

SP Transmission
**Annual
Performance
Report 2020/21**



**SP ENERGY
NETWORKS**

Our transmission network comprises under 4,300 kilometres of circuits and 156 substations operating at 400kV, 275kV and 132kV

4,300KM

Our network area serves around 7% of all consumers in Great Britain, and we have connected 30% of all GB onshore wind generation

30%



SP Energy Networks owns three regulated electricity network business in the UK: SP Transmission plc (SPT), SP Distribution plc (SPD) and SP Manweb plc (SPM).

National Grid Electricity Transmission

Our Business

SPT is the licensed Transmission Owner (TO) for the Central Belt and South of Scotland. We serve 2 million consumers connected via our distribution network and our workforce of 488 internal employees are supported by around 150 major contracting and supply companies. Our transmission network comprises almost 4,300 kilometres of circuits and 156 substations operating at 400kV, 275kV, 132kV and 33kV. Our network area serves around 7% of all consumers in Great Britain, and we have connected 30% of all GB onshore wind generation. We take electricity generated from power stations, wind farms

and other sites and transport it through our transmission network to centres of demand.

Our network is crucial to the delivery of the Government's Net Zero target and to help mitigate climate change due to its location in an area of outstanding renewable energy resources. We transport energy from Scotland for use in centres of demand in England and Wales, benefiting consumers well beyond our license area. Our vision as a business is to provide a safe, reliable and economic transmission system for current and future network users; and deliver a sustainable,

low carbon energy system. By adopting a more sustainable approach, we are managing the network more effectively for customers and the environment, year on year.

SP Energy Networks is part of the Iberdrola Group. Iberdrola is a global energy leader, the number-one producer of wind power and one of the world's biggest electricity utilities by market capitalization. Iberdrola is investing 34 billion euros during 2018-2022, laying the foundations for sustainable growth over the next decade. The UK makes up 17% of Iberdrola's global investment portfolio.



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Welcome

A message from our CEO

As Scotland continues to drive towards net-zero emissions SP Energy Networks has a critical role to play. Our journey to a Net Zero future is already underway. In the last year, we have reduced our business carbon footprint by nearly 33% (excluding losses). We are supporting societal decarbonisation by enabling high volumes of low carbon connections to our network. We play an essential role in providing security of supply both 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.

Over the last 8 years we have invested more than £2.3bn in our transmission network as part of a demanding investment programme which delivered on all our T1 commitments – building major infrastructure to pave the way for a low carbon future, connecting our customers and replacing assets to safeguard the long term performance of our network. Through efficient project delivery, we delivered savings of £162m against our allowances for these work programmes.

We connected 1948 MW of new capacity, which was 78% of our baseline target for the price control period. We have invested heavily to maintain and upgrade our network to ensure long-term, reliable electricity supplies to our customers. Given the abundance of renewable energy in and around Scotland, our network is strategically important in allowing this energy to be harnessed and transported to meet demand in England. In the case of shared-use infrastructure, SPT has delivered a significant increase in additional network capacity over and above the baseline target of 1073MVA. This additional capacity will support the connection of directly connected and embedded renewable generation for the benefit of customers and assist in the achievement of UK and Scottish government climate change targets.

We are delighted that our stakeholders recognise the improvements we are making on a continuous basis to meet their needs. The score on our stakeholder satisfaction survey continued to be high, with an increase in our satisfaction score to 8.6 out of 10, significantly better than the benchmark level of 7.4.

The impact of COVID-19 and the subsequent lockdowns in March 2020 had significant consequences for our 2020/21 outage programme and major effects on our supply chains. We reviewed and revised plans to maximise delivery of as much of the remaining work programme as was practically possible. As an operator of critical national infrastructure, our priority is to keep the power flowing to our 3.5million customers, in turn keeping them connected to family, friends and work. Within this most challenging of years, we achieved a reliability level of 99.999902%.

I hope that you find this year's report informative and as ever, we would be delighted to receive feedback on it so that we can continue to develop it for future years.



Frank Mitchell
CEO of SP Energy Networks



Our performance in summary



Executive summary

This report sets out how our business has performed in 2020/21, the final year of the RIIO-T1 Price Control period.

Prior to the impact of COVID-19, we were very well placed to deliver all of the outputs set out in our T1 Business Plan. Despite the effects of the Pandemic, we still managed to make strong progress over the course of the year in terms of investment delivery, operational performance, customer service, innovation, sustainability and stakeholder engagement.

The impact of COVID-19 had significant consequences for our 2020/21 work programme and major effects on our supply chain. We revised plans and made extensive, concerted efforts with our supply chain and NGENSO to maximise delivery of as much of the remaining work programme as was practically possible.

Our totex delivery year on year continued, with £228m of expenditure in the year, taking our cumulative investment in T1 to around £2.3bn. Over the 8 years of T1, we spent £162m less than allowance through efficient project delivery, which will be shared with consumers.

One new wind farm was connected in the year. The Nearth Na Goithe (NNG) offshore windfarm connection was successfully commissioned (448MW) in March 2021. Over the course of T1, we delivered 29 connections, 4 more than our original plans and all for renewable energy sources. However, the total capacity connected was 1,948MW, which is below our original T1 Business plan threshold of 2,503MW and we expect allowance to be adjusted accordingly.

Alongside these connections, a range of reinforcement projects, which strengthen the network to facilitate new connections, have been delivered. Within the reporting year, we added 109MVA of additional capacity around the Dunbar area, enabling generation connections to the local distribution network. This takes the total capacity increase on our network to 3,471 MVA for the full T1 period, over three times the baseline target set in our Business Plan.

Over the course of the T1 period, we have delivered significant increases in the boundary transfer capacities into and out of our Licence area. Export capacity across the Scotland / England boundary has been increased by more than double, from 3,150MW at the start of T1 to the current level of 6,600MW. This was achieved through a series of significant projects, including the innovative 'Western Link' HVDC link, the largest of its type in the world, constructed in partnership with National Grid Electricity Transmission. In addition, 2 joint projects undertaken with Scottish Hydro Electricity Transmission increase the import capacity into our area from 1,800MW at the start of T1 to 3,250MW by the end of the period.



8.6/10
Stakeholder Satisfaction

Overall stakeholder satisfaction survey – highest performance recorded for a third consecutive year, against a benchmark of 7.4.

Our strong performance on non-load related investment continued. Prior to the lockdown in March 2020, works were well progressed for the delivery of all of the remaining modernisation projects in T1, including refurbishments and replacements on 275kV overhead lines, 275kV and 132kV switchgear, 275kV shunt reactors and 132kV transformers. The cessation of outages to protect security of supplies to consumers given unprecedented operational conditions experienced during the first lockdown adversely impacted delivery plans. Whilst much of this was recovered, a few outages to complete T1 works have necessarily had to be rescheduled to 2021/22.

Over the year and despite the unique challenges we were faced with, we failed to deliver just 48MWh of energy. This was mainly attributable to a single incident on a double circuit route in Edinburgh (where one circuit was out of service for planned works and the other faulted). Overall, our network reliability level for the year was 99.9999% – an excellent outcome given the high level of network depletion required to recover project works that had been delayed by the Pandemic.

We are delighted that our stakeholders recognise the improvements we are making to meet their needs. Over the last three years, we have delivered consistently high average performance in the annual survey, with the rating for overall satisfaction at 8.6, well above our baseline of 7.4.

Our Green Economy Fund focuses on the communities in which we operate and supports the ambitious green targets of the Scottish Government to boost local economic growth and improve air quality in our cities. Whilst COVID-19 affected the delivery of some projects, the team successfully delivered 36 schemes and fully expended the allowance (from an initial 'Expression of Interest' level of over 2,000 enquiries).

Throughout T1, we have embedded innovation within our investment and operational activities. In the reporting year and in collaboration with NGENSO and Hitachi ABB Power Grids, we deployed a hybrid synchronous compensator (H-SC) on the GB transmission system. This, the world's first H-SC system, provides key grid services such as inertia, short circuit level and reactive power which have been depleted through the closure of thermal generation plants. The technology helps maintain system stability with increasing levels of renewable generation and enhances capacity for power flow. A 12-month live trial is now underway, providing much needed support for transmission voltage control.

Further detail in relation to these and other key aspects of our performance over both the course of the year and cumulatively across the full T1 period is presented in the remaining sections of this report.

Outputs at a glance

Output	Metric/Target	Actual (In Year)	Status	Year on Year Trend	Comment
Stakeholder KPIs	69% (Ofgem break even level)	76.7%			This score of 76.7% reflects the consistency in our performance on connection offers, engagement with connected customers and broad interest customers.
Stakeholder survey	7.4 (Ofgem break even level)	8.6			This year we have recorded an improved performance in the annual survey, with the rating for overall satisfaction increasing from 8.4 to 8.6.
Stakeholder engagement Ofgem panel score	Ofgem – Target out of 10	6.4			We achieved first place in the Stakeholder Engagement & Consumer Vulnerability Incentive 20/21 for Transmission with a score of 6.4 which increased from 5.94 the previous year.
Timely connections	100% (74 calendar days to submit final offer)	99%			110 in year connection offers made on time with just 1 failure to make an offer on time.
Network capacity	1,073MVA (RIIO-T1 baseline forecast)	109MVA			Cumulative total for the price control is now 3,471MVA.
Connections to the network	2,503MW (RIIO-T1 baseline forecast)	448MW			Cumulative total for the period is now 1,948MW equating to 77% of output target.
Modernisation outputs	100% (RIIO-T1 business plan target)	104%			We continue to stay ahead of our planned outputs for RIIO-T1, and delivered our network renewal outputs in full.
Energy not supplied	225MWh (Based on 10 year average pre RIIO-T1)	48MWh			Overall, our network reliability level for the year was 99.9999%; an excellent outcome in light of the high level of network depletion required to recover project works that had been delayed as a result of the COVID-19 pandemic.
Contractor safety	Total Recordable Injury Rate (TRIR)	0.16			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.
Public safety	0	0			We can report again this year that there were zero injuries to the general public resulting from our assets or operations.
Environmental discretionary reward	50% – 69% (Targeted score in 'Proactive' range)	99%			This is the highest ever score for the industry wide Environmental Discretionary reward.
Carbon footprint – SF ₆ leakage	908kg (2021 Licence term)	775kg			15% below the target: an increase from 503kg recorded last year.
Carbon footprint – Network losses	No individual target. This is included within the Total BCF target.	163,198.0 tCO₂e			This is an improvement over last year's emissions of 194,256 tCO ₂ e.
Carbon footprint – Building losses*	6,463.73 tCO₂e	1,172.79 tCO₂e			This is an improvement on last year's emissions of 1,785.29 tCO ₂ e.

Status

- Ahead of target
- On target
- Below target

Year on year trend

- Improvement over prev yr
- In line with prev yr
- Deterioration since prev yr
- Substantial deterioration

Financial performance Summary

Our expenditure

This year:

Our total expenditure this year was £228.10m. This was £98.67m above our totex allowance. The breakdown was as follows:

Totex comparison (2020/21 real £m)	Allowance £m	Actual £m	Variance £m
Load Capex	-7.38	52.66	-60.04
Non-Load Capex	108.1	136.09	-27.99
Controllable Opex	28.8	39.36	-10.56
Totex	129.43	228.1	-98.67

Full RIIO-T1:

Our Total expenditure for the full RIIO-T1 was £2.3bn. This was £162m below our Totex allowance. The breakdown was as follows:

Totex comparison (2020/21 real £m)	Allowance £m	Actual £m	Variance £m
Load Capex	1,336.84	1,187.2	149.64
Non-Load Capex	887.37	792.84	94.53
Controllable Opex	210.3	292.29	-81.99
Totex	2,434.51	2,272.33	162.18

Our revenues

In 2020/21 we recovered £394.2m. 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 adjustments from previous years.

Incentive awards earned in 2020/21 (revenue rec'd in 2022/23)

Smaller incentives earned in 2020/21 (£ thousands)

SF₆ emissions 152

Stakeholder Engagement 933

Large incentives earned in 2020/21 (£ thousands)

Stakeholder Satisfaction 2,636

Reliability 2,384

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 we spend, we collect:

10% of the costs in the same year

90% of the costs over the life of the asset, which gets added to the 'Regulated Asset Value' (RAV) balance.

Ofgem assume that we fund this RAV by:

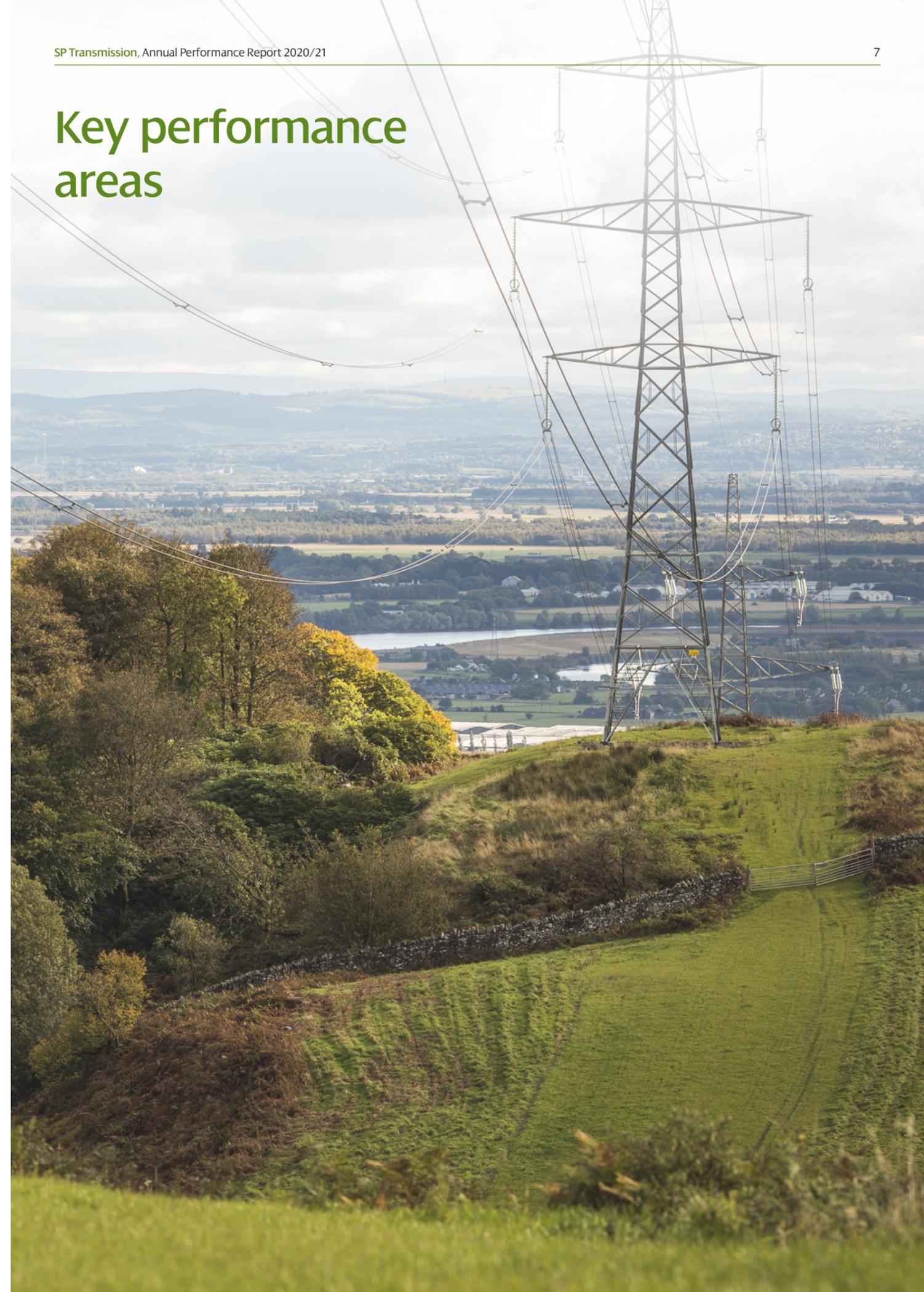
45% equity – on which we receive a return of 7.0%, as set by Ofgem for the 8-year period

The weighted average cost of funding the RAV is therefore 3.75% for 2020/21

At 31st March 2021 our RAV was £2,568m (20/21 prices), relatively flat with the prior year at £2,575m (20/21 prices) in the prior year, as we continue to invest in the network.

8-year average 2020/21	Return on Regulatory Equity (RoRE) – All numbers reflecting Ofgem's Notional Gearing methodology.
7.00%	Base Return – Set by Ofgem for the 8-year period.
0.98%	IQI Additional Income – Agreed by Ofgem as part of the price control, and is a reward for the quality of our business plan and recognition of our fast-tracking.
0.98%	Totex Efficiency Savings – Any savings we make on our investment plan are shared 50:50 with the consumer, and we are currently forecasting some savings over the 8-year period. This results in a benefit to both consumers and our shareholders, and is in addition to meeting all of our specified outputs.
0.24%	Reliability Incentive
0.01%	SF₆ Emissions Incentive
0.17%	Stakeholder Satisfaction
0.13%	Environmental Discretionary Reward
-0.05%	Network Innovation Contributions
9.44%	RoRE – Operational Performance

Key performance areas



Serving our stakeholders

Our customers, stakeholders and communities are extremely important to us.

They are at the heart of everything we do, and the changes we make are designed to give them a network which suits their needs. The needs and preferences of our stakeholders are understood through extensive engagement, and are at the core of every initiative we implement.

Stakeholder Engagement and Consumer Vulnerability Incentive 2020/2021

Overall, we strive to exceed expectations for consumers, network users and wider stakeholders. This year, for the first time ever, we achieved first place in the Stakeholder Engagement Incentive 20/21 for Transmission scoring above all other Transmission companies.

The Incentive demands that we show our key projects and initiatives which demonstrate our commitment to delivering positive outcomes for our customers and stakeholders, driven by key feedback and engagement.

Ofgem seek proof of a robust engagement strategy embedded throughout our business and our engagement with Accountability provides this assurance.

Independent external scrutiny on our approach to stakeholder engagement

We want to be continually challenged on our strategy and the advances we are making in our approach to stakeholder engagement, to ensure we are delivering the best possible service to those we impact.

We continue to align our stakeholder engagement strategy with the Stakeholder Engagement Standard AA1000 set by Accountability, the owners of the global standard. Every year, we are audited against this standard supporting our efforts to assess, design and implement our integrated approach to stakeholder engagement. This year we have achieved the highest categorisation phase possible of 'Advanced' in the 2020/21 Accountability AA1000 Health check with a score of 81%, an overall increase of 15% since our first health check in 2018. This notable achievement demonstrates our true commitment to continuous learning and improvement in stakeholder engagement.

The network is changing rapidly, and it is crucial for us to maintain an open dialogue with stakeholders and continue to measure what is important to them. We have focused on making our strategy inclusive – targeting stakeholders across all sections of society.

We want to be confident that we are doing the right thing. With the focus from Ofgem and the independent audit, we can be sure that we are on track and don't miss any opportunities for future improvement.

Continuous consultation on our business priorities

Our network is changing rapidly as are our stakeholders needs and preferences. We understand that our stakeholders have their own path to Net Zero and we may be a key part to enable their transition. Their requirements are changing, and we can forecast what this means for our network, but we need to be consulting on the right things.

We know this because over the last 12 months, we conducted extensive engagement with our customers and stakeholders to understand their priorities as well as their specific needs and preferences. Engagement with over 6,000 stakeholders using methods such as focus groups, and in-depth interviews and surveys, has supported the development of our strategic priorities. These efforts allowed us to gather a clear understanding of the priorities of our customers and stakeholders and deliver a business in direct alignment with their needs.

This year, we carried out additional research to validate these priorities through our annual transmission stakeholder survey. Feedback highlighted key focus areas of maintaining existing levels of system reliability and connecting new renewable generation to our network as top priority areas.

Our focus areas in 2020/2021

Our findings from our ongoing mature programme of engagement allowed us to identify the priorities of our customers and stakeholders to deliver a business in line with their needs and preferences – summarised in four strategic goals:

Strategic Goals	What this means in practice
 Leading the way to deliver Net Zero	Taking a leading role building a healthier, more accessible energy model – one which leaves the carbon economy behind.
 Delivering benefits through innovation and whole systems solutions	With smarter solutions, we are doing more with less – deploying new technology, processes and ways to share data.
 Maintaining world leading resilience and system operability	Adapting our world-class network to meet challenges, including extreme weather and black start events – delivering ever-higher performance for consumers, network users and wider stakeholders.
 Putting our customers, stakeholders and communities at the heart of our plans	Listening and learning even more from our stakeholders, allowing us to continue to raise our efforts as we work to improve lives, create jobs and protect vulnerable consumers.

Serving our stakeholders *continued*

Leading the way to deliver Net Zero

As the owner of critical national infrastructure, we have a fundamental role to play in supporting Scotland achieve it's Net Zero ambitions by 2045. We are committed to driving this step-change, taking a strategic leadership role to influence and shape key policies to make these ambitions a reality.

Outcomes:

- Co-created eight new principles through the ENSLG, to ensure Scotland's communities are at the heart of achieving Net Zero by 2045.
- Committed to 16 actions through the Edinburgh Climate Compact – reducing emissions through our operations, transport and buildings.
- Enabling Scotland to achieve 11GW offshore wind target by 2030 through the Transmission Network Review.
- Over 320 employees invited to our Net Zero event, equipping our staff with knowledge to support the business and help our stakeholders realise Net Zero ambitions.
- Identified a set of 20 initial actions through the South of Scotland Energy Transition group to unlock opportunities and support a sustainable future for the region.

Delivering benefits through innovation and whole system solutions

Innovation is at the core of what we do, it's part of our DNA. We have the ambition and capability to lead the industry by innovating in the best interests of our customers and stakeholders. We do this to reduce costs and facilitate a low carbon economy, all whilst continuing to improve customer service, security of supply and network performance. A continual cycle of innovation leads us to find new and improved solutions to our customers' evolving needs. These solutions will play a vital role in delivering Net Zero at the least cost and disruption for our customers.

Key outputs

- ✓ 552 stakeholders engaged
- ✓ 23 outcomes
- ✓ £36.3m* customer value

Joined Whole Systems Charter – working in collaboration to achieve Net Zero targets

- Signed up to the Whole Systems Charter along with SGN, National Grid ESO, SSEN and National Grid Transmission committing to key joint principles, supporting the alignment of our collective resources, strategies and ambitions to build and maintain a future energy system that delivers clean, sustainable energy for customers through efficient and collaborative transformation.

First TO to launch a Transmission Connections Portal

- Optimising the customer journey through the transmission connections process – increasing the quality of connections applications and improving overall flexibility of the customer journey.

60% reduction in time on site – utilising drone technology to carry out site assessments

- Introduction of innovative drone technology to inspect our transmission network delivering environmental benefits and reducing costs.

*Customer value is 'Total Profit Value' derived from SROI measurement of selected projects only.



Serving our stakeholders continued

Maintaining world leading resilience and system operability

Our customers' and stakeholders' foremost priority is the reliability and resilience of our transmission network. While our network is among the world's most reliable, the rapid increase in renewable generation (30% of all GB's renewables are connected to our network), broader supply and demand shifts, the digitalisation of the energy system and more frequent extreme weather events bring new and significant challenges. To continue to deliver world-class resilience and reliability and meet our customers' and stakeholders' primary need, we must take bold steps to manage these rising challenges.

Key outputs

- ✓ 304 stakeholders engaged
- ✓ 15 outcomes
- ✓ £8.6m* customer value

World first demonstration trial – increasing system operability in the event of a black start

- Trial successfully demonstrated green technology and renewable generators can play a key role to rapidly restore power in the unlikely event of a total or partial shutdown of the National Electricity System.

Supported the vital role of the NHS, by ensuring security of supply

- Worked with Scottish Government to make sure new field hospitals had the connections, capacity and resilience required to adequately fight the spread of the virus.

99.99% system reliability – phenomenal level of performance

- Developed contingency plans with other network operators, Scottish Government, Ofgem, BEIS and Local resilience groups to ensure we maintained optimum security of supply, protecting the most vulnerable and ensuring supply to critical sites such as hospitals, nursing homes, treatment works and food supply businesses.

*Customer value is 'Total Profit Value' derived from SROI measurement of selected projects only.

Putting our customers, stakeholders and communities at the heart of our plans

Being the trusted partner for our customers, stakeholders and communities is extremely important to us. They are at the heart of everything we do, as the changes we make are designed to give them a network which suits their needs. Recognising this role, we have continued to invest in the wellbeing of our local communities.

Key outputs

- ✓ 20,223 stakeholders engaged
- ✓ 41 outcomes
- ✓ £24.7m* customer value

Winner of the Community Engagement Award at the 2020 Planet Mark Awards

- Over £2.1 million invested in community regeneration projects – enhancing the environment in local communities

*Customer value is 'Total Profit Value' derived from SROI measurement of selected projects only.

Key achievements this year

Stimulated learning discussions with **1,045** organisations through our Green Economy Fund

Launched new Access Roads Framework – reducing waste to landfill

55 full time jobs created through Green Economy Fund



Drone technology deployed – reducing time on site by **60%**

First TO to launch customer connections portal – **1,200** users to date



World first project demonstrating wind power can restore a black start

Ensured security of supply to vital NHS hospitals throughout COVID-19



Community Engagement Award winner at the 2020 Planet Mark Awards

Principal Partner for **COP26**



Innovation

'Innovation is at the core of SP Energy Networks. We continue to develop our strong innovation culture within our business in order to maintain a leading position in innovation.'

Our NIC Projects

We are very proud of the NIC-funded innovation projects we deliver at SP Energy Networks and continue to make real progress on these as we prepare for the network of the future. Our NIC Innovation Phoenix project has deployed the world's first hybrid synchronous compensator (H-SC) on the GB transmission system at Neilston 275kV substation. With conventional thermal power stations, which have provided stability in the past, being replaced by renewable energy, such as windfarms, innovative projects like our Phoenix project are not only important for network stability but are key to the green recovery and our Net Zero and climate change ambitions.

This new technology helps maintain system stability and security, providing essential grid services such as inertia, short circuit level and reactive power which were largely depleted due to the ongoing closure of thermal generation plants on our network. This H-SC combination of a static condenser (STATCOM) and a Synchronous Condenser will enhance capacity for power flow on our network and is expected to increase the UK transmission B6 boundary power transfer capacity by up to 98 MW. With the UK Transmission system previously experiencing record breaking low demand during the covid pandemic and associated lockdown, this pioneering project has never been more important to help support system security and stability.

In a normal year, the construction of innovative grid technology would be challenging. With the onset of the covid pandemic and lockdown, this was raised to another level with working and international travel restrictions, supply delays and furloughed resources. Our people rose to the challenge and a big effort was made by all concerned throughout 2020 to complete construction and commission of the Phoenix project whilst ensuring full compliance with the prevailing public health advice. With support from our Project Partners working at Neilston, and remotely, we were able to adapt to these restrictions, to keep the project on track and allow energisation of the H-SC and commencement of the live trial in October 2020.

During the 12 months Live Trial, our project partners NGENSO, University of Strathclyde and Denmark technical university (DTU) have continued with power system simulations exploring a range of capacities and locations for H-SCs within the SP Energy Networks and GB Network Transmission network. These study results are being compared with real data collected during the live trial and will be used for the Cost Benefit Analysis where we have engaged with NGENSO and an independent market consultant to help understand the commercial value and mechanisms to incentivise the roll out of this technology.

The synchronous compensator and hybrid synchronous compensator technology is to be rolled out as business as usual in RIIO-T2. Building on the learning from Phoenix project, Eccles voltage support and real time system (ECVC), a project with a total value of £95.3m will give the B6 transmission system boundary a 280MW uplift. Ultimately, Phoenix will aid with the transition to a future Net Zero transmission network that can benefit from clean renewable energy resources without

compromising the security and quality of supply to customers whilst enhancing capacity for power flow.

Our Distributed ReStart project, in partnership with NGENSO and TNEI, successfully completed the Design Phase with production of detailed deliverables from all three main workstreams: (1) Power Engineering & Trials; (2) Organisational, Telecoms & Systems; and (3) Procurement & Compliance. Encompassing outputs from each deliverable the project has developed a roadmap outlining the route to market from both technical and commercial perspectives. The project is now within the final Implementation Phase; where SP Energy Networks, leading the Power Engineering & Trials Workstream, will seek to apply the development of our network case studies within the Design Stage to full network trials on three separate Distributed Energy Resources "anchor" generators. Our first network live trial was successfully completed in October 2020, one year ahead of schedule, at the Drax owned Glenlee hydro plant. Work is also underway within SP Energy Networks to advance elements of the control theory developed during the project to enable greater flexibility from DERs to enhance network stability and wider market participation.

Our NIC Project FITNESS (Future Intelligent Transmission Network Substation) successfully demonstrates a reduced outage and low risk approach to future substation monitoring, protection, automation and control. The solutions enabled by FITNESS facilitate reduced network costs and constraints, significantly benefitting customers. The success of the FITNESS Project has led to the launch of the digital substations initiative to build the necessary skills within Energy Networks, development of utility wide standards, specifications and requirements for successful roll-out of digital substations in RIIO-T2 and RIIO-T3. RIIO-T2 plan has identified substations where FITNESS will be applied as BaU. The CAPEX and OPEX benefit savings have been estimated to be between 5-10% and 40-50% respectively per substation.

Figure 1 Phoenix H-SC



Innovation

continued

Our Transmission NIA Portfolio

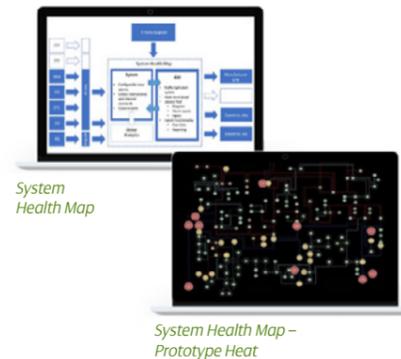
Our Transmission NIA innovation project portfolio continues to be shaped by on-going stakeholder engagement, both internal and external, with a view to maintaining a balanced portfolio that not only addresses the near term transmission issues, but also those anticipated beyond 2021. In addition to funding smaller projects, we will continue to utilise NIA Transmission funding, where appropriate, to prepare for future Strategic Innovation Funding (SIF) submissions. Our NIA projects will play a key role informing the development and delivery of future SIF projects, and we recognise the importance of wider stakeholder engagement and knowledge sharing for the benefit of the industry. SP Transmission invests significant efforts to safeguard our system resilience and supply reliability. Partnering and collaboration is a critical part of our innovation strategy and we believe that our projects are greatly enhanced by incorporating wider experience, knowledge and skill sets.

Examples of three key NIA Transmission Projects are:

1. System Health Map

SP Transmission is developing a 'System Health Map' which collates multiple existing separate data sources from the Transmission Network into one centralized platform. This platform uses trending and analytics to allow early intervention and an overall improvement in asset management. Many of the online monitoring datasets have no mechanism to collate the data gathered or to support engineers in processing or analysing this data. Many of these data sets solely rely on man-power to import, analyse and generate outputs from the raw data. The project is now in its final reporting stage, with technical work being complete.

Figure 2. System Health Map



Innovation

continued

2. 400kV Dynamic Cable Rating Retrofit

As the penetration of low carbon technologies (LCT) increases in the UK, greater circuit loading will be experienced on the transmission network. Under certain loading scenarios the power flow on transmission circuits may need to be constrained, which can result in multi-million-pound constraint payments. Rather than undertaking costly network reinforcement schemes, with long lead times and environmental impacts, one option is to operate the network using dynamic ratings. One such circuit where the declared capacity is likely to cause future constraint issues is the Torness to Thornton Bridge (Crystal Rig) 400kV circuit. This project will investigate the feasibility of using the Random Phase Multiple Access (RPMA) wireless technology coupled with point sensors and integrated with a Dynamic Capacity Rating (DCR) scheme to provide a cost effective retrofit dynamic rating solution to evaluate real-time thermal behaviour of strategic cable circuits. The key business benefit is the potential to determine additional headroom power transfer capacity on a cable circuit which could eliminate or defer network reinforcement, and avoid the various costs and risks during the associated outages, and extend the life time of network assets.

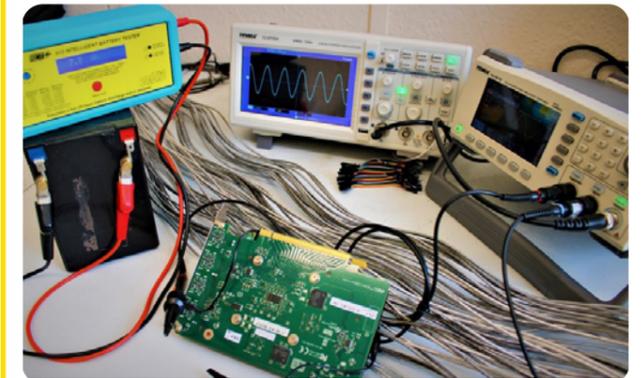
Figure 3. Sensor unit on cable (left) and communication of temperature data via RPMA wireless technology (right)



3. Project Conan

Project Conan commenced in March 2021. The project will develop a remote-controlled condition assessment device for overhead transmission lines that will significantly improve upon the condition measurement accuracy, reliability, sample rate and processing capabilities currently in practice. It will also develop concepts or methods for measurement of All Aluminium Alloy Conductors (AAAC) condition and develop the first body of scientific information to provide a reliable basis for interpreting the condition of Aluminium Conductor Steel Reinforced (ACSR) or AAAC results, upon which to make consistent, traceable condition-based decisions.

Figure 4. Laboratory development of aluminium conductor condition assessment techniques



Innovation

continued



DRIVE is a three-year program to strengthen the culture of innovation and to make innovation relevant for everyone across the business. The focus of the initiative remains to empower and enable employees to get involved in innovation and provide the tools and mechanisms to do so.

Our highlights from 20/21 include:

Continued use of a digital innovation platform to allow collaboration and engagement on real business challenges. To date, over 1,200 colleagues have used our platform across 10 innovation campaigns. This has resulted in the generation of over 280 ideas and has helped support colleagues in developing and implementing innovative ideas within the business.



The ideas generated through iHub are reviewed by the Innovation team and assessed through the NIA governance process. One such example has been a new NIA project on "landslide protection asset". This was generated through an iHub campaign looking at "What big efficiencies can we deliver in SP Transmission?" This project will study the vulnerability of the transmission network to damage from landslides and landslides and prove the use of a landslide protection system. In addition, we plan to consider nature based solutions to address high risk areas.

An integral part of the Drive initiative has been the network of Innovation Champions across the business, supporting our innovation projects transitioning into BaU. Another critical component of their role has been generating ideas, which is evident from both projects highlighted above submitted by Innovation Champions. We currently have an Innovation Champion network of 96 Champions to support with the development and implementation of innovation projects that have been generated through the DRIVE program.



Sustainability and environment

Our environmental responsibilities: 'The SP Transmission network is a crucial enabler of the UK's renewable energy objectives.'

We provide a safe, reliable and economic transmission system for current and future network users and deliver a sustainable, low carbon energy system. We play a critical role in providing security of supply across GB and in facilitating the connection of new renewables. By adopting a more sustainable approach, we are managing the network more effectively for customers and the environment, year on year.

Our environmental responsibilities

Vision and drivers

Our vision is to be a sustainable networks business:

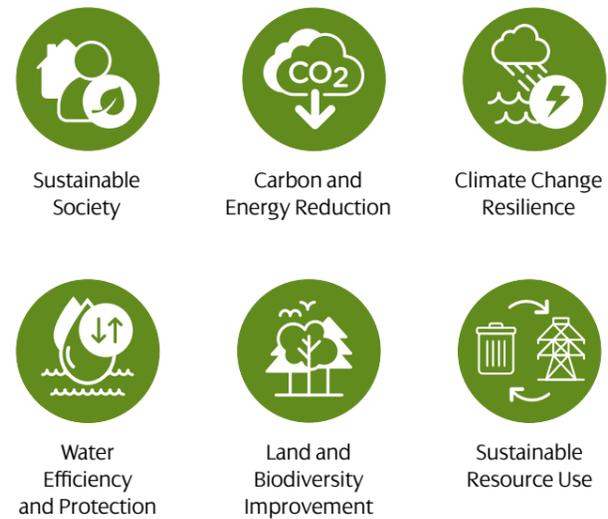
- Efficiently managing and developing our network in support of the low carbon transition; and
- Achieving neutral or positive environmental and social impacts.

We aim to be a leader in this area. Our actions to become a sustainable network operator drive our supply chain and support our customers and communities to become more sustainable.

In line with these key principles, our Strategy is reviewed annually by key internal and external stakeholders, including our Sustainability Stakeholder Working Group made up of key external stakeholders including SEPA, NatureScot, Zero Waste Scotland and the Sustainable Scotland Network. Strategy development is underpinned by expert advice and benchmarking from sustainability-focussed organisations including AccountAbility and Planet Mark. All Directors of SP Transmission and Distribution participate in the Executive Sustainability Steering Group (ESSG). The ESSG conduct a comprehensive annual review of the Strategy to ensure our goals remain in line with policy developments and are ambitious enough to demonstrate leadership.

Our Sustainability Drivers

Our Sustainable Business Strategy is underpinned by six key drivers, developed in collaboration with stakeholders. The drivers are often interlinked and rarely used in isolation, for example climate change adaptation, land and biodiversity and water are often key drivers in project planning.



2020 Sustainable Business Strategy Updates

In 2020-21, we carried out ten stakeholder workshops, four working groups and four strategic panels in order to discuss the ongoing development of the Sustainable Business Strategy with a wide range of stakeholders. Topics covered included scope 1-3 greenhouse gas reduction, supply chain sustainability, biodiversity, natural capital and social sustainability.

Feedback from these engagements has led to a number of changes being proposed for the Strategy:

- Development of new draft Net Zero and Carbon Neutrality targets,
- Development of proposed updates to the sustainable society driver and objectives,
- Commitment to the development of a Biodiversity Action Plan, and
- Identification and discussion of new external influences, such as the Scottish Climate Emergency Skills Action Plan.

We also carried out a strategic gap analysis with Resource Futures, developing a series of actions to enhance maturity across all key impact areas.

As our Strategy covers both our Transmission and Distribution licences, our Executive Team made the decision to delay the 2021 update of the strategy document to enable further engagement workshops and the development of the distribution Business Plan to influence it further.

Sustainability and environment *continued*

Initiatives and Progress

Whole Systems Planning

The UK economy is decarbonising at pace, driven by ambitious national and international targets to keep global temperature rises well within a maximum of 2°C, and subsequent reports underlining the importance of sub 1.5°C increases, from pre-industrial levels. Driving societal decarbonisation through the timely connection of renewable electricity generation ranks as our top priority, alongside continuing to provide excellent network reliability and availability. The key uncertainty facing our network – and how we develop it economically and efficiently – is the changing generation landscape, the scale, timing and location of new generation and the timing of generation closures.

Not responding quickly enough risks delaying the connection of new generation and the transition to a low carbon energy sector. But building too much or too far ahead of time leads to higher customer bills. We have an ongoing role to help strike the right balance. This means proactive scenario planning, and where necessary taking decisive action to modify our investment plans.

In the 2020-21 scheme year we have made a number of significant changes to strengthen our whole systems planning approach, delivering a range of positive outcomes including:

1. Influencing national policy and principles – Scottish Energy Advisory Board, Energy Networks Strategic Leadership Group (ENSLG), Scottish Government Update to Climate Change Plan 2018-2032, Scottish Offshore Wind Policy Statement, Offshore Transmission Network Review, National Planning Framework 4, Infrastructure Commission for Scotland (ICS).
2. Whole systems partnerships for green recovery and Net Zero – Whole systems charter, Green Recovery, Innovation partnerships, Environmental partnerships, City engagement and partnerships for Net Zero.
3. Enabling the Stability Pathfinder Process.
4. Whole systems approaches for system capacity, stability and black start – Accelerated capacity requirements, Proactive optimisation of system strength and black start capability, North of England and South of Scotland Security, Global first Virtual Synchronous Machine grid repowering, Distributed ReStart, Stability Pathfinder.
5. Integrated whole systems planning, digitalisation and innovation – New Whole Systems Team, Cross-network cooperation for efficient whole-systems solutions.



Sustainability and environment *continued*

Black Start Case study

Virtual Synchronous Machine

During 2020-21, SP Transmission worked jointly with SP Renewables to develop and trial a Virtual Synchronous Machine (VSM) at Dersaloch Wind Farm, successfully re-energising the wind farm and part of the transmission network in a global first trial. The development and trial of the VSM tested the ability of groups of renewable energy resources to self-start, managing the assets using novel algorithms to behave in a way that would allow them to 'form' the grid, rather than 'following' it. Initially, the scope of the trial only extended to re-energisation of the wind farm back to their network

connection, but SP Transmission proactively proposed a third phase for the project to test the Machine's capability to re-energise part of the transmission network and re-synchronise at a point remote from the wind farm on our network. Preparation for the trial involved over a year of intensive engagement between SP Renewables, SP Transmission and the Scottish Government. The trial was carried out in October 2020 and successfully proved that wind farms can be grid forming.

Our Carbon Footprint

We mitigate climate change most significantly through our actions to connect low carbon generation for societal decarbonisation. But while we do this, we must reduce the carbon footprint of our business and operations and ensure that our network is climate-change resilient.

In 2020-21, the carbon equivalent impact of electricity lost from the network between generator and user (network losses) made up 89% of SP Transmission's total scope 1 and 2 footprint. Sulphur hexafluoride (SF₆) made up 10% and depot and substation energy, business and operational transport combined to make up the remaining 1%.

Performance – business carbon footprint (excluding losses) Overview

During 2020-21, SP Transmission delivered reductions across all categories of business carbon footprint except for sulphur hexafluoride emissions, which increased. Due to the potency of sulphur hexafluoride (SF₆), which has an extremely high global warming potential, this led to an increase in our overall controllable business carbon footprint. Excluding losses, the Business Carbon Footprint (BCF) has increased from 14,901 tCO₂e in 19/20 to 19,604 tCO₂e in 20/21.

SF₆ emissions: Whilst the underlying trend is downwards, SF₆ emissions are volatile on a year-to-year basis, being significantly influenced by any considerable failure or leakage from the large assets on the Transmission network. In 2020/21 the largest contributing factor to an increase in SF₆ emissions was from measuring the SF₆ recovered from decommissioned equipment at a large 275kV Substation.

As SF₆ is the most significant contributor to our carbon footprint (excluding losses) we continue to prioritise SF₆ leakage reduction and drive alternatives via our supply chain. The SP Transmission T2 SF₆ working group brings internal expertise together to drive forward both SF₆ alternatives and reduce leakage. Options trialled during 2020-21 included the implementation of a flange repair kit and a low-pressure top-up kit that permanently attaches to a leaking asset, reducing the total amount of gas used for top-up. We also collaborate with the other Transmission Operators to identify areas of challenge, where we can work together to identify and implement solutions. In the reporting year this included an SF₆ alternatives workshop.

Depot and substation energy use: the carbon impact of depot and substation energy use decreased, largely due to 2020-21 being the first full year in which this energy has been purchased on a green source tariff.

Operational transport: Operational activity continued as essential work throughout the COVID restrictions. Non-essential operational travel was reduced and therefore emissions fell to 452 tCO₂e in 2020/21 compared to 478 tCO₂e in the previous year.

Business transport: The move to the majority of our meetings being carried out remotely in the reporting year had a significant positive impact on our business travel related impacts with emissions reducing to 308 tCO₂e in 2020/21 compared to 558 tCO₂e in the previous year. We have launched a new UK travel policy to complement our carbon reduction ambitions. The newly introduced policy includes reductions in overall travel by insisting on business essential travel only, a ban on flights between Scotland and London and no business class flights between Europe and the east coast of the USA.

Sustainability and environment *continued*

Sustainable Resource Use

As a sustainable networks business we need to embed sustainability across everything we do, from the goods and services we procure to the design and delivery of projects and operations, taking into account impacts along the value chain with a cradle to cradle approach to sustainable procurement and resource management.

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 divert 95% of our waste from landfill by 2023, to recycle or re-use 100% of waste by 2030, and to move to zero waste by 2050. In 2020/21 we achieved a 65% landfill avoidance.

During scheme year 2020-21 we undertook to understand our suppliers (their environmental sustainability views, plans, current performance and maturity) through various methods, to give us insight into how we can address the associated new and emerging strategic challenges in achieving our goal to become a Sustainable Networks Business.

Action on sustainable procurement and resource management focused on incorporating our sustainability commitments and enhanced environmental standards into documentation, setting up supporting processes and engaging with the supply chain.

We held our annual Transmission Supply Chain event virtually this year. Topics included our RIIO-T2 sustainability commitments and the next steps in implementation. This event provided an opportunity for suppliers to engage in dialogue with SP Transmission management team and procurement staff. We also held a Sustainable Procurement workshop to gain stakeholder input to develop our approach to strategy implementation in areas of challenge and gauge the maturity of our supply chain.



Performance dashboard

Driving Decarbonisation

448MW

of renewable generation connected to our network since April 2020.

£4.2m

invested in ongoing innovation activities supporting decarbonisation and environmental protection.

65.28

average number of days to develop a connections offer against 72 day target.

24%

increase in connections applications from 2019-20, 98% increase since 2017.

99%

awarded the highest ever score for industry-wide Environmental Discretionary Reward.

Mitigating Climate Change

4%

Business Carbon Footprint, excluding network losses, decreased by 4% since 2013-14.

32%

Business Carbon Footprint, excluding network losses, increased by 32% this year.

13%

Business Carbon Footprint, including losses, reduced by 13% this year.

46%

SF₆ carbon emissions increased by 46% this year, primarily due to permanent removal of a large SF₆-filled asset.



5 years

PlanetMark external verification certificate for 5 years in a row.

Enhancing the Natural Environment



Full ISO 14001 Environmental Management Certification.

Piloted use of Defra Biodiversity Metric 2.0.

Zero

environmental regulatory interventions in 2020/21.



Partnership development of natural capital assessment tools.

Sustainable Resource Use



Partner member of the Supply Chain Sustainability School.

4%

reduction in annual total waste from previous year, 35k tonnes total.

65%

landfill avoided.

Sustainable Society

8.6/10

Stakeholder satisfaction is 8.6/10, well above our 7.4 benchmark.

20.48%

gender pay gap for SP Transmission in 2020.



supplier engagement platform launched.

SMARTWASTE
delivered by bre

Top 10 suppliers by value onboarded.

53 full time jobs

281 indirect green economy jobs created via £20m committed to 35 projects through our 2-year Green Economy Fund, delivering an estimated 169 tCO₂ reduction per annum.

A safe network

‘The wellbeing of our customers, our people, our suppliers, and the public is and always will be our number one priority.’

We have a duty to ensure that our infrastructure is safe, and that all of our operations ensure the health and safety of everyone who comes into contact with our assets or activities. Our vision is to deliver the highest standards of Health and Safety performance, where no injury, or ill health is caused by our activities. Our approach is underpinned by our Health and Safety Management System (ISO45001), which is independently verified and certified.

Our Staff and Contractor Safety

We monitor performance using Total Recordable Injury Rate (TRIR). This defines significant injury levels as a factor of hours worked (injuries per 100,000 hours). We achieved a TRIR in 2020/21 of 0.16 with only 2 TRIR incidents having been experienced by our contractors in the year. This was an improvement in the overall rate from 2019/20 of 0.37 with 10 Contractor incidents.

	2019/20 TRIR	2019/20 Number of Recordable Injuries	2020/21 TRIR	2020/21 Number of Recordable Injuries
Staff	0.32	2	0.17	1
Contractors	0.73	10	0.16	2
Combined	0.60	12	0.16	3

Based on root cause analysis in 2020 we have focussed on a number of initiatives to help improve the H&S culture of both ourselves and our contractors.

These include:

- Behavioural Based Safety Awareness course undertaken by SPT Staff with a completion rate of over 85%.
- Return to work ‘Soft Start’ initiative/campaign across SPT in January to address a higher trend of incidents occurring at the start of the calendar year. Soft start was a phased and controlled return to work over the course of January, which implemented reduced work targets and more emphasis on health and safety engagements. This resulted in no TRIR incidents in the first 3 months of the year for the first time in 5 years.
- Contractor HSEQ Forums facilitated remotely over MS Teams.
- SPT Vehicle and Plant Contractor working group which includes contractor representatives working together to improve vehicle and plant management. This group is represented at an Energy Network Association working group.
- Working at Home Awareness initiative rolled out across SPT staff with support from Safety Representatives, to help people work safely whilst home based.



A safe network *continued*

Public Safety

We can again report that there have been zero public safety injuries as a result of interactions with our network or from our operations, achieved in part by extensive inspection and maintenance programmes, public safety education programmes, liaising with the emergency services and schools with relevant safety messaging, support to 3 public safety centres (financially and educationally), as well as our powerwise website which is aimed specifically at electrical safety for children.

Mental Health and the impact it can have is being acknowledged now more than ever before. SPT has a positive approach to mental health and provides a range of support services for staff. We have seen a number of positive engagements with the launch of a mental health awareness week that included our own employees sharing their experiences to raise the profile and understanding of mental health.



Whole System

Whole electricity planning for a low carbon future.

Our contribution to planning for future transmission network capacity takes account of whole system developments and challenges to whole system network planning for the low carbon transition.

The key challenges that we have worked to overcome during the 2020-2021 scheme year are:

- Green recovery from the pandemic
- Significant increases in the anticipated amount of offshore renewable generation planning to connect since the submission of our RIIO-T2 Business Plan, driving:
 - increased volume and complexity of connections and reinforcement projects
 - the need to increase transfer capacity across key network boundaries
- Rapid growth in asynchronous and intermittent renewables and the need to ensure system resilience and stability
- Increasing societal reliance on electricity
- Responding to the global and national biodiversity emergency.

Our contribution is annually reviewed and improved through regular and detailed engagement with relevant system users and through the governance structures described below. Strategies for delivering the whole systems low carbon transition are reviewed at least annually and plans are refined on a flexible, ongoing basis. Please see Definition and Strategies below.

In the 2020-21 scheme year we have made a number of significant changes to strengthen our whole systems planning approach and these have delivered a range of positive outcomes, which are listed below:

1. Influencing national policy and principles – Scottish Energy Advisory Board, Energy Networks Strategic Leadership Group (ENSLG), Scottish Government Update to Climate Change Plan 2018-2032, Scottish Offshore Wind Policy Statement, Offshore Transmission Network Review, National Planning Framework 4, Infrastructure Commission for Scotland (ICS).
2. Whole systems partnerships for green recovery and Net Zero – Whole systems charter, Green Recovery, Innovation partnerships, Environmental partnerships, City engagement and partnerships for Net Zero.
3. Whole systems approaches for system capacity, stability and black start – Accelerated capacity requirements, Proactive optimisation of system strength and black start capability, North of England and South of Scotland Security, Global first Virtual Synchronous Machine grid repowering, Distributed ReStart, Stability Pathfinder.
4. Integrated whole systems planning, digitalisation and innovation – New Whole Systems Team, Cross-network cooperation for efficient whole-systems solutions.
5. Integrated whole systems approaches for communities, consumers and low carbon developers – Providing direct enhanced services to reduce impact on customers, Enabling the Stability Pathfinder process, Green Economy Fund, Zero carbon communities.

We also continued to proactively develop whole systems solutions for the benefit of users and customers.

As in previous years, all of the developments above are supported by our existing System Review Group and Investment Review Group processes, which continue to provide ongoing oversight and challenge to our whole systems development approach.

We are proactive in implementing solutions that optimise whole system performance and bring savings for users and consumers.



Whole System *continued*

We do this by systematically and proactively focussing on the following aims to drive improvements (examples of 2020-21 solutions identified under each aim):

1. Coordinating across whole system actors to deliver the most efficient network solutions, including proactive optimisation of solutions for connecting parties
2. Maximising available capacity for system users through proactive optimisation of network capacity
3. Proactively optimising voltage and power quality and system strength, and
4. Maintaining network reliability and optimising black start capability.

We are actively removing the regulatory, commercial and technical barriers to whole system planning and the delivery of the low carbon economy.

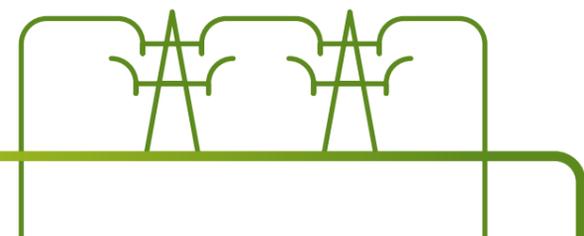
Examples of barriers include:

- Network stability, security and resilience concerns resulting from the removal of synchronous generation could suppress the connection of further low carbon generation, slowing down GB decarbonisation efforts
- System restoration capability mechanisms are not yet able to make use of renewable generation or stability assets or give appropriate locational signals in determining the geographic spread of black start services
- Without a defined GB-wide black start recovery standard, it is challenging to define the appropriate level of preparation and investment
- Local and national Net Zero pathways are not yet fully embedded in all regulatory mechanisms
- Any delays to the delivery of the required boundary transfer capacity may stall the exponential growth in offshore and onshore renewables
- Current decision making on the development of offshore renewables does not yet fully integrate consideration of:
 - the transmission networks' ability to connect these offshore windfarms,
 - the strategic decision as to their locations, and
 - the end destination for the renewable electricity they generate.

- Current lack of integration across different aspects of infrastructure represents challenges to Net Zero delivery
- Traditional commercial approaches to network connections don't yet fully take account of the specific needs of parties connecting alternative smart grid technologies
- Network outages required for the connection of renewables in areas of high renewable resource can result in significant disruption to pre-existing connected renewable generators
- technical, engineering and commercial challenges create barriers to the widescale roll-out of stability services, such as hybrid-synchronous condensers

The following narrative and supporting evidence provides examples of SP Transmission's contribution during scheme year 2020-21, including:

1. Reducing regulatory barriers by:
 - a. Influencing Scottish Government Update to Climate Change Plan 2018-2032
 - b. Accelerating offshore renewables
 - c. Influencing Infrastructure Commission Scotland delivery plans
2. Reducing commercial barriers by:
 - a. Adapting contract terms to meet the emerging needs of stability services developers
 - b. Providing direct enhanced services to maximise renewable generation
3. Reducing technical barriers by:
 - a. Removing technical barriers to the roll-out of Hybrid-Synchronous Condensers
 - b. Enabling renewable access to black start and capacity markets



COVID

COVID-19 has transformed many aspects of our lives, from where we work to how we live our everyday lives.

Last year, we witnessed an unprecedented challenge in keeping the power flowing to our customers; in turn keeping customers connected to family, friends and work. Our entire workforce rose to the challenge, doing everything they could – going above and beyond to deliver what was needed.

In responding to the Pandemic we:

- Developed contingency plans with other network operators, Scottish Government, Ofgem, BEIS and Local Resilience Groups to ensure we maintained optimum security of supply.
- Shared best practice with other electricity networks and the ENA to strengthen our collective response – ensuring consistency of messaging. This was further shared internationally, extending best practice on a global scale.
- Proactively engaged with our entire Supply Chain and contractors at the beginning of the pandemic. Digital surveys issued to our contractors to understand impacts and mitigate risks, ensuring essential projects continued.
- Conducted comprehensive review and monitoring of our infrastructure around hospitals, nursing homes, water treatment works and food supply businesses across Central and Southern Scotland to ensure continued security of supply to these critical sites.
- Rescheduled outages and re-prioritised works to provide additional capacity and more electricity where it was needed, supporting the NHS.
- Engaged stakeholders throughout outage re-planning, ensuring they were supported and satisfied with plans.
- Worked with Scottish Government to make sure new field hospitals had the connections, capacity and resilience required to adequately fight the spread of the virus.
- Proactively advanced our shunt reactor programme to balance over-generation and low demand to manage network fluctuations in preparation for the UK population working from home.
- Managed demand risk through weekly operability meetings with all TOs, DNOs and NGEsO to remove the risk of an over supply on the network.
- Dedicated COVID-19 response team established to identify key workers and implement safe working practices enabling critical work to continue in our communities.
- Established sub-group of union representatives to outline appropriate standards and practices across the business to maintain security of supply.
- Embedded innovative solutions such as our iHUB drone project to inspect overhead lines.
- Continuous engagement with the National Health and Safety committee (HESAC) sharing key learnings on new working practices adopted to keep our staff, contractors and customers safe.
- Provided feedback to over 110 Trade Union questions in advance of HESAC calls, outlining working procedures and risk assessments ensuring the health and safety of our colleagues and customers.
- Signed the C-19 Business Pledge, demonstrating our commitment to help society at large through the COVID-19 crisis.



COVID

continued

Our efforts achieved the following outcomes:

- Maintained 99.999902% reliability throughout the pandemic, protecting the most vulnerable and ensuring supply to critical sites such as hospitals, nursing homes, water treatment works and food supply businesses.
- Customers were not impacted by fluctuations in demand as a direct result of proactively advancing our shunt reactor programme.
- Over 185 contractors completed our COVID response survey to proactively mitigate risks, ensuring essential works continued.
- Inspections proactively completed at over 120 substations around critical sites to maintain resilience – ensuring life-saving support continued to be provided 24/7.
- Reduced on site contact with landowners during the pandemic through adopting drone technology for site inspections.
- Improved health, safety and employee wellbeing as a result of enhanced level of engagement across network operators and Trade Unions which will be an enduring legacy.



Green Economy Fund – The story so far...

We're proud of the relationships we've built and the achievements we've made so far. Through the Green Economy Fund, we have committed to voluntarily contribute up to £20m over a two-year period. We're backing initiatives that will benefit the people of Scotland, the country's ambitious green energy plans, and local economic growth.

Choosing the right projects

The fund aims to support a variety of projects across the Scottish communities that we serve.

The projects we support through the GEF must support the fund's aims, and demonstrate that they will fundamentally reduce carbon emissions and have a positive environmental impact.

They should also:

Deliver clear social benefits with any income generated being reinvested into activity with good social outcomes.

Support the most vulnerable in our society.

Boost local economic growth, leading to new jobs and businesses across Scotland.

Whilst projects don't need to be innovative, they must be unique in their approach. Most importantly, they should generate lessons that can be shared. This is key, because if the fund can help us to build a solid roadmap for others to follow, we can affect wider social, economic and environmental benefits.

Green Economy Fund continued

The four project categories

All the projects we are backing sit within one of the following focus areas:

Transport

Projects promoting the uptake and infrastructure provision of electric vehicles or other low-carbon solutions.



Heat

Projects that centre on the provision of affordable low-carbon energy for the communities we serve.



Renewables

Projects that look at innovative low-carbon solutions, and energy utilisation at a local level.



Education

Projects focusing on the creation of a low-carbon workforce.



A wide-reaching invitation

To attract a wide range of projects that will deliver long-term benefits, we made eligibility for the fund as inclusive as possible.

Applicants had to be a Scottish organisation, or a UK organisation with a Scottish footprint – for example, staff based in Scotland within SP Energy Networks' operating boundaries.

We invited a wide range of organisations to apply – from charities, community groups, housing associations and local authorities to schools, academic institutions and businesses.

The application process

The GEF grant application process was designed around the principles of an open and fair competition. We wanted to select projects that would have the maximum positive impact, demonstrate a range of different aspects of the green economy, and have a realistic chance of succeeding within the scheme's timescale.

With these principles in mind, the Energy Saving Trust (EST) helped us to facilitate the application rounds, fund awards and management of the engagement with ongoing projects, including reporting, evaluation and funding claim processes.

Funding awarded

By March 2020, we had agreed to award funding to 35 projects, which after administration committed the entire funds.

35

Green Economy Fund – Our fund dashboard

From the start of the Green Economy Fund, and throughout, we have captured key metrics which provide a snapshot of the full impact of the fund. These figures have been calculated up to March 2021.

226 Heat/Electric batteries installed in social housing



Net energy stored/saved
73,549kWh

55 Full time green economy jobs created



Indirect jobs created
591

Knowledge sharing sessions

1,045



Additional projects enabled by the activities funded
69

Green Economy Fund continued

These figures are calculated by Energy Saving Trust, based on the information provided by the projects.

Low carbon generating measures installed

25

This includes micro hydro-schemes, solar PV array's, wind turbines and ground source heat pumps.



Low carbon energy generated

474,085MWh



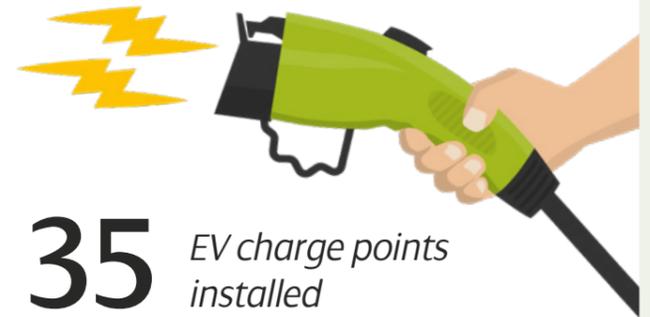
231 tCO₂e pa

Carbon savings



29 ebike / ecargobikes purchased

43 Electric vehicles (EV) purchased



35 EV charge points installed

EV journeys completed

17,043



201,610 miles

Travelled in EVs

Expenditure and outputs – Load and Non-load Related

“RIIO” is Ofgem’s framework for setting price controls for network companies. RIIO stands for Revenue = Incentives + Innovation + Outputs. Effectively this means that we are only rewarded for delivering exceptional performance in our incentive, outputs and innovation.



Investment performance

2020/21 was the last year of RIIO-T1, and over the year, we made substantial progress in completing our T1 plan delivering a number of significant outputs despite challenging conditions and changing requirements on the system.

In the final year of RIIO-T1, our original Business Plan had forecast expenditure of £307.1m but with changes to the plan over the course of RIIO-T1, our actual expenditure was £228.1m taking our total investment over the eight years of RIIO-T1 to £2.3bn.

A changed landscape

Across our RIIO-T1 business plan, the position relative to allowance has varied, reflecting changes in project delivery profiles since the RIIO-T1 Business Plan was submitted but on the whole, delivering all key outputs.

Prior to the impact of COVID-19, we were very well placed to deliver all the remaining tasks set out in our RIIO T1 Business Plan.

The impact of COVID-19 and the subsequent lockdown in March 2020 had significant consequences for our 2020/21 outage programme and major effects on our supply chains.

We reviewed and revised plans to maximise delivery of as much of the remaining work programme as was practically possible. There were extensive and concerted efforts made with our supply chain to secure material and ensure a safe environment for staff. The materials for our projects are sourced from around the world and the impact of the pandemic affected these supply chains in different ways. We have also seen impacts from Brexit with alternative arrangements being required for equipment coming into the UK.

We have worked proactively with National Grid ESO who approve outages and access to the network to recover as many of the cancelled outages as we could.

Notwithstanding this, however, there was significant additional risk to our programme delivery from Covid control measures and system outages that necessarily extended through the winter. We were successful in recovering the majority of the programme, however, a small number of activities slipped into the T2 period.

*Whilst delivering our outputs,
through innovation and efficiency,
we have made savings of*

£162m



Non-load expenditure and outputs

Investing to maintain reliability

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.

We have had a strong performance on non-load related investment throughout RIIO-T1 and this has continued with delivery of a broad range of outputs. Our comprehensive planning approach has enabled us to achieve more without unduly increasing network risk. In the last year we spent £70.9m compared to our initial plan of £82.7m. Over the course of T1. Our total non-load expenditure was £514.4m compared to the plan of £618.9m.

Prior to commencement of lockdown in March 2020, works were well progressed on site for the delivery of all of the remaining outputs we had planned for RIIO-T1. This included completion of works on 275kV overhead lines, 275kV and 132kV switchgear, 275kV shunt reactors and 132kV transformers. The initial cessation of outages to protect the security of the network and supplies to consumers adversely impacted 2020/21 delivery plans.

Whilst much of this was recovered, a few outages to complete T1 works have necessarily had to be rescheduled to 2021/22. Delivery in 2020/21 included:

Our Transformer replacement programme was substantively completed for RIIO-T1. At St Andrews Cross, which feeds a substantial part of Glasgow City Centre, one 132kV transformer was replaced and the second one removed in preparation for its replacement in the first year of RIIO-T2. At Charlotte Street, feeding the East-end of Glasgow, one 275kV transformer was also replaced.

Major engineering works associated with the replacement of end of life circuit-breakers and other switchgear were completed at Currie, Wishaw and Strathaven 275kV substations. At Kaimes 275kV, three circuit breakers at end of life were removed with one new one being commissioned in the year. The remaining two additions have suffered programme delays resulting from COVID-19 and will be delivered in 2021/22. Works on 132kV substations at Chapelcross and Currie were also completed in the year.

Our reactor modernisation programme was completed with the commissioning of four units at Smeaton (East Lothian) 400kV and Bonnybridge 275kV. Three units were disposed of at Shrubhill and West George Street 275kV substations.

Completion of the T1 overhead line major refurbishment works on the final 275kV routes around Edinburgh, Mid-Lothian and East Lothian – Currie to Kaimes (XP), Kaimes to Cockenzie (XS).

V-route 132kV overhead line major refurbishment, completing the planned 132kV programme for RIIO-T1.

The major refurbishment works are supported by a programme of minor works to maintain the reliability and performance on other overhead lines until they are due for major works in the future. This approach ensures that the network assets are modernised in an efficient manner without compromising long-term customer service.



Load related expenditure and outputs

Changing network requirements

Our plans for the transmission network need to continually evolve to account for the changing landscape of electricity generation and demand. Over the RIIO-T1 period we have seen a significant increase in generation connecting to the transmission network across the network in Scotland. This requires additional points of connection onto the system, and also reinforcements to ensure the network has sufficient capacity to transmit the power to where it is being consumed. This is called Load related activity.

Long term planning is critical to ensuring the network can meet the requirements of users, but this is subject to change as a result of the impact of government policy, changing requirements from generation customers and challenges we face to secure access to land for constructing new assets.

Over the last year we spent £52.7m on load related activity taking the total spend in RIIO-T1 to £1.2bn compared to an allowance of £1.3bn. For load related expenditure, our allowances are determined by a variety of automatic mechanisms which provide allowances based on the outputs connected to the network. The underspend compared to allowance was due to a number of innovations that we introduced to ensure the timely delivery of the projects and value for money for customers over the eight year period.

Continuing to connect our new customers

Over the course of the last year we provided 110 connection offers to customers seeking to connect to the network, an increase of 11% compared to the previous year. Over the course of T1 there has been a near doubling of the level of applications that we process annually. Transmission owners are measured by Ofgem on the timescales we take to provide an offer and despite this massive increase, we only had one offer which took longer than the target of 90 days.

There was only one new transmission directly connected wind farm commissioned in the final year of RIIO-T1. The Nearth Na Goithe (NNG) offshore windfarm connection was successfully delivered (448MW) despite significant planning delays, COVID-19 and very poor weather conditions in Q1 2021.

Significant development and construction, continued across our portfolio of onshore and offshore windfarms for delivery in RIIO-T2 and T3. The out turn cumulative total for RIIO-T1 was 1,948MW, 78% of the baseline target for the price control period. Over the 8 years we delivered 29 schemes; four more than our original plans. We continue to work closely with developers to seek earliest connections where it is cost efficient and economical to do so. Over the course of the last year we have fully embedded the use of our connections portal, Apollo, to enhance the customer experience which has been well received by connecting customers.

Creating additional capacity

As well as connecting new customers, another important feature of our connections work is ensuring that the system has sufficient capacity to allow the generation to be transmitted to where it is required, and also reinforcing the network where more than one customer will require access. This is called shared-use infrastructure.

SPT has delivered a significant increase in additional network capacity over and above the baseline target of 1,073MVA. SPT have spent broadly in line with agreed allowances whilst delivering an increase in network capacity of 3,471MVA; over three times the baseline target. This additional capacity will support the connection of directly connected and embedded renewable generation for the benefit of customers and assist in the achievement of UK and Scottish government climate change targets. In the last year we delivered 109MVA of additional capacity in the reporting year around Dunbar, enabling connection of new generation connections via the distribution network.

A secure and operable network

A range of other load related projects were also completed to ensure the ongoing operability and capability of the network as a result of the changing generation and demand patterns across Great Britain.

This included the completion of the final shunt reactor at Elvanfoot to take the RIIO-T1 portfolio to seven 33kV 60MVA shunt reactors to support the effective management of system voltage across Scotland. This is necessary as a result of reduced availability of large synchronous generation plant. These became of particular value during the Covid restrictions due to significant demand reductions as a result of lockdown restrictions and increasing volumes of generation across the distribution network.

Additionally, works related to planning conditions on the completed Beauly to Denny overhead line continued. These include 132kV undergrounding of existing overhead lines. The removal of the redundant 132kV overhead lines and other works associated with the Stirling Visual Impact Mitigation Scheme (SVIMS) are now expected to complete early next year.

The new Kendoon to Tongland Reinforcement (KTR) project continued to make progress with overhead line routeing, environmental assessment, stakeholder engagement and consultation continuing in the year.

Other expenditure

Opex

We also have an ongoing programme of maintenance and inspection activity to ensure that our assets continue to perform as expected as well as fulfilling our statutory obligations. This also complements investment to maximise the availability of all our assets. Maintenance and inspection policies are regularly updated reflecting operational experience and best practice.

We repaired a larger than expected volume of minor plant and cable defects (classified under faults), to maintain the integrity of our network. These defects are identified through our regular routine inspection and maintenance regimes.

Over the RIIO-T1 period, our total allowance for inspection and maintenance was £210.3m whilst our actual costs were £292.3m.

Totex comparison Capex	(2020/21 real £m)	Allowance £m	Actual £m	Variance £m
Baseline – Wider Works (BWW)		4.08	14.8	10.72
Baseline – Other LR Capex		-11.46	37.86	49.32
Sub-Total Load Related Capex		-7.38	52.66	60.04
Asset Replacement Capex		82.67	70.98	-11.69
Other Capex		24.11	63.66	39.55
Non Operational capex		1.23	1.45	0.22
Total Capex		100.63	188.75	88.12

Totex comparison Opex	(2020/21 real £m)	Allowance £m	Actual £m	Variance £m
Faults		1.2	1.85	0.65
Inspections & Maintenance and Other direct costs		12.23	10.19	-2.04
Indirect Costs		15.38	26.06	10.68
Adjustment for IAS 19 pension accrual		0	1.26	1.26
Total Controllable Opex		28.81	39.36	10.55
Totex		129.44	228.11	98.67



Our revenues

'In 2020/21 we recovered £394.2m. 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 adjustments from previous years.'

We recover our revenues through charges to the system operator, National Grid – who, in turn, levies charges on users of the transmission system across GB. Based on our forecast performance, the Operational Return on Regulatory Equity over the full RIIO-T1 period is estimated at 9.4%.

Our revenue allowance – the basics:

- An allowance is set by Ofgem.
- This is calculated using a formula.
- There are various components to the formula.
- Some components are fixed, and some depend on variables (such as MW of generation connected).
- Some components relate to individual investment schemes, e.g. those listed under Strategic Wider Works.
- Performance under the various incentive schemes will affect revenue allowance with a lag of two years.
- Differences between what we recover and what we are allowed to recover are adjusted for in subsequent years.



Our RoRE (Return on Regulatory Equity)

‘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:

10% of the costs in the same year.

90% of the costs over the life of the asset, which gets added to the ‘Regulated Asset Value’ (RAV) balance.

Ofgem assume that we fund this RAV by:

55% borrowing – on which we receive interest payments of 1.07% (for 2020/21).

45% equity – on which we receive a return of 7.0%, as set by Ofgem for the 8-year price control.

The weighted average cost of **funding the RAV is therefore 3.75%** for 2020/21.

At 31st March 2021 **our RAV was £2,568m (20/21 prices)**, relatively flat with the prior year at £2,575m (20/21 prices) in the prior year, as we continue to invest in the network.

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 09/10 prices and therefore represents an average real equity return over the 8-year price control.

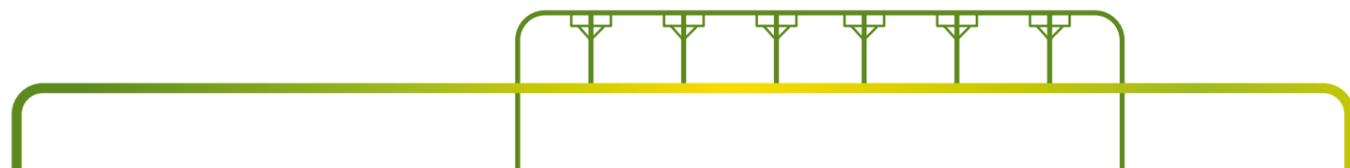
We have followed the Operational RoRE methodology used by Ofgem in their Regulatory Financial Performance Reporting (RFPR) to ensure consistency.

For detailed information about our financial performance, please see the SP Transmission Regulatory Accounts which are published annually, available from https://www.spenergynetworks.co.uk/pages/accounts_information.aspx

Our Regulatory Financial Performance Report, available from https://www.spenergynetworks.co.uk/pages/regulatory_financial_performance_report.aspx

8-year average 2020/21	Return on Regulatory Equity (RoRE). All numbers reflecting Ofgem’s National Gearing methodology.
7.00%	Base Return – Set by Ofgem for the 8-year period.
0.98%	IQI Additional Income – Agreed by Ofgem as part of the price control, and is a reward for the quality of our business plan and recognition of our fast-tracking.
0.98%	Totex Efficiency Savings – Any savings we make on our investment plan are shared 50:50 with the consumer, and we are currently forecasting some savings over the 8-year period. This results in a benefit to both consumers and our shareholders, and is in addition to meeting all of our specified outputs.
0.24%	Reliability Incentive
0.01%	SF₆ Emissions Incentive
0.17%	Stakeholder Satisfaction
0.13%	Environmental Discretionary Reward
-0.05%	Network Innovation Contributions
9.44%	Return on Regulatory Equity – Operational Performance

Looking forward



Looking ahead to RIIO-T2

Our next price control review, RIIO-T2, lasts five years from 2021–2026.

This will be an exciting period with the new legally binding targets for Net Zero which is rapidly changing the generation landscape in not only Scotland, but across Great Britain. In this period we are also expecting to see increasing demands for electricity as the electrification of transport and heat continues to grow. These changes will make the reliability of the network all the more critical to the customers and communities we serve.

For the five year period, Ofgem have determined our baseline allowance to be £1.23billion (18/19). Based on the rapidly changing nature of generation and demand, we expect the actual expenditure to be considerably higher. Ofgem have acknowledged the need for greater flexibility in RIIO-T2 and additional funding requirements will be developed with Ofgem to meet the changing needs.

A number of projects are already progressing for RIIO-T2 including the modernisation of the 40mile ZA overhead line stretching from Cockenzie near Edinburgh to Eccles in the Borders. A number of projects such as this have advanced over the last year to allow for an early start to the RIIO-T2 period and ensure we can deliver the outputs we set out in our plan.

We have also continued with our Independent User Group originally established to support the creation of our T2 Business plan, as we very much value its input in helping shape our plan as it evolves to meet new needs, providing challenge to our delivery performance and holding us to account on the commitments we have made.





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