

How we get there

Our 5-year plan for transforming
what our transmission network delivers



OUR TRANSMISSION BUSINESS

We take electricity generated from power stations, windfarms and various other sources and transport it to the local electricity distribution network and between other UK transmission networks.

SP Transmission plc (SPT) is the licensed Transmission Owner (TO) responsible for the transmission of electricity in Central and Southern Scotland. We are a wholly owned subsidiary of Scottish Power Energy Networks Holdings Limited (SPENH), referred to as SP Energy Networks (SPEN). SPEN is part of the Iberdrola Group – a global leader in clean energy and electricity grids.

Our transmission network is part of a GB-wide grid that collects electricity generated from power stations, windfarms and various other sources, and transports it over long distances to millions of homes and businesses.

Our system is crucial to the delivery of the Scottish and UK Governments' renewable energy objectives due to our location in an area of outstanding renewable resource and the critical integration we provide with other transmission networks. We have a unique role in connecting renewable generation and bulk transfer of renewable energy from Scotland into England and Wales, benefiting stakeholders well beyond our licence area.

Around 80% of customers in Scotland are within our network area. As an operator of Critical National Infrastructure, our priority is to keep power flowing to our customers. Our network reliability is currently measured at 99.9%.

99.9%

The value we add to UK infrastructure is measured in terms of regulatory asset value. Our RAV is forecast to be £4.8bn at the end of RIIO-T2.

£4.8bn

Our transmission network is comprised of over 4,300 kilometres of circuits (3,759km of overhead lines, 593km of underground cables and 196km of HVDC cables) and 166 substations operating at 400kV, 275kV and 132kV.

4,300km

SCOTTISH AND SOUTHERN ELECTRICITY NETWORKS TRANSMISSION (SSEN-T)

We have 8.7GW of generation connected to our network and we keep electricity flowing to over two million homes and businesses in our own region, and help to keep supplies secure and reliable across GB.

8.7GW

SP TRANSMISSION

NATIONAL GRID ELECTRICITY TRANSMISSION (NGET)

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CEO STATEMENT

We have a chance to shape a cleaner, greener future for us all.

A more sustainable future

Achieving Net Zero is mission critical to fighting the harmful effects of the climate and biodiversity crisis, here in Scotland and around the world.

This means finding ways to stop adding to the total amount of greenhouse gases in the atmosphere. As a society, we need to become less reliant on fossil fuels and use more sustainable energy. The progress made so far in developing cleaner sources of energy will not count for much if the electricity grid is unable to transmit this power to homes and businesses. Significant investment at a faster pace is needed now to move the electricity grid forward and to cope with increasing demands for electricity.

We are committed to ensuring consumers and network users get a fair deal. Making this crucial investment now will drive a positive impact on stabilising and lowering consumer energy bills in the longer term. And it will achieve the UK's ambition to be a clean energy superpower, enhancing the security and resilience of our energy supplies.

Scale of the challenge

This business plan establishes our proposals to invest £10.6bn in our transmission network between 2026 and 2031. This is a step change in transmission investment, over three times more than the £3.4bn in our RIIO-T2 plan.

We are ready to lead the way to a more sustainable future, using our proven track record, extensive experience, innovation and collaboration.

Creating the network we need

Our plan provides a clear, credible vision for the network we need, with a defined set of efficiently sized, costed and future-proofed investment projects to progress urgently. It outlines how we will build capacity and readiness to deliver quickly, efficiently and at scale.

These projects are consistent with the Future Energy Scenarios (FES) of the National Energy System Operator (NESO), and its Clean Power 2030 advice to the UK Government about delivering a future energy system with increased amounts of domestic energy production. Collectively, these projects create a plan that delivers infrastructure fit for a low-cost transition to Net Zero.

In developing our plan, we have also used insights from our SP Distribution business, the Distribution Network Operator (DNO) within our transmission licence area, to give us a holistic view of our whole network.

System security and high-quality service

Society will become more dependent on electricity as we decarbonise transport and heating. This means system security has never been more important and we are facing increasing levels of risk that need to be managed from changes to the mix of generation and customer technologies, to climate change, physical and cyber-related threats.

We will invest over £100m to build resilience to physical, climate and increasingly sophisticated cyber-related threats.

We also do not overlook the critical importance of maintaining the highest quality standards of service for today's transmission customers and electricity consumers. To do this, we will exemplify best in class asset management and achieve long-term value for money across our portfolio of assets.

Delivering our plan

To deliver our plan, we need more skilled people and a strong, stable supply chain. This must also be supported by reforms to planning and consenting in Scotland, and the connections queue.

We have developed a robust and agile workforce and supply chain strategy. Through this we will develop and grow a modern, diverse, high-quality, well-trained workforce fit for our future – around 1,400 new, high quality green jobs directly – effectively doubling our current workforce – and will also support over 11,000 jobs across Scotland and the rest of the UK.

To ensure our plans can be delivered in a sustainable and timely manner we have implemented arrangements that give our supply chain partners guidance, certainty and confidence to commit to our plan. And we will take advantage of the benefits and buying power of being part of the Iberdrola Group – a global leader in clean power and energy grids – to finance unprecedented levels of investment and to strengthen and stabilise our supply chain in the UK and beyond.

Being a responsible business

On the pathway to Net Zero, it is critical that we lead the way and our own operations are as sustainable as possible, mitigating and improving the environmental impact of our own activities and supply chain.

We are committed to becoming a Net Zero Networks Business by 2035, making the activities outlined in this plan a key stage of that journey.

Creating positive legacies in our communities

Our plan will add value to economic growth and local communities, creating a lasting, positive legacy for future generations. Independent research from Centre for Energy Policy (CEP) at the [University of Strathclyde](#) has concluded that investment from our plan could contribute sustained economic benefit to UK GDP of around £2bn per annum.

The communities we serve that will host this new and upgraded infrastructure are key to enabling Net Zero. In response and in recognition of this, we have developed a Community Benefit Fund and a Transmission Net Zero Fund to help communities thrive, supporting their own decarbonisation journeys and local priorities that matter most to them.

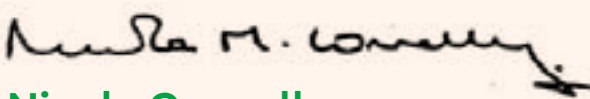
This has been built upon our extensive experience and proven track record in delivering award-winning community funds including our Green Economy Fund and Transmission Net Zero Fund.

Stakeholder engagement

I would like to thank everyone who has shared their opinions and perspectives to build this plan. Significant stakeholder engagement has directly influenced our business planning process and decision making.

We have also drawn from our own extensive experience and engaged with UK Government, Scottish Government, Local Authorities, industry partners and Ofgem. Our Independent Net Zero Advisory Council (INZAC), acting as our Independent Stakeholder Group (ISG), has provided challenge and scrutiny to the business plan development and we look forward to enduring engagement in the delivery of our plan.

I am very proud to present our RIIO-T3 business plan at a pivotal point in history, the energy transition, which is truly the challenge and opportunity of our time.



Nicola Connelly
CEO, SP Energy Networks





“The Independent Net Zero Advisory Council (INZAC) believe SP Energy Networks have produced an ambitious and robust business plan that has been developed in response to not only the INZAC challenges but their broader stakeholder engagement. They have taken on board our feedback and responded to the challenges put forward.”

Angela Love, INZAC Chair
December 2024

Our RIIO-T3 plan at a glance

Investment in our transmission network has far-reaching environmental and economic consequences for our society. It is a critical enabler of the low-carbon transition and its associated economic benefits including lower energy prices. Our investment is also essential to wider economic growth as all new or growing industrial and commercial customers have a high dependency on reliable electricity networks. The value we deliver for society is far greater than the network investment itself. It extends to supporting communities, protecting critical national infrastructure, job creation, collaborating with academia, managing uncertainty, as well as working in partnership with Government, Ofgem and other stakeholders.

Consumer outcomes that our plan delivers

The inputs to our plan and outputs from it will meet the four strategic Net Zero outcomes for consumers that we are targeting as a sector. Below are key targets and proposals in our plan for RIIO-T3.

INFRASTRUCTURE

Infrastructure fit for a low-cost transition to Net Zero

We will increase the capability of our network to transport electricity by building more infrastructure, removing constraints and increasing the capacity of circuits. Our proposals will make a determined contribution towards Net Zero by enabling the connection and flow of more clean energy to our homes and businesses. We are aiming to connect 19GW of renewable generation in RIIO-T3 compared with 11GW in RIIO-T2. The near doubling of renewable generation we will connect over a five-year price control period represents a significant shift in the scale and pace of our plans.

Facilitate the connection of additional renewable generation

19GW

Reduction in GB constraint costs from investments made by us and other TOs.

£4.9bn p.a.

RESILIENCE

Secure and resilient supplies

This is a critical time for networks. Demand is changing, generation is evolving and new threats are emerging during a phase of intense network development. We will operate and maintain our network to the highest standards whilst adapting to meet the challenges of extreme weather, cyber and physical threats.

Long-term monetised risk benefit

Lr£23.1bn

Maintain current level of network reliability

99.9%

VALUE

System efficiency and long-term value for money

The impact of our plans on energy bills will be an additional £6.47 per annum. Our plan will include year-on-year efficiencies to keep this impact proportionate. In return, we will bring our long-standing expertise in managing risk and uncertainty as we deliver at unprecedented scale and pace to create a network that will benefit generations to come, boost the economy, create jobs and is resilient to threats.

Impact on annual bills

+£6.47

Long-term boost to jobs

11,000

Long-term stimulus to GDP

£2.0bn

SERVICE

High quality of service from regulated firms

Network users and consumers will remain at the heart of our decision-making as we aim to listen and learn more from our stakeholders. We are committed to delivering on this and improving the quality of service across the full project lifecycle, measured through the quality of connections survey. We are now in the third year of the survey and will strive to further improve our score. We are also investing heavily in new data and digital solutions to enhance productivity, improve service provision and increase our capacity to deliver.

Quality of connections survey (score out of 10)

8.3/10

Our investment in data and digital solutions

£94m



Summary of our total proposed expenditure

Our total expenditure (totex) of £10.6bn to operate the transmission network in RIIO-T3 can be split into several cost categories. We provide an explanation below of each category and illustrate a breakdown of totex by each category in the circle diagram.

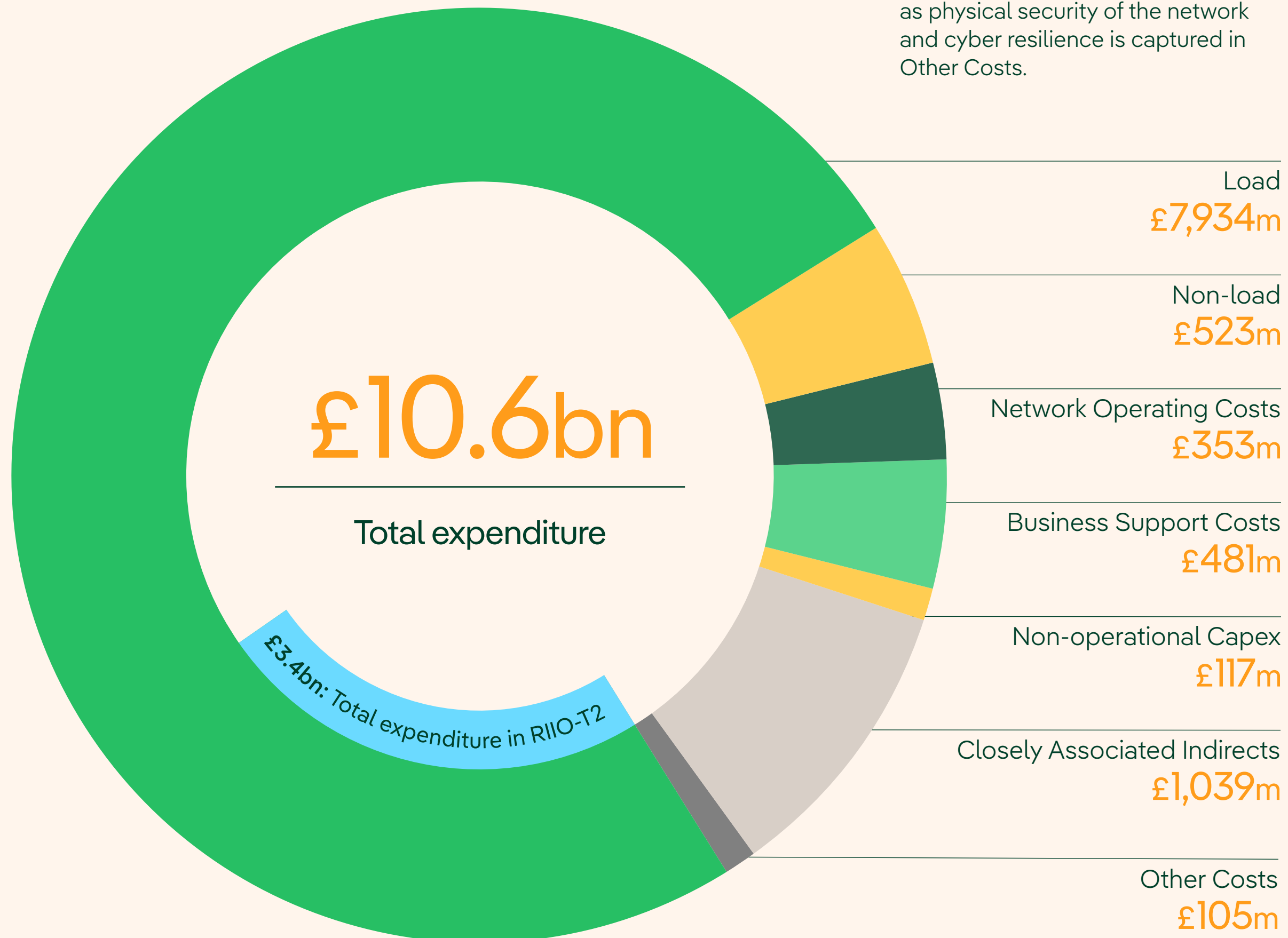
Load-related expenditure comprises all costs in relation to reinforcement of the transmission system due to changes in the generation or demand on the system. It also includes the cost of connecting new generation and demand customers.

Non-load expenditure relates to the replacement and refurbishment of assets, while Network Operating Costs (NOCs) include investments in operational technology as well as inspection, maintenance, fault repair, substation electricity costs and dismantling of redundant assets.

Indirect activities are those that support the delivery of work being carried out on the transmission network, but do not themselves involve physical contact with the infrastructure assets. Costs associated with indirect activities fall into two main categories:

- Closely Associated Indirect (CAI) costs which include expenditure on activities for designing, co-ordinating and managing work being delivered by our operational teams e.g. project management, network design and engineering support etc.
- Business Support Costs (BS) which includes operational expenditure on support functions required to run our business e.g. HR, finance, IT and telecoms, etc.

Non operational capex costs includes expenditure on IT, telecoms, property, and vehicle assets. Expenditure such as physical security of the network and cyber resilience is captured in Other Costs.



Our revenues

We recover investment in the network through annual charges to bill payers over a over the long term. We refer to our annual charges as our revenues. The RIIO-T3 revenues in the table below reflect our finance proposal to Ofgem and are at levels we need to attract investment and raise debt. We expand on our proposals in [Section 4](#) → of this document and provide details of our analysis in our [Finance Annex](#).

The regulatory arrangement of collecting revenues over the lifetime of assets is to ensure customers are paying for those assets as they are in use. This also results in less volatile charges for customers and provides inter-generational fairness between customers who use the network over its lifetime.

The consequence of such an arrangement is that we need to fund this investment in the short term with a reliance on borrowing from banks and investors, who in turn require a return on their investment. It is therefore crucial that there is a fair return allowed relative to the risk and other investment opportunities in the wider market.

In RIIO-T2 and RIIO-T3, 'Other costs' – in terms allowed revenues – are deemed to be negative because it captures elements that must be excluded from the calculation of our allowed revenue. These reductions to our allowed revenue are known as directly remunerated services (DRS), and relate to revenues recovered directly by us for the provision of certain services defined in our licence such as connection services or diversionary work (relocating parts of our network) under obligation. The exclusion of DRS elements ensures that network charges only recover revenue that TOs have not already been remunerated for directly.

Revenues Comparison 2023/24 prices	RIIO-T3 (£m)	RIIO-T2 (£m)
Past Investment (including all revenue items)	2,179	1,488
Recovering Investment (including financeability adjustment)	920	81
Operating the network	761	493
Cost of Financing	1,413	165
Taxes	315	234
Other costs	-22	-95
Total	5,567	2,366

Impact on consumer bills

Transmission Network Use of System charges (TNUoS), the official term for charges used to recover revenues, have so far remained relatively consistent for consumers over the last two price control periods.

The step change in investment in the transmission network will mean that TNUoS charges during the RIIO-T3 period are expected to increase. However, the impact of this increase is smoothed out due to longer term recovery of investment. TNUoS charges – which combine charges from all TOs in GB – are expected to increase from c.£45p.a. to c.£97p.a. Our element of this charge would be around £12.07 per bill payer, per year in RIIO-T3. It is currently £5.60 in RIIO-T2. Therefore, our plans in RIIO-T3 represent an increase of £6.47 in annual energy bills. The diagram here shows the annual TNUoS cost attributable to our plans over the last two price controls and what it is projected to be in RIIO-T3.

Independent analysis has found that households across the UK would be better off by £46.78 per annum by 2030 and £60.21 per annum over the long term as a result of our investment. Given that context, we believe an increase of £6.47 in annual bills represents value for money.

Our impact on the bill



We are committed to making our plans for RIO-T3 clear to all of our stakeholders. Our plan is comprehensive, ambitious and focused – with detailed and compelling cost and engineering justification. That ambition extends to how we are presenting our plan. By doing all we can to make our plan and the supporting reasoning transparent, easy to understand and easy to navigate for anyone who wants to know more.

Guide to our plan

This document is the foundation to understanding the scope of our plan and the rigour and expertise on which it is built. We organise the material in three sections.

First we explain the “what” – the large range individual projects and activities we are delivering to expand the capacity of our network and strengthen its integrity.

Secondly, we step through the “how” – the foundations we have built and will grow over RIO-T3 to ensure this large, ambitious programme of work is deliverable.

Thirdly, we conclude with the “why” – describing and quantifying the value that our plan delivers, what it will cost, and the conditions for attracting the necessary investment.

The plan can be read end-to-end in this order, but is also designed to help readers navigate easily to specific parts. Each section and significant part is prefaced with a summary and links are provided to supporting annexes where a more detailed understanding is required. There are also illustrations throughout our plan of the critical role that stakeholders have played in shaping and influencing what we are proposing.

We also recognise the importance of not losing sight of the key outcomes that every individual element of our plan is ultimately seeking to promote. To this end, we map our plan elements clearly and directly to the four key outcomes for energy consumers articulated by Ofgem which we flag as infrastructure, resilience, value and service. You will also see embedded within our plan links to six short videos where members of our team explain different aspects of our plan.

Our business plan and how we are ready to deliver is set out in three sections:

WHAT	HOW	WHY
A defined set of efficiently-sized and costed investment projects to progress with urgently.	Building a capability and readiness to respond and deliver quickly, efficiently and at scale.	The value our plan delivers.
The rigorous asset stewardship and interventions we undertake to maintain the integrity of the network.	Deepening our grasp of priorities and insights from stakeholders and supporting communities that host our network.	The total expenditure in our plan and how we have tested those costs for efficiency.
The critical importance of maintaining the highest standards of service for today’s network users and customers in our operations and safeguarding measures.	The evolution in how we embed digitalisation, unlock the value of data, and meet the needs of our stakeholders.	The impact of our plan on bills.
	The vital role of innovation in how we develop and advance our business.	The parameters needed to ensure it remains financeable and investable.
	Our drive to minimise the environmental footprint of our own activities and supply chain.	

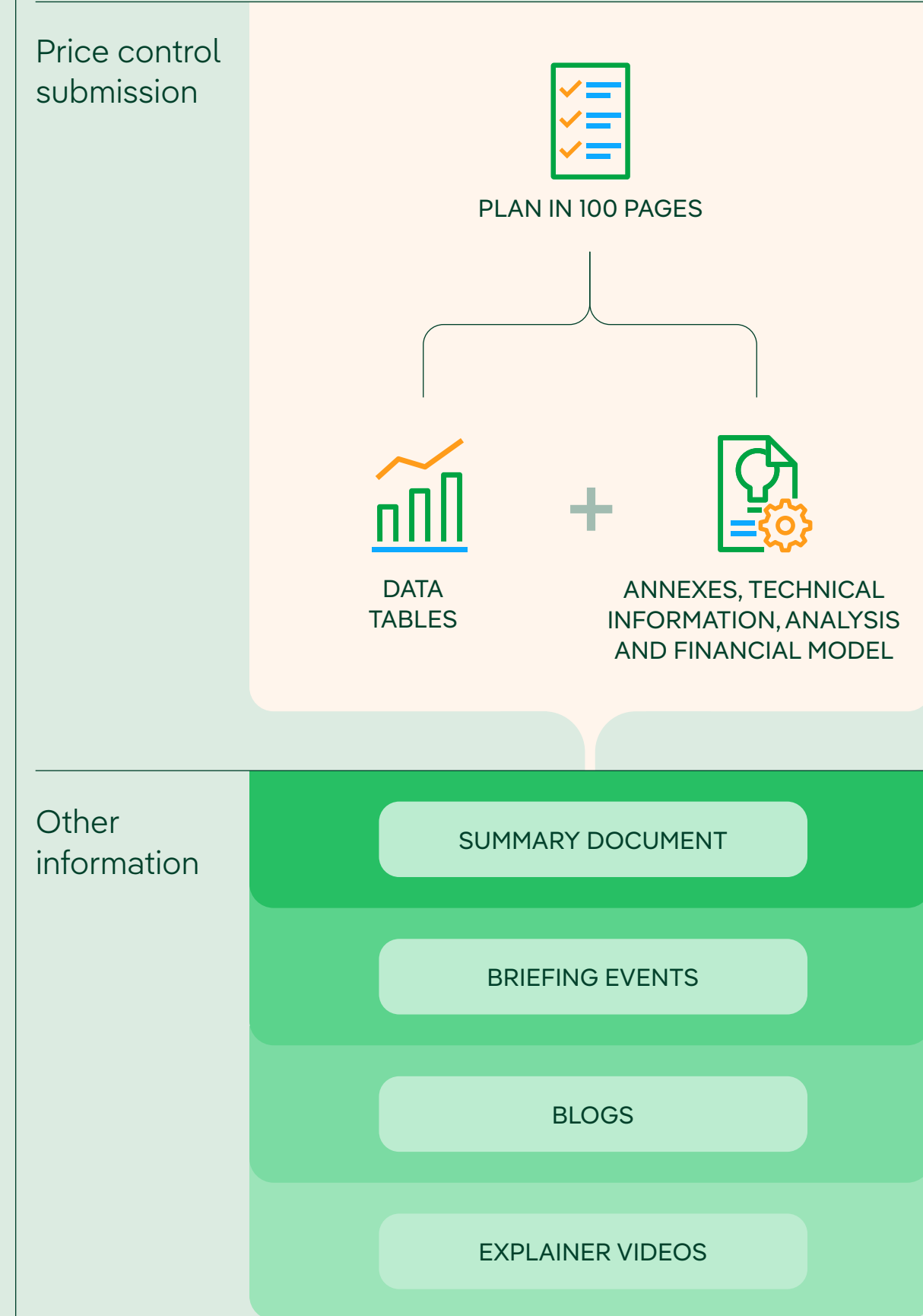
Signposting delivery of consumer outcomes:



Accessing Information

Our price control submission to Ofgem is comprised of this document, data tables, detailed annexes, technical information, analysis and modelling. We publish the main documents of our price control submission on our website. As illustrated in the diagram below, we also provide other information – a high-level summary of our plan, blogs and explainer videos – to communicate our plans more widely.

Material supporting our plan



BUSINESS PLAN COMMITMENTS

Our key commitments

We have set out a series of business plan commitments for the RIO-T3 period. From a long-list we have carefully curated those commitments to create a focused set of challenges across the full range of our activities which will make us think outside of our business-as-usual operations, show ambition, are rooted in evidence and can clearly deliver additional value for our customers and communities. We have ensured each has a clear implementation plan and metrics to track progress.

17

You can find our full suite of 17 commitments, their timelines and metrics we will use to demonstrate performance later in our plan.

INFRASTRUCTURE

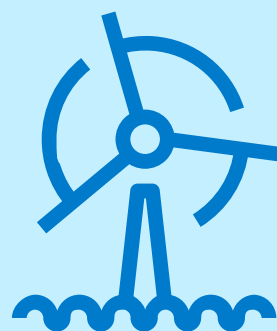
RESILIENCE

VALUE

SERVICE

Enable the transfer of more clean, green power

We will deliver projects which will increase the network capacity of the Scotland - England (B6) boundary from its current capacity of around 6.6GW to approximately 10GW.



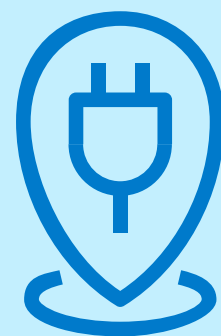
Maintain a cyber resilient network and cyber secure services

We will commit to continuous improvement in cyber security, ensuring compliance with Network and Information Systems (NIS) regulations and enhancing our cyber resilience. We strive to protect our systems and deliver reliable and resilient services to our customers, through continuous monitoring, employee training, and collaboration with industry partners.



Reduce greenhouse gas leakages

We will install SF₆-free equipment in RIO-T3. SF₆ filled equipment will only be installed if a viable SF₆-free solution is not available. We will also reduce emissions from SF₆ leakage in line with the trajectory required to meet our Science-Based Target (SBT).



Build our resilience to cyber threats

We will commit to a dynamic, risk-based approach to cyber security, informed by the latest threat intelligence. We will safeguard our critical infrastructure and maintain robust cyber resilience, through adaptive security measures, continuous risk evaluation, and strategic investments in advanced technologies.



Empower the Net Zero ambitions of our communities

We will deliver a £20m Net Zero Fund in RIO-T3 to enable more communities we serve to take part in the transition to Net Zero. Building upon success of our RIO-T2 Net Zero Fund, we will continue to provide vital support and tailored guidance to help communities develop robust Net Zero plans and projects. We will work with community organisations and charities across our licence area to enable local decarbonisation initiatives and fund projects which will accelerate Net Zero transition and generate measurable social value.

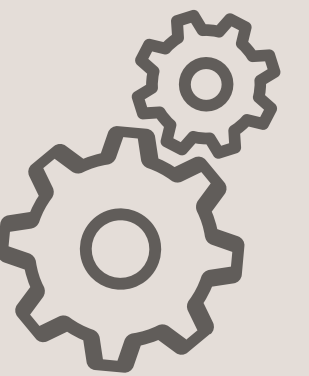
Protect and enhance nature through our projects

We will deliver nature enhancements across all projects with a measurable impact on ecosystems, achieved through local partnerships, providing at least a 10% increase in biodiversity on projects subject to planning consent.



Reduce carbon emissions in our operations

We will deliver economically efficient actions to reduce our Scope 1, 2 and 3 Greenhouse Gas (GHG) emissions in line with our sector-leading 2035 Net Zero GHG Target, including targeting 80% of our supply chain, by spend, to set externally validated GHG reduction targets.



Grow a resilient workforce

We will improve our capability to deliver at pace. We have already started this transformation process and we will implement our new delivery-focussed operating model by April 2026. We have already recruited 300 new resources over the last three years, and we will recruit around 1,400 brand new roles over the RIO-T3 period. We will fill 200 of our technical roles through our trainee programmes.



In this section we step through our plans for investment and operational activities that are critical to keeping our network safe, secure and reliable – while also scaling up at pace the capability of our network to connect new generation and handle power flows within and across our network. Plans integral to making a successful transition to a sustainable energy sector, and to dealing with new and heightened physical, climate and cyber risks to our energy security. We begin by describing and illustrating the scale of change required to move from today’s network to the network we need.

Key stakeholders

UK Government, Scottish Government, Regulators and Planning Bodies; Consumer & Community Groups, INZAC, Media; NESO, other Transmission Owners, wider industry, supply chain

Examples of impacts on our plan:

Actions to manage SF:

Working with our Sustainability Stakeholder Working Group, and consulting externally on our Environmental Action Plan using our Engage360 platform, we built strong consensus around the need to act, but also insights that challenged the value-for-money of installing real-time leakage monitoring. Our own analysis validated this, resulting in a cost saving.

Setting priorities for climate resilience:

Our strategy has been strengthened significantly through engagement. Including through our close collaboration with Network Rail and being able to draw on the expertise and insights of organisations like Sniffer, one of Scotland’s leading sustainability charities. This led directly to a change in the pilot projects we are running during RIO-T3 to prioritise slope stabilisation.

What we need to deliver

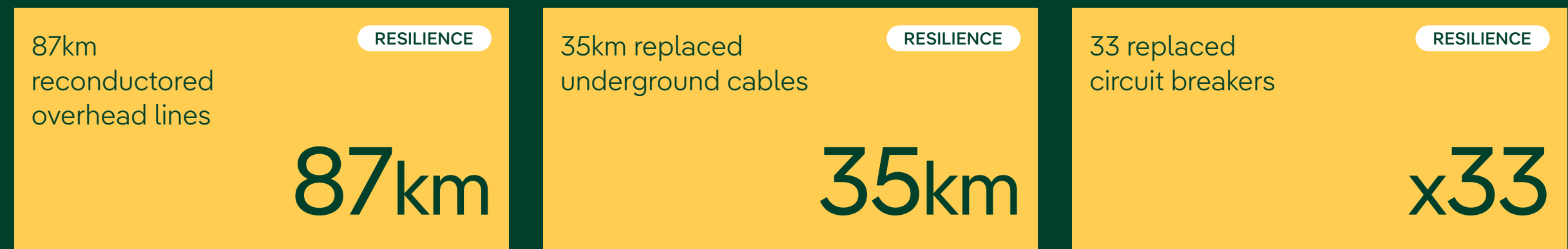
MARYAM HEIDARIAN,
Load Lead Engineer
explains our approach →



Our load-related investment

Adding significantly to the infrastructure available to meet the growing needs of new transmission users.

£7,934m



Increasing the resilience of our assets

Maintaining the integrity of our network assets through targeted, risk-based replacements and upgrades.

£523m



Maintaining the integrity of our network

Maintaining the integrity of our network through how we inspect, protect and operate our network to inform when and how we intervene.

£259m

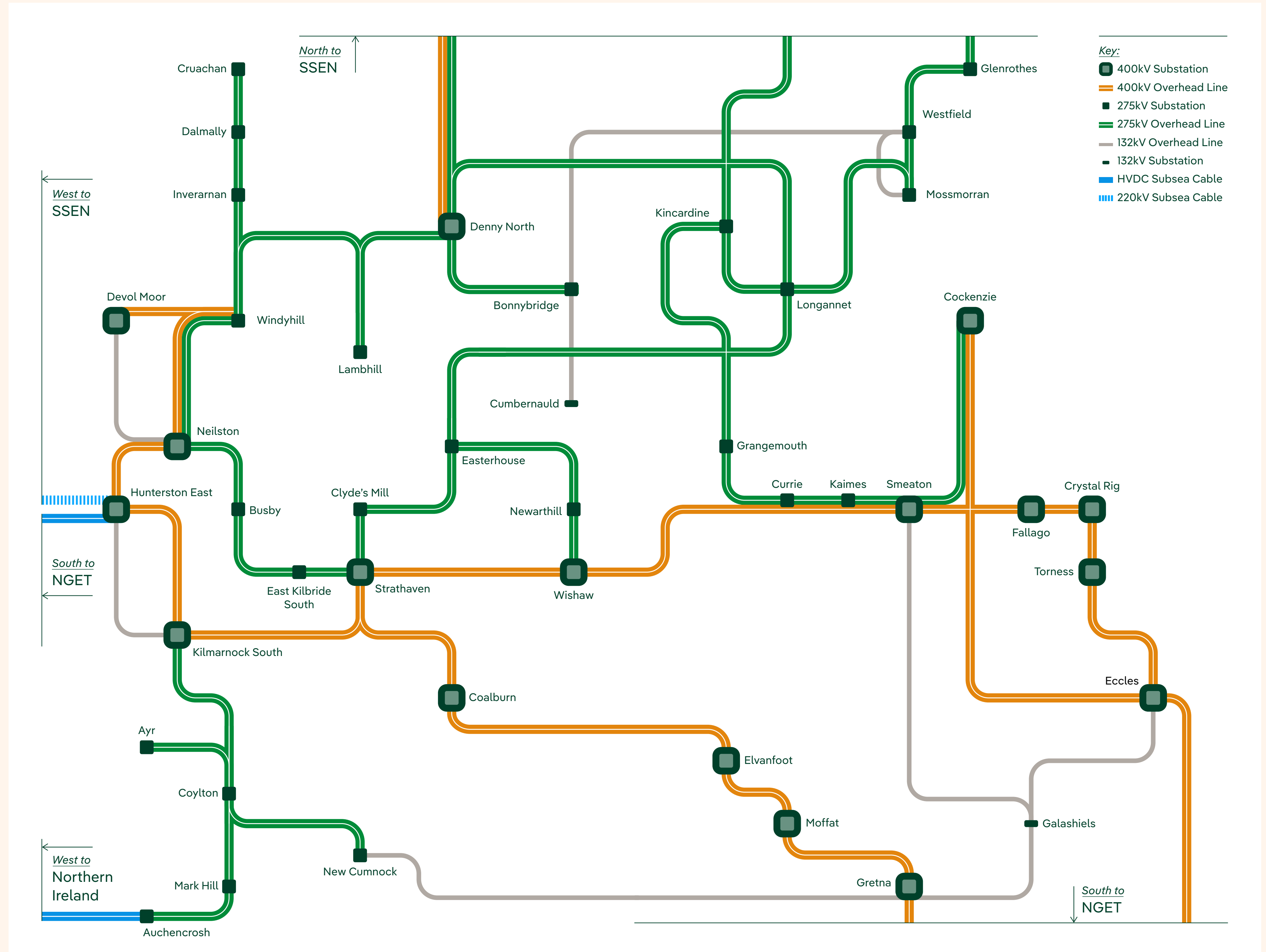
The network we have today

The core purpose of a transmission system is to enable electricity supply and demand to be balanced in real time, over a large geographic area. The backbone of the network we have today was built to achieve this by routing power from a small number of large, predominately coal-fired, power stations such as Longannet and Cockenzie, to local distribution networks. The power flowed in one direction – from generator to the distribution network – and stayed largely within our own system boundaries.

The requirements of the system have changed. Coal plants with useful system benefits have closed and large variable wind farms now connect directly to the network. Distribution-connected resources can also affect transmission operation. Transmission assets have had to be built within areas that previously had none, where wind resources are high-quality. Power flows on the system are now multi-directional across the transmission system, but also to and from the distribution system, leading to upgrades to existing assets to manage this change. We also now rely far more heavily on inter-area power flows between ourselves, SSEN-T in the North and NGET in the south.

These factors have already driven significant expansion of the transmission network, within our area and working with SSEN-T in the North and NGET in the south to increase bulk transfer capability across the GB system. This includes the construction of the Beaulay – Denny line, which runs approximately 220km from the North of Scotland to the central belt, increasing approximately 1.2GW over the B4 boundary, and the Western High Voltage Direct Current (HVDC) link between Hunterston in our network and Flintshire Bridge in NGET’s area created the first 2.2GW HVDC corridor over B6 between Scotland and England.

This is the legacy that we are building on during RIO-T3 to create the network we need.

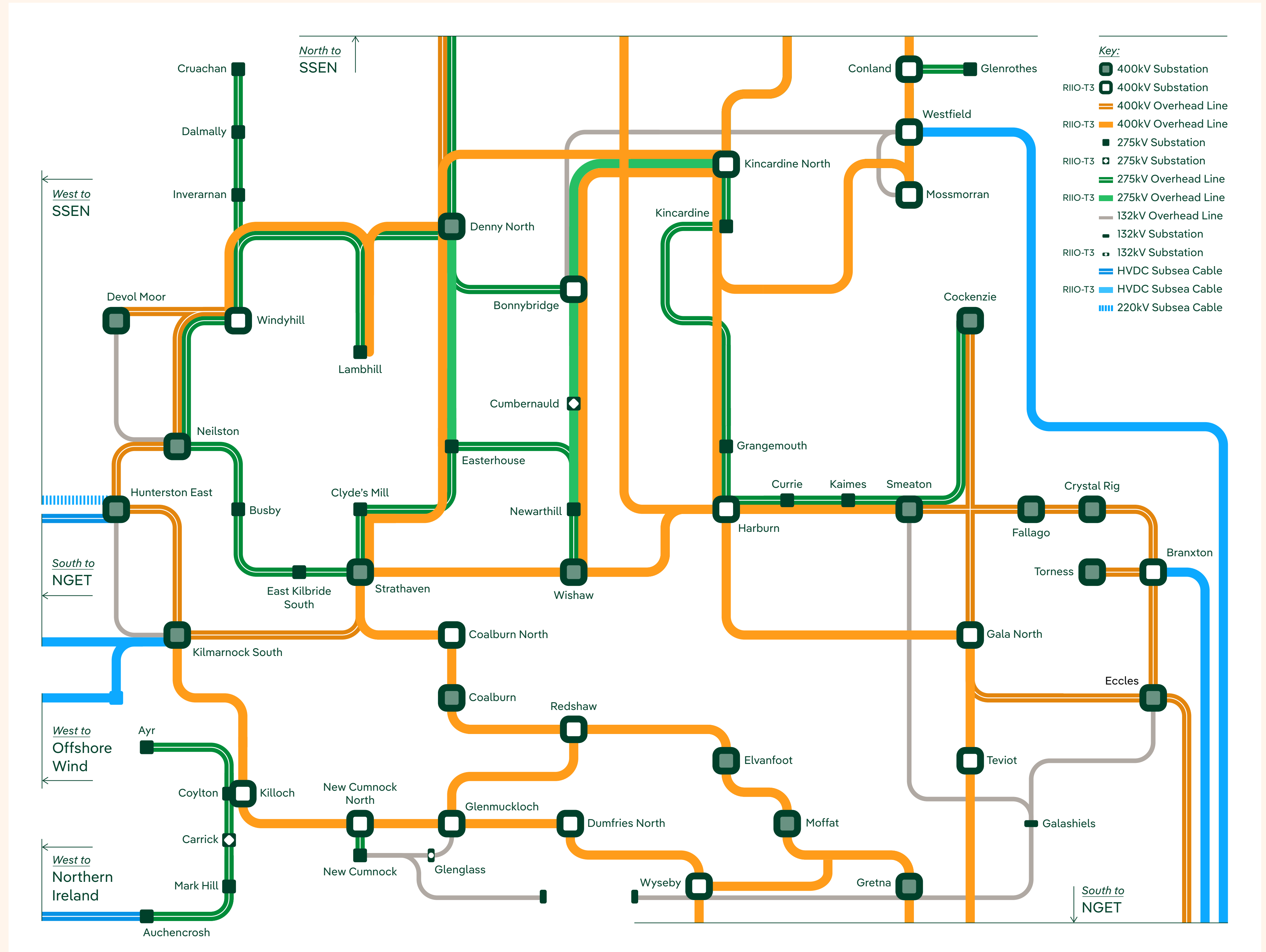


The scale of change to create the network we need

The network we need is fundamentally driven by the decarbonisation of the energy sector – which has been outlined within the UK Government’s ambitions leading to the Clean Power 2030 plan, and will see GB’s electricity system operate at 95% low-carbon generation by 2030. These goals have been translated into pathways by the National Energy System Operator (NESO) through its Future Energy Scenarios (FES). These pathways show the generation, including technology type and capacity, and the demand backgrounds that we need to plan our transmission network to.

The FES 2024 Holistic Transition Pathway requires 28GW of renewable generation to be connected to the SPT system (including embedded generation) by 2050, with the peak demand expected to double from 3GW to around 6GW. This difference between total generation and total maximum demand within the SPT area leads to significant additional energy flows across our system boundaries. For the boundary between Scotland and England, known as B6, the maximum requirements increase to 40GW in 2040. This is in the context of the current capability of around 6.6GW.

Translating the pathways into specific investments on our network also requires us to understand more localised drivers, analysed and quantified in the Distribution FES (DFES) created by our local DNO, SP Distribution (SPD), with its local view of the generation and demand requirements. These allow us to work with SPD to target our network investments to best support both Transmission and Distribution customers going forward. The result is a portfolio of optimised investment projects to deliver large-scale changes and the network we need. It sees us maximise the use of our existing network assets, by reconductoring the majority of our main transmission corridors with high capacity conductors. It also sees us roll out targeted ways to strengthen our ability to restore the network in emergency situations. And it sets out plans to progress major new transmission corridors in South West and South East Scotland, and further expansion of capacity through the traditional backbone of our network through Central Scotland.



Understanding the network we need

Our plans are integral to a national effort to create a sustainable and secure energy system, aligned to pathways to Net Zero modelled by the National Energy System Operator (NESO). We also plan jointly with the Distribution Network Operator we serve, to ensure that opportunities are not missed to design in incremental improvements.

A key resource is the Future Energy Scenarios (FES) published by the National Energy System Operator (NESO). They represent three different, credible ways to decarbonise the UK’s energy system as we strive towards the 2050 Net Zero target.

The basis of our RIIO-T3 plan is the FES 2024 Holistic Transition (HT) which has been specifically selected and endorsed by Ofgem and uses a balance of electrification and hydrogen to get to Net Zero. The development of the FES considers cross sector factors therefore providing a whole system view of the requirements to achieve Net Zero. They are developed each year by the NESO using its overarching view of the whole GB energy system using research, analysis and stakeholder engagement, and form an industry standard for annual system planning.

It is anticipated that B6 boundary capability will increase from

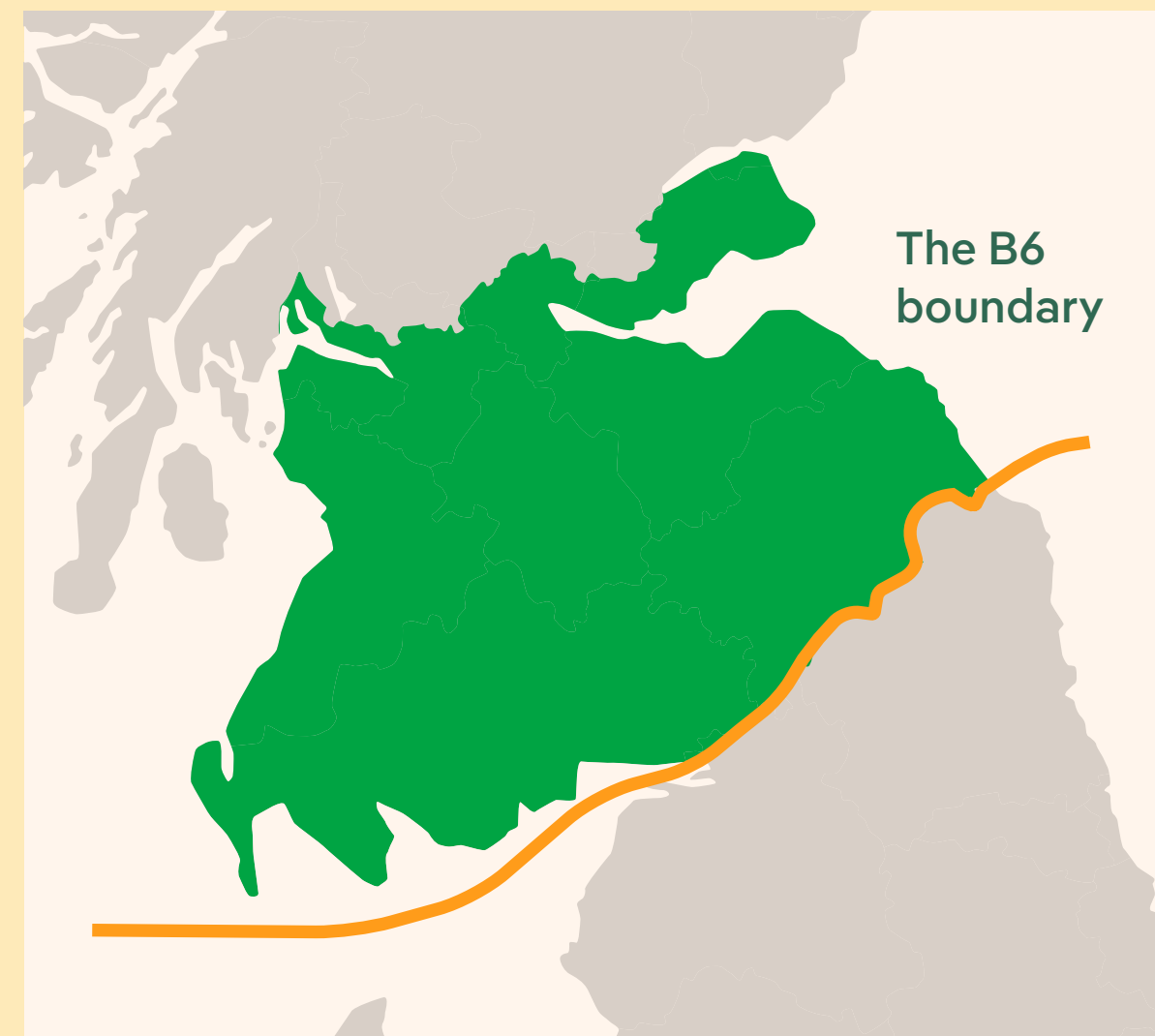
**6.6GW to 40GW
by 2040**

Transporting electricity across the county

Although demand in our area will increase to achieve the Net Zero goals, the renewable resources we have means that we need to invest to enable significant electricity flow across boundaries between our network and other parts of the country.

The FES 2024 also provides a guide on the level of investment in wider system reinforcements required to facilitate these bulk power transfers by showing power required over the system network boundaries. A key system boundary lies south of the SPT area – connecting the SPT network with the north of England, B6. The maximum required transfer over this boundary is largely consistent for all northern boundaries: additional investment is required across the full GB system to enable bulk power transfer.

The current capability of the B6 boundary is around 6.6GW with required transfer rising to around 40GW by 2040. How significantly and rapidly the role of our network has changed is illustrated by required capability of the B6 boundary. In 2019, when we were developing our last 5-year plan, the forecast was for a 14GW transfer capability by 2040. The level of power flow across the system based on the FES is the basis for the economic analysis carried out by the NESO to inform our wider system reinforcements – further information on this can be found in the ‘Strategic Projects’ section of this document, and in the NESO’s Pathway to 2030 and Beyond 2030 reports.



New Connections

The FES pathways are not blueprints and there are many different ways in which progress along a particular pathway could affect how and where we need to expand our network.

The impact of this uncertainty is most acute for new connections. We need to plan for many different combinations of new connections across a wide geographic area and the connections queue currently has over 78GW of generation, dominated by battery storage whereas the FES 2024 Pathway requires less than 30GW of generation connected within the SPT area by the end of 2050. Therefore the queue is significantly over-subscribed. If we invested for all 78GW and the pathway was as modelled, much of the investment would be under-utilised. Similarly, we cannot invest for a specific combination of new connection projects to comprise the 30GW assumed in the FES because those might not be the combination of projects that proceed.

The generation profile provided by the FES provides us with a tool to inform our investment plans – feeding into our connections probability analysis to target parts of our network where the risk of under-utilisation is low if we were to build additional capacity for generation.

The ongoing Connections Reform work, aligned with the UK Government’s ambitions to create a Clean Power 2030 plan, could have a significant effect on the precise requirements for individual connections. Our plan can flex to accommodate these changes.

We also use the FES to provide a view on future demands on the system and it shows that overall demand will increase across the distribution system to achieve Net Zero by 2050. The increase in residential demand due to the electrification of heat and transport will be offset to an extent by greater efficiency. Although flexibility will play a role in managing these demands, it is anticipated that the SPT area demand (at GB Peak) will double from around 3GW to 6GW by 2025.

In addition to the FES, we use the SP Distribution’s Distribution Future Energy Scenarios (DFES) as they are based on the FES but applying their local knowledge. The FES recognises significant demand growth across many existing sites in the coming years with the uptake of Low Carbon Technologies (LCTs).

We work closely with SP Distribution to provide optimal solutions for increases in capacity – be it through uprating of existing substations or establishment of whole new ones – to ensure the best solutions are developed. We have contracted significant new transmission connected demand, for example hydrogen electrolysers and data centres. We have used our Transmission Economic Connections Assessment (TECA) to assess these and assign probabilities to each project and have included within our plans accordingly.

System operation

The strategic approach to planning how energy networks need to develop also identifies challenges relating to system operation, specifically potential stability issues associated with the changing mix of generation technologies used to meet demand. This has informed a number of projects to be included within our plan, for example:

Synchronous compensation – required for stability and voltage control, particularly at times of high power transfer.

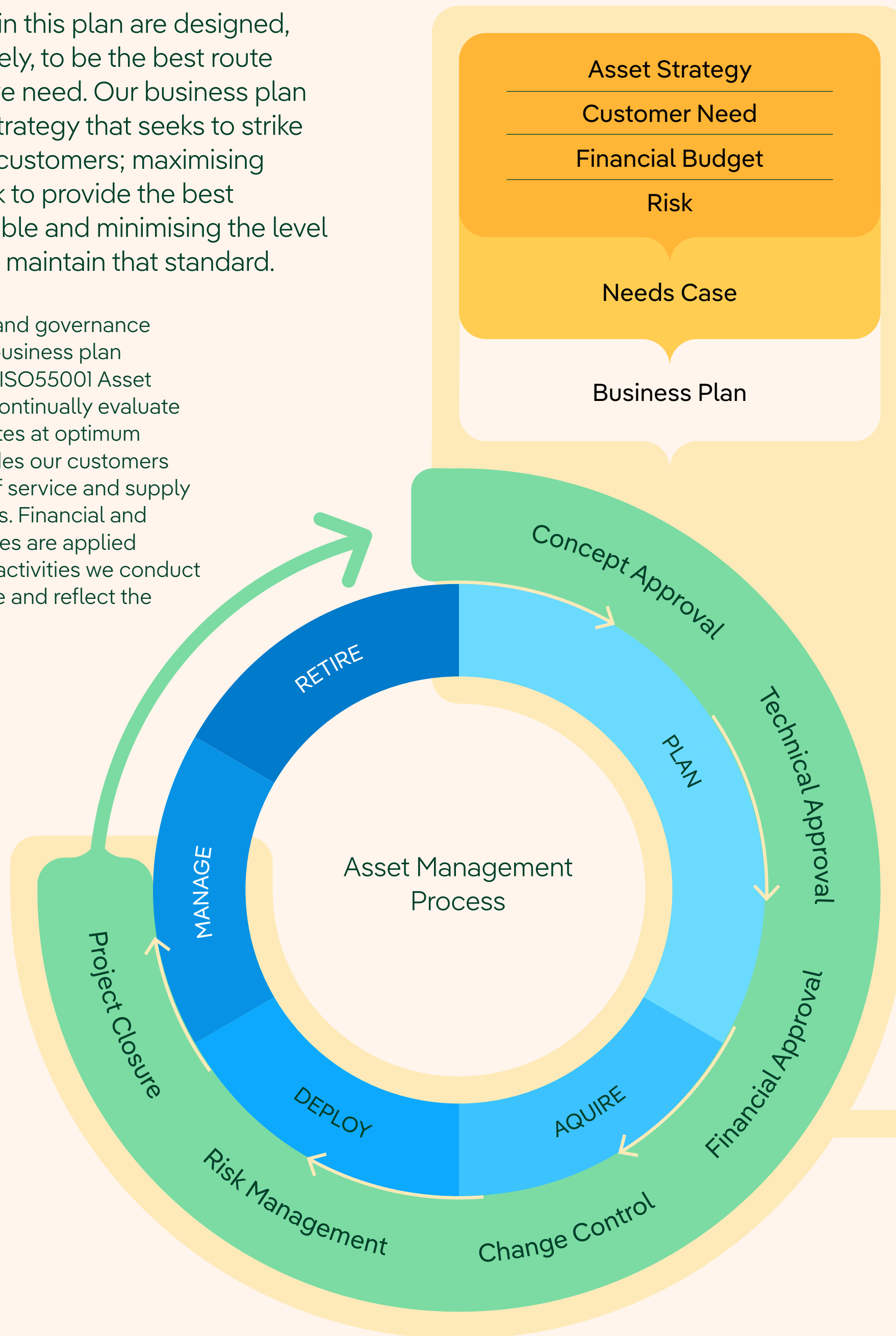
Harmonic Filters – consistent with our approach in RIIO-T2, we have identified a number of key sites that will suppress harmonic issues seen across the predominantly wind-dominated system 132kV.

Detail of these types of projects can be found within our Load-related activity.

Planning a path to the network we need

The portfolio of projects in this plan are designed, individually and collectively, to be the best route through to the network we need. Our business plan is based upon an asset strategy that seeks to strike the best balance for our customers; maximising availability of the network to provide the best standard of service possible and minimising the level of investment required to maintain that standard.

Our investment management and governance process intrinsically links our business plan with our externally accredited ISO55001 Asset Management processes. We continually evaluate our network to ensure it operates at optimum performance levels and provides our customers with the continued standard of service and supply they have come to expect of us. Financial and technical governance processes are applied throughout to ensure that the activities we conduct on our network are appropriate and reflect the needs of our customers.



We employ a series of phase gates in our process to ensure we correctly evaluate, challenge and ultimately deliver the best balanced solution for all our stakeholders. We provide strong governance and control of our investment process in the shape of stage gates.

We consider many factors to determine the significance of each network need and this early stage of the process is essentially just an idea until it passes the Concept Approval phase gate. At this stage the idea becomes an actual project having passed the first stage of validation.

We then complete a Technical Approval, reviewing the available options to satisfy the network requirement which where possible will be supported by a Cost Benefit Analysis. Upon agreement of the most efficient solution, approval for initial funding for the project is then sought using the Pre-Construction Development (Seed) Funding stage of Financial Approval. This is a significant project milestone essentially moving the project from Concept/ Design into the Delivery Phase, allowing preliminary works to commence and spend to be incurred on the project.

At each stage and for every project we gather evidence and challenge ourselves to answer two fundamental questions. First, is this network need still valid? Second, does the option being proposed today offer the best available balance of all the factors? This ongoing discipline and rigour is key to giving us, and all stakeholders, confidence that our portfolio of projects remain optimal over time, and where necessary adapt and flex.



As GB demand for electricity grows over time, and the location of generation to meet that demand changes, the size and shape of our network needs to flex to match. We call this type of network investment “load-related”. The accelerated shift from fossil-fuel generation towards renewable generation alongside the use of large-scale battery storage and the electrification of heat and transport is driving huge increases in the need for load-related investment across GB, and on our own network. GB-wide strategic planning and co-ordination through NESO, together with more localised co-ordination with the distribution network we serve are both key influences on our investment plans.

In this part of our Plan for RIIO-T3 we set out a portfolio of load-related investment projects, sized and sequenced to match most efficiently where and how the network needs to grow. This involves projects across four different categories, reflecting different purposes, maturity and levels of certainty. But all are on the critical path to creating the network we all need.

New connections

How we are planning and managing the investment to support each of the 377 projects currently in the queue to use the transmission system.

Baseline projects

The network investments that are ready to be completed, and are proposed to be funded as part of our baseline revenues.

Projects with uncertain costs

The network investments that are in the development pipeline and will need funding released during RIIO-T3.

Strategic projects

Investments already flagged as strategically important, and with separate funding arrangements being progressed in parallel with our RIIO-T3 investments.

Our load-related investment

Connecting renewable generation

15x projects in development

Reinforcing across the full transmission network to increase capacity across all SPT transmission boundaries.

Capacity of projects we expect to connect during RIIO-T3

19GW

Compared to 12GW connected during RIIO-T2, and the forecasted 28GW by 2050 in NESO pathway.

Innovation built-in

A whole system approach

Building on the value of past strategic investment to roll out our world-first Distributed Recovery Zones (DRZs) system restoration arrangements.

Future-proofing

21 strategic projects

Investing £4,077m in projects that are being progressed in parallel with our plans and ambition for RIIO-T3.

Projects for new connections

There are 377 new developments in our connections queue, comprising 78GW of capacity – and we have project designs for all of them. But this far exceeds the volumes required in aggregate under the National Energy System Operator’s pathway to Net Zero.

In this part we describe the scale and composition of the queue of new developments applying for connection to our network. This includes how we are planning around the uncertainty over which developments will proceed, and examples of the investments and technology typically involved when we proceed with enabling works (i.e. modifications or reinforcements to the network). An important feature of the arrangements for new connections is that in many cases only a small part of the total costs are paid for by the connecting customer. There are a number of different potential funding mechanisms for the enabling works, depending on scale and complexity.

Assets that are needed only to connect a single customer, known as Connection Assets, are funded directly by the customer. Other assets that could be used to connect additional customers or that become part of the transmission system more generally are funded by the following mechanisms:

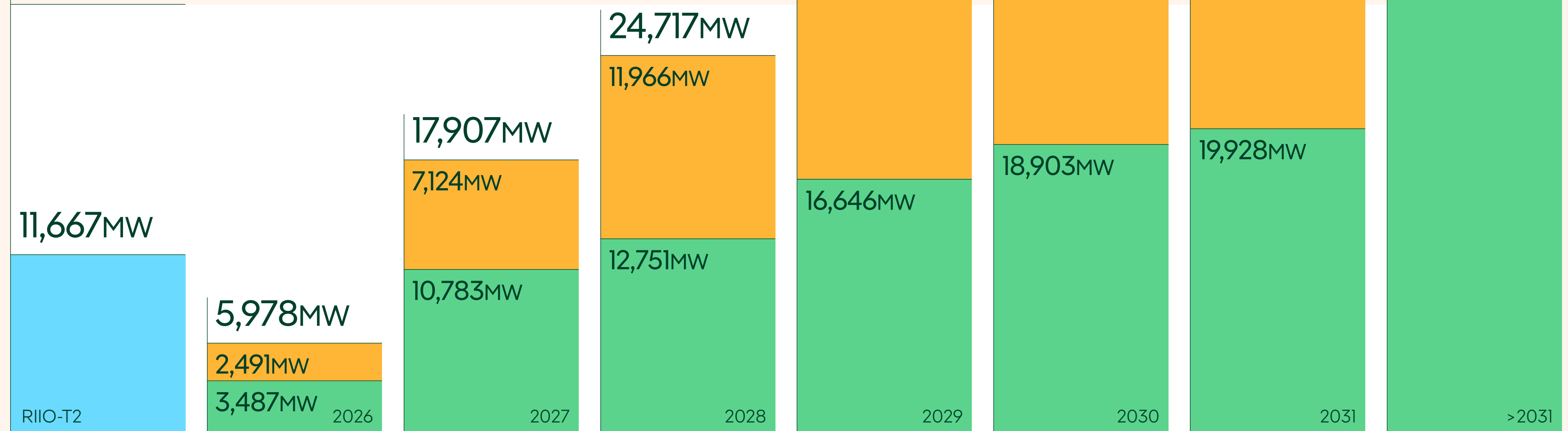
Volume driver – similar to RIO-T2, a set of unit costs will be agreed for typical connections projects and applied to determine the allowance of the project.

Atypical connections projects < £25m – unlike RIO-T2 these will be funded with a Use-It-Or-Lose-It pot (UIOLI), where certain costs will be called off against the pot, and any un-used funds will be returned at the end of the period.

Atypical connections project > £25m – will be funded via the Load Related Reopener – where in period applications will be made to confirm needs and costs, and allowance made if these are approved by Ofgem.

'FES pathway to Net Zero' assumed generation in our area by 2050

28,000MW



The chart below illustrates our contracted queue and how it divides into high, medium and low probability projects. The values in each year are cumulative. SPT’s best view, excluding low probability projects, shows today’s queue at over twice the size of that in RIO-T2, with the contract to deliver more new capacity in 2028 alone than across the entirety of RIO-T2. This increased capacity generally leads to increased complexity in the investment required to provide connection.

Creating and updating a 'Best View' to plan against

We support all connection applications by producing detailed, project-specific designs for the works on our transmission system. But the amount of capacity nominally waiting to connect far exceeds the amount NESO assesses as being needed under any of the credible pathways to Net Zero.

We analyse the portfolio of projects in the queue on an ongoing basis using our TECA methodology to form a 'Best View'. We use the results to plan our programme of supporting load-related investments and inform how best to deploy our project development delivery resources, for example to prepare for and progress planning applications. This tool helps us get projects connected more quickly, and design better targeted investments.

With over 730GW of contracted capacity currently in the GB-wide transmission and distribution queues, there continues to be a pressing case for significant reforms to the existing GB-wide connections process. We therefore continue to be fully engaged in the UK Government's ambitions for a Clean Power 2030 plan and the NESO and Ofgem-led Connections Reform work in the changes to policy and regulation to better manage the connections queue. In the meantime, our TECA methodology represents an innovative, pragmatic and effective way to accelerate progress of new connections at efficient cost. The TECA methodology has been shared and tested with stakeholders and INZAC through its development, and is an excellent example of how effective stakeholder engagement is impacting how we operate as a business.

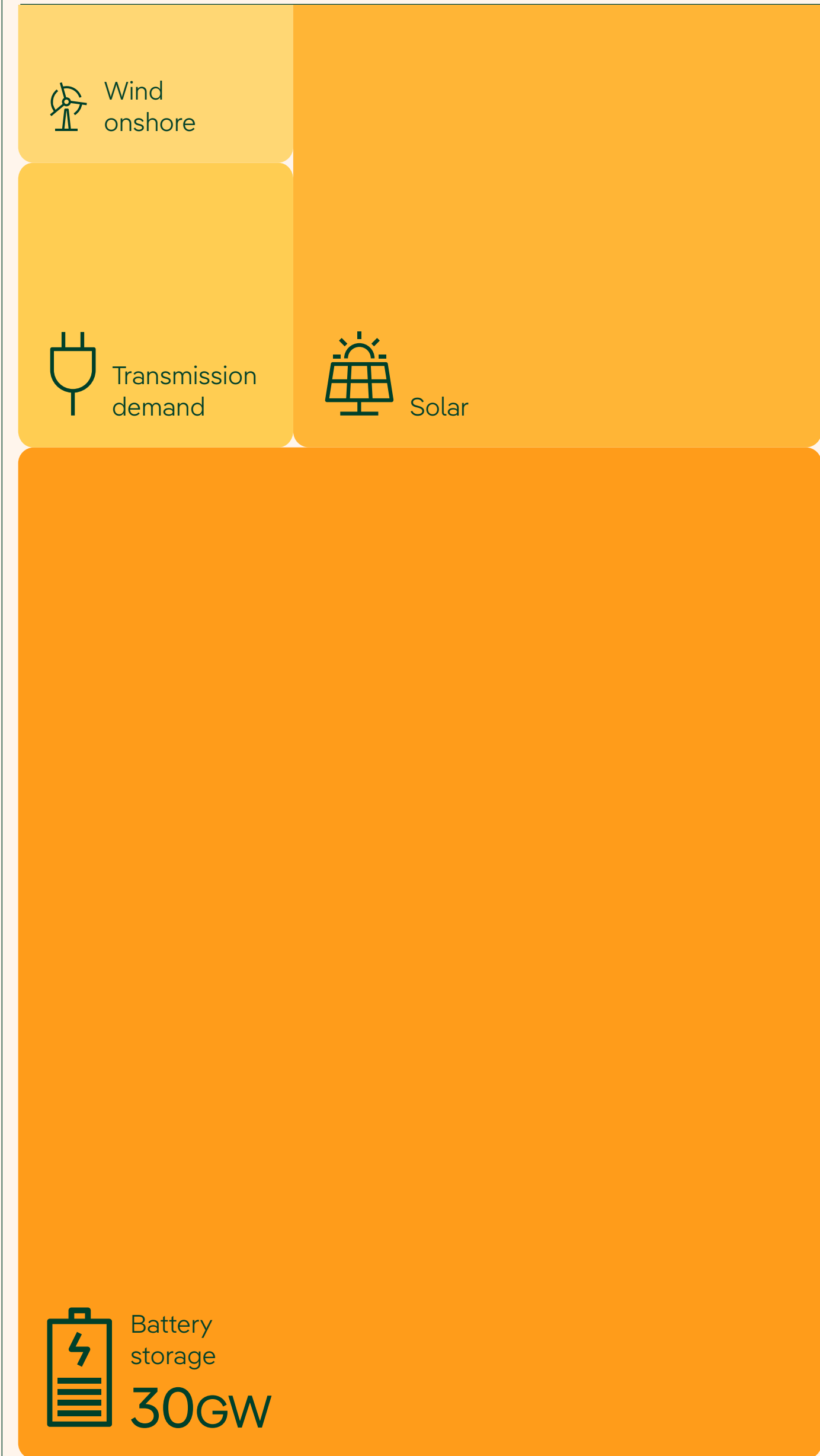
The diagram opposite shows the size and composition of the connections queue when separated into "High/Medium" and "Low" probability projects using our TECA methodology.

It shows the extent of oversubscription relative to the 28GW indicated by the NESO Holistic Transition pathway, and the different technology mix across the segmented queue. To illustrate, under the NESO pathway the overall requirement for battery storage across GB by 2050 is around 2.2% of the full generation mix. This compares to 8GW of high/medium probability projects and 30GW of low probability projects in the queue currently.

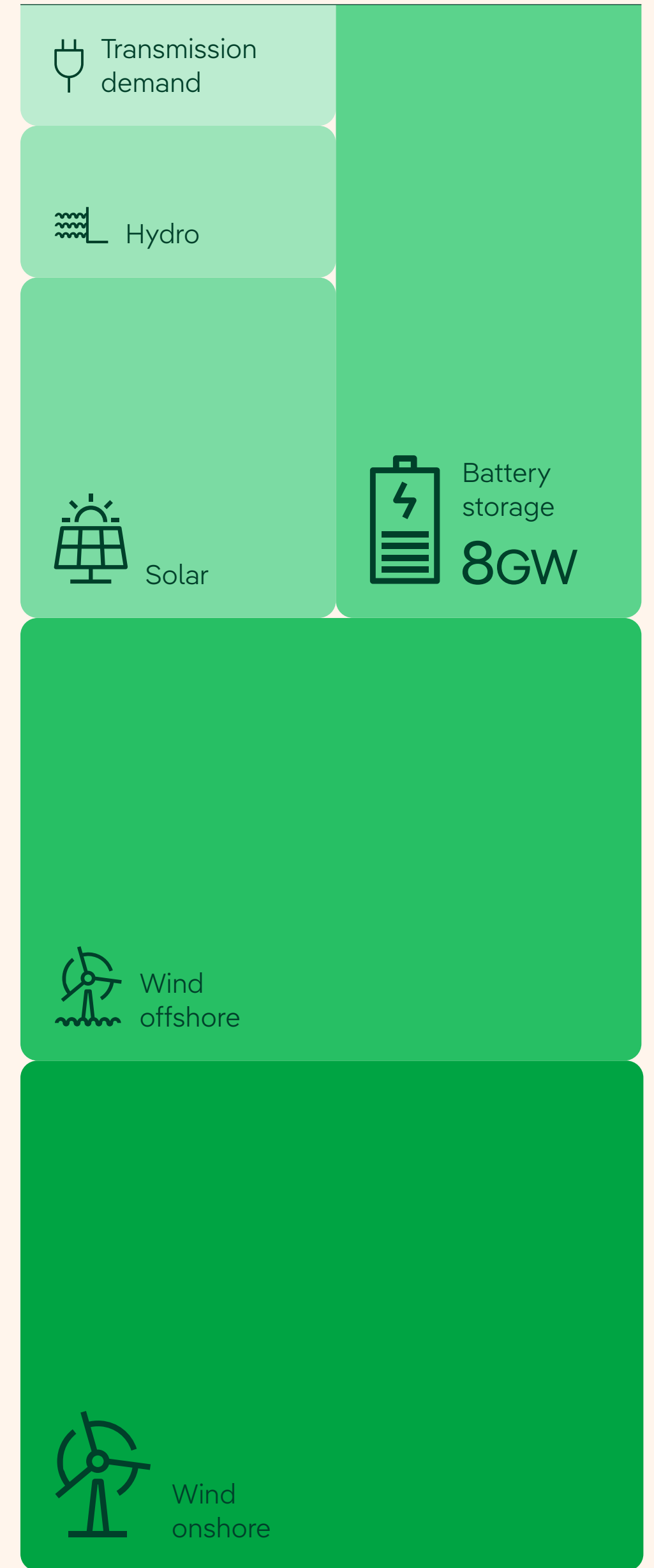
TECA assigns each transmission connection project with a score out of 10 based upon:

	Low probability project	High probability project
Technology maturity Existing experience of a technology locally and globally.	1.5/2.5 <i>Developing technology</i>	2.5/2.5 <i>Widely integrated</i>
Technology subscription Compares connection queue of SPT with FES 2024 and Government targets to determine the requirements.	0.5/2.5 <i>Oversubscribed</i>	2/2.5 <i>Aligns with Government targets</i>
Developer track record General experience of developer in constructing similar projects.	0/2 <i>Inexperienced</i>	2/2 <i>Experienced</i>
Planning milestone Consenting status of the project.	0/3 <i>Application submitted</i>	2.5/3 <i>Approved 2027 energisation</i>
Route to market Clear market route such as existing Contracts for Difference, Capacity Market, or Pathfinder contract.	✗ <i>No contract awarded</i>	✓ <i>Capacity contract awarded</i>
Score From the resulting score, high/medium probability projects become SPT's 'Best View.'	2.5/10	9/10

RIIO-T3 capacity connection queue
Low probability projects



High probability projects





How we plan investment for each connection project

The level of investment required for each individual project can vary – from minimal transmission works of Load Management Scheme (LMS) to provide a non-firm connection to an embedded connection, to a multi-million pound investment spanning over more than a single price control period, with a number of large system reinforcements (in the form of Transmission Owner Reinforcement Instructions or TORIs) also required to enable the connection.

The complexity is generally driven by the location of the new development relative to the existing transmission system, as well as the capacity of the proposed development. A larger capacity development is more likely to drive significantly more transmission works, particularly as any remaining capacity is used up by other projects across the network. Two examples are set out opposite which illustrate the range of projects that are in the connections portfolio.

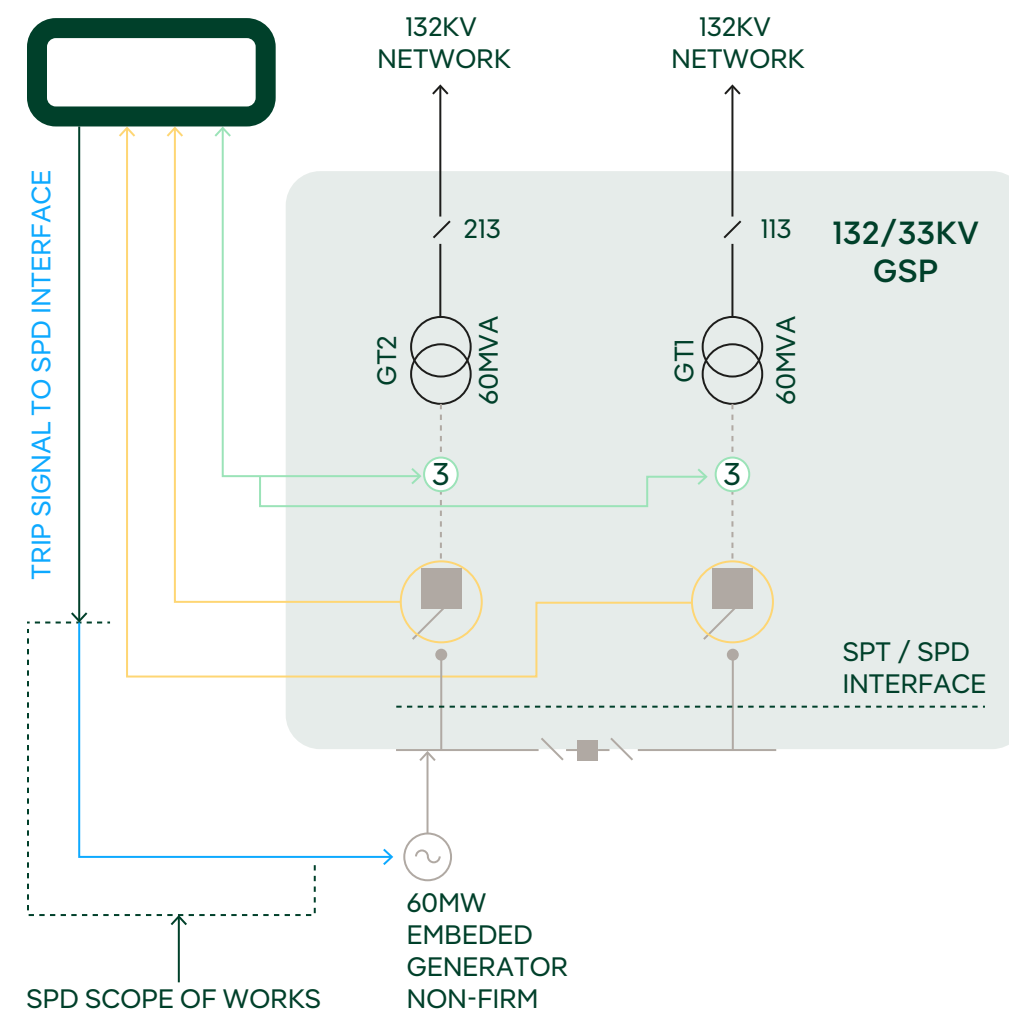
- Key:**
- 520kV (DC)
 - 400kV
 - 275kV
 - 132kV Substation
 - 33kV Overhead Line
 - Connection Asset 99MW wind farm
 - Infrastructure Asset 99MW wind farm
 - Connection Asset 200MW BESS
 - Infrastructure Asset 200MW BESS
 - New TORI New 275kV circuit and collector substation
 - New TORI Extension of 400kV/275kV substation
 - New TORI New 400kV circuit to new 400kV substation
 - New TORI New 400kV circuit to HVDC bussing station
 - Measurement Signal (LMS)
 - Measurement Signal (LoM)

Illustrations of how the scope of connection works varies

SIMPLE EXAMPLE

An example of our most simple connection project is the installation of a protection scheme to enable a connection to SP Distribution’s network, which ensures that the new capacity does not overload a section of the transmission network. This type of project is relatively low cost, around £200k, and will be completed within two years of becoming contracted. It is also an example of how we have taken a technical innovation, and integrated it into our business-as-usual with significant benefits for our connection customers. The scope of works for a 60MW battery connection are:

- At the 132/33kV GSP substation, installation of load management scheme, to prevent overload conditions (specifically when importing) on the single remaining transformer when the other transformer is out of service. The overload will be removed by the LMS disconnecting the battery energy storage system (via SPD).
- A loss of mains (LoM) scheme has also been specified to mitigate the risk of creating an islanded 33kV system for the loss of the 132kV supply.



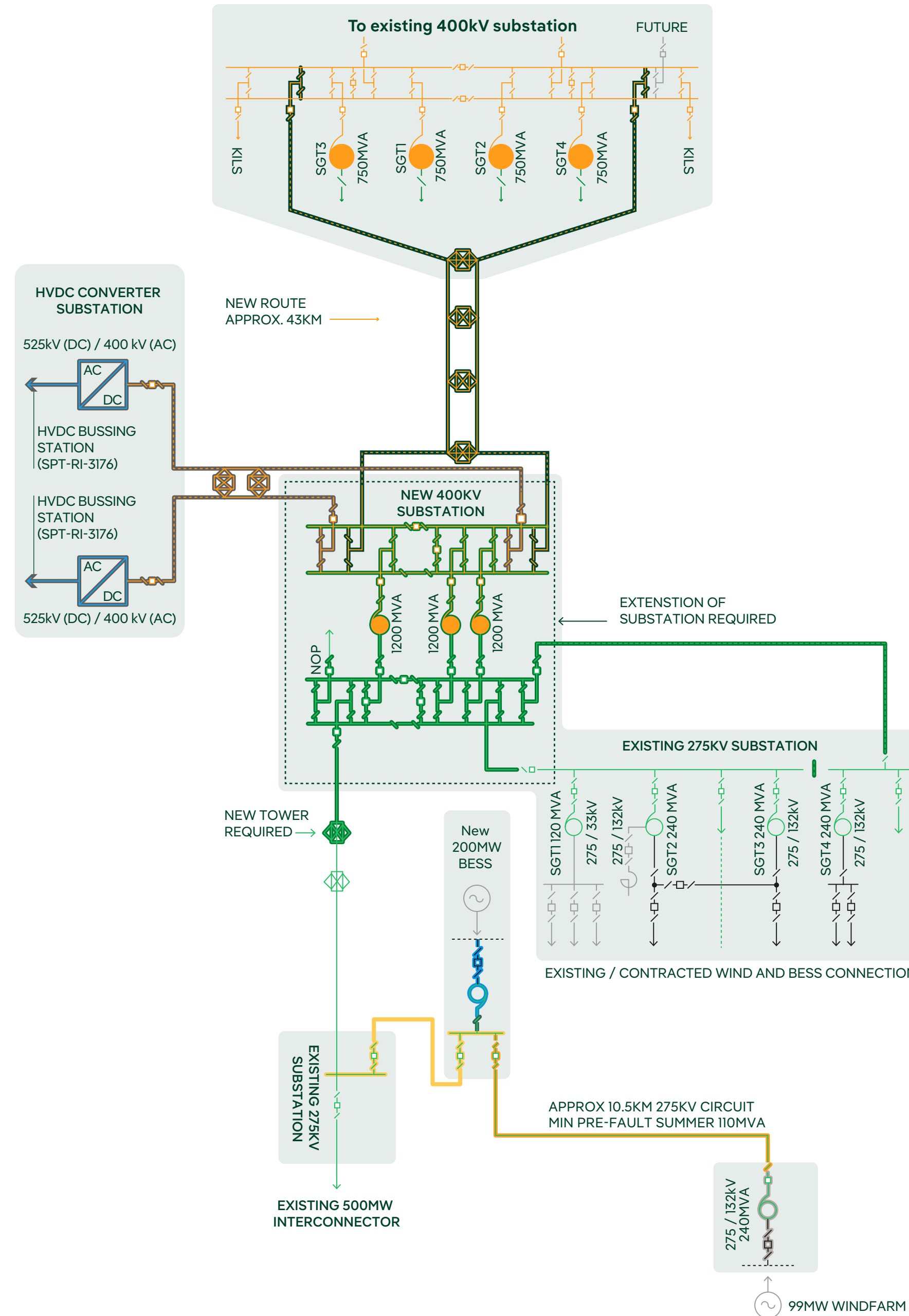
COMPLEX EXAMPLE

An example of one of the most complex projects is for the connection of a new 100MW wind farm in a remote area of our network. To enable an earlier connection date, a two stage approach is being taken to the connection, with initial connection works completing in 2029 with LMS to protect the proposed assets that have the potential to become overloaded. A second stage will then complete in 2031 which will allow the wind farm to have full system access under intact conditions.

The works are described below:

Stage 1 is a shared solution with a Battery Energy Storage System (BESS) and interface with the LMS to manage the export of the site. It is proposed to establish a new collector substation at the BESS site that will connect to the local 275kV substation via approx. 0.5km of 275kV underground cable. From the collector substation, install approx. 10.5km of 275kV circuit to the wind farm’s own substation where a 275/132kV SGT shall step down the voltage to the requested level. A 132kV ‘metering’ circuit breaker and associated disconnectors shall be installed to provide a point of connection. This stage has a total cost of around £40m for the specific connection works, but requires three TORIs costing around £10m to also be completed.

Stage 2 shall include a suite of reinforcement works to alleviate the curtailment associated with the LMS in Stage 1. These include construction of new 400kV overhead line routes and connection into new strategic substations to provide the interconnectivity required to accommodate the new capacity. These works are contained within 12 individual TORIs totalling £3.5bn, which will also enable a further 6.6GW of other new connections, all of which underwrite a share until they connect.



Baseline projects

At a time when uncertainty is high, the industry is moving and changing at pace, in terms of policy, markets and technology, we have elected to minimise the risk to GB consumers by only including projects in our load baseline where the needs, scope and costs are certain. Although relatively low in total value, these projects deliver significant benefits through two routes. First, rolling out past innovation to implement a new, more resilient long-term regime for supporting restoration of the transmission network in emergency conditions. Second, by realising the benefits of past future-proofing of our investment plans, which are designed in options to expand capacity if needed.



INFRASTRUCTURE VALUE SERVICE

Currie GSP Transformer Replacement

Following a request from SPD, as our local DNO, there is a need to standardise the existing Currie 132/11kV grid supply point (GSP) to develop and maintain an efficient, coordinated, and economical system for the distribution of electricity as well as providing an additional 120MVA capacity to enable connection of new renewable generation in the local area.

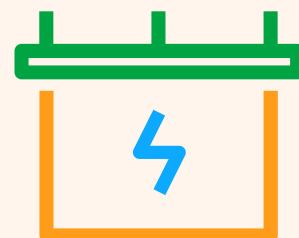
Currie substation is located to the south west of Edinburgh and is the connection point of several major transmission lines throughout Central and Southern Scotland. The Currie compound consists of Currie 275/132kV substation and Currie 132/11kV GSP. The Currie GSP currently has two non-standard 30MVA 132/11kV grid transformers (GTs).

The proposed scheme involves installation of two 90MVA 132/33kV grid transformers, associated 33kV transmission cable works and two transmission 33kV circuit breakers at the SPT side. To minimise the project's associated cost the new grid transformers would be installed in the same location as the existing 132/11kV GTs and using the same 132kV bays and cables.

The existing 30MVA grid transformers at Currie GSP were installed in 1967 and are now at the end of their life. Historically there have been fault level issues on the existing system at Currie GSP, the proposed works will mitigate these, ensuring a safe and secure performance in all areas of our electricity network.

Additional capacity for new generation and demand.

120MVA



INFRASTRUCTURE VALUE

Braco West to Denny Uprating (BDUP)

With substantial renewable generation connections in the north of Scotland, the surplus power flow from Scottish and Southern Electricity Networks Transmission (SSEN-T) into the SPT area will be increased accordingly. Therefore, the boundary circuits between these two licensed areas need to be reinforced. It is proposed to upgrade the circuit connecting into Denny North substation from Braco West substation (in SSEN-T's area) to 400kV, from 275kV. These works, programmed for 2029, complete the southern end of Beauly - Denny upgrades, as set out within SSEN-T's Accelerated Strategic Transmission Investment (ASTI) project (BDUP). The proposed scheme increases the boundary thermal limit by circa 660MVA.

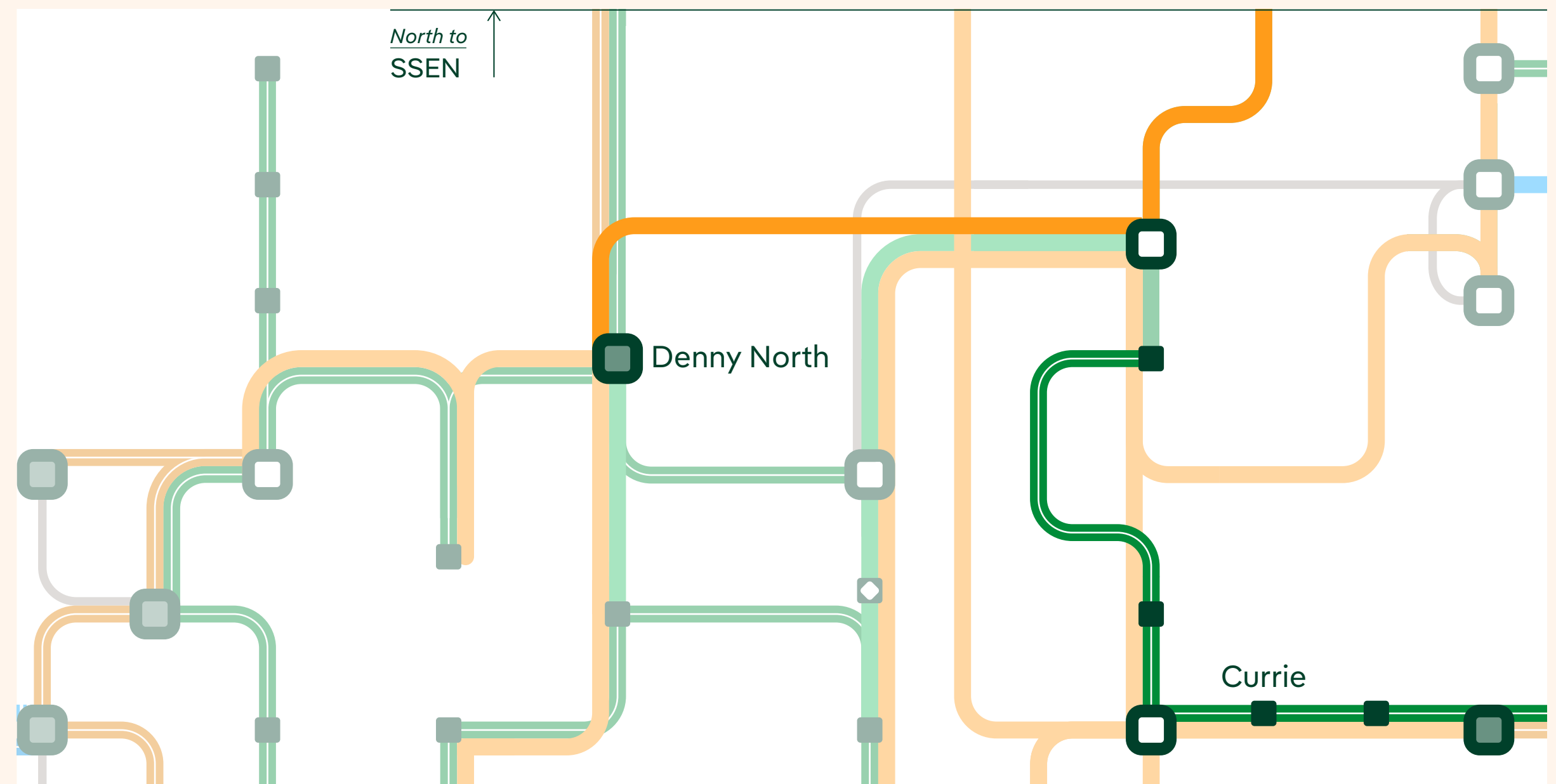
The circuit (ZW Route) currently terminates at Denny North 275kV substation and will be transferred to Denny North 400kV substation. This upgrade was anticipated at the time of building Denny North 400kV substation with a spare bay included in the design. This means the cost is minimised as the substation will not need to be extended. Therefore, the proposed upgrading is the most economical solution and presents minimum disruption to our customers.

MOTIVATION:
Reducing constraint costs for GB consumers by increasing boundary capability of the boundary between SPT and SSEN-T (B4).

SCOPE:
Upgrade 275kV Braco West - Denny circuit to operate at 400kV.

TOTAL COST:
£3.09m

ENGINEERING JUSTIFICATION:



RESILIENCE

Transmission Upgrade – DRZs

MOTIVATION:
Adoption of innovation as business as usual across Transmission and Distribution licence areas.

Providing an improved service to our customers under emergency conditions.

SCOPE:
Establish a network restoration zone within SPT area adding switching and control equipment at strategic 132kV substations.

TOTAL COST:
£16.2m

ENGINEERING JUSTIFICATION:

SPT is working with the NESO to create Distributed Restoration Zones (DRZs) in different areas of SPT licence: Central and Fife, Dumfries and Galloway, where in the event of a partial or complete loss of supply, customers will be restored via embedded generation connected at 33kV. This scheme reviews the network from a System Restoration perspective to ensure the system is restored in a safe and controlled manner, minimising the restoration time. This project proposes works on the SPT 132kV network co-ordinated with SPD’s works on their 33kV network, enabling access to higher volumes of embedded generation and load, restoring more customers, and creating a stronger and more secure network.

Additional switching and controlling equipment will be installed at strategic SPT locations across these zones enabling the DRZs to be energised and controlled in a safe and co-ordinated way. The proposed locations are Carsfad, Earlstoun, Glenlee, Glenluce, Tongland, Dumfries, Drumcross, Leven, Redhouse, Glenluce, Tongland, Kendoon, Bathgate, Bonnybridge, Westfield and Stirling 132kV substations.

BUSINESS AS USUAL INNOVATION

Restoring the system in an emergency

Transmission networks are designed to have very high levels of reliability and resilience, and this extends to the ability to “re-start” the system in the extremely rare circumstances where there is a total or partial system shut-down.

Historically, generators with the capability to self-start could be used to start a large coal-fired generation unit to support system restoration. Following the closure of all large restoration-capable plants, there are no ready sources of generation that are capable of system restoration connected directly to our network. We are therefore responding by creating new system restoration arrangements and ensure that we can support the NESO in its system restoration plans in the most effective way if there is a partial or total system shut-down.

Power restoration from outside the area requires a very strong transmission ‘spine’. Energising long lines and large transformers can cause very large disturbances which can significantly affect a weak network. This considerably increases the risk of bringing down all or part of the spine network, leading to delays in achieving full network restoration.

Within the RIO-T2 period, a programme of works has commenced which seeks to minimise these switching risks, by using circuit breakers to split up key circuits from transformers, and adding ‘Point on Wave’ relays which better control when the breakers close. Within our RIO-T2 plan, a number of sites were identified for completion during RIO-T3. These have been reviewed to make sure they’re still the right solutions and they are included in our T3 Restoration baseline project.

In addition to our transmission restoration project, SPEN have also completed an innovation project in partnership with the NESO called Distribution ReStart – which proved the concept of establishing power islands within the distribution system via live trials at Redhouse, Chapelcross and Galloway. Following the successful completion of this project, a business as usual project has been kicked off to create three further Distribution Restoration Zones, in Central, Fife and Dumfries, such that power islands can be established in tandem with the works to restart the transmission system. This project is the first of its kind, and has wider relevance for any system with large volumes of distributed generation.

x3 DRZs
distributed
restart zones

6 x 275kV
substations
upgraded

RESILIENCE

T3 Restoration

MOTIVATION:
Increasing capability of the system for customers under emergency conditions.

SCOPE:
Upgrading of key sites to help ensure correct operation under restoration conditions.

TOTAL COST:
£5.3m

ENGINEERING JUSTIFICATION:

Within our RIO-T2 plan, we outlined a number of key sites that required minor upgrades to increase performance under restoration conditions in a programme to run during RIO-T2 and RIO-T3.

This project is the second phase of the works to complete the programme. At Coylton, Currie, Dalmarnock, Denny North, Easterhouse and Smeaton, we will replace existing relays and disconnectors. Works will be aligned with other projects ongoing at these sites to ensure efficient delivery.

Our network is extremely reliable but we plan for all eventualities.

99.99991% for 10 consecutive years

Projects with uncertain costs

We have planned projects with clear needs cases based on our TECA review, FES 2024 and all other forecast system requirements, but there could also be uncertainty around final scope, timing, or cost. In those cases, we have established needs cases in the form of site or route strategies. We have taken into account the strategic projects that will provide our transmission system with the key routes and nodes needed to accommodate Net Zero and integrated modernisation works to reduce network risk.

These projects will be developed within the RIO-T3 period with cost submissions made through the Load Related Reopener at a suitable time so the costs presented here are our current estimates. This section provides detail of each of these projects based on their geographical location in our licensed area:

South West Scotland

Central Scotland

South East Scotland

South West Scotland

10 key projects



Central Scotland

3 key projects



South East Scotland

3 key projects

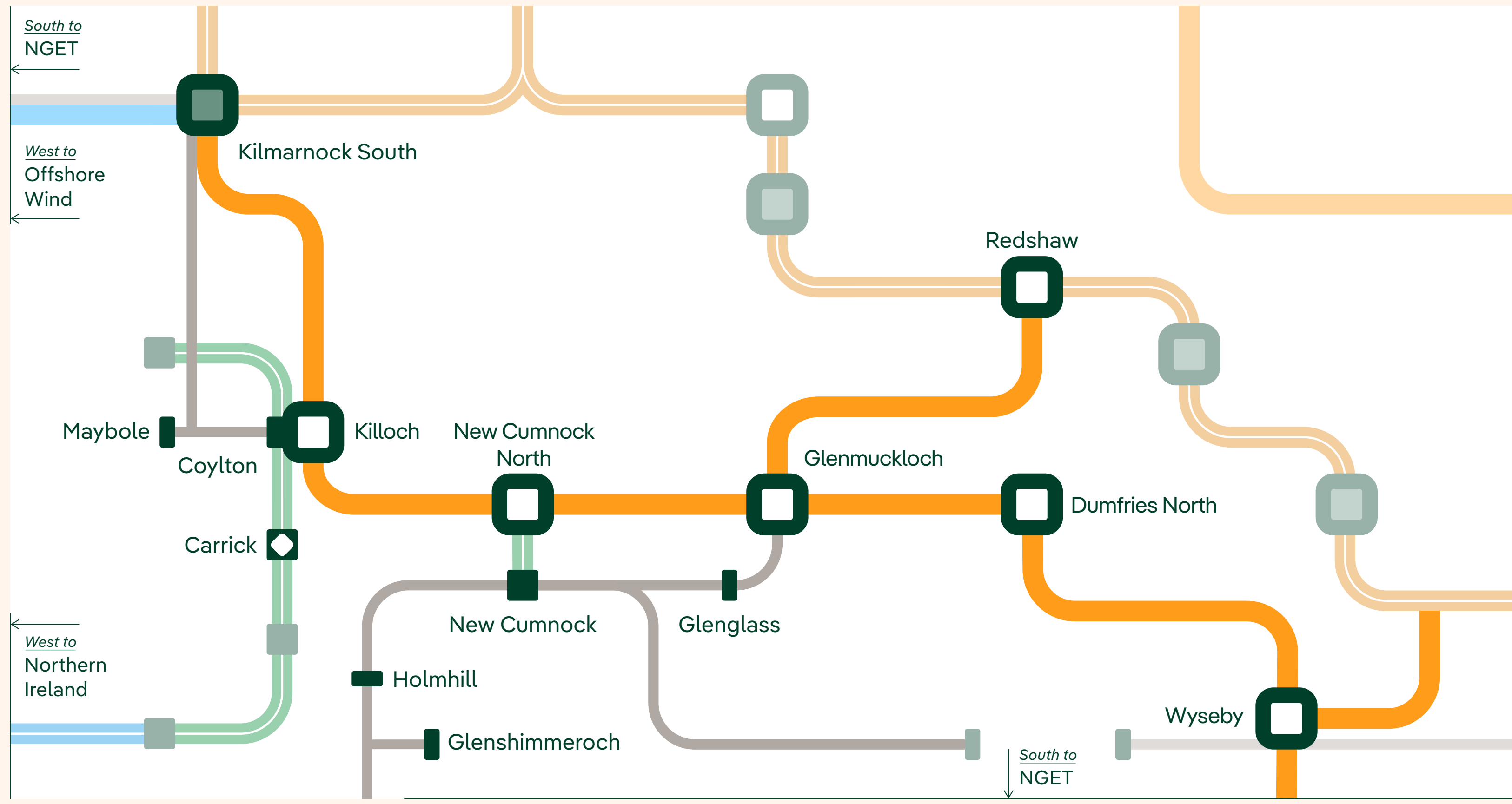


SOUTH WEST SCOTLAND

South West Scotland is a region with excellent natural resources for renewable generation, but also a region of historically low demand for electricity with limited existing transmission capacity. We have now reached the limit of growth that can be supported by the existing network, including the Western HVDC link commissioned in 2017. The answer for the energy system as a whole is a new onshore transmission corridor and a strategic project developing a new subsea HVDC link. The projects in this part step through how it will be done.

Our best view indicates connection of over 7.5GW renewable development in the SWS area during the RIO-T3 period. The transmission circuits in the region extend across licence boundaries, serving as a power corridor by connecting SSEN-T in the north and National Grid Electricity Transmission (NGET) in the south.

Strategic schemes have been proposed by NESO, SPT and NGET for the region. The example is the WCN2 project: it will establish a new 400kV double circuits between Kilmarnock South (SPT) to the north of England (NGET). It is a joint scheme between SPT and NGET, which increases the capability of network by constructing a new 400kV onshore circuit over the B6 boundary and plays a key role in enabling wider reinforcements in the region.



INFRASTRUCTURE VALUE SERVICE

Glenmuckloch to ZV Route 400kV Reinforcement

MOTIVATION: Maximising the boundary transfer between Scotland and England (B6) within the existing transmission network, as part of WCN2 project.

Facilitating connection of c.1GW of renewable generation.

SCOPE: Installing a new Glenmuckloch 400kV substation. Installing c.25km of 400kV double circuit OHL between Glenmuckloch substation and ZV route.

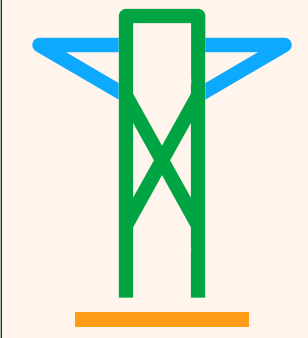
TOTAL COST: £139.62m

ENGINEERING JUSTIFICATION:

Glenmuckloch is a new 400kV substation proposed in South West Scotland, east of New Cumnock. It will play a key role in facilitating wider reinforcements in the region. The substation will ultimately serve as enabling work required for connection of around 1GW of renewable generation in the area. It will provide a new point of interconnection between New Cumnock and the main west coast onshore Scotland-England connection, via Glenmuckloch itself and the construction of approximately 25km of new 400kV double circuit overhead line.

The staging of the construction of the proposed Glenmuckloch 400kV substation has been established to reflect the growing needs in the area - it will be initially built to accommodate a new 400kV double circuit overhead line to a point of connection at the new Redshaw substation on the existing ZV Route overhead line, enabling new connection capacity in the area. From the first stage of the project, land and building space will be established to accommodate all foreseen future requirements. One of the key stages for the project will be the establishment of two new double circuits to New Cumnock North and to Dumfries North, ultimately forming part of a new 400kV double circuit corridor between Scotland and the North of England delivering much needed B6 capability.

This project was identified by the NESO in the Beyond 2030 report (with the project reference WCN2) as required to facilitate an increase in B6 boundary capability. Additional future bays will be also included within the substation planning to accommodate future requirements.



Connecting low-carbon generation, co-ordinating with strategic reinforcements.

c.1GW

INFRASTRUCTURE

SERVICE

New Cumnock North Substation

This project focuses on establishing a New Cumnock North 400kV substation in a location north of the existing New Cumnock 275kV substation in order to enable connection of contracted renewable generation in the local area. Part of this project also requires the existing Coylton – New Cumnock circuit (also known as WA Route) to be diverted in the proposed location for the New Cumnock North 400kV substation where it will feed the existing New Cumnock 275kV substation.

The New Cumnock North substation additionally plays a key role in facilitating the wider reinforcements in the transmission network. The existing New Cumnock 275kV substation is connected to Coylton 275kV substation and feeds the local 132kV network. To reflect the growing volume of contracted renewable generation and as part of the wider reinforcements in south west Scotland, the transmission system in the New Cumnock area needs to be uprated to 400kV to create the required capacity in the network.

This substation will provide a new point of connection on the planned west coast onshore Scotland-England link. The New Cumnock north 400kV substation integrates into the new 400kV double circuit OHL corridor between Scotland and the north of England delivering much needed B6 capability. This project was identified by NESO within the Beyond 2030 report (with the project reference [WCN2](#)).

Similar to our planning in other parts of the network, the New Cumnock North 400kV substation will be delivered in a staged manner. The staging of the construction of the proposed 400kV substation has been established to reflect the growing needs in the area, which enables sizing of the substation based on future connections.

MOTIVATION:

A new strategic transmission node to accommodate both local generation, and connection with the new 400kV double circuit between Scotland and England ([WCN2](#)).

SCOPE:

Establishing a new 400kV substation.

TOTAL COST:

£175.14m

ENGINEERING JUSTIFICATION:

INFRASTRUCTURE

Killoch 400kV Substation

MOTIVATION:

A new strategic transmission node to accommodate both local generation, and connection with the transmission corridor.

SCOPE:

Establishing new 400kV and 275V substation near the existing Coylton 275kV.

Re-routing and uprating of existing XY and WA Routes between Kilmarnock South and Coylton to 400kV with HTLS conductor.

TOTAL COST:

£121.90m

ENGINEERING JUSTIFICATION:

To accommodate new generation connections in Ayrshire and allow for the utilisation of the new west coast onshore corridor ([WCN2](#)), we are establishing Killoch 400kV substation north of the existing Coylton substation. This scheme additionally facilitates the construction of a new 275kV substation at the Killoch 400kV substation site, which will be fed via new 400/275kV super grid transformers (SGTs).

Killoch 275kV substation will in turn connect to Coylton 275kV substation which feeds the 132kV network. This project will also focus on rerouting of XY Route, between Killoch 400kV and Kilmarnock South 400kV, and WA Route, between New Cumnock North 400kV and Killoch 400kV, into Killoch 400kV, both of which will be uprated to 400kV as part of the works for the project.

This scheme will support the wider reinforcement works to the 400kV network in the wider area, further supporting the accommodation of new generation. As part of the [WCN2](#), this substation will form part of the new 400kV network in the South of Scotland, linking the New Cumnock and Kilmarnock South 400kV substations and feeding the 132kV network through the link between Killoch 275kV and Coylton 275/132kV.

INFRASTRUCTURE

Wyseby 400kV Substation

MOTIVATION:

A new strategic transmission node to accommodate both local generation, and connection with the transmission corridor.

SCOPE:

Establishing a new 400kV substation.

TOTAL COST:

£66.99m

ENGINEERING JUSTIFICATION:

The planned Wyseby 400kV substation will facilitate connection of approximately 1.9GW of contracted renewable generation in the local area.

Wyseby is a new 400kV substation proposed in the SWS area in north west of Gretna 400/132kV substation. This project is to establish a new Wyseby 400kV substation and install a new double circuit OHL, circa 1.85km, between the new Wyseby substation and the existing 400kV double circuit between Moffat/Elvanfoot (in SPT's area) and Harker (in NGET's area). The existing Strathaven – Harker 400kV double circuit OHLs is known as ZV Route.

To reflect the growing development in the area, this substation will be developed in a staged manner ensuring our designs can respond to the network future needs. From the first stage of the project, land and building space will be established to accommodate all foreseen future requirements. This project enables providing a new point of connection on the West Coast Onshore Scotland-England link, i.e., [WCN2](#).

1 of 5 key nodes
creating a new 400kV
circuit between Ayrshire
and north west England.

Facilitating the connection
of contracted renewable
generation in the local area.

c.1.9GW



INFRASTRUCTURE

SERVICE

Dumfries North 400kV Substation

MOTIVATION:

A new strategic transmission node to accommodate both local generation, and connection with the transmission corridor.

SCOPE:

Establish a new 400/132kV substation, to be sized accordingly for all strategic connections in the area, both at 400kV and 132kV.

TOTAL COST:

£42.54m

ENGINEERING JUSTIFICATION:

Dumfries North 400/132kV substation is a new node on our SWS network enabling establishment of the new west coast onshore corridor (WCN2). Dumfries North substation will be located between Glenmuckloch 400kV substation and the 400kV network in NGET's area. This substation forms part of the wider reinforcement works in the south of Scotland to establish a new 400kV OHL network between strategic substations in the area. These works will allow for the connection of a significant number of new renewable generation developments in the area and will provide a new exit route for the generation to the wider network. Although the contracted delivery date of this substation is 2036, there is a clear requirement to include this substation within our RIIO-T3 plans as it will be further designed and developed as part of the wider network in this area throughout the period.

INFRASTRUCTURE

SERVICE

Carrick 275KV Substation

MOTIVATION:

New collector substation on existing 275kV route to connect 143.4MW of 'Best View' wind generation.

SCOPE:

Establish new 275kV substation.

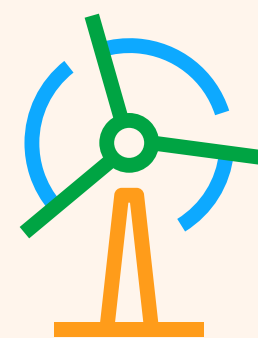
TOTAL COST:

£13.78m

ENGINEERING JUSTIFICATION:

This project establishes a new 275kV collector substation on existing YY Route overhead line between Coylton and Mark Hill/Auchencrosh.

This solution represents the best option to connect 143.4MW of onshore wind generation near an existing 275kV circuit, where options at existing substations in the area are limited due to space and capacity constraints. At the preferred location, the new substation will be established as a single busbar to provide a turn in connection to YY Route, where two new 275/33kV transformers and associated circuit breakers and disconnectors will be installed to provide points of connection to two wind farm sites.



In a renewables-rich area, we're providing more capacity.

143.4MW

BUSINESS AS USUAL INNOVATION

Harmonic Filters

In our reinforcement plans we have ensured our network is compliant with electrical industry standards such as harmonic voltage levels. Harmonics are a form of electrical pollution that is present on the electricity waveforms and comes from consumer applications and network equipment. With an increased number of wind farms in the SWS area the amount of OHL and cable circuits required for connecting the new renewable developments to the electricity system and consequently, network harmonic pollution is rising. To prevent harmonic voltages in excess of standard planning and compatibility limits on our 132kV network, similar to our RIIO-T2 programme, standardised harmonic filters will be installed on multiple locations: at new Glenshimmeroch, new Redshaw, Arcleloch Extension and Coalburn 132kV substations.



INFRASTRUCTURE

SERVICE

Glenshimmeroch Reinforcement

A significant volume of wind farm connection applications has been received in the SWS area near the existing Blackcraig – New Cumnock B/ Kendoon 132kV circuit, known as DG Route.

Glenshimmeroch collector substation is a new point of connection on DG Route that enables collection of more than 200MW of contracted renewable generation from wind farm developments in the area and accommodates a 20MVAR harmonic filter.

To reflect the growing needs in the area in addition to the existing generation on DG route, this project will uprate the section of circuit between the new Glenshimmeroch substation and the tee off point on New Cumnock B – Kendoon circuit. This section currently consists of circa 1km of 132kV underground cable with a continuous summer rating of 231MVA and circa 6.3km of 132kV OHL conductor (installed on wood poles) with summer pre-fault rating of 176MVA. We will replace the existing underground cable to increase the rating by 79MVA to continuous summer rating of 310MVA. Also, the existing OHL circuit conductor will be replaced using High Temperature Low Sag (HTLS) conductor, increasing the rating by approximately 119MVA to a summer pre-fault rating of 295MVA. At Glenshimmeroch substation a new 132/33kV 120MVA transformer will be also installed to collect the wind farm's generation along with an additional 132/33kV 60MVA transformer. This project will be contingent on several incremental reinforcements in our network which provide additional transmission capacity to the local and wider network, such as Glenmuckloch to ZV Route and Glenglass extension and Glenmuckloch collector reinforcements, which are discussed in the following sections.

MOTIVATION:

Facilitating connection of 200MW renewable generation in Dumfries and Galloway.

Reduction of harmonic disturbances across the network.

SCOPE:

Establishment of Glenshimmeroch 132kV substation.

Upgrading 7.3km of existing 132kV underground cable and OHL conductors.

Installation of a new 132/33kV 120MVA transformer.

Installation of a 20MVAR harmonic filter.

TOTAL COST:

£26.75m

ENGINEERING JUSTIFICATION:

INFRASTRUCTURE

Glenglass to Glenmuckloch Substation

MOTIVATION:

Enabling work to accommodate both local generation, and connection with the new 400kV double circuit between Scotland and England (WNC2).

Facilitating connection of c.300MW renewable generation in South Lanarkshire.

SCOPE:

Establishing a new Glenmuckloch 132kV substation.

Installing c.9.3km of 132kV OHL between the Glenglass and Glenmuckloch 132kV substations.

TOTAL COST:

£45.41m

ENGINEERING JUSTIFICATION:

This project is a reinforcement between Glenglass 132kV substation and a new Glenmuckloch 132kV substation during the RIIO-T2 and early RIIO-T3 periods. These works will extend the 132kV transmission network in SWS from Glenglass 132kV substation to a new Glenmuckloch 132kV substation, enabling the connection of circa 300MW of contracted renewable developments in the local area.

This scheme additionally facilitates the future extension of the transmission network from Glenmuckloch to Redshaw 400kV substation on the ZV Route, enabling the connection of a further 650MW of contracted renewable generation capacity in the SWS area.

INFRASTRUCTURE

SERVICE

Holmhill 132kV Substation

Enabling connection of circa 480MW of renewable generation near Holmhill area, in East Ayrshire, requires installation of a new Holmhill 132kV substation in SWS.

Holmhill 132kV substation will be established near the existing DE Route, a 132kV circuit connecting Kendoon substation to New Cumnock B substation. A new high-capacity underground cable, circa 250m, will be established between the new Holmhill 132kV substation and the tee off point on the DE Route providing summer continuous rating of approximately 563MVA.

This scheme is designed to provide the optimal substation and equipment size to accommodate current and future requirements in the area. The Holmhill 132kV substation will consist of a 132kV single busbar and two 132kV circuit breakers for generation connections via Lorg and Quantans Hill 132kV circuits. The Lorg 132kV circuit will be circa 8km of OHL with summer pre-fault rating of 295MVA, enabling connection of approximately 265MW wind farm generation. The Quantans Hill 132kV circuit connects a new Quantans Hill 132kV collector substation to the new Holmhill 132kV substation and entails circa 6km of OHL with summer pre-fault rating of 295MVA. The new Quantans Hill 132kV substation enables collection of 211MW of contracted renewable generation from wind farm developments in the area.

MOTIVATION:

Facilitating connection of 480MW renewable generation in East Ayrshire.

SCOPE:

Establishment of Holmhill 132kV substation.

TOTAL COST:

£35.47m

ENGINEERING JUSTIFICATION:

INFRASTRUCTURE

RESILIENCE

VALUE

SERVICE

Coylton to Maybole 132kV

MOTIVATION:

Increasing capacity of the exiting circuits in South Ayrshire to facilitate connection of c.580MW renewable generation.

Coordinating with the non-load requirement of the network.

SCOPE:

Replacing the existing 132kV conductor on X Route with HTLS conductor.

Rebuilding the existing 132kV circuits made up from N, CG & CD Routes to accommodate a higher capacity conductor.

TOTAL COST:

£91.75m

ENGINEERING JUSTIFICATION:

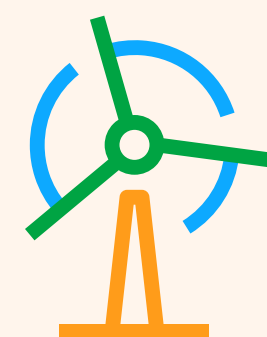
An increase in the generation connections in South Ayrshire and the thermal capacity limitation of the existing circuits in the area drives a scheme to fully rebuild the existing N, CG & CD 132kV overhead line (OHL) routes between Coylton 132kV, Maybole 132kV and Kilmarnock South 132kV substations, with the existing towers on X Route to be maintained and reconducted. The splitting of the scope of this project between X Route and the rest of the circuit is driven by the condition of conductors on X Route.

The thermal rating of the existing 132kV OHL circuit on X Route is 89MVA and the thermal rating of N, CG & CD Routes is 106MVA. To enable connection of circa 580MW renewable generation in South Ayrshire area, this scheme proposes to provide the additional capacity required.

The current condition of the conductors on X Route is that intervention is required on the circuit before the rebuild of the other routes could be completed due to consenting and construction timescales. To mitigate the asset risk, X Route will be reconducted using a High Temperature Low Sag (HTLS) conductor in advance of the N, CG and CD Route rebuild which will provide similar capacity.

N, CD & CG Routes will be rebuilt using new towers capable of carrying higher capacity standard conductors. This solution will provide the increase in rating to accommodate the new connections.

This will be a significant uprating of the existing line and will allow for the connection of future generation in the area. The new route will run parallel to the existing lines; with CG Route, which currently runs parallel to N Route, to be amalgamated into N Route. The reconducting of X Route is scheduled to be completed in 2029, with the rebuild of N, CD & CG Routes to begin in 2030. The new circuit is contracted to be energised in 2032 to align with connection dates.

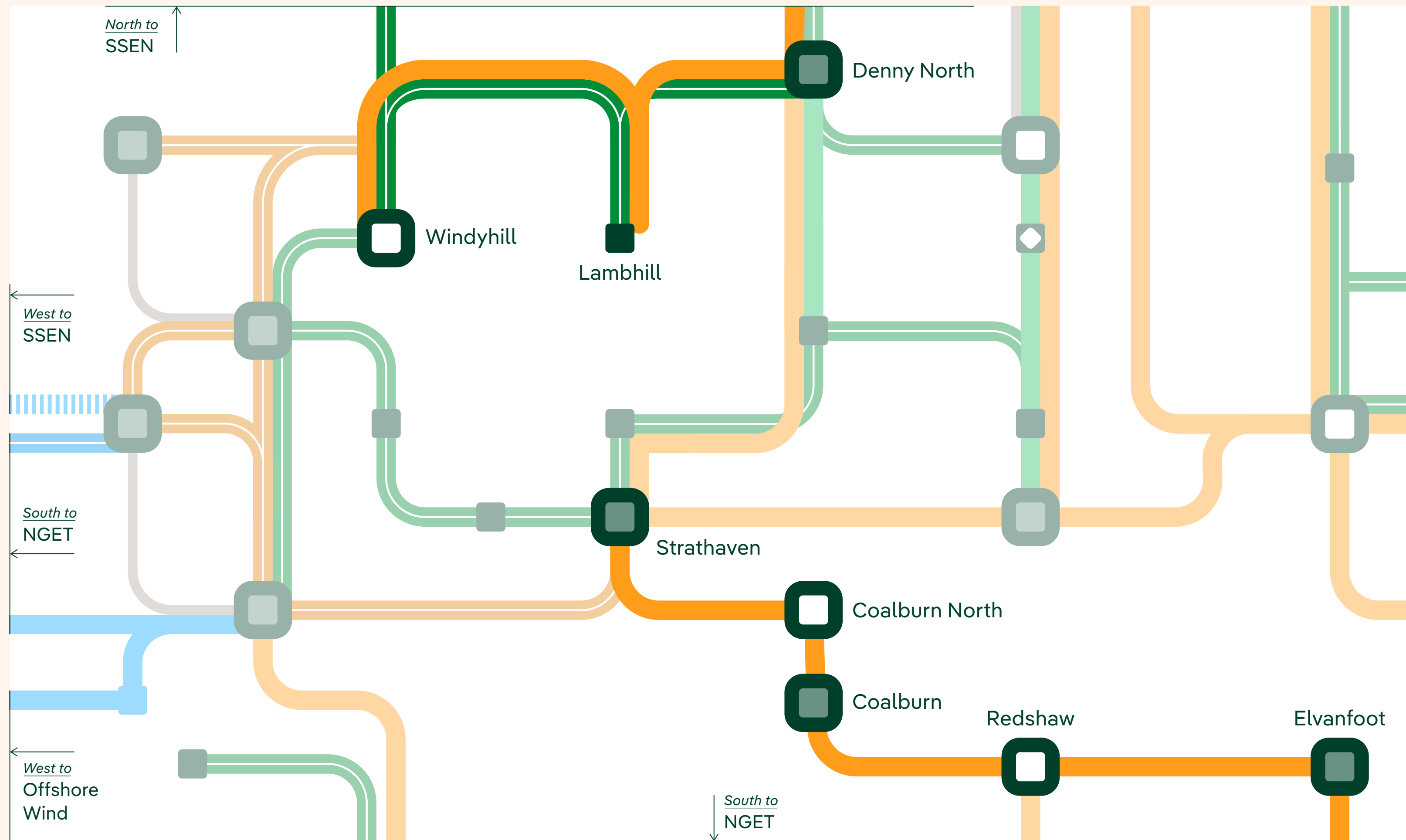


Adapting our existing assets
to enable new connections.

480MW

CENTRAL SCOTLAND

Central Scotland is historically the area with the largest existing transmission network. This provides opportunities to increase capacity by upgrading existing circuits, which is more cost-effective and has less environmental impact than building new routes. The projects set out in this part are examples of how we are planning to maximise the potential of these opportunities to transfer power through the region, and support the connection of new generation within the region itself. The reinforcement works are recommended in the Pathway to 2030 and Beyond 2030 reports.



INFRASTRUCTURE RESILIENCE VALUE SERVICE

Windyhill – Lambhill – Denny North Reinforcement (DLUP)

MOTIVATION:
Increasing the B4 and B5 boundary capability, to further accommodate renewable generation across Scotland.

SCOPE:
Upgrading of the existing 275kV circuit between Denny North, Lambhill and Windyhill to 400kV operation.

Establishment of a 400kV substation within existing Windyhill substation site.

TOTAL COST:
£131.27m

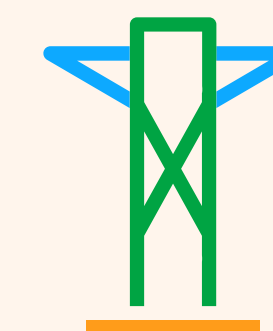
ENGINEERING JUSTIFICATION:

This project is to establish a new Windyhill 400kV substation and uprate Denny North – Lambhill – Windyhill 275kV circuit to 400kV operation. The main driver for this project is to facilitate increased power transfer into and through the SPT network from renewable developments across the north of Scotland. These works are programmed to commence in the RIIO-T2 period and complete during the RIIO-T3 period.

The Windyhill – Lambhill – Denny North 400kV Reinforcement will help to ensure the network is ready for the changes required by Net Zero targets by facilitating new generation across Scotland. It supports the maximisation of transfer capability via existing transmission OHL routes and is fully aligned with other planned reinforcement of north to south transfer capability across boundaries B4 and B5. This project, alongside a number of other wider system reinforcements was identified as required by the NESO’s Holistic Network Design to enable the UK government’s offshore wind target by 2030.

The project scope and delivery sequence will be closely aligned with these complementary projects to ensure an economic, efficient, and co-ordinated overall programme of works to relieve thermal bottlenecks in the SPT network and enable the increased connection and transfer of renewable energy.

The new 400kV substation at Windyhill can be accommodated within the existing substation boundary thanks to the strategic planning we undertook when replacing the existing 275kV substation during RIIO-T2.



Replacing conductors on existing towers to maximise the re-use of assets.

64km

BUSINESS AS USUAL INNOVATION

Synchronous Compensation

Several large conventional power stations in the SPT area have closed, with the last large synchronous generators expected to close before 2030. At the same time, converter-based renewables have grown rapidly. This leads to a reduction in system strength to a level where significant operational difficulties can be expected. Our business plan aims to maintain an acceptable minimum level of system strength by installing a number of synchronous compensators or hybrid synchronous compensators across the network, like those currently being installed at Eccles, or initially trialled through our innovation project Phoenix. This will help to maintain a minimum level of regional inertia, an important aspect of system strength, to help reduce the impact of various disturbances on the system.

PROJECT PHOENIX

£23.3m

5 year innovation project

INFRASTRUCTURE

VALUE

SERVICE

Redshaw Cluster Reinforcement

This project entails establishment of new Redshaw 400kV substation, new Redshaw 132kV substation ('A' and 'B' board), four new 400/132kV 360MVA super grid transformers (SGTs) connected to 'A' and 'B' board (two SGTs to each board), and two new 132kV harmonic filters (one to each board) at Redshaw substation. Redshaw is a new point of connection in proximity of Strathaven – Harker 400kV OHL (ZV) route, between Coalburn and Elvanfoot 400kV substations. To establish the Redshaw substation, the ZV Route will be diverted to the new substation location, which requires installation of three new 400kV towers and the associated OHL conductor between each span.

Redshaw 400kV substation will enable the timely and efficient connection of approximately 2.8GW of contracted renewable generation in the local area and will also facilitate the extension of the transmission network from Glenmuckloch 400kV substation to ZV Route, enabling the connection of a further circa 650MW of contracted renewable generation capacity in the SWS area. The establishment of Redshaw 132kV substation ('A' and 'B' board) and the provision of additional transformer capacity together facilitates the connection of a further circa 350MW of local renewable generation to 132kV network.

MOTIVATION:

A new strategic transmission node to enable connection of local renewable generation.

Reduction of harmonic disturbances across the network.

SCOPE:

Establishing a new 400kV substation.

Establishing a new 132kV substation ('A' and 'B' board).

Installation of two 20MVAr harmonic filters.

TOTAL COST:

£173.93m

ENGINEERING JUSTIFICATION:

INFRASTRUCTURE

VALUE

Strathaven to Harker 400kV Reinforcements

This scheme is to replace the conductors on the existing circuits between the Strathaven and NGET's Harker 400kV substations, also known as ZV Route which is circa 126km in route length, with an HTLS conductor system. This will increase the route's thermal capability to match the existing 400kV switchgear. This will increase the boundary transfer capability between Scotland and England (on boundary B6) ahead of the establishment of new circuits, as well as enabling more than 2.3GW of new generation onto the ZV Route substations. The scheme is made up of two separate projects: Strathaven to Elvanfoot 400kV Reinforcement (NOA code [VERE](#)) and Elvanfoot to Harker 400kV Reinforcement (NOA code [EHRE](#)).

Both the Strathaven to Elvanfoot and Elvanfoot to Harker reinforcements are identified by the NESO in the Beyond 2030 report (with the project references [VERE](#) and [EHRE](#), respectively) as required to increase the B6 boundary transfer between Scotland and England using the existing transmission network, and is key to economically enabling the connection of renewable generation both locally, and across Scotland.

The works are also co-ordinated to address condition issues related to the earthwire which would otherwise have required specific intervention.

MOTIVATION:

Reconductoring with HTLS to maximise the boundary transfer between Scotland and England (B6) using the existing transmission network.

SCOPE:

Reconductoring of c.126km of existing 400kV OHL between Strathaven and NGET's Harker substation with HTLS conductor.

TOTAL COST:

[EHRE](#): £122.22m

[VERE](#): £90.34m

ENGINEERING JUSTIFICATION:

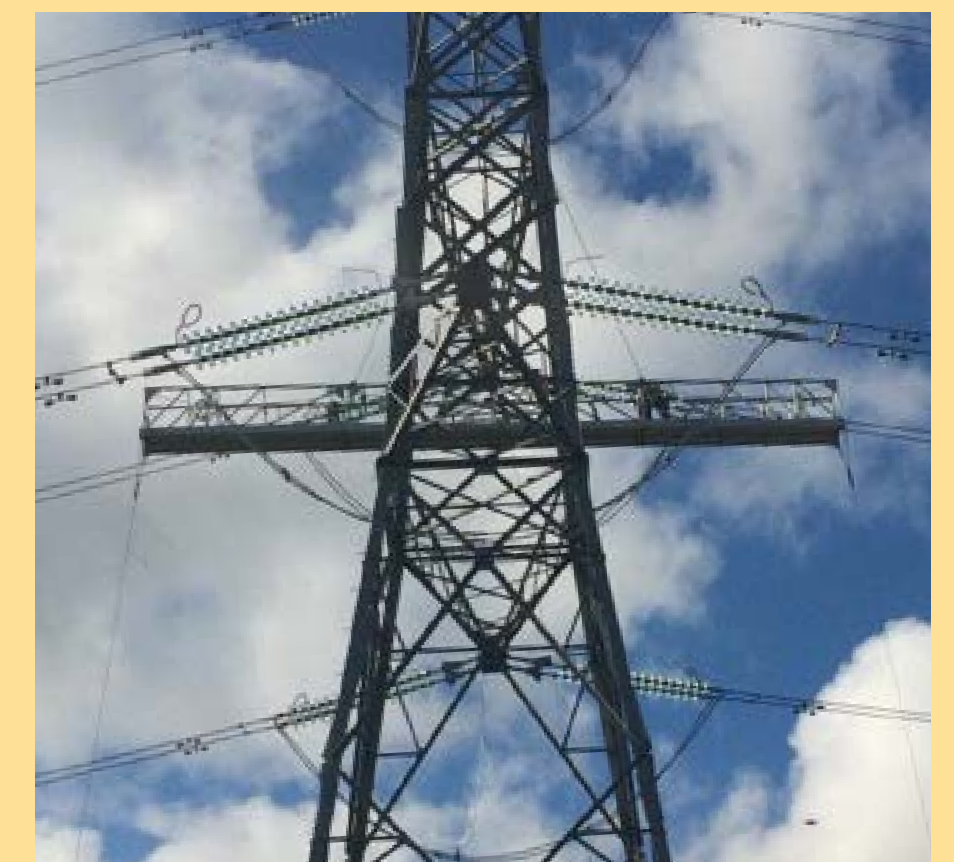
BUSINESS AS USUAL INNOVATION

High Temperature Low Sag conductor

To prepare for the required significant network capacity increase demonstrated by FES, we install HTLS conductor in strategic locations on our overhead line circuits. HTLS conductor offers greater power transfer capacity across the network than the conventional conductors but can be installed with minimal intervention on our existing towers, allowing us to maximise our existing network instead of or prior to construction of new lines. In RIIO-T3 we will replace existing traditional conductor systems with HTLS in various projects for a range of reasons.

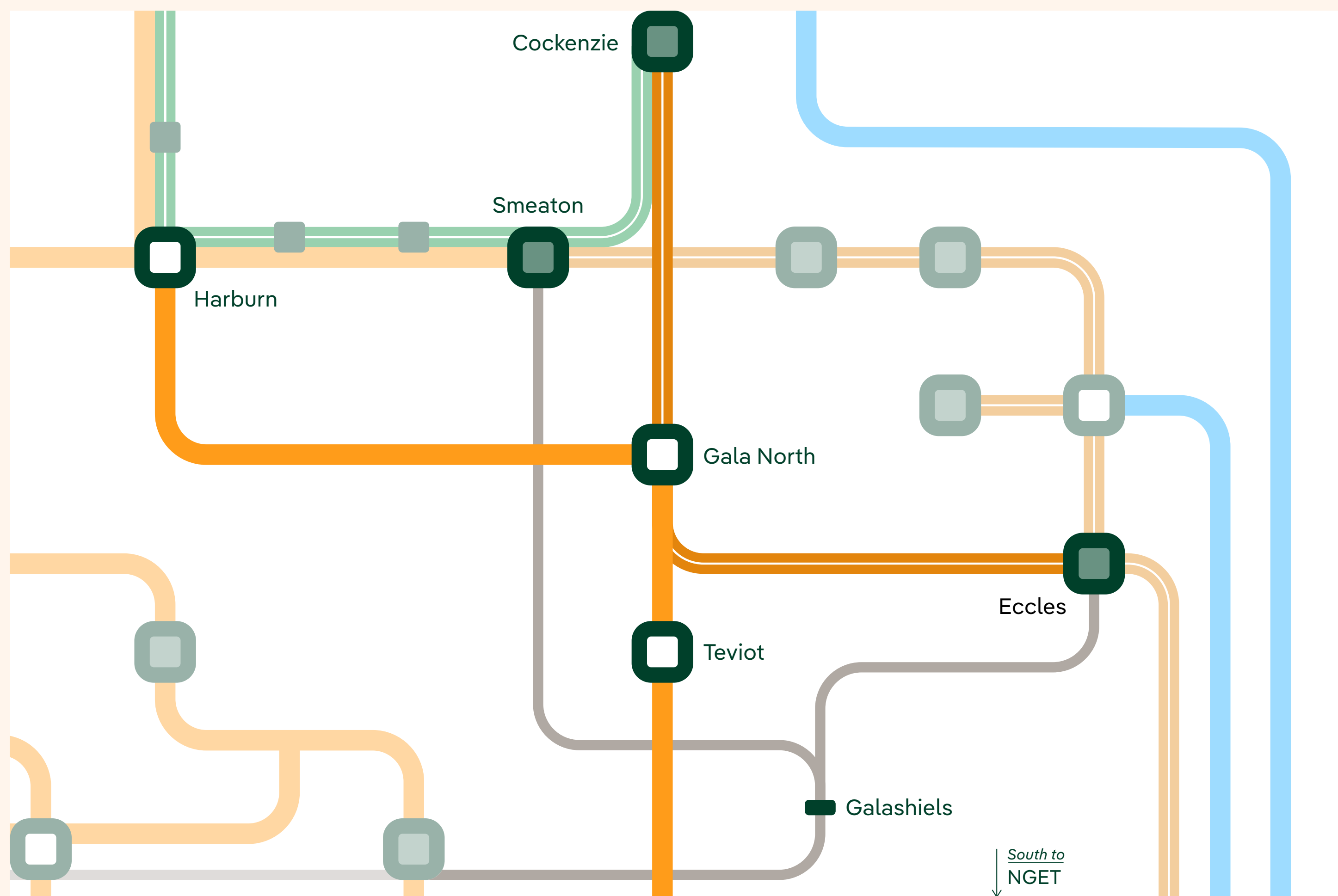
Replace circa 116km of conventional conductor on ZV Route with HTLS to maximise power transfer capacity over B6 boundary using our existing network. Accommodate local generation connections, for example reconductor 6.3km of the existing Blackcraig – New Cumnock B/Kendoon 132kV OHL circuit to a new collector substation to increase capacity by approximately 119MVA.

Aligning with asset health condition with new connections drivers reconductor of 4.3km with HTLS conductor on X Route to ensure timely intervention between Coylton and Maybole substations.



SOUTH EAST SCOTLAND

The South East of Scotland is another area where historically our network has been relatively sparse, but where the capacity to transfer power needs to expand significantly to access available resources for renewable generation, including offshore. As with our plans for South West Scotland, this involves creating a new transmission corridor onshore (alongside new planned HVDC links). The projects described in this part are key components of this process.



INFRASTRUCTURE RESILIENCE SERVICE

Gala North Substation

MOTIVATION:
A key strategic site to be established on our existing network to accommodate both local generation and wider system reinforcements. Providing additional GSP capacity to SPD.

SCOPE:
Establish a new 400/132kV substation adjacent to the existing 400kV circuit on ZA Route and 132kV P Route for the connection of approximately 1.6GW of new generation (both Transmission and Distribution connected). Lay out site to accommodate two new 400kV double circuits identified as required as wider system reinforcements, CMN3 and HGNC, to increase power transfer capability across the system.

TOTAL COST:
£158.45m

ENGINEERING JUSTIFICATION:

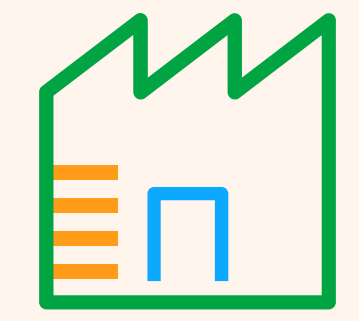
This project is the construction of a new 400/132kV substation, which will act as a strategic transmission node, accommodating up to 1.6GW of local generation, as well as facilitating connection to two new 400kV double circuits as identified as required in the NESO's beyond 2030 report. The substation will be designed from day one to accommodate at least twenty 400kV bays required, as well as a new 132kV twelve bay substations, fed by two 360MVA 400/132kV transformers to provide connection to local transmission customers, as well as provision for a new GSP for distribution connected customers. The site will be energised in 2028 to accommodate the initial local connections, with ongoing development of the substation for the connection of the strategic projects to align with the overhead line programme.

This substation is a new point of connection between Cockenzie – Eccles 400kV double circuit OHL (also known as ZA Route) and Dunlaw Extension – Galashiels 132kV OHL circuit (also known as P Route). The Gala North substation will be located circa 10km south of Dunlaw Extension substation and in the area between ZA Route and P Route. This location is selected given the proximity between ZA Route and P Route and the routes of the new circuits proposed in the CMN3 and HGNC projects.

This substation provides an exit route into the Dunlaw-Galashiels-Hawick-Eccles 132kV part of the SPT network. The Gala North substation is sized to facilitate the contracted generation and enable future expansion and connectivity to other parts of the system.

Strategic reinforcements co-ordinated to reach where our customers want to connect.

1.6GW



INFRASTRUCTURE RESILIENCE SERVICE

Teviot 400/132kV Substation

MOTIVATION:

A key strategic site to be established to accommodate up to 1.8GW of local generation and wider system reinforcements.

SCOPE:

Establish a new 400/132kV substation between the proposed Gala North and a new substation in the North of England.

TOTAL COST:

£90.10m

ENGINEERING JUSTIFICATION:

Teviot 400/132kV substation is proposed in an area with a very limited transmission network, and has a requirement to accommodate up to 1.8GW of renewable generation which would otherwise require significant individual radial connections to the nearest transmission network. The substation will consist of a new 400kV substation, connected via a new 400kV double circuit to the proposed Gala North substation, and to a new circuit forms the strategic project CMN3 as identified by the NESO in their Beyond 2030 report for enabling the network for Net Zero.

Two new 132kV boards will be established at the location, fed by two 360MVA 400/132kV transformers each (totalling four 360MVA transformers on site).

This site is contracted for completion in 2033, after the RIIO-T3 period, however, given the scale of the project, a significant amount of design and development work will be required in advance of this date, and there is a requirement for site access before the end of RIIO-T3.

INFRASTRUCTURE RESILIENCE

U & AT Routes 132kV Replacement

A new 132kV circuit, c.29km in length, will be constructed in parallel to the existing circuit between Galashiels and Eccles substation, to be energised in 2028. The new line will be of increased capacity, using twin upas conductors, increasing the capacity of the existing line by around 221MVA. The existing line will then be decommissioned and removed. The specification of the new circuit is established to allow for future development of the 132kV and 400kV network in the area planned after completion of this project.

The U & AT Routes are our 132kV overhead line circuits between Galashiels – Eccles 132kV. The U Route circuit was initially built in 1932 and the AT Route circuit following in 1959. The condition of the assets along the routes, including insulators, wood poles and towers indicate that the routes are approaching the end of their useful lives. Through asset condition reports, it has been determined that a full replacement of the line is required in order to provide a reliable connection between the two substations with the capacity required.

The project has also been identified as enabling works for a number of large-scale generation schemes in the surrounding area, around 500MW in capacity. There is also a need from SP Distribution for new capacity in the area, which will be supported by this project.

MOTIVATION:

Combining asset health drivers with growth in generation to determine optimal project scope.

Enables around 500MW of generation connections in local area.

SCOPE:

Construction of a new 132kV circuit between Galashiels and Eccles, and removal of existing circuit.

TOTAL COST:

£66.37m

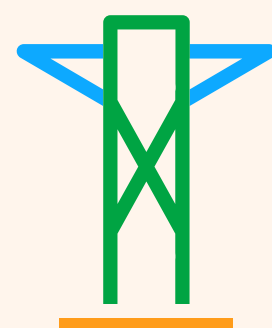
ENGINEERING JUSTIFICATION:

BUSINESS AS USUAL INNOVATION

Load Management Scheme

Load Management Schemes (LMS) are geographically distributed systems detecting, in real-time, unacceptable overloading of transmission assets and disconnecting the generation/battery connections contributing to the overload in accordance with contractual agreements. Employing LMS maximises the use of network capacity. We have developed multiple load management schemes at different geographical locations of our network during the RIIO-T1 and RIIO-T2 periods and they now are standard solutions that will continue to be used during RIIO-T3.

These LMS schemes have been embedded in our network through proactive engagement with SP Distribution as our related DNO to respond to their customer needs in addition to our own. Currently, these schemes have enabled connection of circa 1.91GW of renewable generation to 50 substations and grid supply points. Going forward, we will enable connection of up to a further 10.89GW of renewable generation to the system in our full portfolio.



Joined-up network planning to reinforce the network and connect our customers.

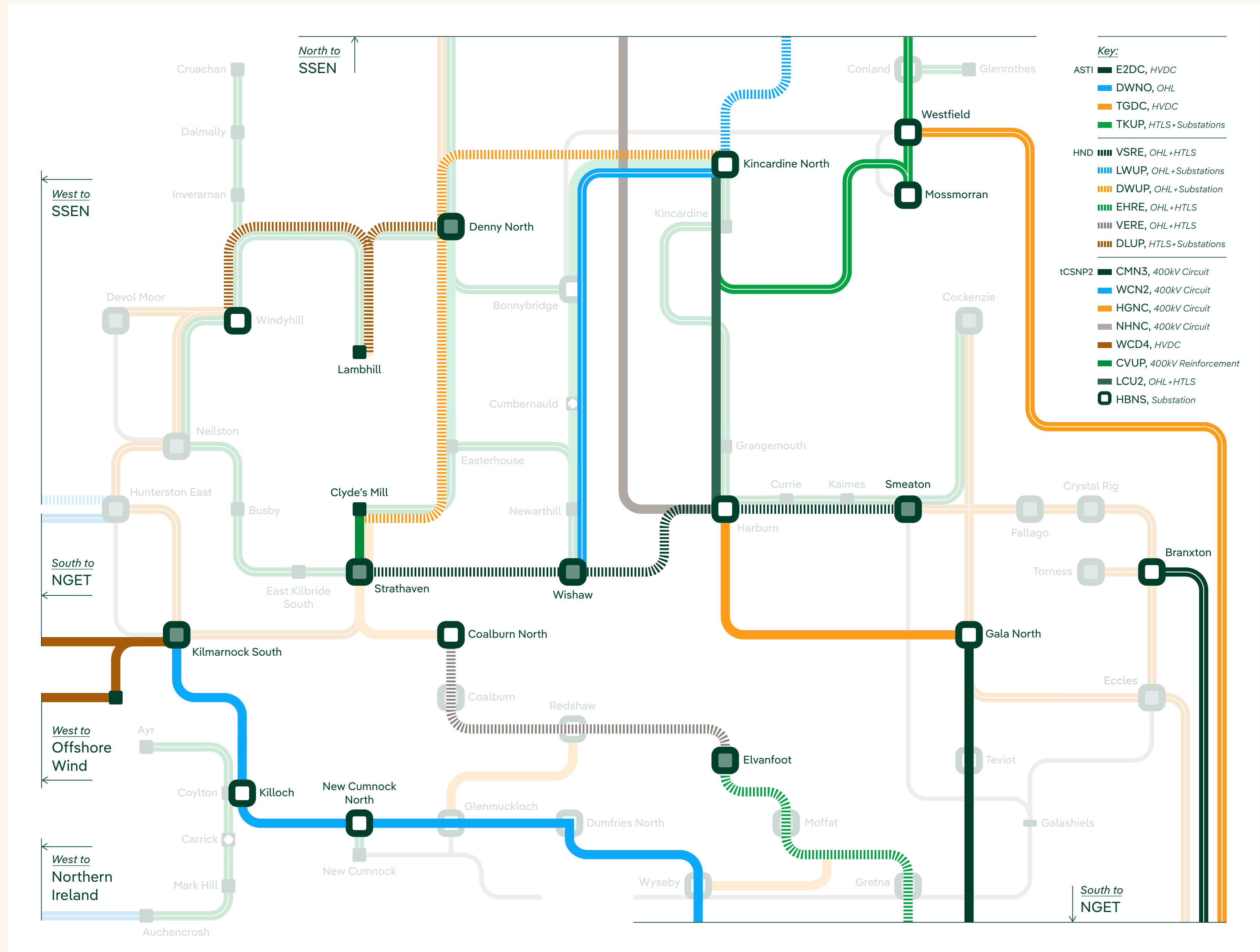
1.8GW

Strategic projects

Our strategic projects are our most significant investments that will continue during the RIIO-T3 period and beyond. These provide the additional network motorways facilitating the large power flows across the full GB system. These projects have been identified through working closely with the NESO and the other TOs to determine the requirements, but have been developed to coordinate with all of our system needs – including works to accommodate new connections and asset health interventions, whilst ensuring the system remains operable within the Security and Quality of Supply Standard (SQSS) limits.

You will find details of the connection nodes to be established on our new circuits from [page 19](#). ←

Each of the projects have specific funding mechanisms already established and therefore are not included within our RIIO-T3 baseline plan.



LAURA CAMPBELL,
Head of Strategic Projects
explains our approach →

INFRASTRUCTURE RESILIENCE

Accelerated Strategic Transmission Investment (ASTI) Projects

Identified within the NESO's Holistic Network Design, significant onshore and offshore network required to achieve the UK Government's target of 50GW of offshore wind by 2030. Through this work, four ASTI projects were identified within our network area, in addition to a number of key onshore enabling works.

Also within the Holistic Network Design report, there were a number of smaller projects identified as required, which are not large enough to be ASTI projects themselves, but are key enabling works on our existing network that are as important in the move to achieving our Net Zero goals.

£4,077m
of project activity
ongoing in parallel
with our plan

Current ASTI Projects (Required for 2030)

Project Code		Cost* (£m)
E2DC	<i>EGL1 – A new 2GW HVDC subsea link from a new Branxton 400kV substation to Hawthorn Pit in the northeast of England.</i>	970.36
DWNO	<i>A new 400kV OHL from Bonnybridge to an existing OHL north of Glenmavis, together with associated substation works, conductor W replacement and voltage uprating on existing OHL routes.</i>	217.04
TGDC	<i>EGL4 – A new 2GW HVDC Eastern subsea link from Westfield to south of the Humber estuary, together with associated onshore works.</i>	1,389.71
TKUP	<i>New 400kV substations at Mossmorran, Westfield and Glenrothes to establish a 400kV double circuit corridor, on existing overhead line routes, between Kincardine North and the SSEN's Tealing.</i>	345.58

Holistic Network Design (HND) Projects

–	<i>New Branxton 400kV substation to facilitate the connection of E2DC and reinforcement capacity between Scotland and England, as well as the connection of planned offshore renewable generation in the Firth of Forth.</i>	104.18
VSRE	<i>Replace existing OHL conductor on the strategic east-west Strathaven – Smeaton (XH/XJ Route) corridor with HTLS conductor.</i>	120.04
LWUP	<i>Establish new 400kV substation north of Kincardine and connect to Denny North at 400kV.</i>	123.40
DWUP	<i>Establish a 400kV single circuit corridor south from Kincardine North, on existing OHL routes, to Clyde's Mill substation.</i>	77.30
EHRE	<i>Replace existing OHL conductor on the southern (Elvanfoot – Harker) section of the strategic north-south Strathaven – Harker (ZV Route) corridor with HTLS conductor.</i>	122.22
VERE	<i>Replace existing OHL conductor on the northern (Strathaven – Elvanfoot) section of the strategic north-south Strathaven – Harker (ZV Route) corridor with HTLS conductor.</i>	90.34
DLUP	<i>Establish a new 400kV substation at Windyhill and a 400kV single circuit corridor, on existing OHL routes between Windyhill, Lambhill and Denny North.</i>	131.27

*SPT works only

INFRASTRUCTURE RESILIENCE

Transitional Centralised Strategic Network Plan 2 (tCSNP2) Projects

NESO's follow up to the initial Holistic Network Design, detailed in the Beyond 2030 Report a further ten projects over and above the initial HND projects. The two upgrades indicated, EHRE and VERE are included in our Central Scotland projects, and a number of the new onshore circuits have been designed to include collector substations for local generation.

Other than EHRE and VERE, these projects also have their own specific funding mechanisms and therefore do not feature within our baseline plan, but do play a key part in the work we will be doing in designing and developing the network throughout the period.

tCSNP2 Projects Project Code		Cost* (£m)
CMN3	<i>New 400kV circuit between Gala North and Carlisle area.</i>	357.48
WCN2	<i>New 400kV circuit between Ayrshire and Carlisle area via new substation(s) within Dumfries and Galloway.</i>	728.38
HGNC	<i>New 400kV circuit between Harburn and Gala North.</i>	280.24
NHNC	<i>New 400kV circuit between New Deer and Harburn.</i>	205.03
WCD4	<i>A new 2GW HVDC subsea link from south west Scotland to north west Wales, incl. connection of 2GW Offshore Wind Farm.</i>	2,601.88
CVUP	<i>Clydesmill to Strathaven 400kV Reinforcement.</i>	40.29
LCU2	<i>Kincardine North – Currie B5 Reinforcement.</i>	106.88
HBNS	<i>Establish a new substation at Harburn.</i>	115.05

*SPT works only

The quality and rigour of our asset stewardship is a key aspect of how we deliver value to energy consumers over the long-term. This part of our plan focuses on how we preserve the integrity and resilience of our network by replacing and refurbishing existing network assets based on an assessment of risk that accounts for the health of an asset and the consequences of it failing. Our strategy is designed to ensure we balance cost-efficiency and the timing of our interventions. We also allow for interactions with our load-related investments to minimise disruption and capture joint efficiencies. That means we are targeted with our actions and avoid costs from premature or unnecessary work. We set out our plans for five different categories of network asset in turn:

Overhead lines

How we are planning to refurbish and replace conductors, fittings and towers.

Underground cables

How we are planning to improve replace and reduce environmental risks across the circuits we run underground.

Circuit breakers

How we are targeting replacement works to reduce fault and environmental risks.

Transformers and reactors

How we are planning the right mix of replacement and refurbishment.

Non-lead assets

How we are managing the assets and systems at our substations that enable our system to run efficiently.

Increasing the resilience of our assets

Value of reduced risk

£23.1bn

How much our targeted interventions to reduce asset failures will reduce network risk over the life of those interventions.

Co-ordinated investment

82%

The proportion of our conductor replacement that is being delivered by co-ordinating with major system reinforcements.

Circuit breakers with lower environmental risk

96%

The minimum reduction in Global Warming Potential by moving to non-SF₆ gas insulated switchgear, which we are driving towards during RIIO-T3.

Future-proofing

90MVA

The higher standard rating for all 132kV transformers we are replacing during RIIO-T3, uplifted from 60MVA to secure low-cost options for future growth.

Risk Assessment Methodology

By keeping our assets in good condition, we avoid disruption on the network caused by asset failures. Primary outputs of our non-load related investment such as network reliability and the delivery of power have a direct impact on existing network users and customers. They contribute directly to the consumer outcome of secure and resilient supplies.

We deliver an extremely high standard of performance in network reliability, currently measured at 99.99%. Our non-load programme aims to maintain this performance despite conditions for doing so becoming harder in RIO-T3. Our transmission network will be growing at a rapid rate with new substations, overhead line and cable systems being constructed. The network will also be increasing in complexity because of greater interconnectivity with other networks, use of new technology and changing system characteristics (such as bi-directional power flows).

The content opposite begins by describing the asset-risk assessment methodology adopted across the transmission sector in GB called NARM – Network Asset Risk Metric. We outline how our non-load related investment manages the network risk outlook over the course of RIO-T3.

We then describe our asset management policy and strategy for the two categories of assets in the regulatory framework – lead and non-lead assets. Lead assets are major components on a transmission network, specifically circuit breakers, transformers, cables, reactors and overhead line conductors, towers and fittings. These are assessed in the NARM framework. Non-lead assets (the rest of our asset portfolio) are not yet included in the NARM methodology, but we identify and optimise our interventions using the same principles as for lead assets.

The overview we provide is complemented by detailed information in our [Network Asset Management Strategy Annex](#).

Risk-based interventions through NARM

All assets will in time, fail. The time to failure varies depending on the effectiveness of maintenance regimes. To simply replace an asset at pre-defined intervals without consideration of its condition would be wasteful and expensive. There are some circumstances however where compliance with legal and statutory requirements makes this necessary, such as recent requirements to replace oil filled plant to comply with the Persistent Organic Pollutants Regulations. The NARM methodology aims to bring a consistent approach to decision-making by TOs on investments to refurbish and replace lead assets.

NARM supports decision-making by assigning a financial value to the risk of an asset failing. This concept of ‘monetised risk’ is calculated for each lead asset by multiplying the asset’s probability of failure (PoF) with the consequences of that asset failing (CoF). We establish PoF for an asset using data we have on its condition. CoF is the cost associated with the impact an asset’s failure would have from a system, environmental, financial and safety perspective. The monetised risk for the network as a whole is the cumulative monetised risk for individual lead assets on the network.

A reduction in overall network monetised risk (or ‘total network risk’), relative to the ‘do-nothing’ position, is achieved over time as we complete our programme of refurbishment and replacement. The benefit we deliver is quantified by the difference between total network risk that would materialise without any intervention and the total network risk with interventions. The diagram opposite illustrates the reduction in total network risk that our RIO-T3 plan will deliver. We plan to invest £507m (around 5% of Totex) through our non-load related programme to deliver this network risk benefit.

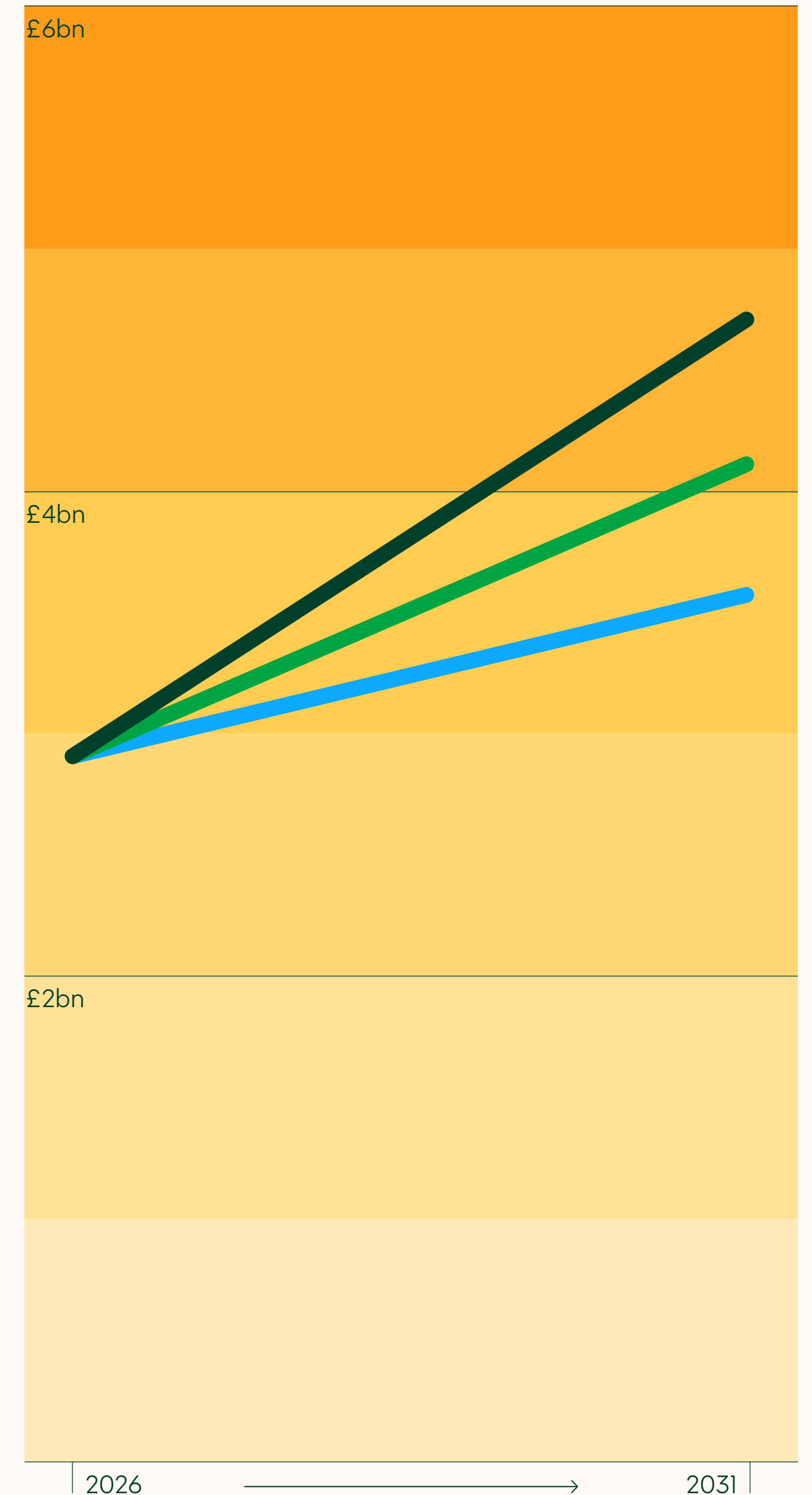
The network risk position at the end of the period will be higher than at the start if we do not intervene on the assets that are in poor condition. As a result of our interventions, the risk at the end of the period will be greater than at the start but less than it would have otherwise been. This is because assets that are in good condition do deteriorate over time and as these make up most of the assets on the network, they contribute a material increase in risk. This is not a concern because the risk is mostly made up of assets in good condition that are just naturally going through their expected lives.

The risk reduction that comes from the planned interventions is calculated over 45 years. This is known as the Long Term Risk Benefit and the total generated by our plan is Lr£23.1bn.

A number of asset interventions happen through our load-related plan. It is part of a coordinated approach to network planning where we might take the opportunity to replace an ageing asset when we are uprating or extending the circuit that the asset is on. These are strategic decisions that aim to avoid costs and risks associated with taking circuits out of service multiple times. Had such asset replacement or refurbishment not been in our load-related plan, we would have included these interventions in our non-load programme.

As well as the monetised risk movement of our network, for each of our lead asset types we provide a graph which explains how the asset interventions in our load and non-load plans combine to reduce the risk in our poorest health assets.

RIO-T3 Lead Asset Network Monetised Risk



How we optimise intervention proposals

When translating the strategies into an intervention plan, there are multiple factors we need to take into account to ensure we are optimising the investment we are making in our asset base.

We have already discussed how we make decisions on what will form our non-load plan based on the condition of our assets. We have a number of options available to use but primarily we decide between asset replacement or refurbishment. While the upfront cost of refurbishment is likely to be lower, we need to consider the effect of the intervention over the long term. We typically expect refurbishment activities will extend the life of an asset by about 20 years; any shorter than this and it may not present the best value. Our Cost Benefit Analysis (CBA) process evaluates our interventions over the life of an asset, and we use this to optimise our interventions.

When considering our non-load plan, we also need to consider the wider context of our network and any interactions with our load investment programmes. The connection requests and network reinforcements required to facilitate these connections change more rapidly than the condition of our assets. Our accredited asset management processes tell us when an asset is reaching the end of their life and this forms our non-load plan. We constantly evaluate the projects in our non-load plan against our load driven activities. Doing this means we do not reductor an overhead line which would then require uprating to a higher capacity a short time later for example. In fact, in our plan over 80% of the reductoring work we're undertaking will be part of load-related programmes. This ensures that wherever possible we visit an asset once, carry out the work required and then only carry out inspection and maintenance activities until that asset starts to near end of life.

When creating our non-load investment plan our goal is to continue to provide high standards of network reliability to our customers. But we do so ensuring our solutions are optimised through strategic investments that avoid additional costs from acting too late or too slowly.

80%

of the reductoring work we are undertaking will be part of load-related programmes.

Interactions between load and non-load programmes are aspects we have considered in our previous plans. In RIIO-T3, however, we have chosen to make more strategic investments to accommodate future load growth where no specific need is currently apparent. When considering this we have taken reasonable steps to ensure the strategic investments are still delivering the best value to consumers. There are two opportunities for strategic investment in our non-load plan and the feedback from our stakeholders provided strong support for including these works in our plan.

Conductors

When we are reductoring 132kV construction overhead lines due to condition we are choosing to install the largest conductor possible on these towers without having to strengthen the steelwork or foundations. We would normally install 'Poplar' conductors as the like-for-like replacement for 'Lynx' conductors on non-load related projects. However, in RIIO-T3, we will install 'Sycamore' conductors which gives a 20% capacity increase while the increase in cost to do this is minimal; primarily a small increase in the conductor and fittings cost but this approach could avoid the need to reductor in the future, before the conductor's end of life. We've applied this approach to the 132kV routes with Lynx conductors which connect to Grid Supply points.

44MVA

additionally provided by conductor strategic investment.

Transformers

We have also chosen to replace the 60MVA rated 132kV transformers in our plan with transformers with a 90MVA rating. Replacing 60MVA with higher rated units will facilitate load growth well into the future with a minimal uplift in cost. We have chosen to limit this type of investment to our 132kV network as applying this principle at 275 and 400kV would increase the costs significantly due to a number of factors and therefore the benefit of the strategic investment may not be realised.

180MVA

additionally provided by transformer strategic investment.

LEAD ASSET STRATEGY

Overhead lines

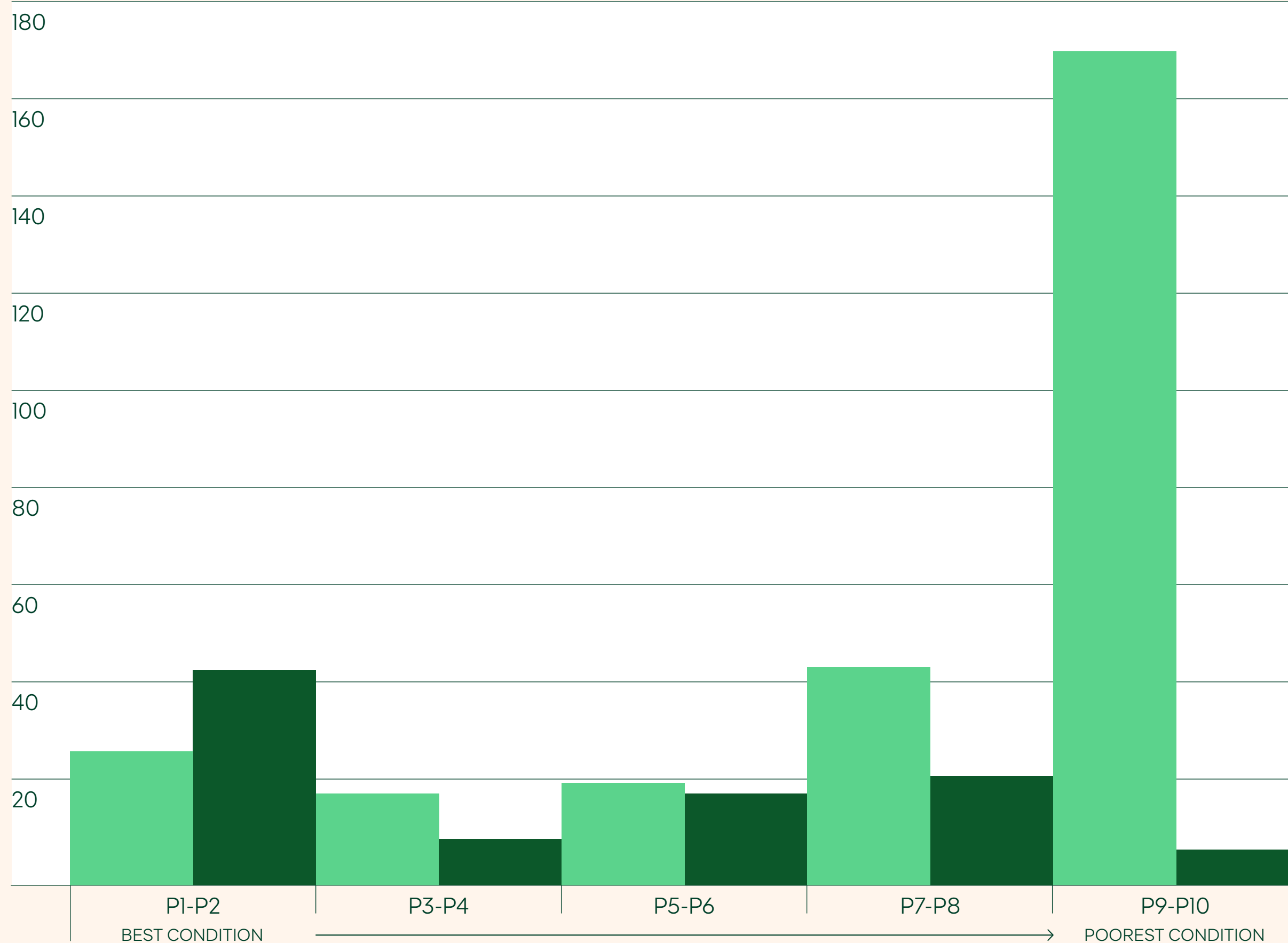
Overhead line (OHL) routes are maintained, refurbished, or have critical components replaced to maintain reliability, operational risk, and safety performance.

The 132kV network was built largely before the mid 1960s utilising aluminium conductors with a steel core (known as ACSR). ACSR conductor uses grease to provide corrosion protection between the conductor layers. On 132kV overhead lines only the core of the conductor was greased. Core only greased conductors deteriorate quicker than later designs where all layers were greased.

The 275kV network was built from the early 1960s. The conductor installed on the 275kV network used core only greased conductor up to the mid 1960s with all layers being greased after this. The 400kV network was built from the late 1960s. The network has grown since the 1990s, mainly by uprating 275kV routes, resulting in core only greased conductors being present on 400kV circuits.

Monetised Risk based on asset condition at 2031 (£m)

Without Intervention With Load and Non-load Intervention



RESILIENCE VALUE SERVICE

Overhead line conductors

Our asset management strategy for overhead lines focuses on optimising the replacement programme of ACSR core-only greased conductors. This is based on evidence collected across the network for this type of conductor and its corrosion rates. When viewed over the long term, the optimised profile for replacement results in a rate of 70-90 circuit km per year. Replacement of these conductors was planned as a long-term programme with specific investments included in each of our business plans, starting in RIO-T1 and completing in RIO-T3.

Quad and twin bundled conductors are prone to wear due to wind induced oscillations. The conductor fatigue which this causes may result in the early life failure of the conductor. Replacement of the associated spacer and dampers helps protect the conductor from this effect. Our fittings interventions began to address this in RIO-T2 and we've identified investments required for delivery during RIO-T3.

4.2%

Conductor Replacement across the 132kV Conductor asset base. 60.2 circuit km.

2.4%

Conductor Replacement across the 275kV Conductor asset base. 26.8 circuit km.

Overhead line fittings

The key life limiting factors affecting the health of conductor fittings and insulators are:

- Corrosion of components. Failures of insulators caused by corrosion of the steel pin of the cap and pin assembly.
- Loss of the split pin and washer from the swivel pin at the earth end of suspension insulators on 400kV L6 type lines has resulted in failure of insulator strings.
- Vibration effects cause deterioration of the spacers on our bundled conductor, which is more severe on quad bundles. As these assets approach end of life the risk of conductor damage increases as the fittings wear away the outer strands.

We planned and delivered a large replacement investment programme during RIO-T1 and T2 avoiding unplanned outages and improving reliability across the insulator and fitting population. This strategy continues with additional interventions during RIO-T3.

4.6%

Fitting Interventions across the 132kV asset base. 287 circuit sets.

2.7%

Fitting Interventions across the 275kV asset base. 96 circuit sets.

Overhead line towers

The key life limiting processes affecting structures are:

- Corrosion of towers occurs when the paint/galvanisation deteriorates.
- Design code changes which highlight limitations of historical tower designs.

Our tower painting strategy continues and we have included painting works in RIO-T3, preventing early deterioration of tower steelwork.

When we plan to replace conductors, we review the mechanical capabilities of the original towers. With some designs from the early to mid 20th century, our improved understanding of the capability may conclude that the towers are not suitable for reconductoring. In these limited cases, we would also need to replace the towers.



LEAD ASSET STRATEGY

Underground cables

The oldest sections of our cable network are around 70 years old (the early 132kV routes) and 60 years old (the early 275kV and 400kV routes). All the routes operate to a wide range of load profiles and are buried in different underground environments.

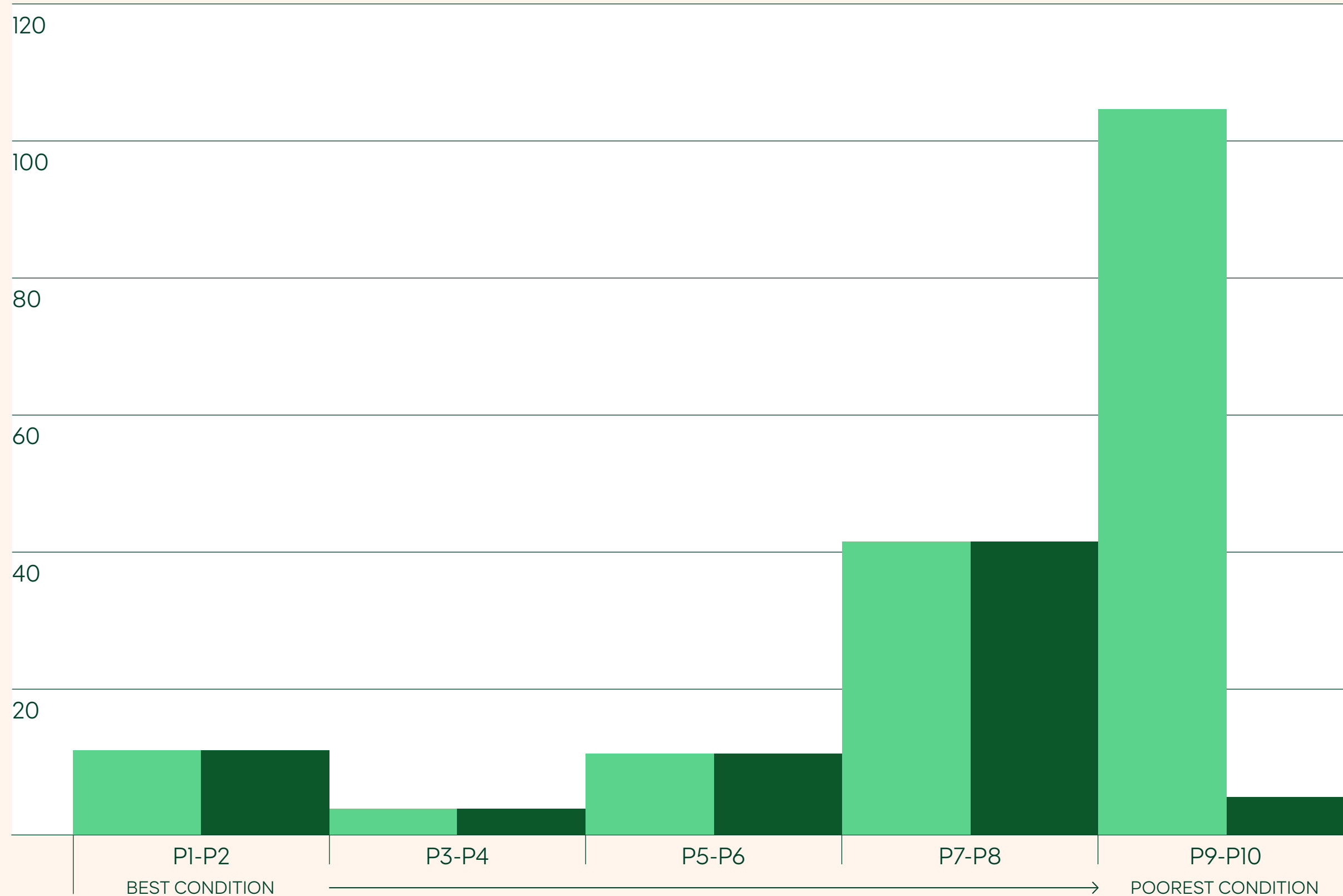
We have defined a method for detailed condition assessment based upon present observed condition, known failure mechanisms, technical asset lives for the various cable system components and their key deterioration patterns. The method also considers criticality of circuits in terms of fault consequences, strategic importance and environmental aspects.

Underground cable systems built before the mid-1960s utilised fluid-filled cables and gas-insulated cable systems. Between the mid-1960s and the later 1990s fluid-filled cables were still the main technology being used. After the late-1990s almost all cables installed were cross-linked polyethylene (XLPE) and oil filled cables were only installed on an exceptional basis.

With gas-insulated cables now fully removed from our network, our strategy for RIO-T3 focuses on fluid-filled and XLPE cables.

Monetised Risk based on asset condition at 2031 (£m)

Without Intervention With Load and Non-load Intervention



INFRASTRUCTURE RESILIENCE VALUE

Fluid-filled cables

Our RIO-T2 investment strategy aimed to improve the condition of targeted fluid-filled cables while building an enhanced surveillance procedure behind the XLPE population to seek to detect condition issues prior to failure. In RIO-T3, we are targeting certain fluid-filled cable circuits for replacement while tagging fluid systems of many other circuits with perfluorocarbon tracers (PFT), which allows deeper interrogation under any failure or leak.

We have updated our strategy because it is becoming increasingly difficult to source the fluid-filled cables and accessories we need to repair faults. While the service history of this type of cable has been generally good, we are experiencing an increasing number of leaks. To allow us to manage the risk associated with fluid-filled cables, we have begun to replace them, targeting the poorest performing. This minimises the requirement for cable spares to manage faults and reduces the environmental risk of our network. The replacements make up 18% of our fluid-filled cables; our best view of the various load-related investments replaces a further 10%. We will keep the cable population under continual review for future price control periods.

9.5%

Underground Cable Replacement across the 132kV asset base. 28.56 circuit km.

XLPE insulated cables

In general, our XLPE cable population is in good condition. We'll continue to monitor them but we expect them to provide many years of reliable service. However, following an electrical fault in early 2024 we identified a particular type of early design of 132kV XLPE cable whose inherent design is likely to lead to further faults which pose a risk to supplies at two Grid Supply Points. The only way to avoid this is to replace the affected 8.2km long cables and we have included them in our plan.

Intervention	Voltage	Circuit Length (km)	Total Cost (£m)
Replacement	132kV	28.56	35
PFT Tagging	132kV	28.69	2
	275kV	3.63	1
			38

LEAD ASSET STRATEGY

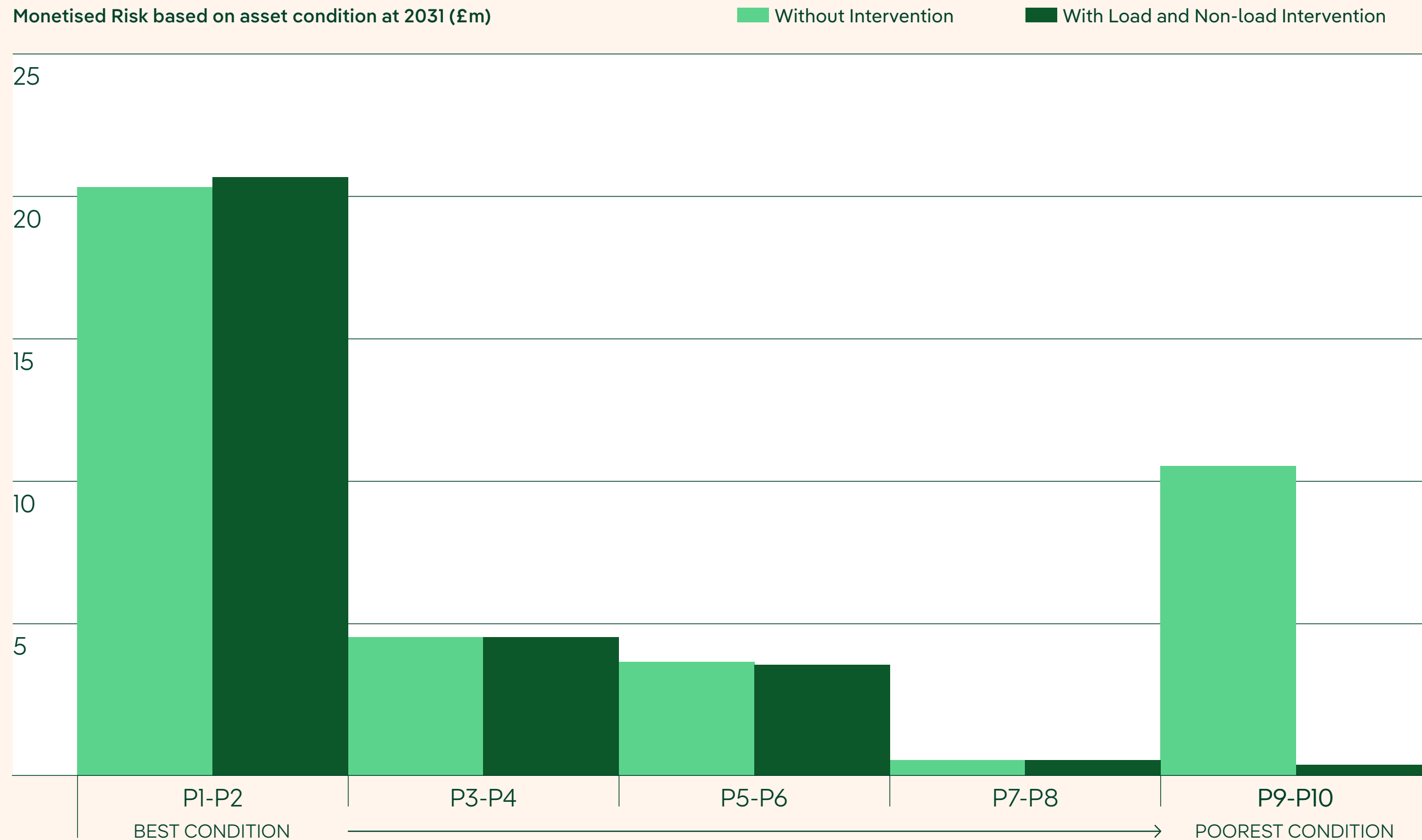
Circuit breakers

We assess the condition of each circuit breaker individually, but we also assess what we call the assets' operational adequacy. The operational adequacy of an asset provides a weighted score based on a number of criteria including manufacturer's support and our in-service experience. The operational adequacy and other criteria are used to calculate the probability of failure which is combined with the consequence of failure to determine the associated monetised risk on an asset-by-asset basis.

In RIO-T2 our circuit breaker strategy was mainly focused on air-blast and oil-filled circuit breakers with a small number of early 132kV SF₆ circuit breakers being candidates for replacement. Our view, at that time, was over the course of RIO-T2 and RIO-T3 we would remove the remaining air-blast and oil-filled circuit breakers from our population and start addressing the problematic SF₆-filled circuit breakers on our network.

A new disruptive failure mode was identified within the bushings of our oil filled circuit breaker population which meant we needed to accelerate the replacement of these assets and remove them all from our network as quickly as possible. This accelerated programme was to remove the unacceptable risk of harm to our staff and the public posed by the disruptive failure of these assets. By the end of RIO-T2 we will have a small number of oil-filled circuit breakers at 132kV and one site with air-blast circuit breakers. The remaining site with air-blast circuit breakers, Longannet, is part of our load-related works (the LWUP project) and will be removed following the commissioning of the new substation at Kincardine North. Our strategy in RIO-T3 therefore is focused on SF₆ circuit breakers.

Monetised Risk based on asset condition at 2031 (£m)



- INFRASTRUCTURE
- RESILIENCE
- VALUE
- SERVICE

SF₆ circuit breakers

The condition issues affecting SF₆ circuit breakers are specific to the technology type. We currently have two different technology types as follows:

- Hydraulic/pneumatic SF₆ circuit breakers: introduced in the mid-1980s.
- Spring Mechanism SF₆ circuit breakers: introduced in the late 1990s.

Hydraulic/pneumatic SF₆ circuit breakers were the first type to be installed on our network. The technology is much older and more complex than a spring mechanism circuit breaker and therefore more problematic. The support for this asset type has also reduced and therefore the availability of replacement components and expertise is dwindling. We have identified assets in our plan that have issues with hydraulic/pneumatic mechanism that require to be remediated.

Depending on the condition of the non-lead assets associated with the identified circuit breakers in our plan, in several instances we are able to replace only the circuit breaker, retaining the non-lead assets. In RIO-T2 our circuit breaker plan, in addition to individual circuit breaker replacement, required some instances of complete replacement of substations. In RIO-T3 our plan is more limited with only one substation, Westfield 132kV, needing the circuit breakers and all non-lead assets to be replaced.

We have also considered the current technological change from SF₆ to SF₆-free and our plan is built to ensure we are installing the minimum amount of SF₆ onto our network. Our goal is that all assets installed will be SF₆-free when viable alternatives are available. The availability of SF₆-free technology is continually evolving. We now have solutions for Gas Insulated Switchgear (GIS) at all voltages, but a challenge still exists for Air Insulated Switchgear (AIS) at 275kV and 400kV.

We anticipate that a 400kV AIS circuit breaker will become available in RIO-T3 which we will install at 275kV and 400kV. The Global Warming Potential (GWP) of SF₆ is 24,300 and the alternative gases used in SF₆-free equipment leads to at least a ninety five percent reduction in GWP, significantly reducing the impact of a leak.

In RIO-T2 we are delivering a plan to replace leaking SF₆ filled circuit breakers. Our RIO-T3 plan has identified family types of circuit breakers which are prone to leaking. While the assets in our plan from these families are not currently leaking, we are convinced they will in the near future and therefore plan to intervene now to avoid the leakage. To allow us to meet our science based targets with regards to leakage it is best to take steps towards preventing that leakage from occurring.

14x132kV

Plan to replace 5.6% of the 132kV Circuit Breakers.

16x275kV

Plan to replace 8.5% of the 275kV Circuit Breakers.

3x400kV

Plan to replace 2.6% of the 400kV Circuit Breakers.

Voltage	Number of Circuit Breakers	Replacement Type	Total Cost (£m)
132kV	14	GIS	35
275kV	11	In-Situ	6
	5	In-Situ	5
400kV	2	In-Situ	1
	1	In-Situ	1

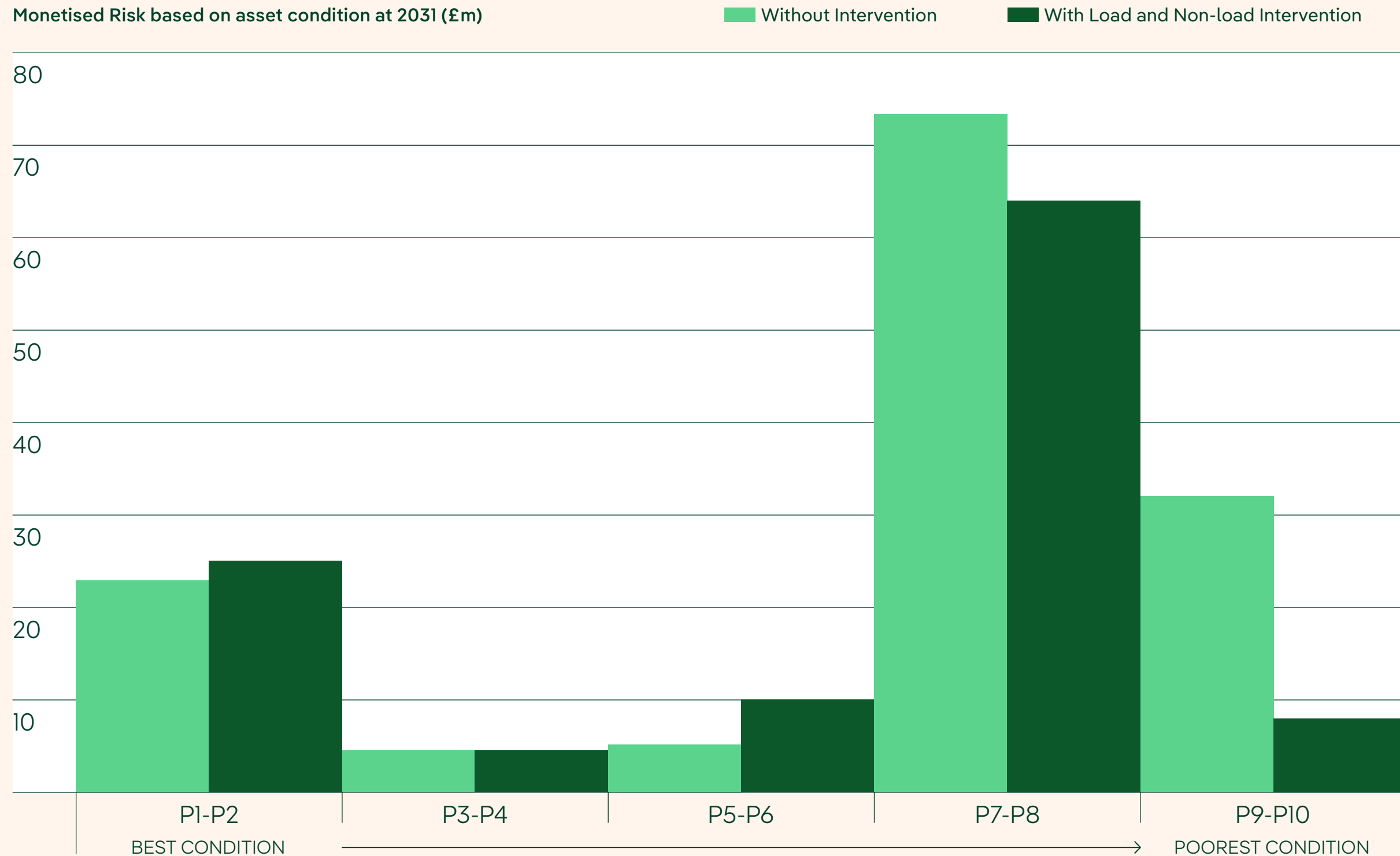
LEAD ASSET STRATEGY

Transformers

Transformers are a key component of the transmission system and allow us to connect parts of the network that operate at different voltages. They are typically large assets filled with oil and failures can present a safety and environmental risk. The lead times to replace them also tend to be long so management of transformers through to the end of their lives is an important aspect of our plan.

Typical deterioration mechanisms for transformers are well understood and can be detected by sampling the transformers' oil and carrying out a range of tests. We carry out annual dissolved gas analysis (DGA) on the transformers' oil along with understanding the acidity of the oil, the oil moisture content, the dielectric strength of the oil and also test the oil for substances that indicate the condition of paper insulation of the transformer. This is part of our continuous condition assessment process for these assets. We also assess the external condition annually which typically identifies oil leaks and corrosion.

The techniques we employ to assess our transformers ensure we have a sound understanding of their condition. To enhance our understanding further when we decommission a transformer, we subject it to forensic analysis. This allows us to better understand the issues we have detected as part of routine analysis and to also have greater confidence that the information we collect correlates well with the asset's health.



RESILIENCE VALUE SERVICE

Replace or Refurbish

In RIO-T3 we have a small number (4% of the population) of transformers we plan to replace but also transformers we plan to refurbish.

In-service failures before RIO-T1 of a particular model of Bruce Peebles transformers made us aware of a design defect in this family. Forensic analysis of those that we removed from our network in RIO-T1 demonstrated this defect was present on all transformers of this type. We therefore have an ongoing, risk prioritised programme to remove transformers with the Bruce Peebles type defect from our network. We have two units remaining with this defect which we plan to remove in RIO-T3.

We have identified transformers which will be replaced based on the transformer condition, following analysis of the information we gather during our routine condition assessment regime. In some instances, this may lead to replacement of the transformer slightly earlier than their ultimate end of life due to the condition of associated assets external to the transformers. We have undertaken cost benefit analysis and have come to the conclusion that full replacement is the solution that provides the greater value to consumers.

We have also identified a number of assets for refurbishment rather than replacement.

Our assessment of these assets has shown that the core, windings and associated insulation systems are in good condition but there are issues with other factors such as the transformer cooling system. During refurbishment we routinely replace the transformers' bushings. Bushings are a key component of a transformer but their condition cannot be assumed by the quality of the oil in a transformer's main tank. As part of our maintenance regimes we routinely test bushing oil, where possible, and this has led us to determine that if we are planning to extend the typical life of a transformer by refurbishment then the bushings need to be replaced as part of that activity.

4.7%

Replacing 15 transformers. 4.7% of asset base.

4.1%

Refurbishing 13 transformers. 4.1% of asset base.

Intervention	Number of Transformers	Voltage	Total Cost (£m)
Replacement	10	132kV	35
	3	275kV	18
	2	400kV	13
Refurbishment	8	132kV	7
	5	275kV	5
			78



NON-LEAD ASSET STRATEGY

Substation systems and infrastructure

Circuit breakers and transformers are not the only assets that can be found in a substation.

The electrical performance of the network depends on sound stewardship of civil assets. Substations have buildings to house electronic protection, control, monitoring (PCM) and telecoms systems in a suitable environment. Transformers can weigh hundreds of tonnes and are filled with many thousands of litres of insulating oil and require reliable foundations and oil containment facilities.

PCM devices perform vital roles detecting faults, automatically re-routing power and making high fidelity recordings of system behaviour. Other high voltage equipment is equally important, such as Gas Insulated Busbars (GIB) which we are targeting to reduce the environmental effects of their insulating gases. We describe our investment plan for some of these diverse assets in this section. More details can be found in our [Network Asset Management Strategy annex](#).

Intervention	Projects	Voltage	Total Cost (£m)
PCM	12	132kV 275kV 400kV	59
GIB Retrofill	2	400kV	4
Environmental Civil Assets Upgrades	Tx Bund	132kV 275kV 400kV	16
Building Energy Usage	Energy Efficiency	132kV 275kV 400kV	7

RESILIENCE VALUE SERVICE

Protection Control and Monitoring

Protection, control and monitoring systems are considered a non-lead asset under the NARM methodology. Nevertheless, their operation is essential to the reliable operation of the electrical network. As with all of our primary assets we have a continuous condition assessment regime in place. For other asset types, our condition assessment regime relies on visual inspection and testing of assets to help us understand when an asset is nearing end of life. The majority of our protection, control and monitoring devices are based on electronics and therefore our way of assessing their condition is based on an approach suitable for these asset types. We consider a number of factors including the manufacturer support available, the maintenance requirements and the defect history of the asset type. We carry out a condition assessment at a model specific level and all assets of that model type will have the same condition assessment result. Protection and control devices typically are manufactured in evolutions of a family model and there are different variants within the family. When we carry out a condition assessment on protection, control and monitoring devices, we will assess each variant separately i.e. there will not be a generic score for the family but a score for the variant.

We will maintain our RIO-T2 strategy in RIO-T3 and continue to replace assets with a Health Index 4 or 5 as assessed against our methodology. In most cases we replace individual protection and control devices and not full schemes. We consider full-scheme replacements when either there is major intervention in the substation (for example all of the substation electrical assets are being replaced) or if multiple assets in the same protection and control scheme are considered to be at or near end of life.

Some examples of projects in RIO-T3 are as follows:

We have Series Compensation equipment installed at our substations at Moffat, Gretna and Eccles. These bespoke installations are used to increase the capacity on our East and West Coast 400kV AC circuits crossing the B6 major boundary. The Series Compensation platform forms part of the circuit, however they have a specialised protection and control scheme (that specifically manages the platform and its equipment, separate from the normal circuit scheme). This equipment is a proprietary design and SPT have experienced a number of issues with the existing installations. The installed equipment is no longer supported by the manufacturer and spares are limited, so we have decided to replace them.

We are replacing the Automatic Voltage Control (AVC) relays at a number of our substations. There are two reasons for this. One is that we are choosing to replace assets at end of life, in accordance with our condition assessment methodology. The second is for one type of AVC relay which has poor performance under reverse power flow conditions. We are changing them to ensure we do not have any voltage issues on sites with embedded generation.

40GW by 2040

It is anticipated that the B6 boundary capability will increase throughout RIO-T3

INFRASTRUCTURE RESILIENCE SERVICE

GIB Retrofill

Gas Insulated Busbars (GIB) are long metal tubes containing electrical conductors surrounded by a gas. Any GIB we installed prior to RIO-T2 will contain SF₆. Due to the design of these types of installation they generally hold large quantities of SF₆ and therefore in the event of a leak, large volumes of gas can be lost. We ensure any leaks are repaired at the earliest opportunity. It is our view that if the SF₆ in GIB can be replaced with a gas with a lower GWP, we will replace it with an alternative gas.

We have an ongoing innovation project to develop a new retrofill gas. This innovation project will remove around eight tonnes of SF₆ from our equipment and although not part of our RIO-T3 baseline this innovation project will deliver in 2026. Retrofill gases are manufacturer and model specific so one gas cannot be used for all applications. Eco-efficient gas to replace SF₆ installed GIB- is available now from Hitachi Energy as EconiQ™ retrofill, this is compatible with ELK-3, 420kV GIB. In RIO-T3, we plan to retrofill all outdoor ELK-3, 420kV SF₆-filled GIB with this ecogas. All outdoor GIB at Hunterston East and Wishaw 400kV substations become SF₆-free by removing just under 7 tonnes, or more than five percent, of SF₆ from our inventory.

The retrofill gases currently available are a gas mixture utilising the C4-FN (C4-fluoronitrile) gas molecule. The GWP of the retrofill gases are significantly higher than for new SF₆-free equipment. However, this still leads to a ninety five percent reduction in GWP when compared to SF₆.

RESILIENCE VALUE SERVICE

Civils

In RIO-T2 we have an extensive substation civils asset refurbishment and replacement programme. Reviewing the condition information of our civil assets, we believe a similar programme is not required in RIO-T3. We have, however, identified a number of transformers' bunds which we plan to upgrade based on their condition. These largely tie in with our transformer refurbishment programme. We also have a building energy reduction programme in RIO-T2, we intend to continue this in RIO-T3.

We are currently reviewing our substation buildings for the presence of Reinforced Autoclaved Aerated Concrete (RAAC). This has been used extensively, particularly on flat or shallow pitched roofs. RAAC has failed on a number of occasions in other industries and therefore we believe this presents a risk to our staff and electrical assets. We have initiated a programme to survey our substation buildings for RAAC. So far, we have identified less than 15 sites where we have RAAC present. We are still completing our RAAC assessments and believe RAAC remediation should be funded by an uncertainty mechanism rather than form part of our baseline. The RAAC remediation measures to be applied will be very site specific. Therefore, we believe an uncertainty mechanism gives best value to consumers rather than baseline funding when, at this time, we have less certainty about the best solution for each site.

In this part of our plan, we describe other things we do to preserve the integrity of the network. We refer to this area of investment as ‘network operations’ and it includes inspections and maintenance as well as repairs. Other key elements include investments in technology to remotely monitor and control our electrical assets and systems to detect and isolate faults on the network. We call this Operational Technology. The work we do to safeguard our network from the impacts of climate change (e.g. flooding, storms), cyber attacks or physical threats also form part of network operations.

How we are maintaining our strengths and scaling up to meet the challenges of RIIO-T3 are described across the following activity areas:

Inspections and Maintenance
How we are adapting to a growing and more complex network.

Operational Technology
How we improve resilience, enable new applications and stay secure.

Climate Resilience
How we manage short-term risks and plan for the future.

Cyber Resilience
How we secure our infrastructure as threats evolve.

Maintaining the integrity of our network

More frequent and sophisticated monitoring of our overhead line assets

Increase to **20%**

Our annual condition assessments in RIIO-T3 from 10% currently, alongside a wide range of data gathering techniques.

Upgrading our Operational Technology infrastructure

£124m

Critical investment to meet the needs and drive the opportunities of a larger, smarter network – and have robust defences against heightened cyber risks.

Scaled up and targeted inspection regimes for substations

60 new substations

Substantial inspections during RIIO-T3, with increased focus on supporting structures and buildings.

The reality of more extreme weather

37 risks

The number of material risks to network assets that we are taking action to manage during RIIO-T3 consequent to more frequent extreme rainfall, floods, temperatures, droughts and storms.

Inspections and Maintenance

We test and visually inspect our assets to identify potential issues before they cause problems. Our maintenance regimes aim to keep our assets in an appropriate condition and operating to specifications. Any issues identified through our inspection and maintenance activities will lead to repairs or asset refurbishment and replacement through our non-load programme. Our teams also respond to faults whenever they occur.

Substations

We have comprehensive inspection and maintenance policies to ensure we fully understand the condition of our assets. In RIIO-T3 this will comprise of monthly inspections of all our substation assets and tailored maintenance regimes depending on asset type and construction. We will maintain this cadence of activity even as we add up to 60 additional substations in RIIO-T3. It is important for us to do so because all our assets must be maintained to make sure they remain fit for purpose, and ensure efficient and secure supply. Our monthly inspections will include security checks to ensure no unauthorised access can occur within substations, for the safety of the public, our staff and our assets.

There are several areas our policies will target in RIIO-T3. First, we need to ensure our staff are equipped with specialist knowledge and experience to manage equipment installed on our network that are no longer supported by the original manufacturer. They also need specialist skills to manage the removal of insulation gases or to deal with leaks of those gases and the introduction of more technologically advanced equipment will require new technical knowledge and skills. We will approach this challenge in RIIO-T3 through a combination of staff development and entering into service agreements with appropriately qualified service providers. Secondly, all transmission substations typically include concrete and steel structures to support assets and a building containing protection and control assets, telecoms and other critical infrastructure. So we need to maintain a large number of buildings and civil assets such as transformer bunds and oil-water separators. We will focus on substation civil assets and an expansion of our programme of civil surveys to ensure our buildings and structures are fit for service and we identify any potential interventions where needed. Finally, we will also target on vegetation management in our substation compounds.

Overhead lines

Our aim for our overhead lines is the same as for our substations: to make sure they operate safely and securely. To do so, we will inspect all our overhead line assets annually. Activities will include thermal inspections of our conductors every two years on each route. We will complement this with visual inspections by foot and helicopter to observe vegetation in the vicinity of our lines, changes in land use and conductor and fitting damage that might have occurred. We will also deploy aerial ground clearance surveys and will survey our network every five years to provide data that will be used in our overhead line design software to provide a full digital model of our network.

Data from our inspections will also inform our condition assessment regime to understand the health of individual overhead line components on each route. Overhead line condition assessment comprises steelwork condition for towers, conductors, insulators, fixtures and fittings and may lead to a more detailed climbing inspection if required. We will increase our annual condition assessments in RIIO-T3 from 10% of our circuits to 20%. As with substations, this expansion in our activity will be delivered notwithstanding the projected growth in our overhead line circuits in RIIO-T3.

A key policy target will be to carry out additional testing on our conductors, dependent on their type. For example we will carry out non-intrusive corrosion testing of the steel core of steel reinforced aluminium conductors (ACSR) which are over 30 years old. This will be followed up by intrusive testing if an issue is detected. For All Aluminium Alloy Conductors (AAAC) we aim to carry out destructive sample testing on any of these conductors that reach 40 years of age during RIIO-T3 to assess the condition of the AAACs on that route.

Cables

Unlike substation and overhead line assets, the majority of our cable assets cannot be visually inspected. We inspect all our visible cable terminations monthly as part of our substation inspections. The remainder of the cables' condition has to be established by testing. This includes testing on the outer metallic sheaths and testing the cable bonding arrangements as these are typically the first indicators of the cable deteriorating. In RIIO-T3, we will test each cable every three years.

Our policy will target extra maintenance for fluid-filled cables. These cables require additional maintenance compared with cross-linked polyethylene (XLPE) cables to avoid leaks and keep them operating reliably. A fluid-filled cable has a tank system that is used to maintain the fluid pressure on the cable system. We will check the pressure monitoring system on these tanks every year to ensure they are correctly calibrated.

Repairs and Fault Response

With an extensive asset base, breakdowns do happen from time to time, so we need to be able to repair our equipment to ensure maximum availability. For equipment which is still supported by the original manufacturer this is reasonably straightforward. However, for assets where manufacturers' support is no longer available, we endeavour to find replacement components to maintain assets in service without complete replacement. Where replacement components are not available, spares are recovered from assets being removed from the system. We develop specialists who understand failure mechanisms associated with different assets, to make sure we have the equipment and services available to carry out repairs and to respond to faults in the most timely and cost-effective manner.



Operational Technology

We refer to the systems and data networks that we use to monitor, control and protect our network as Operational Technology (OT). These are required to ensure safe, reliable, and secure electrical network management. Monitoring and control systems display the status of equipment, alarms and key parameters such as voltage and current levels.

These systems also send electronic signals to operate equipment (such as the opening or closing of circuit breakers). They function as the 'eyes and ears' for our control rooms and enable operation of the network both locally and remotely. Monitoring and control systems are vital to optimise network performance, reliability, and sustainability. Protection systems detect faults in electrical circuits and automatically isolate faulty equipment from the network as quickly as possible. They mitigate safety risks and prevent the effect of a fault spreading to the rest of the network. Protection systems ensure the safety of the public and personnel and also the stability of the electricity network.

Our OT network connects every substation to our control rooms providing secure and remote connectivity between them and the NESO. It utilises a variety of media including 4G, radio, cable, optical fibre, satellite, and leased services. In RIIO-T3, our investment will improve resilience of the electrical network by enhancing the quality and capacity of the existing OT network, replacing obsolete equipment, and deploying new technologies to improve reliability and enhanced management of the network.

£124m operational technology costs

Summary of investment

Reducing risk and increasing resilience of our transmission network is central to our strategy. The overall goal of our investment in OT is to reduce risk and increase resilience of our transmission network. We outline in the following sections our OT investment drivers under four resilience-related themes.

Visibility and Controllability

We will continue to provide the NESO with visibility of our power quality measurements and expand on the coverage of our dynamic circuit rating solution. Our dynamic circuit rating system monitors circuits' loading and provides a rating based on the prevailing conditions.

Integrated Smart Grid Architecture

Continuing from RIIO-T2, we will consolidate our architectural infrastructure, derived from the asset management strategy and the continuous review of our cyber security risk controls, to ensure those controls are still effective in reducing the risk in an evolving threat landscape.

The integrated Infrastructure architecture will continue to undergo refresh and replacement of end of life core assets and upgrades to system applications.

The resulting simplified operating model will help with overall service availability, the deployment of upgrades and new solutions, particularly those associated with onboarding Cyber security controls and applications, effective asset management, and fault resolution.

Consolidation and Standardisation

Removing complexity in the operation of our network will further improve its resilience. We will achieve this simplification by standardising our Supervisory Control And Data Acquisition (SCADA) systems and its underlying functionality. By doing so, we will allow for data integration which enables higher quality, accuracy and efficiency of how we process data. Standardisation will also optimise support for our SCADA systems and provide scalability as growth continues.

Telecoms Network Modernisation

We plan to improve the resilience of our telecoms network by replacing assets coming to the end of their life and exploring opportunities to use industry leading technology.

Our RIIO-T3 proposal sees telecoms investment more than double the investment of RIIO-T2 as a result of a larger telecoms network needed to serve an expanding and more complex network together with the increasing cost of materials and services.

Our 132kV Network Resilience programme mitigates the risks associated with a failure of the telecoms network by providing a "hitless" protection service that will maximise service availability. It achieves this by seamlessly routing critical services over more than one path to avoid disruption from failures.

It is our strategy to remove single point of dependencies in our service and any reliance on a single provider. In RIIO-T3 we will install additional optical fibre infrastructure to allow us to avoid the use of third party services, removing dependency on suppliers who own, maintain, and repair the service.

Finally, we will replace parts of the earliest optical fibre infrastructure as it comes to its end of life during RIIO-T3.

Deliverability

Our RIIO-T3 plans provide for the significant development and growth of our OT infrastructure and associated services. While our plans incorporate a necessary step change in activity in line with what is required to deliver for our customers and stakeholders, we have been anticipating and preparing for this change. We are therefore well placed to build on RIIO-T2 and deliver the significant increase in activity that underpins our plan.

In 2025 we are introducing a revised model Telecommunication Framework which provides delivery, operation and maintenance. The multiple contract model, the awards for which will follow an extensive development and tender exercise, is designed to drive efficient delivery of increased volumes, produce enhanced levels of operational service and will increase competition compared to the previous contract model.

We continue to evolve our processes, supported by standardised solutions, to enable automation, telecoms, and monitoring solutions to be installed, configured, and commissioned efficiently.

Our approach is the same for both our internal and contractor workforce. This approach is around having the right level and volume of specialist resources in the centre, upskilling our field workforces so that they can carry out routine and replicable tasks, and utilising technology to support complex tasks remotely with specialist resource.

Our training and recruitment programmes are heavily focused on the specialist requirements of Operational Technology.



Safeguarding Measures

Increasing intensity and frequency of extreme weather events pose direct threats to infrastructure, operational reliability, and the safety of the transmission network.

As part of our Business Plan, we have developed a Climate Resilience Strategy (CRS) which outlines our approach to maintaining a safe and resilient transmission network amid these evolving climate challenges. The strategy is not just about mitigating risks but also about seizing opportunities to maximise co-benefits, innovate and improve the overall efficiency and sustainability of the network.

We provide an overview of our CRS in the sections that follow and expand further in our [Climate Resilience Strategy Annex](#).

Climate change causing river bank erosion, putting transmission tower at risk



Climate Resilience

We structured our CRS into two main parts.

Part 1: Climate Risk Assessment

We assessed the risks to substations, overhead lines and cables from the impact of climate change. This involved the steps we outline below.

Identification of relevant climate variables and hazards using UK Climate Projection (UKCPI8) scenarios for 2030 and 2050 such as temperature change, varying precipitation and storm patterns and sea level rise, which could lead to heat waves, flooding, and landslides. As part of this step, we ensure alignment with latest scientific findings including projections from Intergovernmental Panel on Climate Change and UKs Climate Change Committee. This helps ensure our CRS is grounded in robust climate science and policy frameworks.

The next step involves an assessment of the likelihood of these hazards occurring and consequence for our substations, overhead lines and cables.

The final step involved evaluating the potential impacts on network performance and identifying priority areas for intervention.

We outline the findings from our climate risk assessment in the next section.

Our climate risk assessment identified a total of 37 risks impacting our assets. We summarise in the diagram opposite the distribution of these risks across our asset categories and highlight a selection of some high-scoring risks.

37 climate risks identified

Substations

12

Increasing frequency of extreme rainfall can pose a threat to the safe operation of substations and affect security of supply.

Overhead Lines

6

Extreme rainfall resulting in nearby rivers flooding causing erosion to OHL foundations.

Underground Cables

4

Underground cables are affected by drought and temperature changes.

Substations & Overhead Lines

5

Wildfires and drought, affect both overhead lines and substations.

All Assets

10

Network-wide risks involve landslides, coastal, flash and river flooding, and storm impacts that impact all assets types.

Part 2:

Adaptation Solutions and Pathways

We identified adaptation strategies to mitigate these 37 risks. These have been categorised into short-term measures, to be implemented during the RIIO-T3 period, and longer-term measures extending beyond this timeframe.

Our whole-system thinking here involves collaboration with external climate organisations like Sniffer as well as engagement with other infrastructure organisations (such as Network Rail and Scottish Water) with common challenges and where impacts on one can result in cascading risks for others. In addition, we will work with government agencies, research institutions, and community organisations to share knowledge, leverage resources, and develop innovative solutions.

SHORT-TERM

Measures which focus on asset protection, that are cost-effective now and provide resilience under a range of future climate scenarios. They include immediate actions to address the most urgent risks and provide a quick return on investment, such as protecting overhead lines and upgrading substation flood defences. Nature-based solutions in close proximity to our assets will also be considered and prioritised early in our adaptation journey.

During the RIIO-T3 period we will set up specific projects to deliver the measures proposed after more detailed study. This study will refine the scope and costs for each project. These will be more focused on the measures to protect sites or assets such as substations or the overhead line network. For the non-site-specific projects like nature-based solutions, discussion and consultation will be required with wider stakeholders to implement these and create a detailed project scope for each.

LONGER-TERM

More substantial changes to network design and operation, such as relocating critical infrastructure. We will also adopt a partnership approach to reducing climate change impacts through piloting catchment area nature-based solutions. These include slope stabilisation through planting, peat bog restoration and restoring coastal wetlands and river channels. These adaptation measures will reduce the most significant impacts of flooding and landslides and have wider social benefits as risks are reduced in the local vicinity. Nature-based solutions also restore biodiversity and nature's ability to provide further regulating services such as carbon sequestration. These actions require more time and resources but offer significant benefits in terms of long-term resilience.

ADAPTING & RESPONDING

As climate change can produce unexpected events, uncertainty mechanisms will play an important role in enabling our response. The range of potential impacts and society's developing understanding of climate risk impacts mean that we will continually update and adapt our strategy.

Our CRS is a critical component of our broader sustainability and risk management framework. We have aligned it with national and international climate policies, ensure it supports regulatory compliance, and contributes to the resilience of the broader energy system. By taking a proactive and strategic approach to climate resilience we are demonstrating a firm commitment to a sustainable and resilient future.

Through this strategy, we are not only protecting our assets and operations but also contributing to the resilience and sustainability of the communities we serve.

Cyber Resilience

The evolving landscape of cyber threats presents new challenges that demand a proactive and adaptive approach to safeguarding our infrastructure and ensuring the security of supply for our customers.

As we transition into the RIIO-T3 period, we remain steadfast in our commitment to enhancing cyber resilience across our transmission network. SPEN adheres to the General Data Protection Regulation and Network and Information Systems Regulations and follows guidance and advice provided by Ofgem and the National Cyber Security Centre.

During RIIO-T3, we will face increasingly sophisticated cyber threats that target both our Operational Technology (OT) and Information Technology (IT) systems. The rapid pace of digitalisation and the integration of new technologies necessitate a robust and dynamic cyber resilience strategy. Our risk-based and threat-informed approach will prioritise the identification and mitigation of vulnerabilities, ensuring that our defences are resilient and responsive to emerging threats.

The convergence of OT and IT systems presents unique challenges for electricity transmission. While this integration enhances operational efficiency and data analytics, it also expands the attack surface for potential cyber threats. Ensuring seamless and secure communication between OT and IT requires robust protocols and continuous monitoring. Our strategy will address these challenges by implementing resilient security measures that protect both the physical and digital aspects of our infrastructure.

During RIIO-T2, there has been a noticeable rise in cyber attacks targeting essential services such as electricity transmission. These attacks are becoming more advanced and persistent, often aiming to disrupt operations and compromise sensitive data. As we look ahead to the RIIO-T3 period, we anticipate that the threat landscape will continue to evolve, with nation states and cyber criminals employing more sophisticated techniques. Our strategy will focus on enhancing our security measures to protect against these evolving threats, ensuring the resilience and reliability of our transmission network.

Our commitment to resilience is underpinned by continuous improvement and investment in our cyber resilience capabilities. We will enhance our OT and IT systems to ensure they are secure by design, incorporating the latest advancements in cyber security technologies and best practices. Continued collaboration with other Transmission Owners will be a cornerstone of our strategy, enabling us to develop whole-system solutions to shared cyber risks and threats.

We recognise the critical importance of maintaining the security of supply for our customers. Our efforts in RIIO-T3 will focus on operational excellence, ensuring that our cyber resilience measures are not only effective but also sustainable. By fostering a culture of cyber awareness and preparedness, we aim to build a resilient network that can withstand and recover from cyber incidents.

Ensuring regulatory compliance is a fundamental aspect of our cyber resilience strategy. We are committed to adhering to all relevant regulations and standards, including those set by the UK Government, Ofgem and all relevant bodies. We continuously monitor changes in the regulatory landscape and adapt our policies and procedures accordingly. By maintaining compliance, we not only protect our infrastructure but also uphold the trust and confidence of our stakeholders. Our proactive approach to regulatory compliance ensures that we are always prepared to meet new requirements and challenges.

The establishment of the new UK Government National Energy System Operator (NESO) introduces additional challenges and opportunities for us. As the NESO takes on a central role in coordinating the electricity system, we should work together to ensure seamless collaboration. This transition may require us to adapt to new regulatory frameworks and operational protocols, while maintaining our commitment to reliability and security. Our proactive engagement with the NESO will be crucial in navigating these changes and ensuring that our transmission network continues to meet the evolving needs of the energy system.

Collaboration with the wider industry and academia is essential for addressing the complex cyber challenges we face. By working together with other network owners, regulatory bodies, academic institutions, and industry partners, we can share knowledge, best practices, and innovative solutions. This collaborative approach not only enhances our own cyber resilience but also strengthens the overall security of the energy sector. Additionally, promoting secure open data initiatives will facilitate transparency and innovation while ensuring data integrity and protection.

SP Energy Networks is committed to being a leader in this space, driving initiatives that promote industry-wide and academic cooperation and setting high standards for cyber resilience. Through these efforts, we aim to build a more secure and resilient energy infrastructure for the benefit of all stakeholders.

Engaging with our stakeholders is critical. SP Energy Networks is committed to maintaining open lines of communication with our customers, regulatory bodies, and industry partners. By actively seeking feedback and fostering transparent dialogue, we can better understand the concerns and expectations of our stakeholders. This engagement will continue to inform our cyber resilience initiatives, ensuring they are aligned with the needs and priorities of those we serve. Through regular updates and collaborative efforts, we aim to build trust and confidence in our ability to protect the transmission network.

Innovation and research are at the heart of our approach to cyber resilience. SP Energy Networks is dedicated to exploring new technologies and methodologies to enhance our cyber resilience. We are actively involved in research projects that focus on developing advanced security solutions and predictive analytics to anticipate and mitigate cyber threats. By partnering with academic institutions and industry leaders, we aim to stay at the forefront of cyber security advancements. Our commitment to innovation ensures that we are continually improving our defences and adapting to the evolving threat landscape.

We are committed to working closely with our suppliers, third-party vendors and partners to ensure they adhere to stringent cyber security standards. By implementing rigorous vetting processes and continuous monitoring, we aim to mitigate risks associated with supply chain vulnerabilities. This proactive approach helps us safeguard our infrastructure from potential threats that could arise from our supply chain.

Training and development are crucial for maintaining a robust cyber security posture. We invest in comprehensive training programs to ensure that our staff are equipped with the latest knowledge and skills in cyber security. These programs cover a wide range of topics and roles, from basic cyber hygiene to advanced threat detection and response techniques. By fostering a culture of continuous learning and development, we empower our employees to effectively identify and mitigate cyber threats. Our commitment to training ensures that we have a skilled and knowledgeable workforce capable of protecting our transmission network.

In addition to traditional cyber threats, we anticipate new challenges arising from the increasing use of Artificial Intelligence (AI) and machine learning technologies. These advancements, while offering significant benefits, also introduce new vulnerabilities that must be addressed. Evolving threats such as AI-driven attacks and sophisticated phishing schemes require us to stay ahead of the curve with cutting-edge defences and continuous, around-the-clock monitoring.

Our investment in threat intelligence capabilities allows us to proactively identify and respond to emerging threats. By leveraging advanced threat intelligence tools and collaborating with industry partners, we can stay ahead of potential cyber threats. This continuous monitoring and analysis will enable us to enhance the overall security of our transmission network, ensuring that we are prepared to address any new challenges that may arise.

We have established robust incident response protocols to quickly and efficiently address any cyber security incidents that may arise. Our incident response team is trained to handle a wide range of scenarios, from minor breaches to major cyber-attacks. By conducting regular drills and simulations, we ensure that our team is prepared to respond to incidents in a timely and effective manner while ensuring we continuously improve through lessons learnt exercises. Our continued focus on incident response enables us to minimise the impact of cyber incidents and maintain the resilience and reliability of our transmission network. We will continue to invest in ensuring that we have a responsive and resilient incident response team who are prepared to mitigate cyber attacks on the network.

Our comprehensive plans for RIIO-T3 are detailed in our Cyber Resilience Business Plan. While the specifics of this plan are sensitive and will not be published publicly, we assure our stakeholders that our approach is thorough, strategic, and aligned with our commitment to delivering a secure and reliable energy supply to our customers.



In this section we cover the “how” of our plan. The foundations we have laid and the steps we are taking to create a new business-as-usual, capable of delivering at the scale and pace needed for RIIO-T3. Our readiness planning touches every part of our business, from how we recruit and train our staff through to how we create positive legacies in communities and habitats. In some areas, by building on our existing strengths. In other areas, by transforming how we organise ourselves, use data and digital tools, and collaborate with our partners. We are RIIO-T3 ready.

How we will deliver

Key stakeholders

UK Government, Scottish Government, Regulators and Planning Bodies; Consumer & Community Groups, INZAC, Academia, Media; NESO, other Transmission Owners, wider industry, supply chain.

Examples of stakeholders influencing our plan:

Market conditions and supply chain options:

Direct engagement with 148 companies via a supply chain survey; meetings with 14 key suppliers and hosted a webinar with another 60 companies. Helping us to shape and refine the new contractual framework for our strategic delivery partners.

Digital services for connection applicants:

Our Connections Summit attended by over 100 industry and policy stakeholders, to discuss challenges and identify opportunities to bring application timescales down. Informing our idea for a “Digital Twin” of our network to enable improved data and tools that will speed up connection offers and create functionality for self-service quotations.

<p>New FTE roles, (majority relating to project delivery)</p> <p>1,422</p> <p>INFRASTRUCTURE</p>	<p>Increase in in-house training capacity with a new training centre</p> <p>x2</p> <p>VALUE</p>	<p>Value of contractual framework with strategic partners</p> <p>£5.3bn</p> <p>VALUE</p>	<h2>Our organisation, workforce and supply chain</h2>
<p>Fund proposed to support clean energy ambitions of local communities</p> <p>£20m</p> <p>SERVICE</p>	<p>Globally recognised stakeholder engagement standards</p> <p>AA1000</p> <p>VALUE</p>	<p>Three distinct engagement themes (infrastructure delivery, communities and connections)</p> <p>3</p> <p>SERVICE</p>	<h2>Engaging with our stakeholders and supporting communities</h2>
<p>Investment in our data and digitalisation programme</p> <p>£94m</p> <p>VALUE</p>	<p>Four pillars for improvement to meet the intensity of RIIO-T3</p> <p>4</p> <p>INFRASTRUCTURE</p>	<p>Excellence against all 11 principles of Data Best Practice</p> <p>11</p> <p>RESILIENCE</p>	<h2>Embedding digitalisation and becoming a data-driven organisation</h2>
<p>Innovation deployed in BAU</p> <p>> £380m</p> <p>INFRASTRUCTURE</p>	<p>Funding for 3 out of every 4 projects to explore experimental innovation</p> <p>>75%</p> <p>RESILIENCE</p>	<p>Exploring higher risk innovation</p> <p>> £22m</p> <p>VALUE</p>	<h2>Nurturing and deploying innovation</h2>
<p>Carbon footprint reduction relative to 2018/19</p> <p>66%</p> <p>VALUE</p>	<p>All waste reused or recycled</p> <p>100%</p> <p>VALUE</p>	<p>Supply chain with greenhouse gas emissions reduction target</p> <p>80%</p> <p>INFRASTRUCTURE</p>	<h2>Being a sustainable, responsible business</h2>

RIIO-T3 will place a greater emphasis on the capability of transmission owners to procure equipment and services and, ultimately, to manage and deliver projects safely, on time, and to cost. We have to achieve this against a backdrop of shortages in equipment and suitably skilled staff. Therefore, we have taken steps to ready our business in three key facets of project delivery – our operating model, workforce and supply chain arrangements. Our aim is to have arrangements in place that are agile enough to respond to changes in the scale and pace of work, and resilient to uncertainty and risk.

Our organisation, workforce and supply chain

NICOL GRAY,
Policy and Licence Lead
explains our approach →



A strong focus
on the delivery
at pace

6 core functions

Transformation of our operating model to align business units with 6 core functions associated with project delivery – Plan & Architect, Design, Develop, Deliver, Operate and Enable.

Growing our
workforce

1,422

The number of jobs we have created in our organisation.

Developing our
workforce

x2 capacity

We will complete construction of a new training facility, doubling our capacity.

A mix of supply chain
contracts to choose from

Hybrid model framework

Has increased our pool of providers enabling us to choose direct contracting, Engineering and Procurement Contracts (EPCs), and the option to use external expertise to suit our needs.

In this part, we outline how we are fine-tuning our capability to deliver the programme of work described in Section 2 by transforming our business and adapting our workforce and supply chain arrangements.

Organisation

How we are changing our operating model to align the responsibilities of business units with the requirements in each phase of a project's lifecycle.

Workforce

How we determine the size and requisite skills of our workforce, and the methods we are using to attract, retain and upskill our people.

Supply Chain

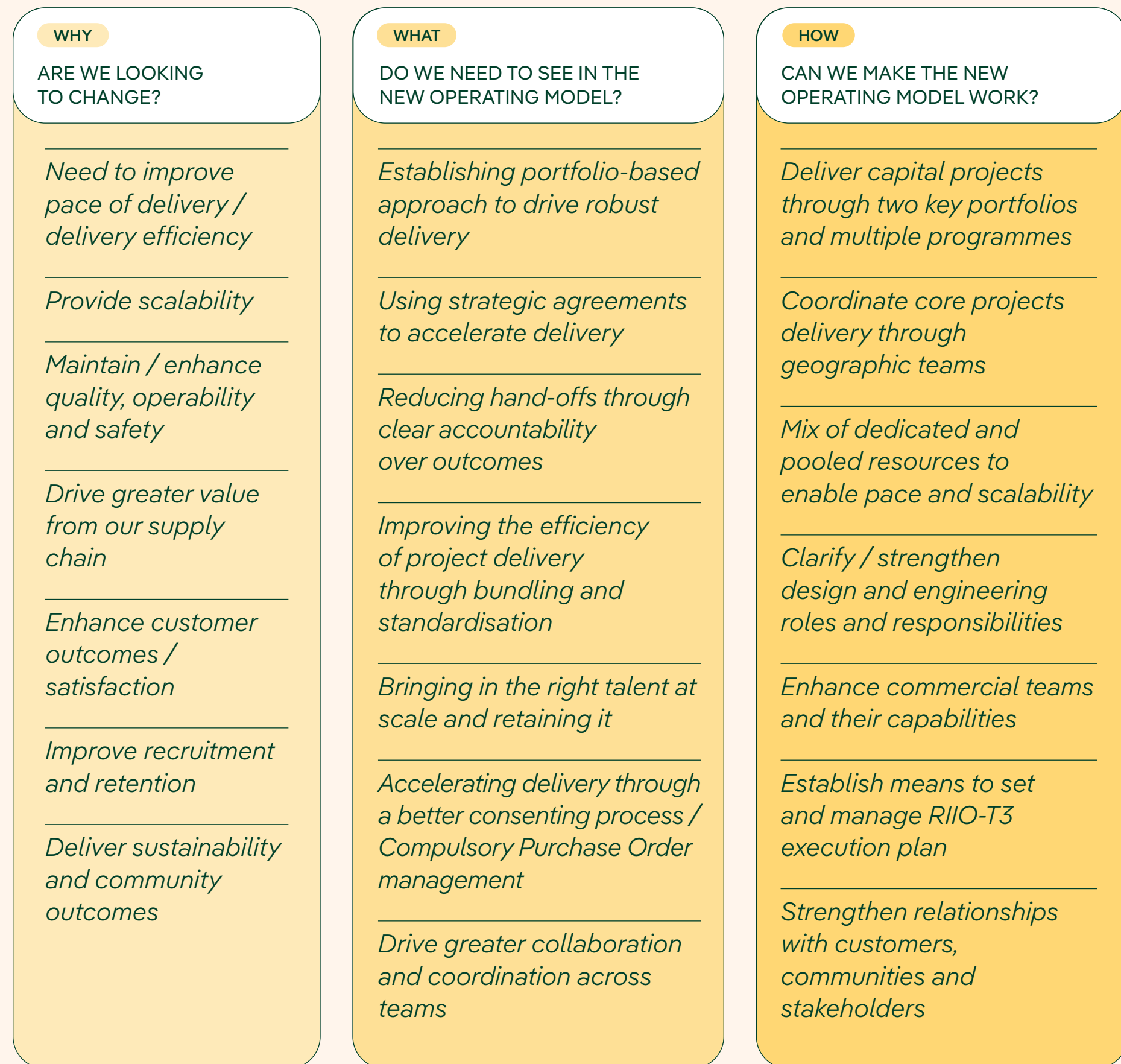
How we are securing the equipment and services needed at a time when global demand is placing constraints on the availability of these resources.

Optimisation

How we are making sure our supply chain arrangements give us the flexibility to respond to changing market conditions.

As we move into RIO-T3, we have made changes to our business to absorb an increasing workload and ensure we maintain a strong focus on the delivery of our planned investments. Our assessment of WHY we need to transform our business has led us to undergo an exercise to determine WHAT characteristics are required to deliver for RIO-T3 and beyond. Through discovery and consultation, we have identified HOW we can make this new operating model work. Our thinking throughout this process is illustrated in the diagram below and described in more detail in our [Workforce and Supply Chain Resilience Strategy Annex](#).

Operating Model



Putting the 'why', 'what' and 'how' into practice has led to the evolution of responsibilities held by our business units.

We outline here the remit of business units shaped by our transformation exercise and illustrate how each unit supports delivery of a project.

Network Planning and Regulation (NP&R)

- NETWORK PLANNING
- NETWORK REGULATION
- ASSET MANAGEMENT

PLAN & ARCHITECT

NP&R leads on the development of our system architecture and asset management. They also lead the engagement with NESO and Regional Energy Strategic Planners on future requirements and customer connection

management as well as being the main interface with Ofgem, national, and devolved Governments and other key stakeholders. Outputs from NP&R influence the future design and operation of the network.

Transmission Investment and Operations (TI&O)

- STRATEGIC PROJECTS
- CORE PROJECTS
- LAND AND PLANNING
- OPERATIONS
- SUPPLY CHAIN AND COMMERCIAL
- STAKEHOLDERS AND COMMUNITIES

DESIGN DEVELOP DELIVER OPERATE

TI&O manages and oversees the development and delivery of capital investment in line with network plans and objectives. The delivery is split into two delivery portfolios:

- Strategic project;** which includes both onshore and off shore Holistic Network Design projects
- Core projects;** which includes connections, load related reinforcements and asset modernisation.

The operation of the network includes the day-to-day maintenance, inspection, switching, fault restoration and ensuring safety

from the system for any works which are being undertaken. With the increasing number of outages on the network due to project works and connections, the operations team will play a greater role in providing safety from the system through outages which will require a growth in resource.

To support the above model, there are several supporting functions which will interact with all of these teams. For example the Stakeholder, Communities and Environmental teams who will interact with local communities to administer community benefit funding, and work with other stakeholders to offset the impact of our work on biodiversity.

Enabling and Support Functions

- CYBER SECURITY
- BUSINESS TRANSFORMATION
- CONTROL ROOM
- CORPORATE SERVICES
- PROCESS AND TECHNOLOGY

ENABLE

We draw on the engineering and other specialist skills we have retained to capitalise on shared knowledge and experience. This includes:

Control room – This unit is responsible for the planning and coordination of network outages as well as the day-to-day, 24/7 operation of the network in coordination with the NESO.

Cyber security – Our cyber security team ensures that a coordinated and robust system is maintained against a growing landscape of threats.

Business Transformation – This unit embeds transformation initiatives and oversees IT application management.

Process and Technology – P&T is responsible for providing a number of specialist functions which develop the processes and technology we use. This includes specialists in engineering standards, sustainability and innovation. This unit provides input to multiple teams given the common need for such specialist functions across our organisation.

Corporate services – Our corporate services provide vital support essential for the efficient operations of our business in areas such as procurement, legal, fleet and facilities. For example as part of this function our People & Organisation team lead on our workforce strategy essential to support the recruitment of skilled resources.

An overview of our rationale is illustrated here and explained in greater detail in our [Workforce and Supply Chain Resilience Strategy Annex](#)

Workforce

We keep track of the skills our workforce requires to meet our business needs. It is a continuous process that enables us to be agile and responsive to changes. We outline in this section how our approach will lead to recruitment, development and retention of a diverse, high-quality, well-trained workforce for RIIO-T3.

Drivers for scale and timing of resource growth

Ofgem has been clear that transmission owners planned network growth is critical due to:

- The societal impact not achieving Net Zero;
 - The reduction in customer bills resulting from connecting more generators; and
 - The impact on UK economic growth.
- To deliver the scale of the physical works required, directly driven by the increased volume and complexity of the projects to be delivered, our front end delivery team needs to more than double in size.

To enable this our business planning and enabling functions also need to grow proportionately and in a timely manner. There are a wide range of enabling business functions including (but not exclusively) planning, regulation, equipment standards, procurement, environmental, human resources, training, finance, legal, treasury, pensions, IT, land rights and statutory planning, facilities management and fleet management.

Proportionate Growth: Our business enabling functions are wide ranging in nature and our forecast growth in these functions has been derived bottom up and based upon drivers relevant to those activities.

For example we will need to grow our teams that secure land rights for substations, cables and overhead lines in proportion to the planned volume of network construction works. Whilst our human resources, recruitment, training, facilities and fleet management teams' growth is directly related to the forecast numbers and types of employees required.

Appendix 2 in the [Cost Assessment Annex](#) accompanying this plan provides greater detail on the drivers and efficiency of the proposed growth across these essential activities.


Timely Growth: It is essential that support functions are in place at the right time to support the project delivery timescales expected by our customers and stakeholders, with most of these required far in advance of physical project delivery. For example, detailed project planning, equipment procurement and securing land rights and planning permissions all commence several years in advance of physical site works.


Regulatory Treatment / Timing of Funding: To satisfy the requirements of our stakeholders, funding of business support and indirect cost activities not currently covered by Ofgem's proposed uncertainty mechanisms have been included in our baseline plans to ensure that these resources can be in place at the right time. Our [Cost Assessment Annex](#) sets out some additional detail on the requirements for this and also considers an alternative funding mechanism that would support a similar outcome.




Building a resilient workforce

We have three clear key goals in how we plan for the workforce we need as a business:

 To recruit a workforce to meet our future growth requirements and attrition forecasts.

 To retain our employees by being an employer of choice through our culture, policies, and listening to and investing in our people.

 To broaden our skillsets through our people development in newly designed trainee programmes and upskilling and reskilling our existing and new workforce.

We do not underestimate the context in which we are operating in, in relation to the retention and recruitment of talent. The UK marketplace for skills is extremely challenging and competitive with recent industry reports highlighting the sector will need to attract and recruit 312,300 new people into the workforce by 2030, a 32% increase. The challenges facing organisations to have the right people at the right time, in the right place at the right cost are especially prevalent in highly skilled sectors such as our own.

Our workforce planning strategy incorporates analysis of strategic skills and capabilities and insights from our continued collaboration with industry and trade bodies such as Energy & Utilities Skills. It provides us with the medium and long-term outlook of what may happen in the labour market and where we anticipate the challenges will be. The modelling of our requirements factors in the attrition we forecast from staff retiring or leaving for other reasons. We use our workforce planning strategy

to anticipate gaps and to address them with solutions such as trainee programmes and upskilling or reskilling programmes.

We engage with the labour market on a regular basis and share insights with our development and delivery teams to create broad awareness of changing market conditions. It is an approach we take to ensure risks are assessed with input from relevant operational teams and timely mitigating actions are taken. In addition to tracking developments in the labour market, we benchmark our workforce strategy measurements with industry-wide metrics to ensure we remain at the leading edge of workforce development. Our benchmarking includes annual reviews of staff remuneration and benefits to ensure we remain competitive in the labour market and are able to attract and retain people at reasonable cost.

Our approach ensures workforce planning is not a one-off exercise. It is a continuous process that enables us to be agile and responsive to changes in the labour market and alert to the needs of our business. This allows us to strategically recruit, develop, and retain a diverse, high-quality, well-trained workforce fit for the future.



Our workforce is expected to grow from our current size of 942 to as many as 2,364 in RIIO-T3.

+1,422 FTE roles

Workforce Modelling and Growth

To deliver the programme of work described in Section 2, we have undertaken a detailed modelling of our future resource requirements. This approach incorporates insights from all historic works, utilising data from our systems and input from subject matter experts built up over several years. Alongside this, we have completed a strategic review of the skills and resources required to establish the future needs of our workforce. This combination of strategy and detailed modelling gives us confidence that the workforce we are proposing to scale to is optimal, in both level and timing.

The diagram below illustrates how the following resource assumptions are applied in our model to produce Full Time Equivalent (FTE) requirements we require to deliver for RIO-T3.

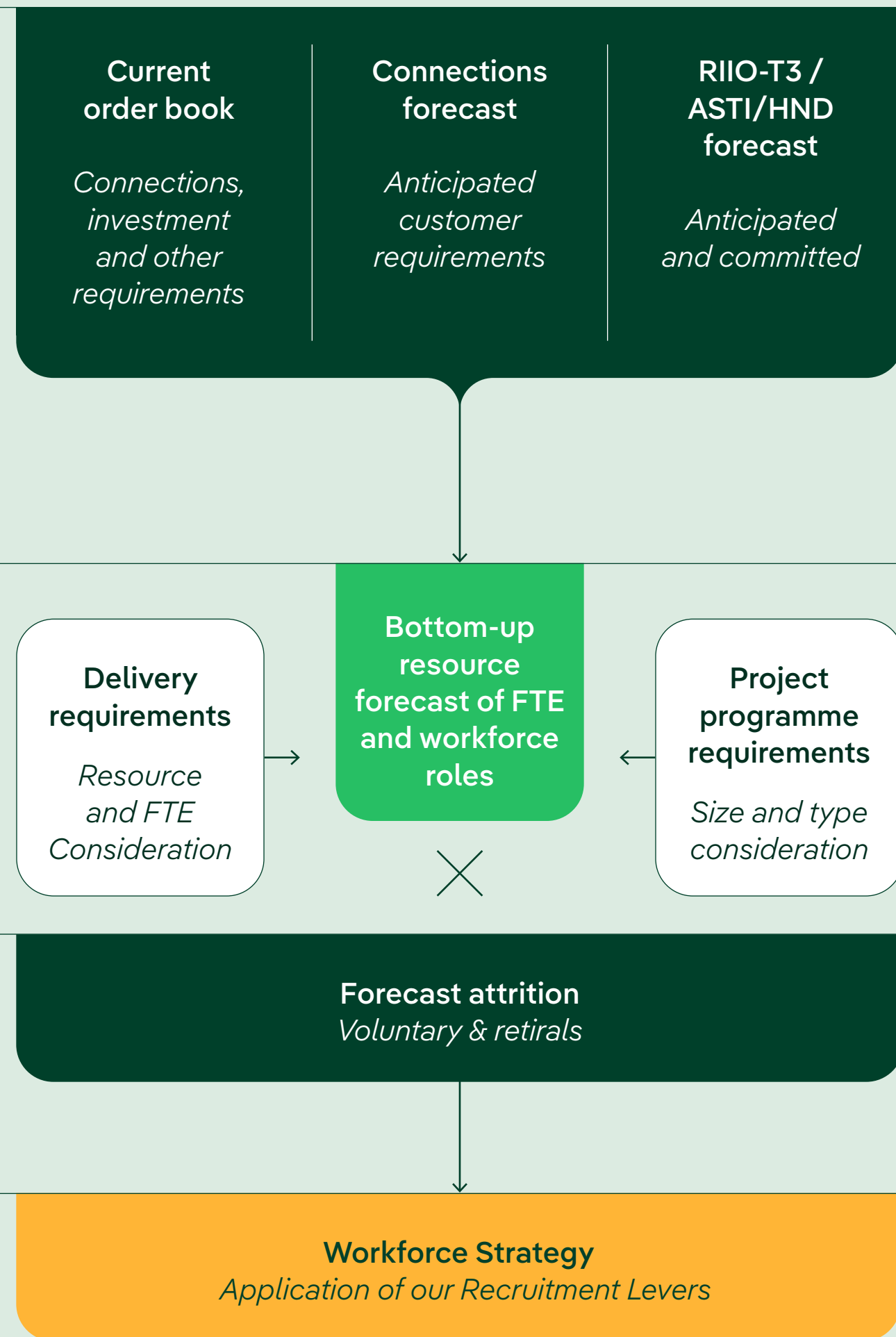
The approach and the results when applied to our best view of what we need to deliver in RIO-T3 are set out opposite. It shows a significant increase in the size of our workforce, commensurate with the scale and pace of the investment we are delivering.

Pipeline of expected work: we review our order book of connections and other activity we have committed to delivering. We then apply our connections forecast and include a review of our anticipated and committed activity for the ASTI, HND & RIO-T3 programmes. The increase in activity for the RIO-T3 programme and significant increase anticipated for connections is what is driving a step-change in resource requirements. For example, the composition of workforce roles shown in the diagram to the right illustrates an increase in land and planning skills because our programme of work will require more access to land.

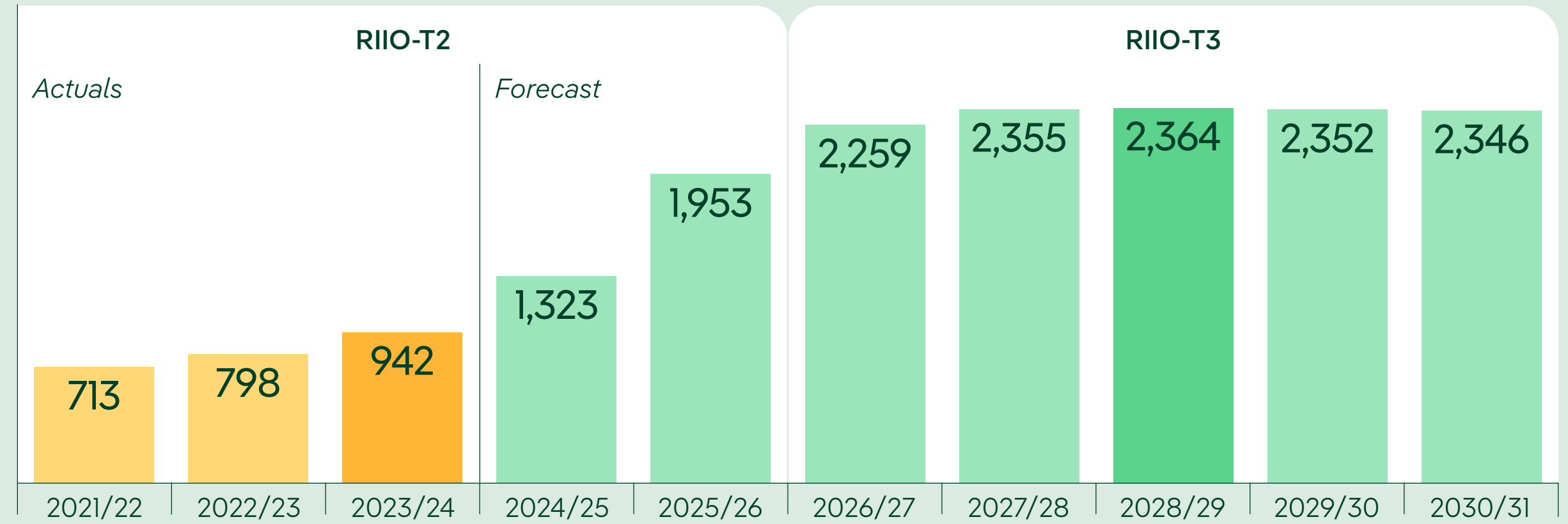
Delivery and programme requirements: our experience and expertise have given us a clear understanding of the resource requirements needed to deliver a project and how to adapt them depending on the size and scope of a project. To produce our bottom-up resource forecast, we apply our delivery and programme requirements to our pipeline of expected work.

Forecasted attrition: we track our retrials and estimate our voluntary attrition to understand the forecasted turnover across the business. Applying this to the bottom-up resource forecast delivers a comprehensive resourcing estimate.

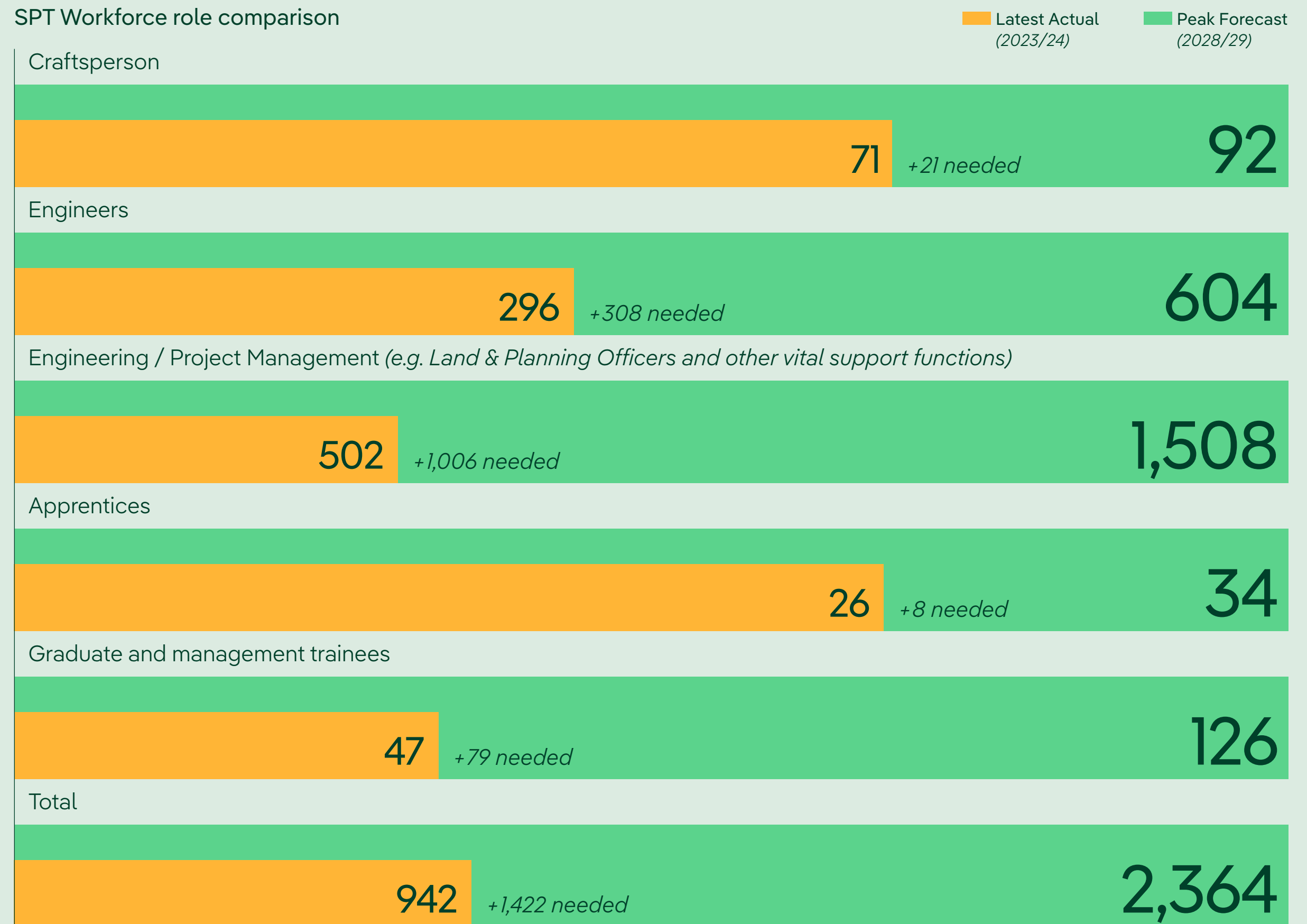
Recruitment strategy: we use our recruitment levers, as described in the following page, alongside market information to produce the workforce we need.



SPT Workforce, year-on-year comparison



SPT Workforce role comparison



Our workforce

The rigour of our approach gives us confidence that our workforce strategy will deliver the right number of people, with the right skills, in the right locations, at the right time and at the right costs. We work together with a network of people, partnerships and resources to develop, recruit, and retain high quality individuals with the skills we need (through education, training and collaboration).

Having the appropriate resources to deliver our plan is vital. We will need to around double the size of our workforce to deliver our RIIO-T3 plan.

Our recruitment strategy is underpinned by the following considerations:

Understanding our baseline: completing strategic workforce planning activity to understand our current workforce including skills, roles and forecasting voluntary and retiral attrition against business strategy and the external environment (including government policy or regulatory changes).

Evaluating supply: assessing the external labour market to understand what skills are available and where against our baseline workforce.

Forecasting demand: using our resource modelling and workload for RIIO-T3 to forecast our future resource and skill requirements.

Gap analysis: using the detail from understanding our baseline, evaluating supply, and forecasting demand we assess the gaps we need to fill to have a robust workforce to deliver RIIO-T3 and understand the risks in a challenging labour market.

Action plan: using our recruitment levers we plan how we will close the gaps, regularly assess risks, and put in place mitigations to create a workforce fit for the future.

This approach ensures that we provide opportunities for our people to grow, establish clear pathways for retaining knowledge within the business and cultivate the talent of the future.

Recruitment Levers

Permanent and Temporary Staff

Hiring new talent from the market – Typically we bring in three different kinds of resource from the external market; highly skilled resource able to deliver the role upon entering the business, skilled resource requiring upskilling or reskilling and overseas skilled workers. We have an A rating sponsorship licence with the UK Home Office to sponsor skilled workers. That rating ensures a smooth process for bringing international talent into the UK.



To facilitate short term appointments to support the delivery of projects for RIIO-T3 and our customers, we have a trusted partnership with our contingent worker Managed Service Provider (MSP). A contingent worker is someone who works for our organisation without being hired as an employee. Our recruitment team works with our MSP and business managers to secure the right contingent workers to assist in delivering our commitments to meeting Net Zero.

Develop

Through this lever, we develop our workforce capability through trainee programmes and the upskilling of experience staff. In line with our long-term strategy on future skills, we have broadened our range of trainee programmes, going from our original 5 programmes to over 30 programmes with several more in development stages. These have included digital disciplines and we have recruited our first cyber security and data science graduates and graduate apprentices.



Retain

To support our efforts to grow our resources we aim to retain staff through our workforce strategy. It is designed to keep people in careers with us for the long-term and to reduce voluntary attrition. This is reinforced by a workplace that focuses on organisational culture as well as the health, safety and wellbeing of employees. It is an environment that helps to create an innovative, integrated organisation where people feel valued. We have also developed plans to ensure that we retain knowledge from those retiring or exiting the business.



Our People and Culture

Our people are key to the successful delivery of our RIIO-T3 plan. Our workforce strategy ensures we have a plan to develop skills and talent from within the organisation and provide a framework that allows our people to be supported throughout their careers. The culture we have created is recognised externally through benchmarks and partnerships outlined opposite.

Global Green Employment (GGE)

As part of the Iberdrola Group, we have launched a Global Green Employment platform to connect prospective candidates with job opportunities in the green energy transition or training that would enable them to commence their green career. Funded by Iberdrola for the good of the sector, the platform aims to bring talent into the industry from other sectors or encourage them towards a green job as they begin their professional careers.

The platform is currently developing the ability to showcase third party programmes dedicated to the training of green talent, allowing users to identify the most relevant ones in terms of the work they want to do, and provide them with programmes to kick start their green career. In addition to the job board, our suppliers, institutions, partner organisations and other companies will be able to publish their own job opportunities, redirecting candidates to the channels of their choice.



As part of the Iberdrola Group, we have launched a Global Green Employment platform to connect prospective candidates with job opportunities in the green energy transition.

Our benchmarks and partnerships



In 2024 we are proud to have achieved the Top Employer 2024 award. As a best practice and benchmarking organisation, the Top Employer Institute identifies companies who are leading the way in employee experience and provide the best working environment. The institute assesses every aspect of the employee experience and considers business strategy, people strategy and leadership.



As part of Iberdrola's global certification, ScottishPower is committed to obtain the EDGEplus certification in 2026. Adopting the EDGEplus approach involves progressing our commitment to diversity and inclusion, covering not only the evaluation of binary gender equity but also its intersectionality with other dimensions of diversity.



Since 2023 we have been a Real Living Wage Employer ensuring we pay all of our directly employed people a Living Wage and have a plan in place to extend that to regular sub-contractors.



In 2021, as part of our ongoing commitment to support the Armed Forces Gold Covenant we have maintained a Gold Award from the Defence Employer Recognition Scheme. The award follows a pledge to support the Armed Forces community, as part of the Armed Forces Covenant. This means we recognise the value that serving personnel, both regular and reservists, veterans and military families contribute to our business and our country.

Supply Chain

Our supply chain is comprised of global providers of services and equipment we need for the delivery of our programme of works. It provides the support and agility to respond to periodic changes in workload over the course of a price review. We have an established track record in delivering using our existing supply chain. It has given us learnings and experiences that we have drawn from to address current constraints in the wider market. We elaborate in this section how our supply chain arrangements have been optimised for the pace and scale of RIIO-T3.



Challenges

Dealing with the step change in activity of our RIIO-T3 programme requires a tactical change in our supply chain of equipment and services. This needs to happen at a time when global demand is placing constraints on the availability of equipment and lengthening manufacturing lead times.

As explained in the previous section, it also means we need to retain staff and recruit from labour markets facing shortages of workers with the technical skills we need. The workforce challenge extends beyond recruitment to developing additional skillsets within our workforce. We need a broader skillset than before to deal with diverse portfolios of work, increased complexity in transmission infrastructure and new technology connecting to our network.

We have embraced these challenges and have been busy changing our supply chain framework and shaping our workforce to create the right platform for success. The next few pages focus on how we have adapted our supply chain arrangements.

Evolution of our supply chain framework

Up until now, we have relied on a delivery model we refer to as our 'Disaggregated Model with Direct Contracting'. This retains for SP Energy Networks all responsibility for designing solutions and managing programmes of work while using small to medium sized subcontractors (known as Tier 2 contractors) to provide specialised areas of work such as civils, overhead lines, cable installation and the supply of equipment.

The 'Direct Contracting' element is carried out through one-off tenders under frameworks with Tier 2 contractors. It involves significant commercial and contracting activity but is effective because we have kept costs down by creating competition amongst a large cohort of contractors, maintained knowledge of rates and prices at a relatively granular level and retained high levels of control over the design of our network.

The Disaggregated Model has worked well with the mix of work involved in transmission network development to date and market conditions we have experienced thus far. However, the scale and pace of our RIIO-T3 programme, requires us to adapt our approach.

Our supply chain framework needs to retain elements of what has worked well so far, but it also needs to ensure the quantity of contracts and individual procurement events remain proportionate, that our partners can deliver a mix of regular and complex projects at pace and that our suppliers have the confidence to commit resources to fulfil our orders for equipment.



On 21st November 2024, we confirmed preferred partners for our Strategic Agreements worth £5.4bn to deliver overhead line and substation work. Seventeen of the 19 contractors chosen to work on the programme are headquartered in the UK and Ireland, demonstrating our commitment to developing the country's wider supply chain.

Our RIIO-T3 delivery model

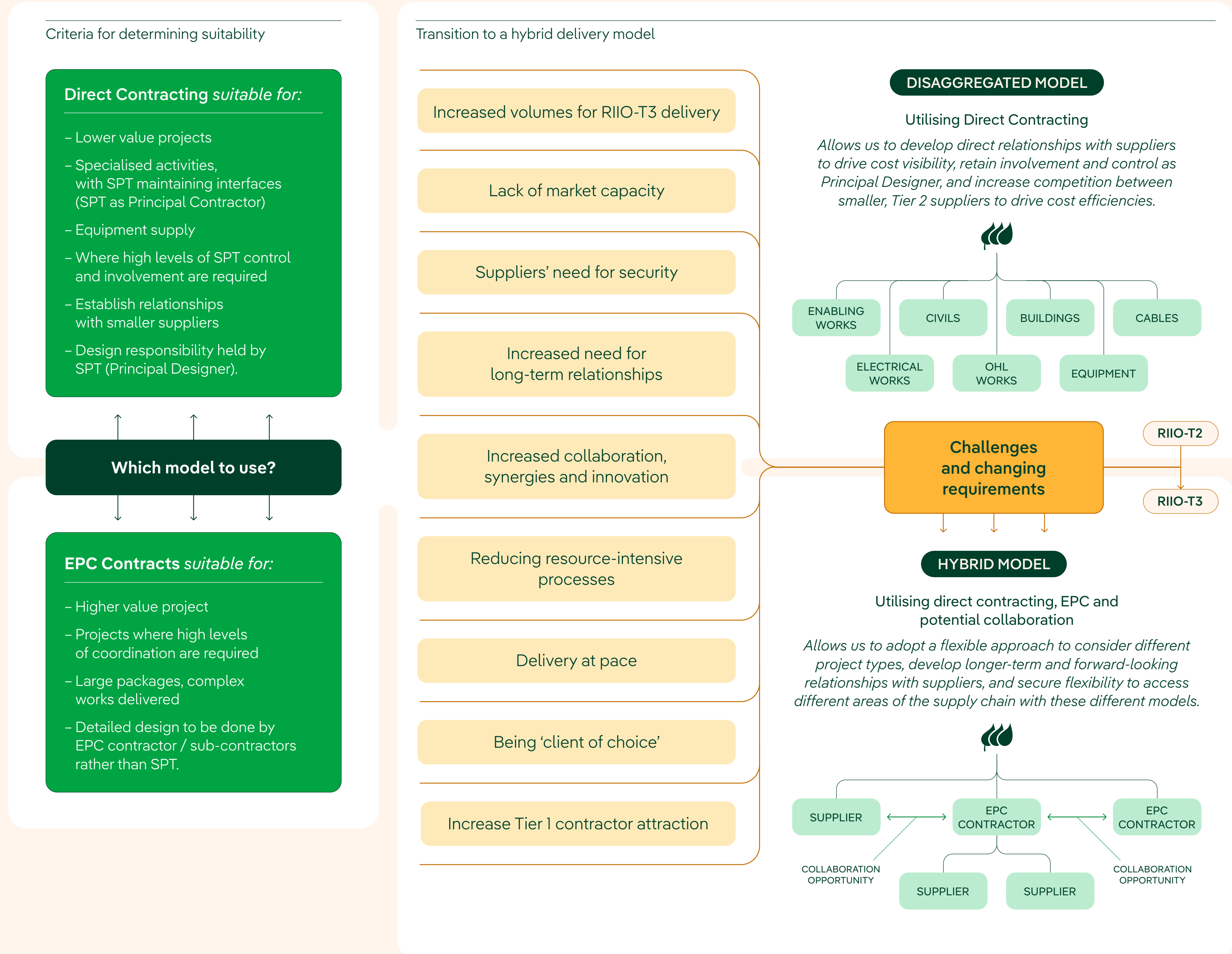
To address the issues described in our business plan and following detailed engagement with key stakeholders and a wide range of companies relevant to our supply chain to understand the emerging landscape, we have developed a hybrid delivery model based on a combination of Direct Contracting and Engineering Procurement and Construction (EPC) Contracting tailored to our portfolio and pipeline of projects.

EPC contracts feature a single agreement covering all stages in a project. We engage EPC Contractors to carry out the design, construction and commissioning on a turnkey basis (meaning the network infrastructure is ready for immediate use when our EPC contractor hands it over to us). EPC contractors – owing to their size, expertise and portfolio of work – tend to have access to their own equipment suppliers, subcontractors and engineering experts and are ideally placed to deliver large scale strategic projects. An EPC Contractor assumes responsibility for delivering an assigned project, and is accountable for the project’s schedule, cost, and performance.

Having a hybrid of Direct Contracting and EPC Contracts gives us options when considering which delivery model is best suited to the mix of work in our RIIO-T3 programme – as illustrated opposite.

The hybrid model also enables us to focus on driving our programme of work to a strict timetable, without getting involved in every single aspect of projects within the programme. It gives us options in developing collaborations between EPC and Tier 2 contractors and mitigates the risk of scarcity in equipment and technical expertise.

Our strategy will strengthen and secure our supply chain. It will enhance resilience and long-term certainty with our supply chain partners and establish a step change in capability needed for RIIO-T3. We depict the transition to our hybrid model in diagram opposite.



Optimising our RIIO-T3 hybrid delivery model

Our strategy is designed to leverage our highly skilled and experienced internal design and development teams who take full responsibility within the disaggregated model, while providing expertise in partnership with contractors via EPC delivery, to provide the challenge and discipline that designs are optimal for our network, and innovation is adopted appropriately. This highly flexible and agile model is capable of responding to current and forecasted market conditions whilst ensuring the most efficient and effective delivery of our plans and will drive value for money for the consumer.

In building and evolving effective long-term partnerships, we will continue to work closely and collaboratively with our supply chain to improve resilience, accelerate the delivery of works and drive value for money. Being part of a global world energy leader like Iberdrola strengthens our strategy because we have access to information, insights and expertise that gives us comprehensive awareness of optimal supply chain arrangements.

Market capacity

We have engaged with a wide range of suppliers for equipment and services and closely analysed the available data to build a clear understanding of the supply chain opportunities and constraints in the global supply chain for transmission equipment and services we need to access. The lead time for critical network components – illustrated below – is continuing to increase due to imbalanced global supply and demand. Since 2020, we are seeing lead times increasing by between 50 to 300%. For some equipment this is a delay of more than a year. Insights provided by Original Equipment Manufacturers (OEMs) suggest that these times will be moving out further in the next 3-4 years due to the quantity of orders and factory capacity being reserved by transmission companies in other jurisdictions and countries who have similar expansion plans to facilitate a transition to renewable energy and away from fossil fuels. We explain in the section on ‘Capacity Levers’ how we will secure supply chain capacity.

Lead time (Months)	2020	2021	2022	2023	2024
132kV Circuit Breaker	6-9	12-18	18-21	18-21	18-21
		↑	↑	→	→
400kV Circuit Breaker	9-12	12-14	16-18	20-24	20-24
		↑	↑	↑	→
400kV GIS	12-14	14-16	18-21	20-24	20-24
		↑	↑	↑	→
132kV Cable	4-6	6-8	8-10	12-14	12-14
		↑	↑	↑	→
132kV OHL Conductor	2-3	2-3	4-5	3-4	3-4
		→	↑	↓	→
60 MVA Transformer	10-12	16-18	22-24	22-24	22-24
		↑	↑	→	→
1,000 MVA Transformer	12-14	12-14	12-16	12-16	12-16
		→	↑	→	→

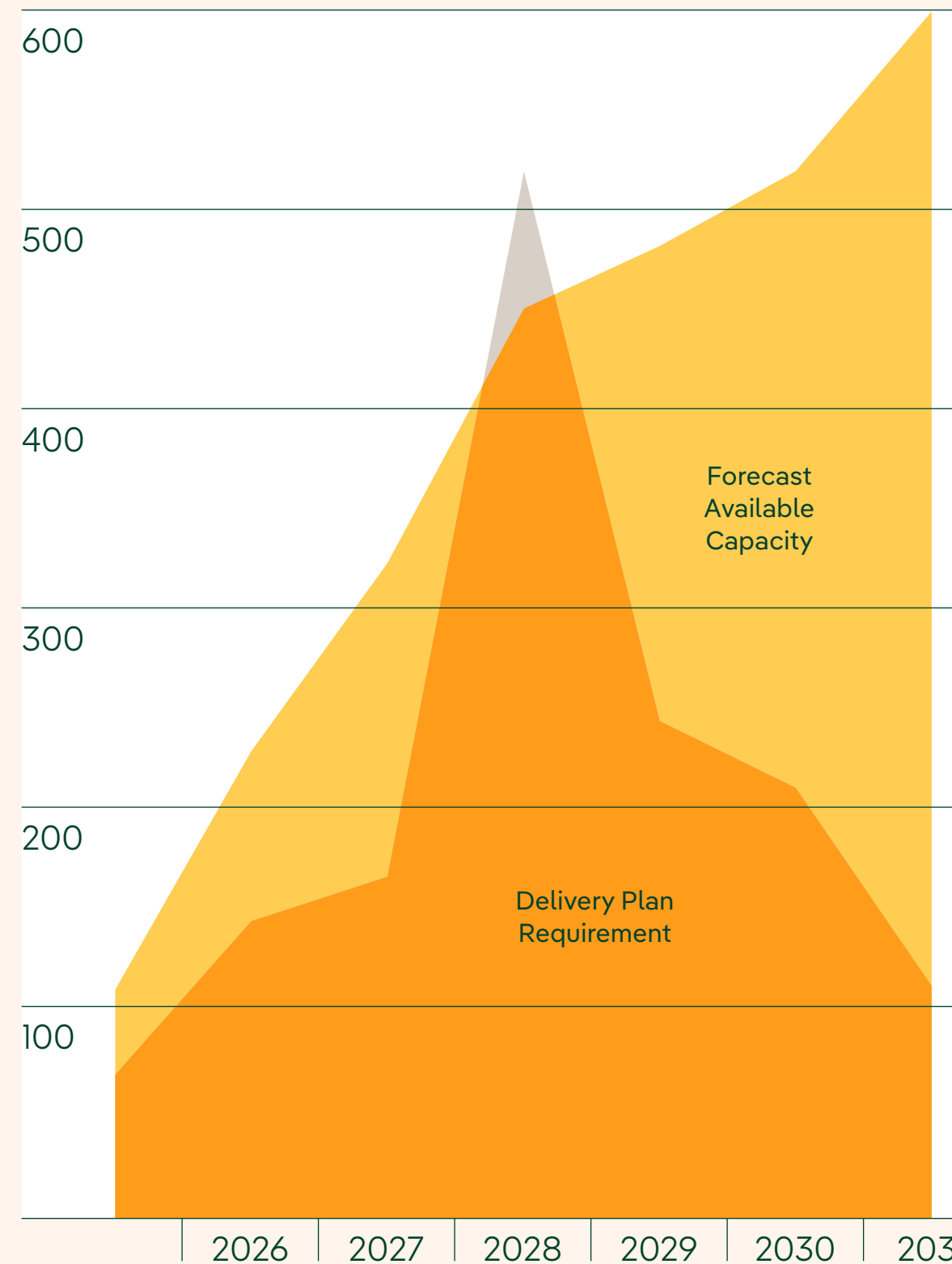
RIIO-T3 capacity assessment

We understand what is required because we have undertaken thorough modelling and planning, at a project-by-project level; we have assessed our existing model and concluded that evolution is essential for success. We have engaged actively with the supply chain (both incumbent and new) to understand what approaches are more likely to secure what we need, converting these insights into actual contracts which secure the appropriate supply chain capacity.

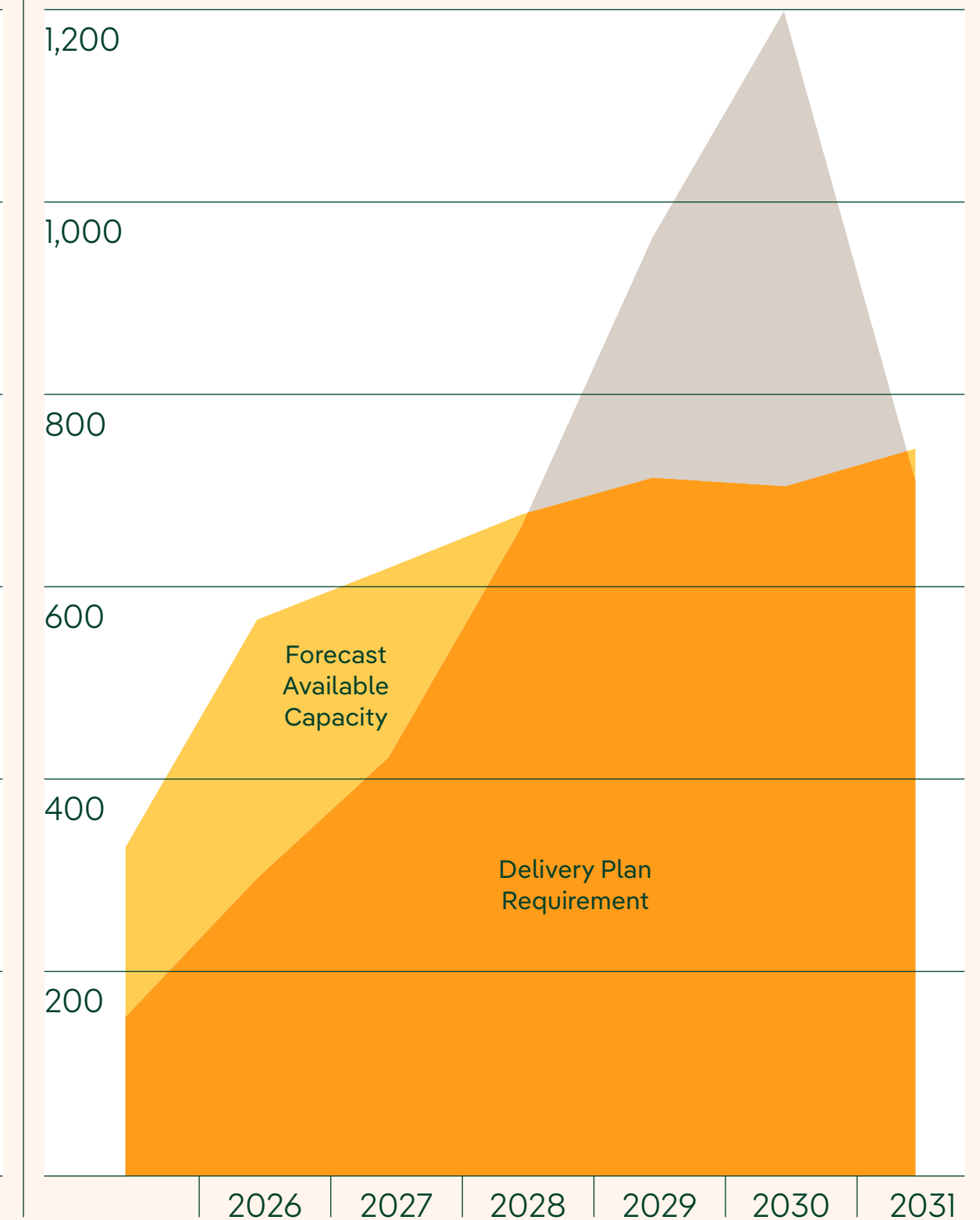
We believe our supply chain is positioned to support us to successfully deliver our RIIO-T3 plan. Our forecasting of the supply chain requirements for RIIO-T3 has allowed us to conduct a detailed gap analysis between our supply chain current capacity, and future requirements. Where analysis has found areas of enhanced risk with regards to overall industry capacity, we will work to expand the supply base through key initiatives.

The following charts provide a quantitative assessment of our service Framework Agreements covering OHL and Substations works. It compares the forecasted available capacity of our service partners with our forecasted delivery plan profile. Whilst the review of contractor capacity for our substation programme suggests we may have capacity constraints from 2028 onwards, the levers we have in place will enable a flexible approach to ensure that capacity is achieved and managed accordingly.

OHL Contractors capacity assessment RIIO-T3 timeframe (£m's)



Substation Contractors capacity assessment RIIO-T3 timeframe (£m's)



Capacity Levers

A key challenge for us will be to ensure that our supply chain is flexible, and can adapt to new information.

The exact delivery dates of projects will be impacted by a range of external factors such as connections reform and outage planning windows. We are confident that we have in place the right combination of levers to manage the deliverability of our plans. As our procurement and contracting strategy evolves, we will use the full set of available levers to sustain timely delivery as market dynamics and our requirements evolve.

c.£5.4bn
tendered through our
Strategic Agreement
Frameworks in 2024

The range of levers we anticipate using are set out here.

Creating long-term capacity

A key message that our supply chain partners have consistently told us can be summarised as:

“To de-risk delivery timelines and accelerate the delivery of critical infrastructure, TOs can support suppliers to increase capacity by making long-term supply chain commitments.”

We consistently encouraged capacity growth in its supply chain by targeting suppliers at Tier 2 or below and attracting new entrants. While this was successful during RIIO T2, the demand for capacity has overtaken availability requiring a different strategy to be adopted. In addition, voluntary or involuntary withdrawal of suppliers from the market has been increasing, requiring us to cast the net wider to attract new entrants.

To address current and future constraints and to provide greater levels of certainty to the wider supply chain we have collaborated with our industry partners to propose a mechanism for the advance procurement of key assets. This will enable a larger and extended order book with the supply chain into the 2030s by securing the supply chain further ahead of specific need.

This will lead to.

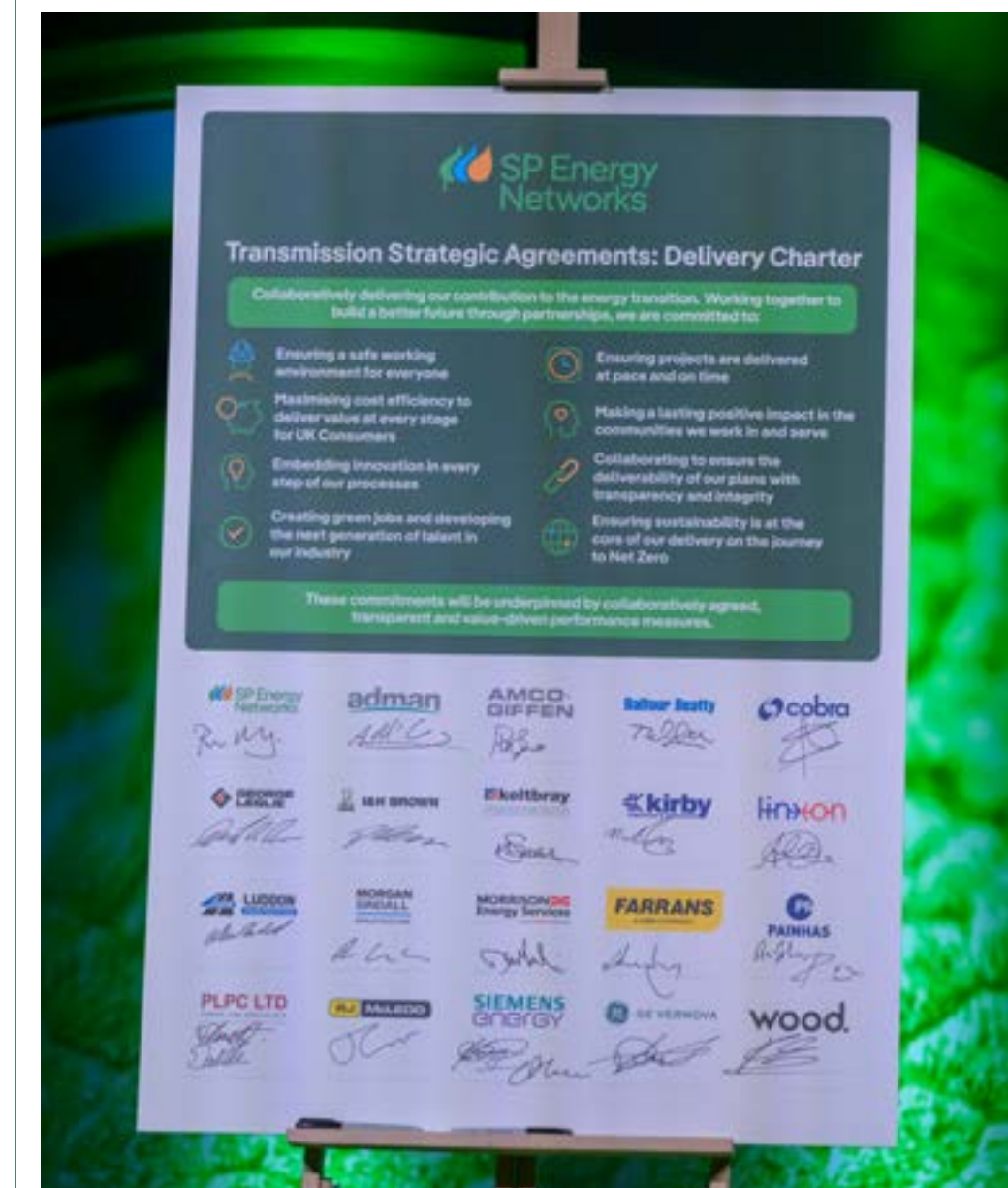
- More flexible approach in our supply chain engagements, for example by making advanced payment milestones and / or enter take or pay style capacity reservation agreements.
- Improving our ability to provide our supply chain greater certainty of need – enabling earlier engagement with the market, to make meaningful commitments many years in advance and providing strong commitment to industry.
- Increasing suppliers' confidence to invest manufacturing capacity, training / job creation and support promotion of UK plc objectives around inward investment.

Addressing this now will remove or reduce the RIIO-T3 delivery issues and give the UK the best opportunity for inward investment options for the 2030s and creates the environment for multi-billion supply chain engagement across all three TOs.

Developing and securing capacity through Strategic Framework Agreements

We began deploying the new Strategic Agreement strategy in November 2023 and attracted bidders covering OHL and Substation activities. We issued our c.£5.4bn Strategic Agreement Frameworks tender to the market during 2024 with the level of interest providing confidence that our plans are achievable and have support of the wider supply chain. This has resulted in a greater number of contractors when compared to the average number of bidders for key categories in 2023. For example, we have secured 5 contractors for electrical works compared to an average of 2 bidders in 2023 pre tender.

The Strategic Agreement allows for direct allocation of projects both for EPC and disaggregated projects. This provides commitment that secures delivery capacity and allows contractors to further invest in resources. Deployment of a stringent benchmarking process ensures costs are competitive. Our process seeks to run projects concurrently to allow live comparison and development of cost, retaining competition even within an allocation process. Our flexible agreements also allow, in most circumstances, deployment of a mini tender process featuring a range of strategic partners. Where we deem appropriate, we can procure a requirement separately from the agreement and issue it to the wider marketplace.



Signing of the Strategic Agreements Delivery Charter setting out our collective commitments to delivery our programme of works.

Standardisation of equipment

The findings and recommendations from the UK's Electricity Network Commissioner's report on how to accelerate the deployment of electricity transmission infrastructure, highlighted the potential for greater standardisation of equipment as a means of mitigating supply chain challenges. We are supportive, and are participating fully in the cross-sector efforts through the Energy Networks Association (ENA) Transmission Acceleration Group (TAG).

Early supply chain engagement

We will continue to maintain frequent engagement with the supply chain via participative forums, bilateral discussions with current and prospective partners and regular, detailed testing of the market. This approach alongside our ongoing engagement with the other two Transmission Owners gives us a strong capacity to identify emerging risks, issues and market trends. The engagement has been a key and valuable input to the development of the approach for RIIO-T3.

Supplier relationship management

Our supply chain strategy has been developed with the objective to improve resilience and long-term certainty with our supply chain partners. To enable us to achieve this goal we are introducing a new Contract Management team which will enhance our ability to support and manage our partners, providing a vital link to drive more efficient planning and capacity utilisation. Enabling our delivery teams to work collaboratively with our contracting partners to allocate projects within governance and plan effectively to ensure efficient utilisation of contractor resources.

Our new Contract Management team will:

- Improve visibility and ownership of current and future purchasing plans.
- Promote wider collaboration to maximise supplier performance and enabling the adoption of innovative approaches to deliver improved value.
- Further develop enhanced understanding of market capacity by category, within our region and across wider markets, providing social value and strengthening local supply chains.
- Provide improved and earlier intervention opportunities to address bottlenecks (e.g. through planning, incentives, standardisation, Early Contractor Involvement (ECI), etc).

Long-term planning and supply chain collaboration

Our engagement activities are designed to ensure that we better understand our supply chain needs and requirements, to ensure that they are ready and capable of delivering and to ensure we work together in a collaborative and efficient way. We need to gauge that our suppliers are both willing and able to mirror our own ambitions to embed innovation, sustainability, and carbon reduction into all our activities and address any potential disconnect. As their client we need to demonstrate leadership and support them in being suppliers for the long term who consider, as standard, all effects of their activities in all stages of their operations. It is critical that our strategic plans and that of our supply chain align.

We have invested in Project Management Office (PMO) capability to consolidate all programme planning at portfolio level, which will enable the supply chain to gain improved visibility. Moreover, we engage directly and regularly with the supplier we work with to discuss specific areas of focus including their needs and their current and ongoing plans regarding capabilities and capacity. We communicate our ongoing requirements to our suppliers but also ensure we understand their issues and constraints. Improving transparency of long-term plans will increase the effectiveness of collaboration and promote investment in increased capacity and workforce recruitment and training.

Disaggregation

Disaggregation of services for procurement has been an effective tool and we will continue to use it. It will be used in a targeted and integrated way to attract smaller and specialised contractors where the requirement justifies it. Specifically, every year we will focus on specific aspects of our disaggregated plan where we see opportunities, to target, engage and develop, Tier 2 contracting capacity.

For critical equipment we have long established relationships with OEMs where equipment is directly sourced through strategic bulk order agreements. This is likely to remain a strategy in some circumstances enabling improved visibility and control over critical equipment supply chains. In addition, collaborative planning with OEMs provides the opportunity to smooth demand over time. In other circumstances, our strategic agreements allow us to also include the supply of key equipment. Being able to run these two approaches in parallel gives us an effective way of securing ongoing value-for-money across the full range of projects.

Shaping our approach through ongoing engagement

We have listened to our industry partners and key stakeholders with the feedback directly influencing the development of our Supply Chain & Workforce Resilience Strategy. Supplier and Contractor engagement is embedded in our Business as Usual (BAU) processes and directly influences our ongoing procurement and wider engagement strategies. In addition, specifically for RIIO-T3, we have engaged with the market and external consultants over the last 18 months to understand market conditions and contracting options. We have listened to our industry partners and key stakeholders with the feedback directly influencing the development of our Supply Chain & Workforce Resilience Strategy.

Direct engagement with 148 companies via our digital outreach programme.

148

Detail meetings held with 14 key suppliers.

14

Webinar Virtual Launch held with over 60 companies.

60



We have listened to consumers, network users and other stakeholders to ensure our RIIO-T3 plans are informed by the needs and aspirations of the people our network serves. Building on our business-wide engagement strategy, we have created a tailored, investment-area-specific approach to our engagement. This ensures we are speaking to the right stakeholders, about the right subjects, in the right way and keeping stakeholders at the heart of our decisions. And we go further by proposing funding to support communities in vulnerable circumstances and to deliver local community-led, socio-economic initiatives and carbon saving projects.

In this part, we outline how engagement has shaped our plan, the approach we will take to engage during the price control period, and the initiative we are proposing to support our communities.

Engagement Strategy

How our stakeholder engagement strategy has helped us shape our RIIO-T3 plan and how we avoid stakeholder fatigue and unnecessary costs through targeted engagement rather than broad-brush events.

Continuous Engagement

How we will keep stakeholders involved during the price control period as circumstances, technologies and policies evolve.

Community Funding

How we will support communities to help them find solutions to local challenges, turn their ideas into feasible projects and unlock long-term benefits through funded projects.

Transparency

How the operation of the Community Benefit Fund (CBF) will be guided by principles and how it will be run by independent administrators and experts.

Engaging with our stakeholders and supporting communities

MATTHEW COLE,
INZAC Member
explains our approach →



Targeted engagement underpinning our plan

9 key workstreams

To ensure we are speaking to the right stakeholders, about the right subjects, in the right way, and for the right reasons.

Independently audited engagement strategy

91% rating

Our score by AccountAbility – benchmarked against the globally recognised AA1000 Stakeholder Engagement Standard.

Continuous engagement during RIIO-T3

3 themes

We will engage under three distinct themes – each driving better outcomes and more effective collaboration.

Delivering benefits to the communities we serve

£20m Net Zero Fund

Supporting community-led projects with a focus on those facing the risk of being left behind in the energy transition.



A plan developed with and influenced by stakeholders

Our business plan is informed by insight from consumers, network users and wider stakeholders. We have considered the direct input from our customers and stakeholders against other regulatory and financial factors to ensure the plan we have created delivers better outcomes for them. This makes it a better plan, full stop.

Building on our RIO-T2 stakeholder engagement strategy, we have developed a RIO-T3 strategy which focuses on the key investment areas of our business plan, known as workstreams. This approach ensures that we are speaking to the right stakeholders, about the right subjects, in the right way, and for the right reasons, driving better decisions which keep consumers, network users and wider stakeholders at heart.

Our Independent Net Zero Advisory Council (INZAC) is integral to this process. As an Independent Stakeholder Group (ISG) established by SP Energy Networks, they play a key role in helping to ensure we engage widely and openly with stakeholders and consumers, representing their interests and holding us to account. They offer guidance, scrutiny and challenge to our current RIO-T2 business performance, the development of our RIO-T3 business plan, and will continue to do so through the RIO-T3 period itself.

Details of how engagement has influenced our decisions are included in our [Stakeholder Engagement Annex](#), which provides a snapshot of the breadth of engagement undertaken with stakeholder groups across different business areas, and how the feedback received has impacted this business plan.

Against every piece of feedback or insight received from stakeholders we have captured whether the feedback supports an existing action or creates a new one and what we did as a result – noting, as relevant, how the feedback was weighed against regulatory, engineering, budget or other considerations to reach a decision.

And it doesn't stop when the plan is submitted to Ofgem. When we publish, we will consult with our stakeholders again – asking for their views in an open consultation, approaching key stakeholders for bilateral engagement and hosting an online webinar.

Our engagement strategy

SPEN's [Engagement Strategy](#) has been in place for over a decade. We have evolved and refined this over time in response to changing expectations, technology and circumstances, while our belief in the value of engagement has remained consistent.

Integral to the strategy is having a common framework for engagement that is embedded across individual teams, rather than just coordinated centrally. In other words, the processes for identifying stakeholders and planning engagements are clearly established, and while supported by our central stakeholder engagement team, it is the expert teams themselves – who know their stakeholders and key issues better than anyone – who lead. We believe this devolved model has allowed us to conduct better engagement, leading to better decisions.

Alongside this, our engagement strategy, governance and processes have been independently audited for the past seven years by external consultancy and standards firm AccountAbility. This audit provides us with a "Healthcheck" score aligned with the globally recognised AA1000 Stakeholder Engagement Standard framework (this was 91% in 2024, one of the highest in the industry and an increase of 2% on our 2023 score). These audits provide us with recommendations for where we can make further improvements, and these are built into action plans that enable us to continue to refine and strengthen our strategy and activities.

“SPEN continues to be strongly aligned to the AA1000 AccountAbility Stakeholder Engagement Standard. The organisation shows a strong commitment to enhancing SPEN's stakeholder engagement strategy, which is communicated both internally and externally”

AccountAbility Scorecard, 2024

Our approach to RIO-T3 engagement

With our existing Engagement Strategy as a foundation, we developed our specific RIO-T3 approach against a series of nine dedicated workstreams. These were identified through collaboration between the INZAC and internal leadership, and structured around stakeholder interest and business operations. These nine workstreams are shown below to represent their complementary and interrelated status.

Each workstream undertook stakeholder mapping and then planned out tailored engagement for those stakeholders who could offer the most valuable and actionable feedback. The INZAC reviewed this to ensure that any gaps or important stakeholders they felt were missing were also considered and accounted for.

To facilitate this review process, each workstream was paired with a dedicated "buddy group" from our INZAC. This aligned specific members with a mix of relevant expertise to each workstream, allowing for concise, informed and balanced discussions on our plans and stakeholder engagement activities (as opposed to covering numerous topics with all members). This enabled more efficient scrutiny and constructive challenge of strategies and activities.

Although matters of finance and cyber security are not subject to the same level of scrutiny through the ISGs, we have engaged on our strategies and plans with dedicated buddy groups in these areas regularly. This maintained a consistent approach for engaging with the INZAC and allowed us to keep identifying areas for improvement.

Triangulation of feedback

Engagement is essential for our organisation. However, input and feedback may not always align – stakeholders may not want the same outcomes or have different priorities for the business to focus on.

We also have to consider the wider context of input, such as regulatory requirements, engineering practicalities, or budgetary limitations. Triangulation of data within this context is therefore critical to ensure stakeholder engagement leads to better decisions.

For example, the reduction of SF₆ insulating gas from our network assets is an important priority for us, and one supported by stakeholders. But doing so comes with significant costs, and so going too quickly with this would not necessarily result in the best overall carbon reduction, represent value-for-money for consumers nor be an efficient allocation of our resources. We have to balance all of these factors to come to the best overall decision. Further detail on this feedback and our decision making process on this example are included in our [Stakeholder Engagement Annex](#).



Enabling the delivery of RIIO-T3 through continuous engagement

We will maintain and refine our engagement efforts with stakeholders as we continue to operate on their behalf and deliver our five-year business plan and beyond.

Our aim is to support both the UK Government's Clean Power 2030 ambition and Scottish Government's Net Zero emissions targets, and meet the needs and expectations expressed by stakeholders.

We are organising the planning and delivery of our engagement activities under three distinct themes. Each theme represents a route through which engagement with different constituencies of stakeholder can drive better outcomes and more effective collaboration. We need to continue to engage with stakeholders to ensure we deliver on the proposals outlined in our business plan.

New challenges will emerge throughout the RIIO-T3 period – circumstances, technologies and policies will change. We will continue to engage with stakeholders and seek their views. This ongoing engagement will not only keep stakeholders informed of how we will respond to these, but also allow us to keep making the best decisions for both present day and the future.



Transmission Stakeholder strategy 2026 – 2031

Investing in the grid at pace whilst maintaining industry-leading safety, security and resilience

PURPOSE OF ENGAGEMENT

Deliver Net Zero: Unlock low-carbon energy potential by delivering the infrastructure which will keep SPEN on track to deliver Net Zero pathways and help to meet Scottish and UK Government targets.

Protect network reliability: It will ensure a reliable network for consumers and other users of the network.

Ensure economic, social and environmental legacy: Investments set out in the plan will deliver additional benefits for local communities, wider society and the environment.

Educate and convince: Make the case that significant grid investment is to the benefit of society, is critical to tackle climate change and will help stabilise energy bills.

WHO ARE THE KEY STAKEHOLDERS?

UK Government, Scottish Government, NESO, general public, Media, supply chain, workforce.

HOW WILL WE ENGAGE WITH THEM?

Bilateral meetings, sector working groups and workshops, industry conferences and events, national public information campaigns.

Engaging with our communities to build strong relationships and develop positive, lasting legacies

PURPOSE OF ENGAGEMENT

Provide a lasting legacy: Ensure that communities impacted by significant new grid infrastructure benefit in a meaningful way.

Support communities: Supporting communities to realise their ambitions is crucial. Great ideas don't always materialise easily and this can lead to a lack of engagement. By providing customised support, such as workshops and project planning assistance, we can help communities bring their ideas to life.

Understand local issues and ambitions: Tailored and bespoke engagement in local areas to understand concerns, challenges and aspirations.

WHO ARE THE KEY STAKEHOLDERS?

Local communities, community groups, consumer groups.

HOW WILL WE ENGAGE WITH THEM?

Community forums, community action plan development, town halls and online consultations.

Enabling unprecedented levels of connections to the grid, enhancing energy security for everyone

PURPOSE OF ENGAGEMENT

Enable connection projects: Support the connection of renewable energy and storage, by co-ordinating engagement and identifying opportunities for a joined-up approach. This journey will begin from day one, at pre-application right the way through to connecting projects to our network.

Understand and improve developers journey: Supporting those seeking a connection through the process with access to the right information at the right time, understanding issues ahead of time and being proactive in managing these. This will be enhanced through increased self-serve tools and improvements to our website.

Advocate for connections reforms: Play a leading role in the industry, suggesting and supporting changes which will reform the connections process.

WHO ARE THE KEY STAKEHOLDERS?

Generation and demand developers seeking a connection, industry bodies, supply chain.

HOW WILL WE ENGAGE WITH THEM?

Connections summits, industry working groups, Moments that Matter surveys.

This is how we deliver lasting benefits in the communities we serve

RIO-T3 Net Zero Fund

We want to ensure that the Net Zero transition is fair and inclusive, which is why our RIO-T3 Net Zero Fund is designed to provide much-needed support to communities struggling to advance their plans and ideas. With the extensive experience we have in this area, we are well-positioned to offer expert assistance and funding to help them accelerate their projects.

In previous price control periods, we set a precedent for meaningful community engagement and delivered positive socio-economic impacts through our RIO-T2 Net Zero Fund and Green Economy Fund. By providing capacity-building support and funding for innovative community projects, we have helped local communities turn their ideas into reality.

While funding local initiatives is key to unlocking Net Zero, many communities need support in developing their projects. Tailored workshops and project planning assistance delivered through our £5m Net Zero Fund in RIO-T2 have proven to be fundamental to enabling communities to take their projects forward. This is why we want to continue implementing the same fund structure in RIO-T3 – the fund will be delivered in three stages outlined opposite. Each stage highlights the objective and support offered.

We are proposing a £20m Use-It-Or-Lose-It (UIOLI) funding allowance for the RIO-T3 Net Zero Fund. This increase is proportional to the increased network investment, and it will be critical to enabling more communities to join the country's journey to Net Zero, prioritising those at risk of being left behind.

Demand for community-led Net Zero projects in our network area is high, far greater than our RIO-T2 Net Zero Fund could support. With increased funding, we will support more projects which otherwise wouldn't go ahead. This investment will help to create the level of action needed to meet Net Zero and fulfil wider social and economic community needs.

Further information on how we will deliver the RIO-T3 Net Zero Fund and measure its effectiveness is available in the Community Funding Section of our [Environmental Action Plan Annex](#).

Stages of the Net Zero Fund

<p>Community workshops</p> <p>1.</p>	<p>Objective: Capacity building to help communities explore Net Zero ideas and identify solutions</p> <hr/> <p>Support offered: Engaging with communities to understand local priorities and providing expert guidance on potential solutions to address key community challenges</p>
<p>Project planning and feasibility support</p> <p>2.</p>	<p>Objective: Enabling communities to firm up their project plans and take their projects forward to the next stage</p> <hr/> <p>Support offered: Offering technical support in developing project plans and assessing feasibility of the project</p>
<p>Funding</p> <p>3.</p>	<p>Objective: Creating measurable impact and legacy through funded projects</p> <hr/> <p>Support offered: Funding community initiatives to deliver tangible benefits for local communities</p>

Our RIO-T2 Net Zero Fund is estimated to save

28,904 tCO₂e

Funded projects will unlock a Net Benefit on every pound spent of

£3.10

OUR RECORD

Delivering measurable value for our communities

Our RIO-T2 Net Zero Fund projects are predicted to save 28,904 tCO₂e (Tonnes of Carbon Dioxide Equivalent), the equivalent to driving around the earth over 7,000 times in an average car. We also looked at the cost efficiency of our fund – on average we invested £256 to save each tonne of CO₂e, which is less than the UK Department for Energy Security & Net Zero's £274/tCO₂e threshold for economic and efficient investment.

We expect that for every pound spent on these projects, an overall Social Return on Investment (Net Benefit per £ spent) of £3.10 will be realised over the maximum benefit lifetime (See our [Environmental Annex](#) for more information).

Not only is our Net Zero Fund creating a cleaner environment through carbon savings, it is also enabling a more equitable transition to Net Zero by supporting vulnerable consumers and communities facing the risk of being left behind. From creating warmer and more energy efficient spaces for community use, to electrifying transport that enables access to essential services like health appointments or food deliveries for vulnerable members of the community – the fund is supporting local projects that unlock social, environmental and economic benefits to deliver a just transition for all. [Find out more about funded projects at our website.](#)



Food Train decarbonises essential community service by electrifying its fleet



Scout group futureproofs community hall with eco-friendly upgrades



Glasgow Women's Library set to become Scotland's first Net Zero museum



New electric car club provides access to transport for vulnerable members of the community



Community Benefits


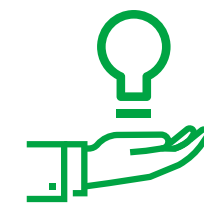


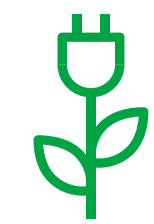
Whilst the energy transition brings many challenges, it also creates many opportunities – opportunities to work with our communities to shape an equitable and sustainable future for all. Every step we take towards futureproofing our network takes us closer to unlocking long-term benefits for both people and our planet.

We recognise that hosting new infrastructure can affect those living nearby. That is why we are committed to delivering social, economic and environmental benefits that will leave a positive legacy within the host communities and beyond.

We have been engaging with the UK Government, Scottish Government and other Transmission Operators to develop a consistent approach to community benefits. Whilst we still await publication of the government guidance, we want to make sure that we are in a good position to start delivering for our communities.

As the investment into the energy infrastructure ramps up in the upcoming RIO-T3 period, we expect that our projects will attract a significant sum of Community Benefit Funding. Therefore, we want to ensure we are ready to engage with eligible communities and help them achieve their local ambitions.

We have spoken with communities and stakeholders across Central and Southern Scotland to gather their views on our Community Benefit Framework. Their feedback alongside our learnings from our previous funds has informed our Community Benefit Principles and shaped our governance and delivery plans outlined in the Community Funding Section of our [Environmental Action Plan Annex](#).

<p>Work in partnership with communities</p>	<p><i>Work in partnership with communities to understand their needs, ambitions and plans for social, economic and environmental sustainability</i></p> 
<p>Provide tailored support</p>	<p><i>Provide tailored support for communities to get the right skills, knowledge, capability and structures in place</i></p> 
<p>Independent funding assessment and straightforward governance</p>	<p><i>Put in place clear independent assessment of funding allocation with fair and straightforward governance</i></p> 
<p>Lasting outcomes for communities, aligned to their ambitions</p>	<p><i>Deliver lasting outcomes for communities, aligned to their ambitions</i></p> 
<p>Evaluate benefits and share learnings</p>	<p><i>Evaluate the benefits that funding has delivered to communities, develop case studies, and share learnings publicly</i></p> 

We propose a Community Benefits Framework which will distribute funding through the following mechanisms:

Local Funds

Our local funds will address the priorities of local communities hosting our new transmission infrastructure projects. We anticipate the need to create separate governance arrangements for projects at a scale that will attract a substantial amount of community benefit funding.

Strategic Funding

We will provide access to funding that can be utilised for larger community projects that can be applied to a wider geographical area. This funding will look to support projects that are aligned to Local Authority, Scottish Government, or regional priorities.

Micro Funding

Some communities have highlighted the need for micro-grants to support smaller community initiatives. We will be open to funding these projects through micro-grants which will be subject to the funding criteria, alignment to local community which will be priorities, measurable impact and long-term benefits.

To empower our communities, we will work with them to understand local priorities and offer the tailored support that they might need to develop their community initiatives.

We want all funding decisions to deliver best value for the local communities, which is why we are committed to fair and clear governance. Drawing from our extensive experience of delivering community funding, we developed a governance framework that centres around transparency, independent decision-making and equitable distribution of resources. We will appoint an independent fund administrator and an independent panel of experts to assess funding applications and ensure that funding delivers lasting benefits for our communities.

We will remain open to innovation and be flexible in our approach to Community Benefits by tailoring our support to the needs of local communities. We want to ensure that communities are not only part of the Net Zero journey, but are also empowered and supported throughout the transition. That is how we will enable community initiatives to improve social, economic and environmental wellbeing of local communities and build a positive legacy.



This part of our business plan describes how data and digitalisation are critical enablers of the step-change in the volume of work we have to deliver in RIIO-T3. Simply recruiting more people without providing them with digital and data solutions to drive efficiencies in processes and tasks will not be sufficient for the pace and scale of work we have planned. We expand on how we are building upon the foundational work achieved during RIIO-T2 to develop and implement these solutions.

In the following pages, we outline how modernisation, better information and efficiencies from data and digital solutions are critical factors in meeting the challenges we anticipate in RIIO-T3.

Context and insights
How changes in our sector have launched a transformative era in data, and how we have sought feedback from stakeholders and gained insights to shape our plans and support stakeholder needs.

Our digital strategy
How we have structured our suite of initiatives to place data, and digital solutions, at the core of our operations and to manage data in the same way that we manage our physical assets.

Delivering our strategy
How we are undertaking a systematic programme of work to add layers of digital and data solutions over the duration of RIIO-T3 and how we have set ourselves up with the right skillsets, resources and capabilities.

Data Best Practice (DBP)
How we will measure and assess our organisational maturity and compliance with the DBP, and the initiatives in place to meet ambitious maturity level targets for each DBP principle.

Embedding digitalisation and becoming a data-driven organisation

Substantial investment in data and digital solutions

£94m

Investment to increase productivity, improve service provision and optimise network management and operations.

Deep insights on needs and requirements of stakeholders

28 personas

Representations of our stakeholders to help us understand their data and digitalisation needs, and to support those needs.

A strategy for data and digital excellence

4 pillars

Each representing a suite of initiatives – designed to work in tandem to improve outcomes for customers and stakeholders.

Resolute focus on achieving Data Best Practice

11 principles

Attaining the highest level of compliance with all 11 principles in Ofgem's Data Best Practice (DBP) guidance.

The context for energy system digitalisation

Our energy system is changing

The scale of what we need to achieve, the pace at which we need to deliver, and the services and support which our customers and stakeholders need are evolving. These unprecedented changes necessitate a transformative era for energy system data.

The drive towards Net Zero creates the need for a generational shift in the way we use our network, increasing our reliance on network monitoring, data-driven intelligence and new digital technologies. We are experiencing an exponential increase in the data which we collect, transform, utilise and share. This data is a vital component for the transformation of our business for RIIO-T3 and beyond, and we must harness digital capabilities to maximise the value for our business, customers and stakeholders.

Our business is changing

We can no longer rely on manual, people intensive processes to deliver the scale and pace of investment which is needed to realise Net Zero. We must embrace data and digital solutions, and develop automation, to improve decision making, optimise our network, maximise the use of our assets, and to manage and reduce risk.

Use of data and the improvement in digitalisation tools can also drive value for money for our customers by enabling us to provide more efficient services and to make effective planning and investment decisions about the future of our network.

Our industry is changing

At the start of RIIO-T2, Ofgem introduced Data Best Practice guidance, a suite of 11 principles designed to ensure data is treated as an asset and used effectively for the benefit of consumers, stakeholders, and the public interest. It provides a standardised suite of requirements for how we engage with our customers and stakeholders and how we deliver for them, ensuring that all network operators are treating data as an asset and putting our users at the centre of decision making.

Engaging with our stakeholders

Our customers and stakeholders are central to our data and digitalisation plans. To ensure our plans align with their needs and aspirations, we have actively engaged both internally and externally throughout our development process. This engagement has enabled us to test and shape our plans. We have also tested our plans with other network operators, Ofgem, and the NESO to ensure we support the data and digital transformation of our industry.

INZAC has been essential in supporting the evolution of our plans, challenging us to go further, and ensuring we listen to and learn from our customers and stakeholders, peers, and industry expertise. Their guidance has ensured our plans reflect best practice, and they have pushed for us to be ambitious in areas such as data security, and encouraged the use of digital and data personas. They also provided support to ensure that the communication of our plan is clear and user friendly.

We recognise that ongoing engagement will be essential for the successful transformation of our energy system. Our engagement with our customers and stakeholders will continue throughout RIIO-T3, and this will include engagement with hard-to-reach groups such as the digitally disengaged, to ensure that provision of our data and digital services is in line with customer and stakeholder needs.

To support our customers and stakeholders in understanding how our plan supports them, we have developed a suite of personas as recommended by the INZAC. These provide insight on the challenges and opportunities our stakeholders have shared with us and outline how our plans support these. An example of our Renewables Developer data persona is shown below, and you can read more on our data personas in our RIIO-T3 Digitalisation Strategy.



Renewables Developer

Challenges in my day to day role: I find it difficult to find data to support my needs. As the data is usually tabular, it is difficult to see trends or areas to focus on, limiting ability to identify opportunities or issues.

Future with Data Sharing & Security: I can now find datasets more easily and the ability to view data geographically helps me to quickly identify locations where we may invest, providing certainty for our business.

STAKEHOLDERS SHAPING OUR PLANS

Highlights of our activity

OUR EXTERNAL STAKEHOLDERS



Feedback from our annual connections summit held in May 2024 was primarily around connections queue visibility and the process for engaging with SPEN to initiate and apply for a connection. This has influenced the development and inclusion of the customer led connections solutions in our RIIO-T3 plan to deliver improved online functionality and increase the information available. You can read more about our customer led connections solutions in our RIIO-T3 Digitalisation Strategy.

OUR OPEN DATA STAKEHOLDERS



In 2024, we sent surveys to over 100 of our Open Data customers and stakeholders asking for their views on how we can support them with access to our data. They told us that the navigation through our Open Data Portal could be made easier and that support on using the datasets available would be beneficial. You can read about the enhancements that we will make to our Open Data Portal in response to this feedback in our RIIO-T3 Digitalisation Strategy.

OUR INTERNAL STAKEHOLDERS



Engagement with over 40 of our internal stakeholders has informed us that a lack of visibility of data in our organisation means that they spend a disproportionate amount of time finding data as opposed to using it. You can read about our plans to improve the visibility of our data in our RIIO-T3 Digitalisation Strategy.

Ensuring our solutions are efficient

Our plans have been thoroughly tested to ensure they are achievable and that they represent value for our customers and stakeholders. For each of our planned investments, we have assessed different options to ensure that we select the most efficient, and most appropriate solution. By thoroughly evaluating each option, we have been able to identify a suite of solutions that will maximise efficiency and effectiveness, leading to more streamlined processes, reduced costs and improved outcomes for our customers and stakeholders.

In developing our data and digital investments, we have worked with world leading IT and digital organisations to develop industry leading, innovative solutions to future proof our business. We engaged a top tier IT consultancy to help us to identify and develop initiatives capable of transforming our digital infrastructure, and ensuring our delivery programme is achievable and cost effective.

Going further, we externally assured all of our proposed investments with an independent third party, improving our cost and timeline estimates in line with these recommendations, and ensuring that we deliver value for our customers and stakeholders. This approach means we are confident in our ability to deliver the required data and digital outputs in our plan while ensuring our investment is an efficient use of regulatory funding.

New data and digital solutions enable increased productivity, improved service provision, and increase our capacity to deliver. This delivers savings by avoiding the need for scaling of manual, and time-consuming processes. These savings have been embedded in our solutions and ensure that we support our business and customers and stakeholders whilst maintaining efficient operations.

Additionally, we have tested our data and digital plans with our innovation team, identifying opportunities to develop new, innovative solutions and to deploy these into “business-as-usual”. By reducing the reliance on manual processes, we will be able to allocate resources more effectively, increasing productivity and enabling the increased scale of project delivery over the coming years.

Our proposed investment comfortably falls within the benchmarked cost ranges for similar scale digitalisation programmes

Low Range
£78.3m

High Range
£126.6m

SPEN data & digital programme

£94m

Introducing our RIIO-T3 Digitalisation Strategy

In RIIO-T3, we will build on the foundational work completed in RIIO-T2. We will develop and deploy the digital solutions that will enable our business to deliver the pace and scale of change which the RIIO-T3 period will require.

We have developed a strategic plan that builds on our RIIO-T2 investments, creating a suite of integrated platforms designed to greatly enhance the customer experience. In the RIIO-T3 period, our customers and stakeholders will require us to deliver connections and invest in our transmission network at a pace that exceeds our historical requirement. Our current processes and systems are not equipped to handle this increased volume and speed of network delivery. To address this, we will develop and implement solutions that offer our customers and stakeholders quick and easy access to the data, information, services, and digital tools they need to support their goals and help them achieve their Net Zero ambitions.

In the past, some of our processes, transactions, and decisions have been digitised but often remained siloed, resulting in our teams working with incomplete data, low-quality data, or requiring high levels of effort to acquire data. To drive our business forward, we will leverage data as a critical asset in our decision-making processes across planning, investment, and daily operations – enhancing efficiency and productivity, and we will deliver cutting edge technology to transform our operations, implementing solutions that are better aligned with the future demands of our business.

“We will deploy new solutions, bring in new data skillsets and develop new working practices to support the evolving demands of the energy sector and create an organisational culture where data is treated as an asset.”

Our Digitalisation Strategy has been aligned to four pillars, each representing a suite of initiatives which work together to create the digital platforms, facilitate the transformation of our data, and support the creation of new ways of working to deliver data and digital excellence.

We will deploy new solutions, bring in new data skillsets and develop new working practices to support the evolving demands of the energy sector and create an organisational culture where data is treated as an asset.

We will build towards a full Digital Twin of our network to enable improved data and tools to speed up connections offers and include customer self-serve quotations. This approach integrates industry leading project management processes, network design and land management platforms, and asset management platforms to improve the reliability and maintenance of our network.

We will enhance our data governance framework to improve visibility and accountability of our data assets by cataloguing them and implementing policies for quality, accessibility, and interoperability. We will securely provide datasets to our customers and stakeholders in accessible formats and support the development of an industry-wide Data Sharing Infrastructure to contribute to interoperability across the energy system. The delivery of our ambitious data strategy will be done against a backdrop of industry leading compliance against the 11 principles of Ofgem's Data Best Practice.

Refer to our RIIO-T3 Digitalisation Strategy for further details on our data and digital solutions.

The four pillars of our Digitalisation Strategy

Our Digitalisation Strategy has been aligned to four pillars, each representing a suite of initiatives which work together to create the digital platforms, facilitate the transformation of our data, and support the creation of new ways of working to deliver data and digital excellence.

PILLAR 1

Delivering tools and insights for our customers and stakeholders

We will develop digital solutions to enhance customer experience when engaging with us, providing greater online functionality for customers to “self-serve” while streamlining processes to increase the speed of a connections offer. We will engage our customers and stakeholders on an annual basis and update our digital plans to reflect emerging priorities.

PILLAR 2

Facilitating network growth through data & digital solutions

We will develop data and digital solutions to enhance project management, network design and land management capabilities to accelerate the RIIO-T3 programme of capital delivery while facilitating collaborative working with our contractors and other third party suppliers.

PILLAR 3

Developing smart network and asset management capabilities

We will develop digital solutions to enhance our asset management capabilities and increase the use of technology to optimise our field operations, ensuring continued network reliability. We will deliver the technology solutions required to support our environmental and sustainability ambitions and targets.

PILLAR 4

Becoming a data driven organisation

We will build on our established foundations of data governance, data sharing and security, engaging on an ongoing basis with our stakeholders to ensure we provide secure and high-quality data which surpasses the need of DBP.

1.

2.

3.

4.

PILLAR 1

Delivering tools and insights for our customers and stakeholders

The initiatives in this pillar will enable us to scale our activities in response to the significant increase in the demand for our service. We have created a plan that builds on our RIIO-T2 investments to create a suite of integrated platforms designed to deliver enhanced customer experience.

Customer Led Connections Solutions

Our customers and stakeholders have told us that their priorities are to be able to access more information online and have greater visibility of our network to allow them to self-serve quickly and efficiently. In response to this, our RIIO-T3 plan includes several customer led connections solutions in which we will revamp our website to deliver an improved online experience, considering accessibility needs to ensure no one is disadvantaged. This will include developing self-service tools that allow connections customers to create indicative designs and costings.

Improving the speed in which a connections offer is provided to a customer looking to connect to our network is also a key focus in our plan. We will leverage the power of artificial intelligence (AI) and machine learning to streamline and automate back-end data collection processes to reduce the time it takes to produce a connection quote.

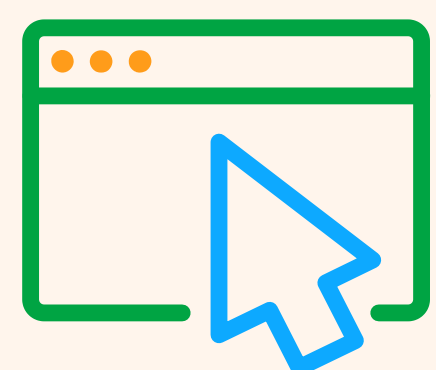
We will also use AI where possible to enhance customer and stakeholder engagement overall, making interactions more efficient and personalised.

CRM Enhancements

We deployed our new Customer Relationship Management (CRM) solution during RIIO-T2. This provides a single view of customer interactions encompassing all customer journeys. Throughout the RIIO-T3 period we will further develop and integrate our CRM solution to streamline processes and enhance our customers' experiences. Customers will receive a joined-up service where all the information relating to their interactions with us is available at the point of interaction.

Understanding when and where maintenance and network outages are planned is a crucial requirement from our customers so we will develop a customer facing platform to make this information available as soon it is known allowing customers to plan accordingly.

WE WILL:	BENEFIT:
Develop our online capacity heatmap and introduce functionality for customers to generate the estimated cost for a new connection.	Empowers customers with the ability to make informed decisions quickly, reducing time and effort required to plan and budget for a new connection.
Develop an online view of planned maintenance and network outages.	Increased visibility of network outages, minimising disruption to customers.
Streamline our internal processes for providing customers a connections quote using AI and machine learning technologies.	Reduction in time taken for a customer to be presented with a connection offer after submitting an application.



PILLAR 2

Facilitating network growth through data and digital solutions

In RIIO-T3, our customers and stakeholders will need us to deliver connections to and investment in our transmission network at a rate faster than we have historically. Our current processes and systems are not capable of scaling to this volume and pace of network delivery. Within this pillar we are proposing a suite of initiatives that will give us the capability to manage this volume and speed of network growth.

Contract Planning and Procurement

Our network growth programme will be delivered in partnership with third party suppliers who provide a range of services and equipment. We have recently announced the awarding of £5.4bn worth of contract opportunities as part of our planned investment. We are proposing a contract management and procurement initiative that will enable us to manage this complex ecosystem and enhance our interactions with contractors and suppliers, taking into account feedback we have received from them.

Project and Portfolio Management

Our project and portfolio management initiative will build a holistic view of projects across the portfolio of network growth investments, enabling management oversight and portfolio-wide decision making. It will integrate with our wider suite of initiatives across all the four digitalisation pillars ensuring that the relevant information is available to support informed decision making, and that the impacts from decisions are consistently reflected across the delivery programme, speeding up the end-to-end delivery process.

Building Information Modelling (BIM)

Our BIM initiative builds on the foundations we have established during RIIO-T2 and delivers a wider and deeper transition which will increase our maturity against the BIM methodology. BIM is the process of designing, constructing, and operating an infrastructure asset, including the generation and management of digital representations of the physical and functional characteristics. This will impact our organisational model, our processes, our ways of working and our technology solutions as well as our external interactions with third party suppliers, customers and stakeholders. It will facilitate collaborative working across a complex range of projects, enabling the coordination of resources to deliver the scale of investment our RIIO-T3 business plan proposes.

Land and Planning

Managing land and planning processes and the interactions with our customers and communities will also be a focus within this pillar. We will improve our internal land and planning processes through integrations and automation. This will include development of enhanced online offerings and will allow landowners to view the progress of projects.

WE WILL:	BENEFIT:
Implement a single project and portfolio management tool.	Efficient delivery of our network growth programme.
Continue to develop the maturity of adopting the BIM methodology from design to delivery and maintenance.	Enhanced network design and modelling capabilities with reduced rework.
Adopt new contract management and performance solutions.	Improved collaborative working with contractors and suppliers.





PILLAR 3

Developing smart network and asset management capabilities

Visibility and management of our network and our assets is a core function of any networks' operations. The central role that our network plays in the move towards a decarbonised energy system, coupled with the increasing risks to energy security arising from a diverse set of factors such as cyber-attacks and climate change, means that we need to transform our approach to network operations and asset management.

Asset Management

Our RIO-T3 programme sets out how we will deploy new technology to capture more data about our network, and how we will collect, interrogate, and make this available to our customers and stakeholders, ensuring that we are able to make informed decisions about the operation and management of our network and our assets.

Our asset management systems are central to our drive for operational excellence in the management of assets. They allow us to design changes to the network, plan and safely deliver work, schedule resources, inspect and maintain assets, model power flows, understand asset risk and consequence of failure, manage vegetation and manage land rights amongst many other functions. In RIO-T2, we have deployed several core asset management solutions.

In RIO-T3 we will significantly enhance these to improve our users' experience and enable new capabilities such as improving integrations, capturing more data, optimising the use of resources, performing more detailed analytics and ensuring the solutions are scaled to the volumes of work we foresee.

We will upgrade our works and asset management platform which will introduce new capabilities that will help optimise our transmission operation. We will enhance our solutions that deliver the Network Asset Risk Metric (NARM) calculations, including the additional asset types and the updated Common Network Asset Indices Methodology (CNAIM) as outlined in Ofgem's RIO-3 Sector Specific Methodology.

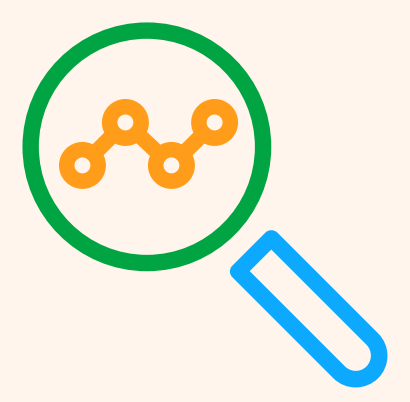
Field Technology

We will deliver a programme of improved field services by using predictive analytics, real-time data monitoring, and automated reporting to make processes related to field activities for planned and reactive work quicker and more coordinated.

Environmental Compliance

We will implement environmental solutions that align with our sustainability goals. These solutions will help us track, report on and reduce our environmental impact, and support our long-term sustainability targets.

WE WILL:	BENEFIT:
Develop and implement new asset management systems.	Enhanced ability to manage assets enabling better informed decision making, ensuring network reliability.
Modernise our inspections and maintenance processes using AI, machine learning and Internet of Things (IoT) devices.	Optimised maintenance schedules to drive efficiency, improve the longevity of our assets and ensure reliability of our network.
Develop and implement a central environmental reporting platform and analytics capability.	Enables monitoring of environmental data, ensuring greater transparency and compliance with regulatory requirements.



PILLAR 4

Becoming a data driven organisation

Our RIO-T3 plans enable us to treat our data as a valuable asset, enhance our capabilities to maximise the value from data, and build the trust to securely share our data with our customers and stakeholders, all in line with DBP.

Foundational Data Developments

During RIO-T2, our foundational developments have focused on our data governance framework; developing our Informatica tool, a suite of data governance policies, and our governance arrangements – with leaders from across the organisation engaged on ensuring compliance with DBP. We also established our Network Data and Intelligence function; responsible for stewarding our data strategy, supported by our Business Transformation Directorate, collectively developing solutions with DBP designed in. This function comprises specialists in data science, data governance, data engineering and data architecture, fields which have not historically been part of our networks business.

Data Governance

We will build on our successes, rolling out a prioritised programme of cataloguing our data assets in Informatica, and assessing the quality of our data. This will enable us to develop clear visibility of our data assets, to measure the quality of our data across our organisation in a standardised and automated fashion, and to identify and deliver an improvement programme which benefits our data users.

Data Sharing

Our customers and stakeholders have told us that access to and use of our data is pivotal to their ambitions. That is why our plans prioritise developments in our data sharing and data services, building on the launch of our Open Data Portal. We will publish new datasets, deliver intuitive visualisations, and enhance the security and accessibility of our Portal, enabling us to surpass the requirements of Principle 11 of Ofgem's DBP guidance.

The UK Government recently published findings of their Digital Spine feasibility study, setting out plans for a centralised Data Sharing Infrastructure. Our plan sets out how we will deliver this, working closely with the NESO and Ofgem to improve the ability to exchange data within our industry, ensuring trusted data flows to Ofgem, the NESO, and other actors in the energy system.

Data Reporting and Analytics

We will deliver the scaled roll out of data products on our Azure platform, developing internal and external use cases to support the needs of our business and the wider industry. This includes solutions for enhanced asset condition analysis, modernising regulatory reporting, improving asset management, and developing climate resilience insights.

WE WILL:	BENEFIT:
Deploy our data governance platform Informatica and catalogue our data.	Improved quality and visibility of our organisation's data assets and supporting information.
Future proof our data sharing for our internal and external customers and stakeholders – helping to realise their ambitions.	Improved access to our data, providing enhanced information and support to our customers and stakeholders.
Create a single source of data to facilitate enhanced reporting and analytics.	Reduced manual efforts, eliminate data silos, and ensure that data is readily available and trustworthy for all users.



How we will deliver

Delivering our Digitalisation and Data Strategy will be a substantial programme of work and will rely on introducing new skills into our business, embracing change management, and ensuring a robust delivery model.

In 2023, we implemented a new operating model, transforming our data and digital teams, setting us up for the scale of the challenge ahead and onboarding new skills and capabilities across system architecture, data engineering, data science and project management. Our data and digital teams are now established, and our teams have been collaborating to deliver data and digital solutions working in conjunction with subject matter experts across our organisation.

Our delivery programme has been segmented into value streams, each responsible for the design, development and delivery of projects aligned to a specific theme. Our value streams have clear accountability for end-to-end products and systems lifecycle, providing application support for systems within their remit.

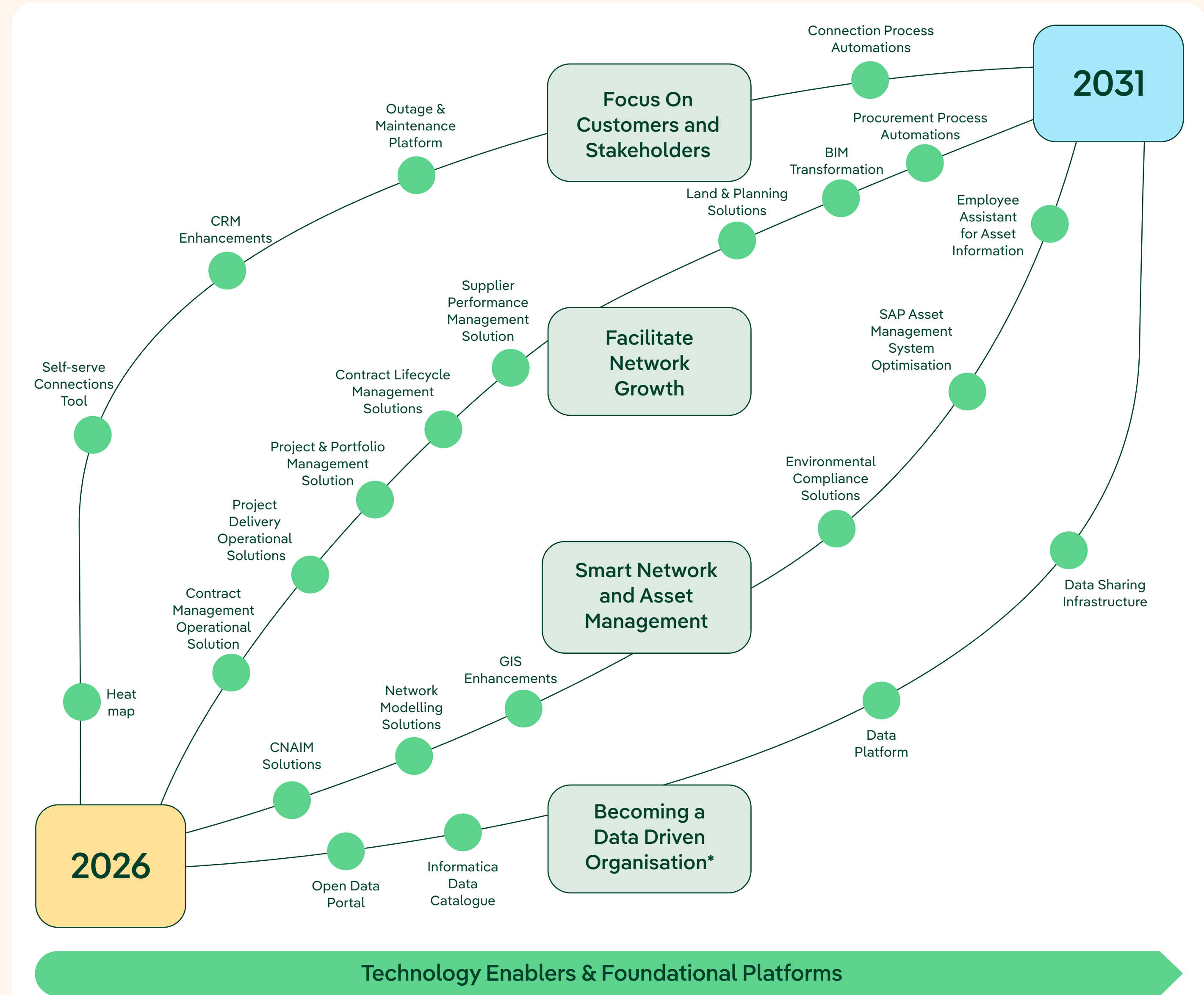
Our delivery model is underpinned by two central support functions, providing a central pool of expertise to make sure the programme delivers quality, outcomes and value. One of the key principles of our delivery model is to ensure the right delivery method for each initiative with the right mix of internal and external resources and skill sets. This hybrid resourcing model utilises a combination of external partners and SPEN staff, allowing us to develop our people and build more skills and capability internally, driving cost and efficiency.

We use an agile delivery approach as this enables us to deliver benefits for our customers and stakeholders early and incrementally and lets us engage with end users on an ongoing basis, ensuring that we can iterate and evolve our plans in real time as the needs of our customers and stakeholders evolve.

We will expand our delivery team over RIIO-T3 across our 5 core disciplines of Solution Delivery, Application Support & Maintenance, Architecture and Strategy, Business Change and Project Management Office (PMO). There will be a further complement of external skills contracted on a temporary basis for specific projects. We have established partner frameworks for some of these skills and any remaining skills will be procured via a competitive tender process. Our resourcing strategy is well considered and has strength in terms of our internal skills being complemented by strategically procured third party partner skills.

Additionally, our Data and Technology Graduate Programme, a 2-year programme that brings together different disciplines to develop and support our data and digital activities, gives us further resource capacity and a diverse range of complementary skill sets.

For RIIO-T3, our five-year programme has been developed into a roadmap which sets out the key milestones in the delivery of our data and digital initiatives. This is aligned to our four pillars and has enabled us to undertake a change impact assessment, helping us to identify who will be impacted, and to understand the scale of change and support required. We have also ensured that our delivery roadmap is not concentrated to one area at any given time, ensuring that we are balancing the needs of our business alongside our programme of activity.



*Please note that the Data initiatives will be delivered incrementally over the RIIO-T3 period.

Innovation in electricity networks unlocks numerous capabilities that contribute to a more efficient, sustainable, and resilient energy system. It enables us to do more with less or to find new ways to grow, modernise and operate our network in a more decarbonised, efficient, economic and coordinated manner. Here, we describe two categories of innovation – the first category, ‘Business-as-Usual (BAU) innovation’ refers to innovation we will fund ourselves using price control allowances and the second, ‘stimulus-funded innovation’ refers to innovation funded through the Network Innovation Allowance (NIA) and the Strategic Innovation Fund (SIF).

In this part, we outline the portfolio of activity in BAU Innovation and Stimulus-Funded Innovation that will deliver pace and scale in our delivery of RIIO-T3 outputs.

BAU Innovation
How we will deploy proven and tested innovation into our day-to-day operations.

Deployment Process
How we will make robust decisions to ensure we optimise value from innovation funding.

Stimulus-Funded Innovation (SIF)
How we will engage with the SIF during RIIO-T3 and continue to respond to annual challenges set by Innovate UK.

Stimulus-Funded Innovation (NIA)
How we will use the NIA framework to progress ideas, concepts and technology to support RIIO-T3.

Nurturing and deploying innovation

A commitment to deploy past innovation in RIIO-T3

> **£380m**

The amount of our RIIO-T3 Totex we are committing to innovation activity.

Systematic approach to adopting innovation into BAU

6 steps

Robust phases in our decision-making to deploy innovation.

Continued support for and engagement with the SIF

> **75%**

SIF applications have received funding.

Ramping up our NIA innovation activity

£22.45m

This represents a 34% increase on the budget we were allowed under RIIO-T2.

Why we innovate

To us, innovation is about doing things differently, developing new solutions and advancing ideas to deliver benefits to the stakeholders we serve. Innovation enhances many aspects of our business and enables us to improve the services we provide.

In general, our innovation brings enhancements in three areas:

Technological

The engineering of new devices and systems.

Commercial

The development of new arrangements with customers and suppliers.

Operational and process driven

The development of new practices.

Innovation-driven advancements in these areas enable electricity network coordination, operations, maintenance and construction to become faster, more scalable, and better aligned with the growing demand for sustainable energy solutions. In this section, we first provide an overview of innovation we will undertake in RIO-T3 using incentives and allowances in the price control (BAU innovation) before outlining activities we plan to undertake using ringfenced innovation stimulus funds – NIA and SIF.

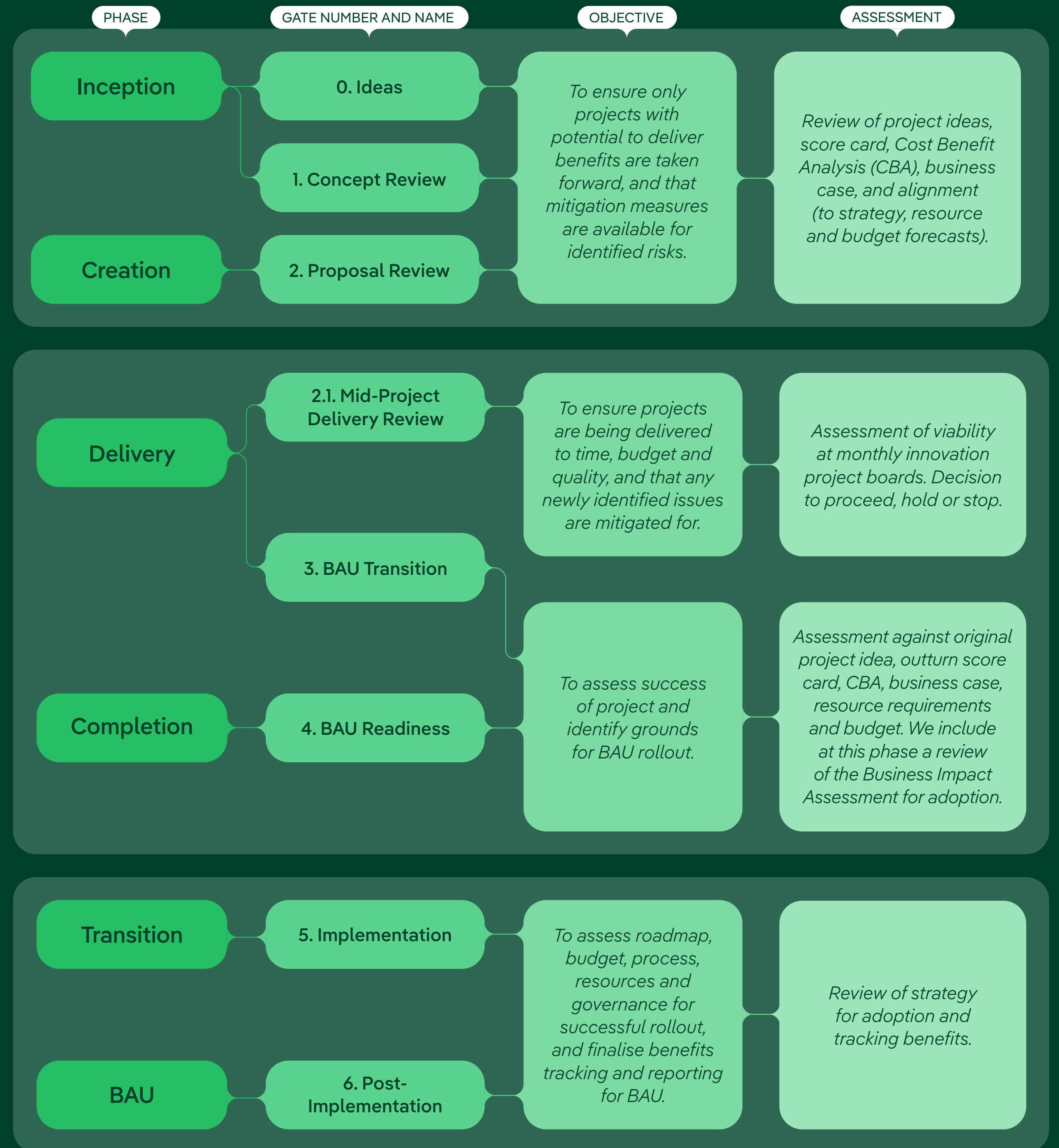
Process of deploying innovation into BAU

During RIO-T3, we will deliver over £380m of Totex-funded Innovation across 29 planned activities which comprise a mixture of both deployment of proven technologies into BAU – originating from stimulus funded innovation projects – plus innovative Totex-funded investment projects to deliver continual improvement of operations and drive efficiencies.

To be considered for deployment in our day-to-day operations, each innovation idea, technology or concept transitions through various checkpoints (or 'gates') where a decision is made to either proceed with the next phase, modify the innovation project in some way or end the project outright. The diagram opposite summarises the evolution of innovation activity from inception to adoption into BAU.

29 planned innovation activities

> £380m of Totex-funded innovation in RIO-T3



Examples of BAU Innovation we are deploying in RIIO-T3

We have a strong track record of deploying innovation in BAU and provide examples here of innovation we are rolling out in RIIO-T3. These examples below demonstrate how past innovation is integral to what we are able to deliver in RIIO-T3. A more exhaustive description of our planned BAU activities can be found in our [Innovation Annex](#).

Nurturing and deploying innovation to achieve the UK's ambition to be a clean energy superpower with enhanced resilience and security of energy supplies.



SERVICE

AI-Generated Connection Offers

This project focuses on the automation of the creation of contractual documents during the connection process.

By streamlining the generation of the necessary documents for the NESO, we aim to enhance operational efficiency and improve customer satisfaction.

This automation will also include pre-planned customer engagement touchpoints, ensuring customers receive timely updates on the progress of their contracts.

We will invest £2.02m of our RIIO-T3 Totex in this innovation deployment.

VALUE

RePower (Distributed Restart)

In collaboration with NESO, the RePower project will bring the learnings, recently demonstrated by the Distributed Restart innovation project, into BAU as a restoration service.

The Distributed Restart project was a partnership between the NESO, The New Energy Industries (TNEI) and SPEN which was awarded £10.3m of Network Innovation Competition (NIC) funding in RIIO-T1.

It explored how distributed energy resources (DER) can be used to restore power in the highly unlikely event of a total or partial shutdown of the National Electricity Transmission System. Past approaches relied on large thermal power stations – most of which have now been decommissioned.

This initiative will lead to significant benefits for electricity consumers by reducing costs for emergency restoration services and will inform research and development in other countries. We will invest £11.11m of our RIIO-T3 Totex in this innovation deployment.

£11.11m

of our RIIO-T3 Totex in this innovation

RESILIENCE

Phoenix Project (Hybrid Synchronous Compensators)

Our Phoenix project in RIIO-T2 successfully demonstrated the design, deployment and operation of the world's first Hybrid Synchronous Compensator (H-SC) at transmission network voltages. The H-SC is a combination of a static compensator (STATCOM) and a synchronous compensator to deliver improved system inertia and voltage stability.

In RIIO-T3, we aim to maintain an acceptable minimum level of system strength by installing a number of synchronous compensation devices across our network, and we forecast an associated expenditure of £312m.

The roll-out of this concept is better suited to funding through an uncertainty mechanism because multiple factors influence its deployment.

We recommend that a re-opener mechanism (uncertainty mechanism) be made available during RIIO-T3, similar to the Innovation Roll-out Mechanism (IRM) used in RIIO-T1, to finance Synchronous Compensation and other innovations with uncertainty over the timing of deployment.

£311.60m

potential expenditure in RIIO-T3

INFRASTRUCTURE

High Temperature, Low Sag Conductors

We first deployed the all-Aluminium High Temperature Low Sag (HTLS) overhead line (OHL) technology in the South-West region of Scotland during RIIO-T1, to address a lack of existing network capacity on the overhead lines that prevented new generators from being connected.

The HTLS conductor is able to operate at higher temperatures, which allows it to provide additional capacity without increasing the weight of the line or the number of circuits. In comparison to regular OHL options, the HTLS conductor delivers financial, as well as carbon and environmental benefits.

This technology will continue to be rolled out in RIIO-T3, with a Totex investment of £338.21m.

£338.21m

of our RIIO-T3 Totex in this innovation

Stimulus-funded Innovation

In addition to Totex-funded BAU innovation activities, our RIIO-T3 innovation portfolio includes activities funded using innovation stimuli through our Network Innovation Allowance (NIA) or Strategic Innovation Fund (SIF).

NIA funding enables exploration of higher risk areas beyond BAU whereas SIF funding focusses more on experimental development and demonstration of large-scale, high-impact strategic projects.

On this page we discuss our approach to SIF-funded innovation. In the next page we present our plans regarding NIA-funded activities.

For a more detailed breakdown of our planned NIA-funded activities, including details of the entities with whom we anticipate collaborating and a comparison of our NIA funding requests in RIIO-T2 & RIIO-T3, please refer to the supporting [Innovation Annex](#).

77% successful

77% of submitted applications being successfully funded and several Beta projects now in flight.

Strategic Innovation Fund (SIF) Activity

We recognise the value and strategic importance of SIF and, over the last four years, have worked collaboratively with Innovate UK (UKRI) – the organisation that sets annual innovation challenges and works in partnership with Ofgem to deliver the fund. We have actively participated in the SIF as it has developed – with our participation starting in SIF Round 1 in 2021.

The SIF innovation process has four main phases, which run on an annual cycle. These are the Challenge, Ideation, Incubation and Acceleration phases. In the Acceleration phase, SIF projects begin a journey with three sub-phases:

Discovery

(feasibility studies; 2-3 months)

Alpha

(proof of concept projects; 6 months)

Beta

(large scale demonstrator developments; 5 years)

Acceleration Phase projects

SIF Stage/Project	SIF funding awarded	Applications submitted	Applications funded
SIF Discovery and Alpha projects	£2.66m	18	14
Beta: Predict4Resilience	£4.52m	4	3
Beta: BLADE	£4.85m		
Beta: Flexible Railway Hubs	£8.26m		
Total	£20.29m	22	17

Our engagement with the SIF competition in RIIO-T2 has proven to be valuable in all Acceleration sub-phases, with 77% of submitted applications being successfully funded and several Beta projects now in flight, with aspirations for their BaU deployment to commence within RIIO-T3.

In line with the Sector Specific Methodology Decision (SSMD) published by Ofgem, we support the continuation of the SIF as a complementary mechanism to NIA to fund more ambitious and high-budget innovation projects.

Building on our success from RIIO-T2, we will continue to respond to annual innovation challenges set by Innovate UK and will compete for and deliver an ambitious portfolio of SIF projects during RIIO-T3.

CASE STUDY

BLADE – SIF Round 2 Beta



Emergency restoration Demonstrator from Offshore Wind (BLADE) is a £5m SIF Round 2 Beta project that will bring electricity system restoration from offshore wind to commercial reality by building the necessary cross-industry understanding between the onshore transmission network owners, transmission system operators, offshore wind farm (OWF) operators, and technology suppliers.

This project builds on learnings acquired from previous innovation projects that considered network restoration and stability, such as Distributed Restart.

The Beta phase, due to conclude in September 2027, will pioneer understanding on the technical requirements for windfarms to provide restoration, the technology specifications that will enable OWF to meet those requirements, the cost of those technology specifications, and the potential revenue achievable by providing restoration services.

This in turn will give clarity to all parties and allow NESO to evolve the restoration market.

This will avoid the cost of building new energy restoration infrastructure, which would be required to meet the Electricity System Restoration Standard (ESRS) requirement of restoring 60% of the network within 24 hours of an outage.

If rolled out across GB, benefits will range between £0.92bn – £1.62bn depending on the option selected.

£1.62bn potential benefit, associated with GB roll-out

INFRASTRUCTURE £5.32m NIA Funding

The transmission network is a critical infrastructure that should be fit to achieve the low-cost transition to Net Zero, and our innovation strategy targets the core developments required to achieve this. The nature of projects will include market engagements, desktop studies, software and hardware procurement and development, and live trials.

Overall, these activities will work towards addressing the need for:

- Enhancing our complex network performance analysis capability
- Enabling the use of more sustainable assets
- Demonstrating better utilisation of existing assets
- Evaluating additional opportunities for ancillary services.

ACTIVITIES:	BENEFITS:
Enhanced transmission performance by HVDC links control and deploying Flexible Alternating Current Transmission Systems (FACTS)	• Faster connection of LCT
Harmonic mapping and AI-based impedance loci calculation for quicker Low Carbon Technology (LCT) connection decisions	• Improve transmission network performance
Enhanced system performance assessment tools (hardware and software) development and deployment	• Defer or discard conventional reinforcement
Smarter OHL routing design and wayleaves streamlining	• Faster decision making on harmonic assessment of LCT connections
Review emerging markets for low carbon technologies to support a holistic approach to achieving Net Zero greenhouse gas targets	• Allowing better utilisation of existing OHLs
OHL temperature and progressive fault monitoring using integrated and distributed sensors	• Improved OHL routing, reducing costs and delays

RESILIENCE £6.15m NIA Funding

Our transmission network must evolve in order to withstand various challenges, including severe weather events and the impacts of climate change. In addition, it must be protected from an increased cyber security threat, while at the same time ensuring it is adaptable and able to accommodate a diverse and decentralised energy mix. Innovation is essential to address this. This will allow us to use data and processes to protect our network in addition to trialling new materials.

In RIO-T3 we will look to address the need to:

- Enhance our long-term network planning capability
- Use advanced technologies for inspection and maintenance
- Introduce more data analytics and data management tools
- Enhance our cyber security capability.

ACTIVITIES:	BENEFITS:
Advanced inspection and surveillance using robotics and analytics	• Better availability of assets allowing faster connection of LCTs
Data analytics and AI supported long term network planning	• Enhance network resilience to the changes in demand and generation
Enhanced operation safety deploying digital technologies	• Optimise use of workforce
Sustainable project delivery and construction (carbon management)	• Improve data accuracy and data sharing
Enhancing OT Cyber Security (Detection, Modelling and Strategy)	• Reducing the carbon associated with critical infrastructure
	• Enhance network resilience against cyber attacks and threat intelligence

VALUE £5.95m NIA Funding

We must be responsible in our network operation, working to minimise costs and maximise benefits for our network users whilst ensuring we meet our Net Zero goals responsibly. Our supply chain also has an impact on the final cost and lead time of products, therefore we must develop a practical approach to support our ongoing procurement strategy in achieving the best value for our customers.

Our activities therefore address the need to:

- Optimise an evolving supply chain
- Improve data access with customers and supply chain
- Improve connection assessments using analytics and AI
- Look into further value for customers' demand responses.

ACTIVITIES:	BENEFITS:
Ancillary services from heat and transport	• Improve network reliability and security of supply by customers' (demand and generation) responses
Understanding the cost for supply chain resilience	• Create infrastructure for customer participation in capacity market and enhanced frequency response
Automated outage planning tool using analytics and AI	• Faster connection application assessment processes
AI-generated connection offers	• Enhance data accuracy and data sharing standards among energy industry players and customers
Ancillary services and integration	• Improve outage planning processes and better network reliability assessments
Data sharing protocols and standards	

SERVICE £5.02m NIA Funding

We know that we must play our role in maintaining continuity and security of supply even in the face of increased demand stemming from the energy transition of heat and transport. In order to achieve this, our innovation strategy is planned to ensure we can explore, test and demonstrate new methods that can help us improve condition assessment and availability of our assets.

We have developed our activities to meet the need for:

- Improving our response and quality of service during extreme events
- Upscaling digital and AI tools for outage planning
- Advancing our knowledge in protecting dynamic networks
- Increasing our use of analytics and monitoring applied to advanced predictive maintenance.

ACTIVITIES:	BENEFITS:
Procedure, specification and architecture design for predictive maintenance using effective monitoring – OHL and substation	• Improve asset availability and overall reliability of grid
Feasibility and specification of a Business Integration Model informing operation and asset management	• More adaptable protection arrangement allowing further integration of LCTs
Adaptive protection system supporting growing uptake of LCTs	• Reducing the cost of protection system in the substations
Geomagnetically-induced currents impact on transmission assets and mitigation plans	• De-risking wide area network outage or black out
Disaster management and response tools assessments	• Improve network design for extreme conditions resulting in improved continuity of supply
	• Allow market competition by participation of wider range of manufacturers

Our ambition to lead by example as a sustainable, responsible business. This part of our plan showcases the breadth and depth behind our readiness to deliver our RIIO-T3 plan without compromising this ambition. Building new transmission infrastructure at scale and pace during RIIO-T3 is unavoidable, but there are many ways in which we can mitigate, reverse or offset environmental and social impacts – to create a sustainable network, and positive legacies. The vision, priorities and activities we describe in this section are aimed at translating this ambition into action over the RIIO-T3 period.

Being a sustainable, responsible business

The next few pages describe our approach to sustainability, how we will maintain progress towards long-term goals and the sustainability measures we will implement during RIIO-T3.

Sustainable Business Strategy

How our approach for reaching long-term sustainability targets is holistic and adaptable to upcoming challenges.

Priority Areas

How our priority areas will ensure we are targeted in mitigating environmental impacts as we deliver our work in RIIO-T3.

Roadmap

How we will maintain momentum towards our long-term targets in 2035 and beyond.

Summary of Activities

How a combination of actions across all our priority areas will contribute to us being a sustainable, responsible business.

A focus on sustainability

7 priority areas

Priority areas designed to mitigate the environmental impact of our operations.

Tackling our carbon footprint

66% reduction

We anticipate reducing our carbon footprint by around 66% relative to 2018/19.

Becoming a Zero Waste business

100%

We aim to have all waste reused or recycled by the end of RIIO-T3.

Promoting supply chain sustainability

80% supply chain

By the end of RIIO-T3, 80% of our supply chain will have validated greenhouse gas emission reduction targets.

EDDIE MULHOLLAND,
Director of Processes and Technology
explains our approach →





Our sustainable business strategy

At the very core of our plan is our sustainable business strategy that outlines our stakeholder-led vision for a truly sustainable networks business. It depicts our short-term goals for RIO-T2, predominantly centred around data gathering, target setting, and the development of methodologies. Developed from the work done in RIO-T2, the sustainable business strategy also depicts our long-term goals for our priority areas.

It defines the goals and targets for 2035 and beyond that we must achieve to realise our vision and it underpins all our environmental commitments for the RIO-T3 period – the full list of commitments is detailed within the Environmental Action Plan (EAP) annex. These commitments will be applied to all activity in the RIO-T3 period – including our portfolio of strategic investment projects.

Our Vision and Priorities for a Sustainable Networks Business

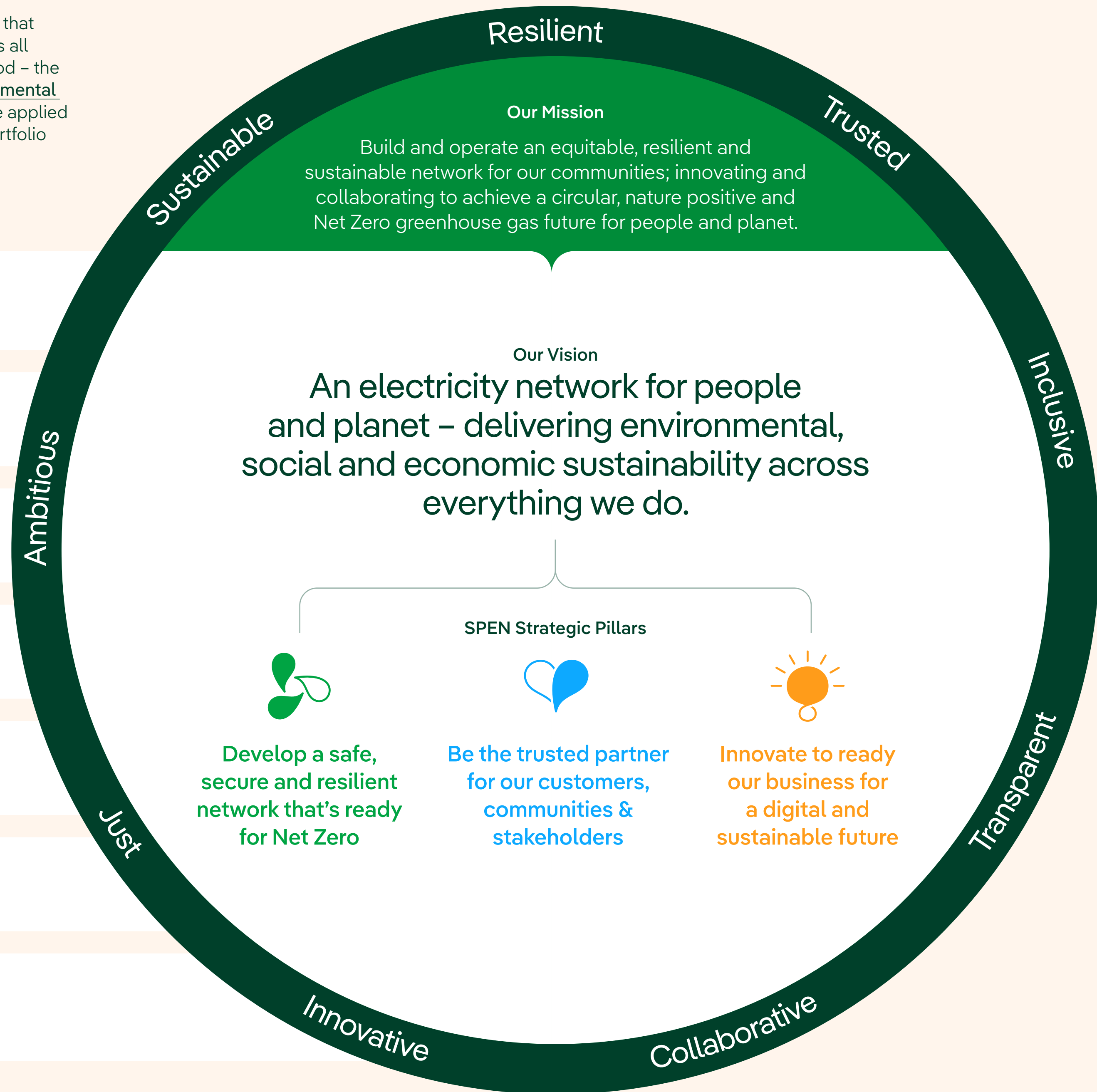
Our sustainability business strategy (SBS) was first launched in 2017 and has been updated and re-issued in 2020 and again in 2023. These revisions were informed by stakeholder feedback and our experiences in developing methodologies and delivering against our targets. This ensures that the latest version addresses the areas that are the most important to us and our stakeholders, and that our targets are both ambitious and achievable.

In RIO-T3 we will build our network at greater pace and scale than we currently are. We must ensure that we mitigate the environmental impacts from this increased activity and maintain progress to our 2035 Net Zero target. Despite the step change in the volume of activity required we are confident that the long-term approach outlined in our SBS, built upon the groundwork done in RIO-T2, will allow us to meet all our RIO-T3 environmental targets.

Our strategy to be a sustainable networks business is built on collaboration, driven by knowledge and data and governed by stringent internal processes and external standards. It is built upon our key sustainability principles: to be Ambitious, Sustainable, Resilient, Trusted, Inclusive, Transparent, Collaborative, Innovative and Just.

Finding efficient solutions to the challenges we face in the timescales required is best done through collaboration. We already work closely with the other Transmission Owners (TO's) and together we have sought to develop common environmental commitments within our RIO-T3 plans to leverage our shared goals and challenges.

-  Climate Action
-  Action for Nature
-  Circular Economy
-  Supply Chain Sustainability
-  Sustainable Society
-  Preventing Pollution
-  Keeping us on track



Our roadmap to a sustainable business

The roadmap below shows our sustainability goals and targets on our journey to 2040.

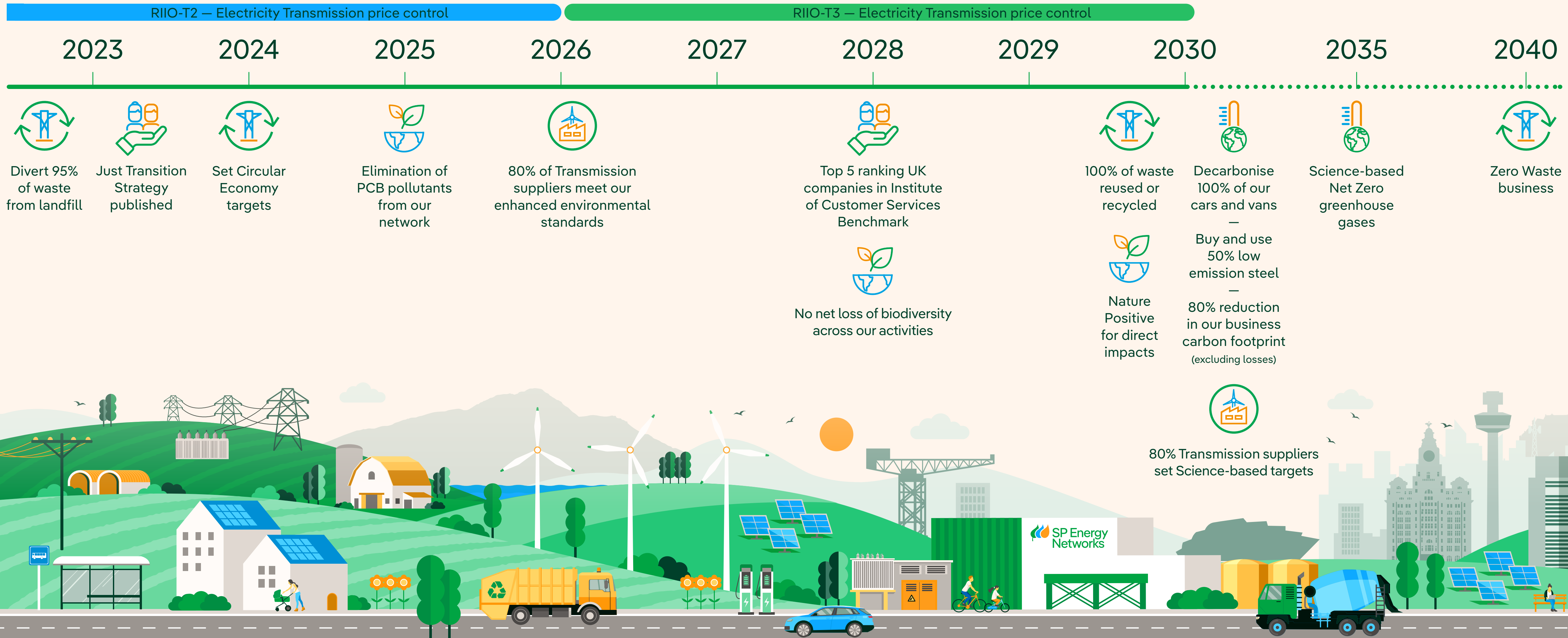
This depicts our long-term sustainability targets and the evolution of these targets through RIO-T2 to RIO-T3 and beyond. Our targets evolve over time in a systematic way, meaning they are built on previous targets to ensure we maintain an ambitious but credible and achievable pathway. For example, we will prior to the start of RIO-T3 divert 95% of waste from landfill to having 100% of waste reused or recycled by the end of RIO-T3 before becoming a Zero Waste business in 2040. This long-term, incremental approach allows us to develop the tools, methodologies, and experience to deliver the change necessary to achieve our targets.

The RIO-T3 price control period is not happening in isolation, it is a five year period in a longer journey towards our goals. To maintain the necessary speed of progress towards our sustainability goals, despite an increase in the scale of network activity, we will build on the foundation of our successful RIO-T2 delivery and achieve the necessary step forward during the RIO-T3 period. Keeping sight of this long-term roadmap, planning for it, making adjustments as our experience builds and having the agility to introduce new ways of working, ideas or technologies is how we ensure the SBS will adapt to the scale and pace of RIO-T3, or indeed, future price controls.

The forward-look in the Sustainable Business Strategy as well as the work we have done in RIO-T2 has laid the foundations for what we want to achieve in RIO-T3.

The milestones set for the end of RIO-T3 represent a significant step change in complexity and ambition than the initial milestones set in RIO-T2. As a result, the initial years of RIO-T3 will be needed to learn and adjust as we build towards the 2030 milestones.

Specific targets and goals have thus been set, to be achieved throughout RIO-T3, to ensure we take that step forward and stay on the trajectory required to achieve our long-term sustainability goals shown below. These targets and goals are detailed in the pages that follow and in the our RIO-T3 EAP.



SUMMARY OF OUR RIO-T3 ACTIVITIES



We are focused on mitigating our own emissions and ensuring that our network adapts to the ongoing impacts of climate change. In 2021, we aligned our reduction targets with the Science-based Targets initiative (SBTi) i.e. a clearly defined pathway in terms of pace and volume of greenhouse gas (GHG) emissions. We intend to reduce GHG emissions across scopes 1, 2 and 3 by at least 4.2% per year – in line with the SBTi trajectory necessary to limit global warming to 1.5°C above pre-industrial levels.

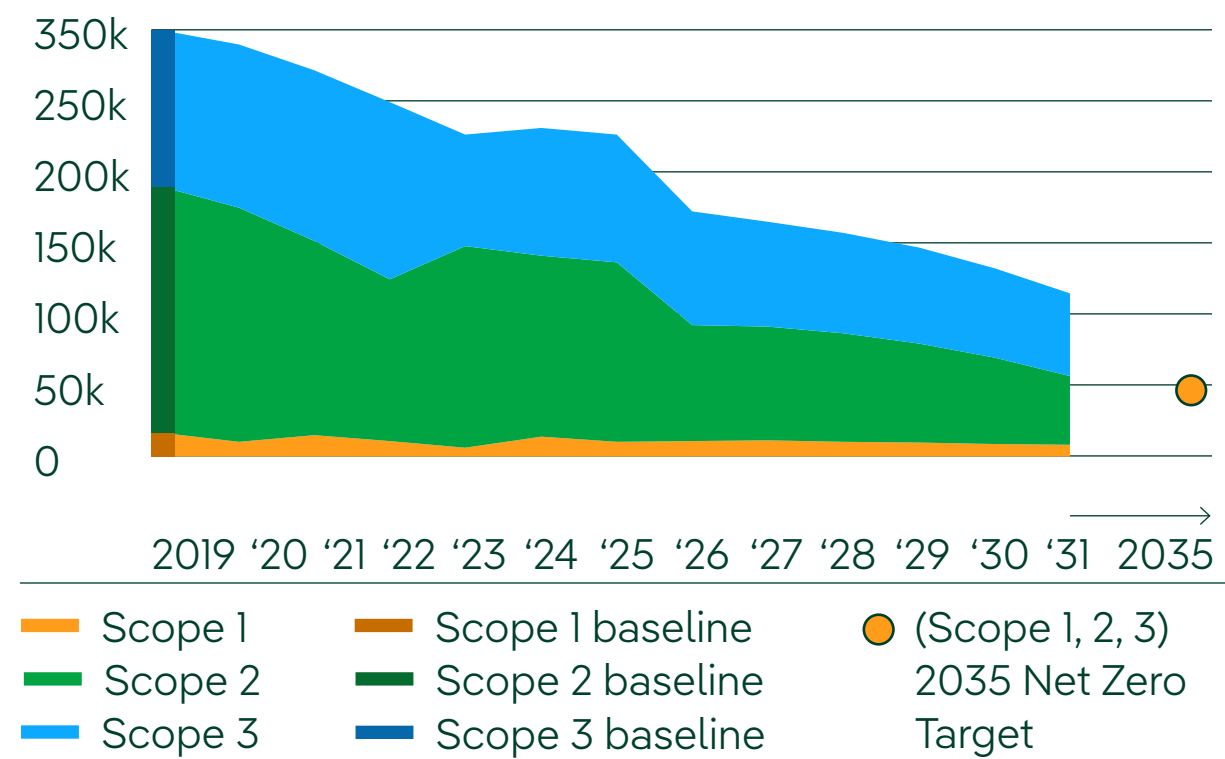
Our commitments related to climate action are aligned to the scale of reduction we need to achieve our SBT by 2035. Our new and extremely ambitious 2035 Net Zero target (outlined below) was set based on the data and methodologies that we have developed in RIO-T2. We aim to monitor progress and track the realisation of benefits of our investments in climate action using an emissions forecasting model that contrasts a BAU scenario with one where our RIO-T3 climate action commitments are implemented.

Overall, by the end of RIO-T3, we forecast that we will reduce our carbon footprint by approximately 66% relative to our 2018/19 baseline. Our RIO-T3 climate action commitments are estimated to result in a reduction of around 22ktCO₂e/yr by the end of RIO-T3 relative to the start of RIO-T3. This is the equivalent of powering more than 9,000 UK households per year.

Ultimately, we aim to reduce our emissions by at least 90% by 2035 before removing any residual emissions via robust offsetting - in line with The Corporate Net-Zero Standard, against which our Science-Based Net Zero Target will be validated. Offsetting refers to emissions reduction or removal resulting from actions outside our organisation's boundaries used to counterbalance our residual emissions.

By the end of RIO-T3, our target is to offset emissions of 80,000 tCO₂e in the RIO-T3 period. This is in line with our Net Zero by 2035 trajectory to offset 10% of our emissions.

Figure 2
Emissions Forecast Against Science-Based Net Zero Target Trajectory (tCO₂e)



GHG emissions are categorised into three 'scopes' as follows:

- Scope 1** – Direct emissions from fuel use and leakage of gases used in our electrical equipment such as SF₆
- Scope 2** – Indirect emissions from electricity used in our buildings and electricity lost as it is transported from generation to consumer
- Scope 3** – Indirect emissions that occur in our value chain, employee commuting and waste disposal

In order to achieve our emissions targets in RIO-T3, we will:

- Use SF₆ alternative insulation gases and replace SF₆ currently on the network
- Reduce SF₆ leakage
- Decarbonise our operational fleet
- Refurbish our substations to improve energy efficiency
- Use low-carbon materials in construction



The greatest positive impact we have on nature is through our role facilitating the decarbonisation of the electricity network, reducing climate change and its impact on the natural environment. Due to high value habitats in many areas of network operation and construction, including peat and ancient woodland, it is imperative we deliver the best outcomes for nature without impacting the supply of sustainable energy. We are committed to developing and operating our infrastructure with care and sensitivity to ensure we prevent pollution, and have existing targets to achieve 'no net loss' of biodiversity from our activities from 2028 and deliver 'nature positive' on our direct impacts by 2030. Being nature positive means that we have more nature in the world than we do now.

The legislation in this area is evolving rapidly, as devolved governments recognise the impact of the biodiversity crisis. We have already seen biodiversity enhancement requirements put into legislation with England implementing a 10% biodiversity net gain (BNG) target and the Scottish Government requiring 'significant enhancement'. Requirements in this area will become more stringent in the coming years, with the Scottish Government set to implement a biodiversity metric in 2025.

The SPEN Action Plan for Nature has been published on our website this year and highlights our approach to the protection, restoration and enhancement of biodiversity and natural capital across our network. We have put initiatives and targets in place to ensure we are nature positive in all our operations that have a measurable impact and not just where planning permission is required.

Our overhead Line (OHL) network is ideally placed to create crucial corridors for nature and our Action Plan for Nature reflects this.

In RIO-T3 we will provide at least 10% biodiversity enhancement across all projects subject to planning consent. In addition, we will deliver natural capital enhancement across projects that have a measurable impact on ecosystems, through working with local nature partnerships, and we will set a target to reduce the impact on nature of from our supply chain. We will also report our progress towards all of these targets. Biodiversity net gain is therefore an integral part of how we design our investment projects. For example, by using data on biodiversity to identify lower impact routes for OHL and by factoring in the necessary funding for targeted biodiversity enhancements as part of project budgets, in the first instance as a 6% uplift.

To enhance nature in RIO-T3, we will:

- Provide at least 10% enhancement to biodiversity on all projects that require planning consent
- Develop local strategic partnerships in order to deliver natural capital enhancement on all projects with a measurable impact on ecosystems
- Set targets in RIO-T3 to reduce the impact of our supply chain on nature



We construct, operate and maintain infrastructure, which is routed through, or next to, a wide range of culturally or environmentally sensitive landscapes and structures. We must minimise any negative effects our activities could have on the environment and communities as much as we reasonably can. Therefore, we will maintain our certification to the International Standard for Environmental Management ISO14001, which requires continuous improvement and the prevention of pollution.

To protect the environment in RIO-T3, we will:

- Remove over 32km of our leakiest fluid filled cables from our network
- Upgrade or install oil leakage containment bunds for transformers at 27 sites





Circular Economy

We recognise the true value of the resources we use to build and operate our network and will embed circular economy principles to ensure they are used efficiently and sustainably. Our ambitious and over-arching long term targets are to reuse or recycle 100% of our waste by 2030 (excluding compliance waste) and to become a totally Zero Waste business by 2040. To reach our vision of a Zero Waste business we need to go beyond reuse and recycling and look at the design, construction and management of our assets to systematically avoid waste being produced in the first place. Additionally, we will utilise low-carbon materials in order to reduce the carbon emissions associated with our construction activities. This will include the use of low-carbon steel and concrete, and the use of Hydrotreated Vegetable Oil (HVO) bio-diesel.

Our top three materials by tonnage are aggregate, concrete and steel. The circularity of these materials represents a challenge across the whole construction sector and we cannot work in isolation to drive the change required. We are working in collaboration with infrastructure organisations, supply chain industry bodies and materials experts to identify challenges and opportunities to increase the availability and cost effectiveness of circular solutions. It will require a significant degree of innovation and supply chain engagement to meet our target of 30% recycled or reused content by 2030 for aggregate, concrete, and steel.

To avoid waste in RIIO-T3:

30% of the aggregate, steel, or concrete we use will be recycled or reused material

We will reuse or recycle 100% of our waste by 2030

Long-term targets:

Recycle 100% of our waste by 2030



Supply Chain Sustainability

We support our supply chain to become sustainable in a fair and collaborative way, ensuring that our partners are equipped with the tools and knowledge they need to match our ambitions.

We are a partner of the Supply Chain Sustainability School (SCSS) and require all our suppliers on new contracts to sign up to the school. For our suppliers, this is a free service and provides learning resources to help them on their sustainability journey. Membership of the school allows us to support smaller suppliers to build their capability to deliver enhanced sustainability standards.

We will maintain our partner status in the SCSS due to the significant benefits both SPEN and our suppliers have realised as a result of having access to quality training materials to upskill staff in sustainability topics.

All our suppliers must meet our environmental compliance and sustainability standards (our 'Supplier Code'). We will continue to regularly review, and publish, these standards to raise the sustainability performance standards required of our suppliers, to ensure that we remain on track to meet our targets.

By the end of RIIO-T3, we also aim to have 80% (by value) of our supply chain set their own validated GHG emission reduction targets. This will help us control our Scope 3 carbon emissions associated with supply chain and develop sustainability practices through the industry.

To reduce the environmental impact from our supply chain in RIIO-T3 we will:

Require all suppliers on new contracts sign up to the Supply Chain Sustainability School

Continue to revise and publish our environmental Supplier Code

Require 80% (by value) of our supply chain to set their own validated GHG reduction targets



Sustainable Society

We know how vital our role is to facilitate the changes required to reach Net Zero GHG, supporting a just transition for the communities we serve, delivering jobs, economic growth and environmental benefits. We recognise our transmission projects can be disruptive, so we make it a priority to work with our communities to minimise this and to give something back. For more information on the ways that we plan to give back to communities, please see our RIIO-T3 EAP.

We published our [Just Transition Strategy in 2023](#) – the first of its kind for a UK electricity network company and our first annual Just Transition Report in 2024.

We plan to publish a Just Transition Report annually, and to update our Just Transition Strategy every three years. This will ensure our Just Transition Strategy aligns to the needs of our stakeholders and the communities we serve, whilst continuing to be embedded across our business.



Keeping us on track

Performance against our plans is published annually via an [Annual Environmental Report \(AER\)](#). During the business planning process, we are working with Ofgem and the other TOs to improve the data and consistency in the AER. Our common reporting methodologies will be detailed down to the actual calculation of each metric and will ensure that TO data is completely consistent and can be directly compared.

We are also working to improve data quality and completeness via the digitalisation of data collation systems. We will also ensure that our annual sustainability data is externally verified in order to maintain a high standard of data and reporting governance and transparency.



In this section we cover the “why” of our plans for RIIO-T3. The ways our plan drives value for households and businesses through their electricity bills and how our plan stimulates sustainable growth in the UK economy. We explain the rigour we apply to ensuring that our costs and bill impacts are controlled – so that the benefits to consumers and the economy are maximised. We also step through what is needed to make our plans credible to investors and lenders, critical to sustaining the scale, pace and affordability of investment over the long-term.

Key stakeholders

UK Government, Scottish Government, Regulators, Consumer & Community Groups, Shareholders, INZAC, Academia, Media; NESO, Supply chain, other Transmission Owners, wider industry, banks and lenders.

Examples of impacts on our plan:

Investability: We present evidence organised within a framework for investability that we have developed through engagement with investors and a wide range of stakeholders.

Promoting sustainable growth: We commissioned the Centre for Energy Policy (CEP) at the University of Strathclyde to undertake independent research to model the impacts of our plans on economic growth and employment in GB.

Why our plan drives value

GEORGE POTTER,
Finance and Modelling Manager
explains our approach →



Increase over RIIO-T3 in the Regulatory Asset Value (RAV) of our network

£7.5bn

INFRASTRUCTURE

Boost to UK GDP from our investments by 2031

over £1bn

VALUE

Cost saving per household by 2030 from reduced network congestion

£167p.a.

VALUE

The value our plan will deliver

£10.6bn total cost

Value of our plan to be competitively tendered

c.82%

VALUE

Increase in our total expenditure compared to RIIO-T2

207%

INFRASTRUCTURE

Average annual increase to household bill from our plan

£6.47p.a.

VALUE

What our plan will cost and bill impact

c.£12.07 per customer bill

Equity injection to support delivery of our plan

£3.0bn

SERVICE

Credit Rating

Baa1/BBB+

SERVICE

NPV neutral financeability adjustment

£494m

SERVICE

Ensuring that our plan is financeable and investable

5.27% WACC



The value our plan will deliver

Significant enhancement of GB critical energy infrastructure to drive our shared goals for secure, sustainable and affordable energy in the long-term-stimulating growth in GDP and jobs, while managing risks and uncertainty. Benefits which a range of studies indicate will far exceed the £6.47 per annum average impact of our plans on customers' bills.

01. Adding to GB infrastructure

The most direct and quantifiable way of characterising the value that our plan for RIO-T3 will deliver is through the value of the assets we will be installing. These add to the total stock of the UK's critical national infrastructure and represent an investment in the provision of essential services that will benefit businesses and households across the country for decades to come. This value can be expressed in terms of the Regulatory Asset Value (RAV) of our network.

We will invest £10.6bn to grow the transmission network in our area. Our network in its current form is forecast to have a Regulatory Asset Value (RAV) of £4.8bn at the close of RIO-T2. Our plan will create a network that has a forecast RAV of £12.3bn by March 2031. The graph below shows the forecasted closing RAV for each of the regulatory periods, this shows the large proportional increase in RAV from RIO-T2 to RIO-T3 (155%).

Closing RAV Comparison across all RIO timelines

RIO-T1	RIO-T2	RIO-T3
£3,011m	£4,808m	£12,281m

Our plans also add value in forms linked to our provision of infrastructure but not captured by the RAV.

First, through net improvements to natural environments and habitats in the areas where our new asset are to be sited, and more widely. Our Action Plan for Nature embodies goals for at least 10% biodiversity enhancement across all projects needing planning permission.

Second, through how we will provide direct support and investment to communities affected by our investment plans through our RIO-T3 Net Zero Fund. This builds on the success and innovation of our RIO-T2 initiatives, and is a direct and practical way to help communities and vulnerable consumers benefit from the transition to Net Zero. We are increasing the value of the Net Zero Fund from £5m to £20m for RIO-T3.

Third, by keeping SP Energy Networks at the leading edge of how technology innovation is supported and deployed to ensure that we are getting continually improving technical performance for our investment.



02. Promoting sustainable economic growth

A second form of value that our plan delivers relates to its impact on the wider economy and economic growth, which is now an explicit consideration in the regulatory framework for setting price controls. The scale of our investment is similar in value to major initiatives such as the UK governments cost of hosting the 2012 Olympics, and such large-scale investments have capacity to stimulate growth and magnify job creation at the level of the UK economy.

While these impacts are uncertain, Independent research by the University of Strathclyde's Centre for Energy Policy (CEP) concluded that our plan could contribute sustained benefit to UK GDP of around £2bn and create and support over 11,000 jobs across Scotland and the UK. Further detail on this research on what it implies for the assessment of our plan is set out on page 79. →

Critically, our plan is driving sustainable growth. The growth and upskilling of our workforce is predominately drawn directly from the communities we serve, and we pride ourselves in being able to help sustain these communities through our investment in jobs and skills. Our plan also embodies ambitious targets for reducing the carbon intensity of our own activities – and pushing the boundaries of what we can achieve through recycling and repurposing our equipment. Further, we are driving sustainability and carbon reduction as much as we can through our supply chain.

More widely, the core purpose of our entire plan is to help bring forward the decarbonisation of the GB energy sector – a critical foundation of long-term sustainable growth. A goal that we also support and sustain through our funding for community level projects and initiatives through our Net Zero Fund and prior to this our Green Economy Fund. Helping to drive change and improve people's lives through more initiatives such as the technical support and initial test fleet of vehicles we provided to Lothian Buses, the largest municipal bus company in the UK, to help them start their switch to electric buses.

03. Management of physical security, climate resilience and cyber security

A third form of value that our plan delivers concerns how we protect energy consumers and communities more generally from a range of different threats. While this protection does not have an explicit monetary value, without our monitoring, expertise and vigilance – as part of a network of organisations with responsibilities relating to critical national infrastructure – incidents affecting the supply of electricity would be more likely, and longer in duration.

On physical security, we are expanding our inspections and surveillance to safeguard against physical security threats. Our plan will ensure the same cadence of activity despite the addition of up to 60 new substations on our network. This includes measures to prevent unauthorised access to our substations, the use of more sophisticated techniques to determine abnormalities on our network alongside the hiring of more inspectors.

On cyber security, during RIO-T3 we are prepared to face increasingly sophisticated threats. Given our systems to monitor and control our transmission network and systems to run our business are increasingly joined-up, our plan ensures that interfacing between these systems is secure. In addition, we are continuing to collaborate with Government agencies, TOs, the NESO and experts to innovate and develop leading solutions and predictive analytics to stay at the forefront of cyber security advancements. We also rigorously vet third-party vendors and partners to ensure they meet stringent standards. Our risk-based and threat-informed approach will prioritise the identification and mitigation of

vulnerabilities, ensuring that our defences are resilient and responsive to emerging threats.

On climate resilience, the increasing intensity and frequency of extreme weather events poses direct threats to infrastructure, operational reliability, and the safety of the transmission network. Our Climate Resilience Strategy has identified key risks such as flooding and landslides and is driving investment during RIO-T3 to upgrade flood defences at substations and protection of overhead line towers through slope stabilisation, and restoration of peat bogs, coastal wetlands and river channels.

37 identified climate risks impacting our assets

Substation	12
Overhead Lines	6
Underground Cables	4
Substation & Overhead Lines	5
All assets	10

The reliability of supply we are aiming to improve on.

99.9999%

Our 'Best View' of new connections, stimulating competition in wholesale markets.

19GW

Annual saving on customer bills from the avoidance of around £4.9bn additional constraint costs by 2030.

over £167

04.

Enabling the energy market to deliver better outcomes

A fourth form of value delivered by our plan relates to the impact on wholesale energy market outcomes for current and future electricity consumers. The cornerstone is the reliability and security of supply. Our plan will help to sustain the very high levels of reliability consumers already experience from the transmission system overall. It will also expand the range of ways we can restore the system quickly in emergency conditions.

In the competitive wholesale markets for electricity, our plan will increase participation through our investments to connect generation and providers of demand-side flexibility services, and by completing the network reinforcements to provide access to the market. This increases competition, and supports a more efficient dispatch to match demand in real time – which translates to lower wholesale costs for energy consumers. It also reduces the cost of managing constraints on the network, which can involve network users paid by the system operator not to generate at times and locations where the network is congested. Avoided constraint costs have been quantified by 2030 to be £4.9bn per annum and estimated at £167 per customer per year. Our plan will also contribute to making GB less reliant on energy imports and less exposed to the effects of volatile globally-traded commodities such as natural gas – both relevant considerations for energy security.

The value delivered to consumers through energy markets is magnified further through our plan by the many ways in which we build efficiency and innovation into our investment designs and network operations. For example, through our deployment of load management systems to enable new users to connect earlier, and our use of conductors that allow our existing circuits to be run safely at higher temperatures.

In some targeted areas, the value we deliver to consumers through our influence on energy market outcomes is subject to financial incentives. Energy consumers are guaranteed a level of performance, and if we do not meet these performance levels then the amount we are allowed to recover through our charges is reduced. If we exceed the target, then we are rewarded – in effect sharing the benefits with energy consumers. In RIIO-T3 incentives will be in place for supply reliability, our processing of new connection applications, gas leakage levels from certain type of switchgear, and how effectively we collaborate with NESO. We are also making additional voluntary guarantees to energy consumers by conferring Price Control Deliverable (PCD) status on all of our baseline projects over £15m. All PCDs that we fail to deliver can result in a reduction in the amount we are allowed to recover from energy consumers.

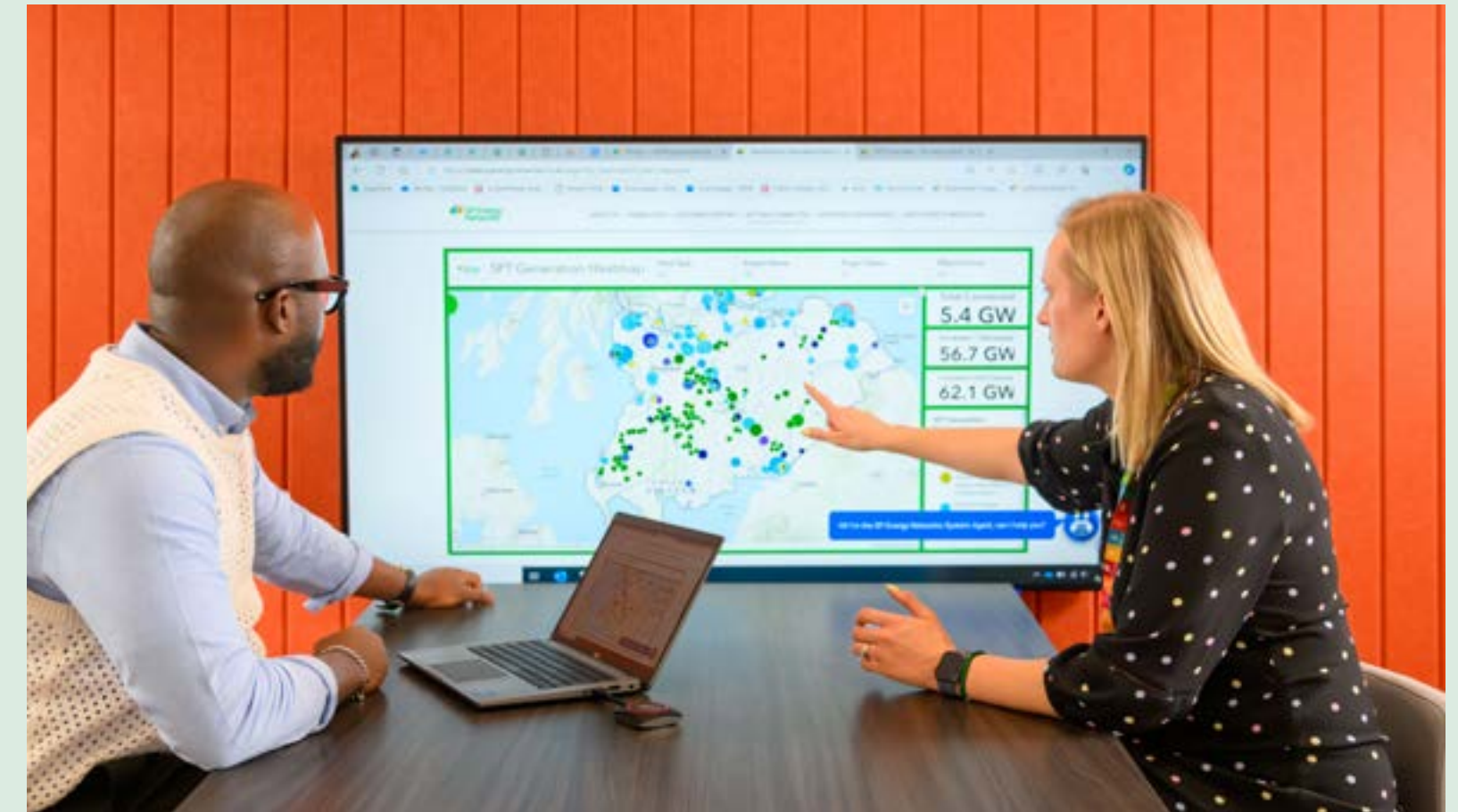
We also have Licence Obligations (LOs) which underpin our ways of working more generally, and which are integrated into the proposals we include in our business plan. Specifically, compliance with design and operational standards in the Grid Code, ESQCR, SQSS and STC, and our obligation to cooperate and coordinate to support Whole System efficiency.

05.

Navigating risk and uncertainty

A fifth form of value delivered by our plan relates to risk and uncertainty, and how we protect consumers against delays, cost over-runs and errors in hindsight over where and when new infrastructure is built. The scale and pace of our plans for RIIO-T3 bring with it huge operational and commercial risks and challenges. Our ability to plan for, manage and mitigate the risks that are within our control can have a big impact on costs and delivery time frames. We are committed and incentivised to drive value for energy consumers in how we manage and navigate risks.

Our plan demonstrates how we are using uncertainty mechanisms to progress projects only when the investment need is established with sufficient certainty. Our decisions on the scope of project to include in baseline funding goes directly to mitigating the risk to consumers of having to make large investment decisions with incomplete information, for example, to reinforce the network ahead of anticipated new generation projects which subsequently do not get built, resulting in consumers having to pay for redundant or underutilised network and potentially squeezing the resources available to deliver other network projects.



We are also driving significant value for energy consumers through the depth and sophistication of our workforce and supply chain planning. Our plan sets out how we have forecast our workforce and supply chain requirements, and built a flexible and resilient capability to deliver with the necessary partnerships and contracts already established. This mitigates the risk of not having the resources and skills available when we need them, which in turn could drive delays and higher costs. These pressures are expected to be particularly acute – and hence the value of our approach more valuable – because of the tight and volatile global markets for much of the plant, equipment and skills we need.

A third way in which we create value for energy consumers is through our understanding and management of risk relates to planning. The depth and rigour of our preparatory work to ensure that issues and concerns are addressed as much as possible at the design and development stage, the quality and depth of engagement with stakeholders and our wider programme of community engagement and support are all key inputs to supporting efficient planning processes for our RIIO-T3 portfolio.

There are however risks and uncertainties that we are less able to manage, because they are to varying degrees outside our control. In these areas – which are also material for RIIO-T3, given the scale of investment involved – it is important to consider the wider regulatory framework within which we will operate. Uncertainties relating to future costs can to a degree be mitigated through indexation, and our plan includes proposals for the treatment of Real Price Effects (RPEs) and for ongoing efficiency. In addition, the framework – primarily through the Totex Incentive Mechanism (TIM), but also potentially through the use of pass-through and re-opener type mechanisms – can be calibrated to adjust for large differences between actual and expected costs driven by significant unanticipated events or developments.

These are important considerations also in the determination of a reasonable and fair rate of return, and should be viewed as complementary. Later in this section, we set out our proposals for a reasonable and fair return that accurately reflects the risks that we and our investors carry.

Independent modelling of economic impacts of SPEN RIIO-T3 plan

Our proposed programme of investment for RIIO-T3 constitutes a large scale capital programme at the level of UK economy. The total cost of £10.6bn is similar to that of hosting the 2012 Olympics, and around half of the cost of Crossrail 1 to build what is now the Elizabeth Line that runs through central London.

We therefore see ourselves as having a heightened responsibility to use all the tools available to demonstrate to ourselves, our stakeholders, investors and energy consumers that it does indeed constitute value-for-money. An additional tool available for investments of this scale is to estimate impacts using macroeconomic modelling of the UK economy. Evidence of this type is also directly relevant to Ofgem’s new statutory duty to “have regard to the desirability of economic growth” (the “Growth Duty”), and how it develops its methods for discharging this duty when assessing investment proposals such as our RIIO-T3 investment plans.

The Research

Earlier this year we commissioned the Centre for Energy Policy (CEP) at the University of Strathclyde to undertake independent research to model the impacts of our plans on economic growth and employment in the UK.

The team of CEP researchers used its UKENVI dynamic computable general equilibrium (CGE) model to analyse impacts under various scenarios with and without SP Energy Network’s RIIO-T3 investments. UKENVI has been extensively peer-reviewed via a wide range of applications, including several involving investments in and extension of the UK electricity network. The CGE approach is the most suitable because it allows researchers to investigate both the dynamic adjustment of the economy and the implications of constraints, particularly in the UK labour market, that will in practice limit the extent of straightforward multiplier impacts of any economic stimulus.



Key Findings (all values in 2023 prices)

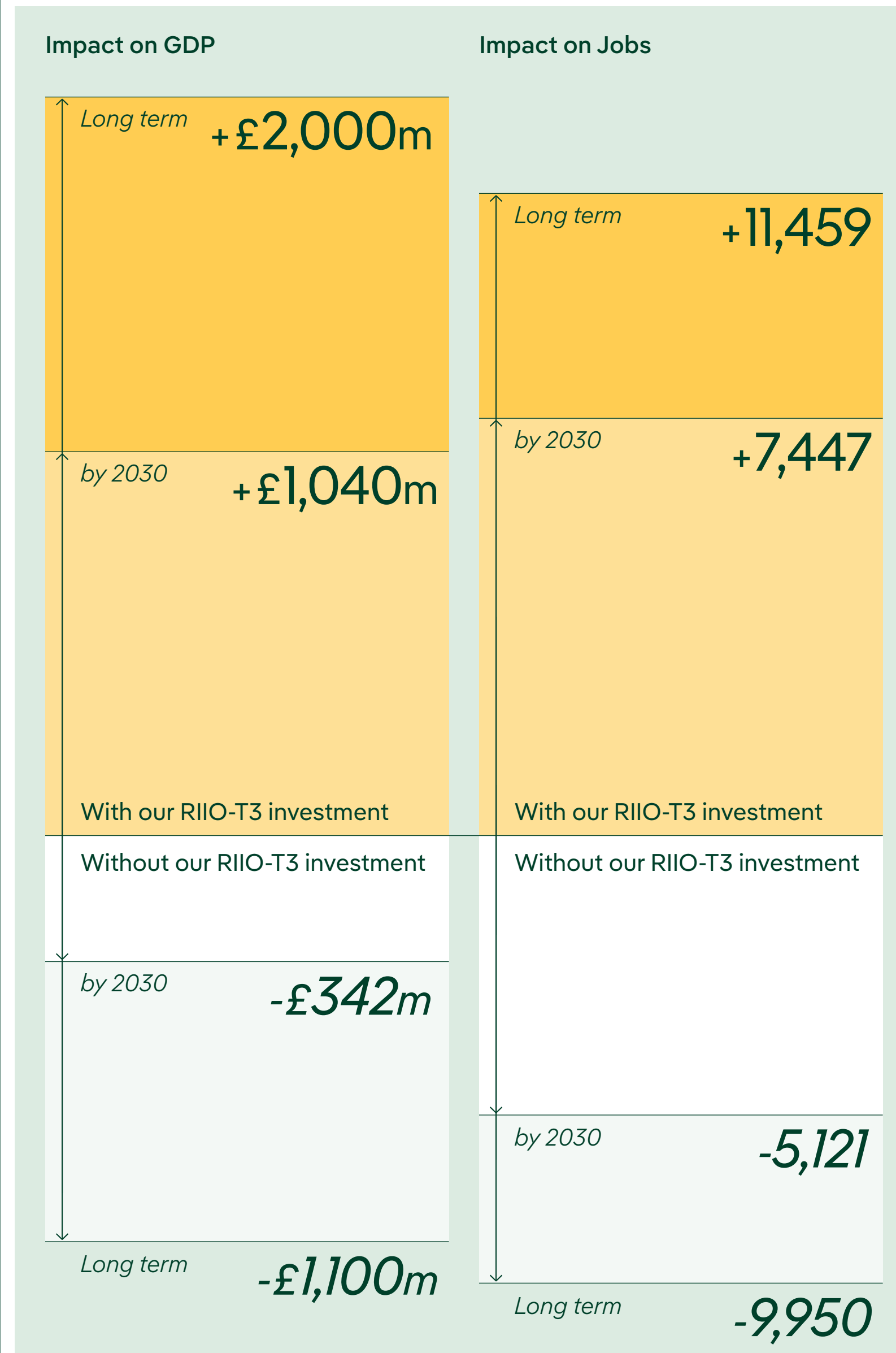
1a: The RIIO-T3 investment plan of SP Energy Networks would drive and sustain wider social and economic benefits in the near and long term. **In 2030 a GDP uplift of £1.04 billion, associated with an additional 7,447 jobs.** Over the long term the uplift in the trajectory of UK GDP is £2 billion per annum with net employment gains of 11,459.

1b: The expansion results in small net benefits to all UK households, with the **impacts being sufficient to support a small boost to real household spending of 0.08% (an average of £46.78 per household) above what it would otherwise be in 2030**, growing to 0.11% (an average of £60.21 per household per year) over the longer term.

2: Analysis supports the need for investment, where no expansion of network capacity to meet demand will worsen outcomes for customers shrinking the economy and reducing jobs. It also supports the timing of investment earlier rather than later, with **economic benefits significantly increased where investment is delivered at pace** as opposed to reactionary investment.

3: The GDP and employment uplifts associated with RIIO-T3 network investment **could be maximised further where broader supply chain and labour market constraints are reduced.**

Economic impacts, assuming electricity demand grows as planned

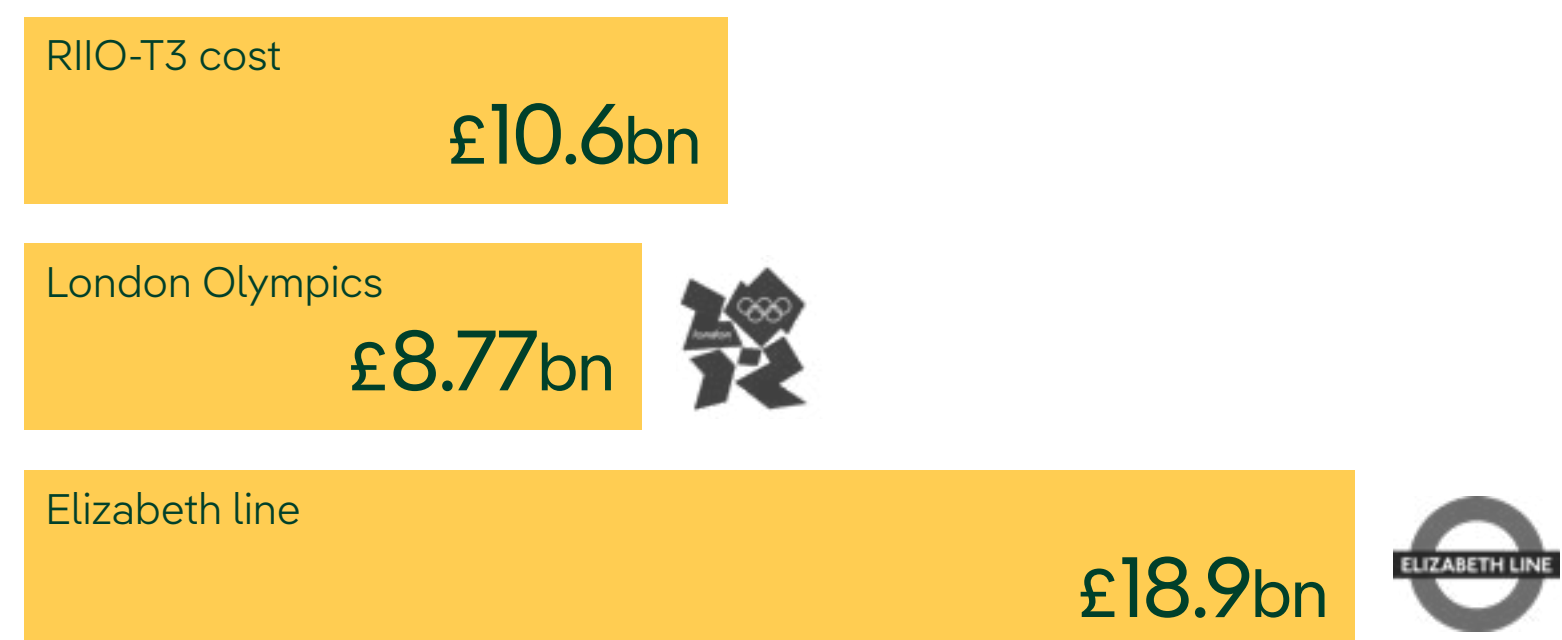


Relevance to the assessment of our RIIO-T3 plan

While the finding from independent research provide assurance to all stakeholders on the value-for-money of our plans, there are three specific insights that we believe are directly relevant to how our plan is assessed by Ofgem:

1. Decisions which carry any risk of making the plan marginally less “investable” could have large negative impacts on energy consumers. The trade off between costs and benefits is not symmetrical. Setting the allowed rate of return slightly too low would be inefficient.
2. The rigour and depth of our plans to be ready to deliver at pace, through our portfolio of investment projects and how we are priming our supply chain and growing our workforce, have a very high value to energy consumers – particularly (with reference to key finding 3) by pro-actively seeking to reduce constraints.
3. The value-for-money case for individual households is compelling when the impact on energy bills is put alongside the economic benefits at stake – and even more so when the environmental and societal benefits of accelerating the transition to a sustainable energy sector are factored in.

Comparison against RIIO-T3 cost



What our plan will cost

In this section we step through the costs we expect to incur over the period 2026 to 2031 in delivering our plan. All values are presented in 2023/24 prices, and are therefore adjusted for the expected impact of general price inflation. The costs we present here are also adjusted for expected input cost inflation across the specific equipment and services we use, to the extent that this differs from the rate of general price inflation. This is termed “real price effects”. The cost forecasts also incorporate a year-on-year efficiency saving of around 0.4% of baseline costs.

The tables here show a breakdown of totex by category and the profile of expected costs over time in RIIO-T3, compared to RIIO-T2. We also explain in more detail what is driving changes in costs for each individual category. On the second page of this part we explain and summarise the extensive work we have done to test and challenge the efficiency of the costs we have included.

Totex in RIIO-T3 2023/24 prices	2027 (£m)	2028 (£m)	2029 (£m)	2030 (£m)	2031 (£m)	Total (£m)
Load-related Capex	1,451	1,585	1,708	1,795	1,395	7,934
Non load-related Capex	145	121	118	85	54	523
Non-operational Capex	39	25	20	20	13	117
Network Operating Costs (NOCs)	74	75	78	61	65	353
Closely Associated Indirects (CAI)	202	209	214	213	201	1,039
Business Support (BS)	89	84	97	101	110	481
Other costs <i>within the price control</i>	37	33	12	12	11	105
Total costs	2,037	2,132	2,247	2,287	1,849	10,552

Why our costs are increasing

The costs of delivering our RIIO-T3 plan are significantly higher than the costs of delivering our current RIIO-T2 plan. This is commensurate with the scale of investment being delivered, the size and shape of the organisation we need to create to support that delivery, and the value being generated for energy consumers over the long term. In the table below we provide a more detailed breakdown of what each cost category involves, and how it is impacted by the overall need to scale up. Further information is available in the [Cost Assessment and Benchmarking Annex](#).

Cost Category 2023/24 prices	RIIO-T2 (£m)	RIIO-T3 (£m)	Change (%)	What the costs are, and why they are changing
Load-related Capex	1,980	7,934	↑ 301%	The cost of our investment projects to deliver extra network capacity by 2031 to support new build renewables onshore and offshore, growth in electricity demand and to reduce costly network congestion. The step up in costs reflects the scale of activity and level of ambition.
Non load-related Capex	545	523	↓ -4%	The costs of our ongoing risk-based interventions to replace and refurbish our in-service assets to maintain the safety and integrity of our network. In this cost area, the level of activity is relatively stable compared to RIIO-T2. Close co-ordination with our load-related plan optimises efficient delivery.
Non-operational Capex	18	117	↑ 537%	The costs of infrastructure critical to the efficient and secure operation of our network assets and our business. A key driver for the increase in costs during RIIO-T3 is our digital transformation. Also include property, fleet and transport costs to support our growth.
Network Operating Costs (NOCs)	180	353	↑ 96%	The costs associated with inspections and maintenance, and the associated processing of data and intelligence. A key driver for cost increases is our use of new technology, in part to understand and manage climate risks to our network assets more efficiently.
Closely Associated Indirects (CAI)	425	1,039	↑ 144%	The costs of key activities which are critical to and which complement our project delivery, including engineering and project management, network design, planning and land purchase – enablers for successful construction delivery which must scale up several years in advance.
Business Support (BS)	187	481	↑ 158%	The costs of wider organisational and operation support functions such as HR, Legal and Regulation to support the growth in the scale of the organisation. Creating the capability to be ready as an organisation to deliver at scale and pace.
Other costs	98	105	↑ 8%	Including the cost of physical and cyber security, to maintain the integrity of our network and protect our systems.
Total costs	3,433	10,552	207%	

The efficiency of our costs

The costs we include in our plan result from an ongoing process of review and challenge to ensure that they are efficient. In the table opposite we step through the different cost categories to illustrate what we have done to give ourselves confidence that the costs are indeed efficient. There are three broad approaches that we adopt to test and demonstrate efficiency.

The first approach is to rely on competition, and competitive tendering. For equipment, services or areas of activities that can be separately contracted for we can seek to secure efficiency through market-testing. This includes the ability to procure the benefits of innovation or efficiency within the supply chain through the submission that competing service providers make to us. A large proportion of our overall totex for RIIO-T3 (around 82%) will only be incurred after competitive tendering, and the discipline of market-testing is a key protection against the risk of inefficient costs.

01

The second approach to giving ourselves and others confidence in the efficiency of our costs is through comparison with other businesses, or “benchmarking”. While this is not always possible, it can be a useful tool and discipline.

02

The third approach is where we cannot competitively procure, and where benchmarking is not possible or reliable. In respect of these cost areas (which comprise around 6% of our totex) we rely on activity-specific evidence and scrutiny.

03

Cost Category 2023/24 prices	RIIO-T3 (£m)	Baseline (£m)	Competitively Tendered	Summary of evidence and reasoning to support efficiency
Load-related Capex	7,934	29	c.95%	Approximately 95% of costs will be competitively tendered. Independent experts have carried out a review of costs based on high-level analysis plus detailed review of a sample of schemes against their benchmarks. The majority of costs will be separately reviewed by Ofgem at an appropriate time as part of uncertainty mechanisms.
Non load-related Capex	523	447	c.95%	Approximately 95% of costs will be competitively tendered. Independent experts have carried out a review of costs and a detailed review for a sample of schemes against their benchmarks.
Non-operational Capex	117	117	c.92%	The majority of costs are competitively tendered. Independent experts in specific areas have carried out assurance and efficiency reviews. Property, vehicles and transport are subject to regular tender exercises.
Network Operating Costs (NOCs)	353	353	c.56%	Maintenance and fault management activities are volume-driven and handled predominated with in-house resource, with regular benchmarking of staff costs against market rates. Equipment and systems to support the function, including IT, procured through competitive tendering.
Closely Associated Indirects (CAI)	1,039	531	c.29%	Costs of component skills sets and services validated by benchmarking analysis, and timing of volume increases aligned to and optimised against the timeframes for the projects these activities support and enable – noting that they must lead project delivery by several years.
Business Support (BS)	481	481	c.54%	Costs of component skills sets and services validated by benchmarking analysis, and time profile of cost increases optimised to be ready and sufficiently mature as required.
Other costs	105	75	100%	The costs are competitive tendered and subject to separate review processes by Ofgem.
Total costs	10,552	2,033	c.82%	Overall, around 82% of costs are competitively tendered, 12% benchmarked and 6% separately justified.

Risk Mitigation Mechanisms

Once our investment allowances are agreed, there can remain significant risk that actual costs diverge materially from our set allowances. Here we explain two important mechanisms to adjust allowances year-on-year so that allowances and costs are more closely aligned, and how they should be calibrated. We also propose a change to how differences between actual and allowed totex are shared between SP Energy Networks and energy consumers when they do materialise.

Ongoing efficiency

Earlier in this section we present our totex by cost category and the profile of those costs over the five years of RIIO-T3. Embedded within the cost profile is an assumption about ongoing efficiency – our general ability to improve how we do things over time. It is set at 0.4% a year, for relevant costs, and applied in a targeted way to ensure the net effect is correct.

The proposed treatment is based on analysis of empirical evidence, the details of which can be found in our [Cost Assessment Annex](#) and in the expert report prepared by [Oxera](#) for this area. We have examined the rate of productivity improvement achieved by closely comparable sectors of the UK economy. It is recognised by regulatory authorities that the selection of comparators and weighting approach involves a degree of value judgement. Therefore, we consider three comparator sets to inform the target, as follows.

Narrow – This set includes the Construction sector only given its similarity to the investments we do into large infrastructure projects.

Broad set – This set includes three operationally relevant sectors: Construction; Transportation and Storage; and repair and installation of machinery and equipment.

Granular set – This is a much wider set than the broad list, therefore including a far larger group of industries weighted by relevance and comparability.

Based on the targeted comparator sectors adopted at RIIO-T2, this would suggest an ongoing efficiency target of c.0.0% p.a. and a stretching target of around 0.2% to 0.5%.

The weights assigned to these sectors, and the rationale for these being proxy industries for our sector is set out in our [Cost Assessment Annex](#).

It is also important to note that adjustments for ongoing efficiency are not appropriate for all cost categories and types expenditure. Adjustments are appropriate for BAU costs and the regularly occurring capital expenditure. However, in RIIO-T3 there are also more “one-off” large projects where ongoing efficiency targets may ignore the following elements:

- *Volumes are likely prescribed and signed off by Ofgem in advance.*
- *Prices are more likely to be set based on market forces, and expected productivity gains already embodied in the contract price.*

We propose that the ongoing efficiency adjustment of 0.4% is only applied to those projects and investments that are generally likely to be repeatable and regular, and not these one-off large projects which are funded through uncertainty mechanisms.

Real price effects

Transmission operators like SP Energy Networks tend to face changes in input prices (in real terms) that may not be appropriately captured by general inflation measures such as CPI or CPIH. Mechanisms have been used to account for these ‘real price effects’ (or ‘RPEs’) by calculating the differences between general price indices and actual input price inflation when setting TOTEX allowances.

Without this adjustment, totex allowances will be too high when general inflation moves ahead of transmission input cost inflation, and too low when the prices we face are increasing faster than prices in the economy more generally. The impact is arbitrary because we have minimal influence on many of the prices we face; we are “price-takers” in national or global markets, in turn impacting the overall risk we are perceived by investors to be carrying as a business.

The difference between general price inflation and the inflation that we experience across the goods and services we rely on as a transmission business can be analysed empirically. In summary, our analysis shows that the prevailing RPE index has not adequately tracked the prices we pay in the competitive market for key inputs, including transformers, labour and civil works. In the majority of the projects that we have examined, the RPE index has fallen significantly short of the price pressures that we face, resulting in substantial underfunding.

The analysis supports two main changes to the real price effects methodology. First, to refresh for the proxies used as the basis of the real cost increases we face – this would allow RPEs to more appropriately track the true increases in our costs. Second to refresh on the weighting of these costs – in order to better track costs, weightings should be realigned and should also be updated more frequently. Further details can be found in the [Cost Assessment Annex](#) and in the expert report prepared by [Oxera](#) for this area.

The impact of applying these improvements in methodology, to our baseline expenditure, is set out in the table below.

Input £m	26/27	27/28	28/29	29/30	30/31	RIIO-T3 TOTAL
TOTEX	6.4	10.7	12.3	12.4	12.4	54.2

Treatment of differences between actual and forecast totex

Even after adjustment for estimates of ongoing efficiency and real price effects there will remain significant uncertainty over whether totex allowances are in line with our actual efficient costs of delivery. The Totex Incentive Mechanisms (TIM) is the key mechanism through which the impacts of that uncertainty are shared between SP Energy Networks and energy consumers. It is another factor affecting the risk we are perceived by investors to carry as a business. We also note that in other uncertainty mechanisms, we have highlighted the importance of protecting our operations and the needs of our customers, from large external shocks. Our TIM proposals that we have set out, suggest a stepped approach based on the extent to which there is under or over spend. Well calibrated RPE mechanisms, and a more banded proposal on TIM are examples of areas where SPEN are acknowledging that we must be resilient to greater risks, and act accordingly, but have reasonable expectations on the way that anomalous price shocks (whether that be positive or negative for our revenues) be treated.

It is also important to recognise that these forecasts are intrinsically uncertain, and it is likely that the outturn development of input prices will differ to what we have assumed. Many of the underlying factors that have driven cost increases and volatility over recent years will continue to be present in the near-medium term. Further, we might expect the sector to face the additional uncertainty regarding supply chain challenges, including constrained labour market, as energy networks in GB and across Europe are simultaneously increasing investment on the network in order to reach Net Zero commitments.

In this context, and looking at responses in other jurisdictions, we believe that uncertainty mechanisms should be adopted as a complement to indexation. Particularly for aspects of our cost base do not track robust, exogenous price indices, given the specialist nature of the inputs and the supply chain issues outlined above. We have explored how regulators across Europe have sought to account for the input price pressure facing energy networks, particularly for cost areas that are highly uncertain. In the [Cost Assessment Annex](#) we set out our proposals for appropriate uncertainty mechanisms for the key input categories.

Bill impact

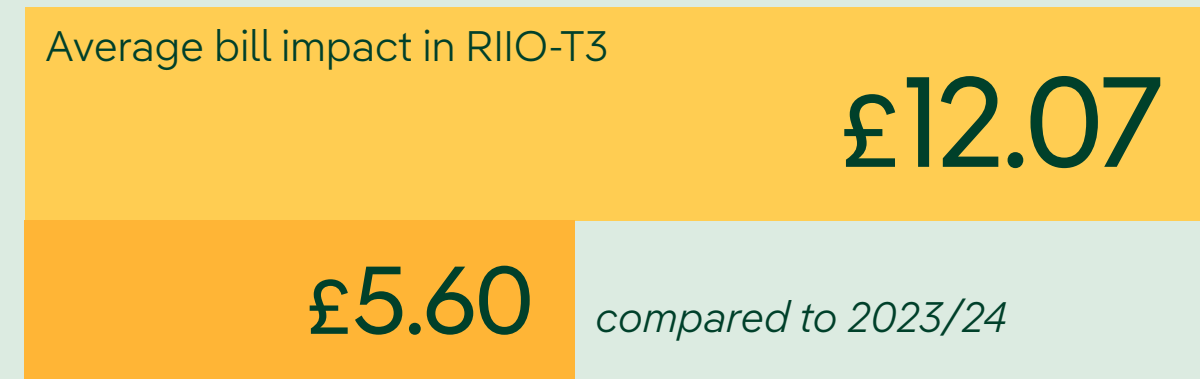
In the first two parts of this section, we set out the different ways in which our plan will deliver value to households and businesses across GB – and what the aggregate cost is forecast to be. In this part we explain how those costs are recovered from consumers through their energy bills, and what the impact of our proposals is estimated to be on average over the RIO-T3 period.

The impacts of our plans on customers' bills is indirect. We do not levy charges on electricity consumers directly. Our allowed revenues are combined with those of the other regulated transmission companies and recovered from users of the transmission system, such as electricity generators and energy suppliers, through regulated transmission charges. Transmissions users then seek to recover those costs, in turn, from their customers.

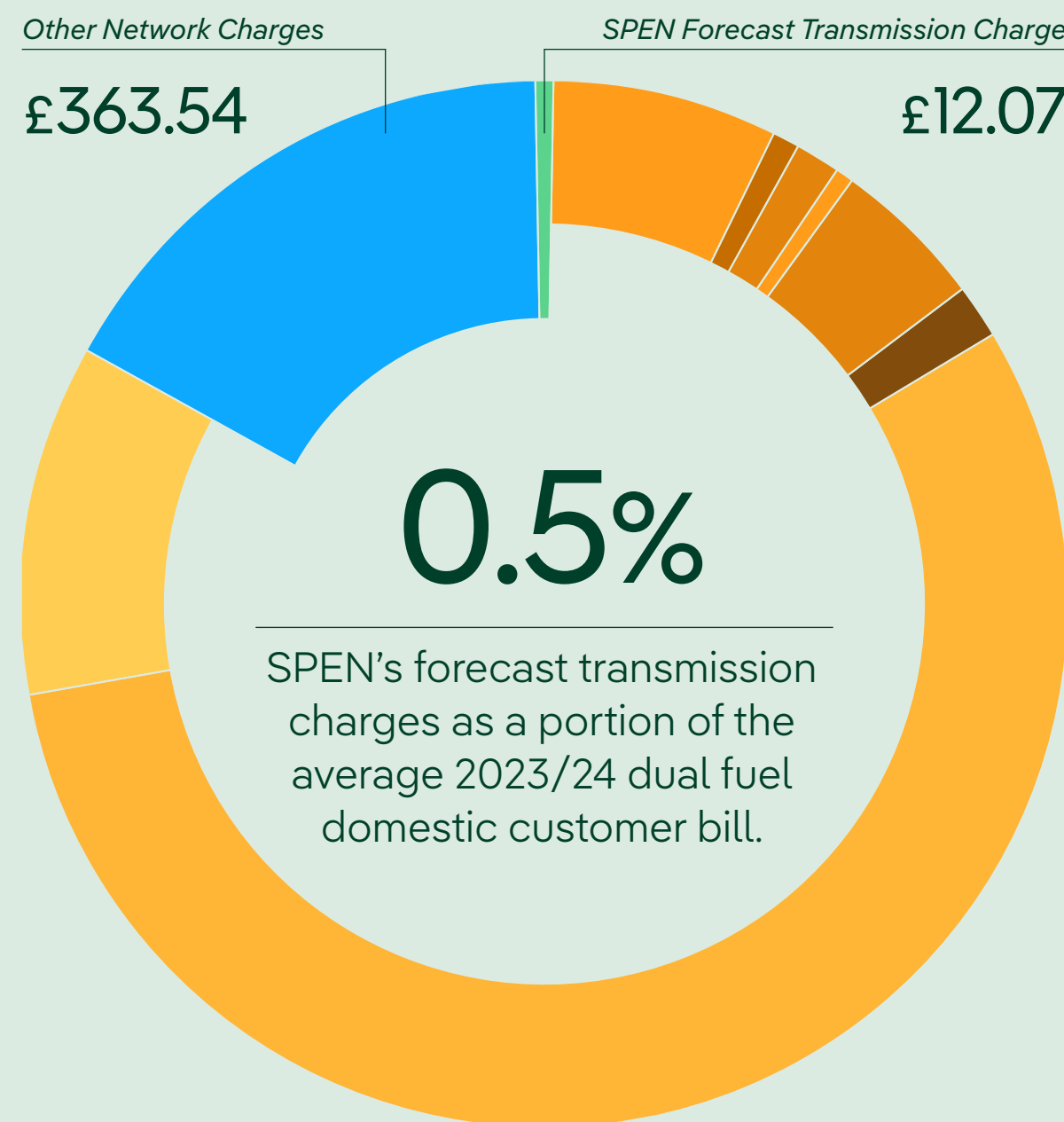
We know affordability is paramount to our customers. The increase in transmission charges of £6.47 per customer as a result of our investment is the optimal solution for keeping bills affordable for our customers now and over the long term. For comparison, the independent research by CEP discussed on [page 79](#) ← suggests our investment would mean households across GB would be better off by £46.78 per annum by 2030 and £60.21 per annum over the long term as a result of our investment. When including all estimated investment on the transmission network, customers could save over £167 per annum on additional costs related to constrained power flows on the network versus where this investment isn't delivered.

Impact on bills during RIO-T3

The electricity bills that households and businesses pay every month or quarter will therefore include an amount attributable to our allowed revenues, either as part of the standing charge or embedded within the unit rate(s). The chart below shows our plans impact for average domestic electricity consumers, and how it is forecast to increase between today and RIO-T3.



To put this into context, the network element of the average 2023/24 dual fuel domestic customer bill is roughly 17%. This covers networks costs relating to managing and balancing of the electricity and gas networks (“system operation”), gas transmission and distribution networks, electricity distribution networks and finally electricity transmission networks. Our forecast RIO-T3 charges as a proportion of the bill, using the average 2023/24 domestic dual fuel customer as a benchmark, will be 0.5%.



Allowed revenues and longer-term bill impacts

Our allowed revenues are set assuming that a significant proportion of our expenditure is financed and recovered over the long-term. For any given regulatory period, such as RIO-T3, our allowed revenues comprise funding designed to cover the share of past and current investment attributable to the period, plus funding designed to cover the efficient costs of running our business day-to-day during the period.

From the perspective of energy consumers, spreading cost recovery over the long-term can support:

- **Intergenerational fairness:** Our network requires large upfront costs. Long-term revenue collection allows us to gradually recover the upfront investment in a fair manner by spreading the recovery cost of our assets over their useful life – ensuring the balance between customers paying for and receiving the benefit from the network.
- **Stable charges over time:** Customers charges are more stable and predictable for any given cohort of consumers, which in turn helps support affordability.
- **“Who benefits, pays”:** We invest in assets which contribute to the provision of transmission services over the long-term. Spreading cost recovery over the long-term supports a closer relationship between what consumers are paying for and the services they receive.

Stable and predictable arrangements for long-term cost recovery are also important for investors and creditors:

- **Financeability of our business:** Consistent and predictable streams of income allows us to finance our operational activities. This means we can cover our operational costs, service our debt, and provide returns to our investors.
- **Risk Management:** Helps us manage asset risk, manage our business operations and navigate regulatory requirement changes.
- **Investability:** Helps us to build and strengthen our investor's confidence that our business is investible and viable on a long-term basis.
- **Incentives to be efficient:** Helps us focus on long-term efficiencies by ensuring we are incentivised to be efficient in managing our costs and responsible for the long-term health of the network.

Costs proposed in our plan for RIO-T3 results in the following revenue breakdown. The estimated total revenues for RIO-T3 of £5,567m drives the average bill of £12.07 a year set out opposite.

To illustrate the significance of being able to spread cost recovery over the long-term, our forecast capital investment over the RIO-T3 period is £9.7bn, however only £920m of this is recovered from energy consumers over the RIO-T3 period. During a period where investment is increasing significantly, this has the effect of dampening the increase in costs for customers. The comparison below between RIO-T2 and RIO-T3 shows this clearly. Revenues are estimated to increase by 135%, while investment is forecast to increase by 207%.

Revenues Comparison 2023/24 prices	RIO-T3 (£m)	RIO-T2 (£m)
Past Investment <i>(including all revenue items)</i>	2,179	1,488
Recovering Investment <i>(including financeability adjustment)</i>	920	81
Operating the network	761	493
Cost of Financing	1,413	165
Taxes	315	234
Other costs	-22	-95
Total	5,567	2,366

The spreading and smoothing of revenue recovery over time means that impacts on the electricity bills paid by households are also smoothed. For the RIO-T3 period this is important because of the step-change in investment required to deliver the wider value for customers identified at the start of this section.

Ensuring that our plan is financeable and investible

The previous two parts of this section set out the value that our RIIO-T3 will deliver, and the total costs involved. In this part we explain the challenge of ensuring that our plan is investible and financeable. This is critically important to ensure that investment plans can proceed at pace, and that the costs are able to be shared equitably across current and future generations of energy consumers.

To emphasise the benefits of being able to secure long-term finance at efficient cost, if we were to fund our RIIO-T3 investment programme on a pay-as-you-go basis, then this would involve energy consumers paying an extra £9.3bn over the 5 year period, or something approximating £106 in total per household over the RIIO-T3 period. And energy consumers from 2031 onwards making no contribution, while gaining significant benefits. This is inequitable.

The scale of the investment planned for RIIO-T3 means that we need to raise significant new equity and debt finance. How investors perceive our plans, and our ability to deliver them while also earning a reasonable profit, will be key to raising the required funds efficiently.

In this part we step through how we have assessed investability, and what needs to be in place to secure it at reasonable cost to consumers. The evidence we present is organised within a framework for investability that we have developed through engagement with investors and a wide range of stakeholders. We believe that it is a sensible and transparent way to present the evidence, and highlight the trade-offs and decisions involved.

The output is a set of key financial parameters that we view as supporting the most appropriate balance of risk and return for SP Energy Networks and our prospective investors in seeking to delivery these ambitious plans in current markets for finance, equipment and skills – set against costs to energy consumer.

Some of this material is technical in nature and further technical detail can be found in the [Finance Annex](#).

Cost of Equity <i>(60% notional gearing)</i>	6.86%
Cost of Debt	4.20%
WACC	5.27%
Credit Rating	BBB+ /Baa1
Dividend Yield <i>of no lower than</i>	3.00%
Equity Issuance Allowance <i>and specific additional cost allowances</i>	5.00%
NPV Neutral Financeability Adjustment	£494m

A framework for assessing investability

We have worked extensively with investors, consultants, other networks and Ofgem to identify what is important to investors when weighing up investment opportunities. From this engagement we have distilled it down to a set of key characteristics that we can assess with evidence, and either “pass” or “fail”.

The framework is set out below. The assessment is derived from quantitative modelling and analysis which relates our expected costs and revenues under RIIO-T3 to a range of metrics and indicators relevant to investors. A key feature is to highlight specifically where and why Ofgem’s latest position as articulated in its Sector Specific Methodology Decision (SSMD) would mean that our plan may not be adequately financed and may fail key financial credit metric financeability tests.

Measure	Assessment	Context SP Energy Networks entering RIIO T3
Financeability Assessment:	PASS OR FAIL	<i>A step-change in new investment (and revenues), and a complex risk landscape and evolving regulatory framework.</i>
<i>A fair allowed return aligned with the level of risk</i>	PASS OR FAIL	<i>Material changes in profile of systematic risks, consequent to sector-wide delivery scale and environment, more competitive for infrastructure investment funding globally.</i>
<i>Cashflows sufficient to make debt repayments</i>	PASS OR FAIL	<i>Step change in value to finance to fund investment.</i>
<i>A fair bet for investors – a symmetrical balance of risk</i>	PASS OR FAIL	<i>Significant rebalancing away from funding via baseline revenues, more exposure mechanism-specific penalties and incentives.</i>
<i>Investment grade credit rating, robust to shocks</i>	PASS OR FAIL	<i>Scale of investment to be funded means greater reliance on ability to attract equity investment to avoid upward pressure on gearing.</i>
Cross-checks to other available investment opportunities	PASS OR FAIL	<i>Continues to be useful and relevant sense-check of CAPM-based analysis.</i>
Remuneration for the cost of raising investment	PASS OR FAIL	<i>More material consideration, given the scale of additional finance required and the environment in which it is being raised.</i>
Reasonable dividend payments	PASS OR FAIL	<i>More material consideration, given the importance of being able to attract equity as part of maintaining overall investability.</i>

Estimating a fair return on investment

The Weighted Average Cost of Capital (WACC) is a measure of the overall return rate required to sustain a business given the risk of the environment it operates in. It is a weighted average of the Cost of Debt (CoD) and Cost of Equity (CoE) under an assumed notional capital structure. An estimate of the WACC is used by economic regulators to set an allowed return for utilities that are not subject to competition.

In estimating the CoE, it is standard practice to use the Capital Asset Pricing Model (CAPM), given that the actual CoE is not directly observable. The CAPM determines the cost of equity through assessing the risk-free rate (RFR), the total market return (TMR) general and an equity “beta” (β). The RFR and TMR provide a level of return for UK industry as a whole and beta scales this to reflect the electricity sector specific risks.

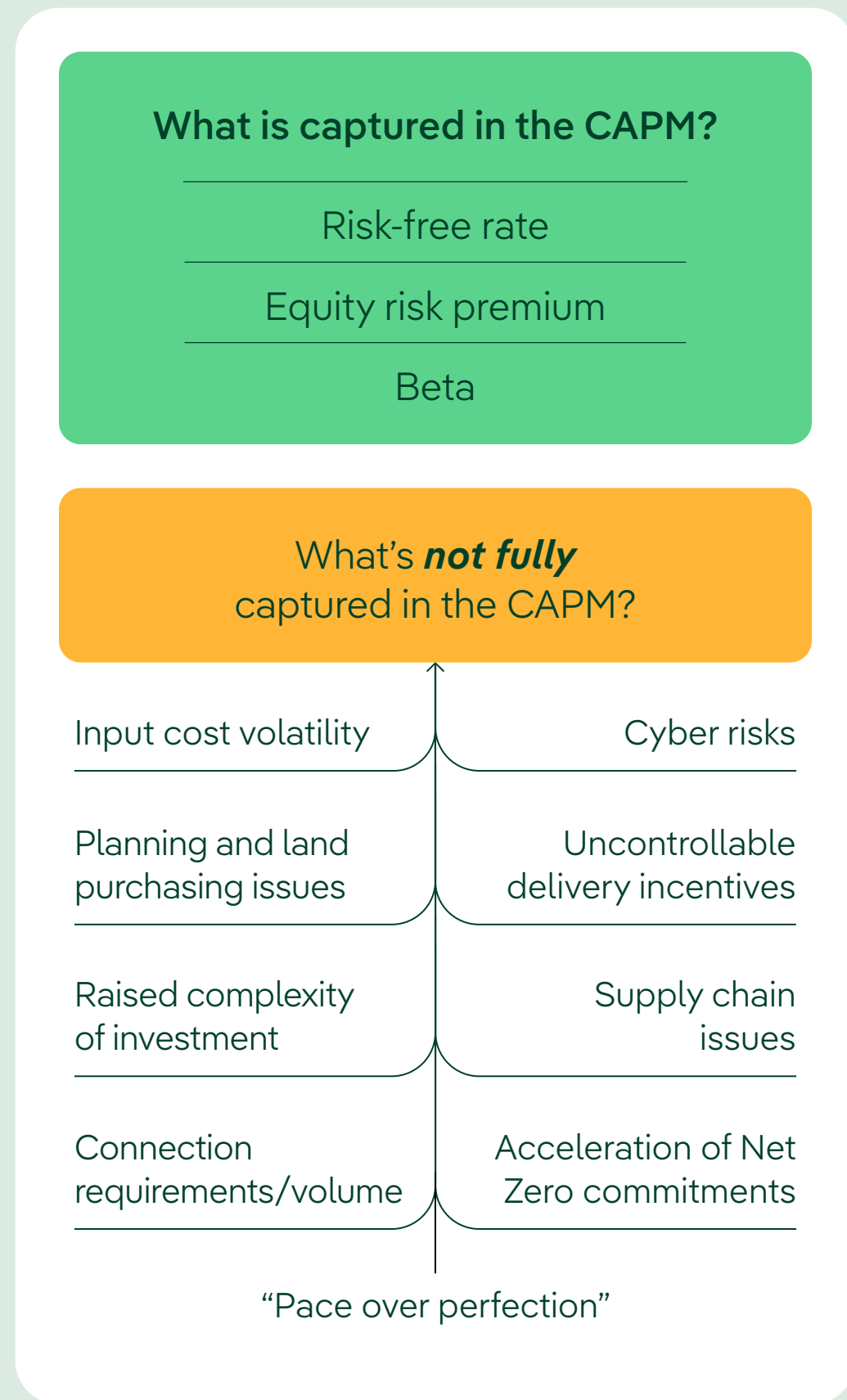
$$\text{CoE} = \text{RFR} + (\text{TMR} - \text{RFR}) \times \beta$$

Each of the parameters used in CAPM can be estimated in a range of different ways, with choices to be made on data variables and methods of estimation. A key challenge in common with all economic modelling is the extent to which data and statistical relationships we observe today will continue, and what factors not included in the modelling might influence or shift trends or patterns over the period we are trying to model. This means that estimating a fair return using CAPM required both technical analysis and subjective judgement.

Factors excluded from CAPM, but which are clearly systematic factors relevant to determining a fair return for RIO-T3 include: supply chain constraints, Ofgem policy shifts (e.g. rethinking how to weigh short-term risks and costs against long-term risks and costs which Ofgem term as “pace over perfection”), input cost volatility, the legal and practical politics of planning and land purchasing.

Here we step through the standard CAPM method for estimating a reasonable and fair allowed return for a company, such as SP Energy Networks, delivering electricity transmission services in the prevailing regulatory and market environments in GB, having regard to the nature and scale of activities involved in delivering what is needed for RIO-T3.

The method calculates a return for equity investors (CoE) and return for lenders (CoD) and takes a weighted average based on an assumed debt:capital ratio (gearing). The estimates of CoE and CoD seek to represent the minimum needed for the investment to be perceived as worth undertaking.



Risk Free Rate

1.54%, indexed

The first driver of allowed returns is the RFR, which should reflect the rate of return that could be expected from a riskless investment. There is no direct measure of this in the market, so a proxy must be used.

We propose the risk-free rate be based on index-linked gilts (ILGs) in line with Ofgem’s position. However, there is a widely held view that this is due to the fixed supply of ILG’s and a high demand from pension funds regardless of price – driving the return below the true risk-free level. Giving rise to a ‘convenience premium’ which must be adjusted for to give the true risk-free rate. Some market evidence suggests this may still be too low. Nominal gilts may provide a better proxy for the risk-free rate, reduced by 2% CPIH long term inflation target. This offers a key cross-check to the ILG based value.

We therefore propose a risk-free rate of 1.54%, with a low end of 1.54% (aligned with an ILG based RFR) and a high end of 2.44% (aligned with a nominal gilt based RFR). The risk-free rate should continue to be indexed, and rise and fall in line with market conditions, and ensure our customers are only exposed to the true RFR as the market changes.

Total Market Return

7.25%

The second driver of the allowed return is the TMR, which represents the expected total return across all UK equity investment opportunities. Ofgem currently calculate this based on long-run historical returns in the UK, this estimate is backward looking, with Ofgem reasoning that past market performance will inform the future. Ofgem’s calculation generally results in a TMR that is relatively unchanged over time.

There is however broad consensus among economists that the TMR changes over time, and in line with interest rates. When interest rates fall returns on gilts and corporate bonds reduce, and investors accept lower returns on alternative riskier investments. While in a higher interest rate environment, investors require higher returns for investments, given its easier to make risk-free returns with high interest.

Our own modelling shows that a TMR of at least 7.25% (likely 7.0%-7.5%) is supported by the evidence. This is also consistent with cross checks of CoE using alternative methods, and supported by Oxera and Frontier Economics expert reports. A more dynamic approach to estimating TMR across price control periods is therefore justified both theoretically and empirically.

Factors that could switch

PASS to FAIL

Our proposals for the Risk-Free Rate and Total Market Return include a key check that need to be accounted for, not doing so would result in a fail for this test.

These parameters must account for the macroeconomic environment. Where we have proposed conservative calculations for the RFR and TMR to account for real world cost of borrowing implications, such as the significant change in interest rates since previous price control determinations.

Areas of concern with Ofgem methodology, specifically where:

The convenience premium is not accounted for in the Risk-Free Rate, under-estimating the base level of return expected by the market.

The total market return is considered to be fixed, as opposed to stable but flexing with the macroeconomic conditions. The total market return would also fail if it does not reflect a wide enough range of methods of estimating the cost of equity as the SP Energy Networks estimates do.

Equity Beta

0.93 at 60% gearing

The third driver of allowed returns under CAPM is the equity beta. This takes the difference between the baseline returns (RFR) and the total UK returns (TMR) and converts it into measure specific to the risks associated with energy networks investment. The theory then being that the CoE is the baseline return (RFR) plus the additional return relative to energy networks company risks ((TMR-RFR) × β). If, for example, an equity beta was 1, we would expect the stock to be as risky as the market as a whole, if more than 1, more risky, if less than 1, less risky etc.

The equity beta is the measure by which the systematic risk faced by a sector should be factored into the CAPM calculation. One of the key issues is that the calculation of the beta relies on historic data to estimate future risk. A valid assumption in a stable risk environment, but with the step change in risk associated with the ambitious investments we are required to deliver set out on page 85, ← and the increased risk environment in RIIO-T3, the beta is a less reliable method of adjusting for systemic risk in setting a reasonable allowed return.

The beta cannot be directly observed as that would require a listed 100% energy network company in the UK. Most network companies, on the other hand, are parts of larger organisations so the riskiness of the stocks cannot be wholly attributed to energy networks risks. As such a set of comparator companies are required which have some level of energy network business. The choice of comparators is clearly an important consideration.

We have carefully selected a suite of appropriate comparator companies to best reflect energy network risk. This finds the asset beta should be in the range of 0.41 to 0.425. We then propose selection of a higher point on the range (0.418), to reflect the increasing systematic risk we have set out. Using this asset beta range, we estimate an equity beta of 0.91-0.95 at 60% gearing.

Asset and Equity Beta Range	Without Ex-post Asset Beta Adjustment	Rounded Implied Midpoint	With Ex-post Asset Beta Adjustment
Lower Estimate	0.38	0.39	0.4
Upper Estimate	0.44	0.445	0.45
Rounded Midpoint	0.410	0.418	0.425
Estimated Equity Beta	0.91	0.93	0.95

Factors that could switch

PASS to **FAIL**

Our proposals for the Equity Beta includes a key check that needs to be accounted for, not doing so would result in a fail for this test.

The Equity Beta must account for the changing risk landscape going into RIIO-T3. Included in this is recognition that the CAPM framework is inherently backwards looking and unable to fully account for forward looking risks. Our proposals include a more risk reflective beta comparator set and adjustments for forward looking risk to ensure this check is passed.

Areas of concern with Ofgem methodology, specifically where:

The comparator industries used to benchmark the Equity Beta are not reflective of the risks Electricity Transmission companies face.

An appropriate point estimate is not selected to recognise that the calculations cannot fully account for forward looking risk.

CASH FLOWS SUFFICIENT TO PAY DEBT OBLIGATIONS **PASS**

Cost of Debt

4.20%

To raise debt capital (which makes up a majority of our capital base), our creditors must have confidence in our abilities to repay our debt obligations. The rate of return on debt must be at an appropriate level, such that creditors will offer the capital, but it will not result in excessive customer bills.

Our proposed position on Cost of Debt is developed in the context of a framework established by Ofgem under which the cost of debt should be on a RAV-weighted basis to account for the need for flexible market returns given the large increase in asset investment. This flexibility is key for us to be able to reflect our cost of borrowing as our asset base grows. The framework established by Ofgem also adjusts in nominal rather than real terms for the fixed-rate element of debt, meaning that there is a semi-nominal cost of debt.

We commissioned independent analysis to assess alternative approaches to estimating this cost of debt in the context of Ofgem’s proposed framework. NERA’s approach of estimating overall cost of debt used iBoxx Utilities Index (18-years trailing average) and an estimation of additional borrowing costs using various premia.

As a result of this method, NERA estimated the cost of debt for RIIO-T3 as being 4.20%. NERA also assessed the calibration of this 4.20% in order to understand the efficiency and timing of our cost of debt proposals, and found them to be efficient. On our current RAV forecasts, this would result in the breakdown shown below.

Cost of Debt Estimation	26/27	27/28	28/29	29/30	30/31	RIIO-T3 Avg
<i>iBoxx Utilities Scenario</i>						
Cost of Debt (Baseline)	3.17%	3.44%	3.64%	3.81%	3.95%	3.60%
Additional Borrowing Costs	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%
Total Cost of Debt for RIIO-T3	3.77%	4.04%	4.24%	4.41%	4.55%	4.20%

Factors that could switch

PASS to **FAIL**

Our proposals for the Cost of Debt includes a key checks that needs to be accounted for, not doing so would result in a fail for this test.

The Cost of Debt must be calibrated such that an efficient company’s debt costs will be fully funded. The calibration of the mechanisms should align with the sectors expected debt costs. This should also reflect the additional cost of borrowing associated with the scale of debt we take on in order to invest.

Areas of concern with Ofgem methodology, specifically where:

The mechanism is calibrated such that companies will not be able to cover their debt costs.

The indexation of the mechanism is not dynamic to reflect changing debt requirements and interest rates.

Additional costs that companies incur in raising new debt are not fully accounted for.

A FAIR BET FOR INVESTORS – A SYMMETRICAL BALANCE OF RISK PASS

One of the key components of investability is the ‘fair bet’ principle. This is to ensure that once the fair level of return is set, regulated companies are able with efficiency and good performance to realise that return. This is done by calibrating the parameters that comprise the price control determination to reflect a symmetrical balance of risk for investors.

The principle is to ensure that a company acting efficiently in line with expectations should earn the base level of return, and where each element of the price control is calibrated such that there is an equal chance of out-performance and under performance.

We propose that the plausible range of out and under performance is calibrated to ensure that companies and customers are not exposed to either significant out-performance, or returns that are too low to cover fundamental costs such as the cost of paying debt.

Return on Regulated Equity

At this stage we conduct Return on Regulatory Equity (RoRE) analysis. This estimates the financial benefits and penalties available to the notional network company in RIIO-T3 from outperforming or underperforming the price control assumptions. In accordance with Ofgem’s Sector Specific Methodology Decision for RIIO-T3 and the RIIO principle, the overall financial package should ensure a fair return to shareholders (as measured by the return on the notional proportion of the RAV that is financed by equity), with a minimum return around the cost of debt.

The RoRE calculation is forward-looking. We use RIIO-T3 average RAV values and average allowed revenue determined by Ofgem’s Business Plan Financial Model (BPFM) in our calculation. We recognise the draft nature of the incentive assumptions due to the ongoing price control refinements and therefore represent an overall incentive package of ±2% RoRE as per the scenarios used by Ofgem in its financial model. We expect that these inputs will be revised as we approach the draft and final determinations in 2025.

Inputs *(Annual Average)*

Base Revenue	1,149
Regulatory Equity RAV	3,793
Gearing	55%
Sharing Factor	75% / 85% / 100%
Totex	2,093
Totex Uncertainty	+/-10% Totex
BPI Incentive	0.3% RoRE
Incentives	0.48%/-0.71% RoRE
ASTI ODI	+1.2% / -1.8% RoRE

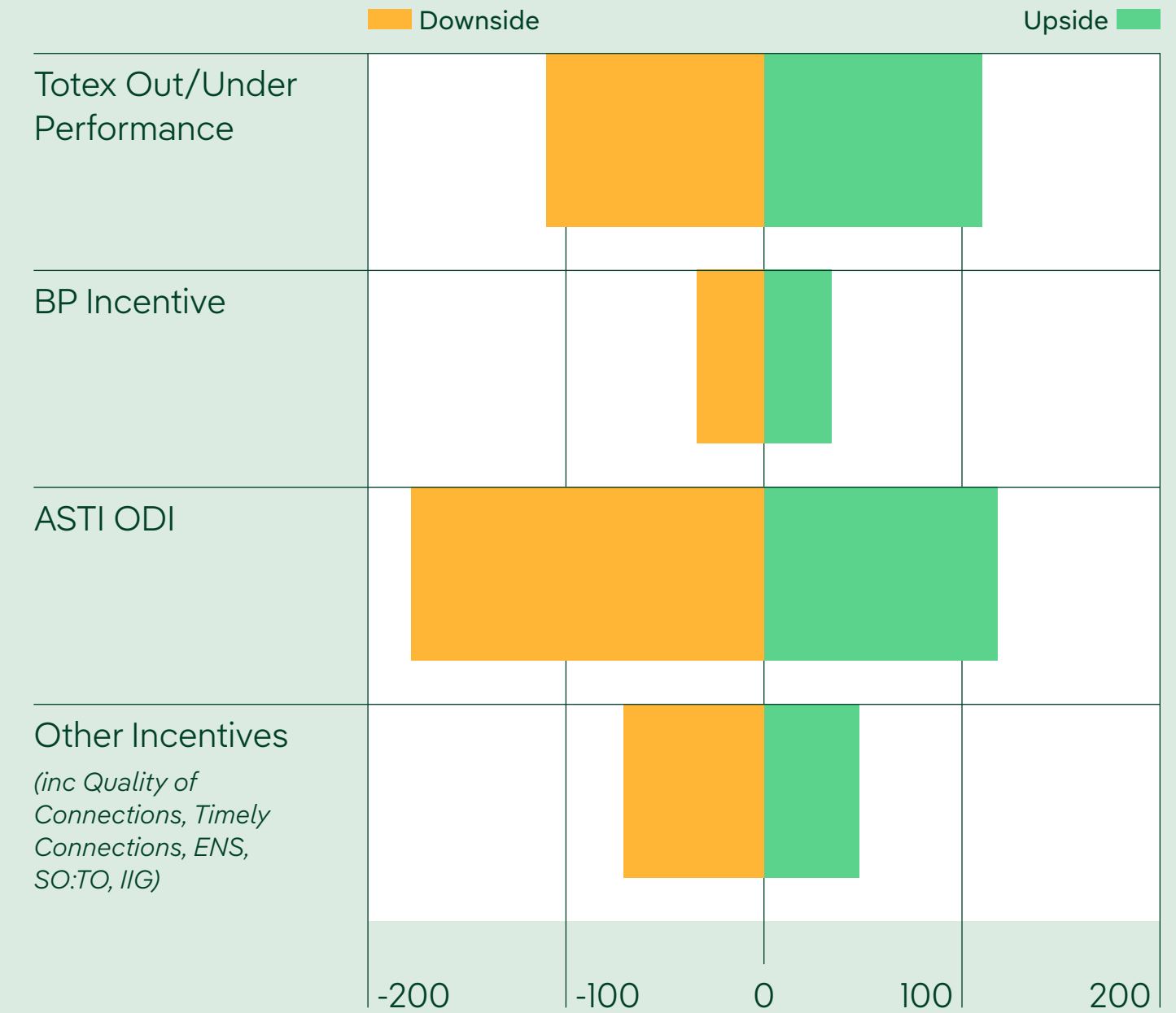
Our position

Our key conclusion is that the range of feasible RoRE at 55% gearing extends from a maximum of 9.6%, down to a minimum of 2.7%. This compares with an average Cost of Debt at 4.20% in RIIO-T3. The analysis shows that the variability around the allowed return is potentially very large, and if left unadjusted much larger than the comparable range for RIIO-T2. We would propose that the minimum risk that we are subject to would take our cost of equity, when accounting for all downside risk associated with these regulatory mechanisms, no lower than the 4.20% cost of debt.

This analysis shows further work is required to ensure the range of outcomes is fair for customers and does not put overall investability at risk. This is a material concern. The large ASTI projects have sizeable penalties linked to late delivery that could reduce our effective overall financial package and have a direct impact on our investability. Our current ASTI projects, have a potential penalty associated with them during the RIIO-T3 period of £67.4m in 2023/24 prices.

Exposure to penalties could be magnified further through the regulatory framework for CSNP-F projects or, more generally, through financial penalties through enforcement action if project delays are perceived by Ofgem to constitute a licence breach.

Another area of potentially uncertainty is the impact of the new regime for competition in onshore transmission. While SP Energy Networks are supportive of competition where it robustly demonstrates consumer benefit, this new policy initiative compounds the inherent uncertainty during the RIIO-T3 period for existing transmission operators. Regular competitive tenders for transmission projects will reduce the certainty that TOs and their investors have over the projects in our portfolio for delivery during the price control period. In addition, there might be perceptions of heightened risks associated with third-party activities on the network, or by being required to step in as providers of last resort should a Competitively Appointed Transmission Owner fail.



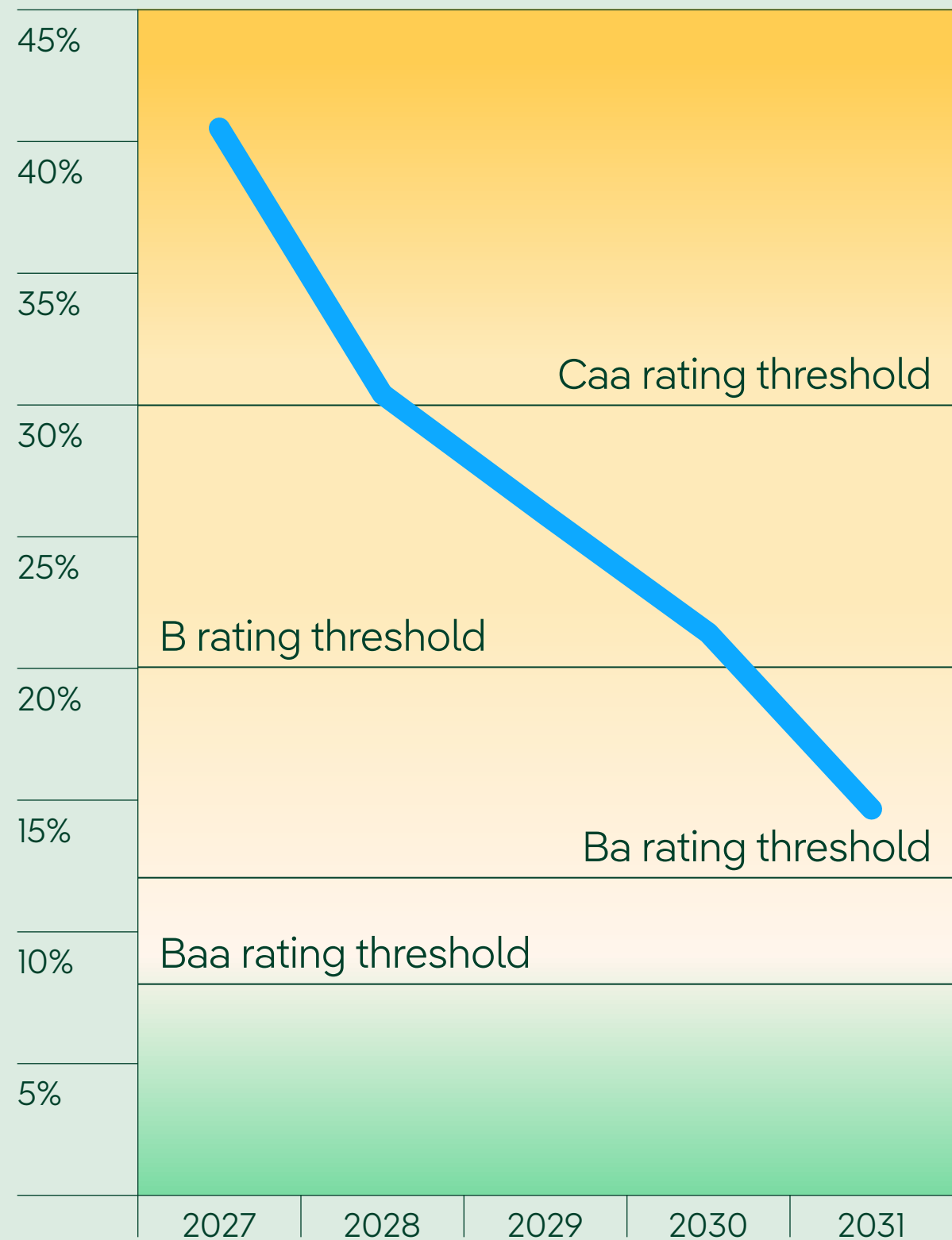
Proportion of RoRE



INVESTMENT GRADE CREDIT RATING PASS

Achieving a strong credit rating signals to banks and investors that they should have confidence in our ability to service and repay our debt. Investor confidence is critically important in an environment where we looking to borrow at competitive rates to fund new investment for RIO-T3. Credit ratings can directly influence our cost of borrowing, in turn helping to keep costs to consumers down.

Capex/RAV — SPEN's forecast position



We have used Moody's investment grade rating approach, which assess our credit risk under the following framework: Regulatory environment and asset ownership Model (40%); Scale and complexity of capital Program (10%); Financial policy (10%) Leverage and coverage (40%). The assessment includes a suite of financial ratios, which build to an overall rating. Each ratio is assigned a rating from Aaa to Caa, building towards the overall rating, where 'Baa' and above is considered 'investment grade'. We are required to maintain an investment grade, so we therefore target a strong investment grade rating of 'Baa1' to ensure we are robust to plausible external shocks.

We have assessed the credit ratings for SP Transmission on both a notional and actual basis against our target overall rating of 'Baa1' before risk. This makes sure our financeability criteria are fully consistent with credit quality underpinning the allowed cost of debt index. This is also consistent with our licence obligation to maintain an investment-grade credit rating. We are not currently targeting an 'Baa1' rating for all credit ratios, but we are targeting ratios that will allow us to score an overall rating of 'Baa1'.

Regulatory environment and asset ownership Model
Policies and decisions of Ofgem have substantial impact on our financial decisions and the operational activities of our business in terms of stability and predictability of regulatory regime and the policies around our cost and investment recovery. This area will be closely monitored for any changes.

Scale and complexity of capital Program
We have assessed our Capex/RAV ratio to showcase our scale of investment and how complex our capital program would be in RIO-T3. Our rating result indicates that our Capital expenditure for RIO-T3 is on average 27% of our total regulated asset value, resulting in overall "B" rating, a reflection of very significant increase in SPEN's capital expenditure with possible financing challenge and execution risk. This rating improves across the RIO-T3 period as the size of the network grows

Financial policy
This refers to Company's strategic decisions regarding how to raise and manage financial resources for its operational activities and investment purpose. Moody's rating is based on striking a balance in risk apportionment between shareholders and creditors. In RIO-T3, ET network's implied rating is assigned "Baa" a typical rating for an Ofgem-regulated network. This reflects the industry track record of stable and resilient finances based on Ofgem assumptions.

Leverage and coverage
Using the leverage and coverage analysis for the assessment of financeability, for the notional company, to demonstrate the movement in our credit ratios and the overall credit rating per Moody's methodology as prescribed by Ofgem. SPEN's detailed results in our Finance Annex reveal that the increase in our debt profile is not proportionate to the allowed return and cashflow. The significant strain on SPEN's cashflow has positioned us to be significantly higher geared than the notional company target. We propose an approach, with interventions, which would enable us to remain efficiently financeable on notional basis in our Finance Annex.

Results based on our proposed financial parameters, including interventions, to ensure financeability are shown in the table below:

RIIO-T3	2027	2028	2029	2030	2031	AVG
AICR	1.97	1.92	1.88	1.85	1.83	1.89
Gearing (closing)	55%	55%	55%	55%	55%	55%
FFO/Net Debt	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
RCF/Net Debt	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%
Rating score	8.3	8.3	8.3	8.3	8.3	8.3
Moody's rating	Baa1	Baa1	Baa1	Baa1	Baa1	Baa1

Moody's Credit Ratios 3-Year Min Average	SPEN's Proposals	
Capex to RAV ratio	26.8%	B
Adjusted interest cover ratio	1.86	A
Net Debt / Total closing RAV	55.0%	A
FFO / Net Debt	12.0%	Baa
RCF / Net Debt	9.6%	Baa
Implied Credit Rating	Baa1	

Our proposals
The following settings and actions are consistent with securing an investment grade credit rating to support delivery of our RIO-T3 plans at an efficient cost to consumers:

- A Cost of Equity of 6.57% (on a 55% gearing basis).
- £3.0bn equity injection to finance the substantial RAV growth and maintain an efficient notional capital structure.
- To make provision for appropriate equity finance, for an efficient notional company, calibrate annual regearing at 55% for the end of the each period instead of opening.

An NPV neutral revenue adjustment of an additional £494m is required, deliverable through a combination of adjustments to asset lives, capitalisation rate and assumed share of index-linked debt.

Factors that could switch

PASS to FAIL

There are a number of factors that go into ensuring a company can maintain an investment grade credit rating. Our proposals to ensure an investment grade credit rating can be maintained includes key checks that need to be accounted for, not doing so would result in a fail for this test.

Companies must be able to achieve an investment grade credit rating inline with rating agencies expected assessments.

Areas of concern with Ofgem methodology, specifically where:

- There is no floor on downside risk where a company can no longer fund its cost of debt.
- The notional company is incorrectly identified causing an uneven distribution of upside and downside risk.
- Cost sharing mechanisms are too strong, exposing customers and companies to windfall gains and losses.

Credit rating robust to shocks

We have worked with NERA to develop a financeability risk model. The model is based on Ofgem’s Price Control Financial Model and helps support our assertion that our proposed financing package is not just efficient, but robust. NERA’s report on [‘Financeability Analysis for SP Transmission over RIO-T3’](#) provides a description of the modelling methodology.

We have experienced significant change in the external environment over the last 5 years. Given the scale of investment we are required to make and the value at risk in delivering that investment, it has become essential that we are not only financeable but that we test our finances against a range of plausible external shocks so we have confidence that we can maximise value for customers in a changing and uncertain world.

We have used the model to assess if the suggested financeability scenario delivers an efficient, robust financeable plan. To do this, our model uses the Monte Carlo method to simulate the individual and aggregate credit metrics over the full range of plausible outcomes. The model does this for every individual risk we have identified. The model considers the risk to cash flows from external risks only – where possible, we have identified the plausible distribution of outcomes for an average network business.

In conjunction with our RoRE analysis, this should make sure the business is sufficiently and securely funded, so that the normal operation of RIO-T3 incentives is unlikely to lead to financial distress when coupled with adverse shocks from external risks. For us, a robust plan is one that makes sure the expected overall credit rating for a notional average transmission business will be solidly within the A to Baa (Moody’s) range of credit rating. (‘Overall’ means we include non-financial ratio components).

Under any realistic combination of adverse external outcomes, there should only be a small probability that this rating might drop to a level inconsistent with the allowed Cost of Debt. More specifically, we target an overall credit rating of A3 or Baa1. This is also consistent with SP Transmission’s license obligations to maintain an investment grade credit rating.

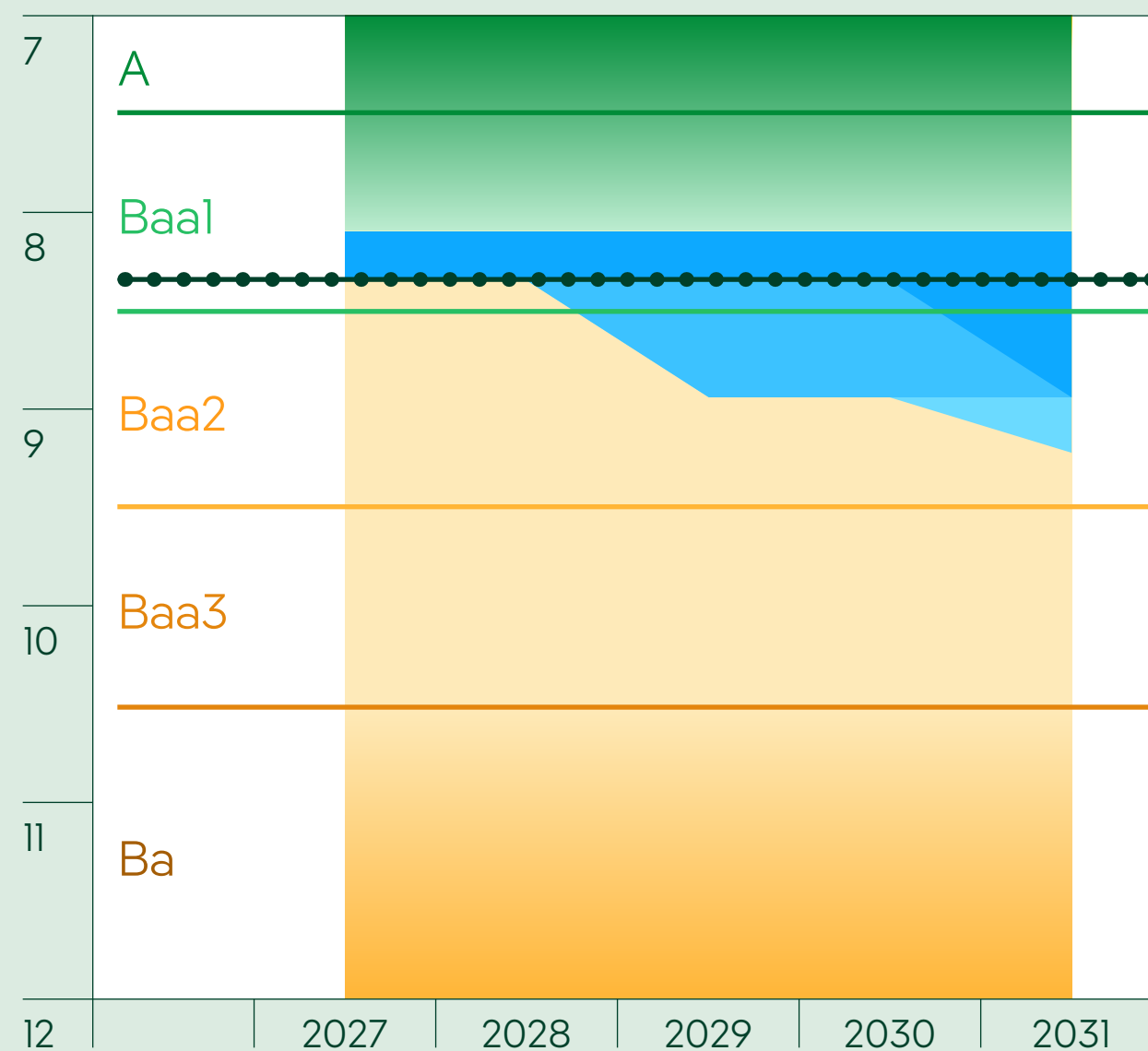
We test the robustness of our financial plan only against external risks not directly within our control. The external risks we consider are listed in the table opposite.

Each unique combination of these inputs constitutes a single scenario. For each scenario, a network business will be exposed to a range of financial risks. Some of these risks will be external to the business, and some will arise from regulatory mechanisms specific to the price control. For example, incentives, output mechanisms and residual risk may be only partly mitigated by uncertainty mechanisms.

We simulate a set of outcomes using Monte Carlo. For each iteration of the Monte Carlo Model we calculate the credit metrics and use these to derive an overall credit rating using Moody’s methodology (as described previously). Importantly, we use each of the components underpinning our proposed allowed return. To recap, these parameters are shown below.

Moody’s methodology applies significantly greater weights to components of the overall calculation. These are closer to the low rating end than to components at A or above, so the distribution of rating outcomes is strongly asymmetric.

SPEN’s forecast credit rating using financeability risk modelling



Results

This analysis demonstrates that our proposals, show a compliant investment grade after all external risks are modelled. For us, this demonstrates a robust plan where the expected overall credit rating for a notional average transmission business will be solidly within the ‘Baa’ (Moody’s) range of credit rating after all adverse shocks from external risks are considered.

Factors that could switch

PASS to FAIL

Areas of concern with Ofgem methodology, specifically where:

Where a significant portion of the downside probabilistic risks fall outside the target credit rating BBB+/Baa1.

Where there is a significant range in the probabilistic outcomes, meaning risk mitigation mechanisms aren't correctly calibrated.

SPEN’s Proposed Parameters	Inputs
Cost of Equity	6.57%
Cost of Debt	4.20%
Gearing	55%
Dividend Yield	3%
Asset Lives	45
Capitalisation Rate	92.7%
NPV Neutral Financeability Adjustment	£494m

● SPEN’s forecast position
 ■ 75th percentile
 ■ 90th percentile
 ■ 95th percentile

External risks

Totex Uncertainty	+/-10% of base assumption for 10-90th percentile applying a triangular distribution.
Non-controllable Opex Uncertainty	+/-10% of base assumption for 10-90th percentile applying a triangular distribution.
CPIH Uncertainty	Simulated based on OBR forecast uncertainty ranges.
Taxation	Actual and allowed tax modelled bottom-up.
Cost of Debt Indexation	Based on modelling uncertainty relating to RAV weighted indexation. We use 17-year trailing approach.
Cost of Equity Indexation	Based on multiple methods on RFR (nominal gilts and index-linked gilts with convenience yield adjustments). TMR is based on TMR cross-checking approaches including TMR glider, long-run TMR and dividend growth model. Beta is based on European comparators and adjustment for forward-looking risks.
Sharing Factor	Based on our proposed stepped TIM mechanism, with a sharing factor of 75% (between +5% and -5% over/under spend), 85% (between +/-5% and +/-10% over/under spend), and 100% (after +/-10% over/under spend).
Dividend Yield	3%
Equity Issuance	£3.0bn
Base Cost of Equity	6.57% (55% gearing basis)
Incentive Uncertainty	Individually calculated between BP incentives, Quality of connections, timely connections, ENS and SO:TO – estimated potential downside – 390 basis points of reg equity, estimated upside – 307 basis points of reg equity.
Totex Capitalisation Rate	92.7%
Proportion of inflation-linked debt	30% of notional debt

CROSS-CHECKS TO OTHER AVAILABLE INVESTMENT OPPORTUNITIES PASS

Estimate of return using CAPM provide a bottom-up view of an appropriate return. However, as we have set out there are a number of issues in determining a fair and reasonable return on a forward-looking basis, using CAPM given that it relies on historic data and assumes the relationships observed in the data will continue in a broadly stable way.

It is therefore useful to compare the return calculated using CAPM against estimates derived from alternative approaches. There are a range of benchmarks to compare our proposed level of allowed return against and seek to confirm whether it is accurate, and is likely to act as an incentive to invest relative to other available opportunities.

Here we set out a scorecard across a range of cross-checks, together with a short description of each method and the respective strengths and weaknesses.

The comparisons suggest a CoE of between 6.58% and 8.61%. This positions our proposal of 6.86% towards the lower end of the range of comparators. In combination with the analytical rigour used to derive our estimate – drawing on analysis from **NERA**, **Oxera** and **Frontier** – the cross-check analysis provides additional assurance on accuracy, investibility and value-for-money for energy consumer of our proposed CoE.

The positioning of our estimate towards the bottom of the range of comparators means that additional adjustments might be warranted to provide further assurance that our plan remains investible. There is some regulatory precedent for such ad hoc adjustments, using other levers to increase final estimates. The comparative analysis does, however, provide strong evidence that our proposal offers value-for-money for energy consumers.

Our proposal Cost of Equity <i>(60% notional gearing)</i>	6.86%
Debt market cross-check <i>Analyses premium of equity over debt, although relies on stable premium</i>	6.58%
Equity valuation cross-check <i>Analyses market prices – forward-looking, but not necessarily risk-weighted</i>	8.61%
Accounting profitability cross-check <i>Backward-looking, but should capture long-term trends</i>	7.15%
Survey-based cross-check <i>Opinion-based, but informed views and forward-looking</i>	7.96%

Factors that could switch

PASS to FAIL

Areas of concern with Ofgem methodology, specifically where:

- A broad set of alternative estimations are not considered, reducing the robustness of the primary estimation of returns.
- Real world implications of competing investment opportunities are not factored in to the financial package.

COST OF RAISING INVESTMENT PASS

An environment which is investible will not unduly penalise companies for incurred efficient costs associated with raising new equity.

Ofgem has already acknowledged the importance of raising new equity in order to invest given that residual income would not suffice for investment requirements.

Ofgem have suggested that they would maintain the 5% equity issuance allowance level from RIIO-T2 into RIIO-T3. It is important that SPEN is funded to efficiently raise the equity required for its large-scale investment in the T3 period.

We have conducted internal analysis with our parent company to determine reasonable estimates of equity issuance costs. On this basis, we believe that equity issuance costs should be at least 5% when accounting for direct costs, indirect costs should also be accounted for warranting and increase to this value. Accounting for both direct and indirect equity issuance cost allowances are essential to appropriately remunerate costs borne to raise the necessary equity to fund our ambitious business plan efficiently.

Factors that could switch

PASS to FAIL

Areas of concern with Ofgem methodology, specifically where:

- The additional costs associated with raising equity are not adequately remunerated, and the equity raised in part needs to fund non-relevant investor considerations.
- Types of additional costs are not considered separately from our overall cost of equity.

ABILITY TO PAY DIVIDENDS PASS

An environment which is investible will enable efficient, well-run companies to meet investor preferences for stable and predictable dividend yields. Many investors in the utility sector have traditionally been attracted by stable and predictable dividend yields. As such, any framework which aims to deliver investability should also be able to ensure that the companies have sufficient financeability to continue to make regular dividend payments.

Our proposals provide a regular enough and sustainable revenue, such that reasonable and regular dividends would be achievable. External studies have suggested that across Europe these expected dividend yields are consistently above 3%.

As suggested above, utilities investors often prefer dividend payments to equivalent capital gains, this proposed financial package should allow favour among such investors, and raise confidence that we are a viable investment – at or above the levels of yield regularly enjoyed among the European comparators.

Factors that could switch

PASS to FAIL

Areas of concern with Ofgem methodology, specifically where:

- Our finances do not allow us to provide dividends at the level/frequency that utilities investors would expect from us to maintain our position as a good investment option.
- We are not competitive as an investment option for utilities investors, who regularly expect low risk/regular financial remuneration.

The investability of our plan in summary

The financial package available to networks and investors must act as an enabler for the deep-rooted and far-reaching value our plan brings to customers.

Assessment of under our proposals

Our focus for our RIO-T3 Business Plan is to maximise the value for customers on a long-term basis. We have set out what work we need to do, how we plan to deliver it, and the value that delivering it brings. Being financeable and investible is fundamental to realising this value. Our proposals are calibrated to ensure we can be financeable and investible for RIO-T3 and beyond. We have set out that the value for customers is significantly increased where we are enabled to deliver the required investment at pace. Because of the value at stake, and the asymmetric nature of the cost and benefits to customers of our plans, it is important that our overall cost of equity is sufficient to allow us to mitigate additional risk and attract the required investment. The cost to customers to enable our plans needs to be weighed against the economic, societal, and environmental value that it brings. Getting the financial package right now sets GB on the right path to sustainable long-term value for all sectors of society.

Measure		Our assessment reasoning
Financeability Assessment:	PASS	<i>Overall our proposals ensure SP Energy Networks as an efficient business is able to continue to deliver its plans, and is robust to plausible risks.</i>
<i>A fair allowed return aligned with the level of risk</i>	PASS	<i>Our proposed return parameters ensure the allowed level of return reflects the changing risk landscape and acts as an incentive to invest.</i>
<i>Cashflows sufficient to make debt repayments</i>	PASS	<i>We propose a calibration of the allowed cost of debt mechanism to ensure only efficient debt costs are paid by customers.</i>
<i>A fair bet for investors – a symmetrical balance of risk</i>	PASS	<i>Our proposals ensure customers and investors are protected from windfall gains and losses, where companies are guaranteed their efficient cost of debt.</i>
<i>Investment grade credit rating, robust to shocks</i>	PASS	<i>We propose a balance of a fair return with cost neutral cashflow measures to ensure a strong investment grade credit rating, robust to plausible external shocks.</i>
Cross-checks to other available investment opportunities	PASS	<i>We measure our proposed allowed return against a balanced scorecard of cross checks, ensuring the fair return is also competitive against other investment opportunities.</i>
Remuneration for the cost of raising investment	PASS	<i>Our proposals include maintaining 5% direct cost of raising investment, in addition to an allowance for indirect costs.</i>
Reasonable dividend payments	PASS	<i>We propose, in line with market evidence and investor requirements, a reasonable dividend yield of no lower than 3%.</i>

Context for further engagement with Ofgem

Ofgem is afforded a wide discretion in calculating and calibrating the financial package networks and investors are exposed to via ranges on various input parameters and datasets. This is particularly pronounced in RIO-T3 given the great deal of uncertainty in the estimation a cost of equity and debt because of the step change in required investment, risk landscape and macro-economic conditions. This is reflected in the wide range Ofgem suggested as part of its SSMD publication.

In moving from wide ranges to decisions, it is critical to recognise the scale, pace and ambition of RIO-T3 and engage objectively and rigorously with the evidence. Further, where subjective judgement is required, to be open and transparent about trade-offs and risks involved. Setting the financial package too low could risk underinvestment at time where investment is crucial for driving value. The positive impact of our plan on GDP, jobs and incomes is further evidenced by the research undertaken by CEP and presented earlier in this section.

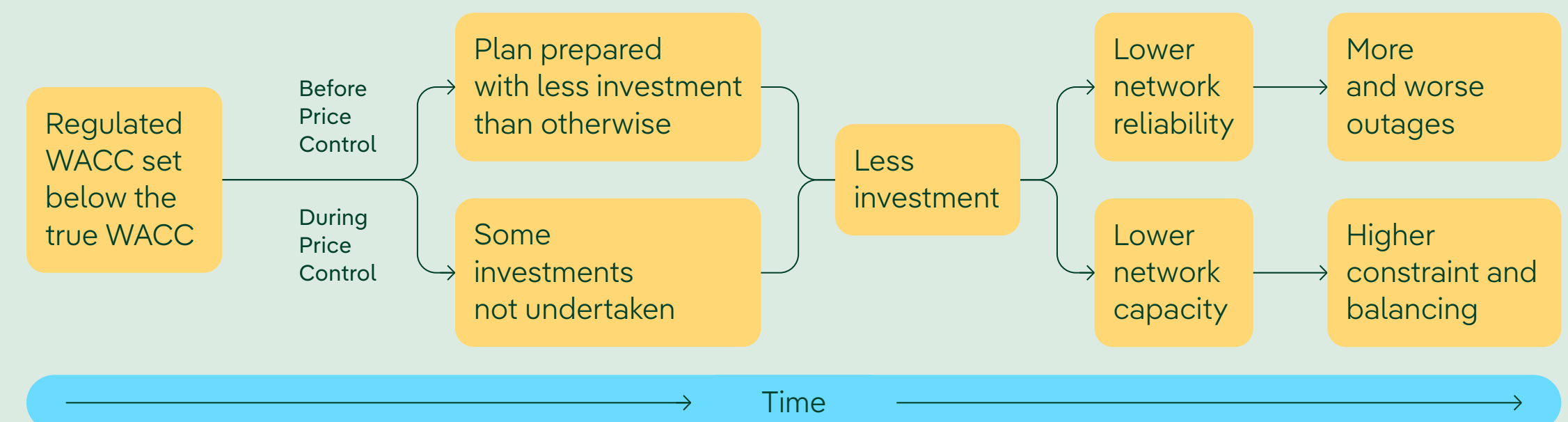
In this instance adjusting the financial package within an appropriate range is an important tool to ensure the underinvestment risk is mitigated and transmission networks and investors are incentivised to implement optimal levels of investment.

The selection of an appropriate point estimate in the range of suggested allowed returns after considering risks, and market conditions, along with the welfare benefits to customers of investment mean that it is appropriate for Ofgem to select a point estimate in the upper end of the range, and in doing so achieve investability.

Our aim is to work with Ofgem in light of the evidence and information we have provided to develop the financial and regulatory framework to enable financeability and investability and maximise the value for customers and society.

To conclude, we have identified that the benefits of our plans are significantly greater than the costs to ensure financeability and investability. This needs to be considered through the lens of the increasing and uncertain risk landscape electricity transmission companies face, along with Ofgem’s new duties for Net Zero and Economic Growth. As such we urge Ofgem, in setting a fair return, to balance the cost and benefits to customers and society, such that the overall financial package conclusively ensures investability and therefore the delivery of our plans. We agree with our customers that we must take bold steps to GB infrastructure investment which will in turn, maximise the sustainable long-term benefits available.

SOURCE: Oxera



In this section we provide additional information to complement the narrative in previous sections. We showcase our ambition in a full list of our business plan commitments, including how we will hold ourselves to account and measure success. We also provide our perspective on how incentive mechanisms will drive better performance and signpost readers to where our subject-specific annexes with additional detail can be found.

Supporting information

17 x RIIO-T3 Business Plan Commitments

A full list of our commitments

4 x Incentive Mechanisms

Embracing incentive-driven change

4x Price Control Deliverables

Detailed in relevant annexes

Finding out more through our annexes

Our business plan is built on a foundation of analysis and expertise, across many subject matter areas developed and refined over time. We are proud of the rigour, quality and technical expertise that sits behind our business plan proposals for RIIO-T3, and the annexes we are publishing as part of our business plan sets out why.

Annex list:

- Assurance Statement
- Climate Resilience Strategy
- Cost Assessment and Benchmarking Approach
- Environmental Action Plan
- ET Load Strategy
- Finance Annex
- Innovation Strategy
- IT & Telecoms Strategy
- Network Asset Management Strategy
- Stakeholder Engagement & Decision Log
- Statement from ISG Chair
- Workforce & Supply Chain Resilience Strategy

Contact us

Please use the following email address to send us feedback or ask us questions about our business plan: riio-t3pmo@spenergynetworks.co.uk

And join us on the journey of developing and implementing our RIIO-T3 business plan by visiting our [RIIO-T3 web page](#) where you can:

- Read our RIIO-T3 blogs
- Watch our T3 explainer videos
- Register as a stakeholder

Our full suite of Business Plan Commitments

We have set out a series of business plan commitments for the RIIO-T3 period. From a long-list we have carefully curated those commitments to create a focused set of challenges across the full range of our activities which will make us think outside of our business-as-usual operations, show ambition, are rooted in evidence and can clearly deliver additional value for our customers and communities. We have ensured each has a clear implementation plan and metrics for measurement.

VALUE

Protect and enhance nature through our projects

We will deliver nature enhancements across all projects with a measurable impact on ecosystems, achieved through local partnerships, providing at least a 10% increase in biodiversity on projects subject to planning consent.

METRICS FOR MEASUREMENT:

Number of Biodiversity Units (BU) created.

Ecosystem services £ value.

KEY MILESTONES:

Establish BU baselines and targets for relevant projects.

(Pre-construction)

Establish partnerships and viable schemes for offsite BNG. **(2025-31)**

Deliver nature enhancement schemes to achieve BU targets. **(By project close-out)**

Undertake enhanced engagement on major projects

We will undertake enhanced stakeholder engagement for every new build and major reinforcement e.g. voltage uprating which requires consent, to aid communities and key stakeholders to understand and engage meaningfully with our proposals.

METRICS FOR MEASUREMENT:

Establishment of project specific webpages.

Production of consultation document and other materials, including means of digital consultation such as 'virtual townhalls'.

KEY MILESTONES:

Updated Approach to Engagement published.

(Q2 2025)

Submission of a Consultation Strategy to relevant decision makers (Local Authorities and/or Scottish Government) for agreement prior to consultation launch. **(2026-31)**

A minimum of two community drop-in events per project. **(2026-31)**

Empower the Net Zero ambitions of our communities

We will deliver a £20m Net Zero Fund in RIIO-T3 to enable more communities we serve to take part in the transition to Net Zero. Building upon success of our RIIO-T2 Net Zero Fund, we will continue to provide vital support and tailored guidance to help communities develop robust Net Zero plans and projects. We will work with community organisations and charities across our licence area to enable local decarbonisation initiatives and fund projects which will accelerate Net Zero transition and generate measurable social value.

METRICS FOR MEASUREMENT:

Reduction of CO₂ emissions.

Social Return On Investment.

Number of people benefiting from a funded project.

Workshop attendees' perceived increase in their Net Zero knowledge.

KEY MILESTONES:

Appointment of the independent administrator and panel. **(Q2 2026)**

First round of community workshops to open for applications. **(Q3 2026)**

First round of feasibility support to open for applications. **(Q4 2026)**

First round of funding to open for applications. **(Q2 2027)**

All projects complete. **(Q1 2031)**

Remove barriers to engaging with us online

We will conduct an accessibility review across our online products and services and will implement annual improvements to continually enhance accessibility using the Web Content Accessibility Guidelines (WCAG) standards.

METRICS FOR MEASUREMENT:

Performance against the 4 principles of WCAG – Perceivable, Operable, Understandable and Robust of the WCAG international standard.

Assessing which of the guidelines and success criteria we now meet each year.

KEY MILESTONES:

Accessibility audit of the website. **(Q4 2026)**

Remediation of highest priority accessibility issues. **(Q4 2027)**

Annual accessibility programme. **(2028-2030)**

Maintain fair finances by paying tax responsibly and transparently

We will promote transparent tax practices by paying the right amount of corporate tax at the right time by maintaining the Fair Tax Mark certificate, an accreditation awarded by the Fair Tax Foundation to companies that pay taxes responsibly.

METRICS FOR MEASUREMENT:

Meet the required criteria as set out by the Fair Tax Foundation to achieve the Fair Tax Mark certificate.

KEY MILESTONES:

Ensure published financial information incorporates all best practice taxation disclosures. **(Q2 2026)**

Monitor the requirements of the Fair Tax Foundation and implement actions as required to achieve compliance. **(Q2 2026)**



INFRASTRUCTURE

Enable the transfer of more clean, green power

We will deliver projects which will increase the network capacity of the Scotland - England (B6) boundary from its current capacity of around 6.6GW to approximately 10GW.

METRICS FOR MEASUREMENT:
B6 asset capacity resulting from the associated projects, using the Transitional Centralised Strategic Network Plan 2 (tCSNP2) Year 9 background.

KEY MILESTONES:
Delivering a new 2GW HVDC subsea link in the northeast of England (EGLI).
(Q1 2031)

Replacing existing overhead line conductor on the northern section of the strategic north-south Strathaven – Harker corridor with High Temperature Low Sag (HTLS) conductor (VERE).
(Q1 2031)

Replacing existing overhead line conductor on the southern section of the strategic north-south Strathaven – Harker corridor with HTLS conductor (EHRE).
(Q1 2031)

Increase the capacity of the network

We will deploy grid enhancing technology to provide increases in network capacity before building new assets.

METRICS FOR MEASUREMENT:
Completion of reconductoring works on XH, XJ, XR, XX, ZG AND ZV routes.
Report on connections completed which use Load Management Schemes.

KEY MILESTONES:
Deployment of HTLS conductor on 450km of our existing overhead line routes.
(Q1 2031)

Connect up to 10GW of additional generation with non-firm access using Load Management Schemes.
(Q1 2031)

Reduce greenhouse gas leakage

We will install SF₆-free equipment in RIIO-T3. SF₆ filled equipment will only be installed if a viable SF₆-free solution is not available. We will also reduce emissions from SF₆ leakage in line with the trajectory required to meet our Science-Based Target (SBT).

METRICS FOR MEASUREMENT:
Number of SF₆ assets installed.
Leakage in kg per year.
tCO₂e.

KEY MILESTONES:
Remove and retrofill 9,265kg of SF₆ from our network.
(Q4 2030)

Reduce SF₆ leakage to a rate of 0.33%.
(Q1 2031)

Use innovation to accelerate industry-leading energy solutions

Leveraging proven concepts, successfully demonstrated through previous innovation projects, including Distributed Restart and the High Temperature Low Sag (HTLS) roll-out project, we will work with our supply chain and academic partners to deliver over £380m of totex-funded industry-leading BAU Innovation.

METRICS FOR MEASUREMENT:
Commissioning records and asset register entries for projects listed in Section 2.4 of our [Innovation Annex](#).

KEY MILESTONES:
Final Determination of the RIIO-T3 business plan.
(Q4 2025)

Routine project milestone reports
(Throughout delivery phases)

Delivery of the overall capex programme.
(Q1 2031)

RESILIENCE

Maintain a cyber resilient network and cyber secure services

We will commit to continuous improvement in cyber security, ensuring compliance with NIS regulations and enhancing our cyber resilience. We strive to protect our systems and deliver reliable and resilient services to our customers, through continuous monitoring, employee training, and collaboration with industry partners.

METRICS FOR MEASUREMENT:
Information included within Cyber Resilience Business Plan.

KEY MILESTONES:
Information included within Cyber Resilience Business Plan.

Build our resilience to cyber threats

We will commit to a dynamic, risk-based approach to cyber security, informed by the latest threat intelligence. We will safeguard our critical infrastructure and maintain robust cyber resilience, through adaptive security measures, continuous risk evaluation, and strategic investments in advanced technologies.

METRICS FOR MEASUREMENT:
Information included within Cyber Resilience Business Plan.

KEY MILESTONES:
Information included within Cyber Resilience Business Plan.

SERVICE

Reduce carbon emissions in our operations

We will deliver economically efficient actions to reduce our Scope 1, 2 and 3 Greenhouse Gas (GHG) emissions in line with our sector-leading 2035 Net Zero GHG Target, including targeting 80% of our supply chain, by spend, to set externally validated GHG reduction targets.

METRICS FOR MEASUREMENT:
% CO₂e reduction (from baseline)

tCO₂e emissions reduction

Number and % of EVs

Number and % of other low carbon vehicles

KEY MILESTONES:
Decarbonise all Operational Fleet. **(Q1 2031)**

Reduce carbon emissions by 5.6% year on year from 2018/19 baseline. **(Throughout RIIO-T3)**

Grow a resilient workforce

We will improve our capability to deliver at pace. We have already started this transformation process and we will implement our new delivery-focussed operating model by April 2026. We have already recruited 300 new resources over the last three years, and we will recruit around 1,400 brand new roles over the RIIO-T3 period. We will fill 200 of our technical roles through our trainee programmes.

METRICS FOR MEASUREMENT:
Recruitment of people, in line with forecast.

KEY MILESTONES:
Business Transformation complete and fully implemented. **(Q1 2026)**

New training facility completed, doubling our training capacity. **(Q4 2029)**

Around 1,400 brand new roles recruited. **(Q1 2029)**

Strengthen the skills and capabilities of our workforce

We will support the creation of around 1,400 jobs directly and over 11,000 jobs across the industry. We are committed to working with our industry partners in academia, skills support and supply chain to develop a resource skills plan which is sustainable and coordinated, to meet our CP2030 targets and beyond.

METRICS FOR MEASUREMENT:
Agreements with industry partners.

Use Global Green Employment (GGE) platform to increase engagement in green jobs across the sector by tracking and monitoring the number of suppliers engaged in the platform, the number of green jobs promoted and the number of universities, colleges and green courses available.

KEY MILESTONES:
Develop a joint coordinated resource and skills plan with our strategic partners. **(Q4 2026)**

As part of our continued development of GGE in the UK, engage universities, supply chain, skills bodies, government and the sector in providing the most up to date information to encourage and support people to enter the industry. **(2024-2031)**

Develop an inclusive and diverse workforce

We will continue our relentless drive to achieve a truly inclusive and diverse workforce through our improved policies, recruitment processes and by supporting and training our people leaders in Diversity Equity and Inclusion (DEI) Legal training, inclusive recruitment and inclusive leadership. We are also committed to improving our DEI data collection rates throughout RIIO-T3. As part of Iberdrola's global certification, ScottishPower is committed to obtaining the EDGEplus certification in 2026.

METRICS FOR MEASUREMENT:
Training plan, % completed.

Data collection rates of Diversity & Inclusion information and reporting of this.

Adopting the EDGEplus approach involves progressing our commitment to diversity and inclusion, covering not only the evaluation of binary gender equity but also its intersectionality with other dimensions of diversity.

KEY MILESTONES:
All senior and high potential leaders will complete Inclusive Leadership Training. **(Q1 2026)**

All people leaders will have completed DEI Legal training. **(Q4 2026)**

As part of Iberdrola's global certification, achieve EDGEplus Certification. **(Q4 2026)**

Work together through partnerships

We will work in partnership with our supply chain to deliver our portfolio of works collaboratively to ensure the deliverability at pace and on time.

METRICS FOR MEASUREMENT:
Annual procurement plan.

KEY MILESTONES:
98% of contracts secure by value, for our CP2030 and HND portfolio. **(Q1 2026)**

80% of contracts secure by value, for all other projects. **(Q1 2026)**

Release annual procurement plan. **(2026-31)**

Become a data-driven organisation

We will engage with our internal and external stakeholders on an ongoing basis through interviews, surveys, consultations and targeted events to develop Data products and services which support their needs, enabling us to provide accessible, high-quality data shared in formats which are secure and interoperable.

METRICS FOR MEASUREMENT:
Annual population of Data Best Practice assessment framework; tracking improved level of compliance across RIIO-T3 period.

Maturity level target of 5 "advanced" across principles 1, 5, 6, 7 and 11 and Maturity level target of 4 "embedded" across remaining principles.

Updated scores included in our December Digitalisation Strategy Action Plan.

KEY MILESTONES:
We will launch a consultation to engage with our stakeholders to identify, develop and publish value adding data sets on our Open Data Portal. **(Q2 2026)**

We will conduct a quality assessment of our network data domains of Asset Management, Operations, and Connections, and develop a programme of data improvement initiatives which will be delivered by the end of the price control period. **(Q4 2026)**

Incentive-driven change

Incentives are a core component of the RIIO framework, which support our progressive delivery plans and directly benefit consumers by driving improved service levels in the areas that matter most to the homes, businesses and communities we serve. The RIIO-T3 incentives framework should continue to drive us to innovate and run our network to better meet the needs and demands of consumers and network users, going above and beyond our licence requirements.

We are confident our business plan is ambitious, and an effective incentives package will recognise that putting customers and sustainability at the heart of our decision making will encourage innovation, help manage risk, ultimately reduce consumer costs, and encourage us to develop new approaches and find opportunities to exceed expected standards.

VALUE

SERVICE

New Connections Incentive

Incentives should drive the right behaviours from TOs to support an economic and efficient coordinated electricity system, enabling the required connections, create value for money for consumers and, drive us to go further to support ambitious Net Zero targets. We welcome Ofgem's view that connections incentives should be looked at holistically, to encourage networks to deliver the outcomes and service that customers want and that incentives should be comparable in strength to those within RIIO-T2. We encourage incentives which are based on customer satisfaction, recognising the vital importance for customers to feedback on their interactions with us throughout their connections journey.

We are entering a pivotal period, with ongoing work on Connections Reform and Clean Power 2030, both in development. We stand ready to work with Ofgem, the NESO and other industry partners to develop and establish RIIO-T3 incentives for the reformed connections model in 2025. It will be important that any connection incentives drive us to make the right decisions to encourage and support the drivers of connections reform, promote co-ordinated network solutions, support those projects 'ready' to proceed with their connections, whilst recognising ambitious Net Zero targets and alignment with strategic network design plans.

We will continue to survey our customers in RIIO-T3 through the New Infrastructure Stakeholder Engagement Survey, a reputational incentive to understand the views of stakeholders who are most impacted by new infrastructure. Given the ambitious developments and projects required during RIIO-T3, we are committed to ongoing engagement and feedback from the communities impacted by our work. We want to understand how we can support communities as we develop the network needed to play our part in the delivery of Net Zero.

RESILIENCE

VALUE

Energy Not Supplied Incentive

MOTIVATION:

Network reliability

Security of supply

Manage risk

Limit outage exposure

PERFORMANCE IN RIIO-T2:

Accumulative ENS target 2021-2023:

390MWh

Our achievement:

91.91MWh

The Energy Not Supplied (ENS) Incentive drives TOs to ensure reliable energy supply to their customers. Our number one priority is keeping the lights on for the communities and businesses we serve, and whilst we support incentivisation in this critical area, our focus on reliability stems from our commitment to those we serve. The incentive has supported change within our business, including the introduction of new approaches to minimise consumer risk. It is business-as-usual for us to take actions to secure supply under a planned outage and make decisions in advance on how we can avoid faults altogether. The processes we follow support consumers by securing energy supplies and allowing us to maintain a reliable network. The balance of reward and penalty within the incentive helps balance affordability and reliability for all stakeholders and is currently strongly weighted to benefit consumers.

We are proud of the changes we have made which have driven improved service levels and have allowed us to exceed the RIIO-T1 and RIIO-T2 ENS targets. In RIIO-T3 we will continue to perform our now well-established actions to ensure reliable electricity supply. This will be critical given the volume of strategic projects, customer connections and asset replacement activities required. However, the ENS risk will unavoidably increase in RIIO-T3 as the volume of planned works puts pressure on alternative parts of the system and the number of interventions on the network mean more outage exposure. Yet we believe our behaviours will continue to reduce the day-to-day customer exposure to potential outages in RIIO-T3.

CASE STUDY

Energy Not Supplied

In November 2022, a loss of supply event was triggered by a third-party crane boom operating directly under the overhead line sections of our Bonnybridge – Bathgate/ Drumcross 132kV circuits. In response, we carried out mitigating actions to limit the effect of the ENS and to restore supplies quickly and efficiently.

Following the incident, the Delayed Auto Reclose protection operated correctly to prevent supply loss to the Bathgate substation, working to restore supply using 33kV network switching in co-ordination with the affected Distribution Network Operator (SP Distribution), and dispatching sufficient resources to manage the site safety and to ensure that normal supply arrangements could be quickly restored. Whilst this event was not incentivised due to the third-party damage, the actions taken reflect the efficient response to loss of supply events we have developed under the incentive.

5,623 customers

Customers affected, with a total loss of supply of 1.6MWh.

5 minutes

The time it took to reconnect customers following damage.

Ofgem's review

Found that our mitigating actions restored supplies quickly and efficiently.



INFRASTRUCTURE SERVICE

Insulation and Interruption of Gases (IIG) Incentive

MOTIVATION:
 Environmental change
 Drive progress
 Reduce leakage impact
 Raise benchmark

PERFORMANCE IN RIIO-T2:
 IIG emissions exc
 exceptional events:

TONNES CO₂e IN 2022:
 Target **21,703**
 Actual **12,196**

TONNES CO₂e IN 2023:
 Target **21,994**
 Actual **12,145**

TONNES CO₂e IN 2024:
 Target **20,805**
 Actual **5,306**

This environmental incentive promotes a reduction in the leakage of SF₆ gas and other gases from assets on our network and supports the transition to low greenhouse gas alternatives. Its presence has encouraged and supported us in a forward-thinking approach, that has ensured we mitigate the environmental impact from network activities. As we build, replace, and decommission infrastructure in RIIO-T3 the incentive will, alongside our legal obligations, continue to mean we raise our standards, ensuring that we explore green alternative solutions and lessen our environmental impact.

Within RIIO-T3 we will continue to replace SF₆ filled assets, which will be driven by asset condition. Through both innovation and business-as-usual projects, we anticipate the removal of around 15 tonnes of SF₆ from Gas Insulated Busbars. We have designed a number of other initiatives to support the reduction of SF₆ on our network and help us detect leakage more readily, including the development of a retrofill gas which will remove up to eight tonnes of SF₆ from our equipment. We are also working collaboratively with the other TOs to identify potential assets at risk of leakage, taking proactive and preventative actions. This forms part of our overarching RIIO-T3 IIG Strategy.

We welcome ambitious IIG targets linking to our Science-Based Targets (SBT) which will reward us where we succeed and penalise us if we fall short. We consider it prudent that any IIG target in RIIO-T3 should be based on outperforming the rate of reductions necessary to achieve our SBT. We want to work with Ofgem to set an appropriate level of ambition, recognising successes to date and the difficulties in maintaining an ambitious target, based on our strong historic performance.

CASE STUDY

Western HVDC Link

Given system operability challenges in the absence of the fault level contribution from Hunterston Nuclear Power Station and ahead of the completion of the Hunterston East – Neilston reinforcement project, we identified the HVDC Run-Back scheme to enable the Western High Voltage Direct Current (HVDC) link to operate at an increased 2.2GW export capacity. Without the development and implementation of the Run-Back scheme, the Western HVDC Link would have been

significantly limited from January 2021 to November 2023. The ESO estimated the scheme saved consumers £35.9m in constraint costs between 2022-2024. The incentive is to develop and deliver works which otherwise would not have occurred, given the technical and commercial challenges of the solution. The incentive mitigated the risks we faced in developing the solution, enabling us to mitigate system operability constraints, reducing the costs paid by consumers.



INFRASTRUCTURE RESILIENCE VALUE SERVICE

SO:TO Optimisation Output Delivery Incentive

The System Operator: Transmission Owner (SO:TO) incentive proactively encourages us to identify and provide solutions to the National Energy System Operator (NESO) to help reduce constraint costs paid by consumers. The incentive allows us to explore innovative ways to approach our delivery plans to reduce consumer costs and improve the service standards of electricity stability and reliability.

In RIIO-T2 the SO:TO incentive has driven a step-change in the way that we identify optimisation solutions, and in RIIO-T3 we will conduct additional route surveys beyond business-as-usual activities, as well as more in-depth studies of our outage plans to identify optimisation opportunities. We will apply our SO:TO Optimisation solution identification process to 100% of outages planned in the Optimisation and Year Ahead stage in RIIO-T3 to identify and propose high-quality solutions and deliver constraint cost savings for consumers. The incentive has significant further scope in RIIO-T3 to develop the behaviours and practices that will drive Whole System value and reduce consumer costs.

With the required development of major infrastructure in RIIO-T3, the necessary reinforcement to support new connections, along with regular maintenance and asset upgrades, the need to manage planned network outages in the period will continue to rise. This makes the SO:TO incentive even more important to our plan. We will work around scheduled activities wherever possible to reduce network constraints, decrease associated consumer costs and stabilise network resilience during times of development. Working together with the NESO, the incentive will allow us to dedicate time and resources to planning, scoping, and implementing changes to reduce constraint costs and benefit consumers financially in both the short and long term.

To build on the success of the SO:TO incentive we have been exploring how the principles could be applied to wider licensees. Working with the other TOs and Ofgem we have been investigating reform of the current Coordinated Adjustment Mechanism (CAM) to incentivise network ambitions to identify high-quality Whole System solutions, which would improve system efficiency and maximise consumer benefit.

MOTIVATION:
 Collaboration
 Improve standards
 Increase reliability
 Build resilience

PERFORMANCE IN RIIO-T2:
 The SO:TO Incentive has enabled an increased focus above BAU on constraint cost mitigation in RIIO-T2.

Delivered consumer savings in 2021 & 2022:

£25.79m

Anticipated consumer savings in 2023:

c.£60m

