote.
	A 10% reduction in our current performance for the average time we take to connect.
	Produce an Annual Connections Report on our performance against these targets.
Major Connections	Improved information provision to our major connections customers including heat maps on our website.
	A named Major Connections Account Manager for every major connection.
	An Annual Workplan on how we will continue to promote an open and competitive market.

Regulatory policy

In March 2013 Ofgem set out its Strategy Decision for the RIIO-ED1 period. The decision includes:

- Package of incentives to promote improvements for minor connection customers including a Customer Satisfaction Survey and a Time to Connect Incentive.
- Introduction of an Incentive on Connections Engagement (ICE) for major connection customers. This is a financial incentive that penalises us if we fail to effectively engage with our major connections' customers.
- Continuation of the Connections Guaranteed Standards of Performance and the publication of a Long Term Development Statement.
- Socialisation of the costs associated with reinforcing our network to allow for our existing customers connecting additional Low Carbon Technologies (LCTs).

The proposals described in this paper are aligned with the regulatory policy, without exception.

An explanation of how our proposals meet regulatory policy requirements is provided in the **Appendix B – Regulatory** Policy.

Contents

Introduction

Our approach to connections has always been, and continues to be, to provide the service that our customers need in a safe, efficient and innovative way.

Our work in providing connections to our customers is underpinned by our core values: safety; service; efficiency; sustainability; excellence; and teamwork. We understand the importance of our role in providing an excellent and efficient service to customers. This means that everything we do from helping a customer to apply for a connection, to progressing the application and completing the connection must be done safely, efficiently and where appropriate innovatively. It also means that we need to make sure that our customers are aware of the alternative providers that may be able to help them with their connection.

In addition to this we are committed to continuing with out work to facilitate the connection of Distributed Generation to our network.

What connection activities do we do?

Getting connected to our network includes a range of activities:

- A single new connection to a new house;
- A large new housing estate, industrial or commercial park;
- Connecting generators and streetlights;
- Modifying existing connections to provide more electricity; and
- Changes to our existing network to accommodate for new connections.

Following the introduction of competition into the connections market, independent companies are now able to provide any new connection. However, certain connections continue to be provided only by the relevant distribution network operator (DNO). Ofgem has therefore defined two distinct groups of connections customer:

"Minor Connections" normally only provided by SSEPD

Minor connections are domestic housing or retail projects of 4 homes or less only requiring work at low voltage (less than 1000V). Despite the introduction of competition into the connections market, minor

connections customers, in the main, continue to be provided by SSEPD. Due to this lack of competition, our connections service continues to be regulated by Ofgem in terms of both price and service.

"Major Connections" provided by SSEPD and others in an open, competitive market

Major connections include domestic housing, retail, commercial or industrial projects of greater than 4 low voltage (LV) connections, a generator, unmetered (street lighting) connection, or a mix of any of these.

These typically, although not always, require work at a higher voltage than LV. We have an obligation to these customers to ensure that they benefit from an open and competitive market.

What's in this paper?

This paper is part of SSEPD's Business Plan for the period 1 April 2015 to 31 March 2023 ("the RIIO-ED1 period").

Part 1 sets out our overall approach to connections including a longer term view, what our stakeholders have told us and how we will report on our progress during the RIIO-ED1 period.

Part 2 relates to **Minor Connections**. It explains our obligations, our historic performance, drivers for change in this area including our stakeholder feedback, and our plans and targets for the RIIO-ED1 period.

Part 3 elates to **Major Connections**. It explains our obligations, our historic performance, drivers for change in this area including our stakeholder feedback, and our plans and targets for the RIIO-ED1 period.

An explanation of how our proposals meet regulatory policy requirements is provided in the **Appendix B – Regulatory** Policy.

Scottish and Southern Energy
Power Distribution

Part 1

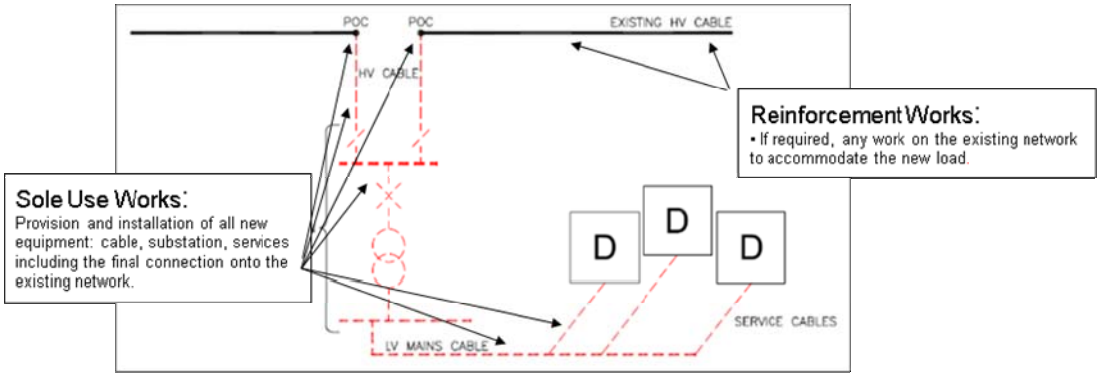
Our approach to connections

Delivering an excellent connection service is important to us. It is the mark of a successful business. We ensure that our customers get exceptional service from a cost, safety and efficiency perspective by appointing a dedicated team of trained experts in designing and delivering new connections.

We are consistently among the most efficient DNOs. More details on how we manage efficiency now and our plans and commitments for the future are laid out in our paper entitled Be efficient. We also monitor our customer service. Overall through the results of our post-connection telephone survey conducted by Ofgem, our customers have told us that they are generally happy with our service. However we continue to strive for improvement through the number of commitments we make in this paper. More details on how we manage monitor and deliver customer service in connections now and our plans and commitments for the future are also laid out in our paper entitled Listening to our customers and providing the service that they want.

Many connections only involve new components to solely supply the new customer, (i.e. the service cable to a property and the joint between this and the larger cable supplying existing customers), as the existing infrastructure can accommodate any requirements for additional capacity. However, many larger developments require additional works to strengthen the existing network to increase its capacity in order to meet the requirements of the new supply being added to the network. We call this extra work reinforcement, see **Figure 1**.

Figure 1 Diagram showing the split between sole use and reinforcement works



When we connect a new customer to our network or modify an existing customer's connection those components used solely to supply the customer are paid for in full by the customer. Any reinforcement to the existing shared network will also benefit other customers as well as the one connecting and so these costs are shared between the connecting customer and among all customers through DUoS (Distribution Use of System) charges, paid by suppliers. The sharing is based on the proportion of the new capacity used by the new connection. DUoS charges are included in all customers' electricity bills, whoever the supplier is, and the income passed through to the local network operator to maintain and operate the electricity network.

Increasing our network capacity for connections

Our expenditure on reinforcement covers all of the investment that we make in our network to ensure that it has sufficient capacity and capability for all new generation and demand connections whilst continuing to provide a reliable supply to our existing customers. The capacity of a network is the amount of electricity that the network may safely carry while remaining within statutory limits of voltage and frequency. Sometimes a new connection may trigger work on a network to increase its capacity because there is not enough spare capacity to carry the additional electricity.

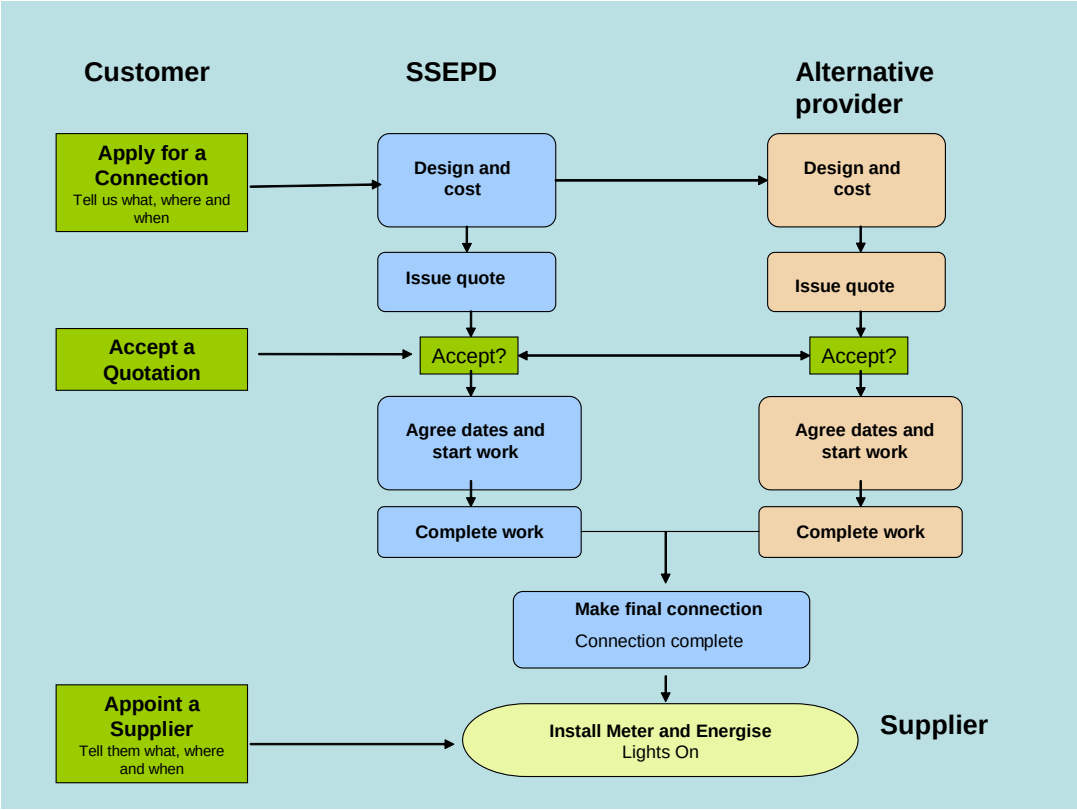
This investment to increase network capacity is split into connections driven reinforcement expenditure as described above, and general reinforcement expenditure. These are defined below:

- Connections driven reinforcement expenditure is driven by individual identified connections customers with costs shared between the customer and all other customers through DUoS charges. This paper sets out our plans including the expenditure we require in order to deliver this.
- General reinforcement expenditure relates to the necessary reinforcement works and investments that are required to ensure that our networks are able to accommodate the background growth in demand and generation where no individual connecting customer is identified. This growth may be as a result of an existing customer installing a new electric heating system, electric car or micro-generation such as photovoltaic panels on their roof. Our plans for general reinforcement expenditure to address background growth are explained in detail in our paper entitled A reliable supply of electricity.

Our strategy for connecting customers to our network

We help to connect thousands of customers to our network every year and our experience has shown that keeping our customers well informed helps them to manage their new build much more successfully. **Figure 2** provides a simple flowchart to show the whole end-to-end process.

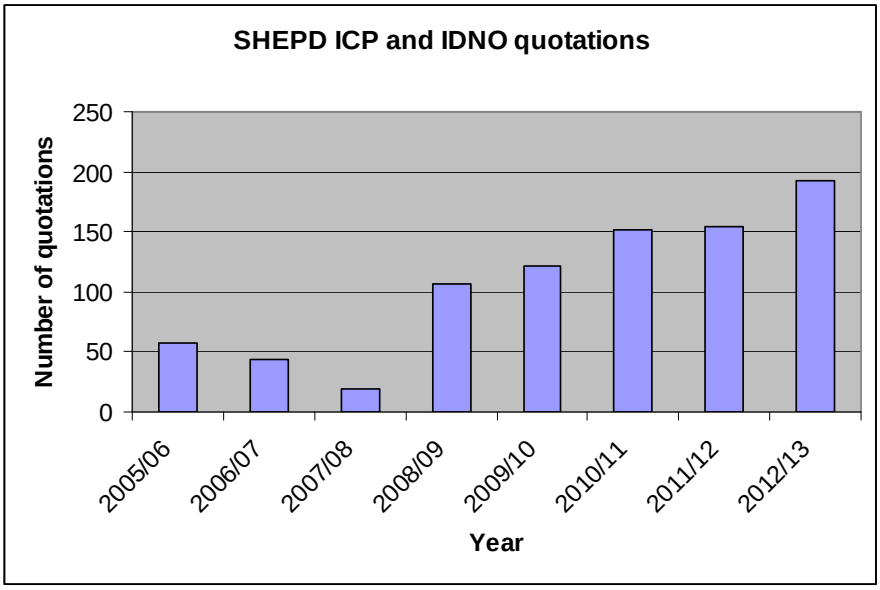
Figure 2 Simple flowchart of the connection process

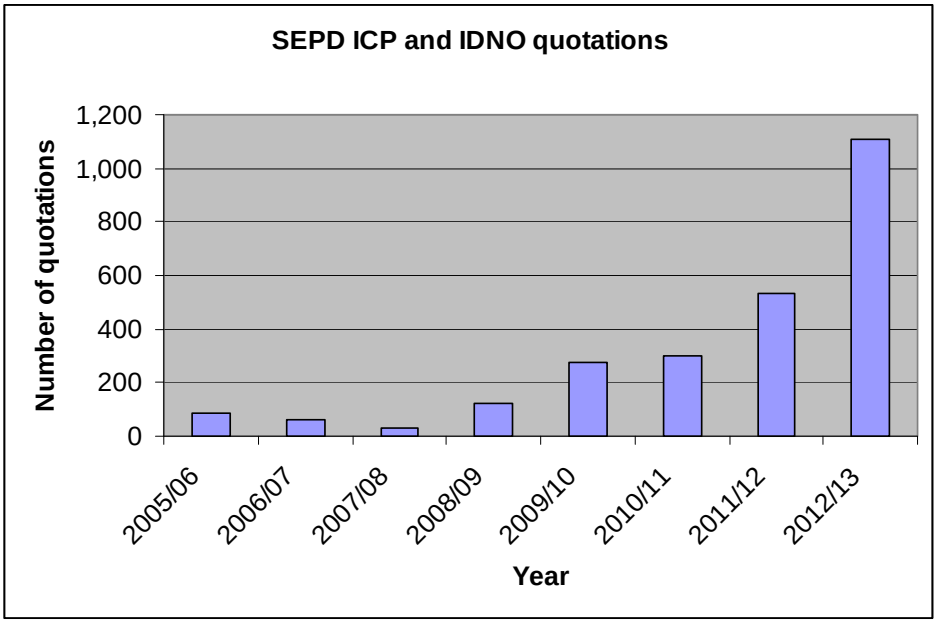


We recognise that many of our customers may never have applied for a new or modified an existing connection before. During RIIO ED1 we believe many more customers will be involved in this process as they adapt to the future low carbon economy. Equally many of our connections customers who deal with us regularly will change the nature of their connections, for example, those that required demand only connections will more commonly wish to export electricity too.

Historically, providing connections was our responsibility as the network operator within our licence areas. Following the introduction of competition into the connections market, independent companies are now able to provide these connections, either as an ICP (Independent Connections Provider) or an IDNO, (Independent Distribution Network Operator). The increase in level of quotations provided to alternative providers is shown in **Figure 3**.

Figure 3 Charts showing increasing number of quotations provided to ICPs and IDNOs





These independent companies are simply another group of customers and our approach to them, as laid out in this section, is no different to any other connections customer. Regardless of whether connections are provided by us or by an ICP or IDNO, the responsibility to ensure there is enough capacity to safely operate and maintain the existing network and the new connection lies with us.

To keep all our customers informed we will continue to develop extensive up-front information on our web site, through leaflets and through our free-phone call centre. We will expand this by providing help in completing an application to apply for a connection, manage and monitor a project.

In all cases we are keen to make the process as customer-friendly as possible. Over the last few years we have introduced a series of initiatives to improve our customer relationships including:

- A dedicated connections call centre with new Customer Service Management structure
- A redesigned quotation letter with clearer costs, different acceptance options and simplified wording.

We also know from both our own experience and from stakeholder engagement that our customers value the personal interactions, commitments and promises that we make to them.

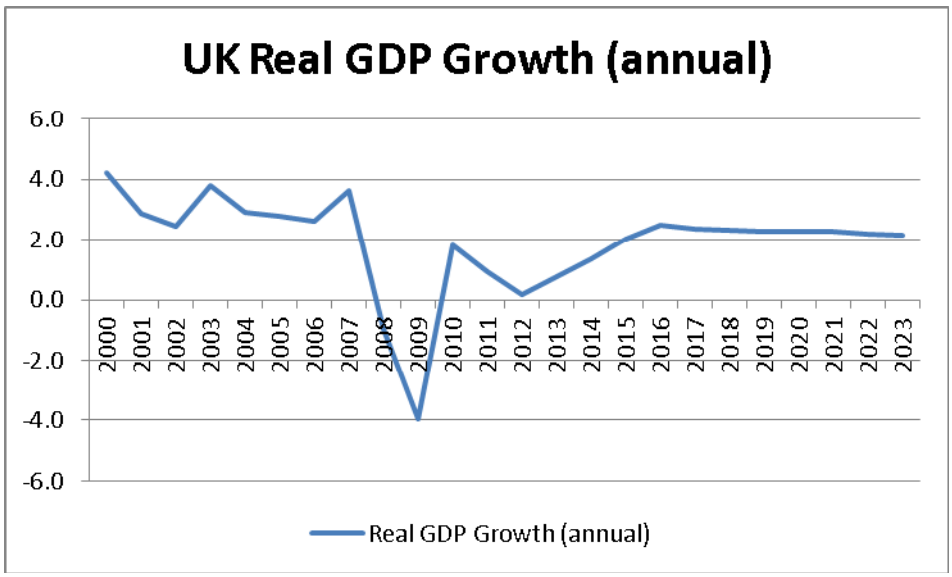
All our quotations have and will continue to include the connection designer's name and contact details to give the customer the opportunity to speak to the person who planned their connection. The quotations also include a breakdown of our charges and which parts are open for other providers to quote for and provide, together with details of how to contact alternative providers. This effectively gives customers the information they need to make an informed decision together with a 'direct line' to the person most able to help answer any questions they may have.

Longer term view

We recognise our responsibility to support economic growth and be ready to provide new connections as we come out of the current recession, through RIIO-ED1 and beyond. Many government and international targets are now based on predictions out to 2050.

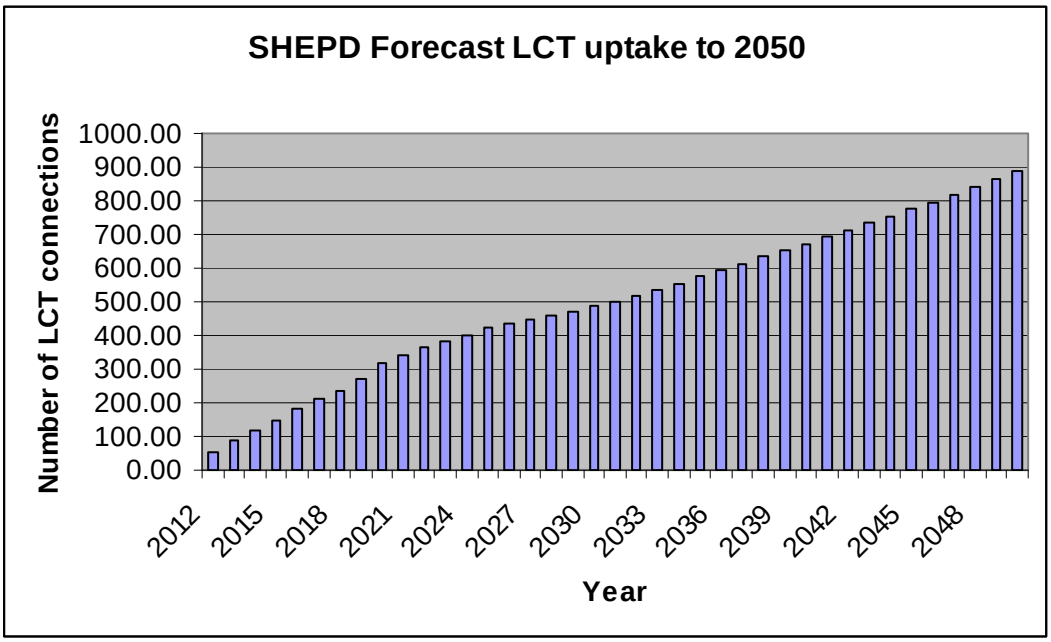
We have verified this with externally validated predictions such as those provided by Global Insights comparative world overview UK-Real GDP growth (15th March 2013) which predicts a relatively steady growth rate of around 2% per annum during the RIIO-ED1 period. This is shown in **Figure 4**.

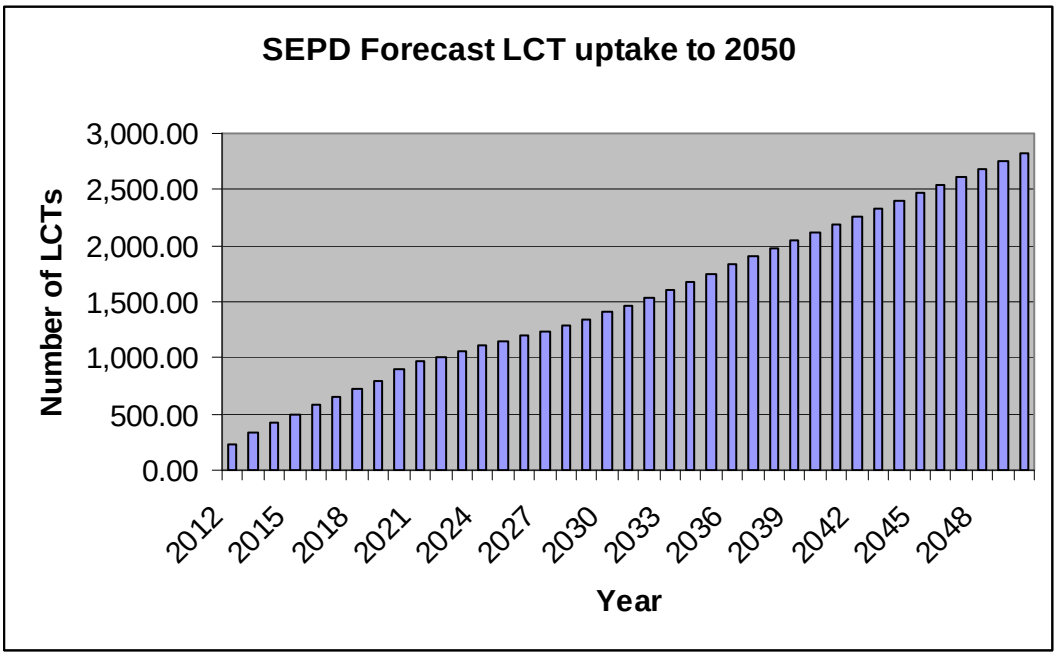
Figure 4 Chart showing GDP growth



One of the most important changes that we expect to see looking forward to 2050 is the increasing uptake of Low Carbon Technologies. The uptake of LCTs is discussed in detail throughout this paper, with the focus on the impacts that we expect to see in RIIO-ED1. However, we have also carried out work looking forward to 2050, a summary of which is provided in **Figure 5** below.

Figure 5: Charts showing forecast uptake of LCTs to 2050

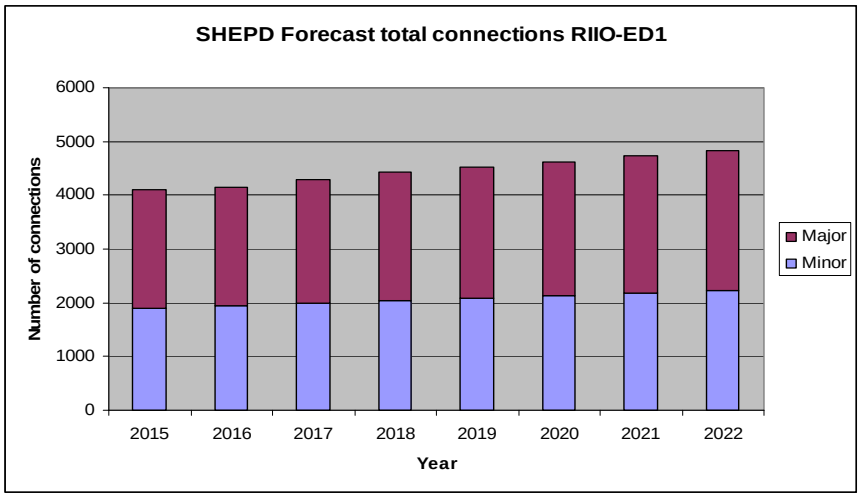


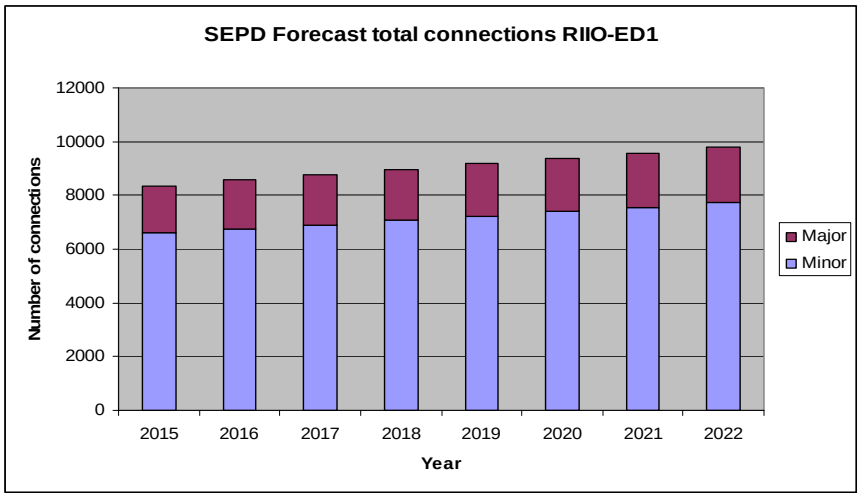


Our overall forecast

Based on significant industry work as well as our knowledge of upcoming connection projects and stakeholder engagement with regional planners and developers, we have developed robust forecasts for the number of connections that we expect to see over the RIIO-ED1 period. Overall, we expect to see a steady increase in the number of connections to our network over the RIIO-ED1 period. **Figure 6** shows the total number of major and minor connections that we expect to see.

Figure 6 Our total forecast number of connections for RIIO-ED1 split by major and minor connections

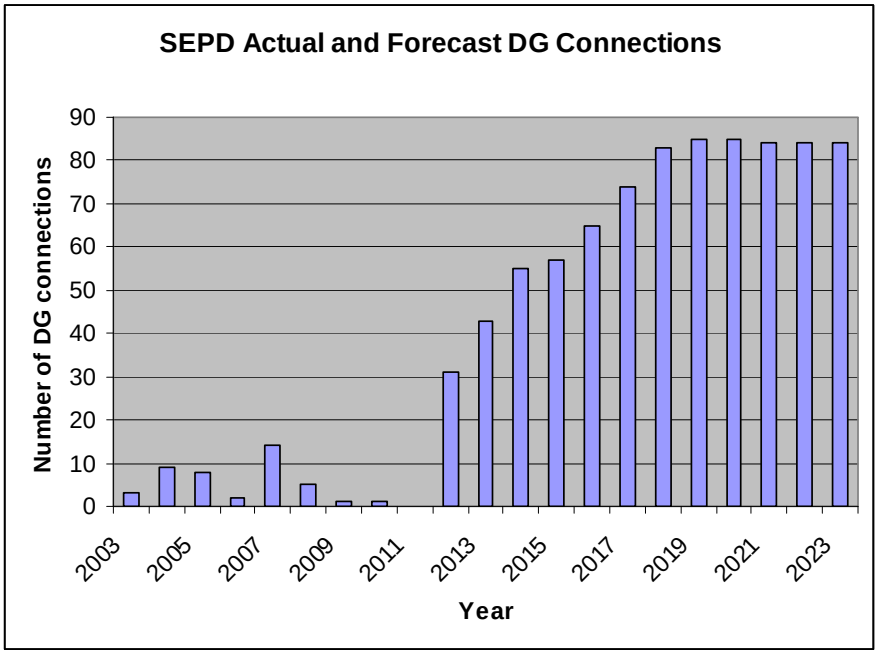


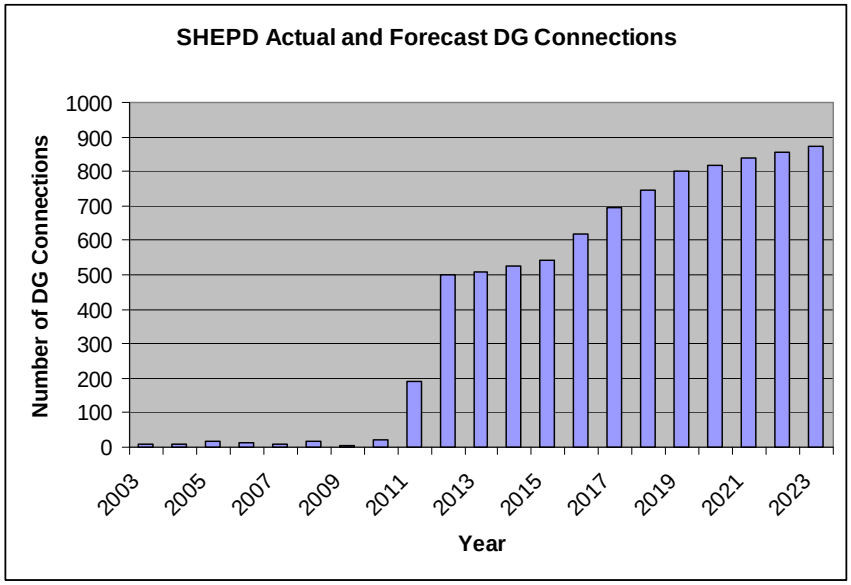


The overall increase in the number of connections that we expect to see can broadly be explained by two key factors:

- The economic growth that we expect to see over the RIIO-ED1 period that will drive an increase in new developments; and
- A widespread increase in large scale embedded renewable generation, as shown in **Figure 7** below. More detail on this can be found in our Distributed Generation General Reinforcement supporting paper.

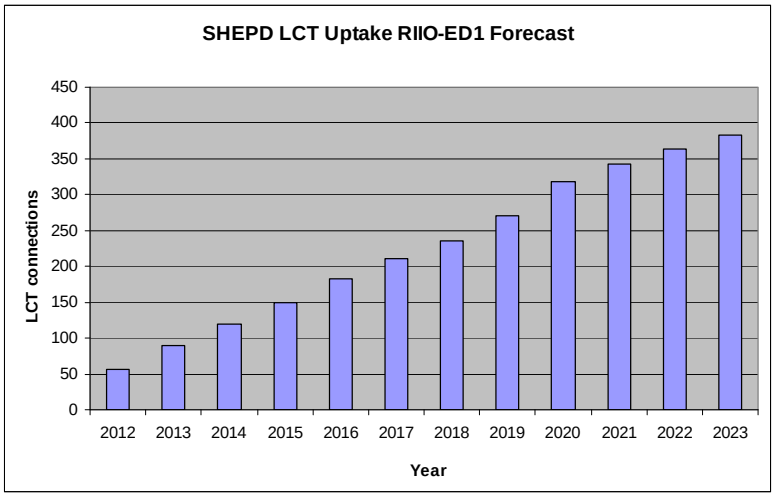
Figure 7: Charts showing increase in level of DG connections in our SHEPD and SEPD areas

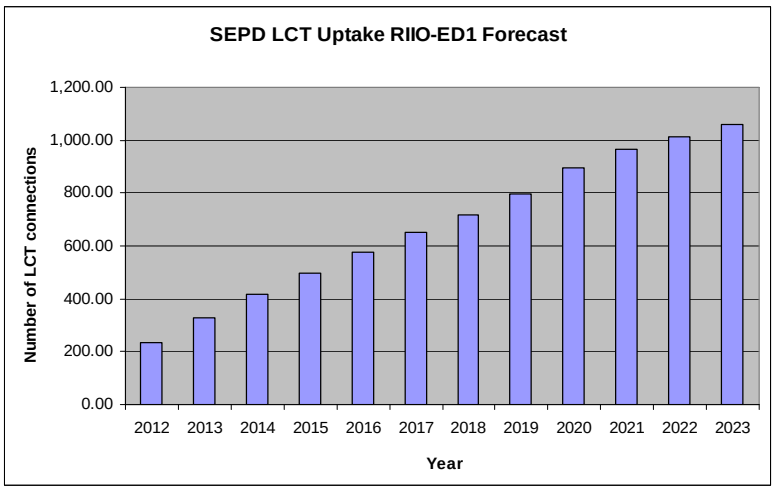




In addition to the overall steady increase in total connections that we expect to see, we also forecast that there will be changes in the types of connections that our customers, particularly through the uptake of Low Carbon Technologies. The increase in Low Carbon Technologies (LCTs) that we expect to see is shown in **Figure 8** below. We need to ensure that our network is ready for the changing nature of connections, and, in particular, the increase in the number of connections that will be able to export and absorb electricity and the impact that this will have on our network. We also expect LCTs to emerge as clusters, i.e. being adopted in certain geographic areas due to the customer groups that are in that area. The effect of this is that instead of evenly using headroom capacity across our network, the issues will be concentrated on single points on our network. This is discussed in more detail in **Part 2 - Minor Connections** and our Domestic Low Carbon Technology during RIIO-ED1.

Figure 8: Charts showing forecast number of LCTs from 2016 onwards





Engagement with key stakeholders

To ensure we continue to offer safe, timely and cost effective connections throughout RIIO ED1 and beyond we have consulted extensively with our stakeholders to understand what is important to them. This has included street surveys, on-line questionnaires, focussed and wider stakeholder engagement sessions.

A summary of the key things that they told us they want to see are listed below. More detail around our stakeholder engagement and the responses we received is included in the following sections.

Our stakeholders believe we should, at the minimum, comply with legislation and guaranteed standards, but also go beyond this by innovating in the areas below.

- Better information and easier access to the people they needed to speak to
- No failures in our GSoP performance, whatever the justification
- Quicker quoting and connections
- The guarantee of competitive pricing through both benchmarking and helping our customers get alternative prices to be able to compare
- The choice of innovative and flexible connections that reduce connection time and cost
- New technology to make more network capacity available.
- Networks built fit for purpose, ready for the low carbon future
- Connections costs for existing domestic customers who chose to install low carbon technology to be minimised.
- For us to facilitate early reinforcement for possible future connections

We have included these views in our plans and made commitments on each one of them. Our commitments for Minor Connections are set out in **Part 2 Minor Connections**; our commitments for Major Customers are set out in **Part 3 Major connections**.

Scottish and Southern Energy Power Distribution

Part 2

Minor Connections

What's in this section

This section is about the plans we are putting into place to ensure we provide all **minor connections**, normally only provided by SSEPD in a safe, timely and cost effective manner. This section includes:

- Our obligations
- Our historic approach and performance in connections;
- Drivers for change in connections including our stakeholders views;
- The targets we have set ourselves together with our commitments and their costs; and
- The uncertainties we face.

Minor connections normally only provided by SSEPD are exclusively smaller low voltage connection projects including a new connection or an alteration to up to 4 premises where all work involved is at low voltage (i.e. less than 1000 volts). These are commonly for example a single retail or domestic housing project of 4 homes or fewer, only requiring work at low voltage, but excludes unmetered connections (e.g. street lighting) and any connections which involve generation.

Ofgem define this customer group as a **minor customer**. Although their connections can be delivered by an alternative provider it is recognised due to their size and value that these remain a group of connections that will normally be provided by SSEPD.

For these customers we plan to deliver:

Our **objective** is… to facilitate an open and competitive market by providing new or modified connections in a safe, timely, efficient and innovative way.

During the RIIO-ED1 period our targets are…

Minor connections	If you apply for an electricity connection and a team member has not been in touch within three working days then we will pay you £20. A 10% reduction in our current (2012/13) performance for the average time we take to quote. A 10% reduction in our current (2012/13) performance for the average time we take to connect. An Annual Connections Report on our performance in relation to these targets.

Our obligations

DNOs are regulated by primary legislation and licence obligations. The most important of these from a connections perspective are summarised below with more detail in

Appendix A - Our obligations.

- The Electricity Act (1989): including Section 16 Duty to connect on request
- The Standard Conditions of our Licence: including the requirement to offer terms and not to act in a discriminatory manner.
- The Electricity (Connection Standards of Performance Regulations 2010): with minimum timeframes around connections tasks tied to financial penalties.

Together, these regulations provide the minimum standards we are required to follow. We always aim to improve on these and explore innovative ways to address new and emerging challenges.

Historical approach and performance

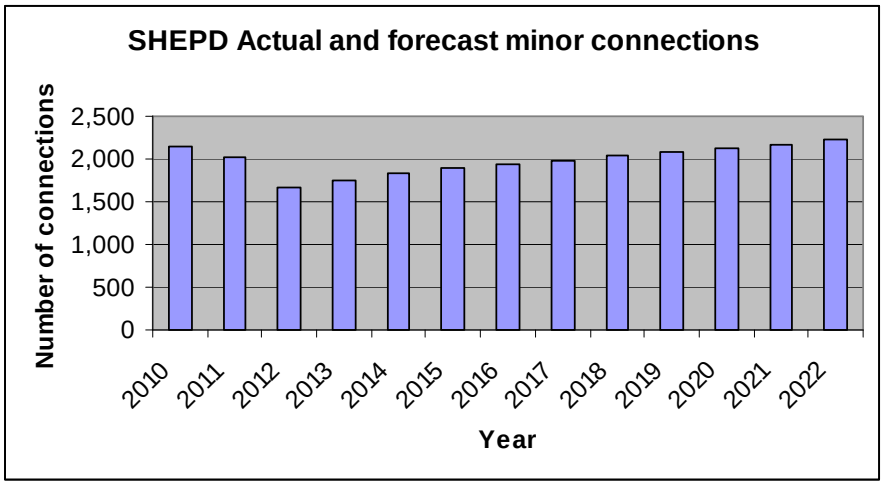
Number of minor connections

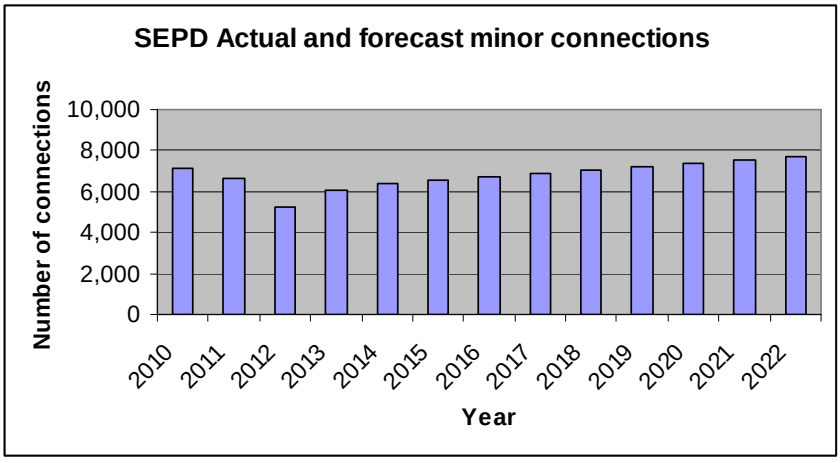
We help to connect thousands of **minor connections** customers to our network every year. These have an average value of less than £1,000, are normally provided only by SSEPD and represent 65-70% of all new connections projects we carry out annually. Our approach has been to deliver these at an efficient and competitive price well within the requirements of our guaranteed standards and licence obligations.

In the existing price control, DPCR5, we have seen a variable level of minor connections over the period. This is show in Figure 4, along with our forecast of a steady increase in the number of minor connections for

the RIIO-ED1 period. Our expected increase in minor connections is one of the elements driving the overall increase in the total number of connections that we expect to see over the period, as shown in **Figure 9**.

Figure 9 Charts showing the actual levels of minor connections in DPCR5 and our forecast level for RIIO-ED1

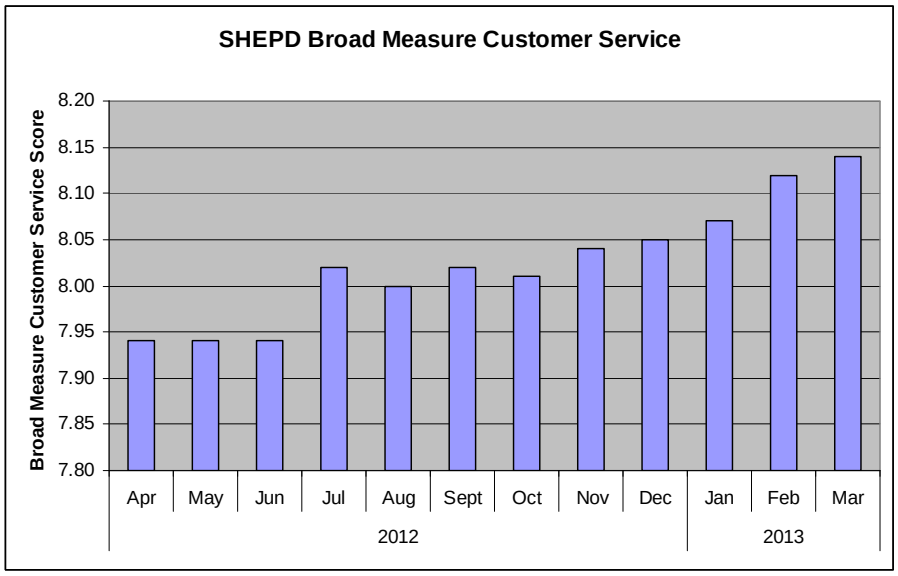


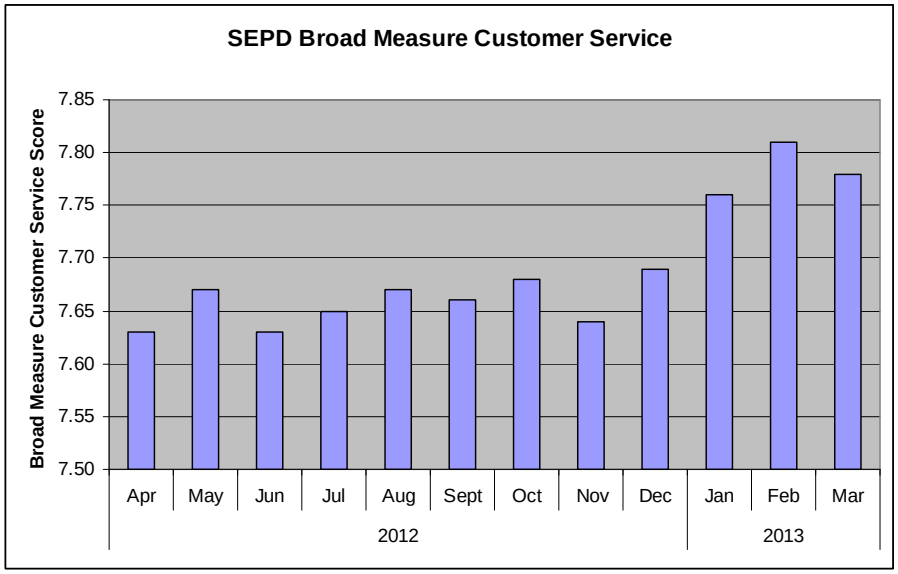


Customer service

Providing excellent customer service is one of our values and is something that we are committed to continuing to achieve across our business. Our experience has shown that keeping our customers well informed is paramount to providing an excellent service as it helps them to manage their new build, or refurbishment much more successfully. We place a very high value on creating an outstanding customer experience, as evidenced in the improving performance recorded by the post-connection telephone survey conducted by Ofgem over the last year (**Figure 10**).

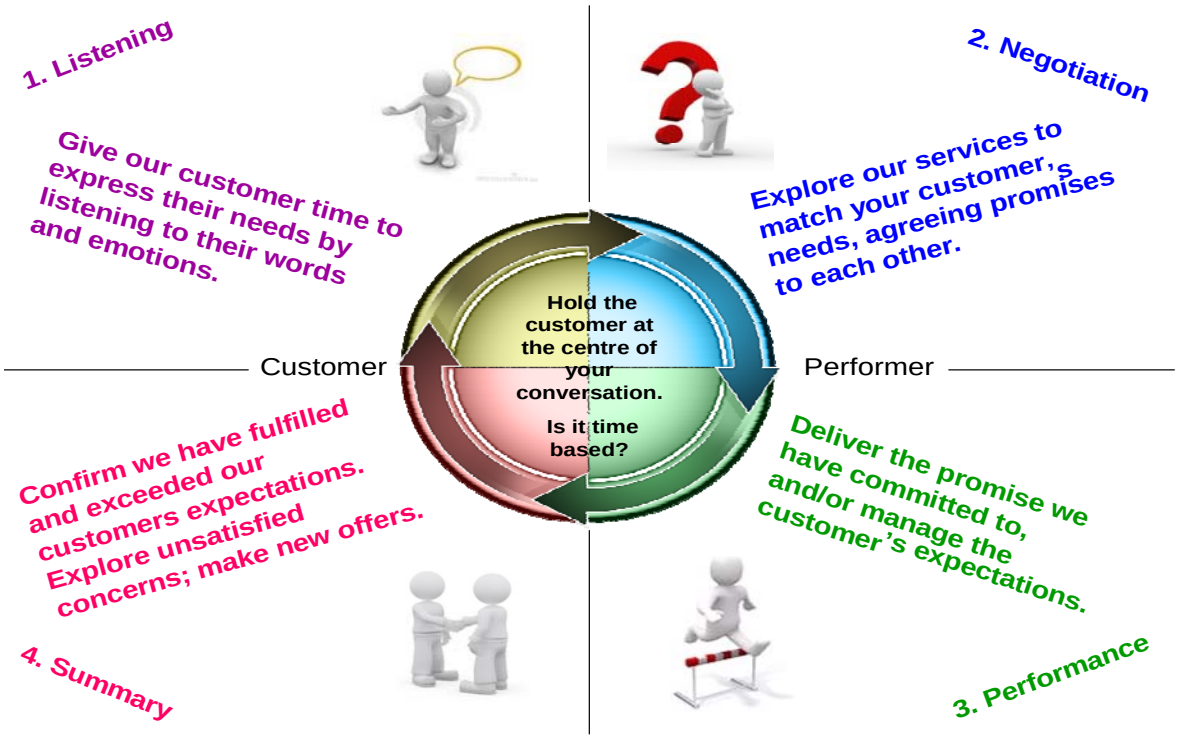
Figure 10 Our improving customer service





One of the principles we have adopted in order to deliver this customer service is Commitment Based Management (CBM), illustrated in **Figure 11**. We know from experience that customers value the personal interactions, commitments and promises that we make to them.

Figure 11 Commitment based management



The CBM loop enhances customer satisfaction by making and keeping promises and giving firm commitments which are time based. The request and promise principle is the basis of our approach to customer service and significantly enhances the customer experience. This approach also makes use of three key components to create a cycle of improvement: quantify our performance (originally through our own survey but more recently using our Broad Measures scores), identify solutions through staff "brainstorming" learning teams and then motivating all to apply through education and training.

Drivers for change

As we plan for RIIO-ED1 there are two broad drivers for change in the area of **minor connections**:

- The views of our stakeholders on how we can improve; and
- Forecast changes to the number and types of connections we provide, including the impact of the low carbon future, the adoption of low carbon technologies (LCTs) in the home and in businesses and the roll-out of smart metering.

These drivers for change are detailed further below.

Stakeholders' views

We have carried out an extensive stakeholder engagement programme, further details of which can be found in our paper entitled What you said: Report on stakeholder engagement and What Our Stakeholders Think.

The input from our stakeholders has been invaluable in informing our decision making, including feedback on the alternative options we have considered. Overall, by engaging with a wide range of stakeholders over the RIIO-ED1 process, we have found that stakeholders' views are a key driver for changing our business.

Our **minor customers** have told us that they want:

- Better information and easier access to the people they needed to speak to

  83% of our connection customers surveyed said they would like to access information and indicative costs on-line, with half of them saying you would like to have access to designers/engineers, project progress and application forms on-line

  When it comes to communicating with us the majority of our stakeholders continue to prefer to speak to a member of staff on the telephone (73%).

- Quicker quoting and connections, providing that this does not increase costs

  85% of our connection customers surveyed told us that achieving a timely connection was very important. 94% of those customers surveyed supported more alignment of connection times with their individual projects. However, our customers were divided on the issue of reducing quotation times, with 57% supporting quicker quotation times as long as the cost of that was passed on to those customers receiving the quicker service.

  "Generally we have a good relationship with contacts at SSEPD, although service standards for new connections need to be reviewed to ensure service standards are included for delivery and quality of grid feasibility studies with early network information provision, as well as service standards for formal applications "

  Response to November consultation

- The guarantee of competitive pricing through both benchmarking and helping our customers get alternative prices to be able to compare.

  85% of our customers surveyed said that cost is a significant factor.

- The choice of innovative and flexible connections that reduce connection time and cost

  "you have the generally right direction, but should be pushing much further and faster with innovation"

  Response to November consultation

  "The revolution in energy supply and changes required in energy use will alter the supply and demand dynamics, shift excesses and shortfalls to different time periods and due to different scenarios. System flexibility to be able to cape with such changes will also be important. This priority will help to meet Government targets on renewable energy, as well as assisting consumers"

  Response to November consultation

- Networks built fit for purpose, ready for the low carbon future

  85% of customers surveyed supported an approach to make sure any new networks are ready for a low carbon future.

- Connections costs for existing domestic customers who chose to install low carbon technology to be minimised.

  71% of customers and stakeholders consulted at our face-to-face and half of all connection customers who responded on-line agreed (strongly agree, 17%: agree, 33%) that the cost of upgrading old connections should be shared among all customers with the remaining disagreeing or neither agreeing nor disagreeing

A full report on the discussions we had with customers can be found in our paper entitled What you said: Report on stakeholder engagement.

Forecast changes to future low voltage connections

The term Low Carbon Technology (LCT) is generally used to describe domestic sized heat-pumps, electric vehicles and small scale distributed generation or microgeneration (less than 16 amps or 3.7kW per phase), mostly photo-voltaic (PV) and small-scale wind.

Heat pumps and electric vehicle chargers generally have a high demand for electricity over many hours, while small scale domestic generation can often cause high voltage issues. Historically, distribution networks have not been designed to accommodate either of these types of loads. Therefore a key theme of RIIO-ED1 will be how we connect these LCTs while avoiding, as far as possible, the requirement to install larger cables and bigger transformers to provide the extra capacity.

We recognise our requirement to be ready to support new and upgraded **minor connections**. We expect to see a substantial growth in the volume of LCTs connecting to our network over the RIIO-ED1 period. This is shown in **Figure 12** below, which demonstrates both the increase in LCTs and the particular impact of PV generation within this.

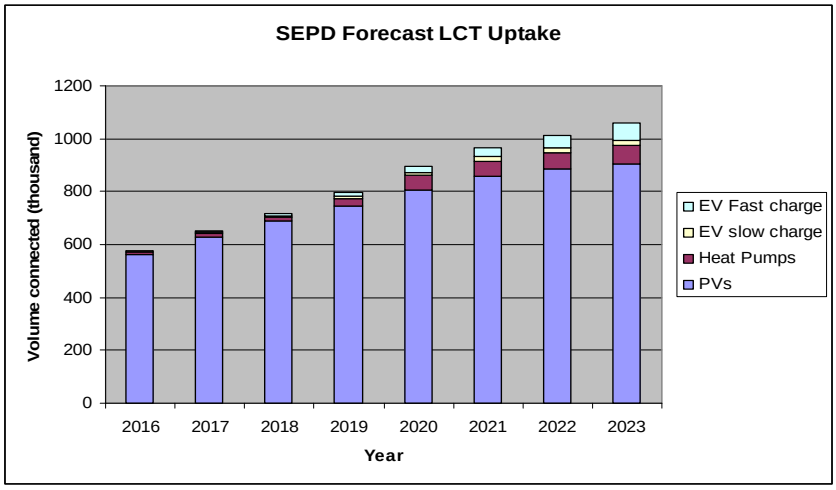
A key issue around the uptake of LCT which will naturally emerge during RIIO-ED1 will be the clustering of LCT technologies. A cluster, from the perspective of an electricity network operator, is where a particular group of customers in a defined geographical area make broadly the same decisions resulting in a concentration of a particular type of LCT. This clustering will have the effect, instead of evenly using headroom capacity across an entire network, of concentrating the issues on single points on that network which then more quickly require to be strengthened or reinforced.

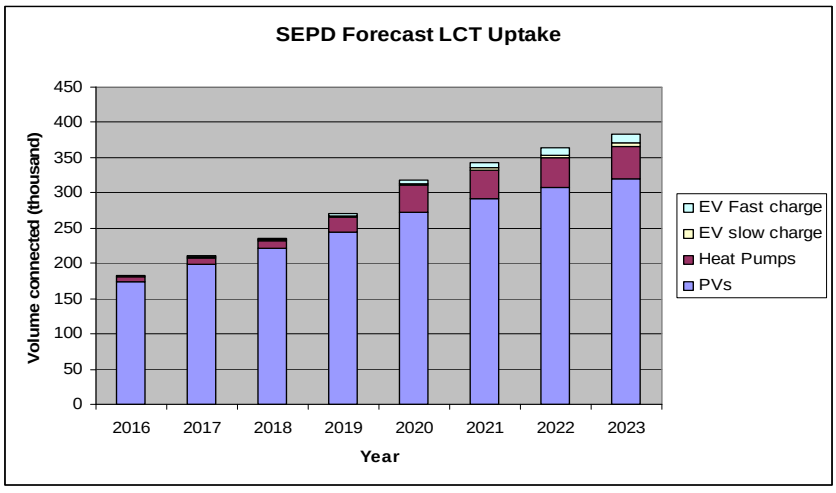
The principle of clustering is a recognised phenomenon we already experience, most recently with the uptake of micro generation such of photo-voltaic (PV) cells on similar housing stock in close proximity due to word-of-mouth between households with similar financial resource. However it is not clear exactly how clustering will emerge for LCT during RIIO-ED1 as many of the factors that drive this, such as government incentives, are beyond the control of a DNO. Again, to help with this going forward this is why monitoring (through smart metering and sensors) and modelling of behaviour has been made a theme of our Thames

Valley Vision Tier 2 Low Carbon Network Fund (LCNF) project (more details of which can be found in our paper entitled Making innovation happen.)

It is also possible that some LCTs will be added to existing premises without us being informed, potentially overloaded the local network and causing supply issues without the opportunity to take proactive action. We need to be prepared for this, and again this is why monitoring (through smart metering and sensors) and modelling of behaviour has been a theme of our Thames Valley Vision project (more details of which can be found in our paper entitled Making innovation happen.

Figure 12 Forecast LCT uptake for RIIO-ED1 by type





Ofgem's strategy decision set out that the costs associated with reinforcing our network to allow for our existing customers connecting additional LCTs to be socialised. We support this approach and discuss the impact of this on our costs in more detail later in the **Uptake of LCTs** section of this paper.

Smart Meters

The government has determined that smart meters should be installed in all homes and small businesses during the RIIO-ED1 price control period as part of our national programme to reduce CO_2 emissions. This will provide price and consumption data to customers and energy suppliers who, it is expected, will implement tariffs which vary depending on the time of day. As a result this will have an effect on the number and type of new connections we make in the future.

Smart meters will also provide demand information that will help us assess low-voltage network utilisation and review how to model low carbon technologies like electric vehicle charging, heat pumps and micro generation. How we will use this information is further explained in the **Our approach to connections** section of our paper below.

Our proposals

We have listened to our stakeholders and used this information, as well as our views on the impact of LCTs and smart meters on the number of connections we will see, to develop proposals for the RIIO-ED1 period. These proposals and our targets are set out in more detail below.

Our stakeholders have told us what is important to them when applying for their **minor connections**. The majority of the feedback that we have received is that our stakeholders would like to see an improvement in our website; an improvement in the content and accessibility of information available including a well trained team; and the assurance that their connections are provided quickly and at a low cost.

To ensure that we address our stakeholders' concerns, we have developed a comprehensive set of proposals.

Improved Information

In order to improve information to our **minor connections** customers we are committing to, as part of our RIIO-ED1 proposals:

- Reworking of the existing content on our website to improve usability.
- A smart on-line application form that directs the user through applying for a connection
- On-line payment for new connections work
- On-line project tracking from application through to delivery
- Expansion of our dedicated new connections call centre
- More training for all our connections staff including call centre, design and delivery teams.

We forecast that these improvements will cost us £3 million across the RIIO ED1 period. This will provide advanced systems including a continually improving web site and an increased and better trained headcount with a doubling of our connections customer service staff. This funding will be divided across our network (£1.2 million SHEPD, £1.8 million SEPD). Further details on improvements we are making to our overall Customer Service can be found in Listening to our customers and providing the service that they want.

In addition to these proposals, two of our 12 Commitments relate to improving information and making it easier for our customers to contact us:

Commitment 8 We want to make it easy for you to fill out a form by giving you the option of doing it online, by post, by phone or LiveChat .

Online 'LiveChat' and phone options will be available from 9am to 5pm Mon-Fri, excluding Bank Holidays. We may also ask you to post us a form where we need a signature for legal reasons.

Commitment 9 We'll keep on asking you how we could do better and publish a report every year on what we are doing about it.

Time to quote and time to connect

Our stakeholders have told us that the times taken for them to receive a quotation following their application, and to get a connection following their acceptance is very important to them.

We already deliver our Connections Guaranteed Standards of Performance 100% of the time (our 2012/13 final quarter GSoP performance) and have committed to continuing this level of delivery during the RIIO-ED1 period. However, the actual time to quote and time to connect that our customers see is a longer period than that set out in the GSoPs, because the GSoPs exclude any time in which we 'pause the clock', for example when we are waiting for information from you, to visit you on site or when your site is not ready to connect.

What you have told us is important to you, in addition to the GSoPs, is the absolute time taken from when you first apply for your connection to when we give you a quotation and from when you accept an offer to when we deliver it, and for us to reduce this, whatever the reason for delay.

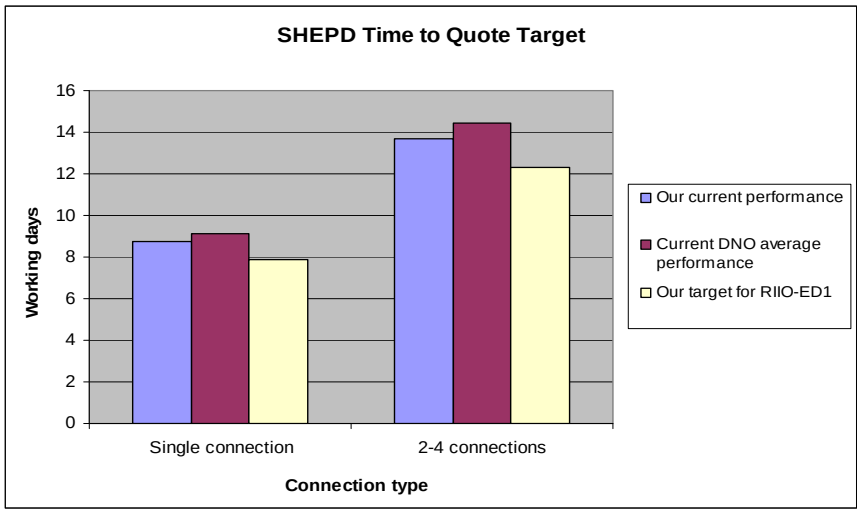
Benchmarking ourselves against other network operators for this average time to quote and time to connect we are comfortably delivering these more quickly than others, as can be seen in **Table 1** and **Figure 13** below. However, we recognise that improving these times is very important to our customers. We therefore commit, during RIIO ED1, to:

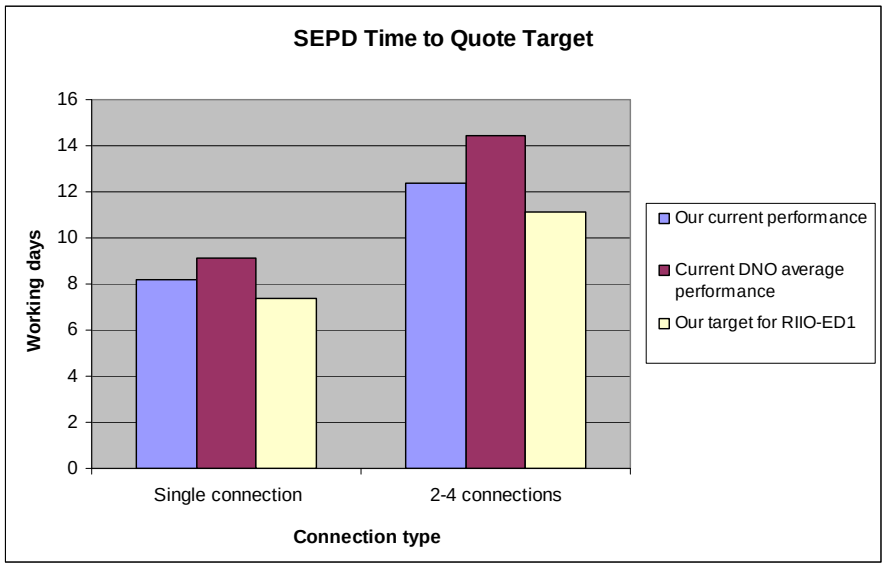
- Improve the average number of working days taken to provide a connection offer following receipt of a competent application by 10% from our current (2012/13) performance; and
- Improve the average number of working days taken to provide a connection following acceptance of a connection offer by 10% from our current (2012/13) performance

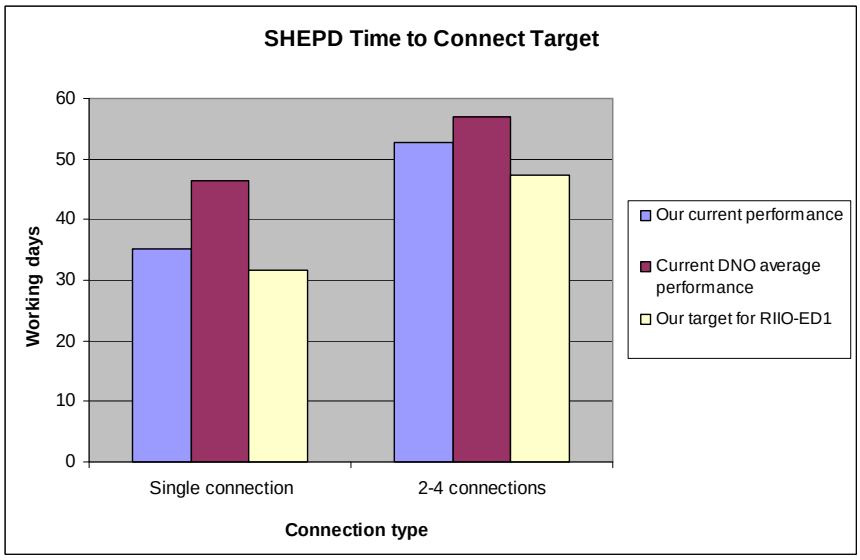
Figure 13 Our current and future commitments on time to connect and time to quote performance

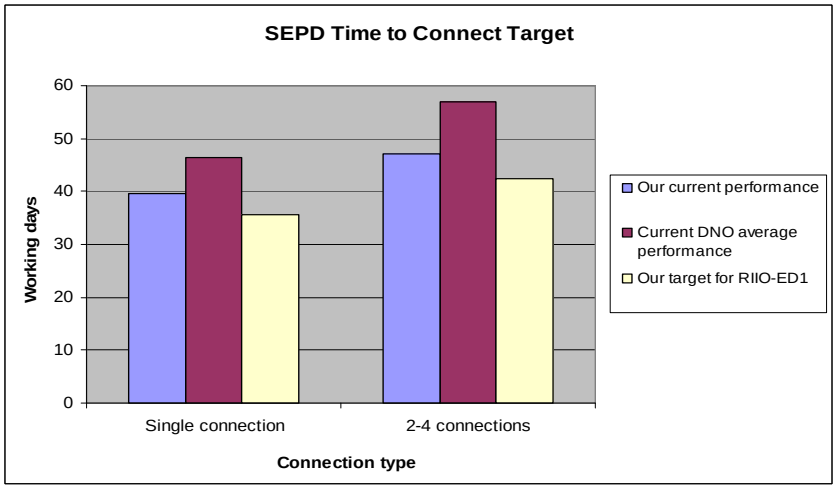
		Our current performance (working days)	Current all network operators average performance (working days)	Our Improved Performance Commitment (working days)
SHEPD				
Single Connection	Time to Quote	8.78	9.14	7.90
	Time to Connect	35.08	46.38	31.57
2 to 4 Connections	Time to Quote	13.7	14.46	12.33
	Time to Connect	52.71	57.01	47.44
SEPD				
Single Connection	Time to Quote	8.19	9.14	7.37
	Time to Connect	39.5	46.38	35.55
2 to 4 Connections	Time to Quote	12.37	14.46	11.13
	Time to Connect	47.19	57.01	42.47

Figure 14: Our targets for improvements in our time to quote and time to connect




SEPD Time to Quote Target
16
14
12
10
8
6
4
2
0
Working days
Single connection
2-4 connections
Connection type
Our current performance
Current DNO average performance
Our target for RIIO-ED1


SHEPD Time to Connect Target
60
50
40
30
20
10
0
Working days
Single connection
2-4 connections
Connection type
Our current performance
Current DNO average performance
Our target for RIIO-ED1


SEPD Time to Connect Target
60
50
40
30
20
10
0
Working days
Single connection
2-4 connections
Connection type
Our current performance
Current DNO average performance
Our target for RIIO-ED1

In order to achieve our time to quote and time to connect targets for new and upgraded **minor connections** projects, we are introducing a number of new practices and processes in RIIO-ED1.

We are going to pro-actively identify applicants unsure or unable to fully complete their application and ensure that our trained staff communicate with these customers at an early stage to offer advice and assistance.

We will also carry out site visits to some of our minor connection customers to provide a quotation 'on-the-spot', where we can and when you want us to.

We will also carry out routine follow-up calls and will extend mobile working practices to our delivery engineers to speed up delivery of connections projects

All of the above will be vital in ensuring that we meet our targets for the RIIO-ED1 period. We plan to absorb the costs for these improvements within the efficiency savings we foresee being able to achieve across our connections business. More details on how we manage efficiency now and our plans and commitments for the future are laid out in our associated paper, Be Efficient.

Forecast changes to future LV connections

Uptake of LCTs

In order to quantify the likely uptake of low carbon technology by our **minor connections** customers and its impact on our networks, we have actively engaged with other network operators in developing a software model through the Smart Grid Forum. This Transform™ model forms an integral part of our Business Plan as it has allowed us to quantify the uptake and impact and then model and consider alternative options to address LCT.

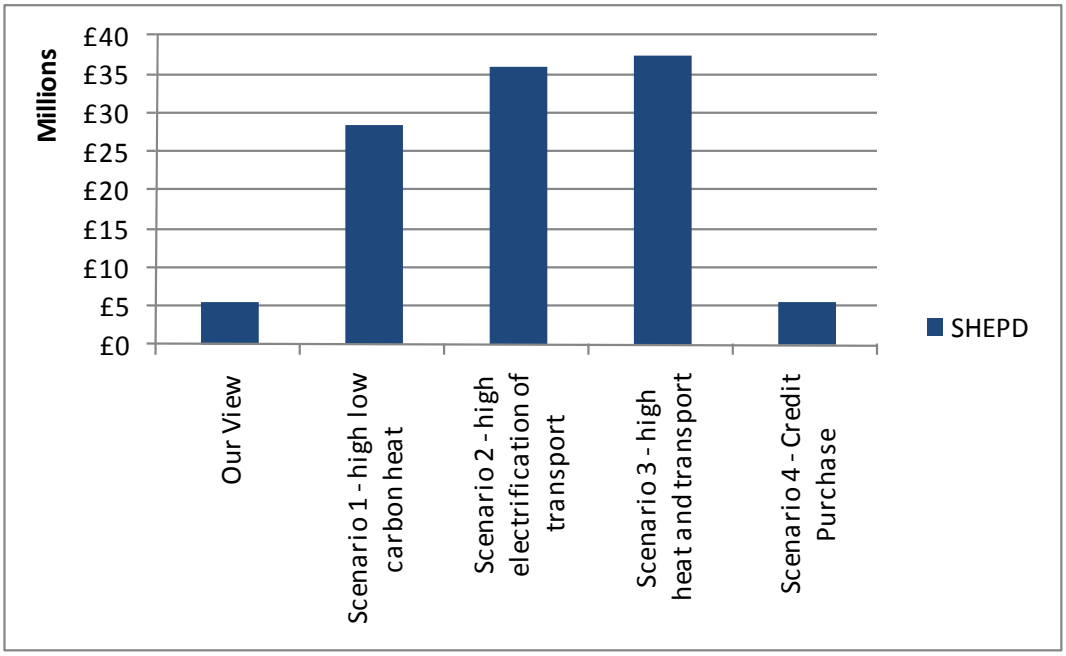
Produced for all network operators to use, Transform™ models our entire network and, using a number of representative networks, simulates the impact of different uptake of low carbon technologies. The model:

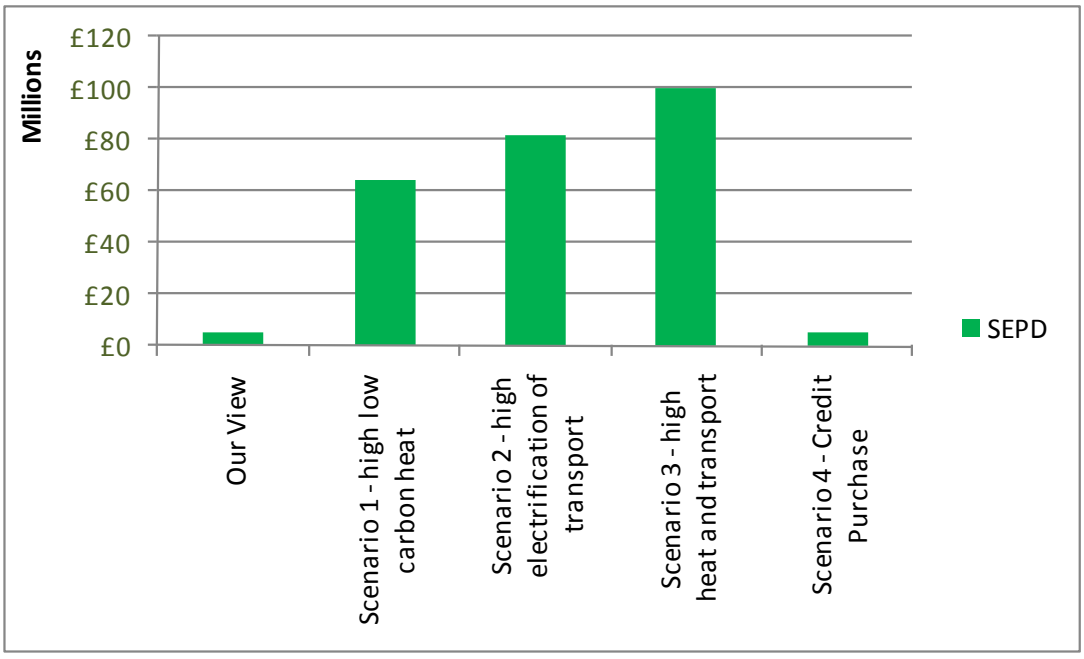
- determines the existing capacity of our networks;
- determines the change in this depending on different LCT uptake scenarios (based on DECC scenarios); and,
- predicts the point at which investment is required.

It then considers both conventional and innovative solutions, their likely impact and cost.

The high level results an incremental solution to the alternative DECC scenario are presented in **Figure 15** below.

Figure 15 Transform predicted costs over the RIIO-ED1 period for an incremental solution approach to the alternative DECC scenarios





DECC Scenarios:

- Scenario 1 – High low carbon heat
- Scenario 2 – High electrification of transport
- Scenario 3 – High Heat and transport
- Scenario 4 – Some uptake of heat and transport but with credit purchase to fulfil obligations

Currently in DPCR5, the level of uptake of LCT and the natural headroom capacity on our existing networks has meant that early adopters have generally been able to connect their new installations with little impact on the electricity network. Although the exception to this has been our more rural networks in the North of Scotland which were historically constructed at minimum cost with very little headroom capacity, these locations have benefited from the uptake of LCT for an element of domestic electricity supply, for example storage radiators and immersion heaters being replaced by electric heat pumps. We have also seen little or no uptake of electric vehicles or installation of micro PV in these areas. We see this pattern continuing through the RIIO ED1 period.

Having considered the alternative results quantified by this work together with our own experience, stakeholder views, knowledge of developer plans and local planning requirements we have come to an informed view of the likely uptake and costs required to connect LCT during RIIO-ED1. Our decision is based on a low LCT uptake (most closely aligned to DECC Scenario 4) with an approach that resolves issues wherever possible through incremental innovative solutions. We are committed to only spend money where absolutely necessary and to actively seek innovative solutions wherever possible. Not only does this most closely mirror our experience and knowledge but we believe it also reflects our commitment to prudent and efficient expenditure. Our forecast level of LCT over the RIIO-ED1 period is provided in **Figure 12**. **Figure 12** also shows the different types of LCT that we expect to see and it is clear that we expect Solar PV to be by far the highest contributor to the increase in LCTs.

Based on the above, we have built into our business plan an increased expenditure of £5.5 million in SHEPD and £5.6 million in SEPD during RIIO-ED1 in additional reinforcement costs to allow us to upgrade our network to ensure that we are able to accommodate new LCT connections. These costs will be recovered from all connected customers through DUoS charges.

This level of reinforcement expenditure is dependant on the application of innovative solutions. More details on how we will identify and develop these, together with the cost benefit analysis included in this, is laid out in our associated Innovation Strategy. Some examples of innovations ready for deployment in RIIO-ED1 for our low voltage networks are:

- The Esprit – a plug-in device which manages car charging on a low-voltage network to avoid overloading by co-ordinating when individual chargers are on/off.
- LV Regulator – a device installed on the low voltage network that automatically addresses high or low voltage issues in real time.

- Targeted LV Network Monitoring – measures utilisation of low-voltage network "hot-spots" to identify where intervention may be required to avoid overloading or unnecessary reinforcement.

This work is showcased in our Thames Valley Vision low carbon networks fund project. Here, in addition to trialling specific devices, we have installed extensive network monitoring to inform our proposals. This monitoring is in preparation for RIIO ED1 and will allow us to:

- Understand consumption behaviour to determine potential network issues
- Anticipate future changes to identify new network management requirements
- Support the necessary changes to network management through new technology and commercial solutions

Central to our innovation strategy is an Innovation matrix summarising the range of innovations we are considering, developing and evaluating. This matrix is aligned with each area of business expenditure including connections and clearly shows where we expect the principle benefits of each innovation to appear. This matrix also forms part of our associated Innovation Strategy.

We will continue to develop and apply these and other innovative solutions to ensure that all connections are provided by making use of innovative and flexible connections wherever available.

Socialisation of LCT Costs

We are supportive of Ofgem's decision to socialise costs for network reinforcements (by recovery these through DUoS charges) where this is necessary to accommodate retrofit of LCTs at existing domestic and small commercial premises. This not only underpins the broader national driver for LCT uptake but is something that our stakeholder engagement has also found wide support for.

We currently recover these costs from the relevant customer where we can accurately identify who this is. However, we will move to the approach of consistently recovering these costs through DUoS charges during RIIO ED1.

Our predictions are based on our existing experience of quotations issued and costs recovered together with output from the Transform™ models which show that the instances of required reinforcement due to uptake of LCT in existing homes will increase substantially through RIIO ED1.

As a result of the socialisation of the costs required to connect additional small scale LCTs to our existing domestic customers, we expect to require an addition £9m of general reinforcement funding in SHEPD and £11m in SEPD. These costs are included in our paper A reliable supply of electricity.

Finally, we are committed to minimising costs to our customers by looking at the longer term and the changes we can make now to allow us to make efficiency savings in the future. To minimise the substantial costs of changes to our network that will be required as a result of LCTs going forward, we plan to introduce

a change to the minimum design standards that we apply to all of the networks that we construct or adopt. We will update our minimum design requirement in each of our relevant connection offers in recognition that even if that connection does not involve an LCT, it is likely that in the future the customer may wish to adapt this connection, or a different customer may take over the property and wish to introduce LCTs. This means that in some cases we will avoid having carrying out further work on that part of the network to accommodate LCTs in the future. The marginal increase in assets is used solely to supply the connection customers and paid for in full by connecting customers and is included in the figures provided in Table CV17 of our Business Plan.

Smart Meter data

Under this government driven installation programme, the majority of homes and small businesses should benefit from smart meters during the RIIO-ED1 price control period. Data from smart metering has the potential to significantly enhance our understanding of how networks operate, especially our low voltage networks. This will become more important as loading on our networks increases as a result of customers adopting LCT.

It is important to appreciate that significant volumes of smart meters will need to be deployed before the data can be considered as useful. Normal access to smart metering data for network operators will not be available until the data capture and management systems go live while the majority of smart meters may not be available until late in RIIO ED1. It is also important to recognise that there will be a charge for data, so we need to demonstrate that the use of data from smart meters delivers a net benefit to our business. It therefore follows that prior to deployment of any systems using smart metering data there needs to be a proven need and that system development and operating costs need to stand up to rigorous scrutiny.

Taking into account the above concerns, and given the recently announced delay to the roll-out, we do not expect to see any benefits of smart meter data until RIIO-ED2. However, as soon as this data becomes available we plan to use it to achieve improvements in costs and customer service in a number of areas associated with **minor connections**. These will:

- Speed up our quotation and connections processes through accurate network information about existing connections.
- Minimise design requirements, reducing connections costs where possible for new **minor connections** through new tools to assist our planners in designing the minimum connection.
- Reduce the requirement for reinforcement to upgrade existing connections through the use of up-to-date and more detailed existing network utilisation.
- Identify, focus on and manage existing loads like space and water heating using smart meter data to minimise the requirement to reinforce low voltage networks where they become overloaded.

Targets for the RIIO-ED1 period

Having considered the above drivers and options for **minor connections**, we have set SSEPD the following targets for the RIIO ED1 period, with costs and measures of success described in **Figure 16** below.

Figure 16 Summary of our targets and costs for minor connections for the RIIO-ED1 period

Our target	What we are going to do
Improve our customer service	Improve our website – online application, online payment and online project tracking. Expand our dedicated connections and engineering teams
Improve our Time to Connect and Time to Quote performance	Improve our average number of working days taken to provide a connection offer and to provide a connection by 10% (based on our 2012/13 performance)
Allow for the connection of emerging LCTs	Fund the network impact of the uptake of LCTs through innovative solutions. Minimised costs for existing customers who adopt LCTs.
Annual Connections Report	We will keep our customers informed on our performance against all of the above targets in an Annual Connections Report.

Risks and uncertainties

Despite significant forecasting work including engagement with key developers and extensive modelling, there inevitably remains a degree of uncertainty around our forecast level of **minor connections** during RIIO ED1.

In particular, despite all of the modelling work detailed above, there remains some uncertainty around the volume, location and clustering of the likely LCT uptake. There is also the possibility that other connection technologies may emerge during the 8 year period that we have not considered in or plans.

Our strategy and proposals for minor connections recognise the high level of uncertainty over the likely investment required in RIIO-ED1 to accommodate new and changing patterns of electricity use. In particular, we have identified in our paper Efficiently managing risk. that if we do see an unexpectedly high level of minor connections over the RIIO-ED1 period, in combination with other variations from our forecast, then we may require the use of the Load Related Expenditure reopener.

With regard to our plans for innovative solutions, there is always a level of uncertainty when rolling our innovative solutions that we may encounter issues that we had not expected or that customers may not welcome the application of innovative techniques to the extent that we expect. Our teams are set up to be as flexible as possible in terms of innovation and we are committed to working with our customers to ensure that we explain the benefits of innovative techniques. More details on our proposals for innovation can be found in our Innovation Strategy.

Requirements under our electricity distribution licence

In addition to our licence obligations (detailed in

Appendix A - Our obligations), Ofgem published its Strategy decision for RIIO-ED1 setting out policy to apply to connections. Obligations around **minor connections** including existing licence obligations include:

- Licence Conditions to ensure that we meet certain standards of service when providing quotations and works, and Guaranteed Standards of Performance for connections governing timescales for providing quotations, contacting the customer to arrange a schedule of works, and completing the connection.
- The Quotation Accuracy Scheme which allows **minor connections** customers to challenge the quotation price.
- The Broad Measure of Customer Satisfaction for **minor connections** customers which incentivises network operators to focus on customer service, increase stakeholder engagement and reduce the number of complaints received.

Additionally for **minor connections** customers, Ofgem plan to introduce a new Time to Connect incentive to reduce the time that a customer waits for their connection to be completed.

Figure 17 below summarises Ofgem's proposed incentives for **minor connections** customer and the potential reward / penalty level for each.

Figure 17 Proposed RIIO-ED1 incentives for minor connection customers

Scope	Incentive/ Measure	Maximum reward exposure (per cent of base revenue)	Maximum penalty exposure (per cent of base revenue)
All connections customers	Guaranteed Standards of Performance (GSOP) (minimum service level)	None	0/As per GSOP payment value
Minor connections customers	Broad Measure of Customer Satisfaction survey	+0.5	-0.5
Minor connections customers	Average Time to Connect incentive	+0.4	0
Total Penalties/Rewards		+0.9	-0.5

We fully support these proposals as they are broadly consistent with the views of our stakeholders and our proposed approach as detailed above. Rather than driving us to change our strategy, these incentives have reinforced to us that service to our customers needs to continue to be a significant focus for us during RIIO-ED1.

Conclusion: our targets, commitments and costs

Our commitment to our **minor connections** customers is to make sure we are ready and able to provide for their changing requirements in a safe, timely and cost effective manner. **Figure 18** summarises our targets, commitments and costs for minor connections for RIIO-ED1.

Figure 18 Summary of our targets for RIIO-ED1 for minor connections

Our target	What we are going to do	How much this will cost us during RIIO-ED1	
		SHEPD	SEPD
Improve our customer service	Improve our website – online application, online payment and online project tracking.	£0.4m	£0.6m
	Expand our dedicated connections and engineering teams	£0.8m	£1.2m
Improve our Time to Connect and Time to Quote performance	Improve our average number of working days taken to provide a connection offer and to provide a connection by 10% (based on our 2012/13 performance)	£0	£0
Allow for the connection of emerging LCTs	Fund the network impact of the uptake of LCTs through innovative solutions.	£5.5m	£5.6m
	Minimised costs for existing customers who adopt LCTs.	£9m (reliability expenditure)	£11m (reliability expenditure)
Annual Connections Report	We will keep our customers informed on our performance against all of the above targets in an Annual Connections Report.	£0	£0
Total cost for RIIO-ED1		**£15.7m**	**£18.4m**
Average annual allowance		**£2m**	**£2.3m**

In addition to these targets, three of our 12 Commitments relate to all of our connections' customers:

Commitment 7 If you apply for an electricity connection and a team member has not been in touch within three working days then we will pay you £20.

Commitment 8 We want to make it easy for you to fill out a form by giving you the option of doing it online, by post, by phone or LiveChat.

Commitment 9 We'll keep asking you how we could do better and publish a report every year on what we're doing about it.

Scottish and Southern Energy Power Distribution

Part 3

Major connections

What's in this section

This section is specifically about those **major connections** that both SSEPD and others can provide in an open competitive market, the challenges we face and the plans we are putting into place to ensure that we facilitate competition in this market and that make these connections in a safe, timely and cost effective manner. This section includes:

- Our obligations
- Our historic approach and performance in connections;
- Drivers for change in connections including our stakeholders views;
- Our approach to these
- The targets we have set ourselves together with our commitments and their costs
- The uncertainties around this

Major Connections include all new connections or alteration to existing with more than 4 connections provided, as well as any project where the work involved is above low voltage (i.e. more than 1000 volts). These are commonly, for example, a domestic housing, retail, commercial or industrial project with more than 4 low voltage connections, a generator, unmetered (street lighting) connections or any mix of the above. These connections can be provided by us or by Independent Connection Providers (ICPs) in an open and competitive market.

Historically, all connections to our networks were our responsibility as the network operator within our licence areas. Following the introduction of competition into the connections market, independent companies are now also able to provide many connections.

Regardless of whether connections are provided by ourselves or alternative providers, as the network operator the responsibility to ensure there is enough capacity to safely operate and maintain the existing network and the new connection remains with us.

For these customers we plan to deliver:

Our **objective** is…to promote an open and competitive market by providing new or modified connections in a safe, timely, efficient and innovative way.

During the RIIO-ED1 period our **targets** are…

Major connections	Improved information provision to our major connections customers including heat maps on our website. A named Major Connections Account Manager for every major connection. An Annual Workplan on how we will continue to promote an open and competitive market.

Our obligations

DNOs are regulated by primary legislation and licence obligations. The most important of these, from a connections perspective, are summarised below but with more detail in

Appendix A - Our obligations**.**

- The Electricity Act (1989): with its Duty to Connect
- The Standard Conditions of the Act: requiring us to Offer Terms to connect and not to act in a discriminatory manner.
- The Electricity (Connection Standards of Performance Regulations 2010): with minimum timeframes around connections tasks and financial penalties.
- The Electricity (Unmetered Supply) Regulations 2001: which govern unmetered connections
- 15a.16 Of Standard Condition 15a (Connection Policy And Connection Performance) Of The Electricity Distribution Licence :extending minimum timeframes and financial penalties to Distributed Generation

These regulations provide the minimum standards we are required to follow. We believe we should always aim to improve on these wherever possible and explore innovative ways to address what are new and emerging challenges.

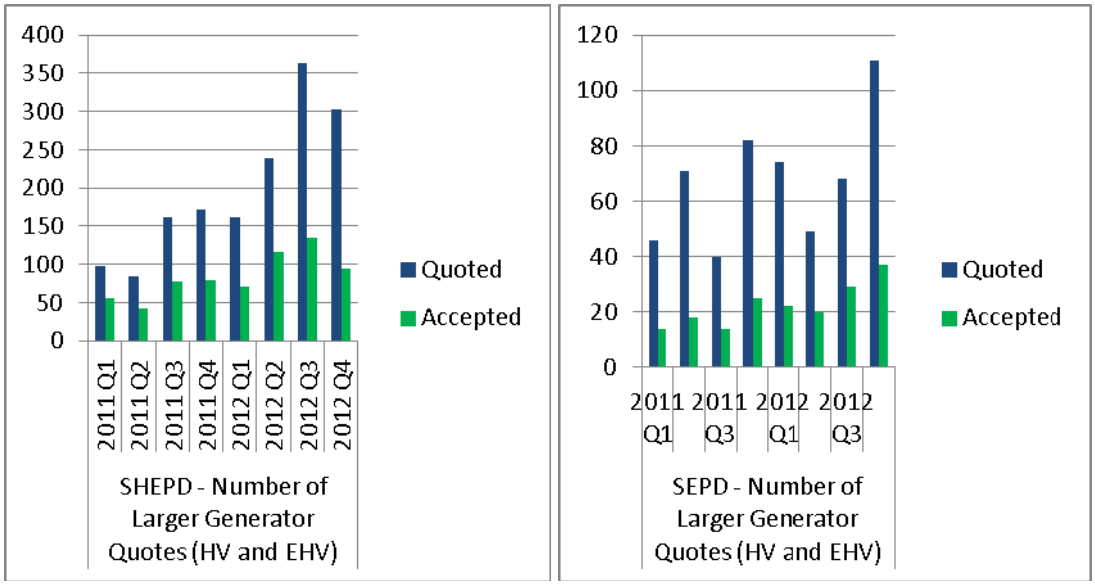
Historical approach and performance

We help to connect hundreds of major connections to our network every year. In the existing price control, DPCR5 (2010 – 2015), we forecast a level of **major connections** over the period of the price control and proposed an expenditure level and final loading that corresponded with the proposed investment level. This did not include expenditure for connecting embedded renewable generation.

For DPCR5, capital expenditure related to connecting large scale embedded renewable generation (DG) was funded through the DG Incentive mechanism and not through the price control.

Figure 19 Number of large scale embedded generation quotations 2011-12shows the number of large generators we have quoted for a connection to our network in 2011 and 2012.

Figure 19 Number of large scale embedded generation quotations 2011-12



We constantly monitor our higher voltage networks using data from our control and monitoring locations to ensure that there is no risk of overloading. Where we need to, we take safe action to avoid overloading, and to ensure that we maintain sufficient spare capacity so that we can transfer additional load following a fault or for routine work if required.

SSEPD has long been an advocate of the role of competition in the energy sector. As well as holding two electricity distribution licences, we are unique in being the licence holder that is also an active network operator outside of our own licensed areas. That is, we own and operate smaller, discrete networks that are connected to the other DNO's networks. We now own and operate over 200 electrical networks across the length and breadth of United Kingdom.

We have also worked hard over the past years to put in place the necessary processes to support alternative providers in our licensed areas. Our competition in connections processes and procedures are readily available to both customers and service providers. We promote these through our website and as part of every quotation we issue. We allow straightforward access for alternative service providers, whilst ensuring the safe operation of our networks and that a high level of customer service is maintained.

Over the last few years, as illustrated in **Figure 3**, we have witnessed the growing number and flourishing nature of alternative providers across all of our **major connections** customer throughout our area, providing compelling evidence of the existence of an open competitive market in **major connections**.

However a significant proportion of **major connections** remain with us to provide. As a result of our stakeholder engagement and in an effort to ensure that customers are making an informed choice our RIIO

ED1 proposals will address this by making a number of commitments going forward to encourage this choice, ensuring the benefits of an open competitive market for all **major connections** customers.

Drivers for change

There are two broad drivers for change in the way we approach **major connections** in the RIIO-ED1 period:

- The view of our stakeholders on how we can improve including how we can further facilitate an open, competitive market; and
- The growth of large scale embedded renewable generation.

These drivers for change are detailed further below.

Stakeholders' views and competition

We have carried out an extensive programme of stakeholder engagement to allow us to develop our Business Plan base on the views of our stakeholders. Our papers entitled What you said: Report on stakeholder engagement and What our Stakeholders Think set out what we have done and what our stakeholders have said in detail. Their input has been invaluable in informing our decision making, including feedback on the alternative options we have considered. Overall, by engaging with a wide range of stakeholders over the RIIO-ED1 process, we have found that stakeholders' views are a very real driver for change in themselves.

Our **major connections** customers have told us that they want:

- Better information and easier access to the people they needed to speak to

  Overall, 83% of you said you are supportive (very supportive, 50%: supportive, 33%) of us providing a better web-based process for applying and monitoring customer projects.

  All major connections customers that we spoke to asked about SSEPD's online application process. All major connections customers consulted said they would like to be able to access the following on SSEPD's website: network information and indicative costs, application forms, acceptance and payment, project progress, project progress, designer/engineer contact details and base information.

"I make numerous G83/G59 requests for PV inverter connections to the network. It would be really useful if there was a system that would allow me to see capacity/capability in the system without having to submit the forms and wait 10 days for a response. But understand that this is a massive task for very little financial return."

Response to our focus groups, interviews and events

- The guarantee of competitive pricing through both benchmarking and helping our customers get alternative prices to be able to compare

All major connections customers taking part in the consultation believed that SSEPD should provide quotations with separate quotes for both the costs for competitive works; and the element that SSEPD have to do.

- The choice of innovative and flexible connections that reduce connection time and cost

  Approximately 2 out of 3 customers and stakeholders consulted (67%) said they are interested in developing schemes wherein return for a faster, cheaper connection they may occasionally have to stop generating.

- New technology to make more network capacity available

  "The revolution in energy supply and changes required in energy use will alter the supply and demand dynamics, shift excesses and shortfalls to different time periods and due to different scenarios. System flexibility to be able to cape with such changes will also be important. This priority will help to meet Government targets on renewable energy, as well as assisting consumers"

  Response to November consultation

- Early reinforcement for possible future connections but where it is not eventually required not to bear any financial risk.

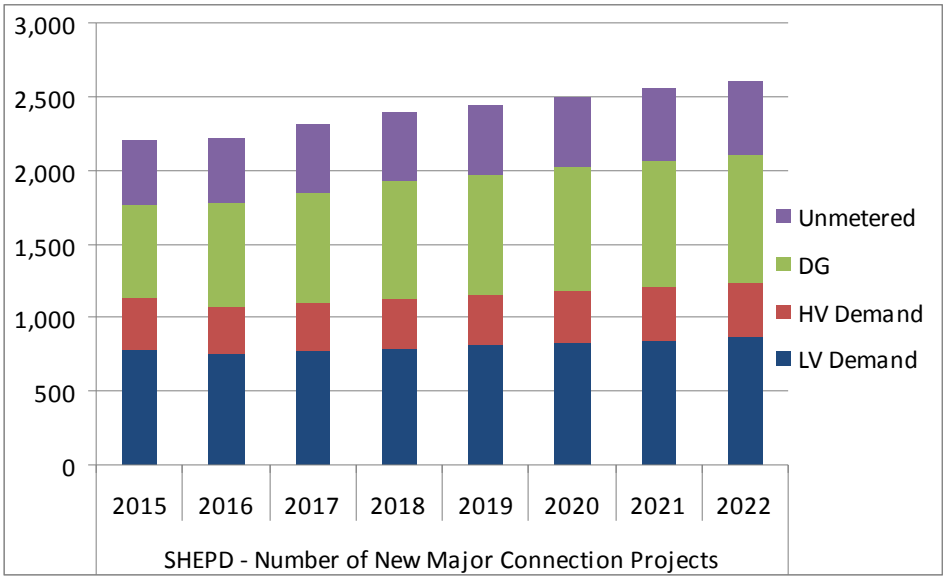
  Given the proposal that we reinforce ahead of need in areas likely to see renewable generation, the majority were supportive (very supportive, 17%; supportive, 50%), with the remainder 'not very supportive'.

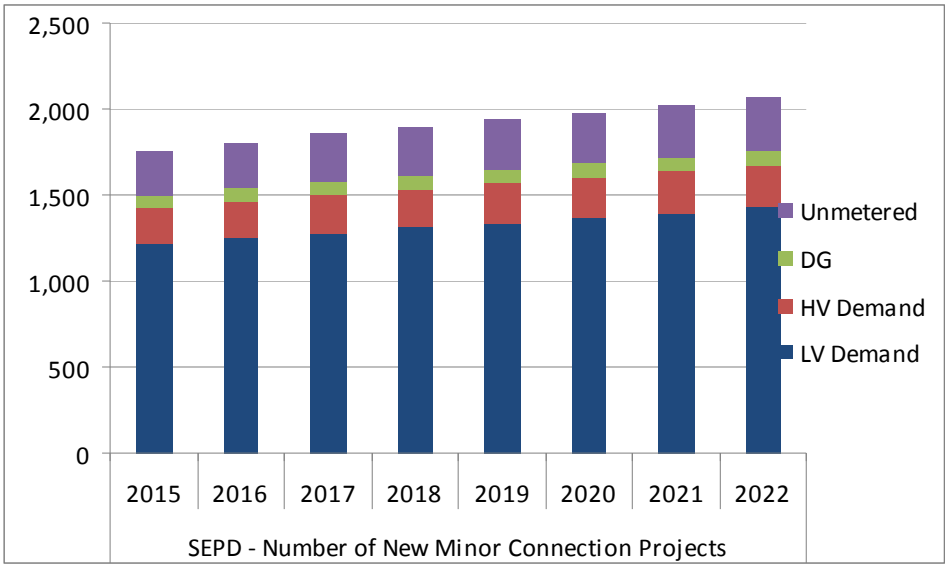
  82% of major and minor connections customers participating in the groups would like SSEPD to prioritise network upgrades where it is expected that there will be lots of large renewable technologies connecting.

Large scale embedded renewable generation (DG)

Figure 20 below shows the different elements that make up our overall forecast for major connections for RIIO-ED1.

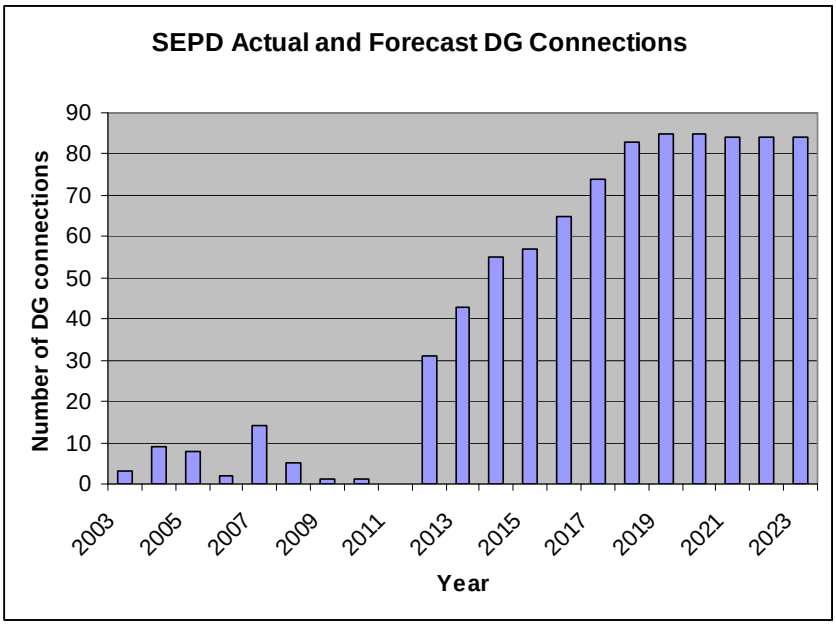
Figure 20 Charts showing our RIIO-ED1 forecast for the number of major connections by connection type

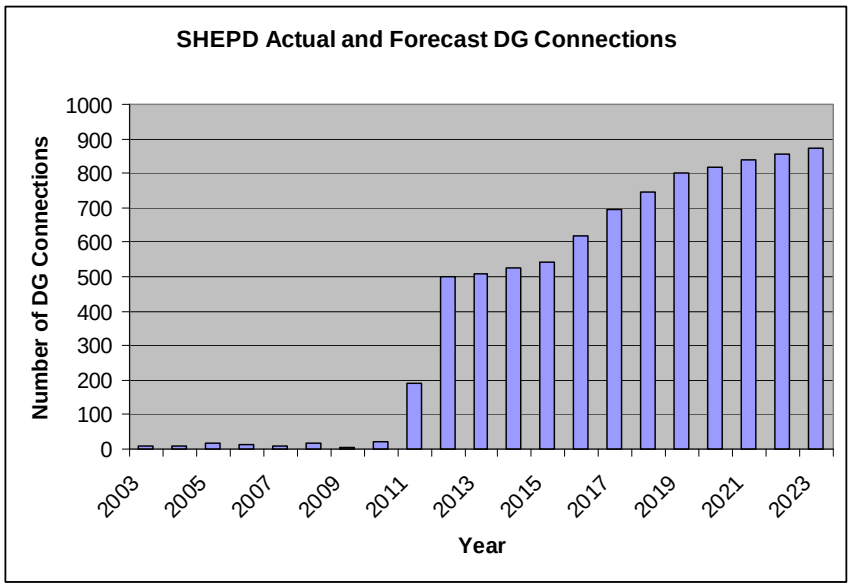




Within this forecast we expect to see the number of large scale embedded renewable generation increasing hugely over the RIIO-ED1 period, as shown in **Figure 21** below. This is mainly driven by government incentives such as the Feed in Tariff scheme, but also reflects the reduced cost of construction and installation and less resistance to achieving planning consents. Further information on our forecasts and assumptions can be found in our paper, A reliable network.

Figure 21 Charts showing actual and forecast DG connections





In our SHEPD area we continue to see very high levels of generation connection applications, particularly windfarms, to our networks and this is in turn is driving major upgrades and alteration to our HV and EHV network to accommodate this additional capacity. Many of our networks have now run out of capacity and require reinforcement to allow more DG to connect.

In our SEPD area, we have also seen a recent increase in the number of large photo-voltaic generation (PV) farms looking to connect to our networks. Typically these may be in the order of 5 to10 MW and will usually connect to our EHV networks. So far this has been accommodated with minimal reinforcements, however it is unlikely that this will continue as many of our networks are also now at capacity and will require reinforcement during the RIIO ED1 period to meet this growth.

In our SHEPD area, the very large volume of renewable generation connections is now driving major upgrades to the transmission network (the extra-high voltage network that SHEPD connect into).

In the same way as distribution network operators require to invest, the owner of the transmission network (SHE Transmission plc) has an obligation to reinforce its infrastructure to accommodate this increased generation. Historically this investment only required to be financially underwritten by larger embedded generators (>10MW). However in April 2013 industry wide rules were introduced to address concerns that unnecessary costs may be borne by others if a generator were to withdraw or reduce their capacity requirements after transmission works have already begun. To address this, Connections and Use of System Code modification 192 (CMP192) was introduced requiring all generators irrespective of size to underwrite any transmission reinforcement required to connect them.

SHEPD is currently absorbing this increased risk for the generators affected by this change. However, as a DNO we need to consider how we can best serve the interests of both generators and all our stakeholders. We must therefore consider all the available options to address this increased risk. We may:

- Seek to remove the existing policy and make small embedded generators fully liable for any costs incurred as a result of their actions
- Continue with the existing policy safeguarding the interest of generators to the detriment of wider customers
- Seek to establish a regulatory revenue recovery mechanism within 'ED1' in the event of generator default.

We have not yet come to a decision on this; however these options and their likely impact during RIIO ED1 are discussed further in our attached CMP192 paper.

Our approach

Our approach in addressing these two broad drivers for change for **major connections**, provided by SSEPD and others in an open competitive, is outlined below.

Addressing our stakeholders' views and competition

All our commitments have an underlying theme of an open and competitive market. We understand that opening the market to competition will be highly beneficial to customers, ensuring that their connections are delivered in a safe, timely and cost effective manner. Therefore, we are committed to facilitating an open and competitive market.

Our stakeholders have told us what is important to them when applying for their **major connections**. The majority of the feedback that we have received is that our stakeholders would like to see improvements in the content and accessibility of information available thorough our website and a well trained team; assurance that they are receiving the highest service and lowest costs through help to access an open

competitive market; stakeholder engagement that assures them we will address their issues as they arise through a visible workplan; and early connections.

To ensure that we address our stakeholders' concerns, we have developed a comprehensive set of proposals.

Improved Information

In order to improve information to our **major connections** customers we are committing to, as part of our RIIO ED1 proposals:

- Better information through further and continued improvement to our website – this will include better technical information and expanded heat maps showing where our network has capacity and where our network is full unless we reinforce it.
- All major connections' customers will be given a named Major Connections Account Manager who will work with the customer throughout the connection process from application to the completion of the connection.
- Assisting customers in identifying an alternative provider to do the remaining work when they prefer to do so.

We expect that making these improvements in our information provision will cost £4.88m across both of our network areas. This includes a doubling in size of our expert technical staff. A break down of this cost is provided in **Figure 25**. More details on how we manage, monitor and deliver connections customer service now and our plans and commitments for the future are also laid out in our paper entitled Listening to our customers and providing the service that they want.

Major connections workplans

We recognise that engagement with our stakeholders is important to them and so paramount in providing excellent customer service. Ofgem have set out relevant and stretching performance indicators in this area. These require that we development and submit action workplans, agreed with our stakeholders and reviewed at least annually to show evidence of progress.

We have three major connections customer groups:

- Demand Connections
- Distributed Generation Connections (LV, HV and EHV)
- Unmetered Connections (Local Authority Street lighting, road signs etc.)

In order to deliver our workplans for these we plan to identify, with each stakeholder group, their issues ensuring we fully understand them. We will then develop and agree a set of challenging targets. Having agreed these, we will deliver on these commitments with a quarterly update of progress. Following delivery, we will report back to customers and receive feedback. This feedback will inform our next set of targets. This process is illustrated in **Figure 22**.

Figure 22 Summary of process for improving our service to major customers

We have already applied this approach to customer service with our Distributed Generation stakeholders with our first workplan developed and agreed in the autumn of 2012. Having now delivered the first quarterly review, we are encouraged by stakeholders who gave positive feedback on progress. We will carry out a second workplan update in August 2013 and hold an annual meeting with our DG stakeholders October 2013 to review performance and set the targets for next year.

Our commitment in our business plan for RIIO ED1 is to duplicating this process with all our **major connections** stakeholder groups, starting with the roll-out of this to unmetered stakeholders in the autumn of 2013. We will do this at no extra cost to our customers.

Connecting large scale embedded renewable generation

As detailed in **Figure 7**, we will continue to see very high levels of generation connection applications into RIIO ED1 with a substantial requirement to reinforce networks that have now run out of capacity to allow more DG to connect.

As part of our business plan we have identified 21 EHV networks in our SHEPD area which have little or no capacity left and will require reinforcement in the ED1 period if more generation is to connect. Details of these are included in our Distributed Generation General Reinforcement Supporting Paper. In our SEPD area a number of our networks are also now at capacity and will require reinforcement during the ED1 period.

We believe that meeting our **major connections** customer objectives for RIIO ED1 and in particular allowing the timely and cost-effective connection of renewable generation will require an innovative approach to avoid extensive and costly conventional reinforcement. We are committed to only spend money where absolutely necessary and to actively seek innovative solutions wherever possible. More details on how we identify and

develop these solutions together with the cost benefit analysis included in this are laid out in our associated Innovation Strategy. Some examples of innovations ready for deployment in RIIO ED1 for our **major connections** customers are listed below:

- Active Network Management – monitors generation output, electrical demand and ratings of equipment to manage loading conditions in real time and avoid the need for costly reinforcement.
- Compensators and Regulators – devices that manage voltage and power flows, increasing the capacity for generation connections to existing networks without reinforcement, allowing generators to connect more quickly and at lower cost.
- Flexible Connection Arrangements – contractual arrangements that have built in flexibility to restrict generation or load to time-slots to maximise network utilisation to avoid reinforcement.

Central to our innovation strategy is an Innovation matrix summarising the range of innovations we are considering, developing and evaluating. This matrix is aligned with each area of business expenditure including connections and our RIIO outputs and clearly shows where we expect the principle benefits of each innovation to appear. This matrix forms part of our associated Innovation Strategy.

We will continue to apply these and other innovative solutions to ensure that all connections are provided by making use of innovative and flexible connections wherever available.

Combining our predictions on the likely levels of generation connection applications, impact on our network capacity and our proposals built on innovative connection arrangements, we forecast that delivering these **major connections** will increase the DUoS element of connections driven reinforcement from a predicted £9.5 million to connect 88 generation projects during DPCR5 to £25 million to connect 306 generation projects over the RIIO ED1 period in our SHEPD area. In our SEPD area the equivalent effect will increase the DUoS element of connections driven reinforcement from a predicted £0.5 million to connect 51 generation projects during DPCR5 to £4.1 million to connect 161 generation projects over the RIIO ED1 period.

Early reinforcement

Through RIIO ED1 and beyond we anticipate increasing use of our electricity networks which will inevitably result in parts of our network reaching capacity and a step-change in reinforcement requirements. We believe we should exceed customer's expectations, and benefit our emissions targets, by reinforcing our network at an earlier stage and minimising delays with connections in such situations. In practise, this would mean that when we are carrying our reinforcement work for a connection, we could install higher capacity equipment than required for that connection such that we are readying that section of our network for future customers that may wish to connect.

The primary driver for early reinforcement is for safety and reliability. It could also reduce the time a customer has to wait for connection, which is most significant for our higher voltage networks because of the lead time for new equipment and the greater complexity of these networks.

Early reinforcement for both our large scale embedded renewable generators and industrial and commercial connections such as data centres is an important issue for many of our stakeholders, highlighted through stakeholder events such as London First and Ofgem's DG Fora. Not only is it an issue for connecting parties, but also for local authorities and regional development.

There are a number of ways in which early reinforcement could be carried out and funded. We consider that a set of criteria would need to be established that would be required to be met before we would consider early reinforcement. These would include:

- Networks where only limited spare capacity currently exists;
- Higher-voltage situations where reinforcement would take extended periods; and
- Locations with genuine customer enquiries, including at least one customer having accepted a quotation to connect, indicating a large potential increase in demand or generation backed up by other robust intelligence, e.g. local Development Plans.

There are then options to be considered as to who should fund the early reinforcement. DUoS customers could fund the early reinforcement, and bear the risk of the cost of these assets if the extra capacity is not subsequently used (although this risk could be minimised by ensuring we have a robust process in place whereby we only carry out the reinforcement when we are assured that the capacity would be utilised). The alternative is that DNOs could fund the early reinforcement, with DUoS customers picking up the costs if the capacity is subsequently used.

Early reinforcement is not something that we can progress on our own as, whichever of the options we look at, a number of licence and code changes would need to be made. We therefore suggest that an industry working group is set up to look at progressing with the necessary licence and code changes during the course of RIIO-ED1.

In the meantime we will be progressing with an alternative consortium option for early reinforcement. This will involve proactively identifying likely large reinforcements on our network and assisting groups of developers to enter into consortia to minimise their time to connect and potentially reduce their costs. We would be able to offer the option of securing future capacity requirements which could be an attractive option for our **major connections** customers.

Targets for the RIIO-ED1 period

Having considered the above drivers and options for major connections, we have set ourselves the following targets for the RIIO ED1 period, with costs and measures of success described in **Figure 23** below.

A more detailed annual breakdown can be seen in further detail in our data tables.

Figure 23 Our targets for RIIO-ED1 for our major connection customers

Our target	What we are going to do
Improve our information provision	Improved website - better technical information and expanded “heat maps” together with the expansion of a dedicated major connections contracts team. The wider role out of Account Managers and Portfolio management for our major customers. Provide support in appointing alternative providers to major customers.
Connect large scale embedded renewable generation	The timely and cost-effective connection of renewable generation.
Major Connections Workplan	Publish an Annual Major Connections Workplan setting out what we will do each year to further promote an open and competitive market.

Risks and uncertainties

There are a number of risks and uncertainties associated with the assumptions that we have used in calculating the volume and costs of new **major connections** in our business plan. These are explained, and quantified where appropriate, in this section.

We have made a number of assumptions around the economic growth over the period, validated by external sources, but there is a risk that the reality will differ from our current forecast. This is something that we will keep track of and we will adapt our plans accordingly, allocating the appropriate level of resource required to deliver all our connections in a safe, timely, efficient and innovative way whatever the volume as it is our licence obligation to do. Our Efficiently financing our plan sets our in more detail the financial assumptions that we have made.

There could be changes in government policy or incentives over the 8 years that produce a major change in network usage, particularly around large scale renewable generation, that we have not accounted for in our forecasts. We have seen a similar issue with the Feed In Tariff scheme in DPCR5. The Government scheme led to an initial peak and a subsequent trough in connections as incentives reduced. If similar events occurred during RIIO ED1 these could have significant impact on our networks.

For DPCR5, the reinforcement costs for making capacity available for large embedded renewable generation are funded through the DG incentive mechanism and not through the “core” price control allowance. The basic elements of the DG incentive accommodate a high level of uncertainty, as the reinforcement costs are

passed on to generators through generation use of system charges and can also flex with volumes of DG connections.

However, during RIIO ED1, as it becomes increasingly difficult to separate load and generation schemes they will form part of a single load related expenditure allowance passed on through DUoS charges as part of the core price control allowance, which means it is more important than ever to make our forecasts as accurate as possible.

Similarly there is a risk that the existing network capacity is fully backed off by growth of large scale embedded renewable generation and then small generation cannot connect without reinforcement. Whilst we have forecast the growth in renewables in our area as accurately as we can there is a risk that a significant number of these will wish to connect to our weakest networks in our most remote areas.

Our Efficiently managing risk paper explains the Load Related Expenditure reopener that we are able to use if the number of connections that we see over the RIIO-ED1 period is significantly different to our forecasts.

Large scale embedded renewable generation projects are, by their very nature, uncertain and outside of our control. The driver for this type of investment is the facilitation of the connection of third parties' projects, which can be subject to a wide range of factors that are outside of our control. In addition to their financial viability and fluctuation of markets and tariffs, examples of other factors include discovery of protected flora / fauna; archaeological concerns; delays in obtaining planning consents; challenges in securing site access; and poor weather. These factors are not exclusive and do, on occasion, combine to make projects particularly challenging to deliver.

Many of our new large renewable connections rely on the completion of significant work on the Transmission system. The timing of these transmission works can have a significant effect on the delivery of connection projects both from a customer's perspective and from ours. We will continue to work hard to minimise this impact.

Innovation is key to our Business Plan and to ensuring that we work as efficiently as possible. This is particularly important for new connections where there are many options that we can explore that may allow us to avoid some reinforcement work. However there is a risk that innovative solutions may not develop as forecast in our business plan or may not provide the solutions that we expect. The success of our many of our innovations rely on customer participation and in some cases changes in behaviour. We will continue to work with our customers to explain the benefits that these innovative measures can bring.

There may be new obligations placed on us through our Electricity Distribution Licence, driven by new technical requirements at UK level or through the European Codes. This may have an impact on our required investment levels.

Our strategy and proposals in our business plan for **major connections** recognise the very high level of uncertainty over the likely investment required in RIIO-ED1 to accommodate new and changing patterns of electricity use. More information on how we view and intend to manage uncertainty and any potential reopeners is detailed in our Efficiently managing risk paper.

Requirements under our electricity distribution licence

In addition to our licence obligation (detailed in

Appendix A - Our obligations), Ofgem published its Strategy decision for RIIO-ED1 setting out policy to apply to connections. These include all Licence Conditions to ensure that we facilitate an open competitive market for our **major connections** customers by meeting certain standards of service when providing quotations and works for alternative providers, and Connections Guaranteed Standards of Performance governing timescales for providing quotations, contacting the customer to arrange a schedule of works, and completing the connection.

For **major connections** customers, Ofgem is planning a new Incentive on Connections Engagement to ensure we engage with them to deliver a robust and well communicating business workplan that addresses their needs. **Figure 24** summarises the details of the incentives for major customers in RIIO-ED1.

Figure 24 Proposed RIIO-ED1 incentives for major connections

Scope	Incentive/ Measure	Maximum reward exposure (per cent of base revenue)	Maximum penalty exposure (per cent of base revenue)
All connections customers	Guaranteed Standards of Performance (GSOP) (minimum service level)	None	0/As per GSOP payment value
Major connections customers	Incentive on Connection Engagement (ICE)	None	Up to -0.9
Total Penalties/Rewards		None	Up to -0.9

Although we have a fundamental concern with any incentive that is penalty only, we fully support the principles underlying these proposals as they are broadly consistent with the views of our stakeholders and our proposed approach as detailed above. Rather than driving us to change our strategy, these incentives have reinforced to us that service to our customers needs to continue to be a significant focus for us during RIIO-ED1.

Conclusion: our targets, commitment and costs

Our commitment to our **major connections** customers is to make sure they benefit from an open and competitive market and that we are ready and able to provide for their changing requirements in a safe, timely and cost effective manner. **Figure 25** summarises our targets, commitments and costs for major connections customers for RIIO-ED1.

Figure 25 Summary of our targets, commitment and costs for RIIO-ED1 for major connections

Our target	What we are going to do	How much we are asking for in our allowances (over the RIIO ED1 Period)	
		SHEPD	SEPD
Improve our information provision	Improved website - better technical information and expanded "heat maps" together with the expansion of a dedicated major connections contracts team.	£0.6m	£1.4m
	The wider role out of Account Managers and Portfolio management for our major customers.	£1.28m	£1.6m
	Provide support in appointing alternative providers to major customers	£0m	£0m
Connect large scale embedded renewable generation	The timely and cost-effective connection of renewable generation	£25m	£4.1m
Major Connections Workplan	Publish an Annual Major Connections Workplan setting out what we will do each year to further promote an open and competitive market	£0m	£0m
	RIIO-ED1 Total	£26.88m	£7.1m
	Average Annual Allowance	£3.4m	£0.9m

In addition to these targets, three of our 12 Commitments relate to all of our connections' customers:

Commitment 7 If you apply for an electricity connection and a team member has not been in touch within three working days then we will pay you £20.

Commitment 8 We want to make it easy for you to fill out a form by giving you the option of doing it online, by post, by phone or LiveChat.

Commitment 9 We'll keep asking you how we could do better and publish a report every year on what we're doing about it.

Appendix A - Our obligations

DNOs are regulated by primary legislation and licence obligations. The most important of these from a connections perspective are summarised below.

The Electricity Act (1989)

The primary legislation that we are required to comply with is the Electricity Act 1989. In relation to connections, the most important sections are as follows:

- Section 9 requires us to develop and maintain an efficient, coordinated and economical system of electricity distribution;
- Section 16 (Duty to connect on request) requires us to provide a connection to our system when required to do so by the owner or occupier of a premises or the authorised supplier acting with the consent of the owner or occupier. It also requires us to make a connection to the distribution system of another authorised distributor (e.g. and Independent Network Operator when required to do so;
- Section 16A (Procedure for requiring a connection) sets out the information that must be included in an application for a connection;
- Section 17 (Exceptions from duty to connect) sets out exemptions from our duty to connect under Section 16;
- Section 19 (Power to recover expenditure) sets out the principles of the charges we are allowed to make to our customers for connections; and
- Section 20 (Power to require security) allows us to require security for the payment of expenditure under Section 19 in certain circumstances.

The Electricity (Connection Standards of Performance) Regulations 2010

These Regulations were introduced in 2010 and set out standards that we are required to meet in relation to connections. This also includes penalty payments where we do not meet the required standards. These regulations provide the minimum standards we are required to follow. We always aim to improve on these wherever possible and explore innovative ways to address new and emerging challenges.

These standards cover demand connections only; however we are also required to meet a set of similar standards for Distributed Generation connections. There are set out in a Direction issues by the Authority to DNOs.

Standard Conditions of our electricity distribution licence

Standard Licence Condition 12 (Requirement to offer terms for Use of System and connection) of our electricity distribution licence sets out a number of obligations that we are required to meet in terms of the provision of connection offers. This includes:

- An obligation to offer to enter into an agreement for connection where asked to do so by a requester;
- Details of information that must be included in our connection offer such as charges and the date by which distribution works will be completed;
- An obligation to provide a connection offer within 3 months from the date at which we have all of the information we reasonably require; and
- Details of scenarios when we would not be required to provide a connection offer, such as where this would lead to us being in breach of other duties that we have under the Electricity Act.

Standard Licence Condition 13 (Charging methodologies for Use of System and connection) sets out a number of obligations that we are required to meet including:

- A requirement to have in force a Connection Charging Methodology, including the Common Connection Charging methodology, that is approved by the Authority;
- A requirement to review the methodology at least once every year;
- A requirement to make such modifications as may be necessary for the purpose of better achieving the relevant objectives as set out in the licence condition; and
- A requirement to publish our Connection Charging Methodology.

Standard Licence Condition 14 (Charges for Use of System and connection) sets out a number of obligations that we are required to meet regarding our Charging Statement. This includes:

- A requirement to have a Charging Statement in place that sets out the basis on which charges will be made for the provision of connections to our system;
- Details of the information that must be included in our Charging Statement; and
- Principles on which our charges must be based.

Standard Licence Condition 15 (Standards for the provision of Non-Contestable Connection Service) set out a number of standards that we are required to meet for non-contestable connection services in at least 90% of cases.

Standard Licence Condition 19 (Prohibition of discrimination under Chapters 4 and 5) sets out our overarching obligation not to discriminate between any persons or classes of persons in carrying out works for the purposes of connection to our network or in providing for a modification to or the retention of an existing connection to our network. This condition also prevents us from discriminating between any affiliate or related undertaking of our business and nay other business in the provision of non-contestable connection services.

Special Conditions of our electricity distribution licence

Charge Restriction Condition 12 (Licensee's Connection Activities: Margins and the development of competition) sets out in significant details the circumstances under which we are able to charge a margin on our connection activities and how Ofgem will assess the development of competition in connections in our area. In summary, we are required to submit a Competition Notice to Ofgem for each market segment of our connections activities detailing the level of competition that exists in that market segment. By 1 December 2013, each DNO must have submitted a Competition Notice to Ofgem. We are only able to charge a margin on our connections activities once Ofgem has determined that we have passed the Competition Test.

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Appendix B – Regulatory Policy

Process: Has the DNO followed a robust process?

This paper is separated into three key sections – Our approach to connections, Minor Connections and Major connections. It includes all of our plans, targets and costs for all of our connections' activities.

We have consulted with stakeholders on our proposals for both minor and major connections. The views of our stakeholders are discussed throughout this paper. How our plans have been influenced by our stakeholder engagement is also explained throughout this paper. We have also produced separate papers entitled What you said: Report on stakeholder engagement and What our Stakeholders Think that set out our stakeholder engagement for all of our plans.

All of our connections costs are included in the relevant data tables and the PCFM.

We provide a section looking at the Longer term view. In addition to this, all of our plans are based on ensuring that we are able to provide long term, efficient delivery. This paper includes specific examples of changes to our strategy now, in order that we are able to provide for customers' changing connection requirements going forward.

Outputs: Does the plan deliver the required outputs?

This paper covers all of the connections' outputs identified in **Ofgem's strategy decision**. It also discusses the policy decisions set out in **Ofgem's strategy decision**. Our proposals are in line with Ofgem's strategy decision, without exception.

We have looked at the resource implication when assessing the cost of meeting all of our outputs, targets and commitments. We have included costs for meeting each of our outputs, targets and commitments in our paper.

We have explained our strategy for ensuring that we meet each of our outputs in this paper. Our strategy for meeting our outputs for minor customers are set our in Part 2 Minor Connections. Our strategy for meeting our outputs for major customers are set out in Part 3 Major connections.

Each of our sections looks at our historic performance against existing outputs as well as looking at what we plan to achieve for RIIO-ED1.

Resources (efficient expenditure): Are the costs of delivering the outputs efficient?

Any expenditure we undertake is need-based and delivers maximum value for our customers. We have always had a close focus on efficiency – it's the way we do things. Our paper entitled "Be efficient" sets out how we compare with other DNOs in efficient performance and how we intend to stay at the forefront of efficiency throughout RIIO-ED1.

We have looked at our historical performance for both minor and connections customers and have used this when producing cost projections for RIIO-ED1. We have assessed a number of different options, as outlined in our paper, to ensure that we always deliver the best value for money for our customers.

Our outputs are clearly linked to our expenditure for both minor and major connections.

Resources (efficient financing): Are the proposed financing arrangements efficient?

Our paper entitled Efficiently financing our plans sets out how we plan to finance our plans for RIIO-ED1.

All of the data provided in this paper is consistent with that provided in the data tables. In particular, Table CV17 contains all of our connections data.

Uncertainty & Risk: How well does the plan deal with uncertainty and risk?

There is a section describing the risks and uncertainties in Part 2 Minor Connections and in Part 3 Major connections.

In addition to this our paper entitled Efficiently managing risk sets our how we plan to mitigate risks during RIIO-ED1. This includes the Load Related Expenditure Reopener.