

A guide to electricity distribution connections policy

Guidance

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Overview:

Electricity distribution network operators must help customers connect to their network in a timely and efficient manner. We place strong requirements and incentives on them to do this. There is a cost to providing a new connection. Some of this has to be paid by the connecting customer.

Sometimes a new connection can require an upgrade of the network. This is so that the connection can be made without affecting other customers' quality of service. When this happens, the cost of this enhancement is shared between the connecting customer and all customers on that network.

We summarise here our policy on connections to the electricity distribution network. We explain the regulations that are in place to ensure customers pay a fair price for their connection. We also describe how we incentivise the network operators to provide customers with a good service.

Associated information

To find out who your local distribution network operator is and how to contact them call the Energy Networks Association on 020 7706 5100 or go to:

<http://www.energynetworks.org/info/faqs/electricity-distribution-map.html>

For a list of independent distribution network operators go to:

<https://www.ofgem.gov.uk/electricity/distribution-networks/connections-and-competition/independent-distribution-network-operators>

For a list of independent connection providers go to:

<http://www.lloydsregister.co.uk/schemes/NERS/providers-list.aspx>

If you are not happy with the service you receive and cannot resolve this with your distribution network operator you can contact Ombudsman Services: Energy on 0330 440 1624, or from their website: <http://www.ombudsman-services.org/energy.html>

You can also refer a dispute you are having with your distribution network operator to us to determine. Please see our website for further information:

<https://www.ofgem.gov.uk/ofgem-publications/38164/determinationsguidanceaug2012.pdf>

For more information on the connection competition tests please see our website:

<https://www.ofgem.gov.uk/electricity/distribution-networks/connections-and-competition/competition-connections>

If you're looking for information about connecting to the transmission network go to:

<https://www.ofgem.gov.uk/electricity/transmission-networks/connections>

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Executive summary

Getting connected

The infrastructure which delivers electricity to customers' premises is the distribution network. Electricity distribution network operators (DNOs) or independent distribution network operators (IDNOs) own and operate these networks. These companies are required by law to offer connection services to anyone who asks.

A well-functioning market for connections to the distribution network will benefit us all. Timely and cost-effective connections enable economic growth and help to decarbonise the energy we use.

We make sure customers, those already connected and new connections, receive good service at a fair price.

Getting the best quality of service ...

The service distribution network operators provide to connection customers is getting better. But there's room for further improvement.

As the regulator, we set the framework that each DNO operates under. This framework incentivises them to improve their performance on connection services. From April 2015 we will strengthen existing measures and introduce new ones to address stakeholders' feedback.

We're increasing the incentive to quote and complete connections quicker. We will make sure the DNOs listen and take action when customers are unhappy. We will continue to monitor and report on DNOs' performance.

... at a fair price

There is a cost to connecting to the distribution network. On some occasions connections cannot be completed until the network is enhanced. Where investment in the network is needed, the customer connecting will need to pay some of the cost, with the rest being shared between all other users of the network.

Connection customers should pay a fair price for the cost of the work required to connect them and there are a number of rules in place that ensure this is the case. However, it's equally important that electricity bills are kept as low as possible for all. The cost of running the network, including building new infrastructure to meet increasing demand for electricity, is spread across all customers of the network. This type of investment could make it easier to connect in certain areas. However, we don't allow network operators to enhance the network and recover the cost of doing so from us all unless they can demonstrate how we will all benefit.

Our policy encourages customers and network operators to think of alternative means of creating a well-functioning connections market without pushing up bills.

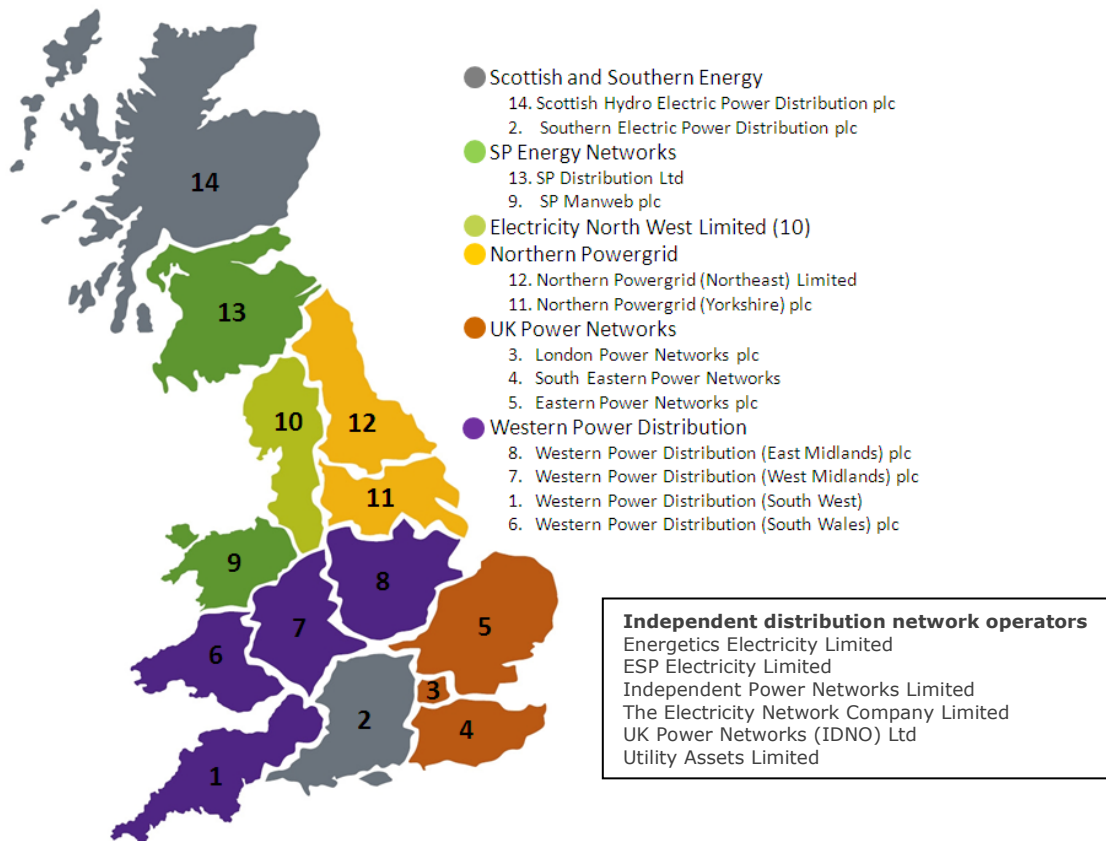
1. Introduction

- 1.1. A well-functioning market for connections to the electricity distribution network is essential. Timely and cost-effective connections enable economic growth and help to decarbonise the energy we use. A wide range of parties may want to connect to the network. These include domestic consumers, housing developers, local authorities and manufacturers. Or it may be a generator of renewable energy who wants to put electricity on to the network so it can be sold to others.
- 1.2. This paper explains the connection process and the regulations that are in place to protect consumers.
- 1.3. There is a cost to providing a connection. These costs are recovered either directly from the customer connecting, or on an ongoing basis from all users of the network through their electricity bills. The cost of a connection can vary between projects. It depends on the size of the connection, where the connection is, the distance from the existing network and whether the network can accommodate the capacity needed.
- 1.4. This paper explores the balance that has to be struck between providing affordable connections and keeping electricity bills down. We also highlight some of the more innovative approaches that are available to enable connections in constrained parts of the network.

2. The electricity distribution network

- 2.1. Most of the electricity distribution network is built, owned and operated by regional monopolies known as distribution network operators (DNOs). Independent distribution network operators (IDNOs) also build and own parts of the network. These companies are licensed by us to carry out their activities. (See Figure 1 for a map and list of DNOs and IDNOs.)
- 2.2. We protect consumers by requiring DNOs to operate under a common regulatory framework. This framework gives the DNOs strong incentives to deliver a low-carbon, high-quality and sustainable energy sector at good value for money for all consumers. We monitor DNOs' compliance with the legal and regulatory framework. Where we find companies are not complying with these requirements we can, and do, take action.

Figure 1: location and ownership of DNOs and IDNOs



3. The legal and regulatory requirements

- 3.1. When a new customer wants to get connected, the network operator for that area must offer to connect them, and set a price for this. The requirement to make an offer of connection is outlined in the Electricity Act 1989 (the act). It ensures that all eligible customers, regardless of their connection requirements, can receive an offer for a new connection. There is no upfront charge to the customer for requesting an offer of connection.
- 3.2. More information on connections legislation is in Appendix 1.
- 3.3. Each network operator has a licence to carry out its activities. The licence contains conditions that set out the processes that apply to requests for connection made under section 16 of the act:
 - Standard licence condition (SLC) 12 requires the network operator to provide specific information in the connection offer, including the charges that will need to be paid. SLC 12 also requires that the network operator makes the offer within three months of receiving the necessary information from the customer.
 - SLC 13 requires a network operator to have and maintain a charging methodology, based on a set of principles. It must also have an associated charging statement (SLC 14). The basis for each network operator's methodology is set out in the Distribution Connection and Use of System Agreement (DCUSA).¹ We approve this methodology, but we don't approve individual charges. DNOs and other affected parties can propose modifications to this methodology.
 - SLC 19 requires that network operators must not discriminate when carrying out works related to connections. In practice this means a network operator cannot unduly discriminate between one type of customer and another.

¹ The common connection charging methodology is schedule 22 of the DCUSA: <http://www.dcusa.co.uk/Public/DCUSADocuments.aspx?s=c>

4. Charging for a connection

- 4.1. A connection offer made under section 16 of the act will inform the customer of the charge it will have to pay. If a DNO is providing the connection the charge will be based on the cost of the “minimum scheme”.
- 4.2. The minimum scheme is the solution designed solely to provide the capacity needed for the new connection at the lowest overall capital cost. A DNO may design an enhanced scheme,² but the cost to the customer will not exceed that of the minimum scheme. The customer can also request work in excess of the minimum scheme where it thinks this would be more beneficial. For example, it may decide that a more expensive route to the existing network will receive planning permission more easily and is therefore worth paying for. The customer will need to pay the full cost of this additional work, including the cost of operating and maintaining these additional assets over their lifetime.
- 4.3. A connection charge will include up to three components:
 - The full cost of assets that:
 - will be used solely by the connecting customer
 - are over and above the minimum scheme, when asked for by the connecting customer.
 - A proportion of the cost of network reinforcement where it’s required. The proportion is calculated based on the share of new capacity created that will be used by the connecting customer. Generally the connecting customer will only pay for reinforcement at the voltage level it is connecting to and one voltage level above.³
 - A rebate to the DNO or a previously connected customer under the Electricity (Connection Charges) Regulations 2002. This rebate will apply where the new connection uses network assets that were installed and paid for by a previous connection. (See Appendix 1 for further information.)
- 4.4. Customers connecting generation equipment to the network will also have to pay for reinforcement in excess of £200/kW. This is known as the high-cost project threshold. Its application makes sure that other network users are not unduly affected by the additional costs caused by the complexity of some connections.

² This could include additional assets to accommodate a larger capacity or assets of a different specification.

³ This refers to the voltage of the electricity in the relevant assets not the voltage of the customers’ electricity supply.

- 4.5. The connection charge won't include any costs that will be recovered through use of system charges, eg maintenance, repair, and replacement costs of the assets installed over their lifetime. The proportion of reinforcement not paid by the connecting customer is paid by all users of that network through the use of system charge (which is part of the electricity bill).
- 95 per cent of connections over the last three years have not triggered any network reinforcement.
 - Where a connection project triggers reinforcement, other network users pay, on average, around 41 per cent of the associated cost. The connecting customer pays the remainder.
 - GB customers pay around £30 million per year for connection-related reinforcement.⁴
- 4.6. From April 2015, where reinforcement of the network is caused by existing domestic or small business customers connecting new appliances, these costs will be funded by all customers (through use of system charges).⁵ In practice this largely formalises current arrangements. This is because reinforcement is needed when customers connect new appliances and use them at peak time. But network operators can't identify which customers these are. We see this as a temporary measure until smart meter data allows network operators to understand when a customer is contributing to peak demand and therefore contributing to the need for reinforcement.

⁴ These figures are calculated based on data submitted by all DNOs over the years 2010 to 2013.

⁵ There may be exceptions for equipment that has a significant impact on the network.

5. Improving the service to customers

Incentivising better performance

- 5.1. Historically, DNOs have been subject to some criticism over the quality of their connection service. We have introduced measures to improve performance in this area. We're in the process of enhancing these arrangements. New arrangements, known as RIIO-ED1, will start on 1 April 2015 and be in place for eight years.
- 5.2. The current arrangements have worked well:
- We introduced a customer satisfaction survey in 2011. Connection customers are asked a series of questions about their satisfaction with the process and how the DNO engaged with them. DNOs receive financial penalties or rewards based on their overall performance. This has led to improved levels of customer satisfaction. DNOs are currently scoring 80 per cent satisfaction on average across GB. This is an 8 percentage point increase since the survey was first conducted.
 - In 2010 we introduced guaranteed standards of performance for connections. These require DNOs to carry out certain tasks within specified timescales. If they fail to hit these timescales the DNO has to pay the customer affected. All DNOs continue to meet the minimum requirements of the guaranteed standards of performance.
 - A successful distributed generation (DG) Forum was established. This has given generation customers an opportunity to discuss their specific issues with DNOs and us. This has led to several improvements in the connections process, including more transparent information to make it easier for customers to connect. Examples include guides on the process a customer will go through and maps indicating parts of their network it may be better to connect to because they have spare capacity (and therefore offer a quicker and potentially cheaper connection).⁶
- 5.3. DNOs can still do more. Connections are one of the primary outputs that DNOs will need to deliver in RIIO-ED1. The focus will be on encouraging DNOs to improve their performance, including providing more timely and cost-effective connections for the growing number of low-carbon technologies. The new measures that we'll introduce to make sure DNOs deliver on their output commitments are:

⁶ This includes a distributed generation connections guide:
<http://www.energynetworks.org/electricity/engineering/distributed-generation/distributed-generation.html>

- An incentive on the **time to quote and connect** smaller connections. A DNO will be rewarded when it meets the target time for issuing a quote and completing a connection. The target will get tougher through the period.
- We are keeping the existing **customer satisfaction survey** which will focus on the views of smaller connections customers. We are increasing the size of the financial penalty or reward a DNO may earn based on its performance against a target.
- An incentive on **connections engagement** targeted at larger and more complex connections (such as housing developments or distributed generation). DNOs will have to deliver a strategy that meets the needs of these customers or face a financial penalty.

Opening up the market to competition

5.4. Not all connections work has to be carried out by the DNO. Competition exists for some work. A customer can choose to use an alternative provider for some connections work known as “contestable work”. Contestable work can be carried out by:

- a DNO
- an IDNO
- an independent connection provider.

5.5. In 2010, we introduced measures to remove regulatory barriers to competition and to provide strong incentives for DNOs to support competition.⁷ Competitive pressure can benefit consumers by increasing quality or decreasing prices, or both.

5.6. These measures include:

- Introducing a four per cent regulated margin that DNOs must charge on contestable connection services in market segments where we consider competition to be viable. This gives other connection providers greater scope to compete with DNOs.
- Giving DNOs the opportunity to have this price control lifted in segments of the market where they can demonstrate that competition can be relied upon to protect consumer interests. We are currently assessing those parts of the market where we have not seen effective competition and considering what further action to take.
- An assurance that we will continue to monitor competition in the connections market.

⁷ Competition in connections: <https://www.ofgem.gov.uk/electricity/distribution-networks/connections-and-competition/competition-connections>

6. Getting the balance right

Our policy

- 6.1. The connection arrangements outlined in this guidance document mean that, unless the customer agrees otherwise, the connection charge is no more than the cost of the work that is required to make the connection. This protects the connecting customer from paying for infrastructure that it will not use.
- 6.2. These arrangements also mean that other network users do not face higher bills because they end up paying for infrastructure which they will not benefit from.
- 6.3. Benefits to all network users are also achieved because the network is used more efficiently. Connecting customers are incentivised to locate where there is available capacity because it will be cheaper for them to do so. This price signal also incentivises these customers to engage with smart grid solutions such as demand-side response as this will reduce their connection costs further.
- 6.4. Allowing DNOs to increase investment ahead of need, ie investing in anticipation of increased demand, would reduce the time it takes to complete connections. If the cost of this investment is recovered from all network users then the cost to the connecting customer will also be reduced. However, it has downsides:
 - The use of system charges paid by all network users as part of their electricity bills would go up even if a subsequent connection was made. This increase in costs to GB consumers would not necessarily result in benefits to them.
 - It increases the risk of infrastructure being built and paid for in anticipation of future energy use that does not emerge.
 - The price signal created by the current arrangements would be weakened. Weakening this price signal pushes up costs for all customers as the network will be used less optimally.
- 6.5. These downsides steer our policy on investment ahead of need. Our policy keeps costs lower for consumers as a whole. 95 per cent of connections over the last three years have been made without any network reinforcement. This suggests that the spare capacity on the network is being used before further investment is made.

Can a DNO invest ahead of need?

- 6.6. Yes. However, a DNO will generally only invest if it is allowed to recover the cost from its customers through their electricity bills. Before we allow a DNO to recover costs from its customers it must demonstrate that the benefits to

them outweigh the cost. The onus is on the DNO to provide this justification. Proposals from DNOs to invest in their network must appropriately share the risk and cost between themselves, connecting customers and wider network users. Where a DNO cannot demonstrate that the investment is in wider users' interests, we do not believe it is right to require customers to pay more.

- 6.7. We describe the process and mechanisms available to DNOs to fund investment in more detail in Appendix 2.
- 6.8. We have previously stated that DNOs who wish to take a more anticipatory approach to investment may be able to recover the costs of doing so from wider network users.⁸ For example, this would allow a DNO that anticipates an increase in demand to install assets with greater capacity than is currently required. DNOs that want to do this must show that the approach has benefits for network users.
- 6.9. Additional capacity created by investing ahead of need may also not deliver the expected benefits. For example, the spare capacity created could be consumed by existing users using more of it. This leaves a customer wishing to connect in the future in the same position as would have been in had no investment been made.

Alternative ways to deliver efficient outcomes

- 6.10. We recognise that some customers are tied to a location which may face capacity constraints that lead to high costs and long timescales for connection.
- 6.11. Increased investment is one way to overcome this challenge. However, the current framework provides and encourages alternatives. These can allow connections to be made in constrained areas without necessarily increasing customers' bills.
- 6.12. There are examples of DNOs engaging with a consortium of prospective connections, or an organisation acting on their behalf. We explained above how a connection request made under section 16 of the act triggers obligations for the DNO. These are set out in the act, associated regulations and the licence. However, more innovative approaches like this may require a DNO to operate with a degree of freedom from the usual constraints. If a customer is interested in pursuing an alternative arrangement, they can request a connection under section 22 of the act.
- 6.13. These alternative arrangements mean that a DNO can consider customers' collective requirements and deliver a combined scheme that reduces the cost and timeframes for all. This can also make it easier for the DNO to invest in

⁸ RII0-ED1 Strategy decision – outputs, incentives and innovation, para 3.55 (March 2013): <https://www.ofgem.gov.uk/ofgem-publications/47068/riioed1decoutputsincentives.pdf>

new network capacity earlier than a more traditional approach might allow. Arrangements could involve an upfront commitment for the customer(s) or a third party to pay the agreed connection costs (including the new capacity) to the DNO when the connection is made. This type of arrangement could give DNOs the confidence to start work, knowing they will be able to recover costs from the connecting customer(s), without adding to the cost for other users of the network.

- 6.14. DNOs and customers can also agree demand-side response measures. For example, a customer could agree to reduce its electricity use during a peak period for a financial reward. This means capacity on the network can be used by other customers, reducing the need for reinforcement.
- 6.15. DNOs can propose, and receive funding for, projects that trial innovative ways to manage their networks.⁹ DNOs identify their own priorities for innovation, but to receive funding they must show that their proposals will deliver financial and carbon benefits to customers. Many projects are looking to maximise the use of existing network capacity to defer or avoid reinforcement. The solutions being investigated include:
- flexible connections with generation and demand customers, for example curtailing connected generators equally in the event of a network constraint rather than on the basis of 'first in, last off'
 - the use of new equipment to actively manage and maintain voltage on networks within design limits
 - monitoring and analysis to understand where network capacity exists but is not recognised or used by current network planning and design practices
 - interconnection of networks with smart technologies to share capacity between circuits and substations.
- 6.16. There are other incentives on the DNO to efficiently invest in, operate and maintain their network:
- All costs are subject to an efficiency incentive. This encourages DNOs to use their network efficiently as any cost savings made are shared between them and their customers.
 - We described in chapter 5 the financial and reputational incentives on DNOs. These incentives aim to improve the level of service DNOs provide to connecting customers. We've outlined how we are strengthening these incentives and encouraging competition.

⁹ Currently this funding is available through the Low Carbon Networks Fund. In RIIO-ED1 it will be available through the innovation stimulus.

Appendix 1 – legal and regulatory requirements

The Electricity Act 1989

1.1. Sections 16 to 17 of the act require DNOs to make an offer of connection to a premises when asked to do so by the owner, occupier or a party acting on their behalf. The customer asking for the connection needs to give the DNO specified information so it can make a connection offer. Sections 19 to 21 of the act require the connection offer to include a statement of:

- The payments the connecting customer will need to make to get the connection. This will be payments to the DNO to cover any expenses it reasonably incurred in making the connection. It may also include payments to a previously connected customer to reimburse it for the initial contribution to the costs of the assets that are now being shared (this requirement is detailed in the Electricity (Connection Charges) Regulations 2002 (ECCRs).
- The reasonable security for the payment that the connecting customer may need to provide the DNO with. Any security deposited with the DNO shall earn interest.
- Any other relevant terms the connecting customer will need to accept.

1.2. Section 23 of the act provides for certain unresolved disputes between the connecting customer and the DNO to be referred to us, and for us to determine whether any party was at fault.

The ECCRs

1.3. A connecting customer may have to pay for a proportion of reinforcement on the network in order to enable its connection. This “initial contributor” may find that those seeking later connections make partial use of those new assets. The ECCRs (also known as the “second-comer rule”) mean customers connecting in the future may need to reimburse the initial contributor and DNO for some of the initial investment.

1.4. The ECCRs only apply where a further connection is made within five years of the initial connection. The rebate is often split between the DNO and the initial contributor. Where a rebate is received by a DNO it will in turn reimburse its wider network users.

Appendix 2 – investing in the network

1.1. We regulate the revenues DNOs can recover through charging their customers. We do this by controlling the revenue they are allowed to collect from customers as part of their electricity bills.

1.2. DNOs operate under a price control framework which lasts a number of years. The current price control will end in 2015. We are reviewing arrangements and setting the revenue and framework that DNOs will operate under for the following eight years (RIIO-ED1, 2015-2023). At a review the onus is on DNOs to submit well-justified forecasts for the volume and cost of the work they intend to undertake. This includes reinforcement to take account of forecast increased electricity use forecast that may be due to growth from existing customers or growth from new connections.

1.3. Our approach to cost assessment gives a DNO the opportunity to submit its case for investment ahead of need on a project-by-project basis. DNOs need to justify that the proposal appropriately shares the risk and cost between themselves, the connecting customer and those already connected to the network.

1.4. Following our assessment of the DNOs' proposals we provide an upfront revenue allowance and mechanisms to allow changes to this revenue during the price control period.

Allowed Revenue

1.5. The onus is on the DNOs to propose, and justify, the revenue allowance they will require for the price control period. Justification for reinforcement requirements should include a needs case for the expenditure supported by cost-benefit analysis.

1.6. In a well-justified investment plan, we would expect a DNO to provide:

- Justification of the volume of investment based on providing information on current asset loading and forecast load growth. This may include information on known new developments, stakeholder engagement, forecast economic growth and forecast uptake of new technologies, eg electric vehicles.
- Justification for the cost of investment based on cost benefit analysis. This may include evidence that the solution proposed offers greater benefit than alternatives, and that the costs are efficient.

1.7. We carry out both a qualitative and a quantitative assessment of a DNO's justifications. We set an efficient revenue allowance for a DNO based on this assessment. Ensuring that the revenue provided is efficient protects consumers from paying for unnecessary investment.

1.8. Larger, higher-value projects are considered on a case-by-case basis. We set requirements for a DNO to deliver specific outputs in relation to these projects.

Mechanisms to change allowed revenue

1.9. We are mindful that there is uncertainty in the volume and cost of reinforcement beyond the control of DNOs. For this reason we provide mechanisms to allow changes to the revenue allowed during the price control period. We include these mechanisms because of the need to deliver value for money for existing and future consumers while also protecting the ability of a DNO to finance efficient delivery.

1.10. There is uncertainty in the level of reinforcement that will be required to accommodate new and changing patterns of electricity use. For example, the level of government support for different renewable technologies and the impact this has on take-up, the speed at which new technology is adopted (eg electric vehicles) and the cost of electricity compared to other energy all affect the level of investment required by a DNO.

1.11. The price control framework includes the following mechanisms to manage the risk these uncertainties create for both DNOs and consumers:

- All costs are subject to an efficiency incentive. If the volume of reinforcement work turns out to be greater than forecast, so expenditure is greater than anticipated, the DNO will share the additional cost with its customers.
- During a price control period, a DNO has the opportunity to justify to us that additional revenue is required. Equally, if the reinforcement costs included in the upfront allowance don't materialise then we can return this money to customers. There is a similar mechanism for individual projects whose cost is expected to exceed £25 million.¹⁰

¹⁰ The mechanisms referred to are the load related expenditure reopener and the high value projects reopener. See RIIO-ED1 strategy decision – uncertainty mechanisms: <https://www.ofgem.gov.uk/ofgem-publications/47070/riioed1decuncertaintymechanisms.pdf>