ED3 RELIABILITY STRATEGY

ED3-S04

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1. EXECUTIVE SUMMARY

Our (ED3-S04) ED3 Reliability Strategy will uphold strong reliability for all customers while targeting additional action at those experiencing the poorest or most disruptive service. While overall network reliability remains strong, average performance can obscure the experience of customers affected by repeated or short interruptions. Our strategy therefore focuses additional investment where customer harm is greatest, while maintaining affordability and complementing the wider asset, resilience and operational investment across our ED3 Business Plan.

We propose **£77.76 million** of targeted reliability expenditure through two programmes in ED3:

- **£52.76 million for Worst Served Customers (WSCs)**, improving reliability for 13,329 customers by the end of ED3; and
- **£25 million for short and multiple interruptions**, comprising £1 million of evidence building and £24 million of UIOLI-funded design, trials and targeted delivery.

This expenditure complements, rather than replaces, the asset renewal, maintenance, reinforcement, climate resilience, operational response and customer-support activities set out elsewhere in our ED3 Business Plan.

The need: improving poor service for those most affected

As at March 2026, 25,697 customers met the revised ED3 WSC definition: 20,617 in SHEPD and 5,080 in SEPD. Each year, 22% of customers in SHEPD and 32% in SEPD experience one or more short interruptions lasting fewer than three minutes. In addition, 18% of customers in SHEPD and 7% in SEPD experience two or more unplanned HV interruptions annually.

The causes, consequences and available solutions vary between our regions and customer groups. SHEPD's long radial overhead circuits, rural and remote communities, exposure to weather and vegetation, and fewer alternative feeds can make interruptions harder to prevent or mitigate. SEPD's denser network presents different customer concentrations, network configurations and restoration opportunities. Our approach will therefore use local network performance and evidence of customer harm to target the measures offering greatest value.

Stakeholders supported targeted investment where customer harm is greatest, while emphasising the need to balance improved reliability with affordability. Critical infrastructure stakeholders also highlighted the potential for interruptions to cause cascading impacts across water, transport, telecommunications and healthcare services. These insights form the basis of our understanding, from which we will build further evidence on where, and how, best to target measures to deliver improvements for those most affected.

What the investment buys—and when funding is used

Our established WSC programme will identify, design and deliver targeted schemes to improve performance for 13,329 customers by the end of ED3.

For customers affected by short and multiple interruptions, we will follow a phased approach:

- **Phase 1 (Build the evidence)**: identify the customer groups and locations experiencing disproportionate harm, map relevant customer and critical infrastructure dependencies to our network and establish transparent intervention criteria and an early-warning threshold below the WSC definition.
- **Phase 2 (Design, trial and assess)**: create a prioritised intervention pipeline, trial measures in selected locations and use customer feedback and performance evidence to assess their effectiveness.
- **Phase 3 (Deliver targeted solutions)**: implement the network, operational and customer-support measures that offer the strongest balance of customer benefit, affordability and deliverability.

Depending on the evidence and root cause, interventions may include preventative asset or vegetation measures, additional monitoring and automation, alternative network feeds, improved customer information, preparedness support and targeted resilience measures.

ED2 credibility and the basis for ED3 delivery

Our established process for WSC identification, design and delivery process is on track to improve service for 12,288 customers in ED2, in line with the commitment we made in our ED2 plan. Across ED2 to date, we have also delivered a 28% reduction in the number of customers in our SEPD area impacted by two or more unplanned HV interruptions. In SHEPD, there has been a 14% increase in the equivalent customers, demonstrating the need for regional targeting of measures tailored to the conditions there.

Building on ED2-developed capabilities, we will employ innovative technologies, network visibility, customer insight and data-led approaches across ED3 to understand harm, target action and reduce interruption likelihood and impact. Further detail is provided in our ED3 Innovation Strategy.

Delivery risks

We will use interruption frequency and duration, customer numbers and characteristics, evidence of harm, network conditions and critical infrastructure impacts to prioritise locations for investigation. We will assess root causes and select interventions based on expected benefits, cost, deliverability and timescales.

For short and multiple interruptions improvements, we will regularly refresh candidate schemes and customer data, to ensure we are focused on delivering the best outcomes for customers. Schemes that no longer offer sufficient value will be replaced through formal cost and governance reviews, and circuits already receiving relevant investment through other ED3 programmes will be excluded to avoid duplication. We will monitor post-intervention performance and customer experience, refining our approach as the evidence develops.

Customer outcomes

By the end of ED3, we will have:

- improved reliability for 13,329 WSCs (based on current assessments of customers and schemes to address them);
- identified and mapped the customer groups and locations most affected by short and multiple interruptions;
- established transparent intervention criteria and an early-warning trigger;
- created and delivered a prioritised pipeline of proportionate network and non-network measures;
- strengthened information, guidance and preparedness support for affected customers; and
- developed measurable evidence on which interventions most effectively reduce customer harm.

Performance monitoring, customer research and continuing stakeholder engagement will test outcomes, support annual reporting and inform future reliability investment.

Our ED3 commitments supported by this strategy

	ED3 Commitment	Metrics
More resilient networks for customers		
We will introduce targeted improvements to reduce unplanned power cuts	**We will halve the number of customers experiencing frequent power cuts compared to a March 2026 baseline, while maintaining overall 99.98% network reliability by the end of ED3, despite more challenging climate conditions.**	Deliver targeted 'Worst Served Customer' schemes to reduce the number of customers experiencing the most interruptions. This will halve the number of customers in this category, with 13,329 customers receiving a more reliable service based on a March 2026 baseline.
		Ensure that 98% of customers are restored within 12 hours following an unplanned interruption in 'normal' conditions
		Maintain our current high levels of reliability despite worsening conditions, with the network at 99.98% reliability.

By the end of ED3, customers should see a more transparent and targeted approach to reliability, with improvements focused on those most affected. During ED3, we will target a 1% year-on-year improvement in Customer Interruptions performance across both networks and, for Customer Minutes Lost, we will maintain our performance, with targeted action to reduce the duration and impact of interruptions for customers who lose supply multiple times. Our decisions will consider not only the frequency and duration of interruptions, but also the relative harm they cause.

2. DRIVERS FOR CHANGE

2.1 HOW STAKEHOLDER ENGAGEMENTS SHAPED OUR PLAN

Our extensive ED3 customer research has clarified stakeholders' views on reliability (among other topics). Our engagement focused on understanding customer priorities, their experience of interruptions, and where customers would support investment for reliability improvements in ED3. Further details on the stakeholder feedback can be found in ***Appendix A***; the key findings are presented here.

Reliability remains a core customer priority, with growing electricity dependence increasing the impact of repeated and short interruptions. Our engagement showed that, typically, customers believe the current levels of reliability of our networks are good, but that there is always room for improvement. There was consistent support for targeted interventions where customer harm is greatest.

Table 2.1 summarises the main reliability themes raised through our stakeholder engagement and how we have reflected them in this strategy. It focuses on the feedback that most directly shaped our outputs, investment priorities and customer outcomes

Table 2.1 How we have responded to stakeholder feedback

Engagement theme	What stakeholders told us	How we have responded in ED3
Overall reliability	Reliability was consistently ranked as a high priority, with strong support for reducing both the frequency and duration of interruptions, but in the context of affordability.	We will continue to deliver high performance, at over 99.98% reliability, through asset management, maintenance, automation, monitoring and targeted network investment.
Worst Served Customers	Stakeholders supported targeted investment where customer harm is greatest, including strong support for improving outcomes for Worst Served Customers.	We are building on our approach to WSC in ED3, targeting schemes to reach more customers and deliver overall improvements in network reliability for those worst affected.
Multiple interruptions	Repeat interruptions were seen as particularly frustrating and a sign that some customers experience poorer reliability than average performance measures suggest.	We will improve our understanding of customers affected by multiple interruptions, understanding how different customers are affected and what steps can be taken to improve this experience.
Short interruptions (<3 minutes)	Stakeholders recognised that short interruptions can cause disruption, especially for customers reliant on digital services, business processes or sensitive equipment.	We will build the evidence base on short interruption impacts, provide clearer information to affected customers and identify where targeted mitigation could offer value.
Critical infrastructure	Water, transport, telecommunications and healthcare stakeholders highlighted the importance of understanding cross-sector dependencies and cascading impacts, as well as relevant standards and requirements.	We will undertake a whole-system assessment of critical infrastructure dependencies across our network areas and use findings to improve communication, data sharing and investment coordination. This will be combined with greater communication across sectors, including direct contact links where possible.
Communication and coordination	Stakeholders wanted clearer communication during interruptions, better coordination of planned works and more transparent explanations of investment decisions.	We will strengthen interruption information, customer guidance and engagement so customers better understand disruptions and how to manage the impact.

2.2 LESSONS LEARNED FROM ED2

Focused engagement with specific stakeholder groups, including critical infrastructure operators, has highlighted opportunities to build on our approach in ED3. These opportunities, which apply beyond just critical infrastructure but have been informed by these engagements, include:

- **Better data sharing** – where possible, sharing more data on network performance between us and other parties will unlock opportunities for more targeted measures across sectors, benefitting all consumers.
- **Proactive engagement** – we have well established engagement links with some critical infrastructure across our network. Establishing regular links with other operators and identifying key contact points for both parties will enable better communication and collaboration as we move into ED3.

- **Common understanding** – long term solutions can be achieved where there is common understanding of applicable standards, requirements or definitions. Improving the dialogue between us and stakeholders to ensure these are clear will reduce confusion and ensure we are targeting measures in the most efficient and effective way.

2.3 IMPLICATIONS FOR OUR STRATEGY

These findings show the need to balance affordability and deliverability with improved reliability and resilience. We have therefore shaped our reliability strategy around targeted investment where customer harm is greatest, informed by the latest evidence on where and how to intervene. We will keep this approach under review as customer insight and network performance evolve. In addition, improving the alignment and communication between us and other critical infrastructure operators will unlock opportunities to provide a better service for all customers.

3. OUR LONG-TERM APPROACH AND ED3 STRATEGY

3.1 OUR LONG-TERM VISION AND APPROACH

Our long-term vision is to uphold strong reliability for all customers while taking more targeted action for customers that experience disproportionate harm from short or multiple unplanned interruptions. By maintaining and renewing our assets at the right time, investing where it delivers long-term value, and using the latest evidence to target additional measures, we will provide a safe, resilient and reliable network as demands on it change.

Regional differences shape reliability management. SHEPD's long radial overhead circuits, rural and remote communities, weather and vegetation exposure, and fewer alternative feeds make interruptions harder to avoid or mitigate. SEPD's denser network has different customer concentrations, configurations and restoration opportunities. Our ED3 strategy uses local performance and customer-impact evidence to select the asset, operational, automation, monitoring or customer support measures offering greatest value in each region.

In ED3, we will identify the groups and locations most affected by short or multiple interruptions, prioritise cases transparently and deliver proportionate network and non-network measures justified by harm, benefit, affordability and deliverability. Regular engagement with key stakeholders will assess intervention impacts. A new early warning trigger will prompt investigation and option assessment before customers meet the Worst Served Customer (WSC) definition.

This approach builds on our (ED3-S12) ED3 Network Asset Management Strategy, (ED3-S03) ED3 Climate Resilience Strategy, (ED3-S06) ED3 Vulnerability Strategy and (ED3-S07) ED3 Targeted Customer Storm Support Strategy, and is supported by our (ED3-S09) ED3 Innovation Strategy, where we set out how new technologies, data-driven approaches and operational innovations will be developed, trialled and deployed. It ensures our (ED3-S04) ED3 Reliability Strategy is not a standalone research programme, but a delivery-focused pathway from understanding harm, to prioritising action, to implementing measures that improve outcomes for affected customers while upholding strong reliability for all.

3.2 CURRENT PERFORMANCE

Through ED2 we are delivering improvements for Worst Served Customers (WSC), defined as those experiencing 12 or more higher voltage (HV) interruptions over three years, with at least two interruptions per year. For ED2 our commitment was to improve performance for 75% of our WSCs, so their experience no longer met the WSC criteria. This means improving performance for 12,288 WSC (8,166 in SHEPD and 4,122 in SEPD), based on qualifying customers as measured at 2019/20, and we are on track to deliver this commitment.

Since the baseline measured at 2019/20, whilst we have delivered schemes that have removed customers from the WSC category, new customers have qualified as WSC on other circuits where performance has deteriorated. The qualifying criteria for WSC in ED3 has been adjusted to 12 or more HV interruptions over three years, with at least one interruption per year. Based on this revised definition, our WSC totalled 25,697 (20,617 in SHEPD and 5,080 in SEPD) at the end of March 2026.

Performance on short and multiple unplanned HV interruptions is summarised in ***Table 3.1***. All incidents, during normal conditions and severe weather exceptional events, are included.

22% of our customers in SHEPD and 32% of our customers in SEPD experience one or more short interruptions, each lasting fewer than three minutes, annually. Most short interruptions arise through the action of automation to restore supplies for some or all customers following a fault, delivering benefits through the avoidance of longer interruptions.

18% of our customers in SHEPD and 7% of our customers in SEPD experience two or more HV interruptions annually. These percentages drop to 5% and 1%, respectively, when counting customers who experience four or more HV interruptions annually. Some WSC are included in these figures and have not been discounted.

Incidents on the low voltage (LV) network are included in short interruptions reporting, but not multiple interruptions measures, due to limitations in visibility of the LV network's connectivity and control. During ED2 we have been rolling out installation of LV monitors at substations to improve visibility of network loading. For ED3 we propose to further develop the capability of LV monitors to include fault detection and location, and support progression to a digitised LV control function. We anticipate this will support development of more reliable measures of multiple interruptions on the LV network.

Table 3.1 Our RIIO-ED2 performance to date

Output Metric	2023-24 Actual	2024-25 Actual	2025-26 Actual
Number of customers affected by short interruptions (SHEPD)	172,273	157,510	186,096
Number of customers affected by short interruptions (SEPD)	1,047,812	1,027,294	932,555
Number of customers affected by 2 or more unplanned HV interruptions (SHEPD)	137,053	130,853	156,738
Number of customers affected by 2 or more unplanned HV interruptions (SEPD)	268,717	212,995	193,296
Number of customers affected by 4 or more unplanned HV interruptions (SHEPD)	39,771	30,902	50,687
Number of customers affected by 4 or more unplanned HV interruptions (SEPD)	35,863	26,899	27,127

3.3 INNOVATION SUPPORTING RELIABILITY

ED2 innovation has improved reliability, customer resilience and understanding of interruption impacts. Growing electricity dependence requires not only fewer interruptions but better network visibility, insight into customer impacts and faster, targeted fault responses. Capabilities developed through innovation provide learning for ED3.

Table 3.2 lists some examples of innovations progressed during ED2. A case study of the High Voltage Fault Location and Anticipation (HVFLA) project is available in ***Appendix B.*** Building on these foundations, innovation will continue to support delivery of our reliability strategy through ED3.

Table 3.2 Innovation projects progressed during ED2

Projects	Contribution
HVFLA, Smart ETR	HVFLA uses improved monitoring, fault data and analytics to identify and locate faults more quickly and accurately. This supports faster isolation and more targeted deployment of field teams, reducing network patrols to find faults, and helping restore customers sooner. HVFLA also provides greater visibility of network disturbances and potential pre-fault activity, supporting a longer-term move towards more proactive fault management before customers are interrupted.
Smart Hammer, Lancet, Megger Sniffer	Introduces more objective, data-led methods for assessing asset condition and identifying deterioration. Smart Hammer improves the detection of internal decay in wooden poles, supporting better-targeted replacement and reducing the risk of unexpected pole failure. LANCET enables transformer oil sampling while equipment remains energised, avoiding unnecessary outages and asset replacement. Megger Sniffer supports faster identification of low-voltage cable faults as part of the LV Fault Finding Toolkit.
VERIFY, Vulnerability Visualisation Tool	Verify combines network, property, demographic and smart-meter information to improve understanding of where interruption-related harm and lower community resilience may be concentrated. This supports more customer-centred investment decisions and helps target resilience measures and support towards communities whose needs or circumstances could increase the impact of an interruption.
Pathways to 2050	Develops evidence and insight into how electrification, evolving customer behaviour and changing consumer needs could affect the network over the longer term. This helps ensure that future reliability and resilience decisions consider not only network requirements, but also how different customers and communities may experience and participate in the energy transition.

3.4 OUR STRATEGIC APPROACH IN ED3

Beyond our wider network resilience and reliability ambitions, our strategic objective for ED3 is to deliver improvements for those customers most affected by short and multiple interruptions, alongside our established approach to WSC. Our strategic approach for short and multiple interruptions can be broadly broken down into three phases, as shown in ***Table 3.3***. This phased delivery creates a clear pathway from understanding harm, to prioritising groups and designing measures, to delivering targeted interventions and monitoring whether they reduce customer harm.

Table 3.3 Phased approach to reliability improvements

Phase	Purpose	What we will do	Outcome	Timing	Costs
Phase 1: Evidence building	Build a clearer evidence base on how short and multiple interruptions create customer harm across different customer groups across our networks, including where they are located.	Carry out customer research, stakeholder engagement, vulnerability insight, recent network performance data and critical infrastructure engagement to identify the customer groups most affected, and the reasons interruptions cause disproportionate harm. We will map these customer	Customer groups and harm drivers mapped across our network. Clear trigger threshold defined for initial review.	Year 1	£1m

		groups and harm drivers to our network.			
Phase 2: Design, trial and assess	Design schemes to deliver across the network, phased over the course of the price control. Identify key locations for initial trials and revisit customer experiences.	We will design intervention measures for key parts of the network where we know there are customer groups that are most affected. For some points, we will trial interventions and monitor their impact through follow up engagement to gather feedback and revise our approach as needed.	A prioritised and justified intervention pipeline. First wave of projects delivered, with clear customer feedback on effectiveness.	Years 2-3	£8m (UIOLI)
Phase 3: Deliver targeted solutions	Implement the measures that provide the greatest value in reducing harm for affected customers.	Deliver the selected interventions, continue to monitor their effectiveness, refine our targeting as new evidence emerges, and use the lessons learned to improve future reliability and resilience planning.	Improved performance for priority customer groups and clearer evidence of how targeted action improves customer outcomes.	Years 2-5	£16m (UIOLI)
Worst Served Customers	Identify and deliver schemes to improve performance for WSC.	Deploy targeted network investments to improve performance for 13,329 Worst Served Customers (over half of the total WSC as at end of March 2026).	Improved performance for customers who met the WSC criteria.	Years 1-5	£52.76m (UIOLI)

3.5 IDENTIFYING INTERVENTIONS

At an aggregate level, we know some customer groups are more affected by interruptions than others, but we do not have detailed data on the relative impact across different customer types, or how this impact changes over time and location. To address this, we are proposing the described programme. Phase 1 will establish which customer groups are most affected by short and multiple interruptions, how impacts differ and how disproportionate harm should be defined. This evidence is essential to selecting effective measures to reduce future disruption.

We will map affected groups to network locations and establish intervention criteria balancing affordability, deliverability and reliability outcomes, in line with stakeholder expectations. These criteria will determine whether network investment, customer support, community resilience or a combination offers the most effective response.

A new “early warning and investigation trigger”, below the WSC threshold, will prompt review of interruption causes and actions to prevent customers becoming WSC, potentially avoiding costlier interventions later. We will confirm the threshold after Phase 1 but expect around four to six higher voltage interruptions annually. Customer contact or our own performance monitoring can initiate the review.

Our strategy is designed to complement our wider work to uphold strong reliability across our networks. Regular refreshes of customer evidence will ensure our approach can adapt with customer insights, enabling us to refocus our efforts considering changes in customer needs.

Stakeholder satisfaction surveys in ED3 Years 1 and 4 will assess interruption impacts across customer groups and changes over time, providing an unbiased assessment of our strategy’s success.

4. OUR ED3 INVESTMENTS

4.1 RELIABILITY FUNDAMENTALS

Overall reliability performance is underpinned by foundational investments and activities on the network, included in other parts of our ED3 business plan, primarily the (ED3-S12) ED3 Network Asset Management Strategy , (ED3-S01) ED3 Load Related Expenditure Annex, (ED3-S03) ED3 Climate Resilience Strategy, and the Network Operating Costs Annex. These investments can be broadly split into two categories: proactive and reactive interventions.

Proactive interventions aim to prevent the causes of interruption, including:

- **Replacement of assets** that have deteriorated to end of useful life, before they fail.
- **Inspections, maintenance and defect repairs** to assets with remaining useful life, to prevent or address arising issues that could lead to failure if not resolved.
- **Vegetation management**, primarily cutting trees to prevent interfering contact with bare conductors on overhead line circuits.
- **Load related reinforcement** to increase capacity, including provision of redundancy where required for security of supply.
- Investments for **adaptation and increased resilience** to changing climate impacts.

Our network is necessarily spread over large geography and exposed to various environments. Prevention of all faults and interruptions is uneconomical, so reactive interventions are a core part of delivering reliability, and include (but are not limited to) the following activities:

- **Protection** monitors the network for faults and trips switches open to cut power and remove electrical danger.
- **Automation**, where installed, acts to isolate an interruption to a smaller section of circuit, which can reduce the number of customers affected by an interruption, re-route power from alternative feeds for some or all customers, or restore supplies to all customers for a transient fault.
- Location of faults may be possible using **measurements and analysis from sophisticated sensors and monitors**. This is more common on 132kV circuits where distance protection is deployed. More recently, we have begun deploying monitors on HV circuits to support the identification and likely location of faults, supporting faster switching and isolation.
- **Switching** is carried out by staff with the objective of locating and isolating the cause of an interruption to the smallest section of network, and re-routing supplies to as many customers as possible from alternative feeds. Switching may be carried out remotely, on site at switch locations, or by a combination of both, depending on the location of the fault, information available, and capability of the switches controlling the affected circuit.
- **Fault repair** is carried out to restore supplies for customers who cannot be isolated from the cause of the interruption. This may involve repair or replacement of assets.
- Depending on the nature of a repair, the number of customers interrupted, and local needs, **mobile generation** may be deployed to restore supplies to customers whilst the repair is completed.

Our Delivery Strategy explains our approach to workforce planning and resourcing to deliver effective response to faults.

Interruption impacts vary by customer type, timing, duration and frequency. Priority Services Register (PSR) customers often depend more on electricity. Enhanced support includes proactive contact during interruptions or ahead of storms, co-created personal power cut resilience plans and home battery packs for critical medical needs. Our Vulnerability Strategy and Targeted Customer Storm Support Strategy set out how we will build on this support in ED3 to strengthen customer resilience.

4.2 APPROACH TO SHORT AND MULTIPLE UNPLANNED INTERRUPTIONS

We measure and report multiple unplanned interruptions on our higher voltage network, in annual regulatory returns to Ofgem. Interruption granularity on the low voltage network is more limited without full visibility of connectivity at that

level, and our strategy is therefore focussed on addressing short and multiple unplanned interruptions at higher voltages where we have better data available.

There are three possible approaches for reducing the impact of short and multiple unplanned interruptions: prevent events, reduce the number of customers affected, or provide information and support to help customers prepare for and manage disruption.

These approaches are not mutually exclusive. In practice, the most effective solution may combine network interventions, operational improvements and customer support. The purpose of our three-phase approach is to ensure that each measure is targeted, justified and linked to a clear consumer benefit before it is delivered. ***Figure 4.1*** gives an illustrative example of possible measures we may deploy.

We will use insights from our work with critical infrastructure operators to strengthen our understanding of cross-sector dependencies and cascading impacts, informing priorities where interruptions could affect wider community, environmental or public-service outcomes. Additional HV and LV monitoring will improve evidence on interruption location, duration and frequency, asset condition and potential fault causes, supporting transparent, cost-effective targeting.

Prevention

Preventative interventions could be targeted to significantly reduce the likelihood of an interruption occurring in the first place. Reducing short or multiple unplanned interruptions on exposed overhead line circuits may be achieved by:

- **Enhanced tree cutting** to prevent contact and damage from falling trees.
- Installing **lightning protection** to prevent interruptions from strikes.
- **Installing shrouding** on exposed terminals and jumpers on pole-mounted equipment, or spacers between overhead line conductors, to prevent interference from wildlife.
- **Replacing sections of bare conductor** with covered conductor to prevent interruptions from contact with wind-borne debris and wildlife.
- Replacing sections of overhead line with underground cable.

Multiple unplanned interruptions may be caused by successive faults on underground cables where damage or deterioration is advanced. In these scenarios, replacement of affected sections with new underground cable would reduce multiple unplanned interruptions.

Reducing exposure

When faults occur leading to interruptions, the numbers of customers affected may be reduced by deploying further automated protection and switches, with various possible objectives:

- Splitting circuits into **smaller sections with fewer customers** so a fault near the far end of the circuit, or on a spur, does not result in the whole circuit being tripped off.
- Enabling **automatic reclosure of switches** to attempt restoration of power following a fault. Where the fault is transient, for example due to contact with wind-borne debris that has blown off again without causing permanent damage, automatic reclosure can restore power for customers within three minutes.

Many distribution substations are connected to high voltage circuits on ring arrangements, where power can be supplied from one direction or the other. Automation, involving switchgear, fault sensors and actuators could be configured to perform automatic isolation of the faulty section, and restoration of supplies to unaffected sections via an alternative feed. Whilst some customers may experience short interruptions in the above scenarios, this may be preferred if the trade-off is fewer multiple unplanned interruptions lasting longer than three minutes.

Where not already available on radial or poorly interconnected circuits, building new interconnecting circuits, along with automation, can provide alternative routes to retore power when interruptions occur on main feeds.

Reducing impact

The impact of short and multiple unplanned interruptions may be mitigated by providing appropriate support to increase their resilience, tailored to suit the type of customer and the disruption they experience. Possible options include:

- **Develop and provide guidance and advice** for domestic customers to prepare for and manage the impact of short and multiple unplanned interruptions.
- Offer **tailored advice for PSR customers** to prepare for and manage the impact of short and multiple unplanned interruptions.

- **Provide batteries** to domestic customers to power essential equipment during short or multiple unplanned interruptions.
- **Make tailored short and multiple unplanned interruptions performance data available** to non-domestic customers, on request and where necessary to enable them to assess their options for managing the impact on their operations.
- **Share information on our plans for interventions** on circuits with high frequencies of short and multiple unplanned interruptions, to enable customers to assess whether there is value in pursuing their own resilience investments.
- **Offer tailored advice for non-domestic customers** on options available for increasing their resilience to short and multiple unplanned interruptions, including alterations or enhancements to their existing network connections, or deployment of uninterruptible or ride-through power solutions.

Figure 4.1 Illustrative example of possible intervention

Illustrative example of how we may intervene

Around 150 customers (including PSR and some customers who are more affected by multiple unplanned interruptions) are supplied through a long, radial overhead line circuit. These customers experienced five interruptions in the past twelve months, along with regular short interruptions (particularly in poorer weather), triggering a review of the network supplying them.

Large sections of the circuit use open-wire conductors, and there is significant tree cover along parts of the circuit. Through analysis of the fault history, asset condition, and network characteristics, we identify that a combination of tree-related faults and circuit condition are likely contributing to overall performance levels. The customers tell us that interruption frequency is the main priority.

We consider possible solutions, including undergrounding the cable, replacing it with covered conductor, installing additional automation and/or protection devices, and carrying out additional vegetation management. For the customer numbers and likely causes, the most cost-effective solution is to replace the overhead conductor with covered conductor in stretch with greatest tree cover, and we bring forward the scheduled vegetation management cycle to coincide with the conductor replacement. We also carry out targeted engagement with these customers to explore steps they can take to boost their resilience, and ensure all customer information is up to date, including PSR status.

This significantly reduces the number of interruptions these customers experience, at an efficient overall cost.

Assessing and determining appropriate interventions

To deliver value for customers, we will develop a decision-making framework governing the interventions we may make to address short and multiple unplanned interruptions performance. This will be informed by our customer research and stakeholder engagement to develop a weighted interruptions score for higher voltage circuits, considering:

- frequency of short interruptions
- frequency of multiple unplanned interruptions
- duration of multiple interruptions
- total customers impacted
- impact by customer type

We will review and update circuit interruption scores annually and identify the highest priority circuits for further investigation and analysis. Circuits already committed for intervention under other drivers (for example WSC, asset replacement or refurbishment, tree cutting) will be excluded on the basis that these investments will be expected to deliver improvements in interruptions performance. We expect to focus on circuits where interruptions performance has not met the criteria for WSC, with the aim of addressing performance before the WSC threshold is met.

We will investigate prioritised circuits to determine the root causes of performance and assess best value intervention options. In some cases, where causes of interruptions are unknown or unclear (especially short interruptions), we may install monitoring equipment to capture and record more faults detail, including accurate location information. This will help us determine the best route to improving performance for these customers.

Where root causes are known or estimated with high confidence, we will design, cost and assess appropriate options for expected improvements in interruptions performance. We will rank and select the most appropriate option based on expected benefit to cost ratio, deliverability and timescales.

We will measure and review performance after a year to assess the benefit of our intervention(s), using interruptions data and customer surveys. The findings of these reviews will assess what value we have delivered and inform the need for any adjustments or refinements to our decision-making framework.

4.3 INVESTMENT TYPES

Funding reflects the certainty of our activities. Phase 1 establishes the strategy's evidence base and long-term effectiveness through activities we can cost now. These are baseline activity costs in table CV15 – QoS & North of Scotland of the Business Plan Data Tables (BPDTs).

For other activities, intervention types are known but locations, timing, total costs and customer reach remain uncertain. We propose a 'Use It or Lose It' (UIOLI) mechanism, drawing funding only where need and customer outcomes are evidenced, protecting affordability. These costs are included in BPDT tables CV15 – QoS & North of Scotland and CV19 - WSC, with delivery progress reported annually.

4.4 DELIVERABILITY

Our established WSC identification, design and delivery process is on track to deliver ED2 benefits. In ED3, a flexible portfolio will maintain a candidate pipeline, refresh WSC data, develop solutions, rank eligible schemes and authorise delivery through cost and governance gates. This accommodates new WSC and replaces schemes no longer offering expected value. Short and multiple unplanned interruption interventions will be managed and delivered similarly. This approach enables us to adapt actual delivery to meet the targeted output levels (particularly the reduction in the number of WSC across our networks) and deliver improvements for customers.

5. OUR ED3 OUTPUTS AND THE BENEFITS TO CONSUMERS

Interventions for Worst Served Customers have been included in prior business plans and informed our output to WSC for ED3. We will remove half of customers, who qualified as WSC at the end of March 2026, from the WSC category. This will deliver improved reliability, with fewer power cuts, for 13,329 customers, by the end of ED3.

Quantifying benefits for customers who do not qualify as WSC, but experience short or multiple unplanned interruptions, will require development as we learn and understand more about the varying impacts of interruptions on different customer groups. The value of benefits will be informed not just by frequency and duration of interruptions, but by their relative impact, discovered through our proposed research and engagement. We anticipate that many of our interventions will be like those undertaken for WSC improvements, and an approximate cost per customer may be used as an initial indication of potential benefits. Using this approach, £24m of targeted investment may deliver fewer short and multiple interruptions for around 6,500 customers. This is an approximation and is likely to vary when the impact of interruptions is considered in valuing and prioritising interventions, or where we find improvements can be delivered at a lower average cost per customer than for WSC interventions.

In determining the value of our investments to address short and multiple interruptions performance, we have been mindful that we don't propose to address all WSC on our network during ED3. Some WSCs will benefit from improved performance due to other interventions delivered through our wider ED3 business plan, but others may continue to experience the worst service. Whilst a greater number of customers do not qualify as WSC but still experience poorer than average performance through short and multiple interruptions, we consider it appropriate to allocate more of our targeted reliability interventions to WSC, based on stakeholder support, its established criteria, and the learning and

understanding needed to quantify the value and benefits of addressing performance for customers who are not in the WSC category.

Beyond targeted interventions proposed in this strategy, improvements will be delivered for WSCs, and customers experiencing short and multiple unplanned interruptions, through investments and activities covered elsewhere in our business plan. These outcomes will be secondary to the main drivers for these other investments and activities, and there are no incremental costs included in those plans to deliver additional improvements for WSCs or customers who experience short and multiple unplanned interruptions.

The outputs and anticipated consumer benefits for this strategy are summarised in ***Table 5.1***.

Table 5.1 Our ED3 outputs, measures and benefits for consumers

ED3 output	Measure	Consumer benefit	Phase
Improve reliability for Worst Served Customers (WSC)	Improve performance to remove 13,329 customers from the WSC category.	Fewer interruptions for customers with the worst reliability experience.	Throughout ED3
Introduce new criteria for customers experiencing worse than average service and investigate causes before they become WSC	Publish criteria by end of Year 1 of ED3.	Sharper focus on worse than average performance will lead to earlier improvements.	Phase 1
Identify customer groups and harm drivers for short and multiple unplanned interruptions	Complete research, stakeholder evidence synthesis and harm-driver definition by the end of Year 2 of ED3.	Creates a transparent evidence base for targeting action where interruption-related harm is greatest.	Phase 1
Map affected customer groups and critical infrastructure dependencies to network locations	Establish mapping methodology and complete priority mapping by the end of Year 3 of ED3.	Enables risk-based prioritisation of locations where network or non-network measures can reduce customer, community or critical infrastructure harm.	Phase 1/2
Develop and publish targeted guidance and preparedness support for affected customers	Publish guidance for domestic, PSR and non-domestic customers by the end of Year 2 of ED3 and refine it as evidence improves.	Improves preparedness and reduces disruption for customers while location-based interventions are prioritised and delivered.	Phase 2
Design, deliver and monitor targeted measures to reduce interruption-related harm	Identify, design and deliver or mobilise priority measures by the end of ED3, subject to value assessment and deliverability.	Reduces interruption-related harm for priority customer groups and provides measurable learning for future reliability investment.	Phase 2/3

6. IMPLEMENTING OUR ED3 STRATEGY

Our reliability strategy will be implemented through a phased approach which will take us from evidence gathering, through delivery, and into refinement and feedback to ensure we are learning as we go. This approach will ensure we are able to target measures where they deliver clear benefits for customers, whilst ensuring we balance this output with overall affordability and deliverability. ***Table 6.1*** and ***Figure 6.1*** set out how our strategy will be implemented over the course of ED3. ***Table 6.2*** sets out or forecast annual expenditure across ED3, and where these costs have been included in our BPDTs. This is our current plan and will be adapted as we garner further evidence and understanding of how best to deliver these improvements.

Table 6.1 Implementation through ED3

Output / phase	Year 1	Year 2	Year 3	Year 4	Year 5
Maintain strong overall reliability and improve outcomes for Worst Served Customers	Confirm WSC forecast, scheme pipeline and delivery plan.	Deliver priority WSC schemes and monitor customer benefit.	Continue delivery and update reduction forecast.	Complete remaining schemes and track outcomes.	Confirm delivered WSC reduction and lessons for future reliability planning.
Phase 1: Evidence building	Carry out stakeholder engagement to understand customer groups most affected and where they are. Map these customer groups to our network. First stakeholder satisfaction survey.			Second stakeholder satisfaction survey.	
Phase 2: Design, trial and assess		Design solutions for key locations. Deliver Tranche 1 solutions on a trial basis. Monitor impact through follow up engagement.	Revise designs for Tranches 2 and 3 based on feedback from trials and stakeholder survey.		
Phase 3: Deliver targeted solutions		Design and deliver Tranche 2 solutions.	Design and deliver Tranche 2 solutions.	Design and deliver Tranche 3 solutions.	Design and deliver Tranche 3 solutions.

Figure 6.1 Implementation through ED3

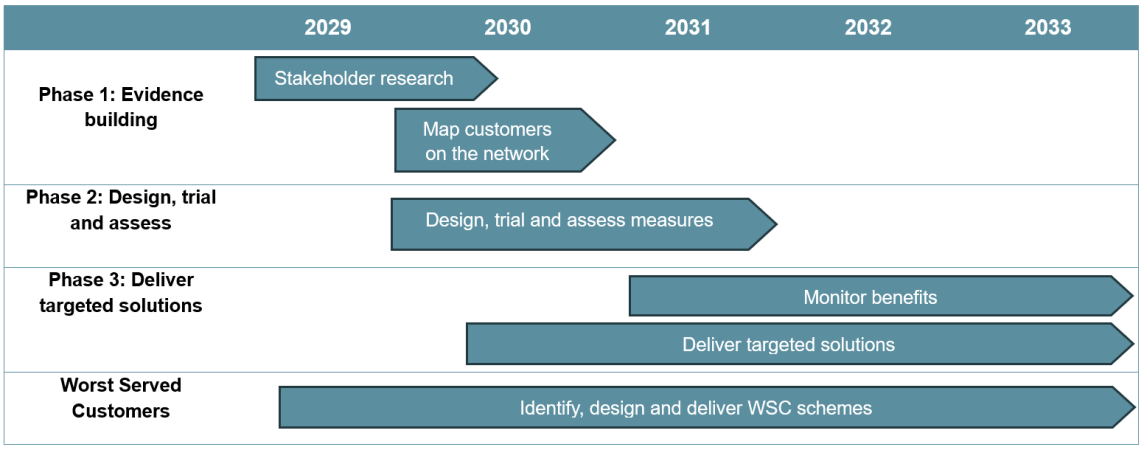


Table 6.2 Forecast expenditure

	Forecast expenditure / BPDT / EJP	Year 1	Year 2	Year 3	Year 4	Year 5	Total
SHEPD	Worst Served Customers CV19 - WSC SSEN_ED3_NLRE_WSC	£0.00m	£9.78m	£9.78m	£14.67m	£14.67m	**£48.91m**
	Short and multiple unplanned interruptions CV15 – QoS & North of Scotland SSEN_ED3_NLRE_Reliability	£0.50m	£5.05m	£5.05m	£5.05m	£5.05m	**£20.70m**
SEPD	Worst Served Customers CV19 - WSC SSEN_ED3_NLRE_WSC	£0.77m	£0.77m	£0.77m	£0.77m	£0.77m	**£3.85m**
	Short and multiple unplanned interruptions CV15 – QoS & North of Scotland SSEN_ED3_NLRE_Reliability	£0.50m	£0.95m	£0.95m	£0.95m	£0.95m	**£4.30m**

APPENDIX A: STAKEHOLDER ENGAGEMENT FEEDBACK

Insights from stakeholder engagement have shaped an ED3 strategy focused on reducing multiple and short interruptions, improving outcomes for Worst Served Customers, and upholding strong overall reliability.

We shaped our reliability strategy through a structured programme engagement comprising consumer insights, broad engagement and targeted and deliberative engagement, involving participants across both our distribution service areas, considering the wide range of geographies we serve.

- Consumer insights provided evidence on customer priorities, expectations and willingness to support investment.
- Broad engagement captured perspectives from network users, consumer representatives, local authorities, critical infrastructure operators, industry bodies, regulators, supply chain partners and environmental stakeholders.
- Targeted and deliberative engagement enabled deeper exploration of key strategic choices, trade-offs and investment priorities with domestic and business customers, stakeholders and subject matter experts.

BROAD ENGAGEMENT

Our early engagement tested how we should prioritise reliability improvements and target investment. Stakeholders consistently supported targeted interventions where customer harm is greatest, rather than uniform improvements across the network. In our Future-Proofing Power webinar, stakeholders ranked improving reliability for customers experiencing multiple unplanned interruptions as the highest reliability priority, while 89% supported targeted spending to improve outcomes for Worst Served Customers. Stakeholders also highlighted the importance of coordinating works to avoid repeated disruption and improving communication during interruption events.

TARGETED AND DELIBERATIVE ENGAGEMENT

Targeted engagement and triangulation validated the overall direction of our strategy and helped refine the interruption outcomes we will focus on in ED3. Across the evidence base, multiple interruptions and customer fairness emerged as the strongest priorities. This supports our ED3 strategy on multiple interruptions, short interruptions and Worst Served Customers, whilst upholding strong average reliability.

Diverging views and continued trade-offs

Stakeholders were broadly supportive of improving reliability and resilience but also recognised that these improvements must be balanced against affordability. The key trade-off is therefore how we target investment where it delivers the greatest customer benefit, while avoiding unnecessary cost for customers.

- **Target investment where customer harm is greatest.** We will prioritise interventions for Worst Served Customers, customers experiencing repeated interruptions, and locations where interruptions have wider community or critical infrastructure impacts.
- **Use evidence to support proportionate decisions.** We will combine customer insight, network performance data, vulnerability information and cost-benefit analysis to test where intervention is justified and where non-network support may be more appropriate.
- **Manage affordability transparently.** We will explain the rationale for investment choices, show the customer benefits expected, and continue to challenge costs so reliability improvements remain proportionate and deliverable.
- **Keep the approach under review.** We will use ED3 research, stakeholder engagement and performance monitoring to refine our understanding of short and multiple interruption impacts and adjust our approach where the evidence supports it.

IMPLICATIONS FOR THE RELIABILITY STRATEGY

Together, these drivers require us to move beyond average reliability performance and focus more deliberately on the customers and locations where short and multiple interruptions create disproportionate harm. Our ED3 strategy therefore uses a harm-led approach: understand the impact, identify and map affected customer groups, prioritise the most material cases, design proportionate network and non-network measures, and deliver interventions where they improve customer outcomes cost-effectively.

This approach enables us to uphold the reliability customers value today while using better evidence to target additional action for those most affected by interruptions. It also ensures affordability and deliverability remain central to decision-making, so interventions are pursued where the expected customer benefit justifies the cost.

APPENDIX B: INNOVATION CASE STUDY

HIGH VOLTAGE FAULT LOCATION AND ANTICIPATION (HVFLA)

Storm Arwen highlighted the operational challenge of locating faults rapidly across widespread network damage.



Severe weather can create multiple simultaneous faults across large and difficult-to-access areas. Faster, more accurate fault location is critical to directing field teams, isolating damaged sections and restoring supplies sooner.

OUR RESPONSE: ACCELERATE PROVEN INNOVATION

We accelerated the deployment of HVFLA, building on successful innovation activity and progressing the capability towards wider operational use.

1 IDENTIFY	2 LOCATE	3 ACT
Waveform monitoring detects and records network events.	Software analysis identifies likely fault locations and search areas.	Control and field teams use the insight to target restoration or investigation.

DESIGNED AROUND OUR NETWORK

The fault-location approach accounts for variations in primary substation design and operation, including protection arrangements, fault levels, transformer earthing and busbar configuration.

INNOVATION THROUGH COLLABORATION

The classification and location capability has been co-developed by us and the University of Strathclyde, combining operational network knowledge with specialist electrical engineering, data and algorithm-development expertise.

COMPLEMENTARY BENEFITS

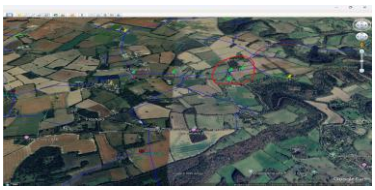
REACTIVE BENEFIT: Reduce duration of sustained interruptions

Faster fault location gives the Control Room better information for switching decisions and enables field teams to be dispatched to a narrower search area. This can reduce time spent patrolling long circuits and support earlier isolation, repair, and restoration.

PROACTIVE BENEFIT: Act on short interruption events

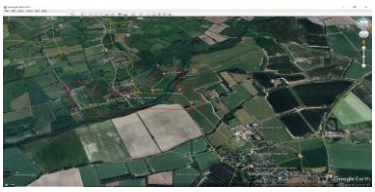
Automatic switching following transient events may restore supply quickly, but the underlying defect can remain. Captured waveform data can identify likely locations for follow-up investigation, enabling intervention before an issue develops into a permanent fault.

OPERATIONAL LEARNING FROM LIVE NETWORK EVENTS



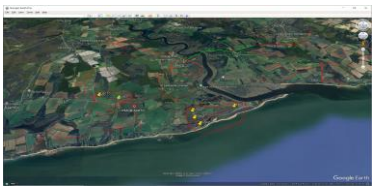
Petersfield E3L5 | Broken pin insulator

Analysis following an automatic reclose event prompted a targeted line patrol. A faulty pin insulator was identified near Crabtree Cottage on a feeder serving 1,241 customers.



Wootton Bassett E4L5 | Broken stay and vegetation interaction

Following an automatic reclose event, investigation identified vegetation risk and a snapped stay causing the pole and line to lean towards trees and bushes. The feeder serves 946 customers.



Langley E6L5 | Vegetation encroachment

A line patrol following an automatic reclose event found a pole heavily overgrown with vegetation extending close to the overhead conductors. The feeder serves 161 customers.

The value of HVFLA is not limited to severe weather events. Monitoring can turn transient events into actionable intelligence, helping SSEN move from reactive restoration to earlier, evidence-led asset interventions, either without interrupting customers or under planned interruptions where customers are given advanced notice.

EXTENDING THE CAPABILITY FROM HV TO LV

The principles established through HVFLA provide a platform for a broader ED3 reliability capability. Additional monitoring across high voltage (HV) and low voltage (LV) networks can improve visibility of interruption location, duration and frequency, while building a stronger evidence base around asset condition and potential fault causes.



- Near real-time LV fault alerts and locations
- Feeder and incident history brought together in one place
- Improved visibility of LV assets and network connectivity
- Pre-fault information, cable health indicators and likelihood-to-fail insights
- A centralised capability supporting more intelligent control of the LV network

HOW THIS SUPPORTS OUR RELIABILITY STRATEGY

- Reduces duration of power cuts by improving the speed and accuracy of fault response.
- Improves understanding of short and multiple interruptions, including transient events restored through automation.
- Provides evidence to prioritise circuits and locations where customer harm is greatest.
- Enables targeted and proportionate interventions based on fault history, asset condition and expected customer benefit.
- Supports earlier investigation before customers progress towards Worst Served Customer performance levels.