ED3 LONG-TERM INTEGRATED NETWORK PLAN

ED3-S02

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EXECUTIVE SUMMARY

Our 2050 Network Vision is to be the UK's leading intelligent network builder and operator, delivering a clean, affordable and available electricity network that enables growth, protects customers and communities, and stewards network assets for long-term value. This Long-Term Integrated Network Plan (LINP) sets out how we will develop our network towards that vision, ensuring the choices we make today deliver enduring value for customers, communities and stakeholders.

The needs of those we serve are changing. Customers increasingly rely on electricity for their homes, transport, businesses and essential services, while communities, local authorities and developers need capacity to support growth and decarbonisation. At the same time, we must maintain a reliable and resilient service, protect customers in vulnerable circumstances, respond to climate and environmental challenges and keep the network affordable. Our challenge is therefore not simply to invest more, but to develop the right network, at the right time and in the right places.

Looking towards 2050, electrification and economic growth will reshape demand, while an ageing asset base, greater dependence on electricity, climate risks and environmental expectations place additional requirements on the network. The LINP brings these requirements together into an integrated approach to network development through four investment drivers: load and capacity, asset condition and reliability, climate resilience and environmental performance.

Customer and stakeholder evidence has shaped five long-term outcomes: capacity to meet future load growth; enabling customer participation; enhanced reliability and resilience; optimised asset management; and reduced environmental impact. These outcomes are interdependent. Affordability and protecting the interests of all customers, including those in vulnerable circumstances, are not standalone outcomes; they are explicit considerations in how we plan the network, assess trade-offs and make decisions across all five.

ED3 is a critical stage on this pathway, not the end point. Alongside delivering interventions where requirements are already clear, ED3 will strengthen our enabling capabilities - People, Processes, Data and Digital, Innovation and Partnerships - needed to support continued network development through ED4, ED5 and towards 2050.

We will Act where need is clear, Prepare where change is increasingly likely and Retain Options where uncertainty remains. Engineering, economic, climate, customer and stakeholder evidence will drive our decisions, enabling us to invest decisively where it creates greatest overall value, avoid premature cost and act early where delay could create greater cost, risk or harm for customers.

During ED3, this means a materially larger and more targeted programme of network development. Asset replacement investment is forecast to increase by around 56% compared with ED2; we aim to increase the capacity of connections accelerated through early-access products from 1.8 GW to 5 GW; and our Worst Served Customer programme will target improved reliability for more than 13,000 customers.

Our wider ED3 Business Plan sets out total totex of at least £8.7bn, 26% more than the estimated £6.9bn[1] in ED2. The LINP brings together around £4.3bn of the network investment underpinning that plan, reflecting the scale of investment needed to reinforce and grow our network to enable electrification, renew ageing assets, manage network risk and strengthen resilience. This investment will unlock significant value for

[1] ED2 estimate is dependent on the outcome of the Load Related Expenditure Reopener.

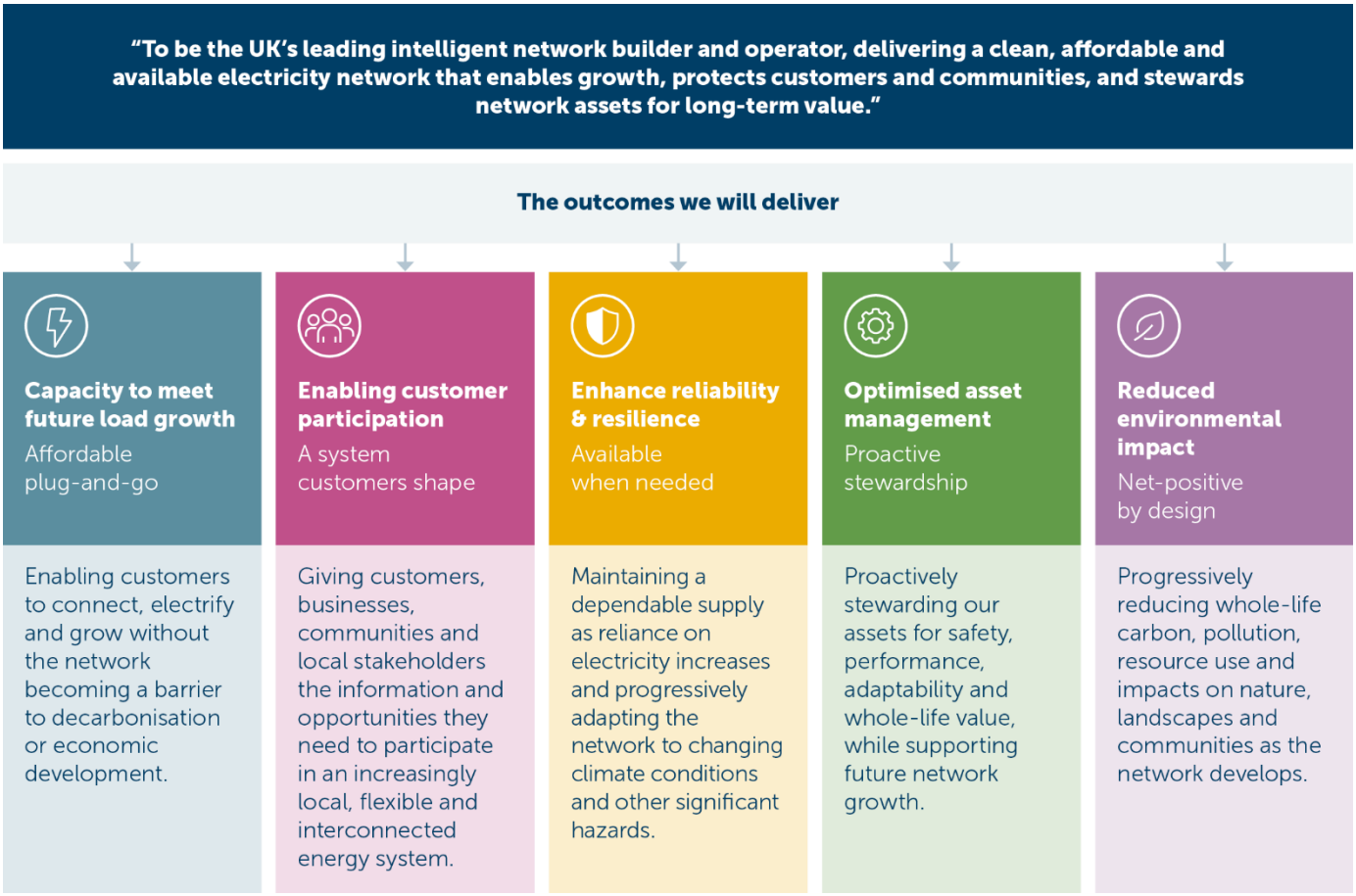
customers and the wider economy, including an estimated £1.73bn of customer savings over ED3, 21,000 jobs supported each year across Great Britain, £10.2bn of additional economic activity, and 83p in every £1 spent on UK goods and services. Further detail on our ED3 expenditure and benefits is provided in Section 2 of our Business Plan Main Document.

The LINP therefore provides clear long-term direction without fixing every future investment decision today, allowing our plans to adapt as demand, technology, climate, customer needs and local circumstances evolve.

1. PURPOSE

Our Long-Term Integrated Network Plan (LINP) explains how we will develop our electricity distribution networks towards our 2050 Network Vision and deliver our identified Customer Outcomes, Figure 1-1. The LINP explains how our ED3 investments accelerate us towards this vision.

Figure 1-1 - SSEN's 2050 Network Vision and Customer Outcomes



The LINP integrates long-term requirements across load and capacity, asset condition and reliability, climate resilience and environmental performance. The LINP provides a framework for ensuring decisions made for ED3 deliver value now and keep the network development progressing towards the longer-term GB energy vision. LINP has also enabled coordinated decision making in ED3, delivering greater customer value.

All our ED3 strategies have been influenced by LINP. This document aims to explain this influence and provide a summary of interventions proposed for delivery in ED3 and an indicative view of investments we expect to make beyond this time, providing all stakeholders with an overview of our network investments. The LINP is supported by our detailed investment plans. **Table 1-1** – How the LINP links to ED3 strategies and evidencesummarises the key elements of the individual strategies and where they have been directly influenced by our network vision.

Table 1-1 – How the LINP links to ED3 strategies and evidence

Document	What it provides	Outcome Focus	LINP sections
ED3 Business Plan Main Document (ED3-BP01)	Our overall ED3 plan, commitments, investment, outputs and customer value.	All	All
ED3 Load Related Expenditure (LRE) Annex (ED3-S01)	Load forecasts, capacity needs, investment requirements and how 'Build and Flex' are used to meet them.	Capacity to meet future load growth	2, 3, 4
ED3 Connections Strategy (ED3-S16)	How we will enable faster, more efficient connections and respond to changing connections needs.	Capacity to meet future load growth	2
ED3 DSO Strategy (ED3-S10)	How we forecast, plan and operate an increasingly flexible network, including Strategic Development Plans (SDPs) and flexibility markets.	Enabling Customer Participation Capacity to Meet Future Load Growth Optimised Asset Management	2, 3, 4
ED3 Network Asset Management Strategy (ED3-S12)	Asset stewardship, condition and risk, and evidence-led approach to replacement, refurbishment and life extension.	Optimised Asset Management	2, 5
ED3 Reliability Strategy (ED3-S04)	How we maintain strong reliability while targeting customers experiencing the poorest and most disruptive service.	Enhanced Reliability & Resilience	2, 6
ED3 Climate Resilience Strategy (ED3-S03)	Climate risk and vulnerabilities, adaptation pathways and interventions to strengthen network and operational resilience.	Reduced Environmental Impact	2, 6
ED3 Environmental Action Plan (ED3-S14)	Environmental commitments and programmes across carbon, pollution, resource use and nature.	Reduced Environmental Impact	2, 6
ED3 Data and Digitalisation Annex (ED3-S13)	Data and digital capabilities enabling trusted information, network visibility and better investment decisions and customer outcomes.	All	2, 3
ED3 Innovation Strategy (ED3-S09)	How we develop, test, deploy and scale new technologies and approaches to deliver measurable customer and network benefit.	All	2, 3
ED3 Delivery Strategy (ED3-S05), with our ED3 Workforce Annex (ED3-S18) and ED3 Supply Chain Annex (ED3-S19)	How we will mobilise workforce, supply chain and delivery capacity for a larger programme.	All	2, 3
ED3 Vulnerability Strategy (ED3-S06)	How we identify and support customers in vulnerable circumstances reflect their needs in our services and planning.	Enabling Customer Participation	2, 3
ED3 Stakeholder Engagement and Decision Log (ED3-O05); ED3	What customers and stakeholders told us, and how it shaped our ED3 plan and decisions.	All	2, 7

Consumer Research Log (ED3-O06)			
ED3 Business Plan Data Tables (BPDTs), Engineering Justification Papers (EJP) Indexes and Cost Benefit Analyses (CBAs)	Detailed costs, volumes, needs cases, option appraisal, benefits and justification.	All	4–8
Strategic Development Plans (SDPs), Distribution Network Options Assessment (DNOA) and our open network data (including NeRDA and LEAP+)	Place-based planning information published outside the Business Plan and refreshed regularly	Capacity to Meet Future Load Growth Optimised Asset Management	2, 9

Across the ED2 timeframe we have led the industry in developing and embedding a more strategic approach to network planning, becoming the first DNO to publish our Strategic Development Plans (SDPs), identifying network needs to 2050. Alongside our Distribution Network Options Assessment (DNOA) this has established a clear and transparent framework for investment decisions, bringing together place-based needs, credible options, uncertainty and evidence to determine the appropriate timing and form of intervention, and consequently ensuring our network vision and long-term strategy is embedded in the process of every decision. This now established approach gives us confidence that our 2050 Network Vision is credible, evidence-led and embedded in the decisions we make today.

ED3 is the next stage in this longer network-development pathway. The LINP gives customers, local authorities, developers and the supply chain greater visibility of expected network development. Where future requirements are sufficiently clear, we will provide transparent signals on investment volumes, timing and sequencing. Where uncertainty remains, we will prepare or retain options until the evidence supports further commitment. In this way, the LINP provides a long-term direction while retaining the flexibility to respond as demand, technology, climate, customer needs and local circumstances evolve.

1.1 OUR 2050 NETWORK VISION

In response to the priorities, trends and evolving needs explained in Section 2 we have set a 2050 Network Vision to direct all our decision-making. This shared view of where our network is heading guides investment and operational decisions and helps us manage trade-offs under uncertainty across successive price controls. We will review it annually alongside business planning, so that it evolves as uncertainties resolve and the industry changes. Our vision is:

"To be the UK's leading intelligent network builder and operator, delivering a clean, affordable and available electricity network that enables growth, protects customers and communities, and stewards network assets for long-term value."

The vision for our Distribution Network links to SSE Group's ambition to make electricity clean, affordable and available for all, and translates it into what it means for our customers. **Clean** means a lower network impact and support for wider decarbonisation. **Affordable** means efficient investment and fair long-term value. **Available** means capacity and continuity when customers need it.

The vision is expressed through five long-term outcomes (Figure 1-1*),* each describing what customers, communities and stakeholders should experience from our network by 2050.

1.2 OUR OUTCOMES

We have defined five long-term outcomes, reflecting what our network must achieve through ED3 to ensure we remain on track to deliver our 2050 Network Vision. Together, these outcomes address customer and stakeholder priorities, with key metrics to track progress across successive price controls. Reliability, affordability, growth, place and trust cut across all outcomes; no single outcome is intended to 'own' one stakeholder theme.

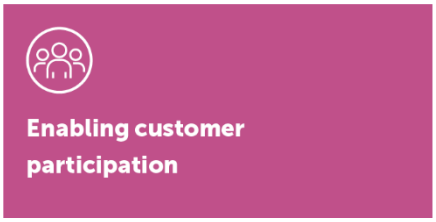
Outcome 1 - Capacity to meet future load growth



We will create the network capacity needed to unlock economic growth, accelerate electrification and enable customers and communities to decarbonise. We will develop capacity ahead of need where the evidence supports it, while using flexibility, access products and other solutions where these provide better value. This means preparing for credible future requirements while avoiding unnecessary or premature investment where uncertainty remains. We will measure our progress through metrics such as:

- Time to connect: proportion of connections energised by the customer's agreed need date
- Cost of access: whole-life network cost per unit of usable access

Outcome 2 - Enabling customer participation



We will empower customers, businesses, communities and local stakeholders to play an active role in an increasingly local, flexible and interconnected energy system. Greater network visibility, accessible data, flexibility services and place-based planning will enable better informed choices and unlock greater value from available capacity. This will strengthen the alignment between local growth, decarbonisation plans and future network development. We will make participation straightforward and inclusive, ensuring the benefits are accessible across different customer and community circumstances. We will measure our progress through metrics such as:

- Participation equity: how evenly customer groups and localities are able to participate
- Customer satisfaction across participation journeys

Outcome 3 - Enhanced reliability and resilience



We will provide our customers with a dependable and increasingly resilient electricity supply as society becomes more reliant on electricity for homes, transport, communications, businesses and essential services. We will improve everyday network reliability and build greater resilience to severe weather, changing climate conditions and other significant hazards, strengthening our ability to anticipate, withstand, respond to and recover from disruption. We will focus our resilience measures where interruptions and wider dependencies could have the greatest impact on customers and communities. We will measure our progress through metrics such as:

- Supply continuity: proportion of customers with no unplanned interruption in a year
- Storm readiness: preparedness across forecasting, assets, operations, communications, customer support and restoration

Outcome 4 - Optimised asset management



We will proactively manage a healthy, safe and adaptable asset base that delivers reliable performance today while enabling the network we need for the future. We will maximise the value of our assets, using condition, risk, criticality and performance to drive decisions on when to maintain, refurbish, replace or retain them. Where intervention is required, we will invest for the long term, considering future capacity, reliability, resilience and environmental requirements so that every intervention contributes to the network we need tomorrow. We will measure our progress through metrics such as:

- Compliant asset management: required activities completed to defined standards
- Fault avoidance: proportion of emergent faults resolved before causing an interruption or failure

Outcome 5 - Reduced environmental impact



We will grow, operate and renew our network in ways that reduce its environmental impact and deliver positive outcomes for the places and communities we serve. Whole-life carbon, pollution risk, resource use, biodiversity, landscape and wider environmental impacts will shape our investment decisions alongside cost, performance and network need. We will make better use of existing assets, adopt lower-impact technologies and materials, embed circular approaches and use nature-based solutions where they deliver credible and proportionate benefits. We will measure our progress through metrics such as:

- Operational emissions: absolute Scope 1 and 2 emissions
- Pollution prevention: SF_6 leakage and risk from fluid-filled cables and other legacy substances

These outcomes are interdependent and should not be considered in isolation. Capacity depends on a healthy, reliable and climate-resilient asset base; better information and flexibility can help customers participate and make more effective use of available capacity; and coordinating reinforcement, asset

renewal, resilience and environmental interventions can reduce repeated works, disruption and cost. We will therefore consider the five outcomes collectively when making long-term network development choices, seeking solutions that deliver the greatest overall value across investment drivers, time periods and places.

The relationships between the outcomes, and the opportunities to deliver value across multiple outcomes simultaneously, are explored further in the Linkages and Synergies **Section 8**.

Section 1.3 sets out the cross-cutting capabilities that enable us to deliver these outcomes, while **Section 2.3** explains how changing network needs, stakeholder evidence and uncertainty determine where we Act, Prepare or Retain Options.

1.3 DELIVERING OUR LONG-TERM OUTCOMES

Achieving these outcomes requires more than infrastructure investment. Our capabilities and ways of working must evolve alongside a larger, more heavily used and increasingly complex network.

Five cross-cutting enabling capabilities support the pathway towards our 2050 Network Vision:

People – developing the engineering, operational, digital, data, commercial and market capabilities needed to plan, build and operate a larger, more complex and increasingly intelligent network.

Processes – strengthening integrated and place-based planning, optioneering and coordinated delivery so that load and capacity, asset condition and reliability, climate-resilience and environmental needs are considered together.

Data and Digital – improving network visibility, forecasting, monitoring, simulation and asset intelligence so that decisions are increasingly evidence-led and can adapt as network needs change.

Innovation – testing new technologies, tools and approaches where established solutions do not fully meet future needs and scaling proven innovation into business-as-usual delivery where it demonstrates clear customer and network value.

Partnerships – working with customers, communities, local authorities, the supply chain and wider energy-system stakeholders to ensure network development reflects local priorities, supports local and GB economic growth and can be delivered at the scale and pace required.

These capabilities will not all need to develop at the same rate across the different outcomes:

- Some are required now to support needs already visible in ED3;
- others must be developed in readiness for changes expected through the 2030s and 2040s;
- and some will depend on how the six identified external trends evolve *(see Section 2).*

We will therefore continue to test our long-term assumptions and adapt the pathway as evidence develops.

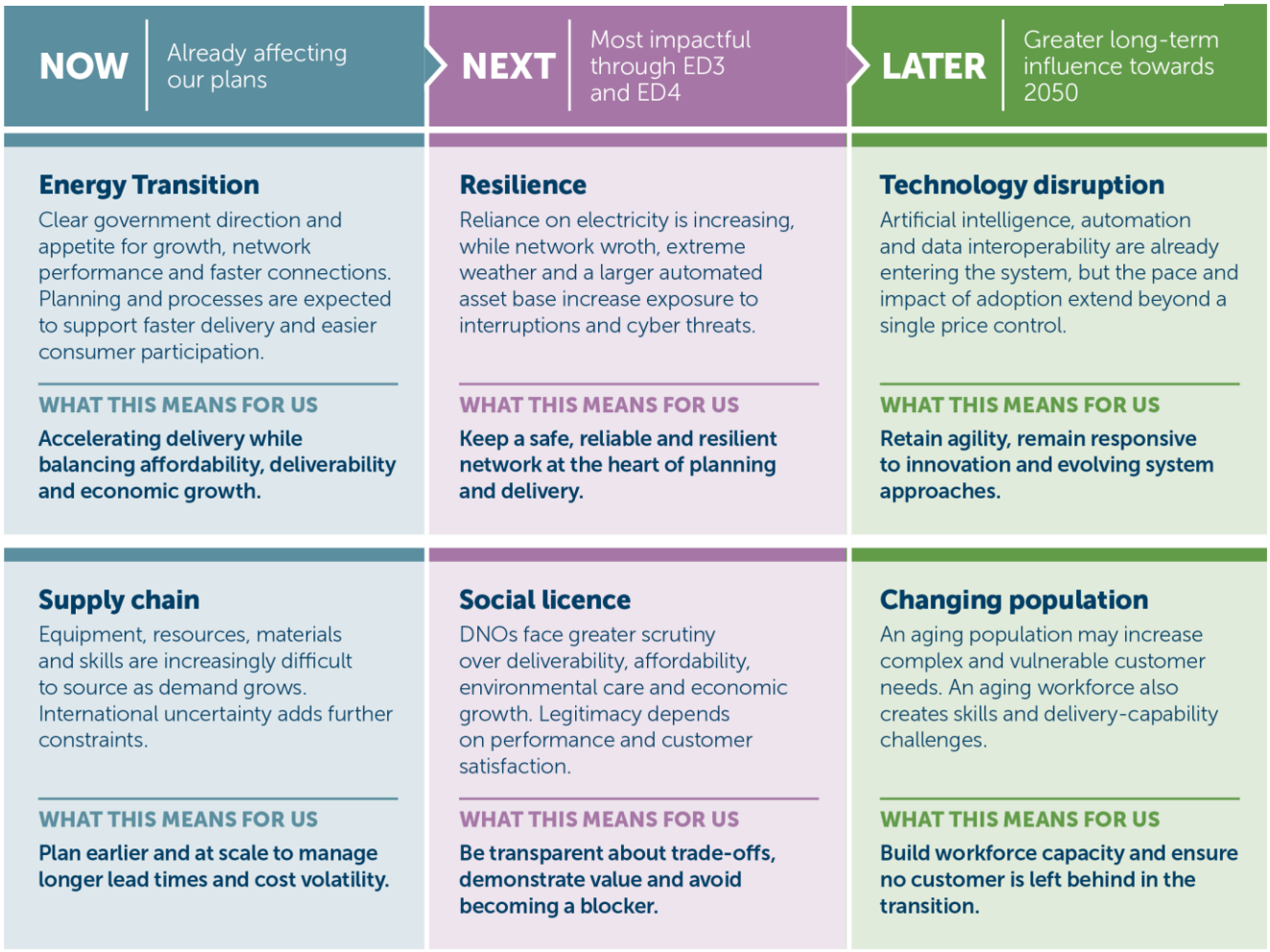
2. CONTEXT FOR DEVELOPMENT OF OUR VISION

The long-term outcomes established in **Figure 1-1** provide the framework for how we develop our network towards our 2050 Network Vision. They bring together what customers and stakeholders value, how the underlying drivers of network investment are expected to evolve, and how we respond where the timing, scale or location of future requirements remains uncertain. This section explains the context and stakeholder feedback that have informed our renewed 2050 Vision.

2.1 THE TRENDS AND MARKET FORCES SHAPING OUR NETWORK

We are planning ahead for a rapidly changing energy system. As part of renewing our 2050 Network Vision, we assessed 75 external factors across political, economic, social, technological, legal, environmental and ethical lenses, considering how they could influence our network, customers and operating environment development over the long term. We consolidated these factors into six interconnected trends and market forces shown in **Figure 2-1.** Together, they provide a structured view of the external change that our long-term network development pathway must anticipate and respond to.

Figure 2-1 - The trends and market forces shaping our network through ED3 and towards 2050



The overall direction of change is clear enough to act on now, although the pace of individual trends and the way they interact remain uncertain. The energy transition and supply-chain constraints are already shaping ED3. Growing resilience and social licence are expected to intensify through ED3 and ED4, and technology disruption and population change have longer-term effects that are less certain but potentially material.

Electrification, economic growth and faster connections could as much as triple electricity demand by 2050. In SEPD, data-centre demand could increase from 0.8 GW to 6.7 GW. We must be ready for this growth, which will not arrive evenly or predictably, and the future energy system could become more centralised or more distributed. Ageing assets, contested equipment and skills, and international uncertainty also mean that our ability to deliver at scale and pace will become as important as securing the investment itself.

Stakeholders also highlighted that uncertainty itself can create costs. Limited visibility can delay local investment and make it harder for suppliers to build workforce and manufacturing capacity. Providing earlier and more credible information on future network requirements can therefore help customers, local stakeholders and the supply chain make better-informed decisions.

Together, these trends and market forces have informed our outcome areas and will continue to shape our individual strategies and actions we take to meet our vision. Their timing and impact will vary, so our long-term planning must be capable of responding as the evidence develops.

2.2 STAKEHOLDER AND CUSTOMER PRIORITIES

Customer and stakeholder evidence directly shapes both the outcomes SSEN is working towards and how long-term investment choices are made. Stakeholders were clear that we should prepare the network for future demand while ensuring investment remains proportionate, evidence-led and affordable. They also prioritised a dependable and resilient service, clearer information, accessible participation, proactive asset stewardship and responsible environmental performance.

This need to balance long-term ambition with the impact of investment on customers runs across all five outcomes. Affordability is therefore embedded across our five long-term outcomes and the choices we make to deliver them. This means balancing the need to invest for longer term efficiency against the cost experienced now. An example of how this is approached for ED3 is in Outcome 1: where our *ED3 Load Related Expenditure Annex (ED3-S01)* includes a *Build and Flex Strategy* to ensure capacity is available to meet future growth, with capacity delivered through a combination of infrastructure build and flexible solutions.

These choices must reflect different needs across the network and between customer groups. Customer priorities are not uniform. Developers place greater emphasis on capacity being available ahead of growth, while customers experiencing repeated interruptions require targeted improvements in reliability. Local authorities and communities need clearer visibility of future network development to support local growth and decarbonisation plans, while customers in vulnerable circumstances or with significant dependence on electricity can experience greater consequences when network performance is poor.

Stakeholders also support proactive asset stewardship and stronger environmental improvement where these deliver credible long-term value without compromising safety, reliability or affordability. This includes support for refurbishment and reuse where assets can remain safely in service, alongside circular approaches and nature-based solutions where their effectiveness can be demonstrated. **Table 2-1** shows

how these stakeholder needs are translated into our strategic approach and contribute to the five LINP outcomes, with affordability and whole-life value considered throughout.

Taken together, this evidence influences both the outcomes we are planning for and the choices we make in getting there. It gives us a clear mandate to provide capacity ahead of growth where evidence supports it, target reliability and resilience investment where customer impacts are greatest and avoid unnecessary cost where future need remains uncertain. Affordability and the differing needs of customers, including those in vulnerable circumstances, are considered throughout these choices, alongside engineering, economic, climate and delivery evidence.

Table 2-1 How stakeholder priorities are reflected in our strategic approach

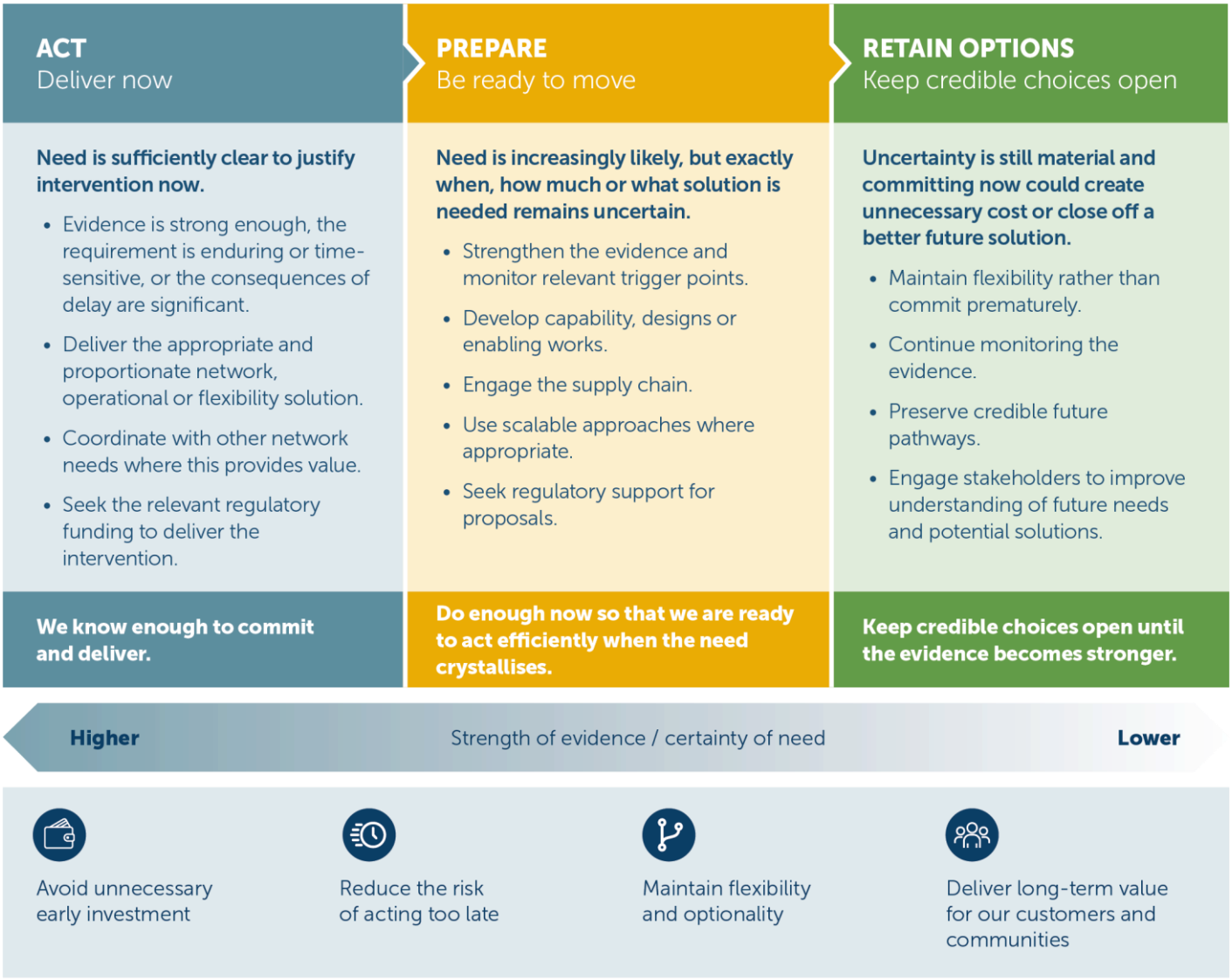
Stakeholder need	Our strategic approach	LINP outcome and evidence
Timely, affordable capacity for growth and electrification. 77% supported proactive local network upgrades, rising to 100% among housing developers.	Use place-based evidence and Act, Prepare or Retain Options alongside Build and Flex to provide capacity proportionately, make best use of the existing network and avoid premature investment.	**Capacity to meet future load growth** *ED3 Load Related Expenditure Annex (ED3-S01) / ED3 DSO Strategy (ED3-S10)*
A dependable and resilient supply, particularly where customer harm is greatest. 89% supported targeted investment for Worst Served Customers; 81% prioritised minimising disruption and helping communities prepare.	Target reliability and resilience investment according to risk, consequence and customer harm, prioritising interventions that deliver greatest benefit while maintaining affordability.	**Enhanced reliability and resilience** *ED3 Reliability Strategy (ED3-S04) / ED3 Network Asset Management Strategy (ED3-S12)*
Clear information and opportunities to participate in the energy transition. 85% wanted early visibility of local network upgrade programmes.	Improve network visibility, place-based planning and participation in flexibility and low-carbon technologies, helping customers make better use of available capacity.	**Enabling customer participation** *ED3 DSO Strategy (ED3-S10)*
Proactive asset stewardship that delivers long-term value. 68% supported high asset-health investment; proactive asset management scored 4.48/5.	Target renewal, refurbishment and life extension using asset health, criticality and risk, coordinating interventions to avoid repeat works and maximise whole-life value.	**Optimised asset management** *ED3 Network Asset Management Strategy (ED3-S12) / ED3 Load Related Expenditure Annex (ED3-S01)*
Lower environmental impact without compromising network performance or value. 87% supported circular asset management; 81% supported nature-based solutions where effectiveness can be demonstrated.	Embed whole-life environmental value through circular approaches and nature-based solutions where these provide credible and proportionate alternatives or complement to traditional interventions.	**Reduced environmental impact** *ED3 Environmental Action Plan (ED3-S14) / ED3 Network Asset Management Strategy (ED3-S12)*

These priorities inform the five long-term outcomes established in *Section 1.2*. Detailed evidence on individual priorities, areas of differing views and how engagement has influenced investment decisions is provided through our ***ED3 Stakeholder Engagement and Decision Log (ED3-O05)*** and the relevant ***ED3 Load Related Expenditure Annex (ED3-S01), ED3 DSO Strategy (ED3-S10), ED3 Network Asset Management Strategy (ED3-S12)***, ***ED3 Reliability Strategy (ED3-S04), ED3 Climate Resilience Strategy (ED3-S03)*** and ***ED3 Environmental Action Plan (ED3-S14).***

2.3 DEVELOPING OUR VISION AND PLAN

We have shaped our 2050 Network Vision around the needs of our customers and stakeholders and the emerging trends that will shape our network. Our Act, Prepare and Retain Options approach (Figure 2-2) provides a clear framework for deciding when and how we respond to emerging needs. The response reflects the strength of evidence, timing and consequences of delay, while recognising the value of retaining flexibility where uncertainty remains.

Figure 2-2 - Our Act, Prepare, Retain Options approach to managing certainty of need



Proportionate decisions at the right time, balancing affordability, readiness and long-term value.

Our approach enables us to make confident, proportionate decisions without waiting for uncertainty to disappear. We can act where the evidence is strong, prepare where a future requirement is increasingly likely, and retain credible options where uncertainty remains, protecting customers from both unnecessary early investment and the costs and risks of acting too late. As forecasts, asset condition, climate evidence, stakeholder needs, market capability and delivery conditions develop, a need can move from Retain Options to Prepare and then Act or be resized or deferred where the evidence changes.

The LINP brings these different considerations together into a single, integrated view of long-term network development, as set out in **Section 3.3**. Detailed analysis of the underlying forecasts, assumptions and evidence specific to the different investment drivers are provided through our ***Load Related Expenditure Strategy***, ***ED3 Network Asset Management Strategy (ED3-S12)***, ***ED3 Reliability Strategy (ED3-S04)***, ***ED3 Climate Resilience Strategy (ED3-S03)*** and ***ED3 Environmental Action Plan (ED3-S14).***

The direction of travel is clear even where the precise timing and location of need remain uncertain. Electricity demand could reach two to three times today's level by 2050, while our ED3 plans aim to increase

the capacity of connections accelerated through early-access products from 1.8 GW in ED2 to 5 GW in ED3. This growing demand will not emerge uniformly, reinforcing the need to combine forward investment with flexibility and retain options where future requirements remain less certain.

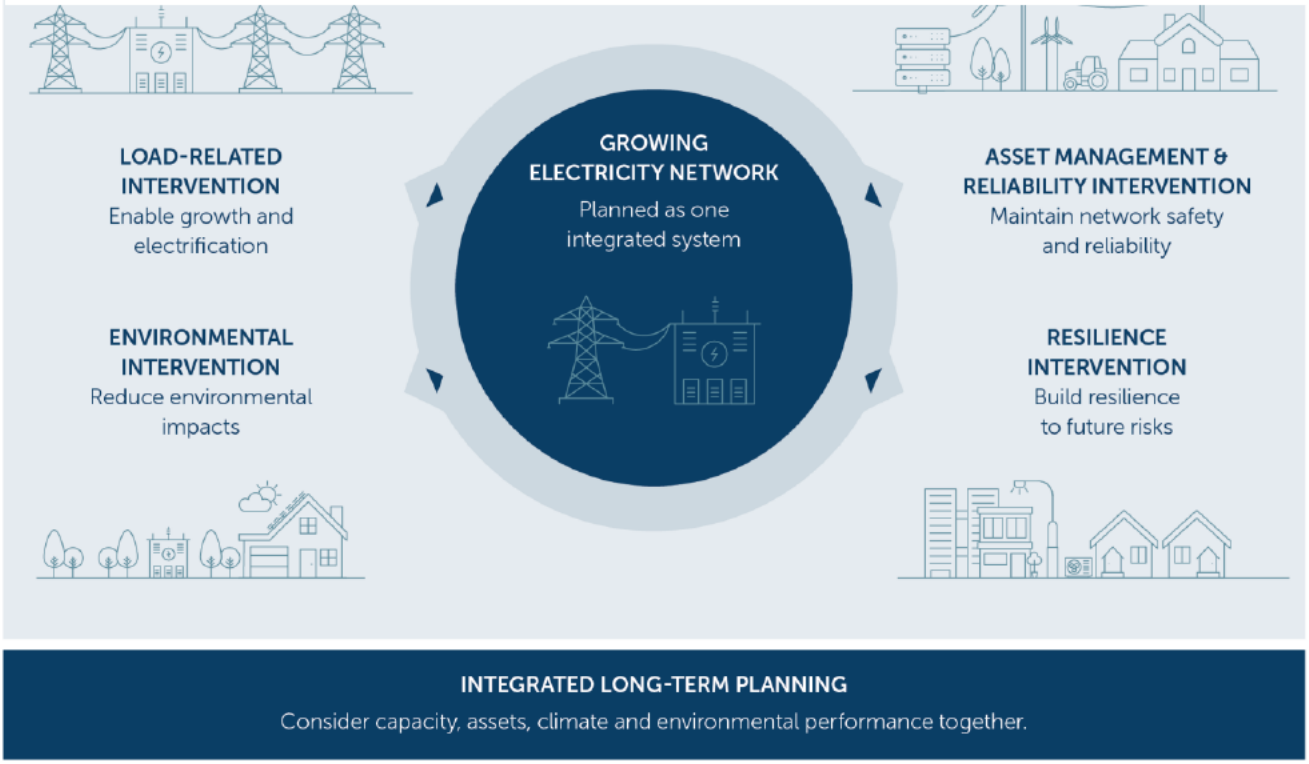
3. NETWORK INTERVENTION OVERVIEW

3.1 OVERVIEW

The long-term network needs described in **Section 2** require a material programme of development across the four investment drivers shown in **Figure 3-1**. This section sets out the key challenges for ED3 and beyond, showing how near-term investment establishes the foundations for the network required by 2050.

What this means in practice will vary across our two licence areas. Demand growth, network topology, asset condition, customer dependency, climate exposure, environmental risk and local priorities create different combinations of need. We will respond to these differences through an evidence-led, place-based approach: acting where need is clear, preparing where change is increasingly likely and retaining credible options where uncertainty remains.

Figure 3-1 - Four interacting drivers shaping long-term network development



Sections 4 - 6 set out the principal interventions proposed during ED3. Detailed needs cases, investment justification, optioneering and supporting evidence are provided through the relevant strategies and annexes: ***ED3 Load Related Expenditure Annex (ED3-S01), ED3 Network Asset Management Strategy (ED3-S12), ED3 Climate Resilience Strategy (ED3-S03), ED3 Environmental Action Plan (ED3-S14)*** and associated regulatory submissions.

3.2 CHALLENGES IN ED3 AND BEYOND.

The long-term network needs described in **Section 2** create three connected challenges for ED3 and beyond: scaling and sequencing a larger programme of network development; targeting intervention where it delivers greatest customer and network value; and maintaining readiness where future requirements are credible but remain uncertain.

Scaling and sequencing network development

ED3 marks a significant acceleration in our response to the trends identified in **Section 2**. The scale of change is already reflected in our ED3 plans:

- **ED3 Network Asset Management Strategy (ED3-S12):** asset replacement investment is forecast to increase by around 61% compared with ED2 as more assets reach intervention thresholds.
- **ED3 Climate Resilience Strategy (ED3-S03)**: £86.04m of ED3 investment proposed reflects the growing requirement for targeted adaptation and preparedness.
- **ED3 DSO Strategy (ED3-S10):** aims to increase the capacity of connections accelerated through early-access products and flexibility from 1.8 GW in ED2 to 5 GW in ED3.

The same emerging trends affect delivery across our strategies. To meet our 2050 Vision, the LINP therefore brings investment drivers together into a coordinated and deliverable portfolio, using programmatic delivery, standardised approaches and earlier visibility of future requirements to build delivery capacity and manage dependencies. Where needs coincide across the same assets or locations, we will coordinate interventions where this provides proportionate whole-life value, reducing repeated works, outages and disruption without introducing unnecessary cost, delay or complexity.

Targeting intervention where it provides greatest value

Network requirements and customer impacts are not distributed evenly across our licence areas. Demand growth is concentrated in particular locations; asset condition and criticality vary across the network; some customers experience lower levels of reliability; and exposure to climate and environmental risks differs by asset type and place. For example, our ED3 Worst Served Customer programme will target improved reliability for more than 13,000 customers currently experiencing some of the poorest network performance, demonstrating how intervention can be directed towards where customer impact is greatest.

The key areas of network development are: reinforcement and flexibility across voltage levels, including a multi-price-control programme of low-voltage upgrades; replacement, refurbishment, repair and life extension for assets reaching intervention thresholds; targeted reliability improvements for more than 13,000 Worst Served Customers; action on priority flood, storm and heat vulnerabilities; and environmental programmes addressing SF_6, fluid-filled cables, pollution prevention, biodiversity and operational emissions.

This evidence-led approach allows investment to be focused where action is justified while avoiding blanket intervention or premature replacement.

Maintaining readiness where future requirements remain uncertain

Not every credible future requirement is sufficiently certain to justify full intervention during ED3, but that does not mean waiting. We will therefore use proportionate monitoring, design, consenting, supply-chain engagement and scalable solutions to reduce future lead times and preserve credible options. The Act, Prepare and Retain option approach applies consistency across all investment drivers and protects customers from both premature investment and the cost risk of acting too late.

The key tools to maintain this optionality in load related investment is Flexibility Services, and for Connections, Access Products.

3.3 INVESTMENT DRIVERS AND OUR 2050 OUTCOMES

We are evolving how we plan, deliver and operate the network to meet these challenges and deliver our 2050 Network Vision. Stakeholder priorities, emerging trends and changing network requirements directly shape our ED3 investment plan and longer-term pathway.

This section first summarises the investment drivers and how we anticipate them evolving from ED2, through ED3 and beyond. As the four investment drivers interact more closely, network development cannot be considered through individual requirements in isolation. Load growth, asset condition, reliability, climate exposure and environmental impacts may affect the same assets and locations at different points in time. Therefore, when developing the plans of these investment drivers we have focused on our 2050 Network Vision and outcomes to ensure these interdependencies are fully considered. The progress we expect in each outcome area is also summarised.

3.3.1 INVESTMENT DRIVERS

ED3 is a transition point. We will strengthen integrated planning, scalable delivery and network intelligence, creating the foundations for more predictive, coordinated and data-enabled ways of working. These capabilities will mature at different rates as network needs, technology and markets evolve.

Figure 3-2 - How our approach must evolve through ED3 and beyondillustrates that ED3 represents a transition point rather than an end state. Some requirements are already sufficiently clear to require action during ED3; others require us to build operating maturity and prepare for needs expected through subsequent price controls; and some remain sufficiently uncertain that retaining optionality is more valuable than committing prematurely.

Figure 3-2 - How our approach must evolve through ED3 and beyond

Investment driver	ED2 Building the foundations	ED3 Accelerating and adapting	ED4 / ED5 Scaling and evolving	Towards 2050 Long-term outcome
Load	Improve forecasting and network visibility; develop flexibility markets; trial more proactive approaches to LV planning and LCT enablement	Accelerate capacity delivery for electrification and growth; embed **Build and Flex** into planning; increase proactive and place-based planning; begin programmatic LV readiness	Scale strategic and anticipatory network development as electrification increases; increasingly coordinate capacity with local and regional energy needs	**Capacity available when and where customers need it**, supporting a highly electrified economy without the network becoming a barrier to growth or decarbonisation and **enabling customer participation**
Asset condition & reliability	Strengthen risk-based asset management; improve asset condition information; target poorer reliability outcomes	Increase renewal and refurbishment as the asset base ages; improve condition monitoring and predictive capability; coordinate asset and load interventions where this creates value	Move increasingly towards predictive and integrated asset management; use improved evidence to optimise intervention timing and future-proof assets	**A safe, reliable and adaptable asset base**, proactively managed for whole-life value and capable of supporting future network requirements
Climate resilience	Improve understanding of climate hazards and network vulnerabilities; strengthen storm and flood resilience	Embed climate risk more systematically into planning and investment; target priority vulnerabilities; improve climate and asset-risk evidence	Adapt assets, standards and investment pathways as climate evidence develops; increasingly consider climate exposure over asset lifetimes	**A network adapted to future climate conditions**, able to anticipate, withstand, respond to and recover from changing hazards
Environmental performance	Strengthen environmental management; reduce emissions and pollution risks; develop nature and resource-efficiency approaches	Integrate environmental considerations more consistently into network development; accelerate SF_6 transition, pollution prevention, nature recovery and resource efficiency	Scale proven interventions; increasingly embed whole-life carbon, circularity, nature and environmental value into investment decisions	**A progressively decarbonised, circular and environmentally sustainable network**, delivering positive outcomes for nature and communities
Cross-cutting enablers	**Innovation • Data & digital • Place-based planning • Stakeholder & customer insight • Workforce & skills • Supply chain & deliverability • Integrated optioneering & decision-making**			

3.3.2 CAPACITY TO MEET FUTURE LOAD GROWTH.

Electrification, economic growth, new connections and Strategic Energy Needs (SENs) will increase and reshape demand. Our licence-area load projections use NESO's transitional Regional Energy Strategic Plan (tRESP) Holistic Transition pathway as the primary planning baseline, tested against alternative pathways and sensitivities, including the sector-wide common sensitivity for slower heat pump uptake. Growth in homes and small businesses will be felt most widely on our low-voltage networks, where electric vehicles, heat pumps and rooftop solar connect, while large new loads such as data centres create concentrated requirements at higher voltages.

While the overall direction is clear, the timing and location of individual requirements remain uncertain. We will combine reinforcement with flexibility, make better use of existing capacity and proactively develop local networks to provide capacity for credible growth, while retaining flexibility where future need is less certain.

Table 3-1 – Load and capacity - Building capacity for future growth through ED3 and towards 2050

ED3 (2028–2033)	ED4 (2033–2038)	Towards 2050
Step change in reinforcement to enable growth in electrical demand Start of a multi-price-control programme of low-voltage upgrades	Placed-based approach for LV investment continuing at pace. Continued growth as heat and transport electrification broadens and local energy plans mature	Demand two to three times today's level. With placed-based reinforcement for all voltage levels Instant LCT connections for all homes.

3.3.3 ENABLING CUSTOMER PARTICIPATION.

Future network requirements will not develop uniformly across our licence areas. Place-based planning will ensure network development reflects how needs emerge locally. It brings together regional stakeholder priorities, local growth and decarbonisation plans, network requirements and wider infrastructure dependencies, while giving customers and stakeholders clearer visibility of how the network will develop in their area. It provides both stronger evidence for our decisions and a clearer basis for local engagement.

We will expand Flexibility Services and Access Products to release capacity, enhance reliability and manage affordability, while making participation more accessible to a wider range of customers.

As transport, heat and communications become increasingly reliant on electricity, the consequences of outages will become more significant. We will strengthen how we build resilience and support customers in vulnerable circumstances, using innovation and new partnerships to respond to changing dependencies.

Improved Data and Digital capability will support this approach through better articulation of flexibility service need and forecasting of faults. Initiatives including Local Energy Acceleration Plan + (LEAP+) and Near-Real Data Access (NeRDA) are improving how network information is shared and used, helping local authorities, developers, communities and other stakeholders translate network evidence into practical decisions.

Table 3-2 – Load and Capacity - enabling greater customer participation through ED3 towards 2050

ED3 (2028–2033)	ED4 (2033–2038)	Towards 2050
Step change in flexibility use through build and flex. 13,000 worst served customers have reduced interruptions and battery pack roll-out to most vulnerable continues.	Fully coordinated flexibility approach between DSOs and NESO. Community schemes and local generation can support some communities in prolonged faults to reduce interruption.	Demand is two to three times today's level. The shape and peak of demand is very different due to automated behaviour. There are harmonious price signals to customers, allowing the network to be fully utilised.

3.3.4 ENHANCED RELIABILITY AND RESILIENCE

We will adapt our network as the climate conditions in which it operates continue to change. In the South, our network will face higher summer temperatures and increasing cooling demand; in the North, warmer winters are expected to increase vegetation growth; and across both licence areas, storms and flooding will require evolving approaches to resilience. Decisions made today must therefore account for both current exposure and the conditions assets may experience throughout their operating lives. Improved evidence during ED3 will determine where and when further adaptation is required.

Table 3-3 – Climate resilience - Strengthening reliability and resilience through ED3 and towards 2050

ED3 (2028–2033)	ED4 (2033–2038)	Towards 2050
Targeted action on priority flood, storm and heat vulnerabilities; better evidence through monitoring	Increasing exposure; climate risk routinely reflected in asset specification and design	Assets installed today operating in a materially different climate

3.3.5 OPTIMISED ASSET MANAGEMENT

We have successfully managed our asset base through targeted life extension and replacement, and ED3 will build on this approach as the network ages and becomes more highly utilised. We will increase investment where evidence shows intervention is required, while continuing to maximise the safe and economic life of existing assets.

Without intervention, monetised risk on our Network Asset Risk Management (NARM) assets would rise by around a third over ED3. We will combine targeted investment with monitoring, digitalisation and modelling to make better-informed decisions on replacement, repair and life extension.

The need for renewal will continue beyond ED3 and extend across civil works, operational IT and telecommunications. We will combine sustained asset stewardship with place-based planning so that, where load, connections and asset needs coincide, opportunities for coordinated intervention are actively considered. This will support a safer, more efficient and increasingly optimised asset base over the long term.

Table 3-4 – Asset condition and reliability - Optimising our asset base through ED3 and towards 2050

ED3 (2028–2033)	ED4 (2033–2038)	Towards 2050
Rising renewal need; NARM risk would rise by around a third without intervention	Increasing need expected across NARM and non-NARM assets, civils and operational IT and telecoms	Sustained stewardship of a larger, more highly utilised asset base on which customers depend more

3.3.6 REDUCED ENVIRONMENTAL IMPACT

As we grow and renew the network, we will embed environmental performance into how infrastructure is designed, built, operated and ultimately replaced. Our long-term direction is clear: develop the network needed for the future while reducing the environmental impact of existing infrastructure and leaving the places in which we invest better off.

Network growth will increase activity and can increase absolute emissions, but we will use that investment to create opportunities to reduce environmental impact. Reinforcement provides opportunities to replace fluid-filled cables with alternatives that remove leakage risk, while we continue to develop and deploy solutions that provide the benefits of gas-insulated switchgear without SF_6.

We will work with communities and local partners to ensure network development supports stronger environmental performance and leaves a positive legacy for nature.

Table 3-5 – Environmental performance - Delivering better environmental outcomes through ED3 and towards 2050

ED3 (2028–2033)		ED4 (2033–2038)		Towards 2050
SF_6 transition, fluid-filled cable removal, pollution prevention, biodiversity net gain and lower operational emissions	►	Wider focus on embodied carbon, circularity and nature recovery	►	Local environment better after network investment than before Build programmes are carbon neutral as a minimum.

3.4 ED3 INTERVENTION, EXPENDITURE AND LONGER-TERM PATHWAY

ED3 is not simply a larger version of ED2. Across the four investment drivers, the scale, mix and maturity of intervention are changing in different ways, progressing us towards our 2050 Outcomes and Vision. The foundations developed through ED2 support this transition, including improved forecasting and place-based planning, greater network visibility and use of flexibility, stronger asset intelligence and condition assessment, and improved understanding of climate and environmental risks. ED3 turns these foundations into more targeted physical intervention, while strengthening the evidence and optionality needed for requirements that will emerge through subsequent price controls.

Table 3-6 provides the headline expenditure view across the principal intervention categories, comparing RIIO-ED2 and ED3 and, where sufficiently robust, providing an indicative view of ED4.

Table 3-6 – Network intervention expenditure - ED2, ED3 and indicative ED4

Area	ED2 Forecast (£m)	ED3 Forecast (£m)	ED4 Indicative (£m)	Reason for change
Load-related investment	1,132.19	2,642.12	4,419.27	A step change in network development to create capacity for electrification, new connections, economic growth and Strategic Energy Needs, building on stronger forecasting, place-based planning and flexibility developed through ED2.
Asset replacement	924.06	1,528.62	1,616.00	Increased targeted renewal as a larger asset population reaches evidenced intervention thresholds, supported by stronger asset intelligence and condition assessment to ensure predictive and proactive intervention is made.
Climate resilience	0	86.04	120.73	A shift towards a broader and more proactive resilience programme, moving from establishing climate-risk and vulnerability evidence towards physical adaptation, monitoring and preparedness.
Environmental programmes	196.9	158.56	189.33	Building on established ED2 activity to deliver measurable reductions in emissions and pollution risk and stronger outcomes for nature and the environment as we develop the network. *Note*: Flood resilience has moved from the EAP and is sitting within the CRS for ED3
Total	**2,253.15**	**4,415.34**	**6,345.33**	

Note: ED2 price base – 2020/21; ED3 and ED4 price base – 2025/26

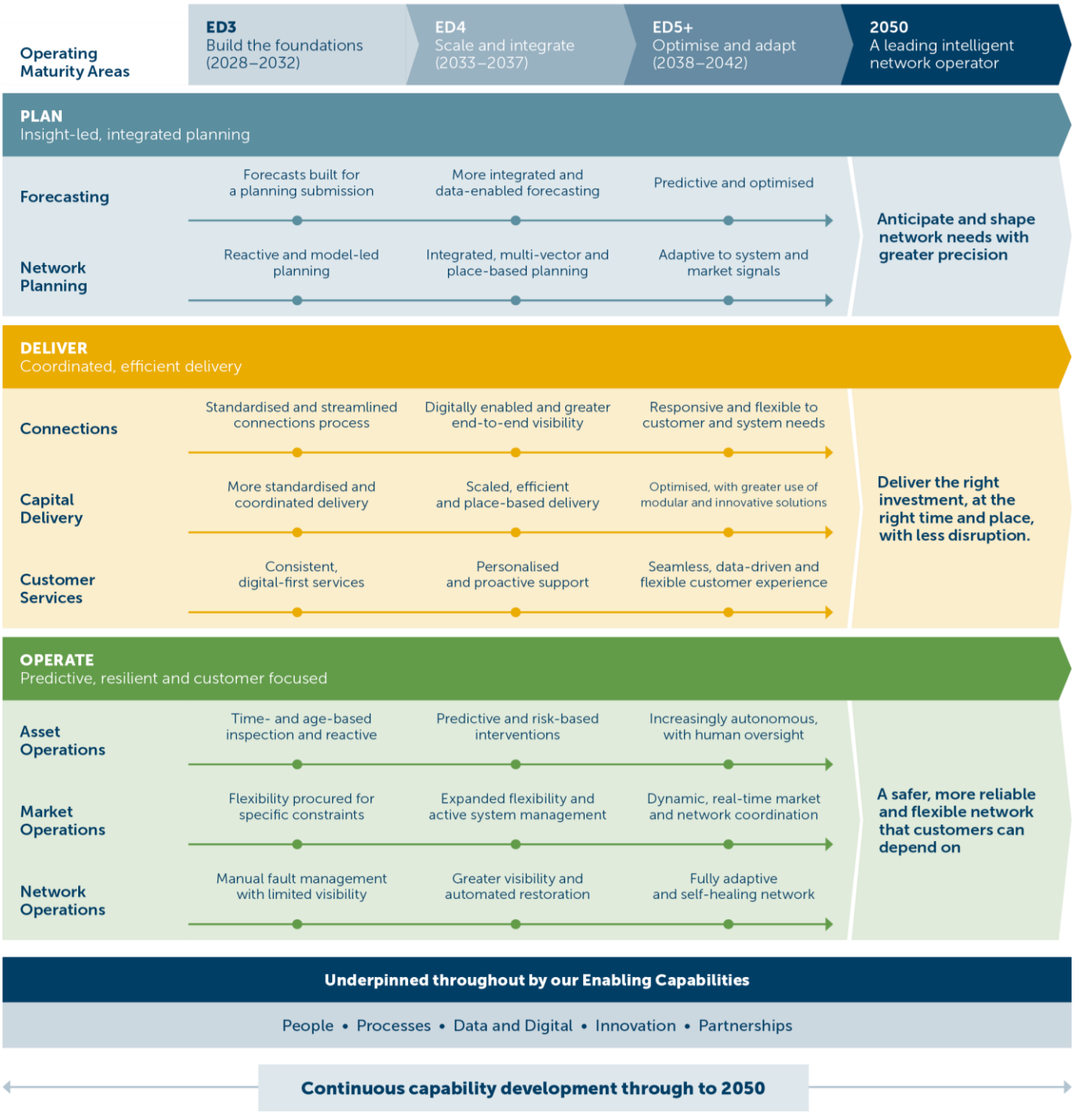
The movement from ED2 to ED3 reflects different stages of development across the investment drivers. Load-related investment is scaling as electrification, connections, economic growth and Strategic Energy Needs increase requirements for capacity, building on ED2 improvements in forecasting, place-based planning and flexibility. Asset investment increases as a larger population reaches evidenced intervention thresholds, with improved asset data and condition assessment supporting more targeted renewal. Climate resilience moves from establishing risk and vulnerability evidence and targeted adaptation towards a broader, more proactive programme of physical resilience, monitoring and preparedness. Environmental investment builds on established ED2 activity while targeting measurable reductions in emissions and pollution risk and increased delivery of nature and environmental improvements.

These changes should not be interpreted from expenditure alone. Differences between ED2 and ED3 may reflect changes in physical volumes, programme scope, intervention type, input prices or unit costs, as well as changes in how expenditure is classified. For example, climate-resilience expenditure is presented separately in ED3, whereas relevant ED2 costs were reported within the ***ED3 Environmental Action Plan (ED3-S14)***.

Longer-term pathway

Delivering this longer-term investment pathway also requires our operating capabilities to evolve. ED3 is a critical stage in delivering our 2050 Network Vision. It delivers the interventions required now while building the capabilities needed to scale, integrate and adapt network development through ED4, ED5 and later price controls. Underpinned by the enabling capabilities set out in **Section 1.3, Figure 3-3** brings together this longer-term pathway across eight Operating Maturity Areas: Forecasting, Network Planning, Connections, Capital Delivery, Customer Services, Asset Operations, Market Operations and Network Operations.

Figure 3-3 - Our long-term operating approach maturity



ED3 will strengthen the forecasting, network visibility, asset intelligence, climate-risk evidence, place-based planning and innovation needed to identify future requirements earlier and assess them collectively. Alongside this, stronger workforce and supply-chain partnerships will improve our readiness to deliver credible future requirements when they materialise.

The pathway will be refreshed through successive planning cycles as demand, asset condition, network performance, climate evidence, technology, customer needs and delivery conditions evolve. Strategic Development Plans and the area-based view in **Section 9** will progressively translate this evidence into a clearer understanding of where needs converge geographically and where coordinated development may provide greater value.

The Act, Prepare and Retain Options approach established in **Section 2** provides the framework for responding as this evidence develops. The purpose of **Figure 3-3** is to show how ED3 intervention, capability development and retained flexibility combine to support an adaptable pathway towards our long-term outcomes, rather than fixing future investment decisions prematurely.

Sections 4 - 6 set out the principal interventions proposed during ED3. ***Section 7*** then explains how optioneering and trade-offs balance immediate need, affordability, deliverability and long-term customer value.

4. LOAD-RELATED INTERVENTIONS



ED3 focus and longer-term value:

Create the capacity customers need, when they need it

During ED3, we will target reinforcement, flexibility and operational solutions where evidence supports action, while preserving flexibility where future requirements remain uncertain. This provides the capacity needed now while maintaining an efficient pathway to accommodate further demand as its location, scale and timing become clearer.

4.1 ED3 FOCUS AND SUPPORTING EVIDENCE

Building on the planning, forecasting, flexibility and network-visibility capabilities developed through ED2, ED3 marks a shift towards a more proactive approach to providing capacity as demand grows. This establishes the capacity and capabilities needed to scale and integrate network development through ED4 and ED5, while retaining the flexibility to adapt as the scale, timing and location of demand become clearer towards 2050. The consolidated pathway beyond ED3 is set out in **Section 3.4**

4.2 OUR ED3 LOAD INTERVENTIONS PLAN: FUNDING AND VOLUMES

ED3 represents a material increase in the scale and complexity of our load-related programme as electrification, new connections and economic development increase requirements for network capacity. Across our primary and secondary networks, the programme combines targeted reinforcement with greater use of flexibility and a transition at lower voltages towards planned, programmatic reinforcement, creating capacity for increasing demand while making better use of the existing network.

Our funding approach reflects the certainty of need. Baseline investment targets requirements where the need and efficient scope are sufficiently evidenced, while flexibility, agile funding and uncertainty mechanisms allow us to respond where future requirements are credible, but their timing or scale remains uncertain. **Table 4-1** summarises the resulting ED3 programme, funding and volumes.

Table 4-1 – ED3 Load expenditure and volumes

[redacted]

Baseline figures represent interventions included within the opening ED3 plan. Uncertainty-mechanism figures represent additional potential expenditure and intervention volumes should the relevant need and funding triggers materialise during ED3. Subcategories shown beneath Secondary Reinforcement provide additional visibility of material intervention types and are not additional to the parent-category totals. Volumes are presented in the most appropriate unit for each intervention and should therefore not be aggregated across categories.

Our approach to the Scottish Islands is considered separately, reflecting the particular whole-system requirements of island networks and the need to develop solutions over time as future needs become clearer. For ED3, this includes targeted development and enabling activity to mature future interventions and support subsequent investment decisions. Further detail on the proposed pathway, including the approach to resilience, future capacity and investment, is set out in our dedicated *Islands Strategy*.

The following graph and maps provide further detail on the scale and geographic distribution of our ED3 load-related programme. Figure 4-1 - Composition of ED3 Load-Related Expenditure (£m) illustrates the composition of forecast expenditure, while Figure 4-2 and Figure 4-4 show the geographic distribution of projects across our two licence areas.

Figure 4-1 - Composition of ED3 Load-Related Expenditure (£m)

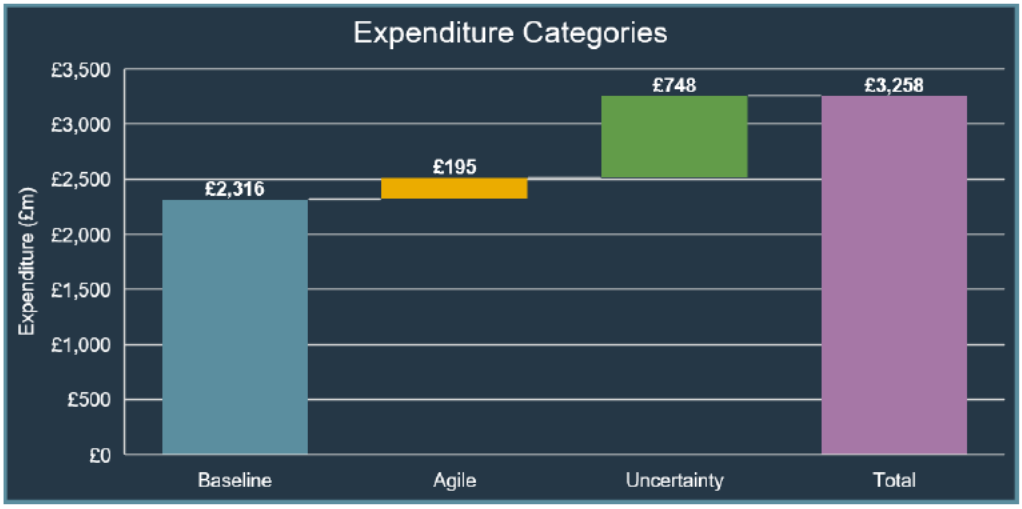


Figure 4-2- Geographic distribution of ED3 load-related projects - SHEPD

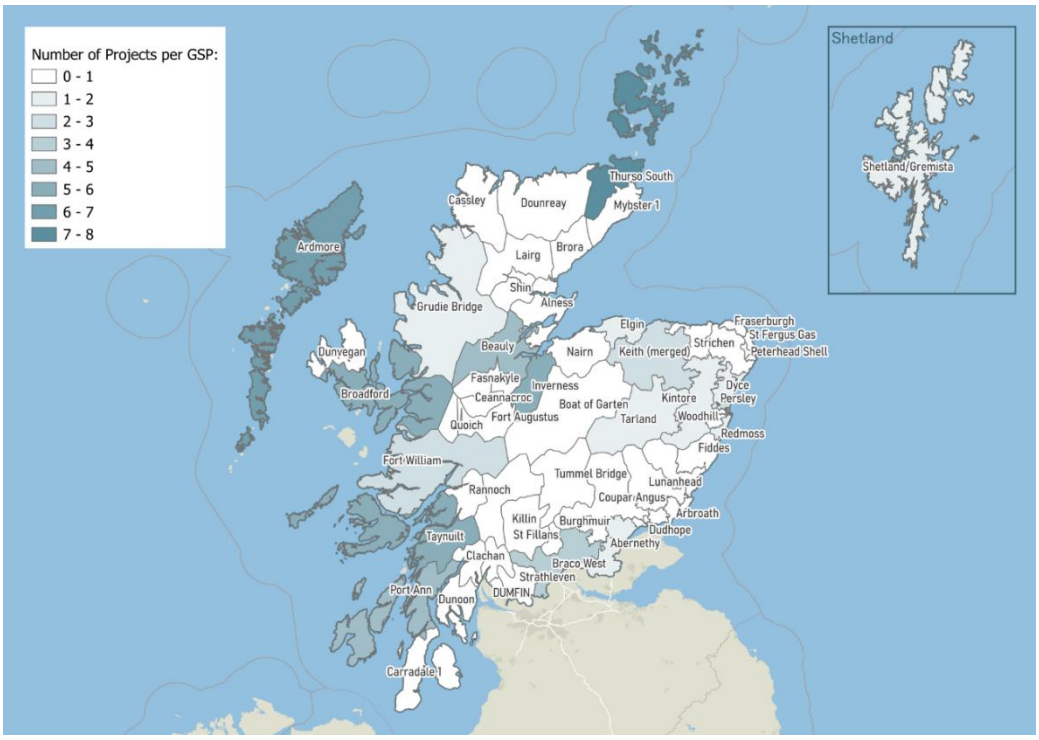
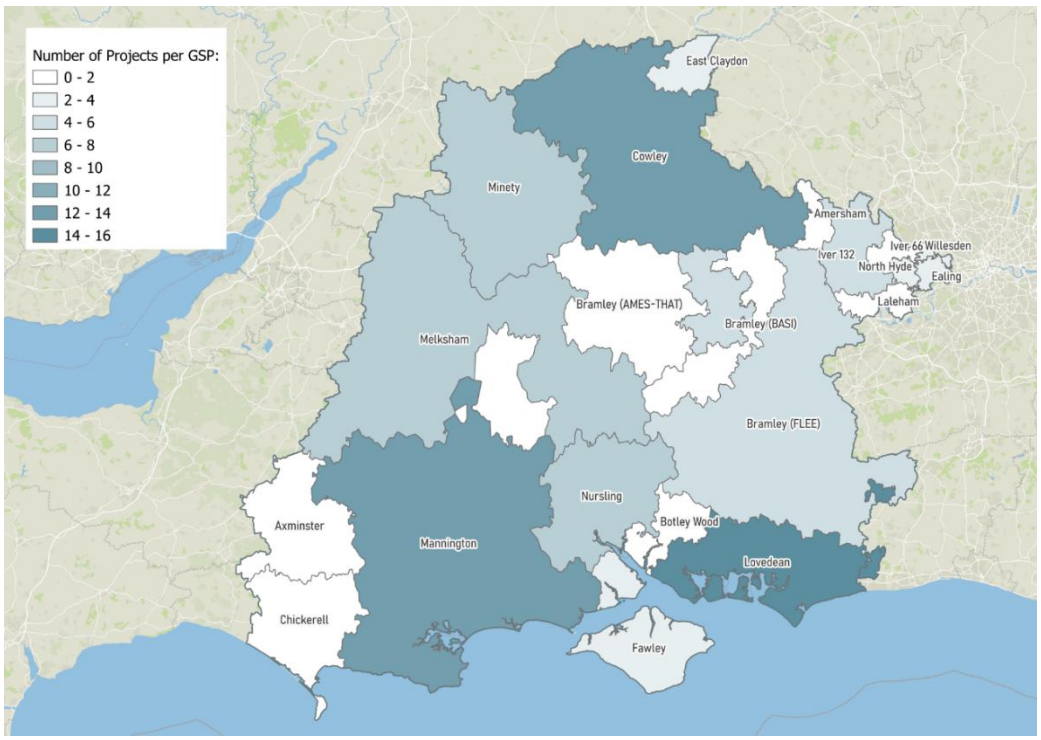


Figure 4-3 - Geographic distribution of ED3 load-related projects - SEPD



4.3 CAPACITY AND LOW-CARBON TECHNOLOGY ACCOMMODATION ENABLED

The principal outcome of our ED3 load-related programme is the additional network capacity required to support new connections, housing and economic growth, industrial electrification and increasing adoption of low-carbon technologies. By targeting reinforcement where requirements are sufficiently evidenced, while retaining flexibility where needs are less certain, we will make capacity available when customers need it without committing consumers prematurely to investment that may not be required.

The capacity enabled through ED3 will support electrified heat and transport, new demand and economic activity, helping ensure that network capacity does not become an unnecessary barrier to customers connecting or decarbonising. **Table 4-2** summarises the capacity and low-carbon technology accommodation enabled through the ED3 baseline plan and potentially through uncertainty mechanisms, with detailed methodologies, assumptions and project-level evidence provided in the Load Related Expenditure Strategy and supporting BPDTs.

Table 4-2 – ED3 Capacity and low-carbon technology enablement outputs (SEPD and SHEPD) combined

Output	Unit	ED3 Baseline plan	Potential total: baseline + uncertainty mechanisms
Total additional network capacity released			
Primary network capacity released (CV1)	MVA	5,190	6,589
Secondary network capacity released (CV2)	MVA	400	419
Low-carbon technologies accommodated			
Heat Pumps enabled	No.	336,685	748,189
Electric Vehicles enabled	No.	2,311,603	
Rooftop Solar installations enabled	No.	51,500	
Other LCTs	No.	2,275	

4.4 INTERVENTION OPTIONEERING AND BUILD AND FLEX APPROACH

Our approach to load planning and optioneering has developed significantly. We were the first DNO to publish Strategic Development Plans (SDPs), establishing an industry-leading place-based planning capability that gives us greater confidence in where, when and why network capacity may be required. The associated Distribution Network Options Assessments (DNOA) translate these strategic plans into transparent, evidence-led decisions on the appropriate timing and form of intervention. For ED3, tRESP Holistic Transition provides an important strategic planning input alongside connections, stakeholder evidence and network analysis, helping us identify potential network requirements and understand the timing and certainty of need.

Flexibility is now an established part of our network planning toolkit alongside conventional reinforcement. During ED2 we embedded a flexibility-first approach through our DNOA optioneering processes, developing the capability to identify flexibility opportunities, engage the market and deploy solutions where they provide an economic alternative to reinforcement. Our ED3 Build and Flex approach builds on this foundation, considering how flexibility can continue to support efficiency, manage uncertainty, and enable overall deliverability of our investment portfolio by creating greater choice in how network needs are met.

During ED3 we will further scale the role of flexibility in managing uncertainty and optimising deliverability of our overall investment plan. We commit to enabling 13.4 GW of flexibility across ED3, encompassing both operational and planning flexibility and representing more than a six-fold increase from ED2. We are targeting a 95% fill rate for tendered flexibility requirements and aim to increase the capacity of connections accelerated through our early-access products from 1.8 GW in ED2 to 5 GW in ED3. We will pursue flexibility ambitiously, while remaining committed to delivering capacity at the right time and in the right place.

Together, tRESP, DNOA and Build and Flex provide a joined-up route from identifying future network need through to selecting and timing the appropriate intervention. This enables us to maximise existing capacity, progress reinforcement where it is justified and retain flexibility where future requirements remain uncertain, ensuring capacity can be provided when customers need it without committing prematurely to network build. As we make greater use of existing network capacity, asset condition, utilisation and performance will remain important considerations in determining where flexibility can efficiently defer reinforcement and optimise deliverability where physical intervention is required.

Detailed methodologies, sensitivities and project-level appraisal are provided in the ***ED3 Load Related Expenditure Annex (ED3-S01)*** and the ***ED3 DSO Strategy (ED3-S10)***. The wider cross-driver trade-offs and governance applied to investment decisions are addressed in **Section 7**.

4.5 LICENCE-AREA OUTPUTS BY VOLTAGE LEVEL

The scale and mix of ED3 intervention differ between SEPD and SHEPD, reflecting their respective demand projections, existing network configurations, identified constraints and the timing and location of emerging network requirements. **Table 4-3** summarises the principal physical outputs and capacity delivered through the ED3 baseline programme by licence area and voltage level.

Table 4-3 – Baseline load intervention outputs

Output	SHEPD	SEPD	Total	BPDT
EHV and 132kV Transformers (Each)	114	67	181	CV1 / CV3
EHV and 132kV Overhead Line (km)	786	310	1,096	CV1 / CV3
EHV and 132kV Underground Cable (km)	246	401	647	CV1 / CV3
EHV and 132kV Subsea Cable (km)	92	0	92	CV1 / CV3
EHV and 132kV Circuit Breakers (Each)	274	425	699	CV1 / CV3
HV Transformers (Each)	2,372	1,393	3,765	CV2
HV Overhead Line (km)	190	14	204	CV1 / CV3 / CV2
HV Underground Cable (km)	94	123	217	CV1 / CV3 / CV2
HV Circuit Breakers (Each)	199	150	349	CV1 / CV3 / CV2
LV Overhead Line (km)	1	14	16	CV2
LV Underground Cable (km)	20	321	342	CV2
LV Service Upgrades	5,712	14,029	19,741	CV2
Flexibility Proposed (MVA)	5,894	7,630	13,524	CV1
Flexibility Proposed (MVA)	30	150	180	CV2
Flexibility Proposed (Number of sites)	40	60	100	CV1
Flexibility Proposed (Number of sites)	224	779	1003	CV2

Note: Figures show outputs associated with baseline load interventions only. Equipment volumes are presented using the most appropriate unit for each intervention type and should not be aggregated across categories. Capacity released represents the additional network capacity attributable to the relevant interventions. Flexibility capacity and sites represent flexibility associated with baseline load interventions. Figures may not sum due to the treatment of interventions that span multiple voltage levels.

5. ASSET MANAGEMENT INTERVENTIONS



ED3 focus and longer-term value:

Intervene on the right assets, at the right time.

During ED3, we will target asset risk through replacement, refurbishment, life extension and condition-led intervention, retaining serviceable assets where this remains safe, reliable and provides better whole-life value. This maintains a strong asset base for the longer term while avoiding unnecessary replacement today.

5.1 ED3 FOCUS AND SUPPORTING EVIDENCE

Our ED3 asset management programme will proactively manage the safety, integrity and performance of our network, targeting intervention where evidence shows it is needed while maximising the value and useful life of serviceable assets. We will combine replacement, refurbishment, repair, life extension, inspection, monitoring and improved asset data and modelling to deliver the right intervention at the right time. This establishes a stronger asset base and the asset intelligence needed to manage increasing renewal requirements through ED4 and ED5, while retaining the flexibility to optimise future interventions as asset condition, performance and wider network needs evolve towards 2050.

The ***ED3 Network Asset Management Strategy (ED3-S12)*** provides the detailed asset policies, evidence, investment justification and delivery commitments supporting this programme. The ***ED3 Reliability Strategy (ED3-S04)*** sets out targeted measures where network performance causes disproportionate customer impacts, while the ***ED3 Climate Resilience Strategy (ED3-S03)*** provides the evidence and investment pathway for climate-driven interventions. This section summarises the asset-management interventions relevant to the LINP, with detailed evidence provided through these supporting strategies, BPDTs and associated investment justification.

5.2 OUR ED3 ASSET MANAGEMENT PLAN: INTERVENTIONS AND EXPENDITURE

Our ED3 programme combines replacement, refurbishment, life extension, repair, inspection and monitoring, selecting the treatment that provides the best whole-life response to evidenced asset need. Replacement is not our default treatment; serviceable assets will be retained where maintenance, repair, refurbishment or monitoring provides better whole-life value.

Improved asset intelligence will enable us to intervene earlier and more precisely. Better asset information, condition monitoring, predictive maintenance and investment optimisation will strengthen how we identify risk and decide where and when to intervene. The ***ED3 Data and Digitalisation Annex (ED3-S13)*** sets out the enabling capabilities and investments in detail.

Table 5-1 summarises the NAMS capital programmes and associated ED3 expenditure. These include NARM and non-NARM replacement and refurbishment, associated civil works, operational IT and

telecommunications and other supporting programmes. Routine inspection, maintenance and repair activity is evidenced through the relevant operating-cost strategy and BPDTs.

Table 5-1 – ED3 asset management programme

Intervention category	Main driver	Primary outputs	ED3 expenditure (£m)			Supporting Evidence
			SEPD	SHEPD	Total	
Asset replacement – NARM (CV7a)	Asset condition and risk	Asset replacement	686.91	270.79	**957.70**	CV7a
Asset replacement – Non-NARM (CV7b)	Asset condition and obsolescence	Asset replacement	264.62	96.69	**361.31**	CV7b
Asset replacement civils (CV7c)	Supporting replacement activities	Civil works	58.87	24.25	**83.13**	CV7c
Refurbishment – NARM (CV9)	Asset life extension	Refurbishment	44.94	1.75	**46.69**	CV9
Refurbishment – Non-NARM (CV8)	Asset life extension	Refurbishment	65.98	13.80	**79.78**	CV8
Condition-driven civils (CV10)	Civil asset condition	Civil refurbishment and renewal	36.47	7.99	**44.46**	CV10
Operational IT & Telecoms (CV11)	Obsolescence and operational capability	Technology upgrades	36.67	17.54	**54.21**	CV11
Diversions (CV5)	Third-party requirements	Asset relocation and network modifications	161.54	12.76	**174.30**	CV5
		Total	**1,356**	**445.57**	**1,801.58**	

5.3 KEY REPLACEMENT VOLUMES BY VOLTAGE LEVEL AND LICENCE AREA

The scale and composition of the ED3 replacement programme vary between SEPD and SHEPD, reflecting differences in their asset populations, voltage responsibilities, condition profiles and network environments. The comparison below shows the key asset-replacement volumes proposed during ED3 against the equivalent RIIO-ED2 volumes, separately for each licence area and voltage level. Detailed asset-level needs and investment justification are provided through the ***ED3 Network Asset Management Strategy (ED3-S12)*** and supporting portfolio evidence.

Table 5-2 – Asset replacement volumes by voltage level

Asset category	Voltage	Unit	SHEPD ED2	SHEPD ED3	Change	SEPD ED2	SEPD ED3	Change
Cable	132kV	km	0.00	0.00	0%	4.80	37.50	681%
Cable	EHV	km	78.46	52.98	-32%	2.75	114.40	4058%
Cable	HV	km	84.00	249.31	197%	121.35	180.00	48%
Cable	LV	Each	121.00	565.00	367%	89.00	5,600.00	6192%
Cable	LV	km	32.92	120.00	265%	284.36	400.00	41%
Overhead Pole Line	132kV	Each	0.00	0.00	0%	0.00	0.00	0%
Overhead Pole Line	132kV	km	0.00	0.00	0%	0.00	0.00	0%
Overhead Pole Line	EHV	Each	3,002.00	3,213.00	7%	3,541.00	2,328.00	-34%
Overhead Pole Line	EHV	km	52.52	43.25	-18%	2.46	12.00	388%
Overhead Pole Line	HV	Each	9,955.00	9,386.00	-6%	13,066.00	17,075.00	31%
Overhead Pole Line	HV	km	54.02	59.20	10%	19.61	99.40	407%
Overhead Pole Line	LV	Each	3,980.00	3,595.00	-10%	13,932.00	16,600.00	19%
Overhead Pole Line	LV	km	63.01	45.00	-29%	264.53	150.00	-43%
Overhead Tower Line	132kV	Each	0.00	0.00	0%	1,048.00	1,662.00	59%
Overhead Tower Line	132kV	km	0.00	0.00	0%	155.56	313.38	101%
Overhead Tower Line	EHV	Each	0.00	130.00	-	30.00	99.00	230%
Overhead Tower Line	EHV	km	0.00	41.31	-	1.39	3.00	115%
Protection	132kV	Each	0.00	0.00	0%	3.00	18.00	500%
Protection	EHV	Each	25.00	86.00	244%	8.00	104.00	1200%
Protection	HV	Each	5.00	44.00	780%	0.00	60.00	-
Protection	Other	Km	8.57	58.80	586%	0.00	167.84	-
Switchgear	132kV	Each	0.00	0.00	0%	35.00	22.00	-37%
Switchgear	EHV	Each	135.00	121.00	-10%	394.00	480.00	22%
Switchgear	HV	Each	1,408.00	1,281.00	-9%	2,137.00	3,405.00	59%

Switchgear	LV	Each	622.00	651.00	5%	3,296.00	9,755.00	196%
Transformer	132kV	Each	0.00	0.00	0%	24.00	17.00	-29%
Transformer	EHV	Each	52.00	58.00	12%	41.00	97.00	137%
Transformer	HV	Each	804.00	610.00	-24%	1,358.00	1,166.00	-14%

The ED3 programme responds to a larger population of assets reaching evidenced intervention thresholds, rather than applying a uniform increase in renewal. Requirements vary materially between asset populations and are expected to continue beyond ED3. As we make greater use of existing network capacity and flexibility, asset condition and performance will remain important considerations in determining the timing and nature of intervention. Acting proportionately now, while maximising the life of serviceable assets, helps manage the longer-term renewal profile and avoids passing an unnecessary concentration of cost, risk and delivery requirements to future price controls.

Further detail on how asset condition, risk and performance are assessed to determine the appropriate intervention and timing is provided in the ***ED3 Network Asset Management Strategy (ED3-S12)***.

5.4 ED3 RISK REDUCTION AND WIDER BENEFITS

Our ED3 programme will actively manage rising asset risk while maximising the value and useful life of our existing network. For NARM assets, the programme removes £1,226 million of forecast risk by the end of ED3 compared with the position without intervention, representing a 19% improvement across our licence areas. While overall measured risk may still increase as the wider asset population ages or the network expands, the programme materially reduces the risk that would otherwise arise. Its benefit should therefore be assessed against the end-ED3 position without intervention, rather than simply comparing risk at the beginning and end of the period.

Table 5-3 presents this risk movement separately for SEPD and SHEPD, distinguishing the risk reduction attributable to the NARM programme from benefits delivered through other interventions that are not captured within the NARM output.

Alongside quantified asset-risk reduction, the programme will reduce the likelihood and consequences of asset failure, support safe and reliable network operation and avoid unnecessary reactive replacement, while retaining serviceable assets where refurbishment or life extension provides better whole-life value. Improved condition and performance evidence will support more targeted future maintenance and renewal decisions, while wider reliability, resilience and environmental benefits will be recognised where material, consistent with the attribution approach in **Section 8.1.**

Table 5-3 – Risk reduction within ED3

Licence Area	Risk at start of ED3 (£m)	Forecast risk at end of ED3 without intervention (£m)	Forecast risk at end of ED3 with our ED3 programme (£m)	%improvement	Risk removed at end of ED3 with intervention (£m)
SHEPD	1,897	2,366	2,073	12%	293
SEPD	2,953	4,086	3,153	23%	933
Total	**4,850**	**6,452**	**5,226**	**19%**	**1,226**

Together, these interventions will maintain a safe and reliable network through ED3 while improving our asset intelligence and preserving the flexibility to optimise renewal as network needs evolve through future price controls towards 2050. The wider interactions with reliability, resilience and environmental interventions, including the opportunities created through integrated planning, are considered in ***Sections 6 -8.***

6. RESILIENCE AND ENVIRONMENTAL INTERVENTIONS



ED3 focus and longer-term value:

Target the resilience, reliability and environmental risks that require action now.

During ED3, we will invest where climate risk, customer impacts or environmental evidence supports intervention, delivering clear and attributable outcomes while strengthening the resilience and evidence base needed to adapt efficiently as risks and requirements evolve.

6.1 ED3 FOCUS AND SUPPORTING EVIDENCE

Our ED3 programme advances two of our long-term LINP outcomes: Enhanced Reliability and Resilience and Reduced Environmental Impact. We will target intervention where reliability, climate risk, customer impacts or environmental evidence demonstrates a need for action, strengthening the network's ability to withstand and recover from disruption, improving reliability where customer impacts are greatest and reducing the environmental impact of how we operate, renew and develop the network.

ED3 is an important stage in the pathway to 2050, delivering measurable reliability, resilience and environmental improvements now while strengthening the evidence and capability needed to adapt our response through ED4 and ED5 as climate risks, network requirements and environmental priorities evolve.

The detailed needs cases, methodologies, programme commitments and delivery evidence are provided in our ***ED3 Climate Resilience Strategy (ED3-S03)***, ***ED3 Reliability Strategy (ED3-S04)*** **and** ***ED3 Environmental Action Plan (ED3-S14)***, together with the relevant BPDTs and Engineering Justification Papers.

6.2 CLIMATE RESILIENCE INTERVENTIONS

Climate change is already affecting the conditions in which our network operates and the challenge is expected to become more material over future price controls. During ED2 we strengthened the foundations of our approach through climate-risk assessment, asset-vulnerability analysis, resilience planning and targeted adaptation. ED3 builds on this by moving towards a more proactive and anticipatory approach to climate resilience, using improved evidence of hazards, exposure and vulnerability to identify where adaptation is required before risks translate into unacceptable customer or network impacts.

Flooding remains the most material climate risk, while windstorms present particular challenges for overhead lines. Heat-related risks are also expected to become more significant over the longer term. Our ED3 programme therefore continues established flood-resilience activity but broadens the range of interventions to include targeted storm hardening, improved restoration capability, environmental monitoring, climate modelling and stronger preparedness and whole-system resilience.

For flooding, we will continue protection of Grid and Primary substations while extending risk assessment, response equipment and proportionate remedial activity to a wider range of network assets. For overhead lines, targeted use of covered high-voltage conductors, limited-contact spacers and selected undergrounding in SHEPD will strengthen resilience to severe weather. In parallel, environmental monitoring at major substations will improve our understanding of heat-related asset performance, allowing emerging risks to be monitored before committing prematurely to large-scale physical intervention.

ED3 therefore combines intervention with preparation for the next stage of adaptation. Improved climate modelling, monitoring and operational evidence will help identify emerging thresholds and vulnerabilities and inform the timing, location and nature of further resilience investment through ED4 and beyond.

Table 6-1 – Significant climate resilience programmes

Programme	Main driver	Key activities	ED3 expenditure (£m)	
			SEPD	SHEPD
Flood resilience (CV16a)	Flooding risk	Site protection measures	**25.25**	**4.80**
Storm resilience (CV16b)	Severe weather	Network hardening and preparedness	**13.85**	**35.85**
Extreme heat resilience (CV16c)	Temperature impacts	Monitoring and adaptation measures	**2.52**	**3.78**
		Total	**41.62**	**44.43**

For customers, these interventions are intended to reduce exposure to weather-related disruption and improve our ability to restore supplies when severe events occur. This is particularly important for customers in vulnerable circumstances, communities and critical services where the consequences of prolonged disruption can be greater. Targeting investment towards the assets and locations most exposed to climate risk will strengthen network resilience, while improved monitoring and climate intelligence will allow future investment to be better targeted as risks evolve.

The consolidated pathway beyond ED3 is set out in **Section 3.4**, with detailed adaptation pathways, scenarios and monitoring triggers provided in the ***ED3 Climate Resilience Strategy (ED3-S03).***

6.3 TARGETED RELIABILITY INTERVENTIONS

Targeted ED3 reliability activity comprises the established Worst Served Customer programme and a phased, evidence-led mechanism for addressing short and multiple unplanned interruptions. For the latter, customer-impact and network-performance evidence will be built and mapped before proportionate network, operational or customer-support measures are designed, trialled and selected. We will place particular focus on customers and communities where disruption can result in disproportionate harm, ensuring our resilience and reliability decisions reflect both network risk and customer dependency.

6.4 ENVIRONMENTAL INTERVENTIONS

Our ED3 environmental programme builds on the progress made during ED2 in reducing emissions and pollution risks and developing approaches to biodiversity, natural capital and environmental improvement. In ED3, significant investment is focused on the areas where targeted intervention can address material environmental risks and deliver measurable outcomes alongside the continued development and renewal of the network.

For climate-change mitigation, we will continue to reduce operational emissions and accelerate the transition away from higher-impact technologies, including targeted replacement of SF_6-containing assets, lower-carbon fuels and support for fleet electrification. For pollution prevention, the programme increases targeted action on legacy risks, particularly fluid-filled cables and oil-containing assets. For nature and landscape, ED3 scales habitat restoration and nature-based solutions while continuing targeted visual-amenity improvements. We will consider nature-based solutions alongside conventional engineering interventions where they offer credible and proportionate environmental and network benefits.

Table 6-2 summarises the significant ED3 programmes and measurable outcomes supporting this transition. Alongside delivery, ED3 will strengthen the evidence and experience needed to shape subsequent interventions as the network grows and environmental requirements evolve, with detailed targets and methodologies set out in the ***ED3 Environmental Action Plan (ED3-S14)*.**

Table 6-2 – Significant environmental improvement programmes

Strategic Goal	Relevant Investment Areas	Key activities	Deliverables / outputs	ED3 expenditure (£m)	
				SEPD	SHEPD
Climate Change mitigation: *Mitigate climate risk by reducing emissions*	SF6 Asset replacement (CV22)	Reduce SF_6 emissions from our assets.	Reduce SF_6 emissions by 55% by 2033 from a 2019/20 baseline & manage the total SF_6 bank in line with alternatives for newly installed assets.	10.40	4.18
	Lower Carbon Fuels (C11)	Reduce emissions.	Scope 1 & 2 emissions reduce by 55% by 2033 from 2019/20 baseline.	3.16	1.62
	EV Chargers (C6 & C11)	Reduce emissions.	Installation of high-capacity EV superchargers across offices & depots and 76 EV chargers at substations.	4.03	2.59
Pollution and Nuisance Reduction: *Prevent pollution and protect our communities from local environmental impact*	UGC Fluid-Filled Cables Replacement (CV22)	Reduce pollution risks.	Reduce cable top-up fluid volumes by 20% against the 2025/26 baseline, remove 84.62km of FFC during ED3 as part of our long-term ambition for full removal by 2050.	67.78	5.56
	Bunding (CV22)	Reduce pollution risks.	Implement Transformer oil containment measures at 112 sites (62 primary and 50 secondary)	8.65	4.3
Supporting Nature: *Protect and restore nature, delivering natural capital benefits and improve visual amenity in and around our license areas.*	Visual Amenity (CV20)	Reduce the visual amenity impacts of overhead lines.	Underground up to 21.93km of OHL or utilise nature-based solutions where technically and commercially viable to meet stakeholder requests to re-establish natural beauty.	10.03	2.2
	Nature-based Solutions (CV22)	Carbon removal & support wider ecosystem services.	Deliver 723 ha peatland restoration, 564 ha woodland creation, and 7 ha seagrass planting projects.	5.35	4.55
	Meeting our Legal Biodiversity Duties – BNG (CV22)	Nature-recovery activities.	Biodiversity Net Gain (BNG) compliance for capital projects that meet thresholds for delivery of statutory planning requirements.	4.15	1.45
			Total	**113.55**	**26.45**

Taken together, our ED3 programmes will deliver a more resilient and reliable network while reducing the environmental impact of how we operate, renew and develop it. By 2033, we are targeting a 55% reduction in Scope 1 and 2 greenhouse-gas emissions and a 55% reduction in SF_6 emissions from a 2019/20 baseline, alongside targeted reductions in the environmental risks associated with fluid-filled cables and oil-containing assets and tangible improvements to nature and visual amenity. These interventions establish the foundations for further environmental improvement through ED4 and ED5, supporting our 2050 outcome of growing, operating and renewing the network in ways that reduce its environmental impact and deliver positive outcomes for the places and communities we serve.

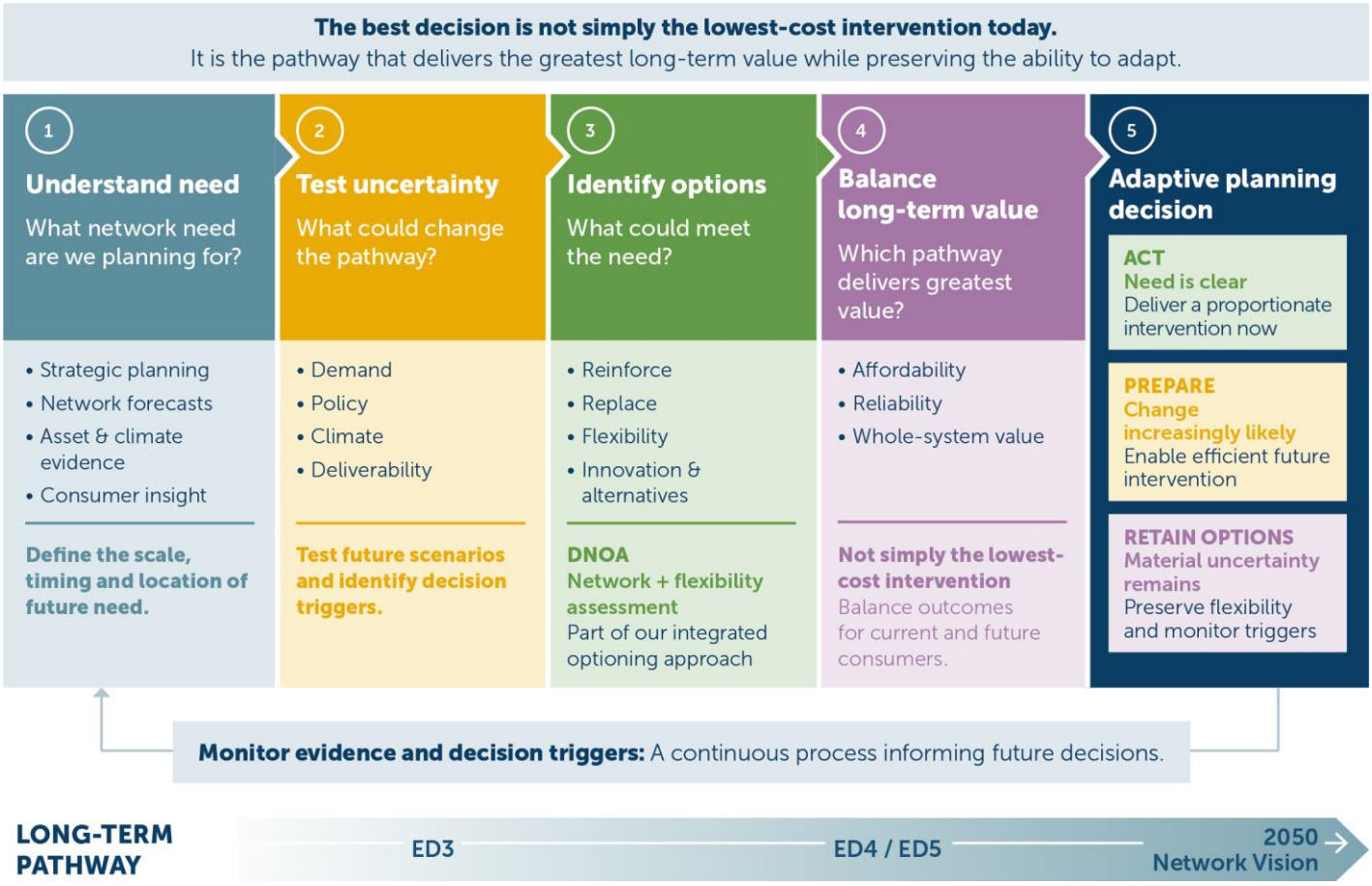
7. OPTIONEERING, SENSITIVITY ANALYSIS AND INVESTMENT TRADE-OFFS

Sections 4 - 6 set out the evidence and intervention-specific approaches used to develop our ED3 plans for load, asset management, reliability, climate resilience and environmental performance. This chapter brings these together through a common decision-making approach, showing how uncertainty is tested, credible options are compared and trade-offs are considered to identify responses that meet demonstrated needs while balancing benefits, costs and affordability for customers.

Our approach provides a consistent progression from evidence and sensitivities to credible options, trade-offs and a traceable decision, while allowing the assessment to reflect the characteristics of each investment need. The Act / Prepare / Retain Options framework established in **Section 2** provides the overarching basis for determining when to intervene, when proportionate preparation is appropriate and when retaining optionality provides better value.

Detailed forecasting, modelling and option appraisal are provided through the relevant supporting strategies and investment evidence, with this section focusing on the common principles that underpin decisions across the ED3 programme.

Figure 7-1 - From evidence and uncertainty to the right intervention



7.1 FROM EVIDENCE TO THE RIGHT PLANNING DECISION

Our investment decisions start with a clearly evidenced need and the consequences of inaction, not a predetermined solution. The evidence reflects the nature of that need, drawing on our understanding of future demand, asset condition and performance, impacts on customers and the wider environment, and the risks and obligations we must manage. Cost, deliverability and affordability are integral to the decision, including whether investment is required now or can reasonably be deferred, balancing near-term customer costs against the risks and potential costs of acting later.

These evidence streams are assessed through the intervention-specific approaches summarised in **Sections 4-6.** At LINP level, this determines whether we Act during ED3, Prepare to preserve an efficient future response, or Retain Options where uncertainty remains material.

7.2 TESTING UNCERTAINTY AND SENSITIVITIES

Sensitivity analysis tests whether a proposed intervention, its timing and its efficient scope remain justified when a material assumption changes. Its purpose is to understand the robustness of the decision and identify the assumptions or switching points that could change the preferred response.

For load-related investment, the prescribed ED3 common sensitivity and the detailed approach set out in the ***(ED3-S01) Load Related Expenditure Annex*** determine whether a need remains within ED3, changes in timing or scale, or moves beyond the period. Where the result changes, the intervention may need to be resized or re-sequenced, supported through an uncertainty mechanism, or limited to proportionate preparatory activity that preserves an efficient future option.

For other intervention categories, the relevant supporting strategy and investment evidence test the material uncertainties associated with the need. These may include asset deterioration and operational risk, future climate hazard or exposure, costs and benefits, flexibility availability, technology maturity or delivery assumptions. The implications of these uncertainties for the investment decision are considered through the relevant intervention-specific methodology rather than through a single common sensitivity approach.

Where the preferred response remains justified across the relevant sensitivities, this strengthens the case for intervention. Where it changes materially, the decision should identify the resulting change in timing or scope and the evidence or trigger that would justify further action.

7.3 IDENTIFYING CREDIBLE OPTIONS

Once the need and its material uncertainties are understood, a proportionate range of credible responses is considered. This includes a realistic minimum-intervention or deferral position and the technically, economically and operationally credible alternatives appropriate to the intervention.

We test the full range of credible interventions before committing to investment. They may include continued operation with monitoring, maintenance or repair; refurbishment or life extension; replacement or reinforcement; flexibility or operational measures; alternative designs or specifications; and proportionate preparatory activity where full intervention is not yet justified. Options that cannot safely, lawfully or practically meet the identified need may be discounted, with the reason recorded.

Shortlisted options are assessed using the appropriate combination of engineering evidence, whole-life costs and benefits, risk, timing and deliverability. Cost Benefit Analysis supports this assessment where applicable but does not mechanically determine the preferred intervention. Detailed option sets, assumptions, reasons for discounting alternatives and project-level analysis remain within the supporting strategies and investment evidence.

7.4 BALANCING TRADE-OFFS AND SELECTING THE PREFERRED INTERVENTION

The preferred intervention is the option that addresses the evidenced need proportionately and provides the best supported whole-life outcome for current and future customers. This is not necessarily the option with the lowest initial cost.

Recurring trade-offs include balancing affordability now against longer-term value, determining whether the evidence supports action now or retaining optionality under uncertainty, considering physical intervention against flexibility, operational or staged responses, balancing service and risk reduction against cost, and ensuring that the preferred technical solution can be delivered when required.

Figure 7-2 - Recurring trade-offs in ED3 investment decisions

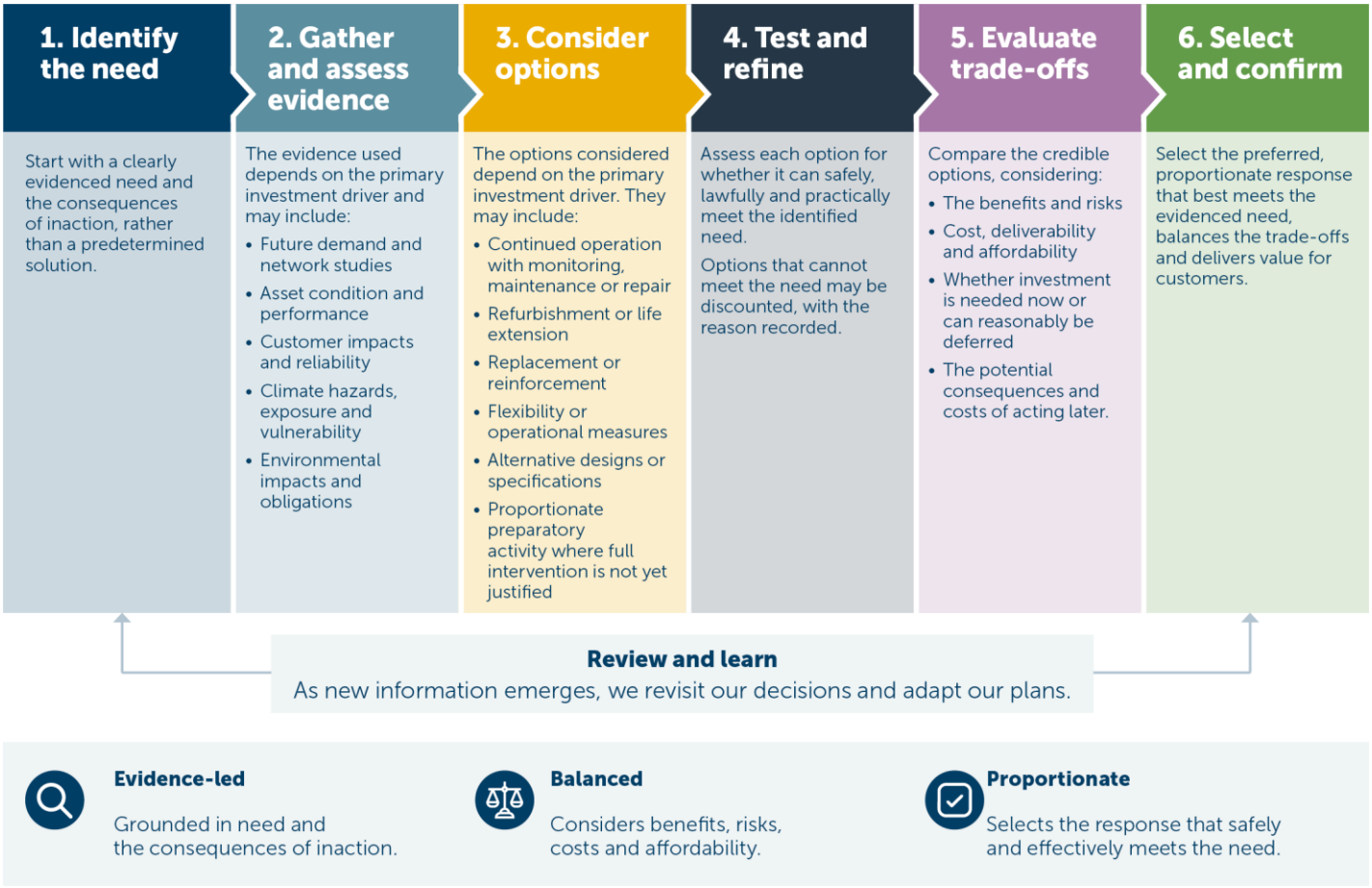
Trade-off	What we consider
Affordability now vs long-term value	Whether lower near-term expenditure could reduce immediate costs but create higher future costs, repeated intervention or constrain future development.
Investment now vs uncertainty	Whether acting early protects consumers or future value or creates a risk of premature or stranded investment.
Capacity provision vs affordability	Whether anticipatory investment is justified by sufficiently credible future need, or whether preparation and retained optionality provide better value while uncertainty remains.
Build vs flexibility	Whether reinforcement is required or flexibility can defer, reduce or complement conventional investment while maintaining security and service.
Reliability and resilience vs cost	Whether additional expenditure delivers a proportionate improvement in service or reduction in risk for current and future consumers.
Specific need vs integrated intervention	Whether coordinating capacity, asset, reliability, climate or environmental requirements provides greater whole-life value than addressing them separately.
Optimal solution vs deliverability	Whether the theoretically preferred option can be delivered when required given consenting, workforce, supply-chain, outage and other constraints.
Local vs whole-system outcomes	Whether an intervention creates wider benefits or consequences for consumers, communities and the energy system beyond the immediate network.
Near-term deferral vs future portfolio deliverability	Whether deferring investment reduces near-term cost while creating a concentration of future work that increases delivery risk, cost or pressure on workforce, supply chain and outage requirements.

Consumer and stakeholder evidence informs how these trade-offs are considered but does not replace engineering, statutory, safety or regulatory requirements. *Section 2* sets out the underlying stakeholder and customer priorities. In individual decisions, the relevant principles include affordability and whole-life value, timely network readiness, avoiding disproportionate customer harm, recognising how costs and benefits are distributed, and avoiding both premature commitment and inefficient delay.

Where consumer research has directly tested a material trade-off, the supporting decision evidence should identify what was tested and how the findings influenced the option, timing or scope. These trade-offs are considered not only at individual intervention level, but across the wider portfolio, recognising that decisions to defer or re-sequence work can affect the affordability, deliverability and overall efficiency of future programmes.

Each material decision should provide a clear line of sight as outlined in **Figure 7-3***:*

Figure 7-3 - Our investment decision making flow



The preferred response is recorded with a clear line of sight from the identified need and material uncertainties through the options and trade-offs considered to the final decision. Detailed evidence, including relevant strategies, BPDTs, Engineering Justification Papers and Cost Benefit Analyses, provides the supporting justification and identifies where changing evidence or assumptions may require the decision to be revisited.

8. LINKAGES AND SYNERGIES

Sections 4 - 6 set out the principal ED3 interventions and their primary expenditure and outputs, while *Section 7* explains the common decision logic used to select the preferred response. This section brings those interventions together, showing where coordinated planning, specification and delivery can create greater whole-life value and support progress towards our 2050 Network Vision.

As the network develops through ED4, ED5 and towards 2050, the interaction between capacity, asset condition, reliability, climate resilience and environmental performance will become increasingly important. Considering these requirements together allows us to use ED3 investment to address evidenced needs now while future-proofing interventions where appropriate, avoiding unnecessary repeated works and retaining flexibility as longer-term requirements evolve.

This does not mean combining every network need into a single intervention. Integration is applied where addressing one evidenced need also changes another network requirement, creates a material secondary benefit or provides a proportionate opportunity to avoid further intervention.

8.1 PRIMARY ATTRIBUTION AND SECONDARY BENEFIT

Each intervention is assigned one primary investment driver: load and capacity, asset condition and reliability, climate resilience, or environmental performance. The primary driver is the evidenced need that justifies the intervention and determines where its expenditure, primary output and supporting evidence are reported.

Expenditure and primary outputs are reported once. Where the selected intervention also provides a material and causally supported benefit under another driver, that benefit is identified separately as a secondary benefit. It is not used to duplicate expenditure, outputs or benefits through another programme or reporting route.

The primary driver therefore explains why the intervention is required, while secondary benefits identify additional value arising from the intervention selected. These benefits remain relevant where they improve the overall customer, network or environmental value of the intervention, even where they do not change the underlying need or primary investment decision.

8.2 MATERIAL LINKAGES BETWEEN INTERVENTION CATEGORIES

The most material linkages arise where addressing one primary need creates wider benefits for the same asset, network section or location. These are recognised where there is a clear relationship between the intervention and the additional benefit. They do not, however, imply that every intervention will provide benefits across multiple drivers.

For example, reinforcement driven by future demand can provide an opportunity to address asset condition or resilience needs at the same location, avoiding separate interventions where an integrated solution provides better overall value. Similarly, asset replacement can provide an opportunity to improve resilience or environmental performance where those requirements can be efficiently incorporated into the design and specification of the replacement.

Table 8-1 summarises the most material recurring linkages across the ED3 programme.

Table 8-1 – Material linkages and secondary benefits

Primary ED3 intervention	Material linkage	Secondary benefit where supported	Attribution
Load-related reinforcement	Asset condition or renewal need on the affected network; existing reliability issue; relevant climate exposure	Asset risk reduction; improved reliability or security of supply; improved climate resilience	Capacity and load outputs remain attributed to the load intervention. Secondary benefits are recognised separately and not reported again as asset, reliability or climate outputs.
Asset replacement or refurbishment	Credible future capacity requirement; existing reliability issue; climate exposure; environmental performance of the existing or replacement asset	Future capacity or option value; improved reliability; improved climate resilience; reduced losses, leakage or pollution risk; improved resource efficiency	Replacement or refurbishment remains attributed to asset management. Secondary benefits are recognised where they arise directly from the selected specification or treatment.
Targeted reliability intervention	A planned load, asset or climate intervention affects the same circuit, location or failure mode	Reliability improvement delivered through the planned intervention	No separate reliability intervention or duplicate output is claimed where the reliability need is already addressed through another funded programme.
Direct climate-resilience intervention	Asset condition, network criticality, restoration requirements or environmental consequences at the affected location	Reduced asset damage or service disruption; improved restoration; environmental benefit where directly linked to the resilience measure	Climate expenditure and primary resilience outputs are reported once. Reliability or environmental benefits are recognised separately where supported.
Load or asset intervention with environmental effects	Replacement of higher-impact equipment; pollution risk; losses; resource use or waste	Reduced emissions, leakage, pollution risk, losses, resource use or waste	The intervention and expenditure remain attributed to the load or asset programme. Environmental benefits are recognised separately where material and evidenced.

The linkages shown illustrate recurring interactions across the ED3 programme rather than benefits expected from every intervention. Where wider benefits arise, they will be recognised where supported by a clear causal relationship and credible evidence, quantified where appropriate and otherwise described transparently. Our Strategic Development Plans (SDPs) will build on this at a local level, bringing different investment needs together to show where wider benefits and opportunities for coordinated intervention arise across the network.

8.3 FUTURE PROOFING AND COORDINATED DELIVERY

Future-proofing is relevant where an ED3 intervention is deliberately sized, specified, sequenced or prepared to accommodate a credible future requirement. This may include uprating an asset that already requires replacement, selecting a climate-resilient specification appropriate to its expected operating life, incorporating scalable design, or undertaking proportionate enabling activity that reduces the need for further works once a future requirement materialises.

Future-proofing does not assume or fund an unevidenced future need. The supporting evidence should identify the credible future requirement, the ED3 design or scope decision and any additional cost or intervention that the decision is expected to avoid or reduce. The wider development pathway beyond ED3 remains set out in **Section 3.4**.

Coordinated delivery can provide further value where interventions coincide at the same asset, site or network corridor. Where supported by the underlying needs and programme evidence, works may be sequenced to share civils, access, consenting, outages or enabling activity and reduce the need to return repeatedly to the same part of the network.

This approach is applied where coordination provides demonstrable whole-life value and does not introduce disproportionate cost, delay or complexity. **Section 9** identifies where ED3 interventions converge geographically and may provide opportunities for coordinated delivery, while detailed programme sequencing and delivery arrangements are addressed through the supporting investment evidence and the *(ED3-S05) ED3 Delivery Strategy.*

9. AREA-BASED VIEW OF ED3 NETWORK INTERVENTIONS

As outlined throughout this document, the LINP brings together network needs that have traditionally been considered through separate investment lenses, allowing us to take a more integrated, long-term view of how the network needs to develop. We have considered not only what investment is required, but how different needs interact, when interventions should be delivered, and how the resulting programme can support an affordable and deliverable transition towards our longer-term 2050 Network Vision.

This integrated approach provides the bridge between strategic planning and delivery. By considering interventions together, we can better understand where activity converges and how investment should be sequenced and profiled across ED3, helping to manage delivery pressures, affordability and the risk of an unnecessarily front- or back-loaded programme.

Without this integrated view, investment driven by different needs could be planned independently, creating avoidable peaks in delivery or expenditure or missing opportunities to coordinate interventions in the same area. The LINP helps us identify these interactions earlier and plan the programme accordingly.

The summary data and geographic views that follow are the practical expression of that planning. **Table 9-1** below brings together intervention volumes by licence area, voltage level, investment driver and measure, providing a high-level view of the scale and profiling of activity across ED3. It provides a clear line of sight from the needs, options and trade-offs described in the preceding chapters to the programme we intend to deliver. The detailed Grid Supply Point (GSP) data and supporting breakdowns are provided in the accompanying spreadsheet (ED3-S02-A01) Long-term Integrated Network Plan Appendix 1 Area Based View.

Table 9-1 – Summary of mapped ED3 intervention volumes by licence area, voltage level and investment driver

Licence Area	Voltage Level	Driver	Breakdown	No. of Interventions by year				
				2029	2030	2031	2032	2033
SEPD	EHV	Modernisation (non-load)	Assets (#)	1173.00	1180.00	1198.00	1189.00	1186.00
			Feeders (km)	121.17	123.17	128.17	127.17	129.17
		Reinforcement (load)	Assets (#)	366.00	484.00	1090.00	844.00	777.60
			Feeders (km)	247.14	148.98	200.53	224.80	118.38
	HV	Modernisation (non-load)	Assets (#)	4813.00	4884.00	4889.00	4887.00	4888.00
			Feeders (km)	63.91	70.91	70.66	71.16	71.16
		Reinforcement (load)	Assets (#)	263.00	425.00	725.00	1145.00	537.00
			Feeders (km)	17.78	17.78	35.68	59.68	30.70
	LV	Modernisation (non-load)	Assets (#)	14566.00	14567.00	14573.00	14572.00	14572.00
			Feeders (km)	115.80	118.10	120.20	121.80	123.80
		Reinforcement (load)	Assets (#)	1288.00	2150.00	3140.00	3735.00	4021.00
			Feeders (km)	58.97	74.24	84.79	98.85	127.55
	NA	Resilience	No. of Interventions	191.20	158.20	159.20	154.20	156.20
		Environment	No. of Interventions	1816.36	1817.50	1969.59	2069.69	1906.85
SHEPD	EHV	Modernisation (non-load)	Assets (#)	851.00	841.00	812.00	840.00	722.00
			Feeders (km)	20.43	36.56	27.68	36.58	27.00
		Reinforcement (load)	Assets (#)	2007.00	1926.00	3966.00	1092.30	1793.00
			Feeders (km)	261.94	285.62	311.77	307.48	142.82
	HV	Modernisation (non-load)	Assets (#)	2912.00	2819.00	2813.00	2635.00	2549.00
			Feeders (km)	60.00	87.80	54.75	56.00	57.85
		Reinforcement (load)	Assets (#)	1894.00	723.00	1106.00	732.00	795.00
			Feeders (km)	160.86	59.59	72.51	25.62	25.27
	LV	Modernisation (non-load)	Assets (#)	1480.00	1437.00	1440.00	1371.00	1339.00
			Feeders (km)	33.00	30.00	36.00	34.00	32.00
		Reinforcement (load)	Assets (#)	433.00	735.00	1030.00	1520.00	2018.00
			Feeders (km)	2.78	4.27	3.96	5.68	5.40
	NA	Resilience	No. of Interventions	243.90	245.90	237.90	225.90	218.90
		Environment	No. of Interventions	1214.10	1214.13	1414.17	1614.32	1420.37

Whilst the summary table shows the overall scale and profiling of the ED3 programme, the geographic views take this a step further, showing how that investment translates across the network and where activity is concentrated. They show both the number of asset interventions and associated length of feeder

intervention, providing complementary perspectives on the scale and spatial distribution of planned activity. Asset numbers indicate the concentration of individual interventions, while feeder length provides a complementary view of the geographic extent of circuit activity. Neither measure alone represents delivery complexity or cost, but together they provide a richer picture of the ED3 programme.

The characteristics of our two licence areas are important when interpreting this spatial view. SHEPD covers a more geographically extensive network, where interventions may extend over significant distances even where the number of individual assets affected is comparatively lower. SEPD is more compact and densely interconnected, with concentrations of activity across multiple voltage levels in some areas. This illustrates not just the volume of intervention, but the different spatial characteristics of delivering the ED3 programme across our networks.

Figure 9-1 - Geographic distribution of ED3 asset interventions by GSP area and voltage level SHEPD

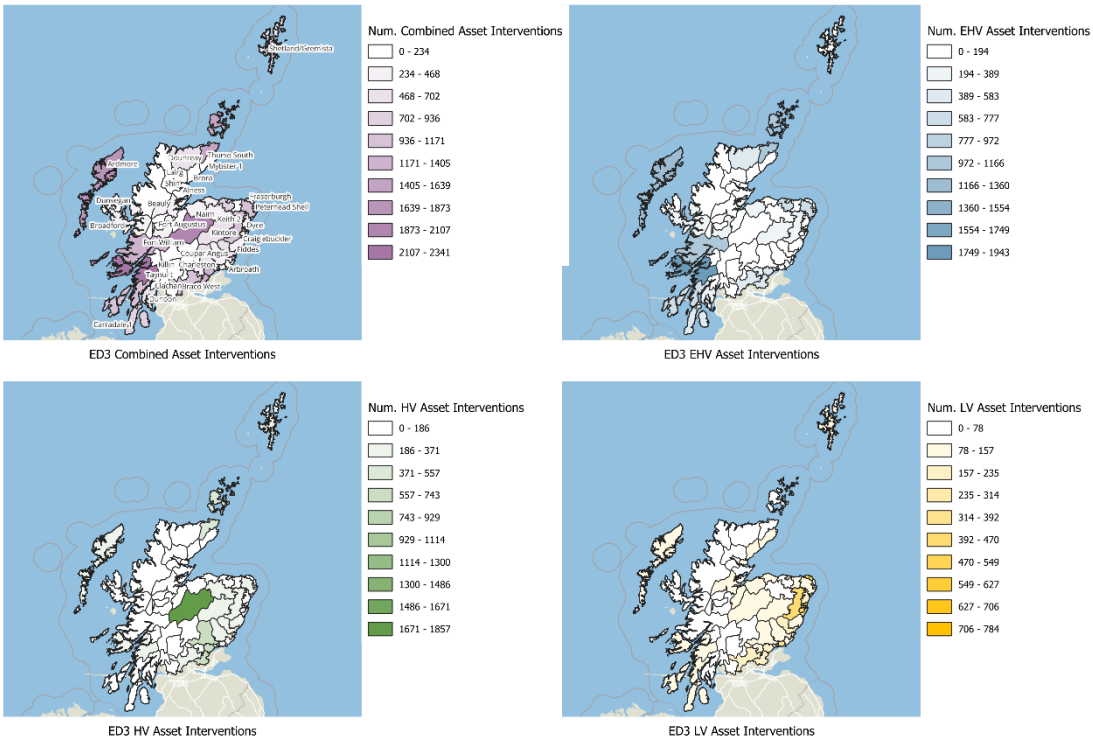


Figure 9-2 - Geographic distribution of ED3 feeder interventions by GSP area and voltage level - SHEPD

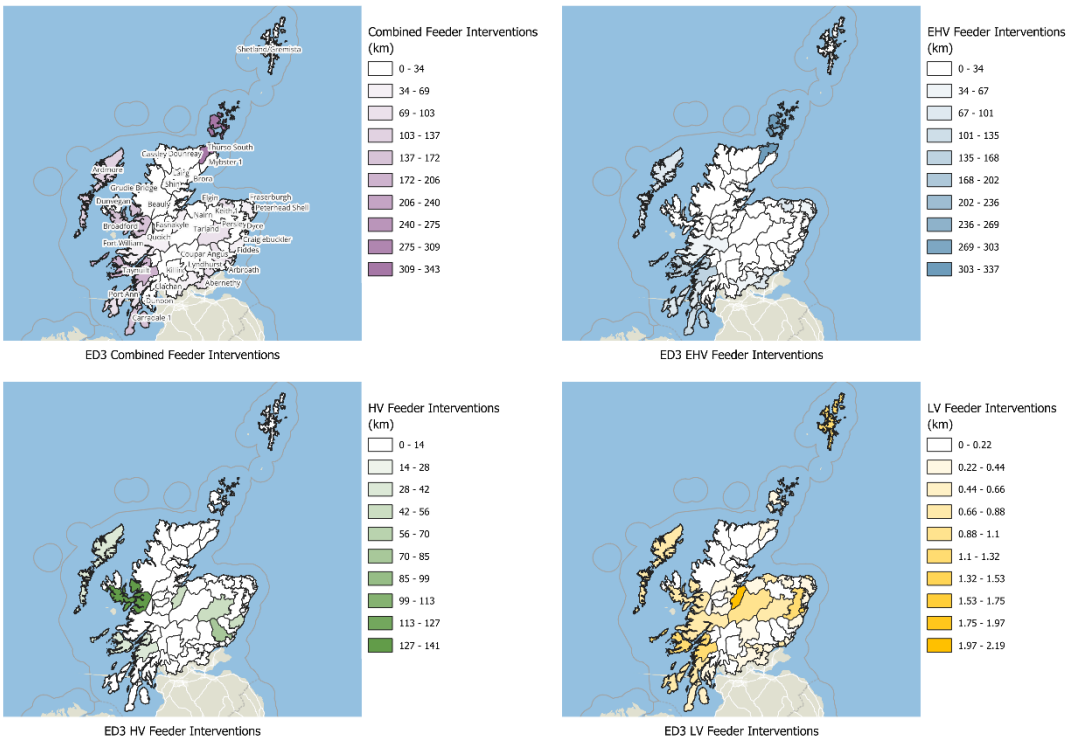


Figure 9-3 - Geographic distribution of ED3 asset interventions by GSP area and voltage level - SEPD

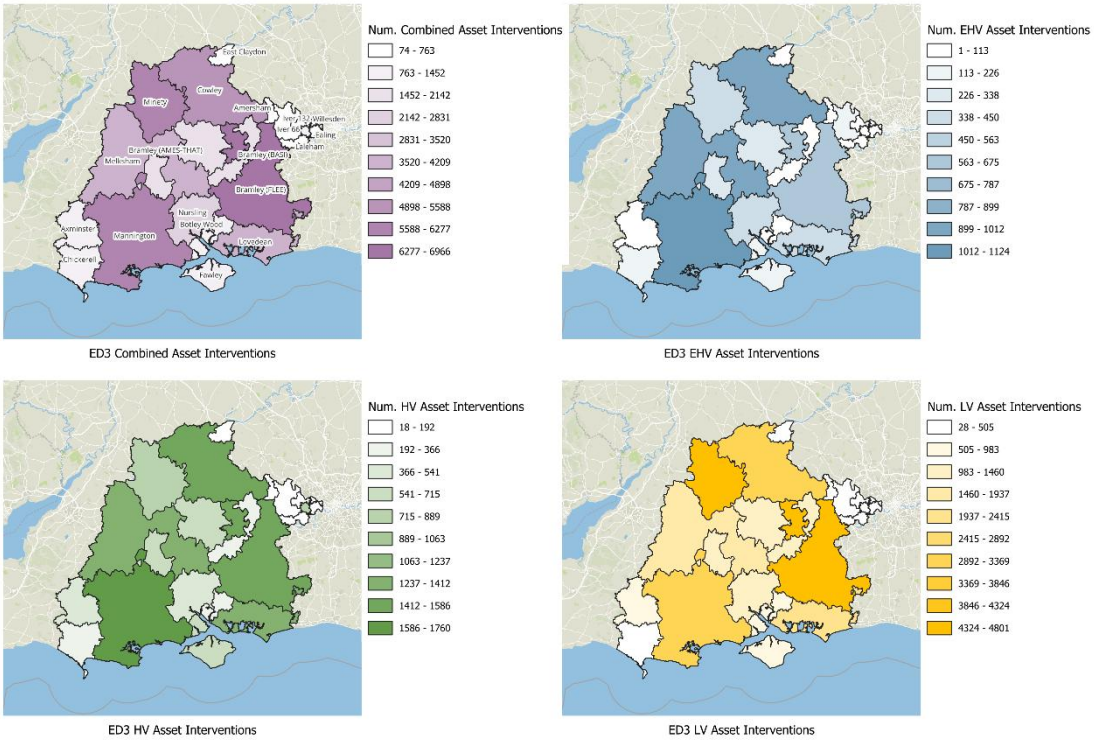
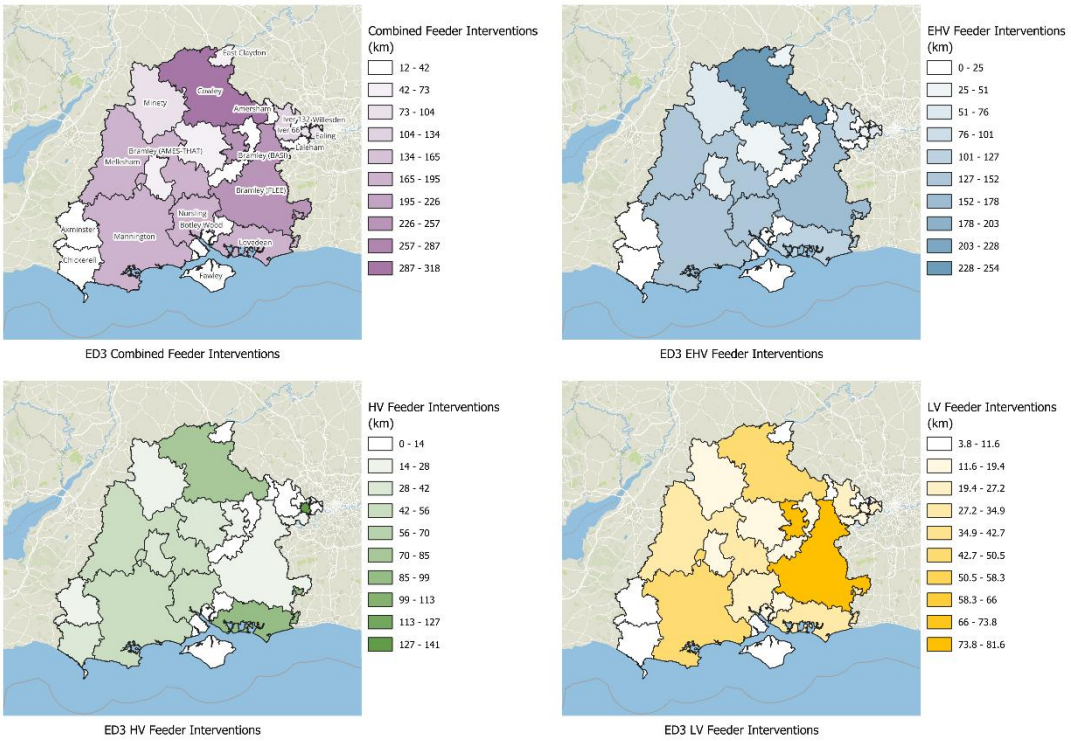


Figure 9-4 - Geographic distribution of ED3 feeder interventions by GSP area and voltage level - SEPD



Taken together, the table and geographic views demonstrate the value of integrated network planning, translating individual investment needs into a geographically informed and appropriately profiled ED3 programme. Importantly, the LINP looks beyond ED3, considering when investment is likely to be needed across the pathway to 2050 and helping us distinguish between needs that require action now and those where we should prepare or retain flexibility for the future.

The value of the LINP is therefore not simply in identifying what we need to invest, but in helping determine where and when network investment should be made across that longer-term pathway. This allows us to sequence and profile investment more effectively, supporting deliverability and affordability in ED3 while avoiding premature investment or delaying action where doing so could increase future cost or risk. As needs and evidence evolve, we will continue to refine this integrated view, maintaining a clear line of sight from the investments we make in ED3 to the development of our network towards our 2050 Network Vision.