SP Transmission

Annual Performance Report 2023/24

SP Energy Networks

Our business

We take electricity generated from power stations, windfarms and various other utilities and transport it through our vast transmission network.

SP Transmission plc (SPT) is the licensed Transmission Owner (TO) responsible for the transmission of electricity in central and southern Scotland. SPT is a wholly owned subsidiary of SP Energy Networks (SPEN). SPEN is part of the Iberdrola Group – a global leader in clean energy, grids and storage.

At SPEN, we keep electricity flowing for seven million homes and businesses 24 hours a day, 365 days a year. Our network collects low voltage electricity generated from power stations, windfarms and various other utilities, and transforms it to the higher voltages needed to efficiently transport electricity over long distances. This high voltage electricity travels to substations located strategically around our network, where it is reduced back to the low voltages needed for use in homes and businesses. Our substations also function as points of connection to our network for customers and neighbouring networks.

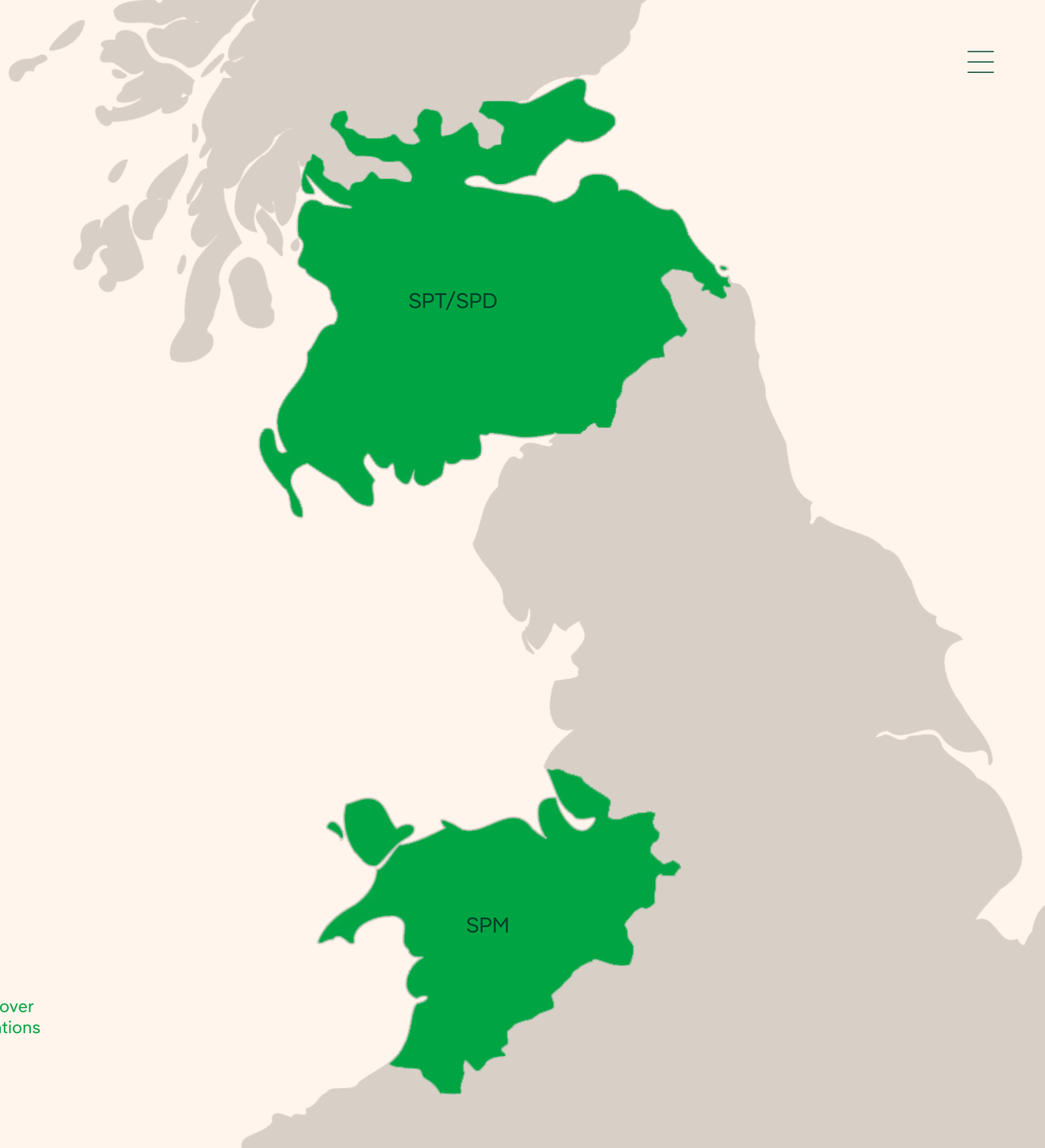
Our system is crucial to the delivery of the Scottish and UK Government's renewable energy objectives due to our location in an area of outstanding renewable resource and our geographical location. We have a unique role in connecting renewable generation and bulk transfer of renewable energy from Scotland into England & Wales benefiting stakeholders well beyond our licence area.

£4.4 billion

Regulatory Asset Value is forecast to be £4.4bn at the end of RIIO-T2

4,500km

Our Transmission network is comprised of over 4,500 kilometres of circuits and 160 substations operating at 400kV, 275kV and 132kV



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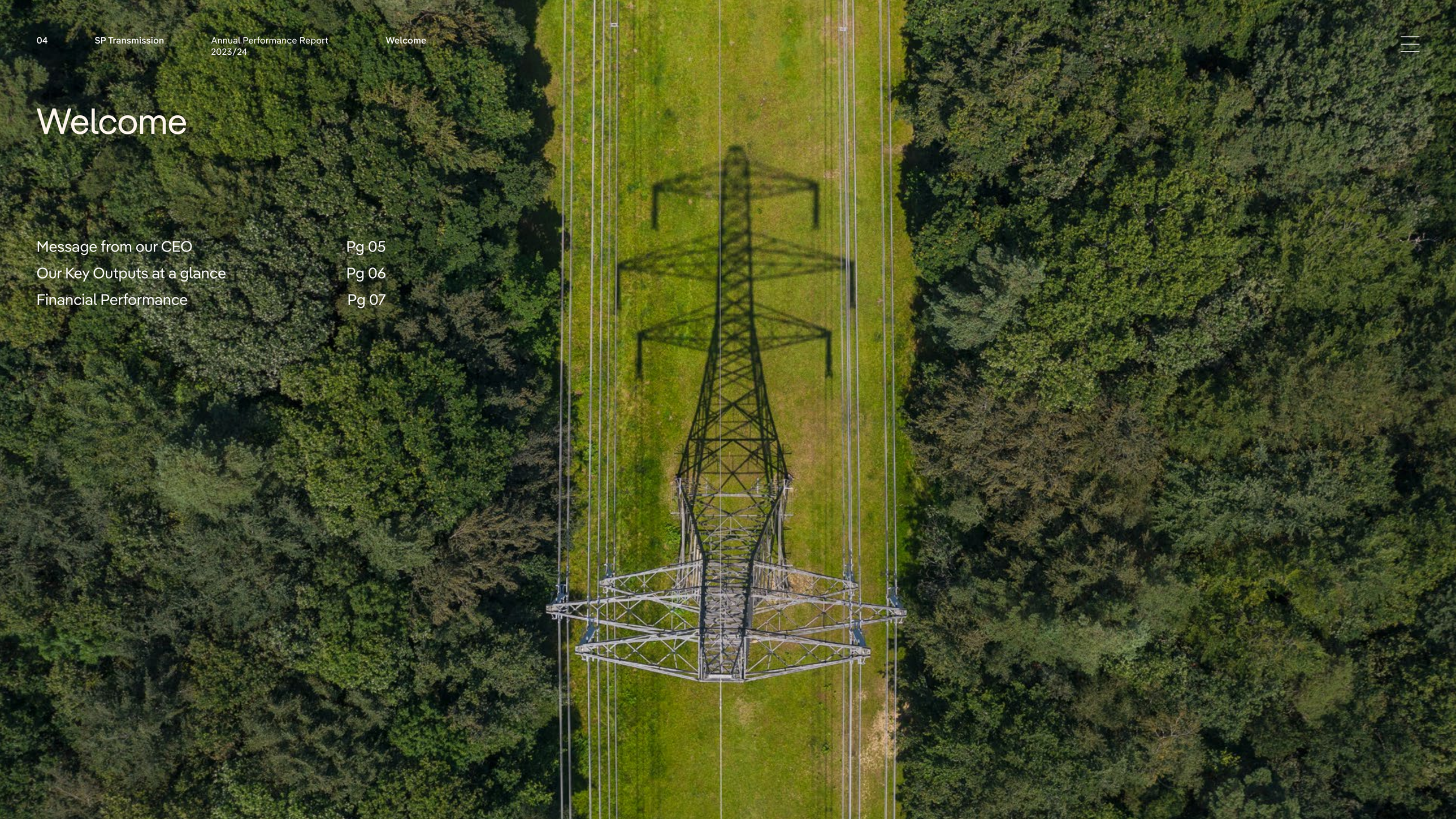


SP Energy Networks is at the forefront of enabling Net Zero and the transition to a more sustainable future for us and future generations. We have a critical role to play, supporting decarbonisation by enabling high volumes of low carbon connections to our network while ensuring security of supply within our Licence area and beyond.

As I step in to my new role as CEO of SP Energy Networks, I reflect on a transformative year for SP Transmission, marked by significant achievements and strategic advancements. We have navigated the challenges of a dynamic industry with our customers at the heart of every decision that we make. Looking ahead, we are excited to build on this momentum, driving forward with a clear vision for a connected future.

Together, we are powering progress and striving to deliver excellence in transmission. Thank you for your continued trust and support. Please read on to find out more about our performance in the last year.

Momentum is growing throughout our RIIO-T2 investment programme, which is crucial given the scale of growth at pace that is required of our business. We forecast to spend £2.9bn, from 2021-2026, in our Transmission network as part of a demanding investment programme which will deliver on our RIIO-T2 commitments – building major infrastructure to pave the way for a low carbon future, connecting our customers, and replacing or upgrading assets to safeguard the long-term performance of our network.

As an operator of Critical National Infrastructure, our priority is to keep the power flowing to our 3.5million customers across our Distribution and Transmission license areas, in turn keeping them connected to family, friends, vital services and work. In 2023/2024, we achieved a reliability level of 99.9999%. This not only ensures that daily life remains uninterrupted but also supports critical infrastructure within our Licence area and beyond, ensuring that electricity generators and consumers continue to benefit from the outstanding levels of reliability to which they are accustomed.

From an environmental perspective, good progress has been made with our Business Carbon Footprint (BCF). In 2023/24, our annual BCF (excluding losses) was 18,481tCO2e. This is 9% lower than in 2013/14 when we first started measuring our BCF. However, the 2023/24 annual BCF emissions increased from the previous year principally due to an 'exceptional' SF_6 leakage event which occurred at Hunterston Conversion Station in June 2023. This event led to an increase of 5,311tCO2e which accounts for 29% of this year's Business Carbon Footprint.

For the regulatory year 2023/24, revenue increased by £145m to £459m compared to the prior year of £314m. Our operating profit was £286m, an increase of £124m compared to prior year. Net profit was £164m, an increase of £70m compared to prior year. The main driver of the increases year on year are higher allowed revenues due to an increase in investment, and inflation offset by higher interest costs in line with the wider macro-economic environment.

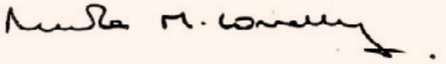
Similar to 2022/2023, in 2023/2024 we continued to see a significant increase in the number of applications being made to connect generation and demand projects to our network – a 53% increase on the previous year. With over 700GW of contracted capacity currently in the GB-wide transmission and distribution queues, there continues to be a pressing case for significant reforms to the existing connections process, at the earliest opportunity. We therefore continue to be fully engaged in the ESO and Ofgem-led Connections Reform work.

We also continue to work closely with UK and devolved governments and regulators to address additional challenges that are ancillary but closely connected to this challenge, specifically planning and consenting challenges, together with supply chain availability and sustainability.

In light of the limitations that we see in the supply chain, we have reviewed our contracting and delivery strategy. We commenced an extensive tendering exercise to create a framework for our future overhead line and substation works with an estimated value of £5.4bn. This tender was launched in January 2024, and we expect to award by the end of 2024 with the first works on the framework commencing in early 2025. This framework will provide long-term commitments to the supply chain to cover RIIO-T2 and RIIO-T3 works, as well as Accelerating Strategic Transmission Infrastructure (ASTI) and other emerging projects over the next 5+ years. This long-term commitment is essential for the supply chain to have visibility and confidence in the pipeline of work to increase resourcing and invest in the equipment required to deliver these works. We are undertaking a competitive process to select the framework partners to ensure value for money but also endeavouring to introduce new entrants to the market through this process, in particular from service partners who are not UK based and have skilled resources in Europe. Proactive measures and strategic adjustments in these areas are key to navigating the complexities of today's global supply networks.

As our investment plans increase, we are also increasing the number of staff in SP Transmission and the associated support functions. We are in the process of opening new operational sites including a major logistics hub at Eurocentral and an office in Edinburgh.

At the heart of everything we do are our customers. They have every right to expect an excellent experience when they interact with us, and it is essential for us to maintain an open and honest dialogue and continue to measure what is important to them. As part of our RIIO-T2 Business Plan 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, more commonly known as the 'Moments that Matter'. We are now in the third year of the survey with our customers rating us 8.27 out of 10, against a benchmark of 7.7. We will strive to further improve satisfactions levels over the remaining years of RIIO-T2 and beyond.



Nicola Connelly
CEO, SP Energy Networks

Our Key Outputs at a glance

	Metric/Target		Actual (in Year)	Status	Year on Year Trend	Comment
Moments that Matter	7.7	(Ofgem break even level)	8.27	Ahead of Target	Improvement on Previous Year	The score for overall satisfaction increased slightly from 8.23 in 2022/23 to 8.27, an increase of 0.04. Survey response rates decreased to 42% (54% in 2022/23).
Timely connections	100%	(74 calendar days to submit final offer)	99.72%	Below Target	Improvement on Previous Year	351 were issued on time and 1 was issued late. The volume of connection offers this year increased by 60% against prior year.
Network capacity	1,781MVA	(RIIO-T2 baseline cumulative 38%)	53MVA	Ahead of Target	Deterioration on Previous Year	Network capacity was added through two reinforcement schemes.
Connections to the network	544MW	(RIIO-T2 baseline forecast cumulative 38%)	129.5MW	On Target	Deterioration on Previous Year	There were 3 new connections commissioned in the reporting year.
Network Asset Risk Methodology	100%	(T2 business plan target)	38.4%	Ahead of Target	Improvement on Previous Year	Increase from 11%.
Energy not supplied	130MWh		91.77MWh	Ahead of Target	Deterioration on Previous Year	Previous year was 3.81MWh. External factors such as the weather had a much bigger impact this year compared to previous years. The number of Transmission system incidents increased from 3 to 8. Whilst performance against previous years has reduced it should be noted that it is still significantly lower than the target of 130MWh.
Contractor safety	Total Recordable Injury Rate (TRIR)		0.59	On Target	Deterioration on Previous Year	TRIR is a widely used indicator and expresses injury levels as a factor of hours worked (injuries per 100,000 hours). A continuous drive for zero harm is our aim. This is an increase on last year.
Public safety	0		0	Ahead of Target	In line with Previous Year	We can report again this year that there were zero injuries to the general public resulting from our assets or operations.
Carbon footprint – SF_6 leakage	946kg		689kg	Ahead of Target	Deterioration on Previous Year	We are still outperforming on our SF_6 leakage.
Buildings energy use – Substation Electricity	No individual target. This is included within the Total BCF target.		1,653tCO2e	Below Target	Improvement on Previous Year	This is down from last year's emissions of 1,849tCO2e.
Buildings energy use – Office & Depot Electricity	1,693tCO2e		0tCO2e	Ahead of Target	Improvement on Previous Year	This year, we recorded 0tCO2e for the footprint associated with office buildings and depots energy use due to a complete transition from standard tariffs to green tariffs.

Ahead of Target · On Target · Below Target

Improvement on Previous Year · In line with Previous Year · Deterioration on Previous Year · Substantial deterioration

Financial Performance

Our Expenditure

Our total expenditure for reporting year 2023/24 was £421.9m. This was £63m below our equivalent totex allowance. The tables shown below use 2018/19 prices.

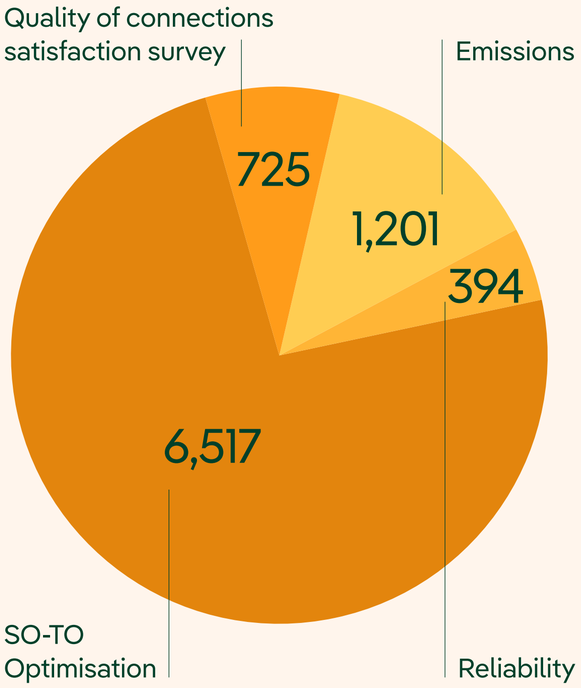
Totex comparison (2023/24 real £m)

Reporting Year	Allowance £m	Actual £m	Variance £m
Load Capex	272.04	248.43	23.61
Non-load Capex	91.20	91.39	*-0.19*
Controllable Opex	22.55	20.10	2.45
Non-Op Capex	1.69	2.07	*-0.37*
Indirect Costs	67.52	54.40	13.12
Other Costs	30.12	5.50	24.62
Totex	**485.12**	**421.89**	**63.23**
Cumulative TOTEX			
Load Capex	521.68	370.58	151.10
Non-load Capex	295.41	252.52	42.88
Controllable Opex	69.23	57.47	11.76
Non-Op Capex	6.39	6.30	0.09
Indirect Costs	177.95	178.97	*-1.03*
Other Costs	58.68	13.70	44.97
Totex	**1,129.33**	**879.56**	**249.78**

Our Revenues

In 2023/24 we recovered £545.1m. Our revenues are set through regulation by Ofgem. They comprise an element which is fixed, an element which is linked to specified variables (such as the amount of connected generation), and an element to capture incentives and other allowances along with adjustments from previous years.

Incentive awards earned in 2023/24 (£ thousands)



Changes in actual or forecast performance under the various incentive schemes will affect revenue allowance in the next round of tariff setting, until final performance is known – a lag of up to two years.

Our Return on Regulated Equity (RoRE)

Investment into the electricity transmission network is a long-term project, the costs of which are spread out over the lives of assets.

RAV (Regulatory Asset Value)

For every pound that we spend, we collect 15% of the costs in the same year and 85% of cost over life of the asset.

15% of every £1

Ofgem assume that we fund this RAV by:

- 55% borrowing of which the allowance for interest payments is 1.92% in 2023/24
- 45% equity with return of 4.91% in 2023/24
- Weighted average cost is 3.27% in 2023/24

45% equity

As at 31st March 2024 our RAV was £3,572m (2023/24 prices), up on the prior year at £3,150m (2023/24 prices) due to higher investment on the network going into the RIIO-T2 price control period.

£3,150m
RAV 2022/23

+£422m
RAV 2023/24

5-year average 2022/23 RoRE

4.80%	**Base Return** Set by Ofgem for the 5-year period, reflecting movements in market conditions
0.08%	**Business Plan Incentive** Agreed by Ofgem as part of the price control, and is the reward for the quality of our business plan submission
0.00%	**Totex Efficiency Savings** Any savings we make on our investment plan are shared with the consumer, at this early stage in the price control we are forecasting the cost of delivering our business plan commitments will match what we set out in our business plan submission.
0.09%	**Reliability Incentive**
0.11%	**Emissions Incentive**
0.00%	**Timely Connections Incentive**
0.07%	**Quality of Connections Incentive**
0.14%	**SO-TO Optimisation Incentive**
0.00%	**Environmental Scorecard Incentive**
-0.02%	**Network innovation**
5.27%	**RoRE** – Operational performance

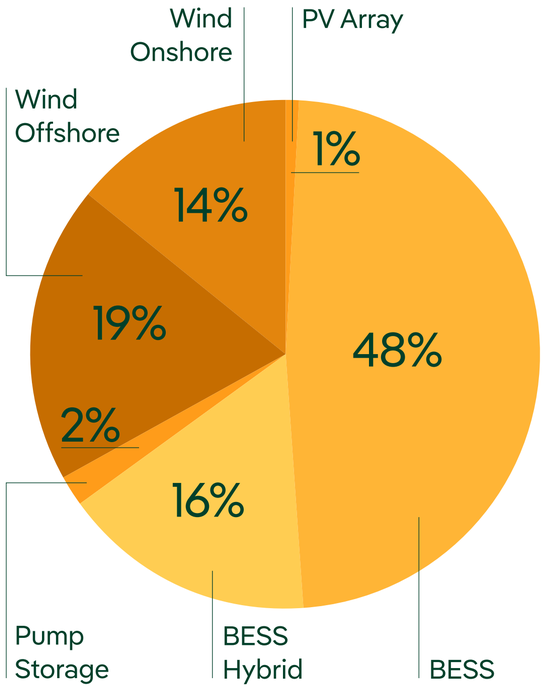
Key Performance Areas

Transmission Connections

For this regulatory year, our team has continued to receive significant volumes of connection applications for access to our network for both direct connections to the transmission network as well as embedded connections, via the distribution network. For the year 2023/24, we processed 645 applications, an increase of 53% from the previous year, 2022/23. With a significant contracted background of over 62GW, major network reinforcements are now required to meet the scale of this unprecedented demand for transmission connections.

In the past 12 months, this contracted background has grown considerably, to over 62GW. With winter electricity peak demand in Scotland being 5GW, and the ESO's latest scenarios suggesting 28GW capacity is required across our network to deliver Net Zero by 2050, and 84GW across the whole of Scotland, this highlights the current scale of over-capacity within the transmission connections process.

Our current contracted background is made up of the following technologies:



Connections Reform

With over 720GW[1] 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 Electricity System Operator (ESO) and Ofgem led Connections Reform work. We are working closely with Ofgem, Government, the ESO, other network operators and industry, ensuring full SPT representation on the key working groups which are considering and driving forward these necessary industry changes: these key working groups include the Connections Delivery Board, the Connections Process Advisory Group, the Energy Networks Association's Strategic Connections Group and the connections reform code working groups CMP434 and CMP435.

We also continue to work closely with UK and devolved governments and regulators to address additional challenges that are ancillary but closely connected to this challenge, specifically planning and consenting challenges, together with supply chain availability and sustainability.

[1] ESO TEC Register

Customer Engagement

We now host our previously annual Customer Connections Summits on a bi-annual basis. These Summits enable us with the opportunity to provide the very latest updates to customers in relation to developments on our transmission network as well as the ongoing Connections Reform work which is looking to revise the current GB-wide connections process. Importantly, our bi-annual Summits also provides us with the opportunity to listen directly to our customers feedback, which we look to act upon, as we continually look to improve our customer engagement. For example, we have taken onboard customer feedback on the wait time for a pre-application meeting to discuss their transmission connection intentions and have put new measures in place to reduce this timeline down from 5 months to 3 weeks. We also use this event as opportunities to identify where new engagement is required and have introduced wider focused emails on reinforcement works on our network.

Additionally, we are working closely with our innovation and data colleagues to trial and develop new self-service tools for our customers. Through this, we have a proof of concept (PoC) initiative in place to trial an online tool that will aid our customers in improving their understanding of current network capacity and constraints in regions across our network. This will help inform customers as to what an offer may look like, should they choose to apply for a connection in that particular part of our network.

Customer Satisfaction

Our customers are extremely important to us, they are at the heart of everything we do, and they have every right to expect a good experience when they interact with us. It is essential for us to maintain an open dialogue and continue to measure what is important to them. By measuring what is important to them, we can tailor our services to meet the evolving needs and expectations of our customers. This approach not only enhances our customers' experience but also drives innovation and growth within our business.

As part of our RIIO-T2 Business Plan we are committed to delivering for our customers and improving the quality of service as measured through the Quality of Connections survey, more commonly known as the 'Moments That Matter'. This mechanism offers a penalty/reward incentive based on those customers rating us out of 10 on their satisfaction of the level of service we provide to them.

As part of the 'Moments that Matter' (MTM) our Connections Customers were surveyed at six key milestones throughout the connections process.

1. Pre-application Engagement
2. Application Process & Offer
3. Development Phase
4. Delivery Phase
5. Outage Management
6. Connected Customer Reviews

The surveys were undertaken on our behalf by a specialist third party 'Taylor McKenzie Research & Marketing Ltd'.

The overall satisfaction score across all the MTMs is 8.27, demonstrating a high level of satisfaction from our customers. Connected Customers, MTM 6, gave the highest score overall this year (9.62) whilst those customers in the Application Process & Offer stage MTM 2, scored lowest (7.13).

The score for overall satisfaction increased from 8.23 in 2022/23 to 8.27. This reflects the continued improvements and initiatives we have implemented throughout the year. Although participation rate in the survey dropped to 42% (53% in 2022/23) there was an overall increase in the total number of responses as there was a 35% increase in MTMs triggered. This is due to the increased activity in transmission connections.

We have identified several areas of focus across all of the MTMs and will continue to review our customers' feedback to improve the overall customer experience during the connections process and build on this year's performance.

MTM survey score 10/10

"The outage management and the direct communication from SP Transmission is excellent, and among the best I have received from any network operator."

Connections customer 2023/2024

Below: Customer connections summit 2023/24

MTM survey score 7/10

"The process would benefit from more interaction throughout to clarify requirements and details.

Connections customer 2023/2024

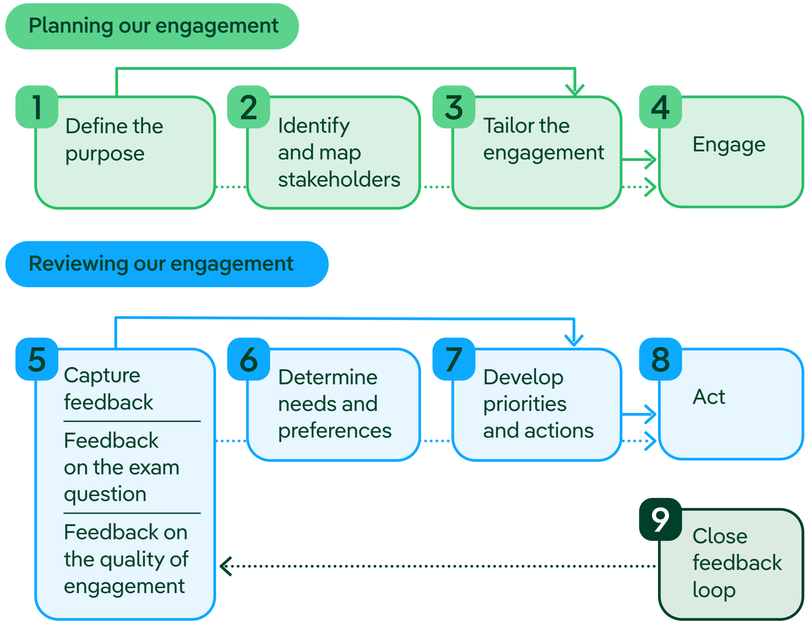
The six 'Moments That Matter' Survey results 2023/24

	Submitted for Survey	Customers Surveyed	Participation Rate	Score
1. Pre-application Engagement	102	54	53%	8.48
2. Application Process & Offer	227	54	24%	7.13
3. Development Phase	60	33	55%	8.39
4. Delivery Phase	29	14	48%	7.93
5. Outage Management	40	22	55%	9.32
6. Connected Customer Reviews	30	21	70%	9.62
Total	**488**	**198**	**42%**	**8.27**

Stakeholder Engagement

Engaging with stakeholders

Through our newly published 2024 Stakeholder Engagement Strategy, we set out five principles which drive our engagement efforts; Inclusive, Authentic, Tailored, Innovative and Deliver Value for Money. These principles are derived from how we currently operate, and how we want to operate in the future, allowing us to be responsive to stakeholder needs and help us improve our approach. It also details the nine-step process of how we plan, review and close engagements, with innovative tools to support our approach.



Our track record

We have a strong track record of delivering high quality engagement across our Transmission and Distribution businesses. Each year we ask AccountAbility, owners of the global AA1000SE standard for stakeholder engagement to conduct a Healthcheck of our performance. In 2024, we achieved a score of 91%, up from 89% the previous year. This represents the highest level of AccountAbility's 'Advanced' classification.

Looking ahead, we remain fully committed to a continual cycle of reviewing and improving our engagement practices. With recommendations from the AccountAbility Healthcheck, we are developing a programme of improvement, working together with our stakeholders to deliver meaningful engagement.

> "SPEN continues to be strongly aligned to the AA1000 AccountAbility Stakeholder Engagement Standard. The organisation shows a strong commitment to enhancing SPEN's stakeholder strategy, which is communicated both internally and externally."
>
> AccountAbility Scorecard 2024

AccountAbility AA1000 Stakeholder Engagement Standard:

Advanced

SP ENERGY NETWORKS AA1000 STAKEHOLDER ENGAGEMENT PERFORMANCE ADVANCED 2024

AccountAbility Health check Progress

Embedding the right tools and processes

We have continued to build on the strength of our stakeholder management system – Tractivity – and have updated its capacities to provide us with greater flexibility and a wider range of functional tools to manage our engagement.

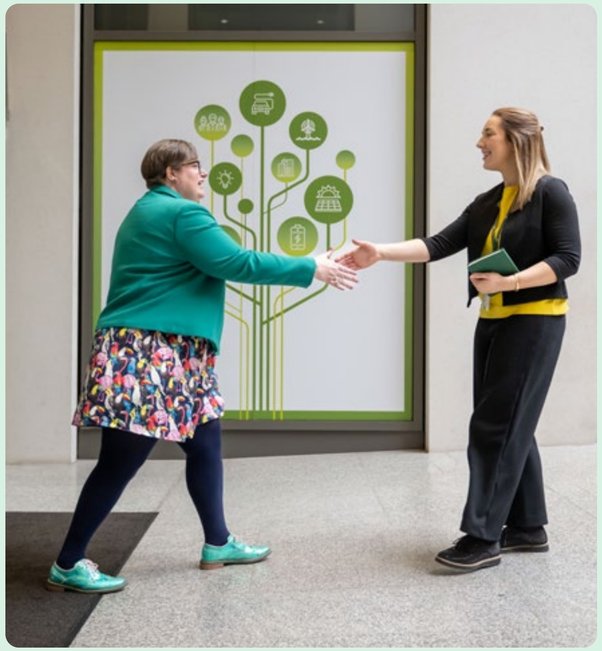
In January 2024, we launched our online Engagement Portal, powered by Engage-360 from Tractivity. The portal links directly with our management system and enables stakeholders to take part in surveys, register for events, and contact us regarding consultations. Importantly, we can share outputs and the impact of our engagements directly with those involved. Our Engagement Portal is accessible via our stakeholder webpages, updated this year, providing a comprehensive overview of how and why we engage.

We have committed to re-testing our engagement priorities with customers and stakeholders on an annual basis and presenting the results to our independent external group every year along with our action plans. We have carried out an annual stakeholder priorities survey to ensure we understand the priorities of our stakeholder and customer groups and reflect those in our engagement. The findings from the survey will be integrated into engagement plans across the relevant business areas.

Community Liaison

Community liaison is one of the main pillars that allows us to successfully complete activities and deliver projects. Relationships with local communities, that have grown and developed over many years, are built on trust.

With our assets and infrastructure situated throughout central and southern Scotland, we have long established relationships across our area that ensure clear communication channels and points of contact are firmly in place to the benefit of all involved. By establishing clear communication channels and accessible points of contact, we can ensure that enquiries and concerns are addressed promptly, leading to resolutions that satisfy all stakeholders involved.



Community engagement is key

With RIIO-T2 well underway, the community liaison team continue to ensure that local communities are made aware in advance of projects taking place on our overhead lines and substations and that every effort has been made to reduce any impact on local communities while work progresses. In addition to local households and businesses, the team engage with ward councillors, community councillors and established groups, often attending evening meetings to provide information and deal with any concerns raised at these forums. One such example of this seen Project Teams recently attended Barrhill Community Council meeting in South Ayrshire prior to work commencing on both Markhill Substation Extension Project and Chirmorie / Strannoch Wind Farm Connections. We are increasingly finding that communities understand the requirement for the volume of work taking place on the network which in the future will deliver many benefits – Net Zero, energy security and stability at the same time allowing our economy to prosper.

Sharing project proposals at an early stage

The community liaison team support the drop in consultation events ensuring that the community is informed and involved in the planning process. These early introductions provide community members with reassurance that Community Liaison will be in place when the project nears the point of delivery. For example an event was recently held in the village of Kincardine in Fife, offering a platform for dialogue and feedback on the proposed construction of Kincardine North Grid Substation.

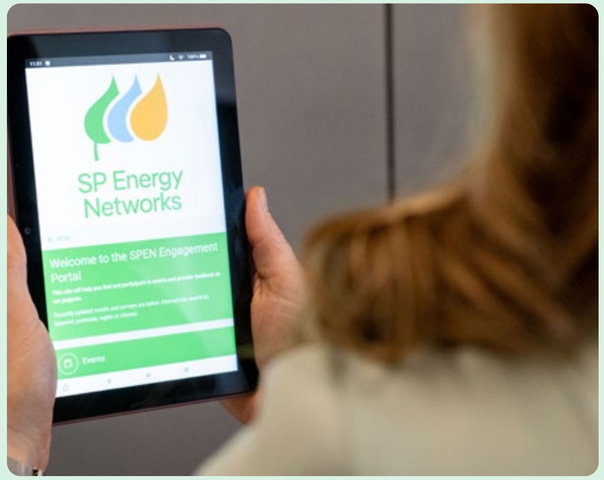
Community support in action

In addition to sharing operational information, we are committed to supporting communities in practical ways with this wider engagement taking place across a range of activities. Each year the community liaison team enjoy attending a number of agricultural shows with the SP Energy Networks events trailer and are also regularly involved in careers events and STEM inputs at schools across central and southern Scotland. When possible, we provide limited direct support to local communities allowing them to put in place plans which may otherwise not be possible – an example of this is the funding of a solar panelled defibrillator (one of the first in Scotland) in the hamlet of Kendoon in Dumfries and Galloway which provides reassurance to the mainly elderly residents at this rural setting.

Supporting good causes at SPEN is very much part of our culture – Beyond the main charities supported by the Scottish Power Group, various SPEN offices actively engage in local community support through foodbank donations and festive season initiatives, like our present collection for charities such as the Salvation Army.

Easy to access online information

The SP Energy Networks website provides a range of information which includes transmission projects in both development and delivery stages.



Evaluating our performance

To deliver the network our stakeholders and communities need, we must measure what is important to them and respond to their ongoing feedback. Each year, we survey a broad range of stakeholders impacted by new transmission projects on the stakeholder engagement process and their experience of engagement with us. The survey, now in its third year, remains a critical tool for measuring stakeholder sentiment. Conducted by an independent market research firm, the survey offers valuable insights into stakeholder perceptions. This year the overall stakeholder satisfaction score was an impressive 9.1 out of 10. By focusing on continuous improvement and open communication, we can ensure that our stakeholder engagement not only meets but exceeds stakeholder expectations.

New Infrastructure Stakeholder Engagement Survey 2023/24

Innovation

Our commitment to innovation is evident in our proactive approach to the Net Zero journey. We have been at the forefront of developing new technologies and solutions that facilitate the energy transition, a critical component in achieving a sustainable future. With a focus on reducing energy losses from transmission substations and introducing environmentally friendly alternatives to SF_6, we are addressing the challenges of the energy system transition head-on.

Moreover, our dedication to innovation is aligned with the global movement towards Net Zero emissions, where the balance of emissions produced and removed from the atmosphere is zero, which is essential for limiting global warming as per the Paris Agreement.

Our innovation strategy, particularly during the RIIO-T2 period, reflects a comprehensive plan to deliver the needs of customers and stakeholders while contributing to the UK's low carbon targets. This strategy is not only about technological advancements but also encompasses a cultural shift towards a sustainable mindset, ensuring that the benefits of innovation are fully realised and integrated into the energy infrastructure of the future.

Strategy

Our RIIO-T2 Innovation Strategy focusses on the key energy transition challenges we foresee as facing our transmission network and reiterates our commitment to our customers and stakeholders. In our strategy we have developed 4 Innovation Clusters, mapped against the ENA Innovation Themes, which are guiding our innovation delivery and ensuring we develop a balanced Network Innovation Allowance portfolio:

— Network Modernisation

— Network Flexibility

— System Security and Stability

— Digitalisation of Power Networks

BLADE Project – Black Start from Offshore Wind project

A consortium led by us is launching a world-leading project to demonstrate the potential of using offshore wind to provide 'black start' restoration services to the electricity grid thanks to funding from energy regulator, Ofgem.

To achieve this, a strong consortium was assembled consisting of SPEN (as the lead network), SSEN, National HVDC Centre, University of Strathclyde and Carbon Trust. Carbon Trust is present in the consortium in its role as representative of the OWA programme. As such, it is bringing into the project a wide range of offshore wind farm developers as project partners: EDF Renewables, EnBW, Equinor, Ørsted, RWE, ScottishPower Renewables, Shell, SSE Renewables, TotalEnergies and Vattenfall.

Black Start is the better-known name for Active Electricity System Restoration Service – the procedure used to restore power in the event of a total or partial shutdown of the electricity transmission system – and which has traditionally relied on fossil fuels like coal and gas.

The Alpha Phase phase of the project was divided into four main workstreams:

1. **Technical Assessment of Onshore System Restoration from Offshore Wind:** This workstream focused on understanding the technical feasibility of different black start methodologies from offshore wind to restore the onshore network.
2. **Commercial Assessment of Onshore System Restoration from Offshore Wind:** This workstream aimed to understand the cost of the different black start methodologies, the value of these methodologies to the system, and the regulatory issues involved.
3. **Technical Assessment of Onshore System Restoration from Coordinated Offshore Network:** This workstream explored the challenges and opportunities of using the future coordinated offshore network to speed up onshore system restoration.
4. **Beta Phase Scoping:** Based on the assessments from the above workstreams, this workstream scoped out the Beta Phase of the project.

The insights and understanding gained from the Alpha Phase are instrumental in enhancing the configuration of offshore wind farms to assist system restoration. This is essential to optimise the overall system design for reliable and adequate restoration, which is necessary to achieve the Electricity System Restoration Standard requirement for each region of GB. The outcomes of the Alpha Phase guided the direction and focus of the subsequent Beta Phase which looks to bring the BLADE concept into reality by onboarding all the key stakeholders to determine the technical and commercial feasibility of the solution and produce a plan for rollout in GB. The beta application has been successful in winning OFGEM support and funding.

Flexible Railway Energy Hubs

Flexible Railway Energy Hubs will demonstrate a transformative approach to accelerate the decarbonisation of the single largest electricity consumer, Network Rail. An Energy Hub is a modular microgrid solution that integrates batteries and local renewable energy with the rail traction network. By transforming the railway into a flexible electricity consumer, the project generates benefits to the electricity network and consumers by reducing wind curtailment expenses via flexibility services and reducing engineering disturbances.

Our microgrid approach will be the first scaled demonstration of a battery powered microgrid that couples two large complex networks, rail, and electricity, facilitating cross-sector decarbonisation.

Hubs will use the railway traction power network as a conduit for delivering flexibility and ancillary services to the electricity transmission network. The “reach” of the traction power network gives access to a wide range of low-cost sites for battery storage and solar panel locations. The traction power network also reaches regions experiencing significant wind curtailment, where Hubs offer significant wind curtailment reduction potential.

Our NIA-funded work has demonstrated the potential for concurrent usage of Hubs to deliver services to the electricity network. Thus, the Hubs will have two distinct user groups: The **electricity network organisations** (ESOs and DNOs), electricity suppliers and **the railway network organisations** (Network Rail, TfL, HS1 and train operators).

The next phase is to demonstrate the minimum viable microgrid incorporating a 1MW battery at a scale able to prove the concept and derisk future investment. The project completed a successful application to the Ofgem Strategic innovation fund for Beta funding.

Cyber security for active and flexible energy networks (Cyber-SAFEN)

Overview

Cyber-SAFEN aims to build and demonstrate an integrated cyber defence (ICD) platform to provide a foundation on which to build essential cyber safe and resilient functions for electricity network PAC, WAMS and SCADA systems against advanced cyber-attacks. Cyber-SAFEN uniquely focuses on a combined intrusion detection (IDS) and intrusion response system (IRS) powered by advanced AI and machine learning technologies to build a dual defence system against advanced cyber threats.

Benefits

Cyber security is a key enabler in the energy system transition as we move to digitise our networks to enable Net Zero. Having a secure infrastructure reduces the likelihood of successful attack and harm.

The key benefits realised by undertaking this project include:

- Reduced risk of outages and damage caused by cyber attacks
- Enable increased digitalisation and automation across the network
- Builds a secure and resilient platform on which to rollout further applications.

A reliable electricity supply is critical everyday life. The 2015 Ukraine energy system cyber-attacks resulted in power outages for nearly 230,000 consumers in Western Ukraine. Cyber-SAFEN looks to develop systems to avoid such situations as well as mitigating any losses they could cause.

Progress

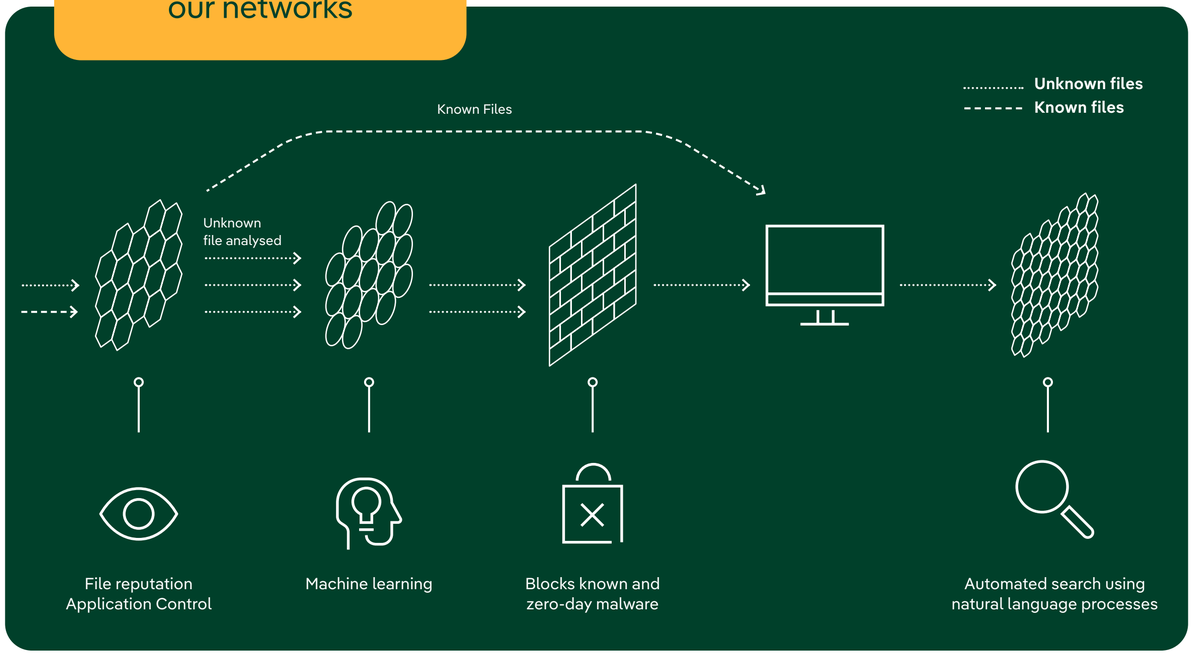
To achieve the aim of an Integrated Cyber Defence system, the project divides the deliverable objectives into four stages:

- Network and data modelling
- Cyber Intrusion Detection System (IDS) design and specification
- Intrusion Response/defence System specification and development
- Performance evaluation and analysis of Cyber-SAFEN solutions.

We’ve completed the first two work packages to design a novel Intrusion Defence System, based on adaptive machine learning, and demonstrated its accuracy in the test lab environment we have established at the University of Manchester.

The project is now advancing to development of the Intrusion Response System to ensure the designed system can accurately detect false positive or false negative outcomes from the IDS. By integrating the IDS and IRS in a single solution, we expect to be able to detect either known or unseen cyber intrusion events with a very high confidence.

Leveraging artificial intelligence to secure our networks



Credit: DeepArmor

Truly Sustainable Substations

Credit: Centre for Energy Equality. VISTA tool.

Taking a circular approach to substation design – minimising whole-life carbon emissions and promoting nature-based solutions.

Overview

Embedding sustainable principles at the earliest stages of a substation development project is critical for the future resilience of the electricity network and the protection of the natural environment and climate. This project will significantly increase our understanding of the environmental impacts associated with the development and operation of substations – and give a clear roadmap for how substations designs can be improved: minimising whole life carbon emissions, embedding the principles of the circular economy and developing nature-based solutions where possible.

Innovation will be targeted to develop the principles of circular design, minimise whole life carbon emissions and embed nature-based solutions to restore biodiversity and maximise the natural capital value around our substations.

Benefits

- Align with the UK and devolved nations' Net Zero targets, reducing the risk of retrofitting to bring substations in line with future carbon emissions targets providing costs efficiencies to customers.
- Reduces UK energy networks reliance on global supply chains – increasing network resilience.
- Supports upgrading and re-purposing of substation components to ensure longevity and adaptability.
- Climate change adaptation through nature-based solutions – increasing the resilience and reliability of the network for customers.
- Carbon sequestration and biodiversity/ natural capital gain.

Progress

To support the design of greener infrastructure, we've developed the VISualising SusTainable Assets (VISTA) tool which enables engineering teams to visualise the carbon impact of various interventions and design changes. This tool helps substation designers to identify the changes that they can make to minimise the impact of our buildings/ compounds on the environment.

We used the learnings from the opportunities register for increasing circularity in substation design and quantified the impact for each to develop the tool.

Sustainability and Environment

A sustainable electricity network connects renewable energy from generators to consumers, this is our core purpose and facilitates the UK Net Zero carbon ambitions. While building and operating the network we have a responsibility to improve the social, economic, and environmental sustainability in the areas in which we work.

Our Sustainability Principles

We have a clear picture of our sustainability impacts through stakeholder engagement, the environmental management system and delivery of previous Sustainable Business Strategies. From these impacts we have created five priority areas for action. There is a dedicated section in this Strategy to each of these priorities, with clear targets and route maps to deliver.

Climate Action

Our Business Carbon Footprint

During this time of unprecedented network growth, we must also reduce the carbon footprint of our business operations, and make sure our network is resilient to the effects of climate change.

In 2023/24, our annual BCF (excluding losses) was 18,481tCO2e. This is 9% lower than in 2013/14 when we first started measuring our BCF. Our 2023/24 annual BCF emissions increased from the previous year principally due to an 'exceptional' SF_6 leakage event which occurred at Hunterston Conversion Station in June 2023. This was recognised as an 'Exceptional Event' by our regulator, Ofgem, who agreed that the event could not have been reasonably foreseen and prevented. This event led to an increase of 5,311tCO2e which accounts for 29% of this year's Business Carbon Footprint.

Operational transport

Our RIIO-T2 target is to decarbonise our operational fleet by replacing 100% of our 72 cars and vans with electric alternatives by the end of T2. After our successful pilot of several models of 22kWh electric vehicle charging points within four different substation environments, we have selected a preferred option which will now be rolled out to our strategic substations during the final years of RIIO-T2.

We have replaced four combustion vehicles with electric vehicles since the start of RIIO-T2. This is less than our target. We are forecast to electrify all cars and small vans by the end of RIIO-T2. However, we are unlikely to achieve our ambitious target of fully electrifying larger vans and 4x4s by the end of RIIO-T2. This is due to a combination of market availability and performance issues related to range and payload. To address these issues, we continue to work with the industry to support the development of new vehicles. Initial trials of 4x4 and similar Light Commercial Vehicle applications are being pursued, with two model lines identified as suitable for applications within our Transmission business.

Fugitive emissions

Overall, the Insulation and Interrupting Gas (IIG) leakage rate for regulatory period 2023/24 was 0.54%. However, this includes 226kg of SF_6 lost as a result of a disruptive failure at our Hunterston Converter Station. The failure of a cable termination combined with the design of the switchgear meant all contained gas was immediately vented to atmosphere. This was an exceptional event which was successfully claimed against Special Condition 4.13.12 in our licence.

Depot and Substation energy use

The planning phase of our RIIO-T2 building refurbishment programme has been completed and the framework for the refurbishment works of 48 of our substations was agreed late 2023. These works are behind in delivery however, we have created a new Agile project unit within our business to deliver these high volume, low complexity works. We are confident that we will be able to meet our commitments in this area during the RIIO-T2 period.

Network Losses

Losses are an inevitable consequence of transferring energy across electricity networks, from generation to demand. Transmission losses are mainly due to the heating of various network components. We have committed to reducing losses by an estimated 14,500MWh (c.3%) over the price control period, thereby limiting losses to a lower level than would otherwise be the case.

To date, asset replacement has been completed on a number of transmission circuits, saving in the order of 400MWh in losses per year, (assuming that the circuit loading follows the same pattern as before the replacement work was carried out).

Business Travel

Greenhouse gas emissions associated with business travel have reduced since we started measuring our footprint. In the first year of RIIO-T2, emissions were low due to covid. Although we have seen a rise in business transport emissions since last year, this is the result of an increase in overall miles travelled. The overall emissions per mile have decreased which is partly due to a decrease in transport emissions factors and because of different travel choices (e.g., higher use of electric vehicles for business travel).

Supply Chain Sustainability

Having a strong relationship with our supply chain is essential for the successful delivery of our sustainability plans. Our diverse suppliers offer various services throughout the entire lifecycle of assets, from design to disposal.

We are continuing to work with our supply chain to improve the sustainability of our projects and programmes of work and ensure consistent reporting across all our supply chain.

During this regulatory year we reviewed our suppliers and contractors to determine those with the greatest impacts and created our priority suppliers list. These 113 priority suppliers account for 90% of all our suppliers by value. This allows us to focus on the suppliers with the greatest impact on our business while allowing our smaller contractors to benefit from the upskilling support we provide through the Supply Chain Sustainability School (SCSS) and Scottish Business Climate Collaboration (SBCC).

In regulatory year 2023/24 66% of our supply chain have committed to or have a validated SBT and 71% of our suppliers, by value, are compliant with our enhanced environmental requirements and we are on track to deliver our commitment of 80% by value by the end of RIIO-T2.

Action for Nature

Across our Transmission business we work to protect and enhance the ecosystems our network operates within. We are committed to applying the principles of the mitigation hierarchy across our operations, avoiding, and reducing the impacts of our construction works where possible, and restoring and compensating for any residual impacts to achieve 'No Net Loss' of biodiversity across the RIIO-T2 period. In 2024 we launched our Action Plan for Nature which details our vision for delivering a sustainable and nature positive network.

Biodiversity and Natural Capital

We have committed to work collaboratively with the other UK electricity Transmission Network Operators to develop our approach to natural capital and biodiversity assessment and delivering enhancement. A consistent approach will ensure decisions are made to assess biodiversity consistently across the network.

NatureScot has commenced the development of a Scottish Biodiversity Metric for use by developers. This tool, to be released in 2025, will be based on the DEFRA V3.1 metric and will be adapted for Scottish habitats and environments. As part of the Scottish Linear Infrastructure Environmental Group, we are a key stakeholder in the development of this tool and guidance.

With limited scope to deliver enhancements for biodiversity within our project boundaries, we are committed to working collaboratively with local communities, stakeholders, and landowners to deliver habitat creation and improvement schemes. During Year 3 we have engaged with several stakeholders, including Nature Scot and Fisheries Management Scotland to discuss our 'No Net Loss' objectives, develop our approach to delivering enhancement projects, and start to build a pipeline of investible schemes. We will deliver biodiversity enhancement projects from this list during years 4 and 5 to achieve no net loss in line with requirements.

Pollution Prevention

While we deliver the low carbon transition and reduce our own carbon impact, we must also prevent pollution, protect, and enhance biodiversity, use resources sustainably and encourage our supply chain to optimise their environmental impacts. Protection of the environment is a key component of how we operate our business.

SP Transmission have reported two incidents to the Environmental Regulator, SEPA, in the reporting period. Both have related to oil leaks from buried fluid filled cables (FFC) in Edinburgh. In April 2023, following investigation of a low oil level pressure on a fluid filled cable, an oil leak was investigated and identified in Edinburgh which was then sealed in July 2023. This resulted in 5,858 litres of oil lost to ground. A separate leak occurred on a separate fluid filled cable supply for Edinburgh and began leaking in Q3 2023 and then sealed in Q1 2024. This leak resulted in the loss of 24,161 litres of oil. The investigation into any potential clean-up of the oil is on-going for both incidents. Neither leak has resulted in oil contamination of water courses, and no enforcement actions or undertakings resulted from the two incidents notified to the regulator.

Circular Economy

As a sustainable networks business, we are committed to incorporating circular economy principles into our policies, procedures, and project delivery. We work collaboratively to improve the circularity of our resources, recognising the value of keeping them in use for as long as possible and retaining their value. In line with this, we have set challenging business targets to reuse or recycle 100% of our waste by 2030, excluding compliance waste.

Our landfill diversion rate increased from year two to year three. We have seen our rate increase to 98.0% landfill diversion, which demonstrates we have achieved and exceeded the target of 95%. This shows our commitment to reaching our overall SPEN target of 100% of waste reused or recycled by 2030.

SMARTWASTE
delivered by bre

Sustainable Society

Achieving the sustainability step-change

Activities to improve our sustainability build on a strong foundation of environmental management and compliance. We are committed to environmental compliance and preventing pollution and have embedded processes to ensure this in our business activities. Our ongoing certification to the International Standard for environmental management, ISO14001, which we have held for over a decade, provides evidence of this.

During regulatory year 2023/24 SPEN maintained our certification of ISO14001 with an external surveillance audit of our Environmental Management System. We are continuing to embed the recommendations and opportunities from this report into our internal systems. In addition, within SPT Major Projects we have implemented a new contractor registration process which requires ISO14001 as a minimum standard for all our contractors.

Just Transition

As we look towards a Net Zero future, SP Energy Networks will play a central role. Whether through enabling a decarbonised future by facilitating low carbon technologies, making sure our network is safe and resilient, or serving customers across our network, our impact can't be understated. To make sure we deliver these activities in a fair and inclusive way, we're taking steps to embed the principles of a just transition at the heart of our business.

Our **Just Transition Strategy** aligns our activities across four Just Transition Principles. These are:

- Acting as a **purposeful business**, taking steps to reduce our own carbon footprint and ensure our approach to the just transition holds us accountable.
- Ensuring that we **leave no one behind** through support of all our customers, but particularly those most vulnerable, and taking steps to ensure fair and equal access to energy transition benefits.
- Working **together with our communities**, coordinating our approach with local partners and stakeholders, whilst making sure our work empowers and invigorates the communities we serve.
- **Sharing knowledge and opportunity** through investing in re- and up-skilling, and creating a positive, fair working environment for our people.

Supporting and Securing our Network

We continue to operate and maintain our transmission assets in line with our policies and procedures, to ensure we achieve the highest level of service for network reliability. This requires robust inspection and maintenance practices, to ensure the equipment will achieve the desired performance levels. On occasion our assets do not achieve the standards we set and impact on the continuity of service.

The last year presented many operational challenges from our asset base with an increase in fault activity across all asset categories. Our Network Reliability continued to achieve over 99.9% however on a couple of occasions the performance of the network impacted on our customers more than previous years. This is reflective in our Energy Not Supplied measure falling below the record performance levels achieved in T2. We will use these experiences to identify opportunities to improve network resilience.

We have continued to show high levels of innovation and flexibility on how we manage the operational network. We have utilised our Emergency Response System (ERS) which is a tool to enable temporary towers or structures to be configured to enhance the resilience of the network when network risk is high due to faults or outage driven activities. The deployment of the system in a controlled manner has minimised the impact on generation and mitigated against network risk by providing an alternative energy path, bypassing the traditional network design/ configuration. We will continue to explore opportunities to utilise the ERS, minimising the impact on customers and generation, which will provide a benefit to the consumer with reduced constraint costs.

Our Network has evolved over the last decade and discuss on a global supply chain. Every new manufacturer providing assets to connect onto the SP Transmission Network, requires a plan to repair the asset should it fail to operate to its design parameters. This requires holding spares to reduce the time to repair the fault and mitigate risk on the network. Lead times for new materials and their subsequent delivery can be a significant, from weeks and months to even years for a new transformer. Therefore, holding strategic spares are critical to ensure the robust operation of the transmission network. Given the growth in the scale and diversity of our network assets, we have recently established a major new logistics hub in the Central Belt of Scotland to support our operational and new build activities.

Our journey to Net Zero will require a significant volume of outages across the network to construct and build new assets safely and efficiently. The operational teams within our business will require to grow to meet the demands of our expanding asset base, creating both industrial and professional engineering jobs.

A Safe Network

Communication and cooperation are key to ensure that our infrastructure is safe, and that all our operational activities safeguard the health, safety and wellbeing of every person who interacts with our assets or activities.

Our dedication to continual improvement was acknowledged through an independent external accredited verification body. We continue to operate to ISO 45001: 2018, international standard and consider this a crucial factor, to ensure the future growth and success of the business. This year has seen undergo a successful AENOR ISO 45001 Re-certification Audit.

Our Staff and Contractor Health and Safety

As a business, we continually monitor our "Total Recordable Injury Rate" (TRIR). This defines significant injury levels as a factor of hours worked (injuries per 100,000 hours). In 2023/24 the total number of hours worked by our contractors was 986,045.

We achieved a combined Staff and Contractor TRIR of 0.59 for 2023/24, which is considered an exemplary performance within our industry.

Over the 2023/24 reporting period, we have focussed on several proactive initiatives to enhance our Health, Safety and Wellbeing culture.

These include:

- The continuation of our New Year safe return to work initiative in 2023/24. Safe start is a phased and controlled return to work over the course of January, with an emphasis on health, safety, and wellbeing engagements.
- A lone working app called PeopleSafe has been piloted with positive results. We are now moving to rollout across the business.
- The SPEN H&S Contractor Forum has been successfully developed and launched. This is a one stop shop for all of our contractors to access H&S, Wellbeing and Public Safety information.
- A Summer Safety Campaign was rolled out across the business from June through to August, with a view to reinforcing the additional risks associated with summer working.

Public Safety

We can again report that there have been zero public safety injuries as a result of interaction or from our operations. In addition to the physical measures we take to protect the public from electricity, for example secure compounds, safety distances and signage, extensive inspection, and maintenance programmes, we also strive to raise electrical safety awareness with the public via several campaigns and initiatives including safety forums with the emergency services.

We attended several agricultural shows and have utilised social media channels as well as conventional media channels to reach different audience groups such as the agricultural industry, construction industry and general members of the public as well as promoting safety for children as part of our ongoing safety campaigns. We've teamed up with celebrity farmer and TV personality, Jimmy Doherty, and YouTube star and TV presenter, Adam Beales, to share important safety messages.

We supported, and continue to support, three safety centres where our key safety messages are presented to children through substation and overhead powerline interactive props and presentations, provided by ourselves, as well as providing them with annual funding.

Our Powerwise website has continually been promoted to schools and parents. This is a curriculum-linked teaching resource to inform young people about the dangers of electricity and provides free, interactive resources.

We have also worked with the emergency services providing them with awareness presentations, as well as offering support to them when any incidents have occurred.

Various communication campaigns have been delivered throughout the year and significant work was done in conjunction with the ENA for the production and promotion of consistent energy and utility safety messages.

Safe Network

Our vision continues to be to deliver the highest standards of Health, Safety, and Wellbeing performance, where no injury, or ill health is realised because of our activities.

Zero public safety injuries

Net Zero Fund

In 2022, we launched our Transmission Net Zero Fund with a clear mission: to ensure that vulnerable communities across central and southern Scotland are not left behind on the country's journey to achieving Net Zero emissions by 2045.

This £5million fund is a vital step toward a just transition – by providing expert advice, capacity building and financial support, we help local community groups overcome barriers to decarbonisation.

The fund operates in three phases:

Net Zero workshops – *delivering general and tailored community workshops to help local communities develop their Net Zero plans*

Help local communities develop their project ideas by demystifying Net Zero and introducing attendees to various decarbonisation routes. Our general Net Zero workshop took place in January 2023, introducing over 70 people to Net Zero options to consider, and it is still available to watch online. We have also delivered 16 tailored workshops since November 2022 to help communities explore low-carbon solutions to their local decarbonisation challenges.

Project Planning and Feasibility Support – *supporting development of formal project plans*

We have supported 12 community organisations in formalising their project plans through tailored project planning and feasibility support. This phase offers projects support and guidance from experts, who help them gather data, assess viability, and develop formal project plans. Not only does this support help communities create robust project plans, but it also enables them to improve quality of their funding applications. We were delighted to see 10 out of the 12 supported projects take their plans forward and apply for our funding support.

Funding Support – *providing funding support to eligible Net Zero community projects*

With over £1 million of funding already granted to seven projects in the first round, the fund is enabling community organisations and charities to accelerate decarbonisation in their area. From installing low-carbon technology and energy efficiency measures in community buildings to electrifying charity transport fleets and community car clubs, these initiatives deliver tangible social, environmental, and economic benefits for the local communities. Our second round of funding is now underway and successful projects will kick off their delivery later this year.

Project Highlights

Food Train's Stewartry branch offering essential food deliveries to older people across Dumfries and Galloway has been awarded £100,000 to upgrade and electrify its fleet of delivery vehicles. This will reduce their carbon footprint, help over 100 older people increase their independence, and reduce the workload of 50 carers.

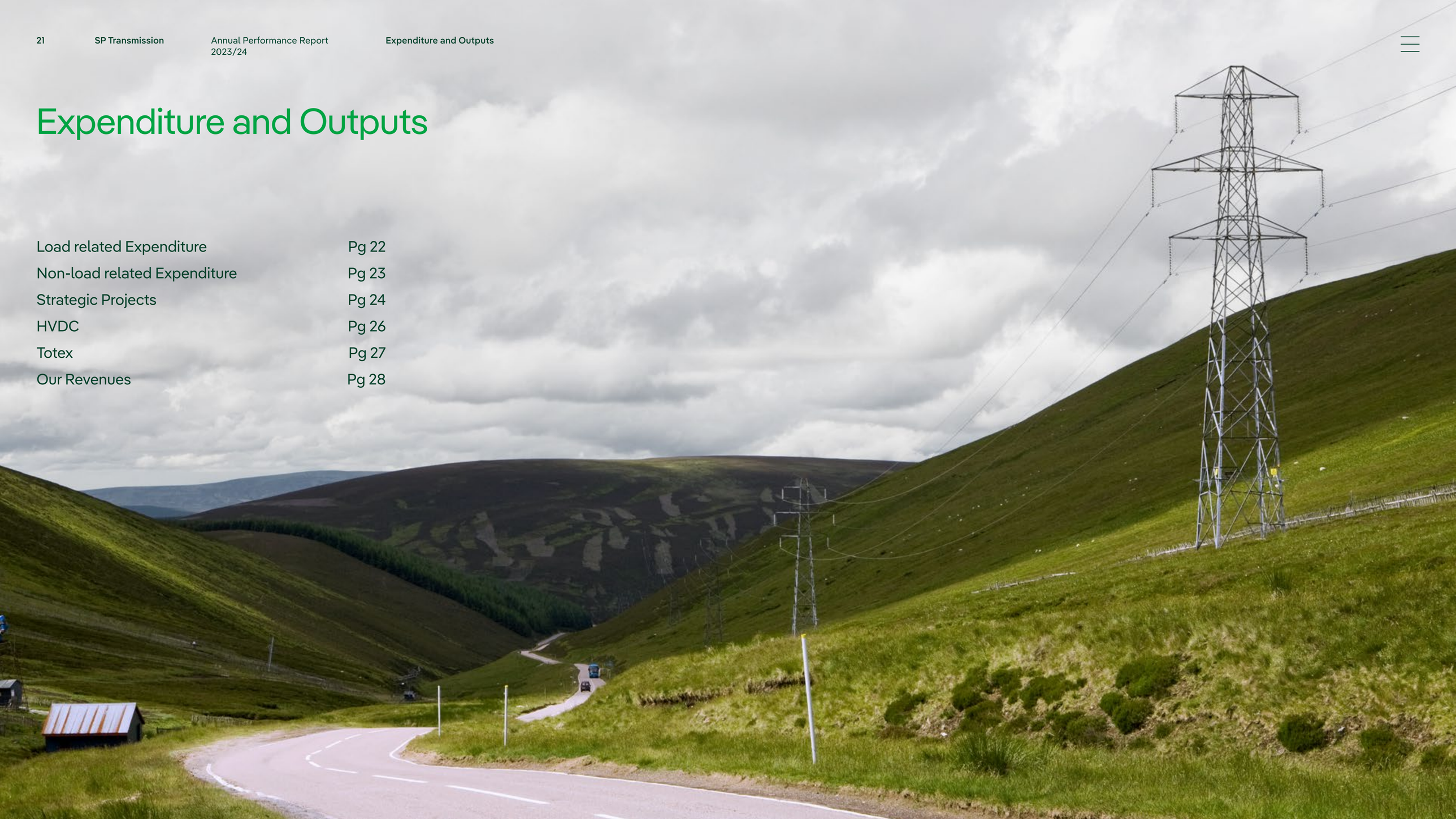
An Ardrossan Scout group has been awarded £93,000 to carry out extensive sustainable upgrades to their community hall with low carbon technology – set to reduce emissions by nearly 400% and allow more charities and community organisations to use the facilities. Learnings from the renovations will also be included in updated 'green' Scout badges to help young people learn about Net Zero.

Govan Heritage Trust have been awarded £150,000 to install a river source heat pump at Govan Old Church, contributing to a sustainable preservation of a historic site. This historic church will be heated using clean energy harnessed direct from the River Clyde – reducing carbon emissions by over 90% and saving 20% in energy bills.

More information about the Transmission Net Zero Fund is available at: spenergynetworks.co.uk/netzerofund

Above: Food Train.
Top right: Ardrossan Scout Group.
Right: Govan Heritage Trust.

Expenditure and Outputs



Load related Expenditure

Our plans for the transmission network are dynamic to account for the changing landscape of electricity generation and demand. The demand for new connections to the transmission network has grown considerably in the last year. This includes energy storage, hydrogen, as well as wind generation and other technologies. This requires additional points of connection onto the system and reinforcements to ensure the network has sufficient capacity to transmit the power to where it is being consumed. This is called Load related activity.

SPT's net capital investment in load related activity for the year was £346.4m a 120% increase on prior year consisting of fixed asset additions and transfers from inventories of £359.3m less capital contributions received of £12.9m (2022 £15.7m). This increase in capital investment demonstrates a significant step forward in the delivery of our RIIO-T2 plan. We continue to see changes in the baseline schemes for T2, primarily due to customer connections being deferred and delays in obtaining planning consents.

Of the £359.3m expenditure in the last year, £193.6m is associated with baseline works and £165.6m for incremental projects which are funded through volume driver or re-openers.

For the baseline spend, a number of assumptions were made to inform the plan at the time of submission to Ofgem in December 2019. The energy and political landscape has changed significantly in that time including:

- A rapid growth in connection applications for energy storage, wind generation and other technologies. In 2023/24, we issued a total of 352 connection offers, a 60% increase on prior year.
- Lower than forecast levels of investment in the first two year in RIIO-T2 due to the legacy impact of COVID lockdown, completion of T1 schemes which were delayed as a result and supply chain shortages.
- Restrictions on outages and system access by ESO due to generation availability, particularly over winter periods which has resulted in planned works requiring to be re-arranged.
- Periods of high inflation and material cost increases as a result of global demand for electrical products and wage increases. This has had a major impact on the supply chain and the availability of resources and equipment.

Increasing demands from electricity transmission

Long-term and Whole System planning are essential to build a resilient network fit for the requirements of future generations to ensure the network can meet the requirements of users. Over 700GW of connections are currently contracted across GB for both transmission and distribution.

In the last regulatory year, three new connections were completed comprising of 103MW of new generation and 27MW of demand. These projects have helped GB take a further step towards Net Zero. It has also supported the decarbonisation of the transport network through an additional electric rail connection to support the ongoing electrification programme being undertaken by Network Rail.

The B6 boundary between Scotland and England was also further reinforced following the closure of Hunterston Power Station through the completion of the Hunterston-Neilston Reinforcement. This project reconfigured the network in West Central Scotland to provide 500MW of capacity uplift across B6 boundary.

Flexing our plan to the wider landscape

As the energy landscape evolves, we have seen a number of changes to the baseline plan that was submitted to Ofgem. Of the original T2 business plan, we are forecasting £51m of projects that will no longer progress over the full T2 period. This includes:

- Seven GSP upgrades for SP Distribution which were based on future generation requirements that have now changed.
- Two Network Rail connections which have been cancelled.
- U and AT OHL uprating has now been replaced with a new build OHL.

Various projects detailed in the business plan have also seen the profiling of spend changed. The main reason for this has been to align load related investment with customer connections and mirror the corresponding delay arising from changes in customer works to avoid unnecessary investment ahead of need in the event that the customer delays further.

The largest of these is the Kendoon to Tongland Reinforcement (KTR). This project which will facilitate more than 700MW of new generation through the construction of series of new overhead lines across Dumfries and Galloway. This project has been subject to a Public Inquiry which commenced in summer of 2022 and a final decision is still being awaited. As a result of this delay, this project has been delayed until a decision is made by the Scottish Government.

We have also seen a change in the scope of a number of load related schemes including DWNO and ECUP as a result of the HND and HNDFUE exercises. Due to these changes, we forecast £110m of Load related T2 expenditure will now be incurred in the T3 period.

Non-load related Expenditure

The assets on our network vary in age and condition. Our experience and expertise are essential for proper asset stewardship, allowing us to adapt our world-class, resilient network for a Net Zero future. The management of these assets through their refurbishment or replacement is known as Non-load expenditure and outputs.

Non-load related expenditure in RIIO-T2

Forecasted spend as part of our RIIO-T2 Business Plan

£470m

Total spend to date

£254m

Delivering on our plans

Non-load related expenditure totalled £93m in the last 12 month period, £254m cumulatively to the end of year three of RIIO-T2 period. Over the full T2 price review, the total Non-load related expenditure is forecast to be £470m. We are forecasting a net overspend against allowance due to increases in supply chain costs for both equipment and from service providers.

In the last year, the XZ Route 275kV OHL Major Refurbishment was successfully completed. This included the replacement of the conductor system, all associated fittings, an inspection and reinforcement of foundations and painting of the towers to extend the lifespan of this critical asset.

Transformers at Strathaven and Kilmarnock GT2 transformer have been replaced as these assets had reached the end of their operational life. Progress has also been made on the Mossmorran & Devol Moor 132 KV circuit breaker replacements. End of life circuit breakers at Eccles 400kV s/s, Westfield 275kV s/s, Galashiels 132kV s/s and Westfield 132kV have also been completed. These projects have allowed the removal of oil filled equipment which has been replaced with modern non-oil containing equivalents.

Adapting our outage requirements

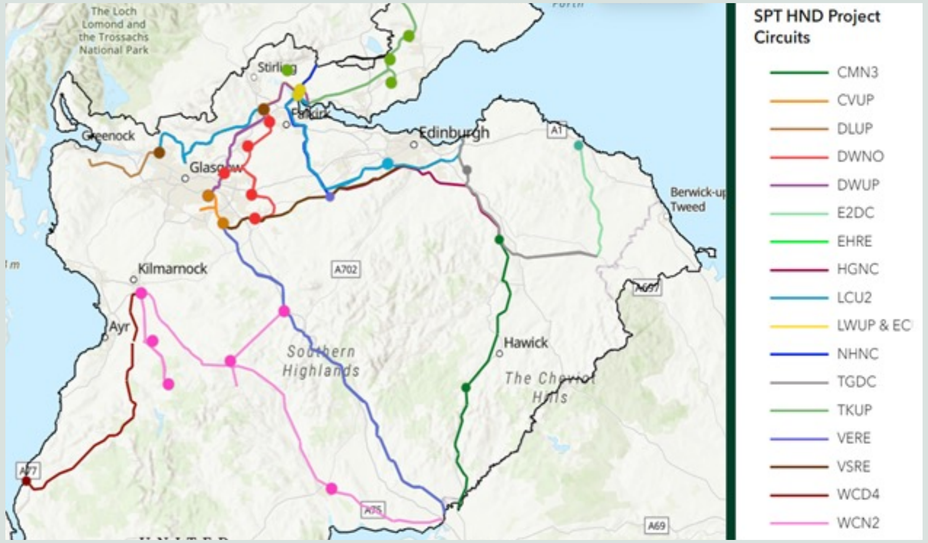
To undertake asset refurbishment or replacement, most assets require to be switched out of service. With increasing constraint costs due to energy prices, as well as outages in other parts of the network, we proactively work with the ESO to coordinate our plans. This has led to some growth after projects being re-scheduled to fit in for outages across the T2 period. The interaction with Load related activity has also had a material impact on the delivery of the plan. In the last year, some overhead line projects were re-scheduled to minimise the network impact over the winter period and support the ESO in ensuring the resiliency of the transmission network.

Advancing our plans for resiliency

The project to increase the telecoms resilience across the 400kV and 275kV network has been accelerated to improve the communications available which will support the significant growth of these assets. As a result of this acceleration, the 132kV Optical Transport Network project has been reprogrammed to follow on from 400kV and 275kV upgrades. The 400kV and 275kV Resilience programme focus has been on extending the fibre network for SPT. Eight new routes were completed in the period covering 56km. Progress has also been made in the replacement of the transmission SCADA and control system to provide a unified system with SP Distribution.

Strategic Projects

To meet the UK and Scotland's Net Zero and offshore wind targets, acceleration of strategic transmission infrastructure is urgently required.



Strategic Projects GIS Map.

This infrastructure investment was updated by National Grid Electricity System Operator (NGESO) on 7th July 2022 as NOA 8 and the tCSNP2 "Beyond 2030" output from March 2024 tabulated below:

DWNO	Establish a new 400kV OHL from Bonnybridge substation to an existing OHL north of Glenmavis, together with associated substation works, conductor replacement and voltage uprating on existing OHL routes.
TKUP	Establish 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 Transmission Tealing substation.
DWUP	Establish a 400kV single circuit corridor south from Kincardine North, on existing overhead line (OHL) routes, to Clyde's Mill substation.
LWUP	Establish a new 400kV substation north of Kincardine and connect to Denny North 400kV Substation, integrating load and non-load related investment drivers and enabling significant reinforcement of transfer capacity through central Scotland.
VSRE	Replace existing OHL conductor on the strategic east-west Strathaven – Smeaton (XH/XJ route) corridor with modern high temperature low sag (HTLS) conductor, similarly integrating load and non-load related investment drivers.
DLUP	Establish a new 400kV substation at Windyhill and a 400kV single circuit corridor, on existing overhead line routes, between Windyhill, Lambhill and Denny North.
VERE	Replace existing OHL conductor on the northern (Strathaven – Elvanfoot) section of the strategic north-south Strathaven – Harker (ZV route) corridor with HTLS conductor.
EHRE	Replace existing OHL conductor on the southern (Elvanfoot – Harker) section of the strategic north-south Strathaven – Harker (ZV route) corridor with HTLS conductor.
BDUP	Uprate the Beauly – Denny OHL route to double circuit 400kV operation.
DNEU	Install a new 400/275kV 1000MVA Supergrid transformer (SGT2) at Denny North 400kV substation.
CMN3	New 400kV circuit between Gala North and Carlisle area.
NHNC	New 400kV circuit between New Deer 2 (Greens) and Harburn.
HGNC	New 400kV circuit between Harburn and Gala North.
HGNC	New 400kV circuit between Ayrshire and Carlisle area via new substation(s) within Dumfries and Galloway.
HBNS	Establish a new substation at Harburn.

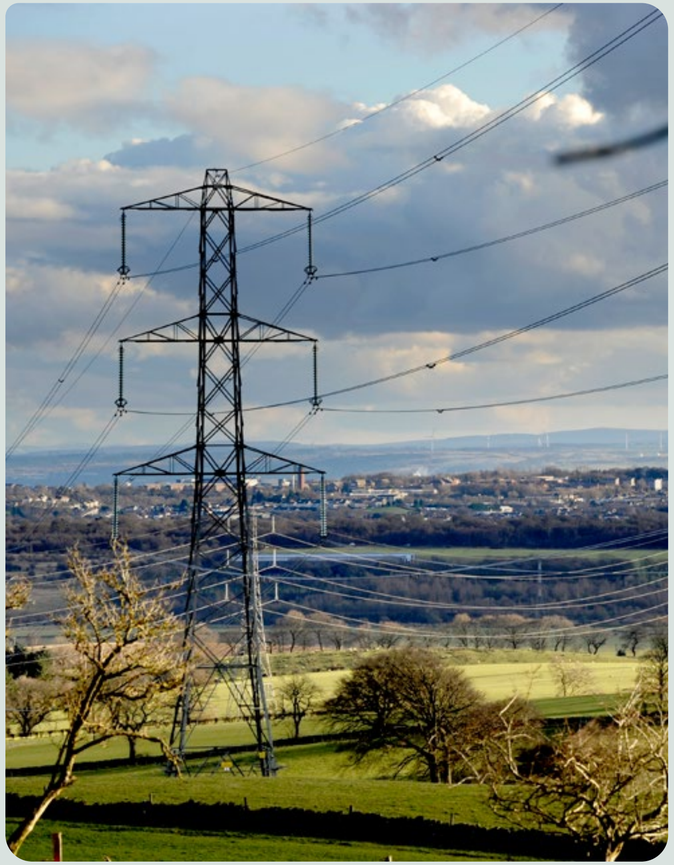
In addition to the above schemes there are two further schemes as shown below:

LCU2	Kincardine North – Currie B5 Reinforcement.
CVUP	Clydesmill to Strathaven 400Kv Reinforcement.

Whilst these two schemes are "on hold" they have been added to the plan for co-ordination purposes.

Delivering the Strategic Portfolio

This programme represents a significant challenge in terms of delivery and capacity. A dedicated Strategic Projects Team has been established at start of October 2024, that assumes responsibility for the development and delivery of the HND programmes. This team has a current FTE of 25 staff that will grow to over 50 into 2025.

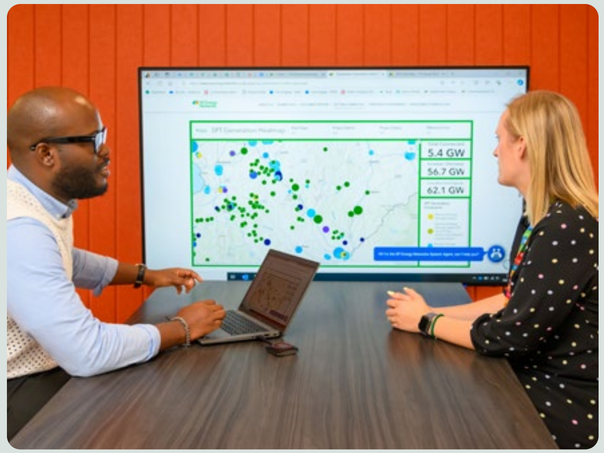


Supply Chain

A significant challenge to the delivery of the programme is the availability of the Supply Chain. Following stakeholder engagement with our supply chain over the past two years and echoed by the Baringa/DESNZ Supply Chain Constraints Study report in October 2023, it is clear that there are significant pinch points regarding engineering, construction and commissioning skills and resource capability in the UK. Furthermore, there is significant global demand for equipment needed for the energy transition on transmission networks.

From this feedback we are nearing conclusion of two large Strategic Agreement framework contracts that have the following attributes:

- Worth £5.4 Billion of investment
- Long-term (Initial 5 years with extension for further 5 years)
- Contracted at a portfolio level
- Flexible delivery models from EPC to disaggregated contracts
- Balanced Terms and Conditions
- Early Contractor Involvement
- Joint commercial and Non-commercial award criteria.



These frameworks are summarised below:

	Overhead lines	Substations
Lot 1	400kV OHL Projects with HTLS conductor (EPC)	Enabling Works (EPC)
Lot 2	400kV /275kV OHL Projects with conventional conductor (EPC)	Construction Works (EPC)
Lot 3	132kV OHL Projects (D&C)	Enabling Works (Disag)
Lot 4	N/A	Civil Works (Disag)
Lot 5	N/A	Electrical Works (Disag)

These frameworks represent the largest contracts that SPT has placed and allow our partners to secure a long-term order book enabling them to proactively recruit for the future and develop the capability to serve not only SPEN but the whole of the UK. This is a key enabler in the challenge to deliver the growth needed for the energy transition.

HVDC

Significant progress has been made on the two HVDC links; Eastern Green Link 1 (E2DC) and Eastern Green Link 4 (TGDC) identified as part of ASTI (Accelerated Strategic Transmission Investment).

These two HVDC links are being developed and delivered with National Grid Electricity Transmission (NGET).

The development and delivery programme has faced the same planning consent and supply chain challenges as other large scale projects. For HVDC projects these supply chain constraints and specialist resource limits are felt particularly acutely due to the very restricted numbers of global suppliers.

Eastern Green Link 1 launched its main EPC contract tenders in 2022. During the tender event there was unprecedented market activity including significant bulk awards by other European TOs. Negotiation of the EGL1 procurement event has concluded and contracts were awarded for cables and converter works in November and December 2023. In parallel with this, the EGL1 Joint Venture between SP Energy Networks and National Grid Electricity Transmission has been transitioned into its delivery organisation.

To facilitate the increased UK and global demand for HVDC cable, the cable supplier for EGL1 has commenced expansion of its factory facilities and build of a new offshore cable lay vessel. EGL1 will be the first use of both of these new assets.

All primary consents for Eastern Green Link 1, including marine licences have been secured and the EPC contractors detailed design and early survey works commenced from January 2024 and continue at pace.

The link is planned to be fully constructed and available to the system operator in January 2029.

Our second HVDC link under development is now known as the Eastern Green Link 4 project. We are working hard with our partners at NGET to move faster than ever before through the development stage of this project.

We have increased resources to continue accelerated design development, land & consenting and procurement. Significant work has been undertaken to refine the design to a point suitable to start non-statutory consultation and procurement activities. This has included detailed assessment across engineering, environmental and economic criteria and has resulted in the selection of preferred sites for the northern converter station at Westfield, Fife and cable landfall at Kinghorn, Fife.

The southern connection point has also been further refined following the publication of the HND FUE which confirmed the need to strengthen below the B9 transmission boundary.

Totex

The UK has experienced significant changes within the energy landscape, primarily, the pathway towards Net Zero. This has resulted in increasing levels of interest in connecting low carbon generation and storage to our network. We created our plan to have the flexibility to respond to this changing environment. We have continued to recruit over the last year to increase our capability for the development and delivery of the pipeline of additional projects.

In the last regulatory year, Load related expenditure totalled £258m which takes the total Load related expenditure to £408m cumulatively to the end of year three of RIIO-T2 period. Over the full T2 price review, our total Load related expenditure is forecast to be £1,564m due to a large volume of new connection applications and additional reinforcement.

Since the T2 business plan was developed, 348 additional projects have materialised with a total value of £7.5bn over T2, T3 and beyond. Across the various uncertainty mechanisms this includes:

- Volume driver – 292 projects with a forecast of £770m
- Medium sized Investment Projects (< £100m) – 40 projects with a forecast of £980m
- ASTI (> £100m) – 11 projects with a forecast of £5,770m

The most significant of these additional projects are Eastern Green Link 1 (EGL1) and Eastern Green Link 4 (EGL4), which are being developed and delivered in joint venture with National Grid Electricity Transmission. EGL1 will deliver a 2GW 525kV VSC converter technology HVDC link and EGL4 is planned to be of similar nature.

The Holistic Network Design Follow up exercise (HNDFUE) concluded in early 2024 and from this process, further major reinforcement projects were confirmed as being required to achieve Net Zero targets which will be funded through the ASTI and MSIP mechanisms which have also added to our load related programme.

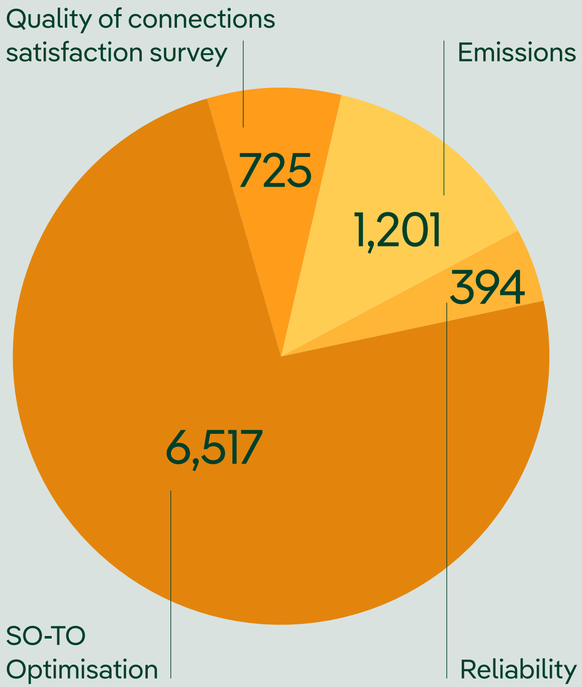
Totex comparison		Allowance (2023/24 real £m)	Actual (2023/24 real £m)	Variance (2023/24 real £m)
Capex	Wider Works	157.28	147.50	9.78
	Other LR Capex	114.76	98.60	16.16
	Sub-Total Load Related Capex	272.04	246.10	25.94
	Asset Replacement Capex	74.93	78.30	*-3.37*
	Other Capex	16.27	12.10	4.17
	Sub-Total Non-load Related Capex	91.20	90.40	0.80
	Non-Operational Capex	1.69	2.10	*-0.41*
	Total Capex	**364.93**	**341.81**	**23.12**
Opex	Faults	3.96	3.42	0.54
	Inspections	1.26	1.25	0.01
	Repairs & Maintenance	9.42	7.44	1.98
	Vegetation Management	0.41	0.21	0.19
	Legal & Safety	4.88	6.09	*-1.21*
	Operational IT	2.63	1.77	0.86
	T1 Carry over	0.00	3.21	*-3.21*
	Total Controllable Opex	**22.55**	**20.18**	**2.37**
Indirects and Other costs	Indirects	67.52	54.40	13.12
	Other	30.12	5.50	24.62
	Total	**97.62**	**59.90**	**37.74**
Total		485.12	421.89	63.24

Our Revenues

Our Revenues

In 2023/24 we recovered £545.1m. Our revenues are set through regulation by Ofgem. They comprise an element which is fixed, an element which is linked to specified variables (such as the amount of connected generation), and an element to capture incentives and other allowances along with adjustments from previous years.

Incentive awards earned in 2023/24 (£ thousands)



Changes in actual or forecast performance under the various incentive schemes will affect revenue allowance in the next round of tariff setting, until final performance is known – a lag of up to two years.

Our Return on Regulated Equity (RoRE)

Investment into the electricity transmission network is a long-term project, the costs of which are spread out over the lives of assets.

Consistent with the RIIO price control framework Ofgem attached a financial reward/penalty to a number of the incentives. This has the effect of changing our Return on Regulated Equity (RoRE) below.

RoRE is calculated based on values in 18/19 prices and therefore represents an average real equity return over the 5-year price control.

We have followed the Operational RoRE methodology used by Ofgem in their Regulatory Financial Performance Reporting (RFPR) to ensure consistency.

For detailed information about our financial performance, please see the SP Transmission Regulatory Accounts which are published annually, and our Regulatory Financial Performance Report.

5-year average 2023/24 RoRE

4.80%	**Base Return** Set by Ofgem for the 5-year period, reflecting movements in market conditions
0.08%	**Business Plan Incentive** Agreed by Ofgem as part of the price control, and is the reward for the quality of our business plan submission
0.00%	**Totex Efficiency Savings** Any savings we make on our investment plan are shared with the consumer, at this early stage in the price control we are forecasting the cost of delivering our business plan commitments will match what we set out in our business plan submission.
0.09%	**Reliability Incentive**
0.11%	**Emissions Incentive**
0.00%	**Timely Connections Incentive**
0.07%	**Quality of Connections Incentive**
0.14%	**SO-TO Optimisation Incentive**
0.00%	**Environmental Scorecard Incentive**
-0.02%	**Network innovation**
5.27%	**RoRE** – Operational performance

RAV (Regulatory Asset Value)

For every pound that we spend, we collect 15% of the costs in the same year and 85% of cost over life of the asset.

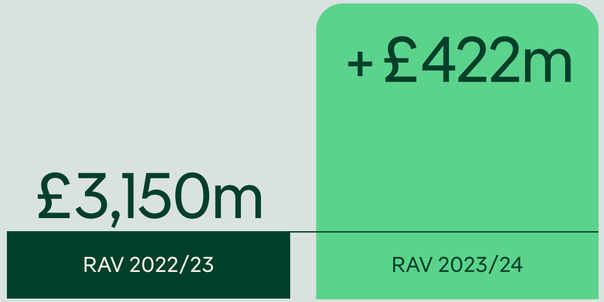
15% of every £1

Ofgem assume that we fund this RAV by:

- 55% borrowing of which the allowance for interest payments is 1.92% in 2023/24
- 45% equity with return of 4.91% in 2023/24
- Weighted average cost is 3.27% in 2023/24

45% equity

As at 31st March 2024 our RAV was £3,572m (2023/24 prices), up on the prior year at £3,150m (2022/23 prices) due to higher investment on the network going into the RIIO-T2 price control period.



Looking Forward

Developing our RIIO-T3 Business Plan Pg 30

Developing our RIIO-T3 Business Plan

An unparallelled opportunity for the growth and development of our transmission business.

The Scottish and UK Governments have set ambitious decarbonisation targets for Net Zero by 2045 and 2050 respectively and the next decade will be crucial in preparing the grid for the increase in electricity demand resulting from decarbonisation of society and the economy.

Our network will be crucial to the solutions needed to meet these targets and prevent runaway climate change. We plan collaboratively and strategically, for the future, to make sure our network plays its crucial role in the most cost-effective way.

The electricity sector is currently operating in the 'RIIO-2' delivery period which for electricity transmission network owners runs from 1 April 2021 to 31 March 2026 (RIIO-T2).

The next 'RIIO-3' delivery period for electricity transmission network owners will run from 1 April 2026 to 31 March 2031 (RIIO-T3). Following publication of Ofgem's Sector Specific Methodology Decision on 18 July 2024, our plan for RIIO-T3 will be developed throughout 2024 with input from our stakeholders and will be published in December 2024.

Our RIIO-T3 Business Plan will set out proposed investment in the transmission network and other initiatives that will be key enablers to achieving government Net Zero ambitions. It will increase the security of supplies of energy, help to protect consumers from the dangers of climate change and will help generate growth, green jobs, investment and community benefits.

RIIO-T3 Business Plan Timeline

Business Plan Development and Stakeholder Engagement	**Ongoing**
Ofgem Sector Specific Methodology Consultation (SSMC)	**December 2023 – March 2024**
Ofgem Sector Specific Methodology Decision (SSMD)	**July 2024**
RIIO-T3 Business Plan publication	**11 December 2024**
Ofgem call for evidence window opens	**18 December 2024**
Ofgem call for evidence window closes	**10 February 2025**
Ofgem Draft Determination (DD)	**Expected June/July 2025**
Ofgem Final Determination (FD)	**Expected Q4 2025**
RIIO-T3 Business Plan delivery period begins	**April 2026**

Stakeholder engagement

Throughout the development of our RIIO-T3 Business Plan, we are engaging extensively to ensure the plan we produce fully recognises the requirements of our stakeholders and commands their support.

As part of the RIIO-3 Enhanced Engagement Framework, networks must have an Independent Stakeholder Group (ISG) in place to provide scrutiny in development of the RIIO-T3 Business Plan.

We have established an Independent Net Zero Advisory Council (INZAC), which will have a vital part to play in the development of our RIIO-T3 Business Plan, scrutinising both the technical plans as well as ensuring any emerging customer issues are fully considered.

Join us on the journey of developing our RIIO-T3 Business Plan

— Visit our RIIO-T3 web page

— Read our RIIO-T3 blogs

— Register as a Stakeholder

SP Transmission

Annual Performance Report

2023/24

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