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RIIO|ED1

Strategy consultation for the RIIO-ED1 electricity distribution price control Reliability and Safety

Supplementary annex to RIIO-ED1 overview paper

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Overview:

The next electricity distribution price control, RIIO-ED1, will be the first to reflect the new RIIO model. RIIO is designed to drive real benefits for consumers; providing network companies with strong incentives to step up and meet the challenges of delivering a low carbon, sustainable energy sector at a lower cost than would have been the case under our previous approach. RIIO puts sustainability alongside consumers at the heart of what network companies do. It also provides a transparent and predictable framework, with appropriate rewards for delivery.

We are now consulting on the strategy for the RIIO-ED1 review. In the 'Supplementary annex – Outputs, incentives and innovation' we set out our high level proposals for reliability and safety. This supplementary annex provides more detail on these proposals. This document is aimed at those who want an in-depth understanding of our proposals. Stakeholders wanting a more accessible overview should refer to the main consultation documents.

Associated documents

Strategy consultation for RIIO-ED1 - Overview

<http://www.ofgem.gov.uk/Networks/ElecDist/PriceCtrls/riio-ed1/consultations/Documents1/RIIOED1SConOverview.pdf>

Links to supplementary annexes

- Strategy consultation for RIIO-ED1 - Outputs, incentives and innovation
<http://www.ofgem.gov.uk/Networks/ElecDist/PriceCtrls/riio-ed1/consultations/Documents1/RIIOED1SConOutputsIncentives.pdf>
- Strategy consultation for RIIO-ED1 - Business plans and proportionate treatment
<http://www.ofgem.gov.uk/Networks/ElecDist/PriceCtrls/riio-ed1/consultations/Documents1/RIIOED1SConBusinessPlans.pdf>
- Strategy consultation for RIIO-ED1 - Uncertainty mechanisms
<http://www.ofgem.gov.uk/Networks/ElecDist/PriceCtrls/riio-ed1/consultations/Documents1/RIIOED1SConUncertaintyMechanisms.pdf>
- Strategy consultation for RIIO-ED1 - Financial issues
<http://www.ofgem.gov.uk/Networks/ElecDist/PriceCtrls/riio-ed1/consultations/Documents1/RIIOED1SConFinancialIssues.pdf>
- Strategy consultation for RIIO-ED1 - Impact assessment
<http://www.ofgem.gov.uk/Networks/ElecDist/PriceCtrls/riio-ed1/consultations/Documents1/RIIOED1SConImpactAssessment.pdf>
- Strategy consultation for RIIO-ED1 - Tools for cost assessment
<http://www.ofgem.gov.uk/Networks/ElecDist/PriceCtrls/riio-ed1/consultations/Documents1/RIIOED1SConCostAssessment.pdf>
- Strategy consultation for RIIO-ED1 - Reliability and safety
<http://www.ofgem.gov.uk/Networks/ElecDist/PriceCtrls/riio-ed1/consultations/Documents1/RIIOED1SConReliabilitySafety.pdf>
- RIIO-ED1 Glossary of terms
<http://www.ofgem.gov.uk/Networks/ElecDist/PriceCtrls/riio-ed1/consultations/Documents1/RIIOED1SConGlossary.pdf>

Links to other associated documents

- Open letter consultation on the way forward for RIIO-ED1
<http://www.ofgem.gov.uk/Networks/ElecDist/PriceCtrls/riio-ed1/consultations/Documents1/RIIOED1LaunchOpenLetter.pdf>
- Handbook for implementing the RIIO model
<http://www.ofgem.gov.uk/Networks/rpix20/ConsultDocs/Documents1/RIIO%20handbook.pdf>
- Electricity Distribution Price Control Review 5 (DPCR5) Final Proposals
http://www.ofgem.gov.uk/Networks/ElecDist/PriceCtrls/DPCR5/Documents1/FP_1_Core%20document%20SS%20FINAL.pdf

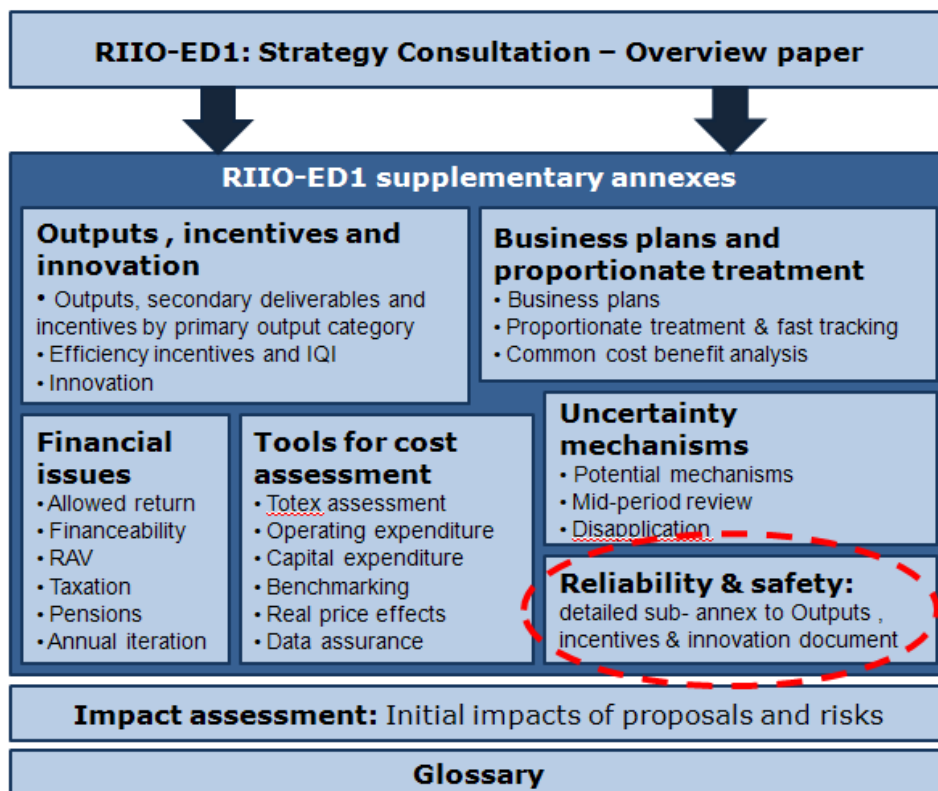
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1. Introduction

- 1.1. This supplementary annex to the main RIIO-ED1 strategy consultation sets out our proposals for the outputs that DNOs will need to deliver over the price control period, and the associated incentive mechanisms. It also sets out our proposed approach to efficiency incentives and to the operation of the information quality incentive (IQI), as well as our proposals to stimulate innovation.
- 1.2. This document is aimed at those who want an in-depth understanding of our proposals. Stakeholders wanting a more accessible overview should refer to the 'Strategy Consultation for RIIO-ED1 - Overview'. Figure 1.1 below provides a map of the RIIO-ED1 documents published as part of this consultation.

Figure 1.1: RIIO-ED1 Supplementary annex document map



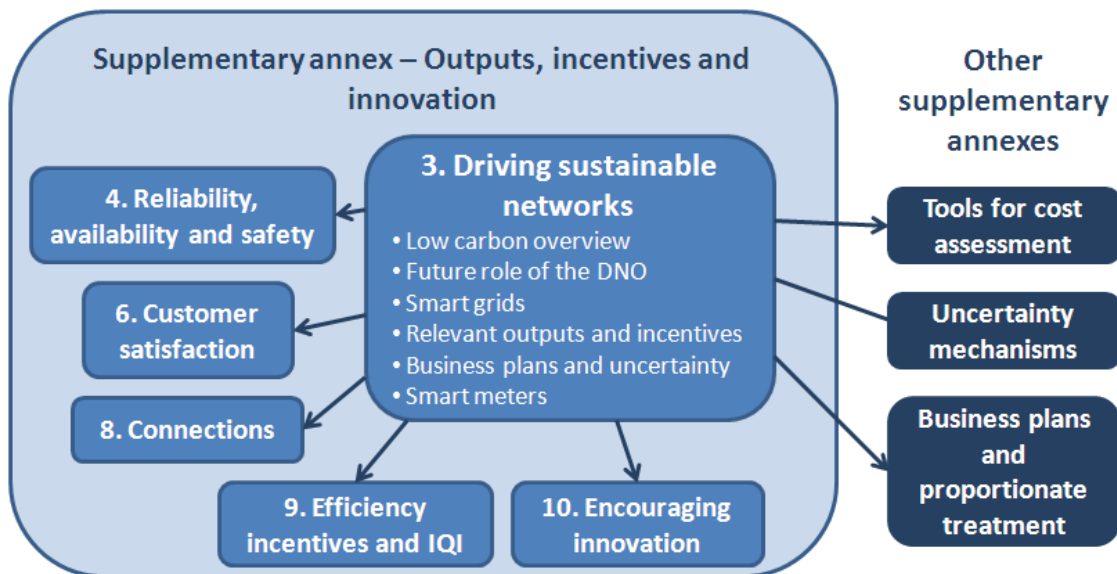
Facilitating the low carbon future

- 1.3. We think that the DNOs' key challenge for RIIO-ED1 is ensuring that they will be able to connect the new low carbon loads required to achieve the national

emissions targets. They will need to enable these loads and generation to connect in an appropriate timeframe, at appropriate cost, without causing network problems and without incurring excessive costs.

- 1.4. We believe this behaviour will be driven by a coherent and balanced package of outputs and incentives, alongside a combination of ex ante assessment and appropriate uncertainty mechanisms. Since these mechanisms are described in different chapters of this consultation, we have included a chapter at the start of the Outputs, Incentives and Innovation document setting out how our individual proposals will incentivise the DNOs to ensure that their networks have the necessary flexibility and capacity to connect these new loads. A diagram of how the 'Driving sustainable networks' chapter links with other chapters and documents in this consultation is shown in Figure 1.2 below.
- 1.5. Smart grids solutions will be an important way of delivering the outputs at reasonable cost. However, they are a means of delivering an output, rather than an output themselves. We consider that DNOs' progress on enabling the transition to a smarter, low carbon network will be measured and incentivised through the package of outputs we have proposed. We have also set out our thinking on this in Chapter 3.

Figure 1.2: Map of the 'Driving sustainable networks' chapter and linked chapters and documents



Summary of proposed outputs and incentives

1.6. Table 1.1 below summarises the key elements of the proposed RIIO-ED1 outputs.

Table 1.1 - Summary of RIIO-ED1 outputs framework

Primary output category	RIIO-ED1 proposals
Safety	<ul style="list-style-type: none"> • Achievement of Health and Safety Executive requirements.
Environmental impact	<ul style="list-style-type: none"> • Replace DPCR5 losses incentive with: an obligation, allowed expenditure to manage losses and a discretionary reward for efficient and innovative loss reduction initiatives. • Consulting on whether discretionary reward should be broadened to include other low carbon facilitation. • Maintain reputational incentive for business carbon footprint. • Maintain allowance for undergrounding overhead lines in areas of outstanding natural beauty and national parks.
Customer satisfaction	<ul style="list-style-type: none"> • Strengthen the Broad Measure of Customer Satisfaction (BMCS) introduced in DPCR5.
Social obligations	<ul style="list-style-type: none"> • Consulting on funding of specific activities or setting outputs (if they can be identified), especially with respect to DNOs improving their understanding of consumer vulnerability and working in partnership with other agencies. • Increase stakeholder engagement element of the BMCS to allow specific activities that address social issues to be highlighted and rewarded.
Connections	<ul style="list-style-type: none"> • Strengthen BMCS element relating to connection customer satisfaction and allow for differentiation of customer size. • Retain guaranteed standards of connection performance. • Introduce a new output on average time to connect (dependent on how much competition there is for connections work in each DNO's region).
Reliability and availability	<ul style="list-style-type: none"> • Continue existing interruption incentive scheme (IIS) with small improvements. Improve the consistency of the asset health and loading indices secondary deliverables. • Reduce the payment threshold under the guaranteed standards of reliability and ensure uniform coverage. • Consulting on the feasibility of an output for worst served customers and output on flood resilience.

2. Overview of Reliability and Safety

Chapter Summary

This chapter summarises our proposals for the output areas of reliability and safety in RIIO-ED1. It gives an overview of the package of proposals, covering primary outputs, secondary deliverables and incentives in these two areas.

Question 1: What are your views on the primary outputs and secondary deliverables for reliability and safety? In particular:

- (a) Do you agree that these are appropriate areas to focus on?
- (b) Are there any other areas that should be included?

Background

- 2.1. The long-term safety and reliability of the electricity distribution networks and their impact on customers are key priorities for Ofgem. Customers expect the DNOs to maintain a safe network while minimising the number and duration of supply interruptions. We also expect DNOs to use their price control funding to prevent longer-term deterioration of network resilience.
- 2.2. Whilst working to improve reliability and restoration, DNOs must maintain compliance with their overall requirement to ensure that their networks are designed and operated in a way that ensures the safety of the public and their employees.

Primary outputs

- 2.3. The Health and Safety Executive (HSE), as determined by legislation, monitors and enforces performance in the area of safety. As one of the output categories under the RIIO framework, we have looked into whether a safety output, beyond complying with HSE legislation and directives, can be developed for RIIO-ED1.
- 2.4. The number and duration of supply interruptions are the current primary outputs for network reliability. Delivery of these outputs is measured through the Interruptions Incentive Scheme (IIS) and through performance against relevant Guaranteed Standards of Performance. We introduced the IIS in 2001-02 to encourage DNOs to manage the number and duration of supply interruptions that occur on the network, taking account of customers' willingness to pay for performance improvements. The scheme sets DNO-specific targets for the number and duration of interruptions on an annual basis. These targets are set based on a combination of the DNO's own historic performance for particular voltages and benchmarked frontier performance where interruption performance can be compared across DNOs.

- 2.5. DNOs receive an annual financial reward or penalty depending on their annual performance against these targets. Performance that is better than the target delivers a reward whilst performance that is worse than the target incurs a penalty. Since we introduced the scheme, it has brought about a significant improvement in network reliability.

Secondary deliverables

- 2.6. As part of the fifth distribution price control (DPCR5), we supplemented to the IIS reliability incentive by introducing the Health Index (HI) and Load Index (LI). These were designed to tie specific price control network investment to specific in-period risk reduction associated with the condition and loading of assets. These metrics link the longer-term reliability benefits of healthier and less highly-loaded assets to a measurable deliverable within the price control. Without these deliverables in place, DNO performance against the primary reliability outputs could suffer in the long term. Within the RIIO framework, these are referred to as secondary deliverables.

Proposals for RIIO-ED1

Safety

- 2.7. We propose that the primary output for safety should be that DNOs comply with their statutory requirements. Our proposals for including safety risk in the asset risk index should help to ensure the long-term delivery of these statutory requirements. At the Reliability and Safety working group meetings, we have considered a number of options for alternative financial and reputational incentives on safety, but feel that these could have unwanted implications for the reporting of incidents. Full details of the considerations and work that has been undertaken can be found in Chapter 3.
- 2.8. We also set out the full details of the considerations and options we have explored through the RSWG, as well as the specific consultation questions on which we are seeking views on from stakeholders. Our proposals for ED1 are summarised below.

Interruptions Incentive Scheme and Guaranteed Standards of Performance

- 2.9. We propose to retain the Interruptions Incentive Scheme (IIS) in ED1, making improvements to the scheme where needed. The IIS has been shown to improve DNO performance, is readily measurable, controllable and can be consistently measured and compared.
- 2.10. We propose a number of changes to the Guaranteed Standards of Performance (GSoP), including the tightening of the standard covering supply interruptions in normal weather conditions from 18 hours to 12 hours.

Incentive rates

- 2.11. We are proposing that the IIS incentive rates should be aligned with those proposed as part of the RIIO-T1 Energy Not Supplied incentive. Based on our initial analysis this change would not result in significantly different incentive rates to those currently used in DPCR5. We are also inviting views on the need for a rolling incentive mechanism to apply to the IIS (as has been proposed for the shrinkage incentive in RIIO-GD1).

Revenue exposure

- 2.12. We propose to increase the overall revenue exposure to the IIS from 139 return on regulatory equity (RORE) basis points for DPCR5 to a point between 250 and 300 RORE basis points for ED1. We are also considering the re-introduction of an upside cap on the amount of money that can be earned by a DNO in any given year through the IIS. We would envisage that this cap would be set at an equivalent level to the downside cap to make the scheme symmetrical. The cap would protect customer exposure over the longer period of ED1, but could also discourage investment benefitting customers at specific points in time.

Separating planned and unplanned targets

- 2.13. We are proposing to have separate targets for planned and unplanned interruptions and minutes lost.

Planned target setting

- 2.14. A certain level of prearranged interruptions will inevitably be required to allow for the necessary asset expenditure plans in ED1. As customers are inconvenienced less by planned outages where sufficient notice is given, they are weighted at 50 per cent relative to equivalent levels of unplanned interruptions. We are consulting on two options for improving and simplifying the methodology for setting the target number and length of planned interruptions.
- 2.15. The options we are considering are to allow DNOs to set out the level of interruptions they feel is required as part of their business plans, or to set a prearranged target based on a rolling three-year average of planned interruption performance. We propose that this rolling average would have a two-year lag before performance impacts on the target. In both cases, we propose that DNOs would be rewarded or penalised based on the difference between their actual performance and the target, using an incentive rate that is half that of unplanned interruptions.

Unplanned target setting

- 2.16. In both the fourth distribution price control (DPCR4) and DPCR5, unplanned interruptions and minutes lost targets have been set using a combination of DNO own and industry average for Low Voltage (LV), Extra High Voltage (EHV), and 132kV whilst the High Voltage (HV) element is benchmarked from the HV disaggregated reporting for the minutes lost targets. For RIIO-ED1, we have outlined a number of options for setting targets, and have indicated that the DPCR5 approach after being slightly amended is our preferred option. In the chapter we have also outlined indicative targets for RIIO-ED1 based on our preferred option from amongst those proposed.

Exceptional events

- 2.17. We propose to maintain the severe weather exceptional event threshold at eight times the average daily fault rate at HV and have updated the threshold numbers using the most recent data. We propose to maintain the one-off exceptional event mechanism, but are considering reviewing the thresholds of 25,000 customers interrupted and/or 2 million customer minutes lost which currently apply for these exceptional events. For the one off events we also propose to review whether to introduce potentially replacing exceptional event days with that period's average performance.

Cut out failures

- 2.18. We are considering, and inviting views on, whether to include interruptions resulting from a single premise cut out fault within the IIS.

Short interruptions

- 2.19. Having explored the possible approaches to incentivising the reduction of short interruptions, we propose that it is not appropriate to implement such an incentive for RIIO-ED1. Our proposal is based on our research on customer willingness to pay, and awareness of the potential for adverse interaction and overlaps between a scheme to reduce short interruptions and the IIS.

Guaranteed Standards of Performance

- 2.20. As detailed in Chapter 7, as part of the review on how we apply the IIS to RIIO-ED1, we have reviewed the associated guaranteed standards relating to

quality of network service, SI No. 698, 2010¹. We are interested in stakeholder views on our proposals to:

- Reduce the 18 hour normal weather interruption duration standard to 12 hours, and review the payment levels of this standard
- Remove the Highlands and Islands exemption from specific guaranteed standards
- Remove the DNO exemption from paying out in the event of a one-off exceptional event
- Consider whether to up-rate payments in line with inflation at the end of DPCR5, or set out the payment levels for each year of RIIO-ED1 based on forecast inflation rates
- Consider the introduction of penalties on DNOs for failing to make payments to eligible customers
- Explore whether payments to customers on the priority service register should be made automatically.

Secondary Deliverables

Load Index (LI)

- 2.21. The LI provides a measure of the loading of the substations on each DNO's primary network.
- 2.22. We propose to work with industry to develop greater consistency in calculating loading and the classification of substations into LI ratings. We set out our proposed approach for the LI1 - LI5 ratings in Chapter 5. We are also proposing that the DNOs' business plans set out the funding that they will need to maintain a specific average level of loading across substations rather than being funded for a specific level of improvement. Chapter 5 also sets out our views on how the impact of Distributed Generation (DG) growth should be captured in the LI framework.

Health Index (HI)

- 2.23. We propose to encourage industry to develop greater consistency across DNOs on how the five HI ratings are determined and the assets that they are applied to. We also propose to combine the impact of asset failure (the 'criticality') with the HI measure of the probability of failure to create an overall risk index (RI) for each relevant asset type. Where it can be shown to be in the interests of customers, we propose to introduce arrangements to allow for over delivery against the agreed deliverable in RIIO-ED1.

¹ http://www.legislation.gov.uk/ukxi/2010/698/pdfs/ukxi_20100698_en.pdf

- 2.24. We propose to include safety as one of the elements of asset criticality that will be considered in prioritising the replacement of assets, which is also relevant to our wider work on safety outputs.

Worst Served Customer mechanism (WSC)

- 2.25. As detailed in Chapter 8, we propose to develop the existing WSC mechanism by following one of the following options:

- Option 1 – Keep the existing WSC mechanism, whilst amending the scheme parameters to encourage wider industry take-up
- Option 2 – Discontinue the existing mechanism and introduce a new incentive scheme where DNOs are rewarded or penalised based on the number of customers experiencing a large number of interruptions each year.
- Option 3 – Develop new guaranteed standards to drive service improvements for WSCs

- 2.26. We welcome respondents' views on the options we set out.

Resilience

- 2.27. We have been exploring whether the cost assessment approach we have proposed for flooding can be developed into a secondary deliverable for resilience. Under that proposal, DNOs would be funded based on a benchmarked cost of removing a specific level of flooding risk. We believe that this could be extended into a metric to track delivery of risk removal. A similar approach could also be taken to fund and measure resilience to a black-start event as well.

3. Safety

Chapter Summary

This chapter summarises our proposals on primary outputs and secondary deliverables in relation to safety.

Question 1: What are your views on the proposed primary output and secondary deliverables relating to safety?

Question 2: Are these appropriate areas to focus on and are there any other areas that should be included?

Question 3: Do you agree with our proposal not to place a financial incentive on the primary safety output?

Question 4: Do you agree with our proposal to create an incentive framework for secondary deliverables for electricity distribution safety?

Overview

- 3.1. DNOs are required to design and operate their networks to ensure the safety of the public and their employees. The Health and Safety Executive (HSE) monitors and enforces performance in the area of safety, as determined by legislation. In this chapter we provide background and context to setting safety outputs. We present our proposed primary output and secondary deliverables and the reasons for these. Finally, we discuss the incentive framework for delivering these outputs.
- 3.2. One of the objectives of the RSWG was to develop a set of outputs recognising the importance of safety within the regulatory framework, whilst being mindful of the HSE's role as the principal safety regulator. The DNOs, the HSE and the Department of Energy and Climate Change (DECC) were participating members of the RSWG.
- 3.3. We propose that the primary output for safety should be that DNOs comply with their statutory safety requirements which are monitored and enforced by the HSE. We propose a secondary deliverable relating to asset risk, which has implications for network safety. This secondary deliverable is set in our proposals on reliability.
- 3.4. Following discussions at the RSWG meetings, at which we explored options for reputational and financial incentives (including a discretionary reward scheme), we propose not to introduce any incentives to the primary safety output. We believe that this is not required as other agencies and mechanisms, including the HSE and statutory obligations, will continue to ensure that companies deliver the primary safety outputs.

3.5. DNOs must comply with the following legislation:

- The Electricity Safety Quality and Continuity Regulations (ESQCR) 2002 that specifies the standards that DNOs (and their contractors) must adhere to on their networks. It also specifies events which must be reported to the Secretary of State (for example deaths and injuries occurring to members of the public caused by the network)
- The Health and Safety at Work etc. Act (HSWA) 1974, which makes provision for securing the health, safety and welfare of persons at work and for protecting others against risks to health or safety in connection with the activities of persons at work
- The Electricity at Work Regulations (EAWR) 1989, which also ensures health, safety and welfare of persons at work specifically in relation to electricity.

3.6. The HSE regulates DNO compliance with these requirements. In the event of non-compliance, the HSE has a number of sanctions available to them to secure compliance with the law and to ensure a proportionate response to criminal offences. Inspectors may offer DNOs information and advice, both face to face and in writing. This may include warning a DNO that, in the opinion of the inspector they are failing to comply with the law. Where appropriate, the HSE may also serve improvement and prohibition notices, withdraw approvals, vary licence conditions or exemptions, issue simple cautions (England and Wales only), and they may prosecute (or report to the Procurator Fiscal with a view to prosecution in Scotland).

3.7. We envisage our strong bilateral engagement developed through previous price controls and the RIIO-ED1 review process will be ongoing so that:

- The HSE can continue to assist Ofgem to understand the safety obligations that the businesses have;
- Ofgem can assist the HSE in quantifying the efficient cost of its current and proposed safety requirements.

Primary output and secondary deliverables

3.8. We propose that the appropriate primary output for safety is compliance with the safety requirements set out in legislation and monitored by the HSE. The HSE is the principal regulator and this primary output supports rather than duplicates their functions.

3.9. It is our view that the primary output should not stipulate an exhaustive list of legislative requirements but include examples of legal obligations such as ESQCR, HSWA and EAWR. This will ensure that the primary output remains

relevant should any further legislative requirements be imposed on the businesses during the price control period.

- 3.10. We propose that the secondary deliverables for safety should be the asset health, criticality and risk index (RI) assessments. These arrangements are explained in Chapter 6. These secondary deliverables provide a framework for managing network risks including safety implications. Our initial view is that asset health, criticality and risk indices provide a useful means of monitoring and ensuring that the DNOs' compliance with future safety requirements is not put at risk by decisions made during the active price control period.

Incentives

- 3.11. As part of the RSWG, we have considered whether it is appropriate to introduce incentives to the area of safety. We have considered both financial and reputational incentives.
- 3.12. With regard to financial incentive mechanisms, the RIIO principles set out that "we will not use automatic financial mechanisms that could have a detrimental effect on safety".² For RIIO-ED1 we therefore propose not to include a financial incentive for the primary safety output. The RIIO principles also recognise that "we may not be using a financial incentive because network companies are incentivised by other organisations (eg the HSE for safety) or other mechanisms (eg enforcement powers, legal obligations)."³ This is consistent with the approach taken in the RIIO-T1 and RIIO-GD1 price controls, where no financial incentive has been attached to the primary safety outputs in RIIO-T1 and GD1.
- 3.13. In addition to this, data on safety performance is already collected and published by other organisations, such as the HSE through its Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR) framework.⁴ It is our view that an additional reputational incentive is not therefore required for RIIO-ED1.

² From the RIIO Handbook p.33:

<http://www.ofgem.gov.uk/networks/rpix20/consultdocs/Documents1/RIIO%20handbook.pdf>

³ From the RIIO Handbook, p.79

⁴ Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995:
<http://www.hse.gov.uk/riddor/>

4. Interruptions Incentive Scheme

Chapter Summary

This chapter details out proposals in relation to the interruptions incentive scheme. In particular, it covers the areas of incentive rates, target setting, revenue exposure and exceptional events.

Question 1: Do you agree with our proposal to align the IIS incentive rates with those proposed as part of RIIO-T1?

Question 2: What are your views on applying the efficiency incentive rate to the IIS incentive rates?

Question 3: Do you believe we need to introduce a rolling incentive mechanism for IIS, along the lines of the shrinkage rolling incentive proposed in RIIO-GD1, and if so outline your views on the merits of this approach for the IIS?

Question 4: What are your views on the level of revenue exposure and do you believe we need to reintroduce a cap on outperformance?

Question 5: Do you agree with our proposal to set separate planned and unplanned interruptions and minutes lost targets under the IIS?

Question 6: Do you have a preference amongst the options which we have outlined for planned interruptions and minutes lost target setting in RIIO-ED1?

Question 7: Do you have a preference amongst the options which we have outlined for unplanned interruptions and minutes lost target setting in RIIO-ED1?

Question 8: Do you agree with our proposals on exceptional events?

Question 9: Do you agree with our proposed approach to smart electricity meters?

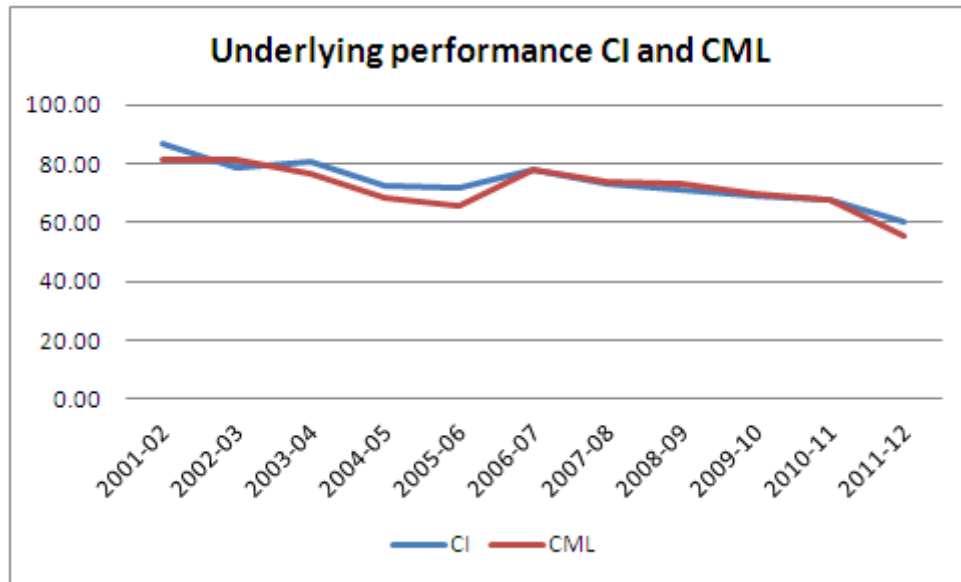
Question 10: Do you agree with us not incentivising short interruptions in RIIO-ED1?

Background

- 4.1. The reliability of the electricity distribution networks is one of our key priorities. Customers expect the DNOs to manage the number and duration of interruptions that occur on the network, taking account of customers' willingness to pay for performance improvements. As part of the Broad Measure of Customer Satisfaction, we gauge customers' views on DNO performance during supply interruptions. This is covered in more detail in the Customer Service chapter of the Outputs, Incentives and Innovation document.
- 4.2. To encourage the companies to manage the number and duration of supply interruptions appropriately, Ofgem introduced an incentive scheme, the IIS in 2001/02. The IIS has brought about a significant improvement in network

reliability. The underlying average⁵ number of interruptions has fallen by 30 per cent and the underlying average number of customer minutes lost has fallen by 32 per cent for Great Britain since the introduction of this scheme. The IIS provides an incentive for DNOs to invest in and operate their distribution system to manage and reduce both the frequency and duration of power cuts experienced by their customers, where efficient to do so.

Figure 4.1 – Underlying Customer Interruptions and Customer Minutes Lost



RIIO-ED1 primary outputs and secondary deliverables

- 4.3. We propose to retain the DPCR5 IIS, with some improvements, as the framework for driving and assessing delivery of the primary outputs for reliability – the number and duration of supply interruptions. The IIS has successfully improved DNO performance, is readily measurable, is controllable and can be consistently measured and compared. It incorporates both the frequency and duration of interruptions, providing a measure that reflects the output delivered to customers.

Proposed incentives

Interruptions Incentive Scheme (IIS)

⁵ Underlying performance excludes exceptional events. There are two categories of exceptional events. The first category covers severe weather events such as storms. The second covers other one-off events, such as those caused vandalism.

- 4.4. The IIS uses two key performance metrics to assess reliability and availability across the DNOs: the number of customer interruptions per 100 customers (CI) and the duration of these interruptions to supply per customer (CML). Each interruption to a DNO's customers costs the DNO money. For DPCR5 this was set at around £5 per interruption per customer.
- 4.5. Under the IIS, Ofgem sets annual targets for CI and CML performance for each DNO. These are then compared to the actual reliability experienced by their customers in that year. The reported data is verified and after a two year lag, each DNO receives a penalty or reward depending on actual performance against target for that year. This means that if a company performs poorly, the amount that it can charge its customers is reduced by the penalty amount. If a company performs well, the amount that it can charge its customers is increased in line with the reward amount.
- 4.6. We intend to continue the IIS in RIIO-ED1, and are consulting here on some of the elements that make up the scheme. These include:
- the incentive rates to be applied
 - applying the totex efficiency incentive rate to the IIS incentive rates
 - revenue exposure
 - target setting:
 - separating planned and unplanned targets
 - approaches to setting planned CI and CML targets
 - approaches to setting unplanned CI and CML targets
 - benchmarking for unplanned targets
 - severe weather exceptional events
 - one-off exceptional events
 - cut out failures
 - smart meter roll-out and the impact on IIS
 - short interruptions.

Incentive rates

- 4.7. For DPCR5, we increased the incentive strength on CMLs, based on our stakeholder willingness to pay research. We found that stakeholders were, in general, more concerned about the duration, rather than the number, of interruptions they experienced. This research was incorporated into the incentive rates that we set for DNOs for DPCR5.
- 4.8. We engaged consultants, Reckon, to carry out a desktop review of the value that customers place on interruptions to electricity supply. This work included an examination of different incentive rates. Their review considered the most recent and internationally comparable research available. Based on this

review, our view is that the DPCR56 incentive rates could be used for the IIS scheme in RIIO-ED1, with an appropriate adjustment for inflation as the DPCR5 incentive rates fell within Reckon's advocated range of suitable rates. However as discussed later we are proposing to align the treatment of IIS incentive rates with the RIIO-T1 Energy Not Supplied incentive rates.

- 4.9. An alternative approach we would be willing to consider is to allowing DNOs to propose their own incentive rates as part of their business plan submission.

Applying the efficiency mechanism to the IIS incentive rates

- 4.10. During the RSWG meetings, we queried the interaction between the IIS and IQI. In particular, we discussed whether the IQI incentive rate should be applied to the IIS incentive rates. This would have the effect of reducing the IIS incentive rates. DNOs respond to the IIS incentive scheme in a number of ways. They invest in assets that improve performance as well as through operational changes which can enable them to deliver improved service without necessarily increasing the costs to deliver that service.
- 4.11. During the RSWG meetings we discussed that investment in automation or other equipment for the purpose of delivering improvements in IIS performance is effectively funded by customers through the IQI incentive rate. This could potentially result in customers paying over their stated willingness to pay for service improvements.
- 4.12. This was raised as an issue for consideration as in the RIIO-T1 Energy Not Supplied scheme the incentive rate of £16k per megawatt hour (MWh) is subject to the IQI mechanism. Once the IQI has been applied to the incentive rate it has the effect of reducing the transmission incentive rates to £8k per MWh.
- 4.13. We are proposing that the IIS incentive rates should be aligned with those proposed as part of RIIO-T1. Based on initial analysis, this change would not result in significantly different incentive rates to those currently used in DPCR5. We welcome views on this proposal, and in particular the extent to which companies' own stakeholder research should be taken into consideration when finalising our decision.
- 4.14. In addition to the question of applying the efficiency incentive to the IIS incentive rate we are also mindful of the proposed RIIO-GD1 rolling incentive mechanism on shrinkage. Rolling incentive mechanisms are designed to remove any disincentive to invest in performance improvements towards the end of a regulatory period. We welcome views on whether there is a need for

⁶ In setting the DPCR5 incentive rates, Ofgem undertook qualitative and quantitative willingness to pay research into improvements in service.

such a mechanism for customer interruptions and customer minutes lost as part of RIIO-ED1. We are interested in respondents' views of the merits of introducing a rolling incentive mechanism for the IIS, particularly how the various components of the IIS, targets, incentive rates, and retention periods would need to be calibrated to ensure incentive compatibility.

Revenue exposure

- 4.15. The upside cap on IIS revenue exposure was removed for DPCR5 on account of the maturity of the IIS scheme and a desire to encourage high-performing DNOs to surpass their targets. There were individual downside collars for CI and CML performance with an overall downside exposure for the period set at 139 RORE basis points.
- 4.16. Due to the longer RIIO price control periods and the fact that we are proposing to set these targets relatively early in the price control process, we are also considering whether to re-introduce the upside cap on out-performance. There is significant uncertainty over the ability of the DNOs to outperform targets set up front. An upside cap would provide an element of protection to customers, ensuring that DNOs do not make excessive returns under the scheme.
- 4.17. If the upside cap on performance were to be re-introduced we would envisage having symmetrical caps and collars. Given that RIIO-ED1 will be longer than previous price control periods, we propose to increase the revenue exposure to a point between 250 and 300 RORE basis points over the entire RIIO-ED1 period. This proposed range has been derived with reference to the level of the DPCR5 downside collar, adjusted for the longer RIIO control period.

Separating planned and unplanned targets

- 4.18. Planned interruptions are incidents arising from planned work on the distribution network and where customers were given advanced notice of the interruption. These interruptions are caused by work such as cutting trees or inspecting and maintaining assets.
- 4.19. Unplanned interruptions are incidents on a distribution network where the customers have not been given advance notice of the interruptions. For example, these interruptions can be caused by trees falling on a line during a storm or assets failing.
- 4.20. The CI and CML targets set for DPCR5 included a combination of planned and unplanned targets. For RIIO-ED1, based on our experience of combining targets for DPCR5, we are proposing to have two separate targets for DNOs. This is because we are proposing to use different methodologies in setting these two elements, with the unplanned targets set up front at the start of the

price control and the unplanned targets varying within the period based on actual performance. Details of these proposals are set out in the sections below.

- 4.21. We feel it is preferable to split them out due to differing levels of robustness between the sources of data for these targets. The data for unplanned targets has been recorded and reported in a more established manner over a number of years, and it is possible to benchmark this data, which provides us with comfort when setting targets. The data for planned targets for DPCR5 was based on the DNOs' forecasts of the work plans and their expenditure plans, setting targets based on this approach is not as robust as using benchmarked data.

Planned target setting

- 4.22. In setting the planned targets for DPCR5, Ofgem took the views of industry into account when determining which elements of forecast expenditure and work-load were likely to drive planned interruptions and minutes lost. An allowance was set for planned interruptions based upon comparative analysis of forecast spend per interruption and minutes lost across a number of areas of expenditure groups (load, non-load, inspections and maintenance, and tree cutting) based on the strength of the link between each activity and the need to interrupt customers. The planned forecasts and the forecasts of expenditure were then benchmarked, to yield an allowance for each DNO. These allowances were then spread evenly across the five years of DPCR5.
- 4.23. We consider that the method used to set allowances for DPCR5 may create an incentive for DNOs to over-forecast the number of planned interruptions required. We do not propose to use the same approach for RIIO-ED1.
- 4.24. The options considered to date are:
- a rolling target setting approach, with a lag of two years before actual performance feeds into DNO targets
 - DNO-proposed targets informed by stakeholder engagement.

Rolling target approach

- 4.25. The rolling targets approach allows the targets to increase and decrease, based on each DNO's actual performance. By setting the lag on the rolling average at a relatively short period of two years, it would mean that DNOs would not be unduly affected by events such as the roll-out of smart meters over the length of the price control. It would also allow enough time for Ofgem to process and issue the targets to each DNO. This can be combined with the process that Ofgem currently undertakes in issuing directions following exceptional events which affect DNOs' performance. We feel that this

approach, whilst more straightforward, is superior to the one adopted for target setting for DPCR5.

- 4.26. We propose that the rolling average would be based on three years of performance data. This will, over time, take into account the inherent levels of necessary planned outages. This method allows Ofgem and the DNOs to avoid the uncertainty around forecasting both expenditure and the impact IIS performance over the price control period. It also avoids any issues surrounding the link between forecast expenditure and the associated number of interruptions, including the mechanistic apportionment of weightings to expenditure groups.
- 4.27. We also propose to share the target setting methodology so that each DNO will know its planned targets ahead of receiving the formal direction from Ofgem.

Set own planned targets

- 4.28. The second option would allow DNOs to set their own planned targets at the start of RIIO-ED1 as part of their well justified business plans. The use of these targets may be more appropriate for companies that succeed in being fast-tracked due to our assessment of their well justified business plans. DNOs would need to present a compelling case, justified by appropriate customer research, as to why the proposed target should be applied in RIIO-ED1.

Unplanned target setting for CI and CML

- 4.29. Given the move to the longer RIIO price control period we have considered alternative methods for setting unplanned targets. For DPCR5, we set the CI and CML targets for DNOs at the start of the price control period. This provided clarity and certainty for DNOs. For RIIO-ED1 we are considering a number of options, including continuing the approach we used at DPCR5, these are discussed more thoroughly below. Specifically, the options we have considered are:

- Setting targets up front
- Rolling targets
- Capped rolling targets
- DNOs' setting their own targets.

Setting targets up front

- 4.30. The DPCR5 CI and CML target setting methodology was predominantly based on disaggregation of HV interruptions data. A detailed process of assigning circuit bands based on physical parameters to HV interruptions was used to benchmark DNOs' performance relative to each other. Benchmarks for HV

interruptions were then calculated for each DNO by summing benchmarks for different circuit bands. Benchmarks for the LV, EHV and 132kV interruptions data were calculated using simpler processes which reflected their relative weight in the overall CI and CML targets. The HV, LV, EHV, and 132kV benchmarks were then aggregated to set an overall CI and CML target.

- 4.31. DNOs are comfortable with this approach and it provides certainty when it comes to determining whether an investment to improve performance for customers is worth pursuing or not. As this method requires the targets for the whole period to be set the beginning of the period, it is clearly very important that we have a robust process in place to determine each DNO's targets. A potential downside to this method is that we may not be able to take performance improvements realised late in the DPCR5 period into account while setting the targets for RIIO-ED1. This would mean that the DNO could reap any benefits for longer than they otherwise would, until the next price control review. However our proposal to apply improvement factors (set out below) to both the CI and CML targets reduce our concerns in using this approach.
- 4.32. This is our preferred option and we propose to retain this method with updated benchmarking to set targets for RIIO-ED1.
- 4.33. We propose to use a broadly similar methodology for calculating unplanned CI and CML targets in RIIO-ED1 to that we used in DPCR5. We have identified underlying performance for 2002-03 onwards by excluding exceptional and one-off events from the data. The initial results of using this method to set CI and CML targets are presented in Table 4.1 and Table 4.2, respectively, below.⁷
- 4.34. In setting the CML targets outlined in Table 4.2, we applied a 75:25 ratio between the first pass of unplanned CML targets and each DNO's current average performance (which was based on four years of performance for LV, HV, Distributed Generation, National Grid, and Other Connected Systems, and for EHV and 132kV was based on ten years) to set a start point for the CML targets in RIIO-ED1.

⁷ Due to incorrect HV disaggregated data from three DNOs which we adjusted, there may be consequential changes to these proposed targets in the strategy decision document.

Table 4.1 - Targets for unplanned Customer Interruptions (CIs)

	Current average performance *	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
ENWL	48.1	47.9	47.6	47.4	47.2	46.9	46.7	46.5	46.2
NPgN	63.6	62.7	61.7	60.8	60.5	60.2	59.9	59.6	59.3
NPgY	70.1	69.1	68.1	67.0	66.0	65.0	64.1	63.1	62.2
WMID	93.6	92.2	90.9	89.5	88.2	86.8	85.5	84.2	83.0
EMID	59.2	58.3	57.4	56.6	55.7	54.9	54.1	53.8	53.5
SWALES	55.6	55.3	55.0	54.7	54.4	54.2	53.9	53.6	53.4
SWEST	57.3	57.0	56.7	56.5	56.2	55.9	55.6	55.3	55.1
LPN	29.3	29.1	29.0	28.8	28.7	28.5	28.4	28.3	28.1
SPN	73.2	72.1	71.0	69.9	68.9	67.8	66.8	65.8	65.5
EPN	75.0	73.9	72.8	71.7	70.6	69.6	69.2	68.9	68.5
SPD	51.8	51.5	51.3	51.0	50.8	50.5	50.3	50.0	49.8
SPMW	37.6	37.4	37.2	37.0	36.9	36.7	36.5	36.3	36.1
SSEH	70.2	69.9	69.5	69.2	68.8	68.5	68.1	67.8	67.5
SSES	64.8	63.9	62.9	62.0	61.0	60.7	60.4	60.1	59.8

* Current average performance (LV, HV, NGC, DG, OCS 08/09 - 11/12) (EHV, 132kV 02/03 - 11/12)

Table 4.2 - Targets for unplanned Customer Minutes Lost (CMLs)

	Current average performance *	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
ENWL	43.4	44.3	43.7	42.8	41.9	41.1	40.3	39.5	38.7
NPgN	63.1	58.0	56.8	55.7	54.6	53.5	52.5	51.5	50.5
NPgY	63.2	62.8	61.5	60.2	59.0	57.9	56.7	55.6	54.5
WMID	67.3	65.9	64.4	63.0	61.6	60.3	59.0	57.7	56.5
EMID	45.5	45.7	44.7	43.7	42.7	41.7	40.8	39.9	39.0
SWALES	28.7	41.6	41.6	41.6	41.6	41.6	40.8	39.9	38.9
SWEST	35.0	49.7	49.7	49.7	49.7	49.7	48.9	47.8	46.8
LPN	41.4	42.1	41.6	41.0	40.4	39.8	39.2	38.6	38.0
SPN	70.3	54.7	53.4	52.2	51.0	49.9	48.8	47.7	46.6
EPN	64.7	55.9	54.7	53.5	52.3	51.1	50.0	48.9	47.8
SPD	47.8	46.8	45.8	44.9	44.0	43.1	42.2	41.4	40.6
SPMW	41.0	40.0	39.1	38.2	37.3	36.5	35.6	34.8	34.0
SSEH	63.4	60.4	59.1	57.8	56.6	55.3	54.1	53.0	51.8
SSES	59.4	53.5	52.4	51.4	50.3	49.3	48.3	47.4	46.5

* Current average performance (LV, HV, NGC, DG, OCS 08/09 - 11/12) (EHV, 132kV 02/03 - 11/12)

Rolling targets

- 4.35. A new option which was discussed at the RSWG meetings was to use a 'best rolling average' method, effectively a one-way ratchet where targets could only get harder. This approach would mean that the targets would be determined based on actual performance during the price control to reflect more recent performance than is currently the case in DPCR5.
- 4.36. This option would involve setting a target rate at the start of the price control based on average performance across prior years. A rolling average would be calculated each year in RIIO-ED1 and, if a DNO's performance improved, this would be reflected in its targets. If, however, the DNO's performance worsened, its targets would not be relaxed. This approach would mean that the targets would be determined based on actual performance during the price

control. One benefit of this option is that it removes the timing issues that exist with setting targets up front in advance of the price control.

- 4.37. Under this option, we would anticipate introducing a four year lag before DNO performance feeds into targets. We consider that this would allow time for DNOs to re-coup the costs of their investment, as well as allowing time for Ofgem to run the target setting process, notify DNOs of their targets, and for DNOs to respond to the new targets with network investment or operational changes. While we would expect to share the methodology used to set these targets, one complication of this option is that the upper quartile CI benchmark used to determine CML targets will be unknown to DNOs until the targets are revealed. As is currently the case, we propose that the frontier DNOs that set the industry upper quartile benchmark for CIs should not be unduly penalised with their CML targets.

Capped rolling targets

- 4.38. An option put forward by other members of the working group was a 'capped rolling average' approach. This method is similar to the 'best rolling average' method described above, with the difference that a DNO's targets could get harder or could get easier based on performance within the control period but would never get any easier than the initial target set at the start of the price control period.
- 4.39. This alternative was suggested due to concerns that, under the 'best rolling average' method, a DNO which managed to outperform its target in only one year of RIIO-ED1 could be unduly disadvantaged over the remainder of the price control. For example, a DNO achieving an actual CI performance of 49 versus a target of 50 in year one and then achieving 50 for the remainder of the price control would be in a penalty position from the point where the performance of 49 had fed into its targets until the end of the price control. This approach would correct for the one year improvement, unlike the rolling targets approach we suggested.

DNOs set their own targets

- 4.40. The final option for unplanned targets is to allow DNOs to set their own targets in advance of the price control as part of their well justified business plans, and based on feedback from stakeholders.
- 4.41. The use of these targets may be more appropriate for companies that succeed in being fast-tracked. One concern with this approach would be that DNOs may propose easier targets than those that we would have set using one of the approaches outlined above. The DNO's stakeholders could be left with worsening performance over RIIO-ED1 while simultaneously rewarding DNOs for this if the targets are too easy to achieve.

Benchmarking for unplanned targets

- 4.42. Ofgem undertakes detailed disaggregation and benchmarking analysis across the DNOs based on the annual performance data reported from the start of the IIS to the most recent data. This analysis is used to set performance targets for each DNO.
- 4.43. A key input to target setting is through the use of benchmarking of quality of supply performance across DNOs to inform the scope for improvement both on CIs and CMLs.
- 4.44. The first step in disaggregation is to consider the voltage levels within a distribution network (LV, HV, EHV and 132kV) separately. The disaggregation process and benchmark calculations are specific to each voltage level and are summarised below.
- 4.45. The benchmarks at each voltage level for each DNO are then summed to give an aggregate benchmark for that DNO. DNO's performance can then be shown as actual performance relative to the benchmark. This approach enables a robust method for comparing quality of supply performance and identifying scope for improvement. Once the benchmarking process has been completed, we use the data to set the targets. Only the CML per CI benchmark is used in setting CML targets, for CI targets no benchmarking is used. Table 4.3 outlines our use of benchmarking for two DNO's (DNO A and B - DNO B is the frontier performer).

Table 4.3 - Use of benchmarking in RIIO-ED1

		CI Target		CML Target
		Initial	Benchmark CI	
	DNO CI Average Performance			
DNO A	100	100 (T)	80	Own CI target multiplied by Benchmark CML per CI
DNO B	30	30 (T)	50	Benchmark CI multiplied by Benchmark CML per CI

- 4.46. So in the table above, DNO A will have an initial CI target of 100 (based on their average CI performance), and a benchmark CI of 80, we propose to use DNO A's CI target of 100 for the CML per CI calculation. DNO B will have an initial CI target of 30 (based on their average CI performance), and a benchmark CI of 50, as they are the frontier DNO we propose to use DNO B's benchmark target of 50 for the CML per CI calculation.
- 4.47. For RIIO-ED1, we propose to use much the same approach as was adopted for DPCR5.

CML per CI benchmarking

- 4.48. This is the benchmark for average restoration times, which DNOs can influence through the processes they implement. For LV, EHV and 132kV, this is based on the sum of the CML for all industry divided by the sum of CI for all industry. The HV CML per CI benchmark is based on the upper quartile level of performance. The CML per CI benchmarks are used in setting targets.

Benchmarking and weighting of 132kV and EHV

- 4.49. There are relatively few incidents each year at the 132kV and EHV voltages. This can lead to volatile performance in any one year. To counter this volatility in DPCR5 we took each DNO's past average interruptions performance at these voltages over a number of years, and included the results in their CI and CML targets. In any given year this averaging could make the overall CI and CML targets more achievable on an annual basis over the price control if they do not have any interruptions at these voltages.
- 4.50. For the part of the overall CI target at these voltages we propose to continue basing the CIs on each DNO's actual average performance averaged over the past ten years for 132kV and EHV.
- 4.51. In setting the relevant CML targets for the first year of RIIO-ED1, we propose to use the lower of each DNO's own CML per CI or the industry average CML per CI, multiplied by each DNO's own historic CI average. This approach has the benefits of introducing an element of benchmarking to the process while recognising the variability of these values between DNOs.

Benchmarking of HV

- 4.52. The HV network has been disaggregated into a number of circuit groups with similar characteristics, known as bands. The bands are defined so that the differences in key characteristics such as the percentage of overhead line, length and the number of connected customers are minimised and that no group is dominated by a single distribution company. Benchmark levels of performance are calculated by Ofgem for each circuit group.
- 4.53. HV targets for DPCR5 were based on four years of interruptions data – 2005-06 to 2008-09. From 2002-03 onwards DNOs have completed standard IIS interruptions sheets with corresponding increases in accuracy of HV interruptions data. For HV benchmarks in RIIO-ED1, we propose to use the most recent four years' data.

Benchmarking of LV

- 4.54. For LV benchmarking we propose to re-use the DPCR5 approach, which was to benchmark the number and duration of interruptions at the total LV level

based on four years' data. As distribution companies have limited ability to influence the number of customers interrupted at LV, the benchmarks are based on each DNO's current level of performance. However, as companies have more influence over the restoration process, the benchmarks for restoration times (CML per CI) are based on average performance across all the companies, which is used in setting targets.

Improvement factors

- 4.55. For the RIIO-ED1 targets we are proposing to apply improvement factors for both the CI and CML targets. We propose that the improvement factors will only apply after setting the initial CI and CML targets for the first year of RIIO-ED1. Given that we are proposing to set targets up front for eight years, we believe that it is appropriate to propose applying improvement factors to interruptions and minutes lost targets in RIIO-ED1, based on historical performance improvements.
- 4.56. On the CI targets we propose to apply improvement factors, as presented in Table 4.4 below. Our proposed CI factors are based on our analysis of DNOs total CI performance over the past ten years of reporting of IIS, this has shown a range of improvement of between a third of one per cent and five per cent. We are therefore proposing to apply an improvement factor of half of one per cent for DNOs beating the current 2008-09 to 2011-12 benchmarks, and one and a half per cent for those who are currently worse than the benchmark.

Table 4.4 - CI improvement factors for RIIO-ED1

	Improvement factor
DNO beating benchmark	0.5%
DNO worse than benchmark	1.5%

- 4.57. For the CML targets, the improvement factors are outlined in Table 4.5 below, these are based on assessing the CML/CI performance of the industry at each voltage level over the same number of years as is used in setting our proposed targets (under the up-front approach). This analysis has shown a range of improvements, and we are proposing to use the average of each in setting the improvement factors.

Table 4.5 - CML improvement factors for RIIO-ED1

Voltage	Improvement factor
132kV	1%
EHV	1%
HV	3%
LV	1%

Exceptional events

- 4.58. Exceptional events are incidents that have a significant impact on a DNO's interruptions performance. There are two categories of exceptional events, the first being severe weather (such as those caused by storms and lightning), and the others are one off events (such as those caused by vandalism). There are two mechanisms in the IIS framework through which we can exclude such events. We propose to retain and update these mechanisms. By excluding such events from the IIS, it allows DNOs to focus on the underlying day to day performance of their network, and makes the targets less volatile. Indicative threshold numbers are shown in Table 4.6.

Severe weather exceptional events

- 4.59. We propose to continue to evaluate severe weather exceptional events against thresholds based on eight times each DNO's daily average higher voltage fault rates. We have updated the ten year period from which we calculate these averages to 2002-03 to 2011-12. We propose to update again next year and that these thresholds will then apply for the entire period and will not be updated on an annual basis.

Table 4.6 - Severe weather exceptional event thresholds for RIIO-ED1

DNO	Threshold	
	Category 1 - Medium severe weather events	Category 2 - Large severe weather events
	8*mean HV and above daily average incident rate	13*mean HV and above daily average incident rate
ENWL	54	87
NPgN	36	58
NPgY	39	63
WMID	63	102
EMID	66	108
SWALES	42	68
SWEST	59	96
LPN	12	20
SPN	54	87
EPN	93	151
SPD	76	123
SPM	69	112
SSEH	59	95
SSES	66	108

One-off exceptional events

- 4.60. We propose to continue this mechanism. We propose to review both the individual one off event threshold of 25,000 customers and 2 million minutes lost. Given the incentive properties in relation to the current exclusions mechanism we also propose to review whether to introduce some form of replacing exceptional event days with period average performance.
- 4.61. In the light of experience gained from the major one-off event that occurred at Dartford in 2009 we propose to amend the IIS and guaranteed standards arrangements, namely the 5,000 customers interrupted standard.
- 4.62. We propose to remove the exemptions from the guaranteed standards which DNOs can invoke in order to avoid making payments to customer in these circumstances. Our current view is that this would require the removal of Regulation 10 (e).⁸ This would mean that eligible customers would receive compensation in the event of a major, prolonged event. Where a DNO passes an independent IIS one-off exceptional event audit, it will be able to recover the associated guaranteed standard payments made in respect of the event via its price control revenues.
- 4.63. Where a DNO fails the independent IIS audit, it will be exposed to the IIS and they will not be able to recover any of the guaranteed standards payments via price control revenues. We may consider the introduction of an individual event cap, although DNOs do have protection via the annual IIS and guaranteed standards caps which we intend to retain.

Cut out failures

- 4.64. Under the current reporting rules, a cut out fault affecting only one customer which, to fix, requires all other customers on the feeder to be interrupted is not counted under the IIS. Individual customers who experience such interruptions are, however, covered by relevant guaranteed standards.
- 4.65. As part of our discussions at the RSWG meetings, Ofgem queried whether we should continue with this approach, or whether such interruptions should count towards a DNO's performance under the IIS for RIIO-ED1.

⁸ Which states that a DNO is not required to make a payment under a relevant standard where *"It was not reasonably practicable for the relevant electricity distributor to take the action required by the regulation before the contravention time as a result of...circumstances of an exceptional nature beyond the control of the relevant electricity distributor..."*

Smart meters

- 4.66. The roll-out of smart meters is scheduled to be completed during the RIIO-ED1 period. Some of the key details surrounding smart meters have not yet been finalised. Once the specific arrangements surrounding the functionality of smart meters and the associated arrangements relating to the data collected by these meters have been decided, the impact on the IIS will be a clearer.
- 4.67. Early feedback from DNOs at the RSWG meetings has suggested that the introduction of this technology will have limited immediate impact on unplanned interruption performance. However, due to the uncertainty surrounding this area, we propose to include a rebasing mechanism within the RIIO-ED1 licence which could be triggered, should there be a material change in reported performance as a result of the use of data available from smart meters.⁹ We believe our proposal for planned targets should address any performance impact caused by the roll-out.
- 4.68. During RIIO-ED1, we expect DNOs to ensure that their new systems can handle and make effective use of the new data streams and we expect to see evidence in DNOs' business plans showing how they plan to do this. We currently anticipate that we will be able to utilise this data in setting targets at RIIO-ED2.

Short Interruptions

- 4.69. Short interruptions are losses of electrical supply that last for less than three minutes, to one or more customers. These losses of supply are also known as transient faults and can be caused, for example, by a branch briefly coming into contact with an overhead line which could cause the line to trip resulting in loss of supply. If this happens, automatic switchgear may operate quickly to clear the fault from the line and restore supplies to any affected customers.
- 4.70. We have discussed in the RSWG meetings whether reducing the number of short interruptions should be incentivised for RIIO-ED1. Based on our discussions and customer research to date, we believe it would be inappropriate to do so. There are a number of reasons for this. Firstly, stakeholder feedback places more importance on reducing the duration of interruptions rather than specifically reducing the number of interruptions. Secondly, the structure of the IIS is such that short interruptions are created by companies trying to reduce the number of customers interrupted. The strength of any incentive to reduce the number of short interruptions occurring is likely to require significant investment or increases to the IIS

⁹ Such an approach has a precedent, as a rebasing clause was included in the DPCR3 licence to reflect potential changes brought about by the introduction of new reporting rules and systems.



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incentive rates beyond what our research has indicated customers are willing to pay.

5. Load indices

Chapter Summary

This chapter sets out our proposals on Load Indices for RIIO-ED1. It details the improvements that we are proposing to make to the scheme, such as the introduction of consistent LI categorisation and accounting for the impact of DG. It also explains our proposals on setting the deliverables for the RIIO-ED1 period.

Question 1: What are your views on our proposals on load indices (LIs)?

Question 2: Do you agree with our proposed common LI bandings?

Question 3: Of the two options outlined for determining the LI deliverable, which do you think is the most appropriate?

Question 4: Where significant numbers of substations that predominantly cater for demand arise, do you agree that the development of a Distributed Generation (DG) index for generation-dominated substations would be feasible and appropriate to implement at the mid-period point of RIIO-ED1?

Background – arrangements in DPCR5

- 5.1. One of the key factors in the overall reliability of a network is how heavily loaded it is relative to its capacity. Networks that are overloaded will experience increased interruptions to customer supplies. This is because the physical condition of its individual assets will deteriorate at a faster rate than otherwise anticipated, whilst substation fuses will be in danger of failing, all of which will lead to an increase in outages.
- 5.2. Within the context of the loading of DNO substations, at a given point in the price control period, a well-justified long-term investment decision to increase capacity at a particular substation is unlikely to immediately result in an improved IIS performance. Therefore, without a secondary deliverable, there may be circumstances in which a DNO would not be financially incentivised within the period to do the right thing and make the investment.
- 5.3. Within the existing regulatory framework for DPCR5, the Load Index forms part of the network output measures. Effectively, this operates as a secondary deliverable for general reinforcement baseline expenditure. For the primary network (EHV and higher), DNOs are required to deliver an equal or equivalent reduction in loading risk to substations as was forecast to be delivered by the schemes included in their baseline allowance.
- 5.4. We propose to maintain this mechanism as a secondary deliverable for RIIO-ED1. Below we set out further details of how the Load Index will work and our view on where we will look to build on the existing framework.
- 5.5. The Load Index categorises primary substations into five bands (LI1- LI5) based on each substation's loading percentage. This loading percentage is the percentage of the substation's firm capacity that is utilised at the point of

maximum demand. An additional determinant can be included in the categorisation based on the length of, or energy at risk during, this demand peak. For DPCR5, DNOs set the loading boundaries that are used to determine each substation's LI rating. These boundaries vary from company to company but are consistent with the high level band definitions shown in Table 5.1

Table 5.1 - Load Index Category Definitions

LI Rank	Definition
LI1	Significant spare capacity
LI2	Adequate spare capacity
LI3	Highly utilised
LI4	Fully utilised, mitigation requires consideration
LI5	Fully utilised, mitigation required

- 5.6. At the last price control, DNOs forecast what the loading, and therefore LI rating, of their primary substations would be at the end of DPCR5, assuming that no load-related investment was made. The proposed load-related schemes put forward by DNOs in their business plans included the relevant firm capacity and maximum demand shifts to show the change in LI rating that each reinforcement scheme was forecast to deliver.
- 5.7. Taking the overall portfolio view of substation loading across each relevant voltage level of the DNO network, both with and without investment, the LI secondary deliverable for each voltage level was set. During DPCR5 DNOs are measured against the delivery of the LI improvement put forward in their plan.
- 5.8. Between the point at which a DNO compiles a delivery plan and the completion of a price control period, there are likely to be credible changes to a DNO's plan. These changes could be brought about by external factors, such as unforeseen changes in demand, technical developments and unexpected demand or generation clustering. Network operators are not required to deliver the improvement in exactly the locations and across voltage levels specified in their plan. To do so would effectively mandate network operators to rigidly stick to their plans, and not respond to any shifts in the requirements of their customers or network. This could ultimately lead to customers' money being spent on work that is not required in the long-term.

Proposals for RIIO-ED1

- 5.9. For RIIO-ED1 we are considering a number of amendments to the framework developed at DPCR5 to improve on the existing arrangements. In particular, we are keen to ensure that the arrangements capture and are sufficiently flexible to respond to likely changes in load profiles. These changes may be due to an accelerated uptake in low-carbon technologies and the development of alternative solutions to accommodate these loads.

Consistency of LI categorisation

5.10. Within the RSWG, we have proposed the development of a common set of criteria for the LI bands. We have also been working towards developing further consistency across DNOs in some of the technical details that go into the calculation of the LI banding of each substation. This has included how elements such as component ratings¹⁰ are derived and how demand side response (DSR) and loads that can be shifted to other parts of the network are captured in the relevant annual reporting. Table 5.2 sets out the criteria used by each DNO group in DPCR5 alongside our initial thoughts on a common banding for RIIO-ED1:

Table 5.2 – Criteria used in DPCR5 to determine substation LI rankings

	ENWL	NPG	WPD	UKPN	SP	SSE	ED1 proposal
1	0-90%	0-90%	0-70%	0-70%	0-90%	0-79.9%	0-80%
2	90-95%	90-99%	70-85%	70-85%	90% - 99.9%	80-89.9%	80-95%
3	95-103%	100-115%	85-98%	85-100%	100% - 120%	90-99.9%	95-100%
4	95-103% >9 hours OR >103% <9 hours	100-115% >24 hours	>98% 8hrs or less >100	>100% <500MVAh	100% - 120% 48 - 720hrs	>100% <54hrs	>100% <24hrs
5	>103% >9 hours	100-115% >672 hours	>98% 8hrs	>100% >500MVAh	100% - 120% >720hrs	>100% >54hrs	>100% >24hrs
		OR >115%	OR 100%+		OR >120%		

Setting the deliverable

5.11. We are also reviewing the deliverable that each DNO signs up for. In DPCR5 the DNOs were required to commit to an improvement in loading levels based on the expenditure they proposed for primary network reinforcement.

5.12. An alternative approach is for DNO business plans to target a specific level of loading across their substation portfolio. For example, this could mean maintaining the current level of risk or delivering a specified target for reduced loading. In order to be able to pursue this alternative approach, we consider it necessary to be able to aggregate the LI rating of each DNO substation into a single risk score for each DNO. We put forward a proposed approach, set out below, for doing this to the RSWG and, with feedback from the group and this consultation, will finalise this for the February strategy decision paper.

5.13. Our proposed approach produces a weighted LI score. To derive this figure, individual substation LIs are weighted based on the number of customers connected to that substation, megavolt amperes (MVA) utilised or a

¹⁰ The level of loading that a component with a specific rating can take.

combination of the two. These figures are then aggregated to produce an overall weighted risk score. The relevant DNO's business plan would then need to identify the target level of loading for their network and the level of expenditure required to maintain the network loading within a tolerance band around this target level.

- 5.14. Figures 5.1 and 5.2 illustrate the agreed deliverable that would be set under the two delivery options that we are considering, based on a hypothetical starting risk score of 10.

Figure 5.1 - DNO commits to deliver a specific risk improvement relative to position without investment at the end of RIIO-ED1 (arrow indicates improvement delta)

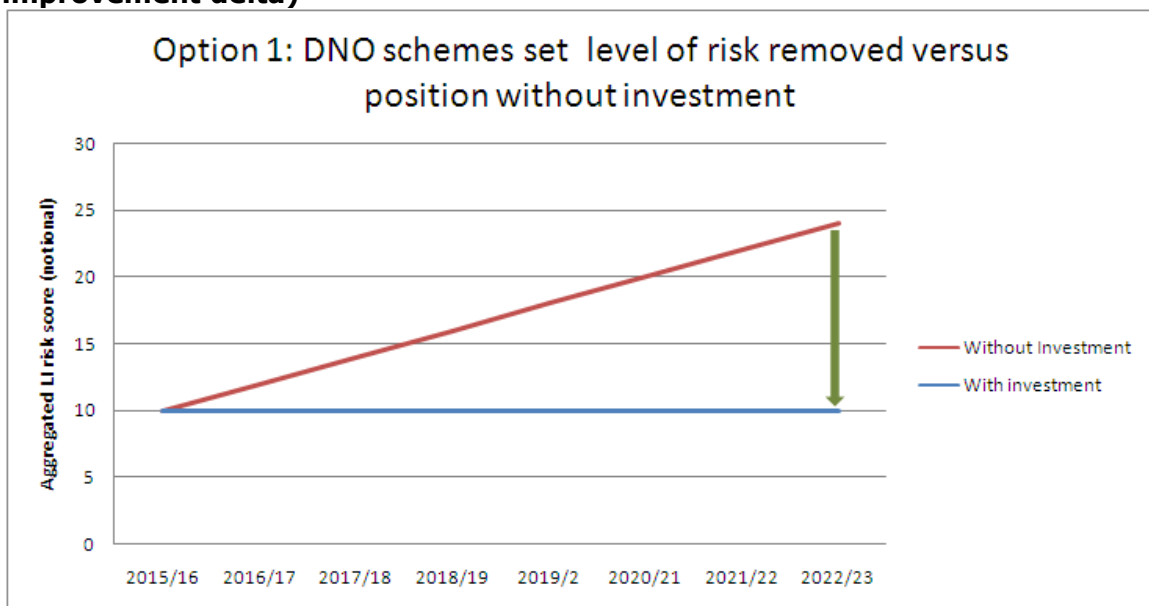
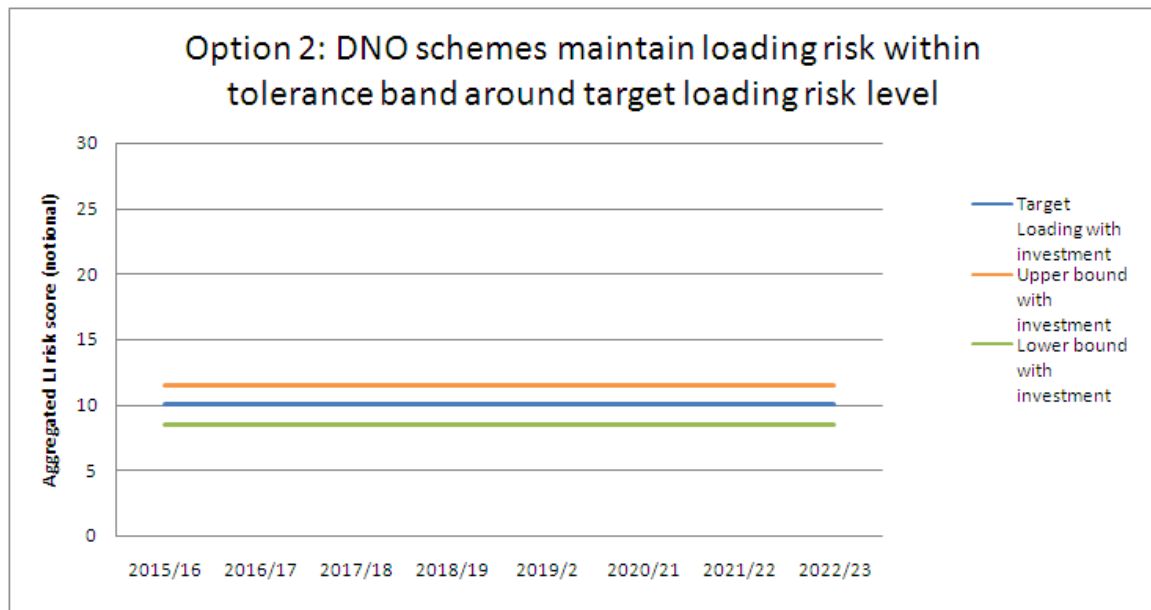


Figure 5.2 - DNO commits to maintain loading risk around a target level of loading risk



- 5.15. Our preference is the second option. This allows for DNOs to set out in their business plans the different potential 'without investment' starting points based on a range of uniform assumption-based demand and generation scenarios. We also think it caters better with the demand uncertainty that we are likely to face in the low carbon future. Under option 2 we could amend both DNO funding levels and required loading risk reduction where demand in the RIIO-ED1 period differs significantly from the DNO initial assumptions. This is likely to be more difficult to in option 1.
- 5.16. We will consider how loading risk is tracked against the upper and lower bands throughout RIIO-ED1, but propose that any financial penalty will relate only to networks that are outside of the tolerance band at the end of the period. We propose that the level of over or under performance will refer to the distance away from the target, rather than the upper or lower band.
- 5.17. Where it is ultimately determined that a DNO has not met its LI deliverable through under delivery against RIIO-ED1 targets, the arrangements for penalising it could take a form similar to the penalty arrangements agreed for network outputs at DPCR5. This would mean making downward adjustments to RIIO-ED2 revenue allowances – with any appropriate penalty or reward adjustment applied – based on the achieved level of performance, as determined through our assessment. Another option would be to take the DNO's agreed load index position at the end of RIIO-ED1 as the starting point for the next price control. So, for example, if a DNO is found to have failed to meet its targets in RIIO-ED1 it would be required to fund the shortfall between its forecast and what it actually delivered.

Impact of Distributed Generation

- 5.18. Given the likely increase in distributed generation within RIIO-ED1, another area in which we have looked to improve on the existing DPCR5 framework is capturing the impact of generation on substation loading. As mentioned above, the LI rating of a substation is derived from a calculation centred on the maximum demand - the point at which the demand peaks. Depending on the size and type connected to the network, generation can offset demand and therefore reduce the point of maximum demand, but also create a network reliability issue that might be a driver for reinforcement in its own right.
- 5.19. Through the RSWG, we worked with the DNOs to understand exactly what impact generation is likely to have on the availability of capacity at a primary substation. The group considered whether latent demand – the demand at a substation offset by any generation at a particular point in time - would impact on the ability to accommodate new demand and whether the LI reporting should be amended to capture the mitigating impact of generation. The group agreed that in the case of substations that predominantly cater for demand falling within the LI1-LI3 categories, an increase in generation would be unlikely to trigger a reinforcement intervention.
- 5.20. With regards to substations that predominantly cater for demand falling within LI4 and LI5, it was suggested that increased load would, in any case, require the DNO to carry out detailed system studies, which would individually assess the impact of the generation in question. To this end, the RSWG was in agreement that there was little value in incorporating the maximum generation element in the LI reporting. Through the RSWG, we intend to gain a fuller understanding of how this interacts with the LI delta or LI band discussed in the two options above.
- 5.21. The RSWG felt that, over time, there would likely be greater value in developing a metric similar to the LI to assess a substation's ability to accommodate growth in DG. At present, the relatively low levels of DG penetration has meant that generation growth rates are, at a substation level, less predictable than the demand equivalent.
- 5.22. A substantial increase in penetration rates of generation on the primary network and a growth in substations that predominantly cater for generation could see generation growth become more gradual, predictable, and amenable to being measured in a DG Index. For these reasons, we intend to develop a DG Index through the RSWG.
- 5.23. If there is sufficient growth in generation connecting to the distribution network at EHV or above, our intention would be to introduce this metric in line with the likely development in updating the engineering recommendation P2/6. Where DNOs propose reinforcement expenditure in their business plans

that is specifically prescribed to accommodate generation growth, in the absence of the aforementioned DG Index, we expect DNOs to set out their own methodology for tracking delivery of risk removed for this expenditure.

Extending Load Indices to the low voltage network

- 5.24. Through the RSWG, we looked into the viability of extending LIs to also operate as a secondary deliverable for secondary network (HV and LV assets) reinforcement expenditure and proxy indicator of DNO ability to accommodate load growth associated with the take-up of low carbon technologies. A number of key LI concepts, such as firm capacity, cannot be directly applied to the LV network and due the complexities of capturing the utilisation of the secondary network, the mechanism would not provide a strong enough measure of the likely ability of low carbon technologies to connect to the network.
- 5.25. The limited ongoing benefits once implemented do not seem commensurate with the difficulties in developing a standalone Load Index to function across the entire secondary network. However, we consider that there may well be some scope to develop this kind of metric for specific elements of the secondary network where these elements are most likely to cause a constraint on the network and therefore require an intervention.
- 5.26. With potential increases in electricity demand resulting from changes in the pattern of energy use and increasing volumes of generation connecting to the distribution networks it is important that there is effective use of both existing and latent capacity. We have suggested a potential financial mechanism based on a target band around LIs. We would welcome views on whether there should be other forms of financial capacity incentives to ensure value for money in moving towards a low carbon economy.
- 5.27. The wider work that was undertaken on exploring the development of an LI for the secondary network should not be considered fruitless. A number of DNOs have explored the possibility of using a number of the concepts that set the primary network LI scores to model the network loading down to the different elements of the secondary network. This can then be considered the starting point to understanding how different changes in load during RIIO-ED1 will impact on expenditure levels. The second of the volume driver options that we are considering for setting baselines for secondary network reinforcement expenditure has specifically developed from the work undertaken on applying LIs to these voltages.

6. Health indices

Chapter Summary

This chapter details out proposals for developing the existing asset health index arrangements in RIIO-ED1. It covers our proposal to introduce a measure of asset criticality into the framework and explains how we intend to assess delivery during the price control.

Question 1: What are your views on our proposals for health indices (HIs)?

Question 2: Do you agree with our proposals to introduce criticality into the HI framework?

Question 3: Do you agree with our proposals for applying financial consequences in the case of material under or over delivery?

Question 4: Do you agree with our proposals to require greater consistency in the types of assessments that the DNOs should feed into the calculation of the asset health indices?

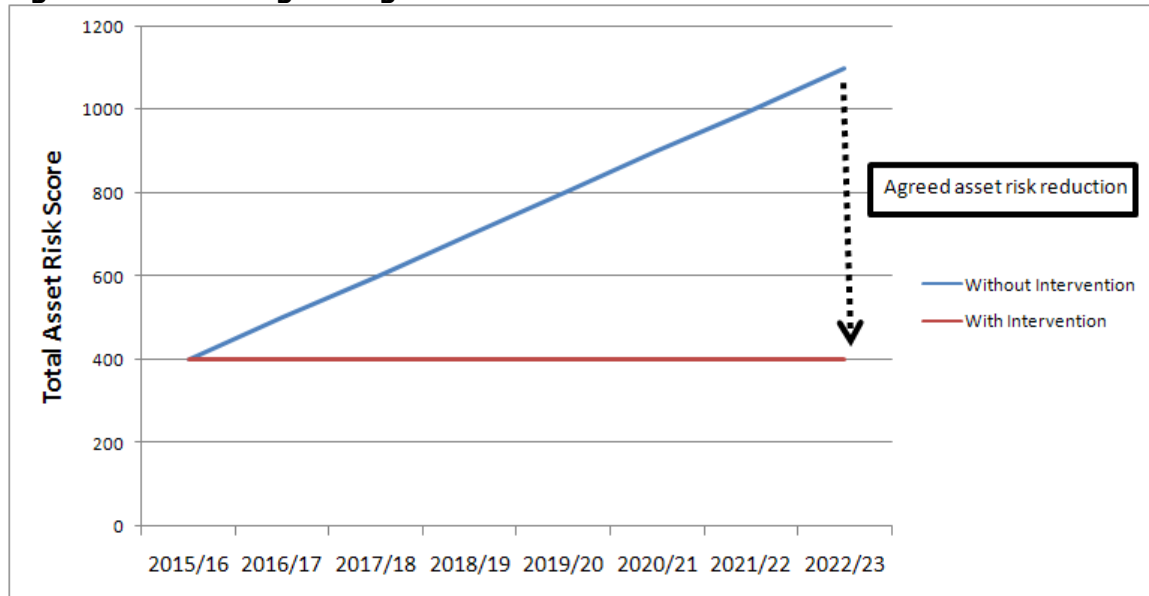
Question 5: What are your views on the suggestion that we would mandate DNOs to develop and maintain HIs in specified asset classes?

Background – arrangements in DPCR5

- 6.1. An asset health index provides a framework for collating information on the health (or condition) of network assets and tracking changes in network health over time. We consider it a useful indicator of potential future reliability and safety issues. Asset health data should be used by the DNOs to assist with the identification of capital programs for the forthcoming price control. The framework ensures that the delivery of primary outputs in future periods is not put at risk by a failure to deliver a suitable level of asset health at the end of the current price control period.
- 6.2. For this reason, in DPCR5, we introduced health index arrangements which tied the DNOs to a package of agreed deliverables during the period. These arrangements formed a part of the 'network output measures' in DPCR5 and have the same purpose as secondary deliverables under the RIIO framework.
- 6.3. In order to agree the deliverable for DPCR5, we asked each of the DNOs to provide forecasts for both the beginning and the end of the price control period. The forecast for the start of the period showed the DNO's view of the health of its network assets as we entered DPCR5. The companies provided two forecasts for the end of the price control period. One showed the DNO's view of network health, assuming that it does not carry out any interventions, such as replacing or refurbishing assets. The other took into account into account the planned levels of certain categories of investment in DPCR5.
- 6.4. The difference between these forecasts represents the positive impacts of the relevant investments made by the DNOs. This is what each DNO has agreed to

deliver by the end of the price control. Figure 6.1 is a simple graphical representation of this process.

Figure 6.1 - Setting the agreed asset risk reduction in DPCR5



6.5. To enable the DNOs to describe the health of the assets on their networks, we set the broad HI categories into which the DNOs categorised the relevant types of network assets. These categories were on a five-point scale ranging from "HI1" to "HI5". These definitions are shown in Table 6.1. However, we left it to each company to define the specific detail of the methodology through which their assets would be allocated to these categories.

Table 6.1 - Health Index Category Definitions

HI Rank	Definition
HI1	New or as New
HI2	Good or serviceable condition
HI3	Deterioration requires assessment and monitoring
HI4	Material deterioration, intervention requires consideration
HI5	End of serviceable life, intervention required

6.6. For example, two identical assets exhibiting identical performance and condition characteristics could be assigned to different HI categories depending on the DNO network within which that asset sits. One reason for this may be that, in certain areas, DNOs have divergent views on when an asset should be considered to be at the end of its useful life and, therefore, on when an asset should be classified as being at the HI5 level.

6.7. At the end of DPCR5, we will to undertake a performance assessment to determine whether each DNO has satisfactorily delivered against the agreed

targets. This review will involve the DNOs explaining the asset management decisions made during DPCR5 and providing evidence of the impact of these on the agreed deliverables. The onus will be on the DNOs to justify that the work carried out in the period has resulted in the agreed reduction in the level of network risk being realised.

- 6.8. The DNOs provide annual submissions, showing the current status of network health. They provide commentary on all material changes that have occurred during the year. This annual data is used to separate out changes in the HI position brought about by DNO interventions such as asset replacement or refurbishment from those brought about by methodological or policy changes, changes to input data or those resulting from data cleansing.
- 6.9. Where we find that a DNO has under-delivered against its targets, we will impose a financial penalty on that company. Where this is the case, we will value the size of the shortfall with reference to the allowed unit costs for the relevant activities and impose a penalty rate of two and a half per cent on this value. Failure by a DNO to deliver the agreed targets in DPCR5 will result in a reduction in the revenues that the DNO can recover in RIIO-ED1.

Proposals for RIIO-ED1

- 6.10. We propose to retain the fundamental principles of this framework for the RIIO-ED1, making improvements to the arrangements where feasible. As was the case for DPCR5, the Health Index secondary deliverable will require the DNOs to demonstrate how the expenditure that we allow through the price control will be linked to the management of network risk.
- 6.11. We propose that we will establish the agreed deliverable using the DNOs' asset health forecasts for the start and end of RIIO-ED1. In addition to this, we propose to collect at the start of RIIO-ED1 additional forecasts showing the expected position mid way through RIIO-ED1. This additional data will assist us in monitoring the ongoing performance of the DNOs during the control period.

Consistency of HI categorisation

- 6.12. As we recognised in the Handbook for implementing the RIIO model¹¹, while common methodologies are desirable in many of the areas measured through secondary deliverables, in other areas, company-specific methodologies are more appropriate.

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<http://www.ofgem.gov.uk/Networks/rpix20/ConsultDocs/Documents1/RIIO%20handbook.pdf>

- 6.13. For this reason, we are considering whether it would be appropriate for us to require greater consistency in the types of assessments that the DNOs should feed into the calculation of the HIs. One way that this could be done would be for the DNOs to jointly develop a set of requirements for each asset type, setting out the minimum standards for the input data that is used to calculate the HI rating for each asset, and the ways in which this data is used.
- 6.14. This would help to ensure that there is a degree of consistency in the types of data used by DNOs to calculate the health of an asset, while also allowing scope for the introduction of additional information over and above the required standard, where the company believes this appropriate.
- 6.15. We are also considering whether we should mandate the companies to maintain and provide data on HIs for specified asset types. Table 6.2 shows the current asset types for which each DNO currently has an agreed HI.

Table 6.2 – HI asset categories for each DNO in DPCR5

	ENWL	NPgN	NPgY	WMID	EMID	SWALES	SWEST	LPN	SPN	EPN	SPD	SPMW	SSEH	SSES
LV Network														
LV Switchgear and Other	Y	N	N	Y	Y	N	N	Y	Y	Y	N	N	Y	Y
LV UGB	Y	N	N	Y	Y	N	N	Y	Y	Y	N	N	N	N
LV OHL Support	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y
HV Network														
HV Switchgear (GM) - Primary	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
HV Switchgear (GM) - Distribution	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
HV Transformer (GM)	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
HV UG Cable	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y
HV OHL Support - Poles	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y
EHV Network														
EHV Switchgear (GM)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
EHV Transformer	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
EHV UG Cable (Gas)	Y	Y	Y	Y	N	N	N	Y	Y	N	N	N	N	Y
EHV UG Cable (Oil)	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y
EHV UG Cable (Non Pressurised)	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N
EHV OHL Support - Towers	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N
EHV OHL Support - Poles	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
EHV OHL Fittings and Conductors (Tower Lines)	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	N	N	Y
132kV Network														
132kV CBs	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y
132kV Transformer	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y
132kV UG Cable (Gas)	Y	Y	Y	Y	N	N	N	Y	Y	N	N	Y	N	Y
132kV UG Cable (Oil)	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	Y	N	Y
132kV UG Cable (Non Pressurised)	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N
132kV OHL Support - Tower	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N
132kV OHL Fittings and Conductors (Tower Lines)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y
Other														
Submarine Cables	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y

Asset criticality

- 6.16. In addition to the asset health data, we propose that data on the criticality of network assets will be introduced into the framework. Criticality provides a measure of the consequence of failure of an asset. We have proposed similar arrangements in both of the gas distribution and transmission price controls (RIIO-GD1 and T1).
- 6.17. The primary benefit of incorporating information on asset criticality into the framework is that DNOs will be able to show that the actions taken during the price control to reduce network risk take account not only of the probability that an asset fails, but also the expected impact of such failures. A number of DNOs have been building up capabilities in this area during DPCR5. Information on the consequences of asset failure should be useful to DNOs in the prioritisation of asset interventions and in demonstrating to us how asset management decisions have been prioritised efficiently.
- 6.18. We propose that the DNOs will assess the criticality of their network assets and provide this data to us both prior to the commencement of RIIO-ED1 (for use in the allowance and health index target setting process) and during RIIO-ED1 (for use in monitoring DNO performance).
- 6.19. A framework incorporating data on both the health and criticality of assets has been proposed in RIIO-T1 and GD1. In the proposed arrangements, the transmission and gas distribution network companies will be required to provide asset data to Ofgem in a matrix akin to the one at Table 6.3 below. Here the network company would insert the number of assets falling into the relevant categories in the light yellow shaded cells. We propose that, for RIIO-ED1, we adopt similar arrangements to those currently proposed in RIIO-T1 and GD1.

Table 6.3 – Example of table for submitting asset health and criticality data

Asset Type		Criticality Index	Asset health index				
			HI1	HI2	HI3	HI4	HI5
132kV Circuit Breaker	Criticality Index	C1					
		C2					
		C3					
		C4					
132kV Transformer	Criticality Index	C1					
		C2					
		C3					
		C4					

6.20. In the table above, the criticality ratings are given on a four point scale ranging from C1 to C4. These ratings are defined in Table 6.4, below. The HI ratings are as described in table 6.1, above.

Table 6.4 – Risk Index definitions

C1	Low Criticality
C2	Medium Criticality
C3	High Criticality
C4	Very High Criticality

6.21. Based on assessments of both the health and criticality of an asset, an overall measure of asset risk is derived. In RIIO-T1 and GD1 these derived categories were termed 'Replacement Priorities'. The intervention undertaken by a network company need not necessarily be the replacement of the whole asset. The company could refurbish the asset, or replace it in part, for example. For this reason, we use the more generic term Risk Index (RI) in this document.

6.22. In arriving at these criticality assessments, we propose that the following factors should be considered:

- **System criticality** - this is based on the impact of the electricity distribution system not delivering services to customers, and could incorporate information on, for example, the number of customers who would experience a supply interruption if an asset failed.
- **Safety criticality** - this is based upon the risk of direct harm to personnel or the public as a result of asset failure.
- **Environmental criticality** - this is based upon the environmental impact caused by asset unreliability or failure, taking into account the sensitivity of the geographical area local to the asset.

6.23. At the RSWG, some DNOs suggested that it may also be appropriate to incorporate the cost of replacing a failed asset in to this composite criticality assessment. While the cost to replace an asset may be less significant within a specific asset health index, it is relevant when considering an investment decision involving more than one asset type. We will consider this proposal before determining what the makeup of these assessments should be in the February strategy decision.

6.24. Table 6.5, below, shows how the Criticality Index (CI) and Health Index (HI) ratings could be combined to determine the Risk Index (RI) of an asset.

Table 6.5 – Example of how health and criticality assessments combine to generate risk index rankings

	HI1	HI2	HI3	HI4	HI5
C1	RI1	RI1	RI1	RI2	RI3
C2	RI1	RI1	RI2	RI2	RI3
C3	RI1	RI1	RI2	RI3	RI4
C4	RI1	RI1	RI2	RI4	RI5

6.25. The RI ratings are given on a five point scale and have the meanings set out in Table 6.6, below.

Table 6.6 – Risk index definitions

RI1	Very Low Risk
RI2	Low Risk
RI3	Medium Risk
RI4	High Risk
RI5	Very High Risk

6.26. Via the RSWG, the DNOs have been tasked to devise a common methodology for assessing the criticality of different classes of assets. We expect the companies to work together in this area and we will take this work into consideration along with responses to this consultation before making a decision as to what the framework for RIIO-ED1 should be. We will specify this in the February strategy decision. The agreed methodology for the calculation of asset criticality will be used by the DNOs in providing forecast information in the business plans which will be submitted next year.

6.27. The DNOs will also review the methodologies used in deriving HI ratings and propose any changes necessary to ensure that only factors relating to the probability of asset failure are taken into account. This will help to prevent any double counting in the asset risk assessment process.

Assessment of delivery

6.28. At the end of RIIO-ED1, we propose that each DNO will be required to demonstrate that the package of works delivered during the control period has delivered the network risk reduction agreed at the start of RIIO-ED1. We do not propose that the companies should be required to carry out the specific mix of workload that will be allowed for at the price control and on which the revenue allowances will be based.

6.29. We believe the DNOs should be encouraged to continue to improve the quality of information that they hold on their network assets. As result of new

information becoming available to the DNOs, it is likely that work will be reprioritised. We would encourage the DNOs to pursue new methods and invest in new technologies in order to improve the understanding of the current and future health of their networks. It is important that the arrangements that we put in place do not preclude this from happening.

- 6.30. It is essential that the DNOs have the means to demonstrate to us and to customers that the level of risk reduction achieved at the end of the RIIO-ED1 is equivalent to or greater than the risk reduction agreed (ie the difference between the DNOs' 'with' and 'without' investment forecasts) at the start of the price control period and that the programme of work that is delivered is of equal or greater benefit to customers.
- 6.31. We propose that one of the ways that the DNOs should be able to demonstrate delivery should be through a composite performance metric. By this we mean a metric which encompasses activity in each of the asset classes for which a DNO collects HI data and uses this information to provide a single performance figure.
- 6.32. This could be used, for example, as an annual progress check to illustrate the percentage of the total of the agreed HI package that a DNO has completed each year. We anticipate that we will publish this performance information each year in the Electricity Distribution annual report. This builds on work that we have already been carrying out in DPCR5 and is another area where the DNOs have been asked to work together and, if possible, make proposals on how this could be achieved.
- 6.33. Continuing the approach employed in DPCR5, we propose that we will ask companies to show how movements in the asset indices have been brought about – be they through asset replacement, refurbishment or otherwise. In order to retain a link between allowed expenditure and delivery, it may not be appropriate for us to count all movements in the index against brought about by DNO as progress towards delivery of the agreed deliverable.
- 6.34. Unlike DPCR5, in RIIO-ED1 we propose to introduce arrangements to enable the DNOs to over-deliver against the agreed HI package. Where this is the case, the DNO will be required to demonstrate that the over delivery was carried out efficiently and that any additional investments made were in the interests of customers. This assessment will also take place towards the end of RIIO-ED1 and will take into account the costs of any additional work carried out. We propose that a financial reward would apply where we find that a DNO has over delivered against its targets. The reason for this is in order to encourage DNOs to continue to make efficient and timely investments throughout the control period.
- 6.35. The arrangements for penalising or rewarding the DNOs for under or over delivery against RIIO-ED1 targets could take a form similar to the penalty arrangements agreed for DPCR5. This would mean making upward or

downward adjustments to RIIO-ED2 revenue allowances – with any appropriate penalty or reward adjustment applied – based on the achieved level of performance, as determined through Ofgem assessment. Another option would be to take the agreed HI position at the end of RIIO-ED1 as the starting point for RIIO-ED2. So, for example, a DNO found to have failed to meet its targets in RIIO-ED1 would be required to fund the shortfall between its forecast and what it actually delivered. Where appropriate, we will look to ensure that our approach is consistent with that taken in the RIIO-GD1 and RIIO-T1 price controls.

- 6.36. Where a DNO is found to have delivered exactly what it agreed at the start of the period, or has delivered an equivalent package of outputs, we will take no action. Table 6.7, below, shows how under and over delivery will be treated at the end of DPCR5, and potential treatments at the end of RIIO-ED1.

Table 6.7 – Proposed treatment of under and over delivery at the end of DPCR5 and RIIO-ED1

Outcome	DPCR5 into RIIO-ED1	RIIO-ED1 into RIIO-ED2
Under delivery	Size of the shortfall valued with reference to allowed unit costs, plus a penalty rate of 2.5 per cent. Reduction applied to recoverable RIIO-ED1 revenues.	Adjustment to ED2 revenue allowances with appropriate penalty adjustments applied where under delivery is not determined to be justifiable.
Over delivery	There are no provisions in the DPCR5 arrangements to account for over delivery by a DNO in the DPCR5 period.	Adjustment to ED2 revenue allowances with an appropriate reward adjustment applied where over delivery is determined to be justifiable.

7. Guaranteed standards

Chapter Summary

This chapter sets out our proposals for the guaranteed standards of performance (2010 No. 698) in RIIO-ED1. Here, we propose to tighten the 'normal weather' standard from 18 to 12 hours and to remove the exemptions relating to customers in the Highlands and Islands of Scotland. We also detail our proposals on payment levels in the RIIO-ED1 price control period.

Question 1: What are your views on our proposals for the guaranteed standards?

Question 2: Do you feel that we should conduct a mid-period review of the guaranteed standards?

Question 3: Do you agree with our proposal to remove the potential double exemption of one-off exceptional events under the IIS and the guaranteed standards?

Question 4: Do you agree with our proposal to remove all of the Highlands and Islands customer exemptions?

Question 5: What are your views on our proposal to reduce the normal weather standard from 18 to 12 hours, the associated changes to payment levels and options for funding?

Question 6: Do you agree with our proposal to keep non-domestic customers in the guaranteed standards?

Question 7: What are your views on the feasibility and practicality of making payments to all customers automatic?

Question 8: Do you agree with our proposal to make payments to Priority Service Register customers automatic?

Background – arrangements in DPCR5

7.1. The Electricity (Standards of Performance) Regulations 2010 (the guaranteed standards)¹² is a piece of secondary legislation that provides for individual customers to receive payments from DNOs if they fail to meet specified standards. These standards cover a range of areas, including supply interruptions.

Proposals for RIIO-ED1

7.2. We propose to retain these standards for RIIO-ED1 but make improvements to some standards based on stakeholder feedback and the experience gained so far in DPCR5. Our proposals include:

- the removal of the special exemptions of Highlands and Islands customers (and removal of Regulation 9)

¹² http://www.legislation.gov.uk/uksi/2010/698/pdfs/ukxi_20100698_en.pdf

- the removal from Regulation 10 of certain exemptions relevant to one-off exceptional events
- tightening the normal weather hours standard from 18 to 12 hours

7.3. Ofgem is required to consult separately on changes to the guaranteed standards, including on any proposals outlined in this chapter. We propose to carry out this consultation closer to the start of RIIO-ED1.

Removal of exemptions

7.4. We recently consulted via an open letter¹³ on some of the areas that we proposed to review as part of RIIO-ED1. This was in response to issues arising from the 2009 Dartford¹⁴ exceptional event and the storms in Scotland which affected tens of thousands of customers over December 2011 and January 2012. The proposals set out in the letter relate to exemptions from IIS and to the interactions between the guaranteed standards and the IIS scheme in relation to one-off exceptional events.

7.5. As referred to above, in 2009 Ofgem had to review a major one-off exceptional event under the IIS. The event affected approximately 90,000 customers, leaving some customers without electricity for up to five days. The relevant DNO invoked an exemption from paying out guaranteed standard payments to the affected customers (as is permitted under the guaranteed standards). This exemption currently remains in the guaranteed standards. In our March 2012 open letter¹⁵ consultation we discussed the removal of this exemption and how we could deal with the consequences of such an action in the IIS. We propose to remove the exemption.

7.6. As indicated in the open letter, for RIIO-ED1 we are also considering the removal of the special exemptions of Highland and Islands customers. The exemptions that apply to these particular customers were introduced due to the network structure in particular parts of Scotland.¹⁶ In these areas, the network is not as resilient as in other parts of Great Britain and the work that

¹³ Ofgem reference 48/12

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=164&refer=Networks/ElecDist/QualofServ>

¹⁴

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=150&refer=Networks/ElecDist/QualofServ/QoSIncent>

¹⁵

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=164&refer=NETWORKS/ELECDIST/QUALOFSERV>

¹⁶ "Highlands and Islands" means the following Scottish local authority areas: the Shetland Islands, the Orkney Islands, Eilean Siar (the Western Isles), the Highlands (consisting of Caithness, Sutherland, Ross and Cromarty, Inverness, Nairn, Badenoch and Strathspey, Skye and Lochalsh, and Lochaber), and Argyll and Bute

would be required to raise resilience to an equivalent level could be prohibitively expensive for the affected customers to bear.

- 7.7. However, recent experience highlighted the confusion that this creates for customers. We are proposing to create consistency for customers across the country and, to achieve this, we propose to remove this exemption for RIIO-ED1. Having reviewed the payments made to these customers over a number of years, we do not believe that the removal of this particular exemption will significantly affect the level of risk to which this DNO is exposed.

Normal weather standard

- 7.8. Currently, under the normal weather standard (Regulation 5), a customer has to be without supply for 18 hours to qualify for a payment. Our DPCR5 research suggested that customers thought that this period was too long. DNOs argued at the time that it would be inappropriate to tighten the standard to a shorter period as no significant technological advances had been made. We have reviewed this situation in light of performance to date in DPCR5 and we believe that there is a strong case to tighten this standard to 12 hours. We do not propose to provide any additional allowance to reflect this change.

- 7.9. As we are proposing to tighten this standard, we are considering the following options for the associated compensation payments:

- maintaining the existing level of payments (with an adjustment to reflect inflation)
- increasing payments given the importance customers place on rapid supply restoration

- 7.10. We welcome views from respondents on these proposals.

Guaranteed standards payment level

- 7.11. We propose two options in relation to increasing guaranteed standards payments to reflect levels of inflation. The first option is to increase the payments to reflect inflation levels from 2009-10 (when the current payment levels were determined) to the end of DPCR5. The second option is to base the payments on forecasts of inflation the mid-point of the RIIO-ED1 control period.

- 7.12. The guaranteed standard payments for DPCR5 are set out in Table 7.1 below, along with two options for payment levels in RIIO-ED1 as described above. The first option re-uses the uplift method applied in DPCR5, and adjusts the payment levels by actual inflation data. The second option is being proposed to take account of the longer RIIO-ED1 price control period. We feel that it is

appropriate to consider using inflation forecasts in setting the payment levels for RIIO-ED1. The figures proposed here have been calculated by uplifting the DPCR5 payments using inflation forecasts out to the middle of RIIO-ED1 (2018-19).¹⁷

Table 7.1 - Proposed Payment Levels for RIIO-ED1

Reporting code	Service	DPCR 5 Guaranteed standards payments	DPCR5 increased for inflation to end of DPCR5	DPCR5 up-rated for forecasts of inflation to mid-RIIO-ED1 (2018-19)
EGS1	Responding to failure of distributor's fuse (Regulation 12)	£22 for domestic and non- domestic customers	£26 for domestic and non- domestic customers	£29 for domestic and non- domestic customers
EGS2	Supply restoration - normal conditions (Regulation 5)	£54 for domestic customers and £108 for non-domestic customers, plus £27 for each further 12 hours	£64 for domestic, £128 for non domestic, £32 for each further 12 hours	£72 for domestic, £145 for non domestic, £36 for each further 12 hours
EGS2A	Supply restoration: multiple interruptions (Regulation 11)	£54 for domestic and non- domestic customers	£64 for domestic and non- domestic customers	£72 for domestic and non- domestic customers
EGS2B	Supply restoration - normal conditions (5,000 or more premises interrupted) (Regulation 6)	£54 for domestic customers and £108 for non-domestic customers, plus £27 for each further 12 hours up to a cap of £216 per customer	£64 for domestic, £128 for non domestic, £32 for each further 12 hours up at a cap of £257	£72 for domestic, £145 for non domestic, £36 for each further 12 hours up at a cap of £289
EGS2C	Supply restoration - rota disconnections (Regulation 8)	£54 for domestic customers and £108 for non-domestic customers	£64 for domestic, £128 for non domestic	£72 for domestic, £145 for non domestic

¹⁷ These figures have been derived using actual inflation data from the Office of National Statistics (for 2010-11 and 2011-12, RPI CHAW – financial year average), forecast data from the HM Treasury consensus forecast published August 2012 (for 2012-13 to 2015-16), forecast data from the Office of Budget Responsibility published in March 2012 (for 2016-17) and a long term RPI forecast of 2.5% (2017-18 – 2018-19). The uplift applied to the DPCR5 payment levels reflects the cumulative inflation figure to the end of 2018-19.

Reporting code	Service	DPCR 5 Guaranteed standards payments	DPCR5 increased for inflation to end of DPCR5	DPCR5 up-rated for forecasts of inflation to mid-RIIO-ED1 (2018-19)
EGS4	Notice of planned interruption to supply (Regulation 14)	£22 for domestic and £44 for non-domestic customers	£26 for domestic and £52 for non-domestic	£29 for domestic and £59 for non-domestic
EGS5	Investigation of voltage complaints (Regulation 15)	£22 for domestic and non-domestic customers	£26 for domestic and non-domestic customers	£29 for domestic and non-domestic customers
EGS8	Making and keeping appointments (Regulation 19)	£22 for domestic and non-domestic customers	£26 for domestic and non-domestic customers	£29 for domestic and non-domestic customers
EGS9	Payments owed under the standards (Regulation 21)	£22 for domestic and non-domestic customers	£26 for domestic and non-domestic customers	£29 for domestic and non-domestic customers
EGS11 (EGS11A, EGS11B and EGS11C)	Supply restoration: severe weather conditions (Regulation 7)	£27 for domestic and non-domestic customers, plus £27 for each further 12 hours up to a cap of £216 per customer	£32 for domestic and non-domestic customers, plus £32 for each further 12 hours up to a cap of £257 per customer	£36 for domestic and non-domestic customers, plus £36 for each further 12 hours up to a cap of £289 per customer
EGS12	Supply restoration: Highlands and Islands (Regulation 9)	£54 for domestic customers and £108 for non-domestic customers, plus £27 for each further 12 hours	£64 for domestic customers and £128 for non-domestic customers, plus £32 for each further 12 hours	£72 for domestic customers and £145 for non-domestic customers, plus £36 for each further 12 hours

Paying out guaranteed standards

- 7.13. We have concerns that low levels of customer awareness of the guaranteed standards may be leading to compensation going unclaimed. DPCR5 already contains a mechanism to recover unclaimed guaranteed standards payments from DNOs in the form of a negative revenue adjustment. We are considering whether we should enhance this arrangement by including a penalty rate on top of unpaid compensation, to act as an incentive on DNOs to pay compensation where it is due.
- 7.14. We also expect to see proposals put forward in DNOs' business plans on how they intend to improve awareness of the guaranteed standards amongst customers.

Non-domestic customers

- 7.15. The level of compensation offered to non-domestic customers has been raised as an issue. It is suggested that payments to large non-domestic customers in particular are too low (at £108) when compared to the losses that the customer may incur as a result of the interruption.
- 7.16. The guaranteed standards do not and were never intended to cover the consequential losses that customers may experience as a result of a power-cut. Instead they are a method of recognising the inconvenience caused by loss of supply, as it is not possible to guarantee a continuous supply of electricity in all circumstances.
- 7.17. For RIIO-ED1 we do not propose to extend the remit of the guaranteed standards to cover consequential losses. We also do not propose to remove large non-domestic customers from the guaranteed standards as we feel that keeping these customers in the scheme maintains the focus of the DNOs on serving all of their customers, regardless of the amount of compensation being offered if they fail to meet the required standards.

Automatic payments

- 7.18. At present a number of guaranteed standards (Regulation 5 to 9, 11 and 14) require customers to apply to their DNO for any payments that may be due to them under these standards. During the working groups, it was suggested that all guaranteed standards payments could be made automatically, removing the need for customers to claim.
- 7.19. Currently the DNOs' systems are not able to tell if particular customers are experiencing an interruption, until the customer contacts the DNO and informs them. For example, an interruption resulting from the failure of one of the three phases supplying a street with 30 customers on it, will generally only interrupt 10 of the customers, but the DNO will not know which of the 30 are affected until the customers contact the DNO to say that they are without supply.
- 7.20. The introduction of smart meters should enable DNOs to identify affected customers and make automatic payments. However we consider that it would be premature to propose to introduce automatic payments for all customers before national smart meter roll out. We propose to reconsider this matter once relevant data from smart meters has been well established and validated in the DNOs' systems. We expect DNOs to propose in their business plans how they intend to make use of smart meter data, with a view to making automatic payments to customers under the guaranteed standards in the future.

- 7.21. As part of their licence obligations, DNOs have a duty to maintain a 'priority service register' (PSR). The PSR is a register of customers who are, typically, of pensionable age, disabled, and/or chronically sick. The DNOs are also required to provide information and advice to PSR customers. This includes information relating to unplanned interruptions. During such events, DNOs must ensure that these customers are promptly notified and kept informed of the time at which supply is likely to be restored. Under the current guaranteed standards, PSR customers, like all other customers, must submit a valid claim in order to be eligible for a payment under the 18 hour interruption standard.
- 7.22. As the DNOs are already required to make contact with PSR customers when they know of an interruption to their supply, and will know when such customers' supplies have been restored, it was suggested at the working group that it may be suitable for these customers to receive payments automatically. We propose that, for RIIO-ED1, DNOs should make payments to PSR customers automatically.¹⁸

Severe weather standards

- 7.23. There is a specific guaranteed standard (Regulation 7) which covers supply restoration during severe weather events such as storms. Such severe weather events fall into one of three categories, based on the number of higher voltage faults occurring and the number of customers affected. We propose to continue to align the exceptional event thresholds with the IIS severe weather thresholds.
- 7.24. The thresholds levels normal and severe weather conditions are set out in Table 7.2 below. We will assess the level of severe weather category three customer numbers in advance of the February strategy decision.

¹⁸ Further discussions on the PSR, is covered in the **Social chapter** of the Outputs and Incentives document.

Table 7.2 - Thresholds for normal and severe weather conditions

	Category 1 - Medium severe weather events	Category 2 - Large severe weather events
DNO	8* mean HV and above	13* mean HV and above
ENWL	54	87
NPgN	36	58
NPgY	39	63
WMID	63	102
EMID	66	108
SWALES	42	68
SWEST	59	96
LPN	12	20
SPN	54	87
EPN	93	151
SPD	76	123
SPM	69	112
SSEH	59	95
SSES	66	108

Guaranteed standards exposure

- 7.25. For RIIO-ED1, we are proposing to retain the overall revenue exposure caps which apply to payments under the normal weather (including large scale events, where more than 5,000 customers are interrupted) and severe weather supply interruption standards. We are proposing to retain this cap, as currently DNOs are not funded for any payments under the guaranteed standards (payments are funded by the DNO's shareholders), and because Ofgem also has a duty to ensure that licence holders are able to finance the activities which are the subject of obligations on them. Given that we are not proposing to change the party who funds the payments, we feel that retaining this exposure cap is appropriate as it avoids imposing increased risks on the DNOs.
- 7.26. In DPCR4 we introduced an individual payment cap per customer under the severe weather event standards alongside removing exemptions from making payments due to severe weather. This approach was continued in DPCR5. We propose to retain a cap on these payments for RIIO-ED1, making adjustments for inflation.
- 7.27. We also propose to retain the cap on payments to individual customers under GS2B (normal weather conditions standard), where more than 5,000 customers are interrupted. We propose to set this payment cap at the same level as the cap for payments to customers under the normal weather standard.

- 7.28. We propose to retain an overall collar on downside exposure to the IIS, payments under guaranteed standards and, if introduced, the incentive mechanism described in Chapter 8, which covers our proposals for worst served customers.

8. Worst served customers

Chapter Summary

This chapter covers our proposals to improve the quality of service offered to worst served customers. We set out three potential options for RIIO-ED1: retaining the fundamentals of the current scheme with changes to key parameters, introducing a new incentive scheme or introducing a new guaranteed standard for worst served customers.

Question 1: What are your views on the proposed options that we have outlined for the worst served customers scheme? Please include what you see as the pros and cons of each of the options, whether you have a preferred option and why.

Background - arrangements in DPCR5

- 8.1. We introduced the worst served customer mechanism in DPCR5, specifically to reduce the number of interruptions experienced by those customers who experience an unusually poor level of service from their DNO. The IIS encourages DNOs to focus on reliability improvements yielding the greatest return per £ invested. The worst served mechanism is intended to address those customers who may not be adequately catered for by the IIS.
- 8.2. Under the scheme, a logging-up mechanism is used for costs incurred by the DNOs to deliver performance improvements to such customers. For DPCR5 the key elements for operating this scheme are outlined in Table 8.1 below. We believe that there is a definite benefit in having such a scheme.

Table 8.1 – Details of the DPCR5 worst served customer proposals

Issue	Proposal
Definition of worst served customer	Customer experiencing on average at least five higher voltage interruptions per year over a three year period ie 15 or more over three years. Additional requirement for a minimum of three higher voltage interruptions in each year.
Required performance improvement	25 per cent reduction in the average number of higher voltage interruptions for worst served customers - measured over full three reporting years post expenditure. If this is not achieved then scope for the DNO to provide evidence of the expected long-term benefit of the scheme.
Total allowance pot	£42 million over DPCR5 provided on a use-it-or-lose-it basis.
Distribution of allowance pot	Based on the number of worst served customers in each eligible DNO.
Cap per worst served customer	£1,000 per worst served customer.
Funding arrangements	Logged up and funded ex post on an NPV neutral basis

Issue	Proposal
	provided that performance and eligibility criteria are met.

- 8.3. For DPCR5, we set a total maximum expenditure level of £42 million. The maximum expenditure for each of the 13 eligible DNOs was set using a fixed allowance per worst served customer. For RIIO-ED1, we propose to keep and build upon the existing worst served customer mechanism, making improvements to encourage wider take-up by the industry where needed.

Developments for RIIO-ED1

- 8.4. We are considering developments for improving the level of service offered to those customers who experience an unusually high number of supply interruptions. Depending on the option that is decided upon for RIIO-ED1, we will need to review the funding/revenue exposure at that time. Our current view is that it would be appropriate for us to roll the DPCR5 arrangements forward into RIIO-ED1 unchanged. This view is based on the levels of take-up witnessed during DPCR5 to date and based on discussions at RSWG meetings.
- 8.5. There are three options that we are considering in order to drive performance in this area, which we describe below.

Option 1 – Retain and improve upon existing mechanism

- 8.6. Under this option, we would retain the basic principles of the existing worst served customer mechanism. Though DNO work on worst served customer schemes has been very limited in DPCR5 to date, it may be appropriate to keep the same framework in place for RIIO-ED1, making amendments to the scheme parameters in order to encourage a more widespread uptake in the industry.
- 8.7. In particular, we could allow DNOs to put forward in their business plans an alternative spending cap per worst served customer and an alternative performance improvement that the DNO would need to realise in order to receive funding. Such changes could assist in making worst served customer schemes which are not financially viable under the current arrangements a realistic prospect.
- 8.8. Any such proposal put forward by a DNO would need to be fully evidenced and supported by appropriate stakeholder engagement work.
- 8.9. We do not propose to allow DNOs to propose alternative definitions of what constitutes a worst served customer.

Option 2 – Incentive scheme

- 8.10. This option would involve the discontinuation of the existing scheme and the introduction of an entirely new incentive scheme, aimed at improving the quality of supply to those customers who experience a large number of supply interruptions, whether presently defined as a worst served customer or not.
- 8.11. This new scheme would involve us setting a target for each DNO based on the number of customers experiencing multiple higher voltage interruptions each year. This target would be based on the performance data we currently collect from each DNO through the 'disaggregation by frequency band' annual reporting. In these returns, we collect data on the customers who have experienced higher voltage interruptions, and the number of times that these customers have been interrupted.
- 8.12. In setting DNO targets under this scheme and in measuring DNO performance, we envisage applying a higher weighting to those customers who experience a higher number of interruptions. Thus a DNO would benefit more under the scheme by reducing the number of customers who experienced, say, ten interruptions than the number who experienced five. We would set an appropriate incentive rate, operating within a cap and a collar, both for rewarding good performance and penalising poor performance.
- 8.13. This option would not guarantee any improvement in the interruptions performance of customers who are defined as worst served customers under the DPCR5 scheme. However, over time this approach should benefit a larger number of customers who experience unusually poor performance.
- 8.14. Much like the IIS mechanism, any penalties would be returned to that DNO's customers and any rewards would be funded by the DNO's customers after an appropriate lag period.

Option 3 – Guaranteed standards

- 8.15. This option would involve the creation of one or more guaranteed standards specifically aimed at improving the quality of service to worst served customers. Under this approach, DNOs would be required to compensate worst served customers where performance does not meet the required standard.
- 8.16. The guaranteed standards of performance already contain a multiple interruptions standard (Regulation 11) for customers experiencing four incidents of at least three hours during a year. We would look to introduce appropriate wording to ensure that eligible customers only receive payments under one of these standards.

9. Resilience

Chapter Summary

This chapter sets out our proposals in the area of network resilience. In particular, it details our thinking on funding work to mitigate the effects of high impact, low probability events and black start, as well as flood risk mitigation.

Question 1: What are your views on our proposals for network resilience?

Question 2: Do you think that our proposals cover the right areas or are there other areas that you think we should be considering?

Proposals for RIIO-ED1

- 9.1. In this chapter, we use the term 'resilience' to refer to the ability of the electricity distribution networks to continue to supply electricity to customers during disruptive events, such as severe storms. The IIS, which we cover in Chapter 4 of this document, gives the DNOs an incentive to manage the underlying number of interruptions, taking into account the sums that customers are willing to pay for performance improvements. DNOs are also required to design and operate their networks in accordance with relevant statutes, codes and standards (such as Engineering Recommendation P2/6).
- 9.2. In certain areas, where we allow DNOs to recover costs associated with specific works relevant to the resilience of the network, it is appropriate for us to ensure that the customer benefits arising from those works are delivered.
- 9.3. In the Tools for Cost Assessment document, we set out our views on the arrangements for funding flood mitigation work as well as necessary improvements in black start capabilities in the RIIO-ED1 period.
- 9.4. There may also be the potential to use the proposed worst served customer incentive as a form of resilience metric. As this measure would be picking up customers experiencing multiple interruptions it may serve as a proxy for the relative robustness of a network over time. There are questions over whether comparisons would be applicable between companies, but suitably designed it may offer insight to individual DNO performance over time.

High Impact Low Probability Events (HILP)

- 9.5. HILP activity relates to increasing the security of supply to localities that have a high gross value added, to levels that exceed those recommended in Engineering Recommendation P2/6.
- 9.6. We set out our proposals for the funding of work to mitigate the impact of HILP events in the Tools for Cost Assessment document. In DPCR5, we maintained an option for the government to provide guidance on the issue of

HILP. If such guidance or direction had been provided, we would have worked with the government and the DNOs to ensure that any investment was made efficiently, taking account of the options available and the benefits delivered. We propose to follow a similar approach in RIIO-ED1.

Flooding

- 9.7. In DPCR5, we allowed the DNOs to recover money associated with works to mitigate the effects of flooding at substation sites. The cost allowances were calculated with reference to the likelihood of flooding at relevant sites¹⁹ and the number of customers likely to be affected by such flooding. This information was used to determine an overall risk score for each DNO.
- 9.8. It should be noted that, during DPCR5, DNOs have developed an improved understanding of the risks associated with flooding. This should allow the DNOs to make more accurate plans for investment in order to manage exposure to such risks.
- 9.9. With all other things being equal, the longer an identified risk is left without mitigating action being taken the more likely it is that an incident will occur. We are mindful of the fact that we may need to take action to ensure that DNOs are not exposing customers to risks for a longer period of time than is appropriate. For this reason, we are considering the introduction of an incentive scheme to promote the timely reduction of flooding risk.
- 9.10. We are considering whether to build on the flood resilience metric used to determine cost allowances in DPCR5 and use this as a secondary deliverable. We are also considering whether it would be appropriate to incentivise the delivery of timely flood risk mitigation based on delivery of an agreed reduction in risk over the period.

Black start

- 9.11. 'Black start' refers to the actions necessary to restore electricity supplies to customers following a total or widespread shutdown of the GB transmission system. Black Start requires distribution substations to be re-energised and reconnected to each other in a controlled way to re-establish a fully interconnected system. The government has identified the improvement of industry capabilities in this area as a key priority.
- 9.12. We are considering whether it is appropriate for us to introduce arrangements in order to ensure that this important work is delivered within a reasonable timescale, such as a secondary deliverable.

¹⁹ Based on data from the Environment Agency

- 9.13. This would help to promote the delivery of resilience benefits to customers commensurate with the funding that we allow DNOs to recover through the price control. If feasible, we would consider combining the proposed deliverables for flooding and black start mentioned here into a composite risk metric.

Appendices

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Appendix 1 – Consultation Response and Questions

Ofgem would like to hear the views of interested parties in relation to any of the issues set out in this document.

We would especially welcome responses to the specific questions which we have set out at the beginning of each chapter heading and which are replicated below.

Responses should be received by 23 November 2012 and should be sent to:

James Hope
Head of Electricity Distribution, Costs & Outputs
9 Millbank,
London SW1P 3GE
020 7901 7401
RIIO.ED1@ofgem.gov.uk

Unless marked confidential, all responses will be published by placing them in Ofgem's library and on its website www.ofgem.gov.uk. Respondents may request that their response is kept confidential. Ofgem shall respect this request, subject to any obligations to disclose information, for example, under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004.

Respondents who wish to have their responses remain confidential should clearly mark the document/s to that effect and include the reasons for confidentiality. It would be helpful if responses could be submitted both electronically and in writing. Respondents are asked to put any confidential material in the appendices to their responses.

Next steps: Having considered the responses to this consultation, Ofgem intends to publish the Strategy Decision in February 2013. Any questions on this document should, in the first instance, be directed to the name and address set out above.

Chapter 2 – Overview of Reliability and Safety

Question 1: What are your views on the primary outputs and secondary deliverables for reliability and safety? In particular:

- (a) Do you agree that these are appropriate areas to focus on?
- (b) Are there any other areas that should be included?

Chapter 3 - Safety

Question 1: What are your views on the proposed primary output and secondary deliverables relating to safety?

Question 2: Are these appropriate areas to focus on and are there any other areas that should be included?

Question 3: Do you agree with our proposal not to place a financial incentive on the primary safety output?

Question 4: Do you agree with our proposal to create an incentive framework for secondary deliverables for electricity distribution safety?

Chapter 4 – Interruptions Incentive Scheme

Question 1: Do you agree with our proposal to align the IIS incentive rates with those proposed as part of RIIO-T1?

Question 2: What are your views on applying the efficiency incentive rate to the IIS incentive rates?

Question 3: Do you believe we need to introduce a rolling incentive mechanism for IIS, along the lines of the shrinkage rolling incentive proposed in RIIO-GD1, and if so outline your views on the merits of this approach for the IIS?

Question 4: What are your views on the level of revenue exposure and do you believe we need to reintroduce a cap on outperformance?

Question 5: Do you agree with our proposal to set separate planned and unplanned interruptions and minutes lost targets under the IIS?

Question 6: Do you have a preference amongst the options which we have outlined for planned interruptions and minutes lost target setting in RIIO-ED1?

Question 7: Do you have a preference amongst the options which we have outlined for unplanned interruptions and minutes lost target setting in RIIO-ED1?

Question 8: Do you agree with our proposals on exceptional events?

Question 9: Do you agree with our proposed approach to smart electricity meters?

Question 10: Do you agree with us not incentivising short interruptions in RIIO-ED1?

Chapter 5 – Load Indices

Question 1: What are your views on our proposals on load indices (LIs)?

Question 2: Do you agree with our proposed common LI bandings?

Question 3: Of the two options outlined for determining the LI deliverable, which do you think is the most appropriate?

Question 4: Where significant numbers of substations that predominantly cater for demand arise, do you agree that the development of a Distributed Generation (DG) index for generation-dominated substations would be feasible and appropriate to implement at the mid-period point of RIIO-ED1?

Chapter 6 – Health Indices

Question 1: What are your views on our proposals for health indices (HIs)?

Question 2: Do you agree with our proposals to introduce criticality into the HI framework?

Question 3: Do you agree with our proposals for applying financial consequences in the case of material under or over delivery?

Question 4: Do you agree with our proposals to require greater consistency in the types of assessments that the DNOs should feed into the calculation of the asset health indices?

Question 5: What are your views on the suggestion that we would mandate DNOs to develop and maintain HIs in specified asset classes?

Chapter 7 – Guaranteed Standards

Question 1: What are your views on our proposals for the guaranteed standards?

Question 2: Do you feel that we should conduct a mid-period review of the guaranteed standards?

Question 3: Do you agree with our proposal to remove the potential double exemption of one-off exceptional events under the IIS and the guaranteed standards?

Question 4: Do you agree with our proposal to remove all of the Highlands and Islands customer exemptions?

Question 5: What are your views on our proposal to reduce the normal weather standard from 18 to 12 hours, the associated changes to payment levels and options for funding?

Question 6: Do you agree with our proposal to keep non-domestic customers in the guaranteed standards?

Question 7: What are your views on the feasibility and practicality of making payments to all customers automatic?

Question 8: Do you agree with our proposal to make payments to Priority Service Register customers automatic?

Chapter 8 – Worst Served Customers

Question 1: What are your views on the proposed options that we have outlined for the worst served customers scheme? Please include what you see as the pros and cons of each of the options, whether you have a preferred option and why.

Chapter 9 – Resilience

Question 1: What are your views on our proposals for network resilience?

Question 2: Do you think that our proposals cover the right areas or are there other areas that you think we should be considering?

Appendix 2 – Guaranteed Standards

The table below lists the current Guaranteed Standards of Performance.

The relevant statutory instrument can be found here:

http://www.legislation.gov.uk/ukxi/2010/698/pdfs/ukxi_20100698_en.pdf

Guaranteed standards and associated payment levels in DPCR5

Reporting code	Service	Performance Level	Guaranteed standards Payments
EGS1	Responding to failure of distributor's fuse (Regulation 12)	All DNOs to respond within 3 hours on a working day (at least) 7 am to 7 pm, and within 4 hours on other days between (at least) 9 am to 5 pm , otherwise a payment must be made	£22 for domestic and non- domestic customers
EGS2*	Supply restoration - normal conditions (Regulation 5)	Supply must be restored within 18 hours; otherwise a payment must be made.	£54 for domestic customers and £108 for non-domestic customers, plus £27 for each further 12 hours
EGS2A*	Supply restoration: multiple interruptions (Regulation 11)	If four or more interruptions each lasting 3 or more hours occur in any single year (1 April – 31 March), a payment must be made	£54 for domestic and non- domestic customers
EGS2B*	Supply restoration - normal conditions (5,000 or more premises interrupted) (Regulation 6)	Where a large scale event occurs, that is where 5,000 or more customers' premises are interrupted by a single failure of, fault in or damage to a distributor's distribution system, then supply must be restored within 24 hours, otherwise a payment must be made	£54 for domestic customers and £108 for non-domestic customers, plus £27 for each further 12 hours up to a cap of £216 per customer
EGS2C*	Supply restoration – rota disconnections (Regulation 8)	Where supply to a customer's premises is interrupted as a result of rota disconnection on a distributor's distribution system by a failure of, fault in or damage to that system, then supply must be restored within 24 hours, otherwise a payment must be made	£54 for domestic customers and £108 for non-domestic customers

Strategy consultation for the RIIO-ED1 electricity distribution price control
Reliability and Safety

Reporting code	Service	Performance Level	Guaranteed standards Payments
EGS4*	Notice of planned interruption to supply (Regulation 14)	Customers must be given at least 2 days notice, otherwise a payment must be made	£22 for domestic and £44 for non-domestic customers
EGS5	Investigation of voltage complaints (Regulation 15)	Visit customer's premises within 7 working days or dispatch an explanation of the probable reason for the complaint within 5 working days, otherwise a payment must be made	£22 for domestic and non-domestic customers
EGS8	Making and keeping appointments (Regulation 19)	Companies must offer and keep a timed appointment, or offer and keep a timed appointment where requested by the customer, otherwise a payment must be made	£22 for domestic and non-domestic customers
EGS9	Payments owed under the standards (Regulation 21)	Payment to be made within 10 working days, otherwise a payment must be made	£22 for domestic and non-domestic customers
EGS11* (EGS11A, EGS11B and EGS11C)	Supply restoration: severe weather conditions (Regulation 7)	Depending on category of event supply must be restored within 24, 48 or a multiple of 48 hours, otherwise a payment must be made	£27 for domestic and non-domestic customers, plus £27 for each further 12 hours up to a cap of £216 per customer
EGS12*	Supply restoration: Highlands and Islands (Regulation 9)	Supply must be restored within 18 hours, otherwise a payment must be made	£54 for domestic customers and £108 for non-domestic customers, plus £27 for each further 12 hours

* Customers are required to lodge a valid claim under these standards in order to receive a payment.