



Scottish & Southern
Electricity Networks

TRANSMISSION

SSEN Transmission Annual Performance Report 2020/21

www.ssen-transmission.co.uk

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About us

We are SSEN Transmission (the trading name for Scottish Hydro Electric Transmission), and are part of the SSE plc Group. We are responsible for the electricity transmission network in the north of Scotland maintaining and investing in the high voltage 132kV, 220kV, 275kV and 400kV electricity transmission network.

Our network consists of underground and subsea cables, overhead lines on wooden poles or steel towers, and electricity substations. It extends over a quarter of the UK's land mass, crossing some of its most challenging terrain and powering our communities by providing a safe and reliable supply of electricity. We do this by taking the electricity from generators and transporting it at high voltages over long distances through our transmission network for onwards distribution to homes and businesses in villages, towns and cities.

Scotland's transmission network has a strategic role to play in supporting delivery of the UK's Net Zero

target. We're already a mass exporter of renewable energy, with around two thirds of power generated in our networks area exported south. By 2050, the north of Scotland will need 40GW of low carbon energy capacity to support net zero delivery. For context, we currently have close to 7GW of renewable generation connected in the north of Scotland.

We are committed to inclusive stakeholder engagement, and conduct this at an 'Accomplished' level as assessed by AccountAbility, the international consulting and standards firm.

Find out more: www.ssen-transmission.co.uk



SSEN Transmission the world's first electricity networks company to receive external accreditation for a science-based target in line with a **1.5°C global warming pathway**



The new **600MW Shetland HVDC** project is making excellent progress and will provide a mechanism for Shetland to harness the islands' onshore renewable generation and export to the Scottish Mainland



Our network reliability continued to be **>99.99%** overall and achieved 100% reward position on our Energy Not Supplied incentive



The total renewable generation connected to the SSEN Transmission network has increased by over 100% since April 2013 with an increase from **3.36GW to 6.75GW** as of April 2021

Key

- Existing infrastructure
- The Certain View
- Likely RIIO-T2 Uncertainty Mechanism
- Additional potential projects





Rob McDonald
Managing Director

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Welcome

Welcome to SSEN Transmission's 2020/21 Annual Performance Report. Thanks to the commitment of employees right across the business, during the national Covid-19 pandemic response, we've delivered strong operational performance on behalf of the customers, communities and the wider stakeholders we serve.

We continue to ensure the safe and reliable transmission of electricity through our network to ultimately power businesses and communities and we continue to carry out our work in a safe way with the additional adoption of Covid-19 compliant requirements. In 2020/21, this ensured that our network was inspected, maintained, and operated to the highest standards to keep the public, as well as our staff and contractor partners, safe, and that our construction activities did not adversely impact them. We also introduced additional initiatives to support employee health and wellbeing during this challenging time, including a mental health partnership with Thrive: Mental Wellbeing. Our Electricity Not Supplied performance has met its target in all years of RIIO-T1, including during the pandemic.

Delivering net zero emissions and preventing the worst effects of climate change is at the heart of our business. In 2020/21, we received official verification of our greenhouse gas reduction targets by the Science Based Target Initiative (SBTi), making us the world's first electricity networks company to receive external accreditation for a science-based target in line with a 1.5°C global warming pathway. We've also implemented our 'biodiversity net gain' (BNG) policy which is an approach that aims to leave the natural environment around a development site in a measurably better state than before we started work. Our first projects are enabling us to identify areas of potentially irreplaceable habitat and reduce our possible impact. In 2020 we moved our customer and stakeholder engagement on line, sourcing new digital platforms to engage effectively with our stakeholders while face to face events were prohibited. We remain committed to continually improving our engagement with stakeholders, carrying out regular external assurance audits and are pleased to report a total score of 73% for our 2020/21 assessment against the AA1000 Stakeholder Engagement Standard, up 11% on the previous year.

Our strong track record on project delivery throughout T1 has been maintained as we continued to make excellent progress on our capital investment programme during the year despite the impact of the Covid-19 pandemic. Significant projects completed in the year included several load related schemes to upgrade the network such as Melgarve Substation which was built at 500 metre altitude, as well as the replacement of the Inveraray to Crossaig transmission line in Argyll which will protect supply for communities in that region and connect new renewable energy. Good progress also continues to be made on the Shetland HVDC link, which remains on track for energisation in 2024.

Over the duration of the eight-year RIIO-T1 price control, our investment and capital expenditure in the North of Scotland transmission infrastructure totalled nearly £3.5bn, including £436m in 2020/21 on a statutory accounting basis. This investment plays a pivotal role in providing the critical national infrastructure required to facilitate the transition to net zero and to maintain network reliability for the communities we serve. While considerable progress has been made in the decarbonisation of electricity generation, more needs to be done to meet the country's net zero ambitions. The combination of the Certain View and further investments still to be approved by the regulator, could bring the total expenditure across the RIIO-T2 period to over £4bn, and as we look ahead, we are fully focused on delivering our 'Network for Net Zero' business plan.



Safety

At SSEN Transmission nothing is more important than the wellbeing of our staff and colleagues and that they return home in good health to their families each day.

We ensure that our network is inspected, maintained, and operated to the highest standards to keep the public, as well as our staff and contractor partners, safe, and that our construction activities do not adversely impact them. Our safety record over the last three years has been consistent, although the combined (employee and contractor) Total Reportable Incident Rate (TRIR) rate rose slightly to 0.27 last year.

In 2020/21 SSEN Transmission added a complementary safety performance metric of "safe days" to the more traditional TRIR methodology of measuring safety performance. Safe Days' will help us to stay focused on taking care of ourselves, each other and the environment. We have used this metric in revised monthly SHE performance reports and across our local communication channels. Simply a 'Safe Day' is one where we don't have a minor, serious or major incident.

We will still use TRIR as a core metric to benchmark and to look for trends. Knowing the number of people harmed is reducing and that we have more 'Safe Days' is important and helps us to understand if the proactive safety measures we undertake are delivering the right outcomes. In 2020/21 Transmission achieved 347 out of 365 Safe Days.

We continue to drive the message that we should do everything safely or not at all, and with the ongoing coronavirus pandemic, we have continued to carry out our work in a safe way while adopting COVID compliant requirements.

In terms of our employees' health and wellbeing, we have recognised the pressures that the coronavirus pandemic has had and continues to have on wellbeing. Alongside our existing systems, such as mental health first aiders and our Employee assistance programme, in 2020/21, we introduced new initiatives, including a partnership with Thrive: Mental Wellbeing. This is an app that offers 24/7 easy and instant access to support and guidance, intended to ensure support when it is most needed.

Safety Measure	2016/17	2017/18	2018/19	2019/20	2020/21
HSE Reportable Incidents	10	3	3	3	1
Lost Time Incidents	3	5	0	0	2
Medical Treatment Incidents	7	6	4	2	5
TRIR	0.54	0.45	0.23	0.21	0.27

Total Recordable Incident Rate

Total number of recordable incidents for staff & contractors per 100,000 hours worked





Environment & Sustainability

Verification of our Science Based Target

Delivering net zero emissions and preventing the worst effects of climate change is at the heart of our business. Whilst the most material impact we have is through connecting and transporting clean renewable electricity, we also recognise we have a responsibility to take direct action to reduce our own impact on climate change. In 2020/21, we received official verification of our targets by the Science Based Target Initiative (SBTi), making us the world's first electricity networks company to receive external accreditation for a science-based target in line with a 1.5°C global warming pathway.



Business Ambition for 1.5 degrees

In February 2021, we have gone further by signing up to the Business Ambition for 1.5 Degrees Campaign. Already having had our science-based target validated by the SBTi, we were able to sign up to the initiative under the strongest ambition in the short to medium term. As part of this commitment, we have also joined the Race to Zero campaign.

"Our company commits to set science-based emissions reduction targets across all relevant scopes, in line with 1.5°C emissions scenarios. This option ensures the strongest ambition in the short to medium term and enables companies to align with trajectories that lead to net-zero value chain emissions by 2050".

Innovating with our suppliers to reduce SF6 emissions

SF6 is a greenhouse gas and has been used extensively across the electrical industry as an insulating gas for switchgear in substations. If leaked the gas is extremely harmful to the environment. It's one of our Scope 1 emission areas. Using alternative technology to SF6 supports our ambitions to meet our 1.5 degrees science-based target and the transition to net zero emissions. In 2020/21, working with GE and Amey, we energised the world's largest installation to date of SF6-free gas at our New Deer project substation in Aberdeenshire.

We've established a partnership with GE Renewable Energy's Grid Solutions Business to install SF6 alternatives at our Kintore 400kV substation, which will be the first time globally that SF6-free gas insulated switchgear will be used at this voltage level.





Environment & Sustainability cont.

RIIO-T1 Performance in Review

For the third year running, we were awarded a 'Leadership' rating in Ofgem's Annual Environmental Discretionary Reward (EDR); achieving our highest scoring to date and making us the first Transmission operator to achieve EDR leadership status for three consecutive years. We have shown improvement in our business carbon footprint by achieving a Total Business Carbon Footprint (BCF) reduction of 31% over RIIO-T1 and have the best SF₆ leakage performance for the UK Transmission Owners when using a consistent methodology.

Environmental Discretionary Reward

Target = Leadership

Assessed by an expert Ofgem panel, we will receive the score for 2020/21 later in the year



SF₆ Leakage (Kg)

Target = <390.81kg

This measures the sulphur hexafluoride (SF₆) leakage from our switchgear. The target increases as the number of assets using SF₆ on our network increases. The overlaid line graph shows percentage leakage based on total mass installed.



*Our SF₆ asset base increased from c41,775kg to c52,013kg

Business Carbon Footprint (tCO₂e)*

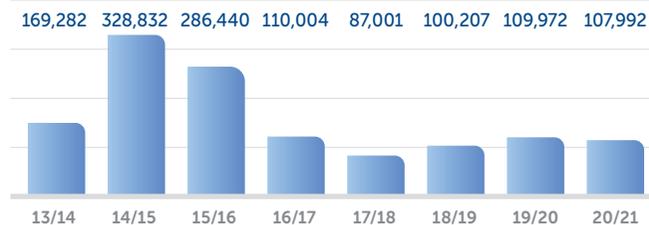
This measures the carbon footprint of the business in delivering our activities



*Tonnes of carbon dioxide equivalent.

Transmission Electrical Losses (tCO₂e)*

The electrical losses from our system are measured as the difference between the energy entering our system and the energy received by customers.



*Tonnes of carbon dioxide equivalent

2020-21 Achievements



We are the first GB network licensee to achieve independent assurance of our greenhouse gas emission reporting to international standards.



We have been assessing the north of Scotland electricity sector contribution to net zero targets by comparing our North of Scotland Future Energy Scenarios with the recently published 6th Carbon Budget by the UK Climate Change Committee. We aim to publish the findings of this study later this year.



Introduced sustainability requirements for our supply chain in our RIIO-T2 framework contracts and are introducing a Supply Chain Sustainability Reporting system.



6 projects have been surveyed as part of our embodied carbon study.



Achieving No Net Loss of Biodiversity on our newly consented projects.



IEMA Sustainability Impact Award 2020 on Biodiversity and Environmental Net Gain (Sep 2020)

Development to Facilitate Generation

Scenarios for a pathway to net zero carbon emissions

The GB electricity system has continued to experience significant change as the energy mix becomes more renewable. 2020 was a record breaking year, which was categorised as the greenest year on record by the Electricity System Operator (ESO). Long periods of coal-free generation and increased output from zero carbon sources were major contributing factors to the reduced carbon intensity of the electricity system.

Achieving net zero carbon emissions requires transformational change in the energy system and required us to rethink the approach to our North of Scotland Future Energy Scenarios. Our North of Scotland Future Energy Scenarios consider future changes in renewable generation and demand reacting to the decarbonisation challenge. Two of our scenarios are now designed to put us on a pathway to achieving net zero carbon emissions. Our third scenario falls short of achieving net zero carbon emissions. Our plans for developing the network are focussed on the requirements to accommodate the net zero scenarios.

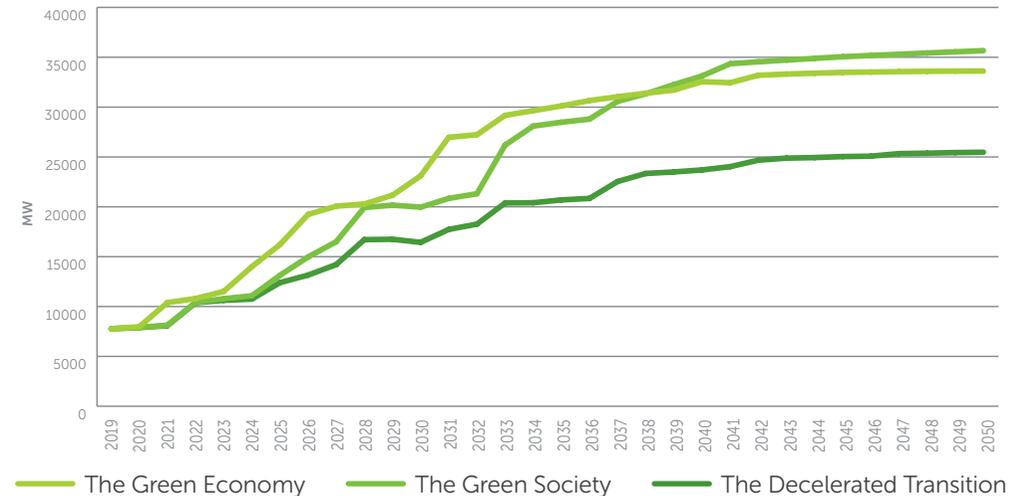
Shetland Development

Significant progress has been made on the construction of the 600MW HVDC transmission link connecting Shetland to GB mainland. The link will facilitate the connection of renewable electricity developments on Shetland, including SSE Renewables' 443 MW Viking wind farm. It will also secure Shetland's future supply needs by connecting Shetland to the GB grid for the first time and enable a 'whole system' approach to decarbonising Shetland's economy. Not only will it drive Shetland's transition to low carbon heat and transport, it will also allow its oil and gas sector to decarbonise its operational electricity requirements, a critical step in the transition to net zero emissions.

RIIO-T2 Certain View projects

We also progressed works on our RIIO-T2 Certain View projects – these are our baseline schemes for the 5-year T2 price control period which will deliver the network capacity and flexibility to accommodate 10 GW renewable generation in the north of Scotland by 2026. Projects include the Tealing 275kV Busbar project, which will facilitate the connection of 1,075 MW Firth of Forth offshore windfarm, and our three east coast reinforcement projects – the North East 400kV upgrade, East Coast 275kV and East Coast 400kV upgrades. Our North East 400kV upgrade combines risk based asset replacement requirements with increases to network capacity to accommodate new generation connections and the NorthConnect interconnector and both East Coast upgrades provide increased boundary transfer capability, i.e. delivering improved north – south power transfer capability.

Annual installed generation capacity by scenario



As we look forward to 2050, further growth in generation is required if we are to achieve net zero carbon emissions. The graph* (above) shows how generation develops in our scenarios



*Based on the 2020 North of Scotland Future Energy Scenarios, these will be updated to reflect increase capacity in Future Energy Scenarios 2021.



Innovation

In 2020/21, we continued to build upon the objectives we set out within our Innovation Strategy; published in 2019. Throughout the year we worked to enhance the success of this strategy by bringing focus on our innovation culture within the business. Innovation should not be the responsibility of one individual person or group, rather it should be the responsibility of the whole organisation to take ownership of innovation and drive it forward.

Our main aim was to stimulate new innovative thinking across our multi discipline organisation. We established a network of over 40 Innovation Champions, a dedicated group of employees from across the business who would be responsible for supporting this innovation culture and provide a step change in their area. The network of champions has enabled innovation to permeate through the business and provide a wider reach in our search for new innovations.

We reinforced this change by introducing a new Innovation Ideas App, an online portal that provides access for all employees to bring forward their innovation ideas. The app was designed and developed by the Transmission Innovation Team and was rolled out in November of 2020.

Network Innovation Allowance	Network Innovation Competition
8 Projects ongoing in 2020/21	2 projects ongoing in 2020/21
2 new projects started in 2020/21	National HVDC Centre Project £1,668,000 spend in 2020/21
£706,000 portfolio spend over 2020/21	NeSTS Project £1,704,000 spend in 2020/21

Innovation Projects

Project Name – Digital Substations
Project Fund – Business As Usual

We commenced a project early this year to explore the opportunities of developing our very first digital substation. With a move away from the conventional substation design, the project involves the concept of replacing the traditional copper cables found in our substations with new fibre optic communications. This technology comes with significant advantages, not only providing significant savings in space, but fibre optic technology enables substation to have self-monitoring features, driving down the cost of maintenance and at the same time, enabling a central and distributed energy system across both gas and electricity supply.

Project Name – Vibration Based Monitoring
Project Fund – Network Innovation Allowance

With the rapid growth in onshore wind generation within the north of Scotland, there is an increasing likelihood that future wind farm developments are sited next to, or in the vicinity of our existing infrastructure, in particular, our Transmission Overhead Lines (OHL). With this close proximity, we don't yet know what effect wake turbulence from turbines may have on our OHLs. To understand this risk, we initiated a Network Innovation Allowance (NIA) project that is aimed at accurately simulating and modelling the effect wake turbulence has on our OHLs, and evaluating the associated wear and tear to our conductors. With this data, we can have a clearer understanding of appropriate mitigation measures to prevent early fatigue on our OHL assets.

Project Name – NeSTS
Project Fund – Network Innovation Competition



We continued to deliver our New Suite of Transmission Structures (NeSTS) project throughout 2020. The project, funded through the Network Innovation Competition (NIC), will deliver a new breed of transmission tower, that can bring significant benefits to the network and the environment around it. We saw success in 2019 as we progressed through stage two of the project, focusing on implementation and construction, and in 2020, a further milestone was met as we commenced construction of the first NeSTS 132kV OHL on the Quoich – Broadford circuit.

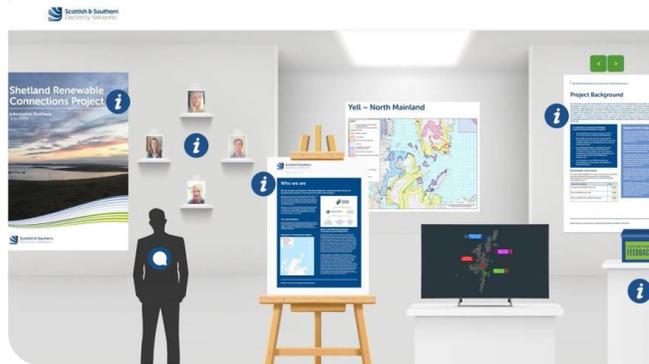


Engineers installing vibration monitoring equipment at Gordonbush

Customer & Stakeholder

ENGAGING EFFECTIVELY WHILE WORKING REMOTELY

Our dedicated teams have supported colleagues throughout the COVID-19 pandemic to source and optimise new digital platforms to engage effectively with our stakeholders. We have provided hands-on support to help them carry out industry-leading stakeholder engagement activities and supported stakeholders who needed additional support to feel confident using these platforms.



CONTINUOUSLY IMPROVING OUR STAKEHOLDER ENGAGEMENT

We are committed to continually improve our engagement with stakeholders, conducting regular external assurance audits on both our Stakeholder Engagement Strategy and delivery plans. We recently undertook the AA1000 Stakeholder Engagement Standard Health Check, in association with the international consulting and standards firm, AccountAbility and are pleased to report a total score of 73% for their 2020/21 assessment, up 11% on the previous year.



Stakeholder satisfaction – Survey

Target = 7.4

This is the output of a survey conducted by an external research company with the score solely attributable to responses to the question “How satisfied are you overall with SHE Transmission?”



Stakeholder satisfaction – Panel

Target = 5.0

An independent panel assesses our stakeholder engagement activities. An improvement plan has been developed to significantly improve our performance in this area.



Stakeholder Engagement External Assurance

Target = Compliant

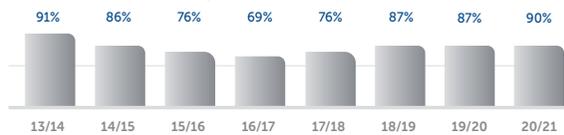
An external assurance team assesses the extent to which we have implemented our stakeholder engagement strategy and plan. The outcome of this is categorised as Non-Compliant, Compliant or Exceeds.



Stakeholder satisfaction – KPI

Target = 89%

Our performance here is measured against 10 contributory KPI's and aggregated to derive a percentage performance score. We have implemented improvement actions to achieve above target performance by 2019/20.



Our Stakeholder Satisfaction Survey asked stakeholders to describe our company personality in one word or phrase. The responses are captured in this word cloud



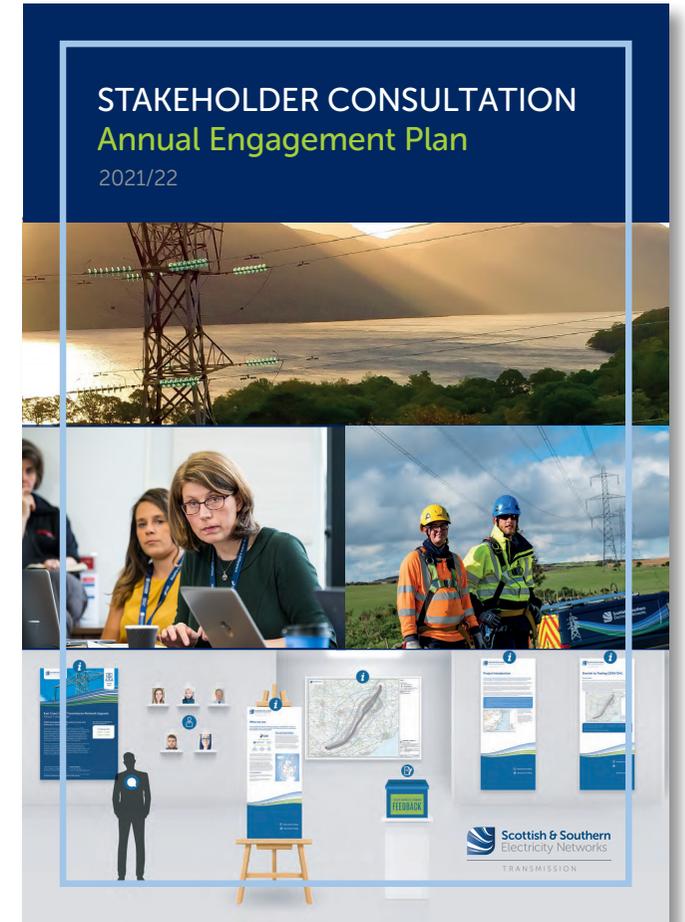


STAKEHOLDER-LED STRATEGY WITH OUTCOMES BASED ENGAGEMENT

Details of our extensive stakeholder-led engagement for 2020/21 can be found in our Stakeholder Engagement Incentive submission to Ofgem. A snapshot of some of these are outlined below:

- **Stakeholder Engagement Training:** Over 700 hours of stakeholder training across the business is leading to improved consistency in our engagement approach, with a more effective team while also further embedding our stakeholder strategy across the business.
- **TNUoS Advocacy:** Our generation customers and wider stakeholders have told us that charges for Transmission Network Use of System (TNUoS) in the North of Scotland are acting as a barrier to the development of renewable energy. Our advocacy work is raising the profile of this issue with policy influencers and decision makers and is gaining cross-party political support.
- **Reduced Customer Application Fees:** Based on requests from connecting customers we reviewed onshore application fees and introduced a fast track process which increases productivity, streamlines the process and provides savings for connection customers of 10-15% on onshore application fees.
- **Covid-19 Safety Measures:** We have invested in safety to protect communities and our people from Covid-19; reduced the risk of infection using protection measures on projects and introduced on-line consultations to avoid project delay until in-person consultations can resume. This is estimated to prevent lost revenue for generation customers of over £111m.
- **Wildfire Information:** We have analysed wildfire data from our partners at the Scottish Fire and Rescue Service to create maps showing areas of highest wildfire risk; shared these back to the Fire service for their own use and also arranged to receive wildfire notifications for relevant staff. This is improving the safety of our colleagues while helping avoid interruptions to consumers and connected generation customers.
- **Compensatory Planting:** Based on stakeholder feedback, we've revised our Compensatory Planting strategy to a local partnerships approach, contributed £10k towards a new post with Argyll & the Isle Coast & Countryside Trust (ACT) and supported the Alliance for Scotland Rainforest Goals; while also delivering our own business woodland replanting commitments.
- **Science Based Target (SBT)** – Actions taken to deliver on our SBT are improving the air quality and reducing pollution of the communities we visit. We are also sharing learning on how we achieved accreditation of our own SBT, helping other organisations commit to their own SBT .

For details of the key themes and initiatives we are engaging on in 2021/22 please see our [SSEN Transmission Annual Engagement Plan](#) on our website.





Network Investment

We have successfully completed the RIIO-T1 period and made considerable progress in the decarbonization of electricity generation over the past decade, but more needs to be done to meet Net Zero ambitions. To achieve this, we need to continue to invest in the transmission network to ensure that increased renewable energy can be connected in the north of Scotland.

Connection Projects

These are comprised of works to facilitate sole use connections for a single connected generator, shared use works for multiple generators, or strategic wider works projects that provide greater network capacity and resilience to support the continued growth in generation connected to our network. Due to phasing of generator requirements and delays attributable to COVID-19, the final two years of T1 have seen no new sole use volume driver connections, but we do anticipate more activity in the first two years of T2.

Timely Connections

Our target is for all offers for connections to the transmission network to be made to customers within the time periods set out in the industry code.



Generation MW Connected in the year

This measures the new generation connected through the sole use volume driver mechanism.



Load Projects

Despite the challenges of COVID-19 during the 2020/21 period, we have positively delivered a number of large Shared Use Reinforcement projects, Loch Buidhe – Dounreay 275kV Reconductoring, Keith – Blackhillock circuit works and the Melgarve 400-132kV Substation project.

Melgarve Substation

The 400/132kV GIS Melgarve substation project including the STATCOMs and associated permanent connection for Stronelairg Windfarm were completed in November 2020.

This project has spanned over 4 years and included a temporary arrangement, a new indoor 132kV substation at Stronelairg

adjacent to the developer's windfarm, and over 10km of new 132kV underground cable to connect to Melgarve substation where the circuit joins the Beauty Denny line. The assets were constructed in some of the most remote and testing weather conditions that SSEN Transmission have experienced including altitudes above 500 metres.

Loch Buidhe to Dounreay

We brought 2 years of hard work to a close, completing the restringing of the 87km long Loch Buidhe to Dounreay overhead transmission line in the North of Scotland.

The Loch Buidhe to Dounreay overhead line has played a vital role in the Scottish energy story for over half a century, having been first constructed in the 1950's to transport energy generated at Dounreay Nuclear Power station.

When Dounreay closed in 1995 it wasn't the end of the story for the line; with new wind power connecting to the national grid and more planned in the coming years, it is now playing its most important role, facilitating the transition to net zero. The new transmission line conductors have higher capacity and allow more green energy to be passed from the new wind farms to the population centres in the south.

Keith – Blackhillock circuit works

Macduff substation was connected to Keith substation via two 132kV overhead line circuits.

Reconfiguration of the Transmission network was necessary to support the connection of up to 150MW of renewable

generation in the Keith area. To facilitate this two additional 132kV Gas Insulated Switchgear (GIS) bays were installed at Blackhillock Substation with two new 132kV underground cable circuits each approximately 3.5km in length installed to new cable sealing tower near to Keith Substation with the circuits being fully energised in October 2020.



Non load projects

Our Non-Load projects are where we replace assets nearing the end of their useful life, before failure occurs. This helps to ensure we “keep the lights on”.

Inveraray – Port Ann

Excellent progress has been made on the Inveraray to Port Ann project, which is Phase 1 of the Inveraray to Crossaig Reinforcement scheme.

The new overhead line and substation assets were successfully commissioned and energised in July 2021. The driver for the project is asset condition as the existing line was nearing the end of its operational life. The new 37km, 275kV ready, overhead line will initially be operated at 132kV. It will ensure a safe and reliable supply of electricity to the communities in the area

for years to come and provide additional capacity to support the increase in renewable electricity generation across the region.

Over 100km of access tracks were constructed or upgraded to enable the installation of 129 new overhead line towers, with modifications at five of our substations to facilitate the upgrade.

Phase 2, Port Ann to Crossaig, site works commenced in June 2021 and is planned to be energised mid 2023.

Cairngorms VISTA

Ofgem administered a £500m fund for electricity transmission owners to mitigate the impact of existing electricity infrastructure on the visual amenity of nationally designated landscapes.

The primary objective of VISTA (Visual Impact of Scottish Transmission Assets) is to use the funding to maximise the mitigation in such designations in the north of Scotland transmission network area. The Cairngorms VISTA project replaced sections of existing 132kV overhead line (OHL) near Boat of Garten Substation with underground cables, removing 12km of OHL and 46 steel towers near the villages of Boat of Garten and Nethy Bridge, within the Cairngorms National Park.

The Contractor trialed an innovative method for configuring and jointing the cable ducts on a trailer mounted platform before being lowered into the trench, significantly reducing the exposure of operatives to risks working in the trench excavation. Following the trial, improvements have been made for application on sites with more undulating ground.

The new cable circuits were fully energised in November 2020 and the VISTA output was achieved on 15th December 2020 with the demolition of the 46th, and final, steel tower.

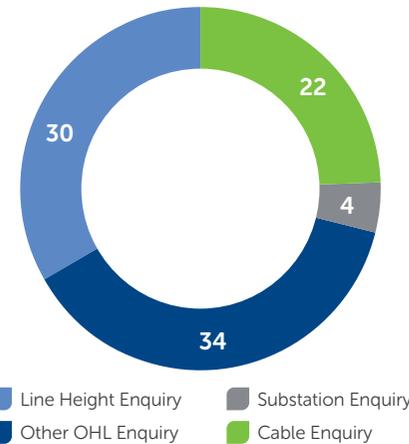
Cross-Sector Infrastructure Interactions

What are ‘cross-sector infrastructure interactions’?

We define cross-sector infrastructure interactions as the information, process and permissions needed from us (or another network operator) when another person or business (“third-party”) wishes to cross or work near our assets this ‘interaction’ can often arise when the third-party is undertaking their own infrastructure development, and where existing assets must be protected to enable the third-party’s project to proceed.

In 2020/21, we received 90 enquiries, the majority relating to construction within proximity of our overhead lines. All enquiries were resolved, and the average resolution time across the year was 19.8 days against a target of 30 days. Resolving these enquiries up front provides significant benefits by avoiding future damage to the network that would carry significant repair costs and could lead to interruptions for customers.

Enquiries Types



All enquires were resolved satisfactorily and we are now working on continuous improvement actions for the process and the resolution time.

We have established a Working Group, comprised of internal stakeholders across our business, whose remit is to improve the process for external stakeholders. The Working Group has made the following recommendations and we will look to implement these in the coming months.

- Publicly available guidance with links to current internal and external standards **(September 2021)**
- Improved digital contact route which stakeholders can utilise to easily check progress **(September 2022)**



Operations

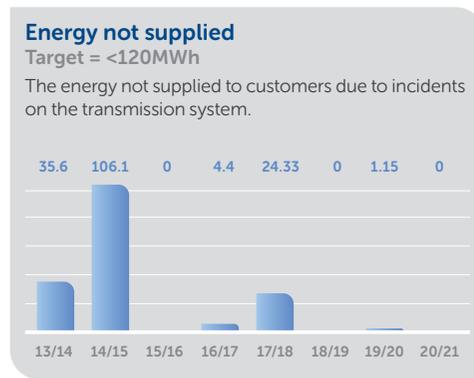
Operations

The Operations team continue to successfully operate and maintain the high voltage Transmission network, ranging from 132kV to 400kV, despite the restrictions placed on us due to COVID.

Possibly the most important link in the chain, our control room managed and operated the system from two discrete locations to minimize the risk of infection to our staff and our operational teams operated in smaller teams.

This all helped to ensure that the transmission network was available when required, that generators were able to export energy and ultimately that the “lights stayed on”. The importance of a reliable energy supply has never been more important.

Our network reliability continued to be >99.99% overall and we achieved a 100% reward position on our Energy Not Supplied incentive. This was largely due to the delivery of all main inspection and maintenance targets, which is particularly pleasing in the current climate. The Caithness – Moray HVDC link maintained it’s 100% reliability, although the annual outage was more challenging than normal as specialist engineers from the main contractor, ABB, had to travel from Sweden, requiring additional safety controls to be put in place due to the pandemic.



Asset Management

SSEN Transmission’s Asset Management function provides strategic, tactical and operational direction to the business, delivering value to our internal and external stakeholders during the whole life cycle of our assets.

The primary focus on the Asset Management Team in 2020/21 was ensuring the continued delivery our RIIO-T1 asset replacement and resilience plans and the preparation of our non-load requirements as part of the wider RIIO-T2 submission. This included: -

- On-going commitment to deliver digitalization of our Asset Register and associated systems
- Successful recertification of our ISO55001 accreditation, now as a stand-alone business (previously was accredited as part of a wider networks business alongside Distribution)
- Developing smart monitoring capabilities which will enhance our risk-based approach to asset management

As part of our stated aim of improving our asset management capabilities, we were benchmarked against other Transmission companies in the International Transmission Asset Management Study (ITAMS). This brings together several Transmission companies from around the world and contrasts each business against key areas of world class asset management.

In the 2020 ITAMS study we attained a score of 3.1, demonstrating that we are competent asset managers. This represents continued and significant improvement from the previous benchmarking in 2018, showing that the changes and improvements we have made over the last 2 years are paying off and we are well on our way to achieving our ultimate aim of world class asset management.

Asset Interventions	T1 Non Load Asset Replacements
275 kV System	
Circuit Breaker	3
Transformers	1
OHL* Fittings (Km)	100.6
132 kV System	
Circuit Breaker	23
Transformer	11
Reactor	10
Underground Cable (Km)	20.4
OHL Conductor (Km)	554.6
OHL Fittings (Km)	803.9
OHL Tower	394

Asset Interventions integrated on to the Transmission Network over the RIIO-T1 Period
*Overhead Line



Performance during the year

The majority of our total expenditure (TOTEX) in 2020/21 remained focused on the delivery of large capital projects including the new Shetland HVDC link. These large capital projects being to facilitate increased generation and associated connections to our network (Load Related), or to renew our existing network (Non-Load Related).

The table below shows our expenditure forecast for 2020/21, that we determined in March 2020 and our actual expenditure for 2020/21. We believe that comparing actual expenditure to forecast expenditure is a better indicator of performance than comparing to allowances for the same period. This is because our base line allowances were established in 2012 based on our projected programme of works at that time. This programme of works has, and will, continue to change for a variety of reasons, meaning that a comparison of actual expenditure to baseline allowances for an individual financial year is not a like for like comparison.



Return on Regulatory Equity (RoRE)

8.9% 8 year weighted average operational RoRE*

* (excluding Transmission Investment for Renewable Generation (TIRG) return and debt and tax performance).

Regulated Asset Value (RAV) at end of year

2012/13 = £1.1bn
2018/19 = £3.5bn
2020/21 = £3.7bn



The RAV is a useful indicator of the growth in the size of our network over the price control period and we are forecasting that by March 2021 it will reach £3.7bn.

Category	Forecast for 2020/21 (£m)	Actual for 2020/21 (£m)	Delta (£m)
Load Related – Strategic Wider Works (SWW)	118.8	121.4	2.6
Load Related – Other	208.9	180.5	(28.4)
Non-Load	87.8	84.0	(3.8)
Non-Load-Vista, Security	27.5	23.3	(4.2)
Operating Costs	56.5	53.2	(3.3)
Non-Operating Costs	10.2	7.4	(2.8)
Total Expenditure (TOTEX)	509.7	469.8	(39.9)

Load Related – SWW:

Actual expenditure in this category was £2.6m higher than our forecast and is mainly driven by higher expenditure incurred on our Shetland project.

Load Related – Other:

Actual expenditure within all other load related projects was £28.4m lower than our forecast made at the end of the preceding financial year. The reasons for this is primarily due to re-profiling of expenditure, across several schemes which have faced delays to their connection dates as a result of scheme modifications along with COVID delays.

Non-Load Related:

Re-profiling of the expenditure for the our non load programme amounts to £3.8m, again due to certain projects now reflecting the latest construction programmes. This excludes Vista and Physical Security which has now been split out into its own category.

Non-Load Related: Vista & Physical Site Security

Re-profiling of the expenditure for the our VISTA & Physical Security projects amounts to £4.2m, due to COVID delays and reflecting the latest construction programmes.

Operating Costs:

Our expenditure for operating costs is lower by £3.3m, mainly due to reduced expenditure on direct operating costs which includes savings on our subsea cables surveys, offset by higher overheads for running our business and gearing up for deliver of our T2 Net Zero business plan.

Non-Op Capex Costs:

Our expenditure in this area has decreased by £2.8m, again due to re-profiling of project expenditure, which includes IT and storage facilities.



Forecast for RIIO-T1

Category	2019/20			2020/21		
	Allowances (£m)	Expenditure (£m)	Delta (£m)	Allowances (£m)	Expenditure (£m)	Delta (£m)
Load Related – Strategic Wider Works (SWW)	1687.2	1,501.2	186.0	1,689.2	1,503.8	185.4
Load Related – Other	1445.5	1,185.7	259.8	1,432.0	1,157.3	274.7
Non-Load Related	285.1	368.8	(83.7)	285.1	365.0	(79.9)
Non-Load related – Vista and Physical Security	53.3	53.9	(0.6)	56.4	49.7	6.7
Operating Costs	260.8	258.5	2.3	260.5	255.2	5.3
Non-Operating Costs	10.1	32.9	(22.8)	10.1	30.1	(20.0)
Total Expenditure (TOTEX) as per RRP	3,742.0	3,401.0	341.0	3,733.3	3,361.1	372.2
Enduring Value Adjustments*	(221.1)	-	(221.1)	(214.9)	-	(214.9)
Total Expenditure (TOTEX) as per RFPR	3,520.0	3,401.0	119.9	3,518.4	3,361.1	157.3

As with our actual expenditure for 2020/21, our TOTEX throughout the 8-year RIIO-T1 period has been centered on delivery of large capital projects, with over 90% of our TOTEX attributable to expenditure in the Load and Non-Load related categories. The total allowances (£3,518.4m) for the RIIO –T1 period includes our baseline allowance, volume driver allowance plus additional allowances awarded under uncertainty mechanisms (SWW, Vista, Physical Site Security).

Based on our final year of RIIO-T1 reporting, 2020/21, our TOTEX for the period is £372.2m less than allowances, equating to an underspend of 10%. These figures currently exclude any close out adjustments for RIIO-T1. Our current view is that our position post close out adjustments will be circa £157.3m less than allowance which is approximately 4% underspend.

The table above provides our expenditure versus allowances position for the RIIO-T1 period and is set against the corresponding forecast position from the end of the 2019/20 period. The following narrative provides explanation of the differences between our final expenditure and allowance position and provides detail of any material changes from the 2019/20 period.



Forecast for RIIO-T1 cont.

Load Related – SWW:

There has been a minor reduction in our expected allowances and expenditure from 2019/20 to 2020/21 of £0.6m, which is mainly driven by a slight increase of spend on the Kinardochy project. Within T1 this would have been an SWW project, but has been secured through baseline allowances for T2.

Load Related – Other:

This expenditure category has the most uncertainty due to its dependency on the progression of new generation which is heavily influenced by UK Government policy. The volume driver mechanism within the RIIO-T1 price control was developed in response to this uncertainty. The volume driver mechanism sets baseline targets for sole-use and shared-use infrastructure and provides the opportunity for further allowances should either baseline be exceeded. We are forecasting exceeding both the sole-use and shared-use baseline outputs as shown in the table below:

Category	Target	Forecast Out-turn	Delta
Sole-Use Infrastructure	1,168MW	1,398 MW	+230 MW
Shared-Use Infrastructure	1,006MVA	2,276 MVA	+1,270 MVA

Our forecast delivery in the shared-use category has reduced in the financial year down from 2,506MVA to 2,276MVA. This reduction is due to delayed energisation of the Beaulieu Keith project (230 MVA) which has crept into T2. Our forecast in the sole-use category remained unchanged, however re-profiling of pre-construction and other load related projects has driven an overall increase in Load Related - Other out-performance.

Non-Load Related:

There is no change to allowances within the Non Load category however re-profiling of some schemes have resulted in a reduced cost of £3.8m within the T1 period compared to what we forecast last year. This will unwind within T2.

Vista & Physical Site Security:

During the last year, Ofgem approved additional Vista schemes which has increased our T1 allowances by £3.1m, however due to the impact of Covid delays, we have seen a re-profiling of costs into the T2 period of £4.2m. This means our overall performance within T1 in this area is £7.3m better than reported last year, however, this will entirely unwind in T2 as we complete and delivery these projects at allowance levels. There is no change in overall performance for our Physical Site Security projects.

Operating Costs:

Our forecast performance in this category has reduced by £3.0m, due to tighter control of expenditure mainly relating to Direct Opex activities. One of the key savings compared to last year is on our subsea cable surveys, which costs less than previously forecast.

Non-Operating Costs:

A large part of the forecast overspend against allowances in this category continues to be related to investment in Maximo and other systems such as a replacement for our existing Geographic Information System (GIS). The increased T1 performance in this category from last years forecast partly relates to delayed expenditure of our network management and control software as we disaggregated this from Distribution, but also delayed expenditure on non operational buildings such as stores which has also been delayed into T2.



Incentive Performance

Primary Output	RIIO-T1 Target	2020/21 Actual	Max Reward £m	Max Penalty £m	Reward/Penalty in 2020/21 ⁽¹⁾	Comments	
Energy not supplied (ENS)	<120MWh	0	1.2	-10.57	1.19	The output has met its target in all years of RIIO-T1	
Stakeholder Satisfaction Output	KPI	89%	90	3.55	-3.55	1.59 ⁽²⁾	Our improvement plan aims to improve our performance in these outputs
	Assurance	Compliant	Exceeds				
	Survey	7.4/10	8.2				
Stakeholder Engagement Reward	5/10	6.34	1.76	N/A	TBC	Reward is to be confirmed	
Timely connections	Connection offers within 60 days	104 Connections made within timescale	N/A	-1.7	-	This output has met its target in all years of RIIO-T1	
Sulphur hexafluoride (SF ₆) leakage, ⁽³⁾ kg	<390.81kg ⁽³⁾	476.10kg	0.43	This is dependent on leakage	-0.1	2020-21 saw an increase in the volume of SF ₆ gas installed as our network continued to grow ⁽⁴⁾ . However, SF ₆ leakage, by percentage of volume fell to 0.92% of installed capacity and continues the overall improvement seen over the RIIO-T1 period.	
Environmental Discretionary Award (EDR)	Leadership	TBC	£4m annual pot available across all operators	N/A	2.0	Satisfactory Annual Statement with a leadership performance	

¹ Earned in year in nominal price and has two-year lag

² Incentive/Penalty is calculated based on Stakeholder Satisfaction Survey, KPI and external assurance

³ <390.81kg is target for 2020/21

⁴ our SF₆ asset base increased from c41,775kg to c52,013kg

Looking ahead – RIIO-T2 and beyond

This year our RIIO-T2 Business Plan ‘A Network for Net Zero’ was approved by Ofgem

Our Plan

Since our last annual report, in December 2020, Ofgem published its Final Determinations for the RIIO-T2 period, which covers the period from April 2021 to March 2026. Our Business Plan ‘A Network for Net Zero’, aims to support both the UK and Scottish Governments’ net zero emissions targets.

The Final Determinations set totex at £2.2bn, a significant increase from Ofgem’s Draft Determinations and, taken together with further investments still to be approved by the regulator, could bring the total expenditure across the RIIO-T2 period to over £4bn. This investment is essential to maintain and grow the north of Scotland transmission network to meet the certain needs of current and future electricity generators and customers, delivering a clear pathway to net zero. This significant investment programme will create jobs and aid the UK’s Green Recovery from COVID-19.

To deliver net zero we aligned our Business Plan with the needs and expectations expressed by stakeholders through five clear, ambitious goals (see right). This includes an ambitious sustainability action plan to achieve one-third reduction in our own Green House Gas Emissions, in line with our 1.5 degree science based target and achieving Biodiversity Net Gain on our site by 2025. The consumer value of our approach was

recognised and rewarded by Ofgem through the RIIO-T2 consumer value proposition, demonstrating our industry leading approach. This was part of the Business Plan Incentive where we received the highest overall reward out of the Electricity Transmission and Gas Networks companies demonstrating the consumer value and efficiency of our Business Plan. We would like to take this opportunity to thank all of our stakeholders involved in the business plan development including helping to shape our plan and responding to Ofgem’s draft determinations consultation.

SSEN-Transmission, alongside other network companies, have appealed Ofgem’s final determination on a small number of technical aspects to the Competition Markets Authority (CMA). This focused on areas where Ofgem’s decision does not reflect the robust evidence provided throughout the price control process, alongside material errors in the decision. The appeal areas are: Cost of equity, outperformance wedge, new exposure to transmission charges and loss of appeals right.

Five years. Five clear goals



Transport the renewable electricity that powers **10 million homes**

Build electricity network flexibility and infrastructure that can accommodate 10GW renewable generation in the north of Scotland by 2026.



100% network reliability for homes and businesses

Make cost-effective investment in new technology to achieve 100% transmission system reliability for homes and businesses by 2026.



Every connection delivered on time

Provide every network connection, tailored to meet our customers’ needs, on time and on budget.



One third reduction in our greenhouse gas emissions

Reduce the Scope 1 and 2 greenhouse gas emissions from our operations by 33% by 2026, consistent with 1.5 degree climate science pathway.



£100 million in efficiency savings from innovation

Through targeted new technology and ways of working, achieve £100 million customer benefits by 2026.

Delivered for around £7 a year

 You can get involved at: www.ssen-transmission.co.uk/riio-t2-plan

What next?

- **We've started delivering our Five Clear Goals and our £2.2bn Certain View:** our robust evidence-based approach set out only investments which are certain, meaning billpayers aren't at risk to paying for something which is not needed.
- **In addition to our certain view,** we will use agile regulatory mechanisms to enable the timely investment in projects when they become certain to accommodate future growth and net zero. We recently submitted an Initial Needs Case for the proposed replacement of the existing Fort Augustus to Skye electricity transmission line at an estimated cost of £400m. This project will reinforce the line to improve customers' reliability but also enable the connection of new renewable generation. SSEN Transmission continues to work with stakeholders in Orkney and the Western Isles to develop and take forward proposals to enable mainland transmission connections.
- **CMA:** We note the Competition and Markets Authority's provisional findings and will continue to engage constructively with the CMA in advance of its final decision, expected no later than 30 October 2021, in order to achieve a fair settlement that delivers for stakeholders and unlocks the investment required to deliver net zero.
- **Transmission Network Use of System (TNUoS):** As a stakeholder led business, with a stakeholder led strategy, we'll continue to advocate on behalf of our stakeholders and customers to overcome current regulatory and policy barriers to the UK's legally binding Net Zero emissions target, including making the case for Transmission Network Use of System (TNUoS) charging reform.
- **We'll continue to build upon our environmental and Science Based Target commitments** to create a "greener grid" for our customers, wider stakeholders and host communities. This includes a focus on habitat restoration and creating bio-diversity growth as we invest and deliver a Network for Net Zero. We are now implementing Biodiversity No Net Loss as a minimum requirement on our newly consented projects, working towards a Biodiversity Net Gain by 2025.
- **Beyond RII0-T2,** the ScotWind leasing round is expected to unlock up to 10GW of new renewable generation which will require significant transmission upgrades both onshore and offshore. We've been working closely with stakeholders including National Grid ESO and other GB TOs as part of a Central Design Group, to produce a Holistic Network Design that delivers the network needed to connect ScotWind. You can read more about our work on ScotWind in the Sustainability Annual Report page 13 and also in our SSEN Transmission Annual Stakeholder Engagement Plan on our website.





TRANSMISSION



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SSEN Transmission is the trading name of Scottish Hydro Electric Transmission plc, Registered in Scotland No. SC213461, which operates under licence and owns, operates and develops the high voltage electricity transmission system in the north of Scotland and remote islands