



Journey to a net zero future

Our roadmap to 2040

We're on a journey to better

South Western
 Railway

Contents



Our journey to a net zero future



I am delighted to share with you our roadmap for making South Western Railway (SWR) a net zero carbon emissions train operator by 2040, ten years ahead of the United Kingdom's 2050 legal deadline.

In 2018, the UK became the first major country to commit in law to becoming net zero by 2050. To meet that legal deadline, our entire economy and society will need to adapt, and the transport sector will be at the heart of this.

While taking a train is already one of the most environmentally friendly ways to travel, and we have already made significant progress as a company to reduce our climate impact, we know there is still so much more to do to reach net zero. SWR is committed to playing a leading role in the rail industry on this vital journey.

Our ambition is for an even greener and more sustainable railway; one which brings customers back after the pandemic with confidence, creates thousands of highly skilled and well-paid jobs, helps local communities across our network to grow and prosper, and protects and enhances our shared natural environment.

This document sets out where we are now, what parts of our business need to evolve to curb our carbon emissions, and how we achieve this by 2040.

Our roadmap is underpinned by five key principles:

Firstly, our plan is scientifically grounded. Our emission reduction targets have been calculated in accordance with the principles of the Science Based Targets initiative. This is a globally accepted standard in line with the Paris Agreement to limit global warming to well below 2°C, preferably to 1.5°C.

Secondly, our plan will deliver the best value for money. A rigorous cost-benefit analysis will be central to our decision-making process when selecting interventions. This will ensure we remain a prudent and efficient operator, while getting the best deal for our customers and taxpayers.

Thirdly, we will target the 'quick win' opportunities first. Some of our emissions are easier to eliminate sooner than others. We will prioritise taking swift and decisive action to decarbonise where we have the most control and influence, and where we can make the most impact on our overall carbon emissions.

Fourthly, throughout our journey to reach net zero by 2040, we will remain flexible and ready to adapt based on factors outside our control. We don't have all the answers now, and there will be challenges along the way, but this roadmap is intended to be dynamic as the wider industry and our country progresses on the path to net zero.

continued overleaf

The ongoing energy crisis has shown we must become more resilient and protect our vital infrastructure, including our public transport network, from future shocks. We must also be prepared to respond to a changing energy landscape with agility as we phase out fossil fuels. The wider decarbonisation of the grid will be essential for us to meet our commitment to be a net zero business by 2040.

As we anticipate the launch of Great British Railways, the rail industry will also need to modernise. For example, the Department for Transport (DfT) aims to remove all diesel-only trains by 2040. Our commitment is to replace our diesel-only trains with electric/battery powered rolling stock by 2029-2032. This will be quite the task and will require the modernisation of significant parts of our fleet.

Finally, we know we cannot do this alone. We have worked hard to develop our plan in collaboration with others, including Network Rail and the DfT. We are thrilled that the DfT supports our roadmap, subject to future funding settlements. We will continue to work closely with all our partners and stakeholders throughout the implementation of the roadmap.

This road map starts the conversation on how we can work together to build a railway for the future; a railway that is committed to net zero and provides greener and more sustainable journeys for everyone.

Claire Mann

Claire Mann
Managing Director



**Next stop:
net zero by 2040**

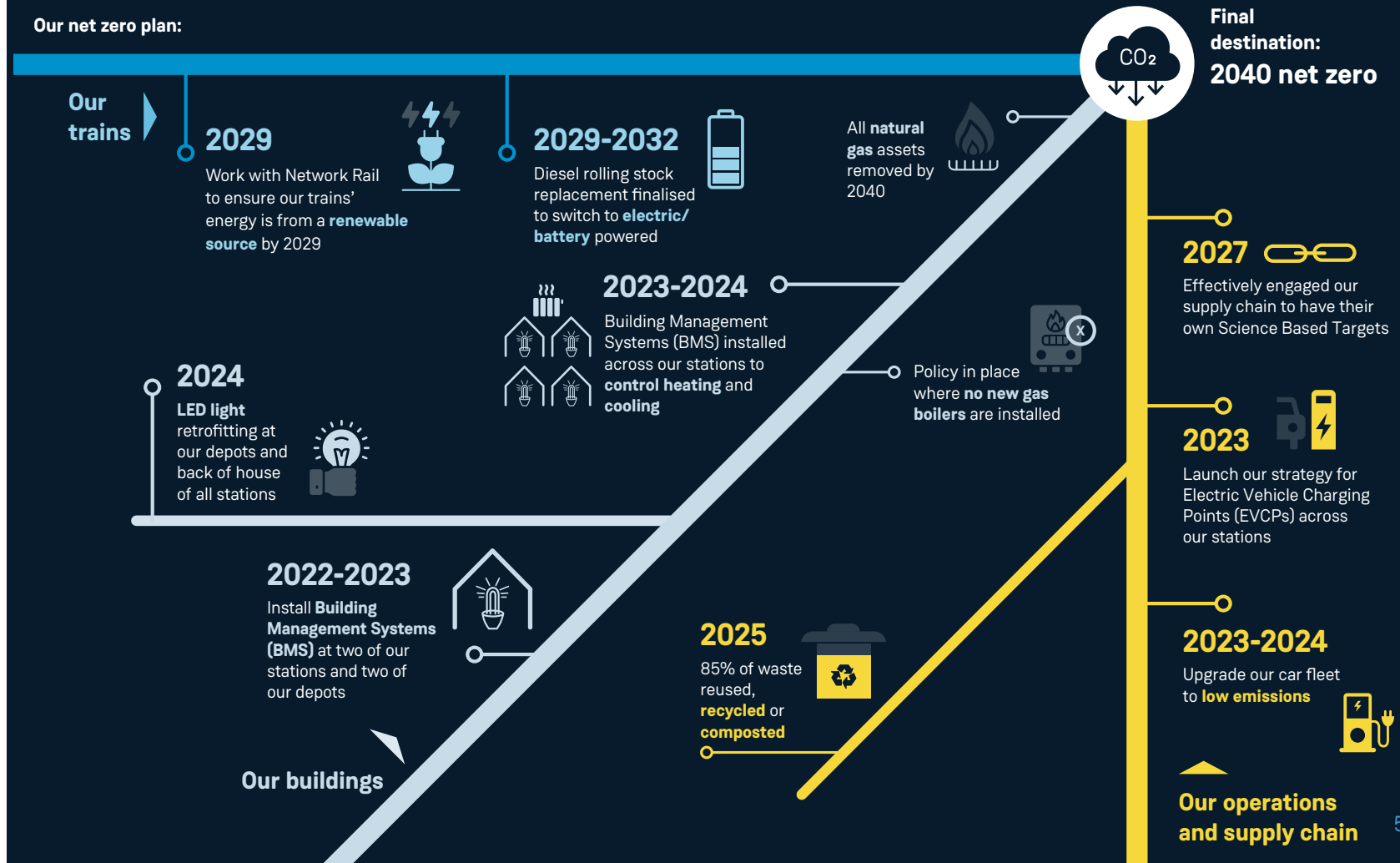
Our plan: how we get there

We are committed to becoming a net zero railway by 2040, 10 years ahead of the UK target.

We will also continue to push forward in supporting low-carbon travel across the region we serve.

By 2030, our emissions will be half of what they were in 2019, and by 2040, the emissions from Scope 1 & 2 emissions (i.e. directly powering our trains and buildings) will be reduced by 95%.

Our net zero plan:



Introduction

This roadmap presents our vision and strategy to deliver net zero carbon by 2040.

Understanding our carbon emissions, as well as the level of control and influence that we have has been an important first stage to developing our approach.

This document aims to provide a summary of this first step in planning our anticipated trajectory towards net zero, setting out key milestones and targets, as well as key interventions within the next five years.

We recognise that this is a journey, and this roadmap will be an evolving plan within our business. Within such an ever-changing space both politically, technically, and financially, we know we do not have all the answers for the next 18 years. That's why setting science-based targets has been such an important step to creating a robust plan towards a reduction of our greenhouse gas and commitment to reducing our impact to the global warming.

We know many challenges and uncertainties lie ahead – from the availability of renewable energy to the level of Government funding. There are also many aspects outside our direct control, especially around national grid decarbonisation. These challenges and opportunities to innovate make it vital that we work together as one industry, working collaboratively with the DfT and Network Rail, among others.

Setting science-based targets is such a crucial part of our plan as these help us forecast what carbon reductions are required each year.

These have helped us set a detailed list of planned actions for the short term which we present in this document, as well as a high-level plan of the likely set of interventions that will form part of our medium- and longer-term action plan.

We will continually review our progress and update our roadmap accordingly, monitoring the key milestones and targets that we have set ourselves.

Our vision and commitment

Vision for net zero
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Our vision and commitment

Our long-term decarbonisation goal is to be net zero by 2040. This means that the greenhouse gases we produce as a business, and those that we remove from the atmosphere, balance out to zero.

The DfT has approved Phase One of our decarbonisation roadmap and our 2040 net zero carbon target and will support our plans (subject to available future funding).

Our roadmap to decarbonisation is focused firstly on making real reductions in our own operations, both in our buildings and operating our trains. We will also work with our suppliers to reduce emissions that we can influence through our value chain.

Our approach is based on:

- hitting our Science Based Target of a 4.2% carbon reduction per year
- delivering the best value for money
- targeting the 'quick-win' opportunities first
- having a flexible approach, which can utilise new technologies or changes out of our control.

Our priority is to mitigate our impact on climate change by setting robust carbon targets to hit each year. This will enable us to make significant emission reductions in the short term, putting us on a decarbonisation pathway that is in line with the Paris Agreement to limit global warming to 1.5°C above pre-industrial levels.

We will deliver the best value for money, analysing payback periods and legacy of any assets introduced or replaced.

We will also target the 'quick-win' opportunities first, where we have the most control and influence, and can make the most impact on our overall carbon emissions. For example, focusing capital investment at our highest emitting stations and depots, and ensuring that we are as efficient in our energy and resource use as we can be.

We will also keep our plans flexible, seeking to optimise asset replacement cycles and consider whole life-cycle carbon so that we can make step changes when renewing and replacing equipment, choosing low-carbon alternatives.

Focusing efforts on harnessing low-carbon technology and innovations is a key part of our longer-term strategy. We recognise that we may need to offset some of our carbon to achieve net zero by 2040, but our ambition is to reduce our emissions first, and only offset residual carbon emissions when there are no other alternatives.

We have committed to become net zero carbon by 2040

Science-based targets and claims

Our emission reduction targets have been calculated in accordance with the principles of the Science Based Targets initiative (SBTi). Science-based targets are the globally accepted standard for setting long-term carbon reduction targets and are calculated in line with the scale of reductions required to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels.

For the SBTi to endorse our decarbonisation roadmap, the criteria set out by the SBTi needs to be met and the carbon footprint must be aligned with the GHG Protocol Corporate Standard, Scope 2 Guidance, and Corporate Value Chain (Scope 3) Accounting and Reporting Standard.

In July 2022 we committed to setting near term SBT's and are currently finalising our scope three emissions. Once completed, we will submit our targets for official validation. We aspire to complete this process by March 2023.

Policy context

The UK Government's Climate Change Act 2008 sets a legally binding target for the UK to reach net zero carbon emissions by 2050. The UK rail industry will play an important part in this transition.

The Transport Decarbonisation Plan published in July 2021 sees the DfT commit to a net zero railway by 2050. The plan aims to deliver an ambitious, sustainable, and cost-effective programme of electrification guided by the Traction Decarbonisation Network Strategy (TDNS) published in July 2020.

The DfT aims to remove all diesel-only trains from the network by 2040, an important milestone in the overall journey towards net zero by 2050. Commitments have also been made to improve rail journey connectivity, with greater integration with walking and cycling to encourage a wider modal shift to rail and greener transport journeys.

Key infrastructure organisations that form the rail industry have also developed carbon reduction targets. For instance, Network Rail has set science-based targets to achieve net zero carbon emissions, by 2045 in Scotland, and 2050 in England and Wales, in line with the 1.5°C warming scenario.

There are also broader changes underway for how the railway will be run going forward. The new Great British Railways public body will oversee rail transport in Great Britain using a new model similar to Transport for London. Parallel to this, the Rail Safety and Standards Board (RSSB) is developing an industry-wide sustainable rail strategy which will be the strategic framework for sustainability in rail for the next 30 years.

Network Rail's TDNS provides the strategic rationale for rail traction decarbonisation and estimates that, by 2050, 97% of carbon emissions could be removed given the assumed levels of electrification, hydrogen, and battery technologies.

For rail traction emissions to align with the Paris Agreement target for well below 2°C of global warming, the following targets have been set within the TDNS from a 2017/18 baseline:

- 27.5% emissions reduction by 2029
- 52.5% emissions reduction by 2039
- 65% emissions reduction by 2044

Recommendations for train operating companies (TOCs) and freight operating companies (FOCs) to support the delivery of net zero target for rail are provided in the **DECARB: interim and long term targets to deliver rail decarbonisation (T1198)**, published in June 2021

NetworkRail

Collaboration is key – working together with Network Rail

“We cannot achieve carbon net zero on our own, so working in close collaboration with South Western Railway is essential to reducing our collective carbon emissions across the Wessex route and delivering on our collective decarbonisation objectives. We’re particularly keen to focus our attention on areas where we can increase our energy efficiency, introduce renewable power sources, and deliver carbon reduction initiatives at our depots and stations”.

Sarah Borien, Head of Environment and Sustainability for Network Rail Southern Region

The Sustainable Stations Guide published by Rail Delivery Group (RDG) considers how train stations can play their part in the Government's commitment to deliver net zero by 2050. It sets out principles and best practice to support the delivery of carbon targets, such as delivering EV charging points (EVCPs), procurement of efficient stations equipment, reducing waste at the operational level from passengers and tenants, and making public transport and active travel the natural first choice for public mobility.

The RSSB's DECARB: Carbon Measurements T1197 outlines recommendations to improve the accuracy of the carbon footprint of the rail sector in the UK. The research found that embodied carbon emissions within the supply chain are the largest source of emissions in the rail sector, and therefore that TOCs and FOCs should prioritise calculating their full Scope 3 footprints as a priority.

FirstGroup's ambition is to be the partner of choice for low- and zero-emissions transport and has a clear vision set out within its Mobility Beyond Today strategic framework for sustainability. In April 2021, FirstGroup committed to a long-term target to reach net zero emissions by no later than 2050, backed up by interim science-based targets. As a member of FirstGroup, and a key part of the UK rail sector, we aspire to play a leading role in the transformation of the UK rail industry.



An industry view: RSSB

“It is really encouraging to see the leadership and action being committed to by South Western Railway in their ambitious decarbonisation roadmap.

Although a relatively small part of the emissions problem compared to other transport modes, decarbonising railway infrastructure and operations as well as increasing their use – by both passengers and freight – will be a big step towards fulfilling the UK's commitment to net zero.

As the rail sector begins to transform to deliver the vision in the long-term strategy for rail, we now need to seize the opportunity.

Establishing a comprehensive and credible industry-wide plan on carbon as well as on the broader environmental and social sustainability agenda will make sure that rail remains the most sustainable choice for moving people and goods over long distances.

The Sustainable Rail Strategy, now in prototype form, is the consolidated industry view of the way to deliver across the environmental and sustainability agenda.

It confirms that to get to a net zero railway by 2050 action is needed to:

- eliminate emissions from both trains and fixed infrastructure
- build consensus on interim industry targets and implement the means to measure progress
- develop and deliver training schemes for carbon skills across the industry.

South Western Railway's decarbonisation roadmap and the actions it instructs will bring best practice for the rest of the industry to learn from and apply elsewhere, boosting capability.

Delivering this long-term vision for a cleaner, greener railway will take many years and require a concerted, consistent effort from operators, infrastructure managers and, crucially, the supply chain, all enabled by Government and Great British Railways.”

George Davies, Sustainable Development Director, RSSB

Our carbon emissions

As a business we operate over 1,500 services each weekday, providing commuter inter-urban, regional, and long distance services to customers in south-west London, the southern counties of England, and the Isle of Wight. We employ more than 5,000 people, serve over 200 stations and operate eight depots.

The carbon emissions from our business can be divided into three key areas:

- **Operation of our stations and depots (non-traction)**
- **Running of our trains (traction)**
- **Our value chain**

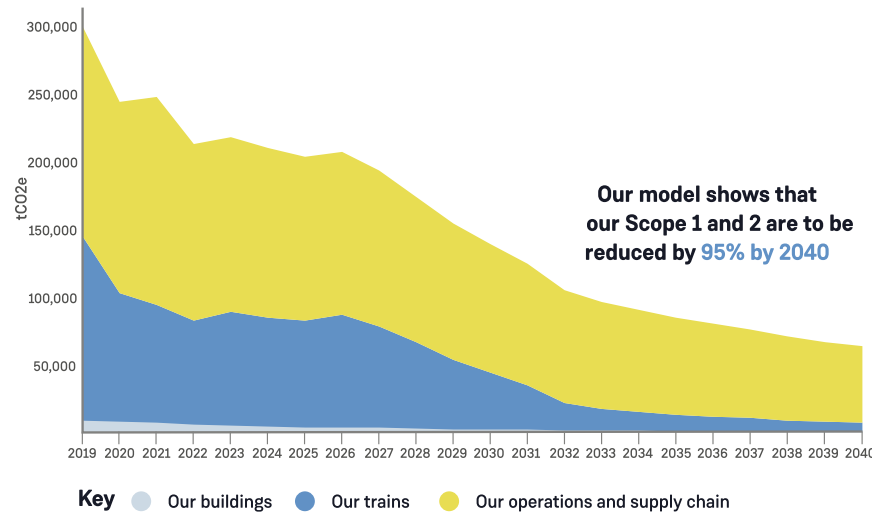


Table 1 shows how emissions from these three key areas align with the three scopes of emissions defined by the Greenhouse Gas (GHG) Protocol. The way in which we have accounted for different types of emissions is aligned with FirstGroup’s approach.

	GHG Protocol Scope
Non-traction emissions (our buildings)	Scope 1: All direct GHG emissions from the fuel our trains use, and the gas consumed within our buildings
Traction emissions (our trains)	Scope 2: All indirect GHG emissions from the generation of purchased or acquired electricity used on our trains and within our buildings for equipment, heating, and cooling
Emissions from our value chain (our indirect operations and supply chain)	Scope 3: All indirect emissions (not included in scope 2) that occur in the value chain / supply chain, including both upstream and downstream emissions

Table 1: Emissions alignment with GHG Protocol scopes

Emissions are presented throughout our roadmap as either tonnes or kg of CO₂e. CO₂e means ‘CO₂ equivalent’ and is a way of presenting the relative global warming potential of the seven greenhouse gases covered by the Kyoto Protocol in comparison to the global warming potential of carbon.

For calculating baseline emissions, we have used 2019 data as the most recent representative year (i.e. pre-COVID impacts). The time frame under which data has been collected reflects existing reporting processes.

Operation of our stations and depots

Current emissions

This refers to the energy we use to heat, light, and operate our stations and depots. Carbon emissions associated with the operation of our buildings in 2019 were 8,400 tCO₂e (as shown in Figure 2), accounting for 3% of total SWR emissions.

Understanding and monitoring energy use across these assets is a well-established part of our business processes, and part of our certified ISO50001 energy management system (ISO50001 EnMS). This helps us make informed decisions to improve energy efficiency.

Stations have a higher demand for lighting, temperature control, and power than depots, accounting for 81% of the total electricity used. Depots have higher space heating demand, accounting for 62% of total natural gas used. Across our network the size of our buildings varies dramatically, with a small percentage of our estate accounting for a majority of energy used.

For instance, 80% of gas was consumed by less than 10% of the estates and 40% of total electricity was consumed by less than 10% of our estate. With this knowledge, we can target sites for intervention on our decarbonisation journey.

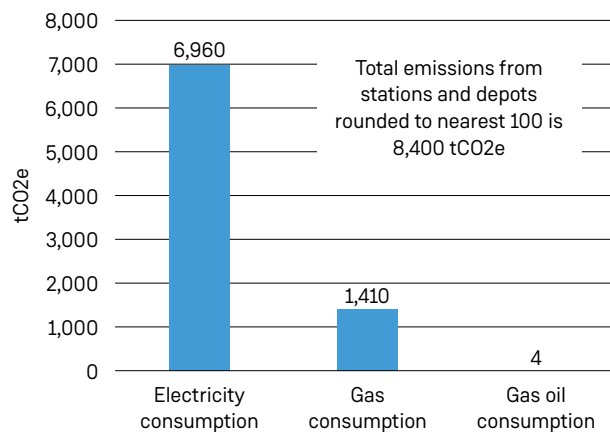


Figure 2: Baseline emissions from stations and depots by source (tCO₂e)

We know that the amount of energy used is very closely aligned to the weather conditions. For example, colder weather in the winter months results in increased energy consumption. Most stations have photocells installed on platform lighting, which means the lights only operate when required. Increasing periods of hot weather also affect electricity consumption as more cooling is required in our buildings.

We recognise that collaboration and engagement is key to achieving our ambitions. We need to work with our colleagues, customers, tenants, other TOCs and Network Rail to reduce the energy we use in our stations and depots to achieve our net zero commitment.

Electricity used for lighting accounts for just over 70% of the total electricity used at stations and depots, and we have already started switching to low-energy equivalents, installing LED lighting across 164 of our stations. This has resulted in a significant reduction in electricity consumption of 20.5% against our 2015/16 baseline in December 2020, even with growing demands of more gatelines and Ticket Vending Machines (TVMs).



Our net zero plan

Modelling the emissions

We have modelled a decarbonisation trajectory for our buildings which assumes that the small amount of non-traction fuel currently used will be phased out by 2025 and that the emissions intensity of grid electricity will reduce by 98% compared to a 2019 baseline by 2040.

Although our carbon emissions from electricity will decrease as the grid decarbonises, there will likely be an increase in electricity demand as we start to upgrade our fleet to hybrid, expand our Electric Vehicle (EV) provision, and switch our heating from gas to electric. At present, we have not included the potential rise in electricity demand from increased use of air conditioning, but we recognise this will be an area of growth in the future.

Significant capital investment will be required to reduce our emissions associated with natural gas. Electrification, heat pumps, and the use of hydrogen are likely to play an important role. However, at present, there are still uncertainties around these options.

Current projections on the accessibility of green hydrogen (hydrogen produced via a zero carbon energy source) suggest that it is unlikely to occur at scale before the 2030s. Our plan is to renew gas assets with appropriate low-carbon options as and when our existing infrastructure requires renewal. Replacing with low-carbon options will be important to reduce the risk of stranded assets and even the need to replace equipment before its end of life.

The following options have been considered when developing our trajectory to net zero by 2040:

Option one: Implementing no projects: Business as usual (BAU).

Option two: Building Management Systems (BMS) at four locations: Wimbledon and Salisbury depot, and Basingstoke and Winchester station.

Option three: All projects and interventions suggested in the Long-term actions section on page 16.

Figure 3 shows the difference in energy demand for the three scenarios outlined above for the period up to 2026. Further analysis will be undertaken, with additional business cases, changes within the energy market, and future carbon-related developments.

Our modelled trajectory towards net zero focuses on implementing key quick-win measures over the next two years to increase our energy efficiency, and only renewing larger assets (such as gas infrastructure) as they come to end of life. This demonstrates best value for money whilst keeping us on track to achieve net zero carbon by 2040, in line with a science-based methodology of hitting a 4.2% reduction per year.

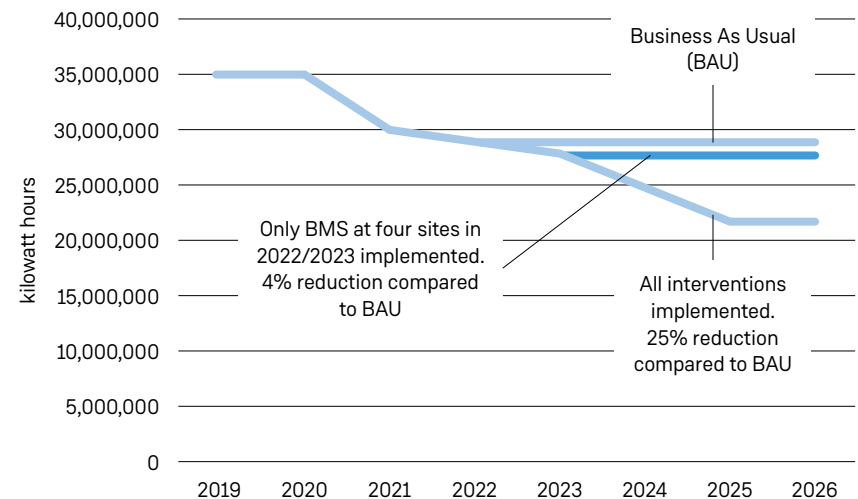


Figure 3: Graph to show different energy demands for three scenarios

Our action plan

To achieve net zero emissions by 2040, we will introduce a number of energy-efficiency measures, and transition to low and zero-carbon technologies as existing infrastructure comes to end of life and requires replacement.

Short-term actions – 2022/23

Over the 2022/23 financial year, we will implement four BMS at Wimbledon and Salisbury depot, and at Basingstoke and Winchester station.

Effective operation and management of the BMS will allow us to optimise the settings in place and maximise energy efficiency, providing greater control over heating, cooling, and use of the equipment. Lighting systems can also be linked to BMS to bring synergy to overall energy management.

The potential energy savings of an effective BMS are:

- 30% savings in gas consumption for depots and stations
- 30% savings for depots and 20% savings for stations in electricity consumption

Over the 19-year appraisal period to 2040, this equates to an estimated energy saving of over 1,100MWh and a carbon saving of 6,000 tCO₂e.



What's a Building Management System?

A BMS is a computer based control system. This can manage facilities intelligently and remotely. Benefits include:

- increase energy efficiency by controlling heating, cooling and lighting effectively
- pick up and fix faults
- provide reporting and enable a clear understanding of how the building is performing

Check out where we are with rolling out BMSs across our buildings within this section.

Medium-term actions 2023/24

Beyond 2022/23 we have identified a number of interventions and actions we believe are important components in our route to net zero. These are:

Further roll-out of BMS

We plan to continue the roll-out of BMS and introduce smart metering at 55 sites. These sites, combined with the four pilot sites consume 80% of our total electricity at our stations and depots (non-traction).

LED lighting

Electricity consumption attributable to lighting at SWR's depots is estimated to be 70-80%. Therefore, another key action would be to install LED lighting at the following six depots: Barton Mill, Bournemouth, Clapham, Fratton, Salisbury, and Wimbledon.

In addition to energy and cost savings, there are potential maintenance savings from LED retrofitting, including:

- longer service life of LED lamp fittings, reducing maintenance frequency
- automatic testing of emergency lighting, reducing requirements for site attendance and associated travel costs/emissions
- remote energy monitoring and control

Over the 18-year appraisal period to 2040, further roll-out of BMS and LED lighting would equate to an estimated energy saving of 3,500MWh and carbon savings of 16,960 tCO₂e.

Energy savings from the interventions proposed in 2022/23 and 2023/24 equate to almost a ~28% energy saving based on our electricity consumption in 2021/22.

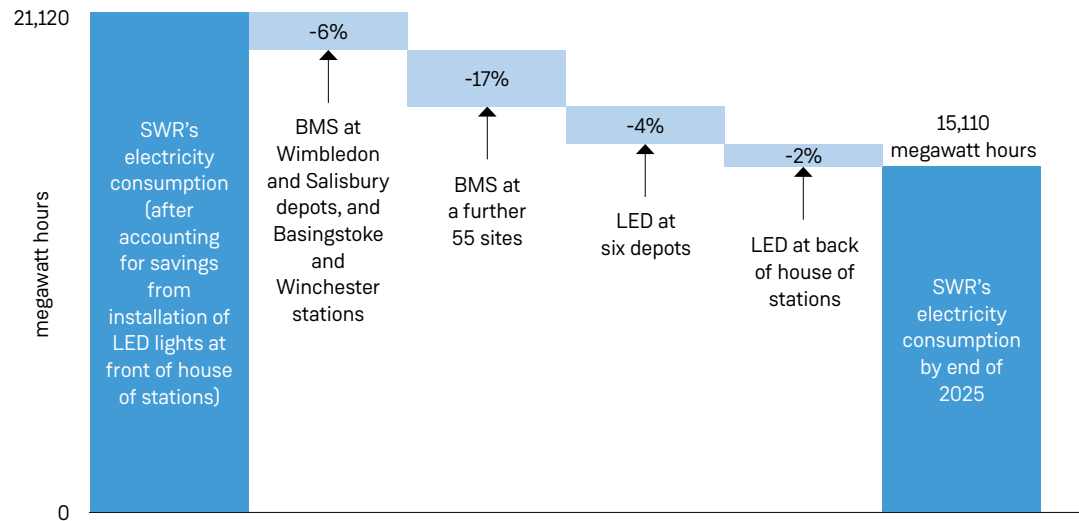


Figure 4: Electricity savings from interventions proposed in 2022/23 and 2023/24



Enabling activities

Enabling actions have also been identified. Whilst these will not have direct energy or carbon savings, they will help us to make energy-saving decisions in the medium to longer term.

- From 2025 onwards all gas boilers at the end of life will be replaced with a lower carbon alternative, such as heat pumps or resistance heaters. Support for this may be available through a scheme such as Salix Low Carbon grant funding.
- We are engaging with Network Rail Southern Region as many of our longer-term decarbonisation actions require collaboration. We will continue to explore the feasibility of onsite renewable energy generation, fabric improvements, and creating lighting zones to enable dimming where available.
- We will investigate the following:
 - opportunities to improve SWR site's building fabric, for example double glazing, draft reduction, improving insulation, and pipe lagging
 - opportunities to reduce energy used in non-building/ infrastructure options for lighting, heating, and cooling (e.g. standalone electric heaters in waiting areas)
 - streamlining changes of train movements in depots to reduce the number of times doors must be open. This information can be used to interlock door opening with heating to ensure heating cannot run with door(s) open.

Long-term actions beyond 2023/24

Beyond 2023/24, the actions we take to reduce our carbon emissions will largely be defined based on the outcomes of studies and interventions undertaken in the short term, and the advancement of low and zero carbon technologies.

These findings will inform the selection of appropriate locations and technologies with the expected priorities being to continue to drive energy efficiency, integrate further renewable energy generation, and transition away from natural gas across the estate.

When considering how much renewable electricity we may require, it is also important to recognise that our electricity demand is likely to increase between now and 2040 due to our transition to an electric fleet and increased use of electricity to provide heat at our depots and stations. Current estimates suggest that this increase could be as much as 4,750 MWh per year by 2040.

Additional energy-efficiency activities

We will continue to develop a detailed action plan of further interventions. These may include removing free-standing electric heaters and fans from waiting areas, and updating heating and cooling controls.

We will also review current procurement practices so that carbon and energy have sufficient consideration within the capital expenditure procurement and approval process.

To meet our 2024 net zero target, it will be important that the energy efficiency of all new equipment is considered as part of procurement decision-making.



Transition away from natural gas and onsite renewable electricity generation

We recognise that there are opportunities to deliver specific fabric-improvement measures to our buildings to improve the thermal performance of stations and depots to enable continued energy efficiency.

Our action plan will work alongside Network Rail's actions, including their procurement of Energy Performance Contracts and any direct Purchase Power Agreement that becomes available. Currently, we have modelled making fabric improvements, such as insulation at 10% of our sites each year from 2024 to 2033, which would result in ~7% reduction in emissions from gas use.

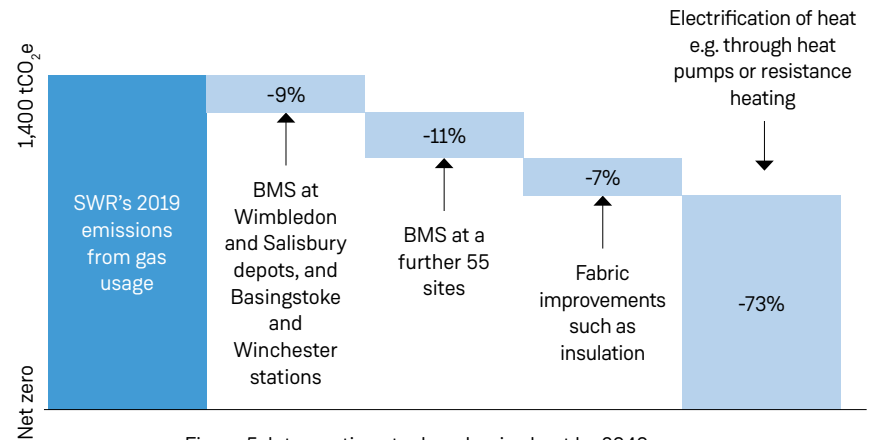


Figure 5: Interventions to decarbonise heat by 2040

We are looking at what a net zero carbon site could look like using Yeovil station and Fratton depot as case studies. At these sites we will pilot innovative low-carbon technologies to identify what will have the greatest impact on decarbonising our emissions that will generate the best value for money.

We will work with Network Rail and the wider industry as technology advances to understand the feasibility of any potential interventions to decarbonise heat. The full range of options to be investigated may include:

- electrification of gas operations
- thermal energy store accumulator tanks which can be used in conjunction with various energy sources in the medium and long term, and require minimal maintenance and can be used in off-grid locations
- ground-source and air-source heat pumps which extract natural heat from the ground or air and are very efficient
- working with local providers to explore demand and supply for hydrogen
- updating or installing heat emitters to suit future ASHP or GSHP e.g. underfloor heating in new build or refurbished offices.

We will determine which stations and depots are feasible to implement the above technologies and provide detail on:

- potential contribution to the reduction in CO₂ emissions
- potential contribution to overall building energy demand
- lifecycle cost of each technology, including payback period
- constraints e.g. local planning conditions, operational restrictions
- opportunities for available grants, tariffs etc.
- existing site technologies
- onsite renewable electricity generation.

Onsite renewable energy generation

Our focus in the short-medium term at our stations and depots is to reduce our energy demand as much as possible and become as efficient as we can be. As grid electricity decarbonises, the carbon return on investment from implementing renewables will decrease, although the wider business benefits and cost benefit is likely to increase as having this local supply will provide us with greater security and certainty of supply, operational cost benefits (e.g. less exposed to price fluctuations, such as those seen in 2021), and even potentially, the opportunity to generate revenue from selling it back to the grid.

If we were to self-generate 25% of our electricity demand from onsite renewables by 2040, this would meet the additional demand required through the electrification of heat and transition of our road fleet to EVs. It would also provide some additional contingency, allowing us to reduce our demand and reliance on the national grid which is a sensible economic and sustainable option.

Given the nature and location of most of our sites, solar photovoltaic (PV) panels are likely to be the most viable option as it is unlikely that other renewable electricity generation options such as hydropower, wind turbines, wave power, and tidal power etc. will be appropriate for our sites and depots due to location requirements.

We will consider locations for PVs where we have the most demand for electricity and the need for a secure supply, these might include sites where heat is electrified or with the planned roll-out of the EVCPs which would lead to an increase in electricity demand. We will work with the wider industry to consolidate information and make cost savings in relation to this. For example, lessons learned over the next few years from Network Rail for solar PV which are currently being installed, or have recently been installed, will provide a foundation for us to roll out any actions most efficiently.

Running of our trains

Current emissions

Operating our trains is naturally the core of our business, and it comes with significant emissions.

The emissions from running our trains are shown in Figure 6; with emissions from diesel trains accounting for 34,350 tCO₂e and electric trains 102,450 tCO₂e in 2019.

Traction emissions are a significant part of our carbon footprint, accounting for 95% of our total Scope 1 and 2 emissions, and 45% of our total carbon footprint (Scopes 1, 2, and 3).

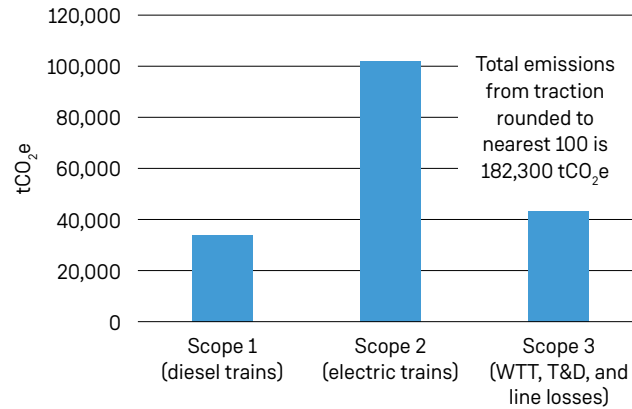


Figure 6: Traction emissions

We have also considered the emissions associated with distribution and supply. Well to tank (WTT) emissions, transmission and distribution (T&D), and line losses associated with the fuels we use to power our trains, comprise ~25% of our total Scope 3 emissions. Our total emissions from traction in 2019 are shown in Figure 6.



We have well-established systems and processes in place to measure and manage the traction energy associated with running our trains, investing in significant improvements to date. However, the electricity used by the electric trains is purchased by Network Rail and therefore is outside of our direct control.

Nevertheless, we are engaging with industry partners to influence the purchase of cleaner energy. We manage this process through the framework of an ISO14001 Environment Management System (ISO14001 EMS) and ISO50001 EnMS.

Driver Advisory Systems (DAS) have been deployed across both our electrified and diesel-powered fleet. This is in the form of driver tablets and connected DAS for junction optimisation, to avoid congestion and regulate speed of services.

The average energy savings from DAS installation at a system level are estimated to be between 5% and 10%.

We are committed to running our services in a clean, safe, and reliable way:

- most of our train services already run on electrified lines, using the 750V DC third rail system.
- our entire fleet has regenerative braking, transferring an estimated 78,700,000 kWh back into the DC supply network every year; this is approximately 18% across our total fleet but varies between 9-26%, depending on factors such as the efficiency of the rolling stock and braking patterns.

We run a diesel fleet of services on the West of England line to Exeter and Salisbury using unelectrified track from the west of Basingstoke, and for Salisbury to Southampton via Romsey services which also serve Eastleigh.

The difference in carbon intensity of diesel compared to electric trains from 2019-2035 is shown in Figure 7.

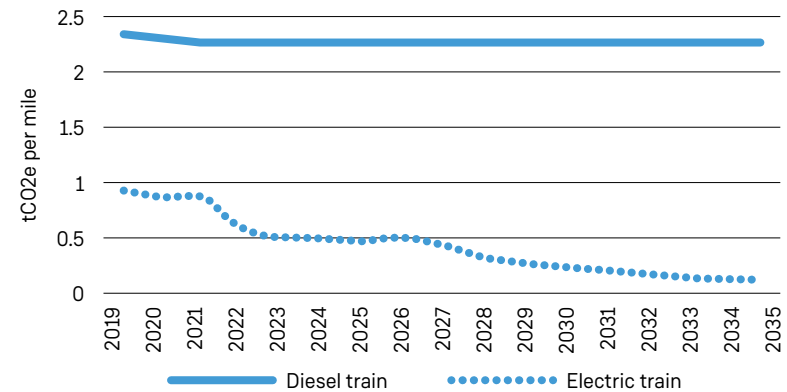


Figure 7: Difference in carbon intensity of diesel train vs electric train (2019-2035) calculated using Defra/BEIS emission factors.

Our net zero plan

Modelling the emissions

Our traction emissions are affected by fleet composition, the technology available to us, and the condition of the wider network. Therefore, decarbonisation trajectories for running our trains are made up of these components.

Our current diesel fleet is approximately 30 years old and will need significant investment in the next five to ten years. Despite trialling numerous promising technologies, retrofitting our diesel fleet with lower carbon technologies at this stage of their lives is not deemed economically viable.

Although there are longer-term plans to electrify some of our non-electrified routes, the implementation timetable is such that in 2030 we intend to replace the diesel fleet with an innovative self-power solution, such as battery and/or hydrogen.

We have modelled the decarbonisation trajectory for our traction operations, based on expected changes in our fleet over the next two to three years, and replacement of diesel engines with battery traction. Should hydrogen engines become a viable option, our model will be revised accordingly.

We will continually evaluate low-carbon options and employ those feasible in fleet replacement. Expected decarbonisation of the wider network has also been included in our modelled trajectory as energy inefficiencies in the network are reduced.

Our action plan

As our traction emissions are affected by the fleet composition, technology available, and the wider network, our actions focus on these elements. Our policy is to only replace equipment at the end of its planned life. Therefore, fleet replacement periods provide a clear cycle over which we can create step changes in our traction emissions.



Short-term to medium-term actions 2022–2024

Maintenance over replacement

We are already reducing our carbon emissions by maintaining components of the trains rather than directly replacing them. For our fleet, the wheels and axles are the only significant items that are regularly replaced from either excessive wear or life expiry. For other components of our fleet, such as the traction motors and gear boxes, we aim to maximise their serviceable life through timely maintenance and overhauls.

Integrating carbon and environmental performance into fleet decision-making

As we look to replace Class 707s, 455s, and 458s with Class 701s (the new Arterio fleet) over the next few years, we will engage with our supply chain, requesting information on the environmental impacts associated with running (and manufacturing) the rolling stock, such as through the provision of Environmental Product Declarations (EPDs) during procurement decisions. This can also be applied to other components procured. This will allow us to better understand our emissions and make informed choices to reduce our environmental impact.

Longer-term actions – 2024 and beyond

Whilst we expect to be replacing our diesel fleet in the next five to ten years, the uncertainty over the exact technology solution requires ongoing active and appropriate participation in associated industry strategies, such as the TDNS and Rail Technical Strategy.

Battery fleet

The technology that replaces the diesel fleet is dependent on what becomes commercially viable for use on the UK network. There is a level of inherent uncertainty assumed with this. However, we are exploring several options that will reduce our emissions as part of running our trains if implemented.

Batteries/electric trains are the most likely option for the replacement of our current fleet, as the technology is already available, and this appears to be the most economically viable solution. There are still some infrastructure challenges associated with this. For example, there are economic battery limits for a journey distance (around 60-80km) which also must factor in any energy requirements due to service delays.

This requires a more in-depth exploration into charging infrastructure, development of charging points, gaps in the network (e.g. Basingstoke to Exeter), and any associated emissions from this work. To address this, we have identified a need for economising on the rolling stock installation and a lineside recharging as part of this. This could require rapid chargers from lineside energy storage so the trains can be rapidly charged, possibly at stations – providing modular capability.

Hydrogen fleet – a potential alternative

An alternative option to batteries is the use of hydrogen, which, depending on the production method, has no GHG emissions associated with its direct use. At the time of writing, hydrogen use in the UK has only just started to be commercialised in other industries. Within rail, there are several challenges that will need to be overcome before replacement of our fleet with hydrogen-based assets. Employing this technology could drastically reduce our emissions from running our trains from our existing baseline and in the longer term reduce our electricity demand.

Network changes

Within the rail network, there are currently large losses from the AC side into the DC network due to inefficiencies. Furthermore, our fleet has become more capable of regenerating electricity, so losses can be reduced as more energy can be put back into the network where it is receptive to this. Therefore, it is imperative that we work with Network Rail to improve efficiencies related to these, to reduce our traction, and fuel and energy emissions.



Our wider value chain

Our value chain refers to our Scope 3 indirect emissions.

Current emissions

Carbon emissions from our value chain make up approximately 52% of total SWR emissions. Our value chain emissions are shown in Figure 8, which include the following:

- the goods and services we buy and lease, which includes rolling stock, goods and services, and leased vehicles
- processing, transmission, and distribution of fuel and energy used to power our trains, stations, and depots (i.e. traction and non-traction energy)
- rail replacement services
- waste associated with stations and depots
- business travel
- employee commuting.

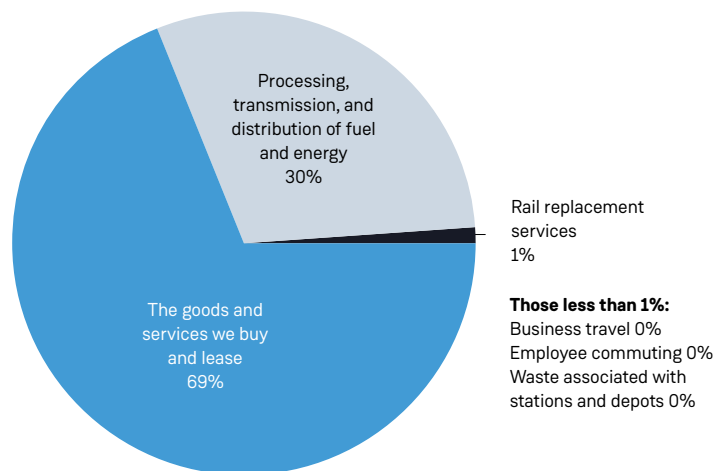


Figure 8: Our value chain emissions 2019 baseline



Understanding our value chain emissions is vital to our plans for achieving decarbonisation. These indirect emissions from supply chain activities are outside our direct control, so are harder to monitor.

Our efforts to decarbonise are focused on where emissions are highest (the 'hot spots') and where we have most influence to reduce emissions (see Figure 9. Note the size of the circles is not representative of the scale of emissions).

Goods and services we buy and lease

The largest source of our value chain emissions is the goods and services we buy and lease, accounting for 68% of total value chain emissions.

The majority of emissions associated with our purchased goods and services are connected with leasing of rolling stock, which contributes 62% to emissions in this category and comprises 65% of annual spend.

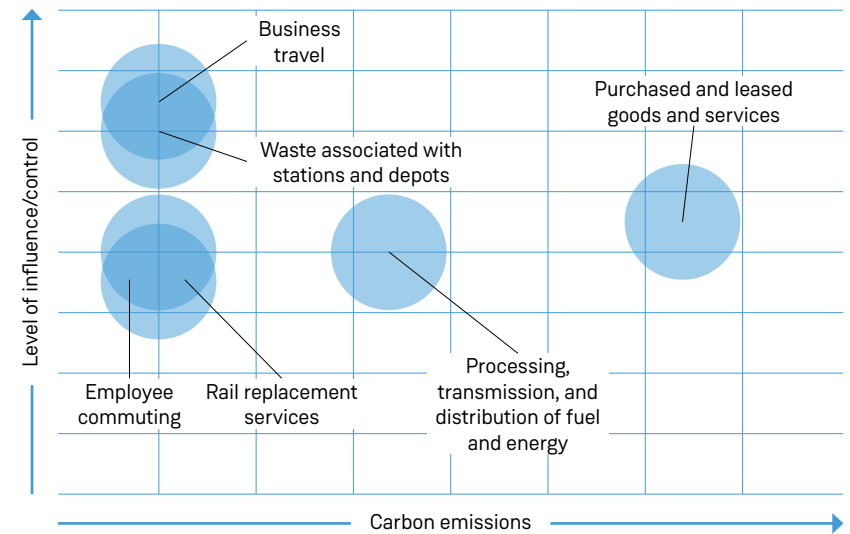


Figure 9: Indicative mapping of SWR influence on Scope 3 emission sources

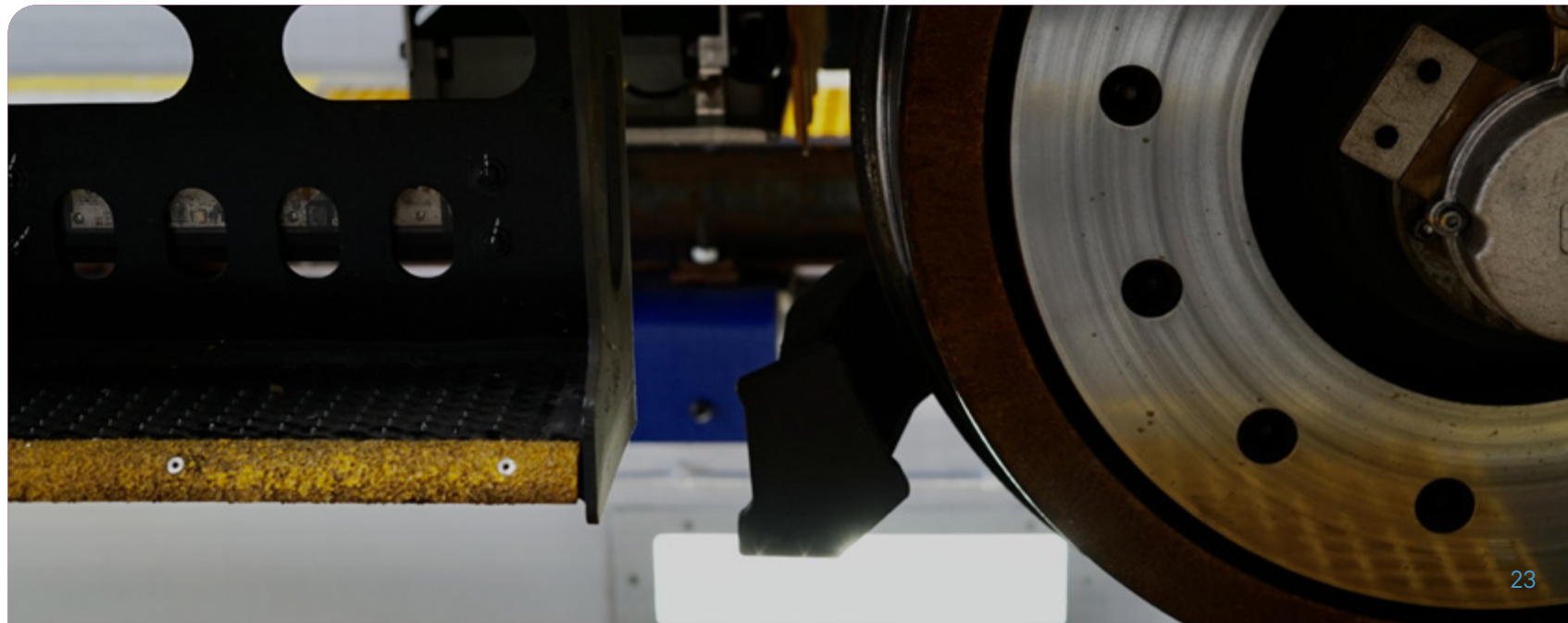


Figure 10 shows the key contributors to spend and carbon emissions within our supply chain of purchased goods and services.

Whilst we do not directly control emissions from the goods and services we buy and lease, we can specify certain low-carbon requirements as part of our contracts, and use our procurement process to select suppliers that are able to provide low-carbon alternatives and are also committed to decarbonisation.

Processing, transmission, and distribution of fuel and energy

The emissions associated with the processing and distribution of fuels, such as diesel used in business travel, stations and depots, and to power our trains, as well as the transmission and distribution losses from our use of electricity across our operations, make up 29% of our total value chain emissions.

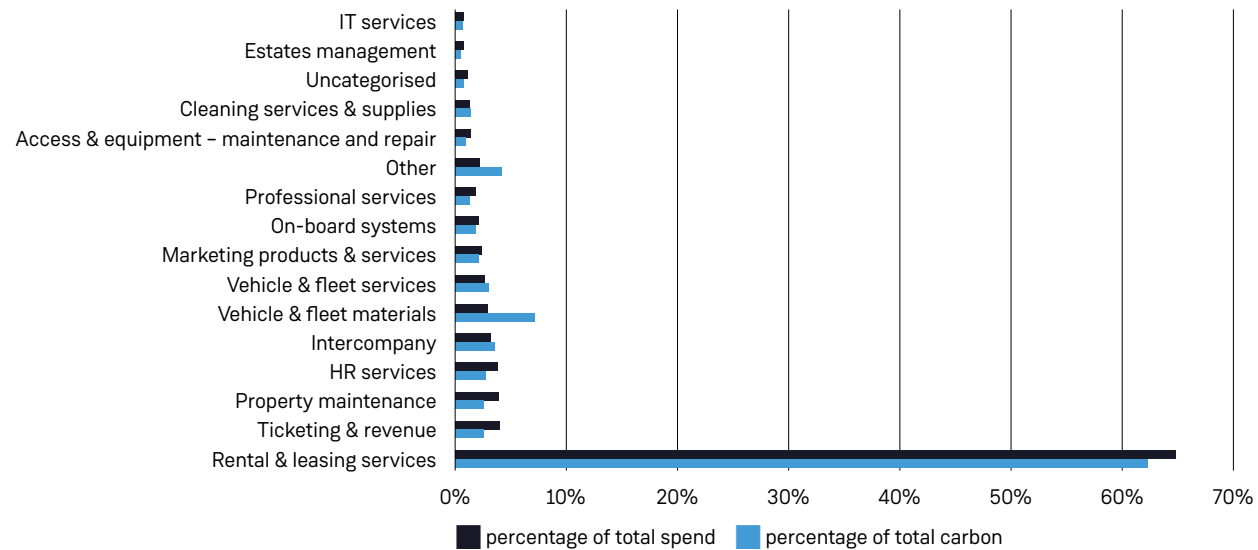


Figure 10: Spend and emissions of goods and services we buy and lease

Rail replacement services

Emissions from rail replacement services contribute 0.5% of total value chain emissions. Within this, the majority of emissions are from taxis, followed by rail replacement buses.

Waste

Our waste emissions make one of the smallest contributions to our value chain emissions (<1% of value chain emissions). This is in part due to our existing, strong waste management policy to recycle at least 75% and maintain zero waste to landfill. Total emissions from waste in stations and depots are shown in Figure 11.

Business travel

Business travel includes all emissions from staff travel and hotel stays for business purposes. This includes leased vehicles, but not owned company vehicles, which are part of our emissions associated with stations and depots.

Currently, staff journeys do not account for travelling on other TOCs. When this data becomes available, we will seek to incorporate this into our baseline. Emissions from business travel contribute <1% to our value chain emissions. However, as with waste, the level of influence we have over business travel is high.

Employee commuting

Employee commuting emissions arise from travel between employee homes and work location. Employee commuting emissions were calculated as 340 tCO₂e for 2019 (less than 1% of total value chain emissions). Ways in which employees travel independently from their homes to SWR sites is influenced by SWR actions. All SWR employees get free travel on SWR services along with discounted tickets to other train operating companies.

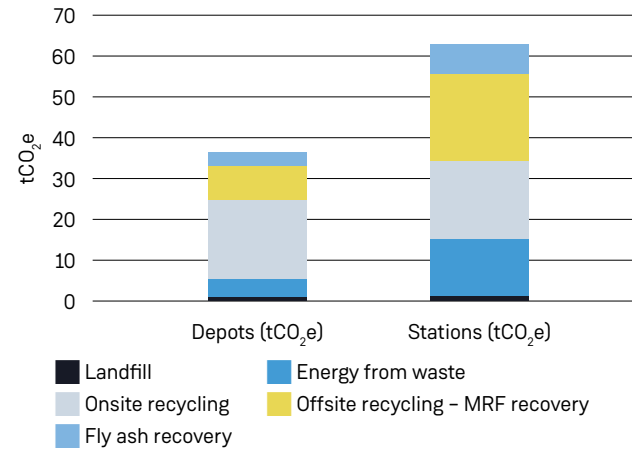


Figure 11: Emissions from waste disposal at depots and stations (tCO₂e)

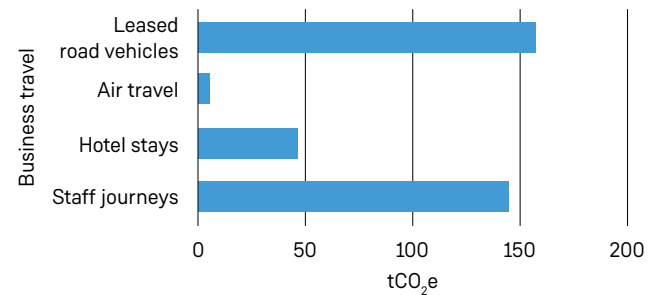


Figure 12: Emissions from business travel (tCO₂e)

Our net zero plan

Modelling the emissions

The decarbonisation trajectory for our value chain emissions models:

- grid decarbonisation by 2035
- changes to fuel and energy-related activities of line losses, WTT, and T&D in line with external energy and fuel decarbonisation and changes to traction, and stations and depots energy use
- transport sector decarbonisation by 2050
- hospitality sector decarbonisation by 2050
- 75% reduction in carbon by 2050 associated with purchased goods and services, based on the target that Network Rail has set for 75% of suppliers to set a Science Based Target. We recognise this will drive sector-wide activity.

The rate of change that we can achieve for our value chain emissions depends largely on the success of our efforts to decarbonise emissions from purchased and leased goods and services.

We recognise our value chain is one of the most complicated areas to decarbonise. We have set some initial qualitative milestones, and will undertake further modelling within the next 12 months to create a detailed quantitative trajectory aligned to SBTi and our net zero 2040 target. We will also expand on our EVCP strategy which will take into consideration the current energy market and the most up-to-date forecasts for the modal shift.

Our action plan

To fully realise our net zero ambition, emissions from the value chain must also be addressed alongside our non-traction and traction emissions. We have less control over these emissions which are also more difficult to quantify. Consequently, our priorities in the short term are mainly associated with some immediate quick wins which will reduce the associated carbon, as well as improving our understanding of these emissions so we can properly target and prioritise future actions on those that present the best carbon and cost returns for our investment.



Overarching enabling activities

Improving data collection and monitoring to better understand our value chain emissions

Our emissions for purchased goods and services have been calculated using data on the emissions intensity of different categories of spend in kilogrammes of carbon per £. However, moving to a more activity-based method to calculate our purchased goods and services emissions, rather than estimating from spend data, would help us to better understand where to focus our decarbonisation efforts and use our influence to reduce emissions.

An activity-based method relies on us collecting specific data directly from our suppliers, so we better understand the emissions of specific goods and services supplied to us, and it involves us working more closely with our suppliers and asking for more information at tendering stage. This will also provide a better understanding of each category of goods and services, in which common materials can be mapped.

We will also improve our understanding of emissions from staff working from home, from the energy that they use for heating and powering IT equipment during working hours, as this will form part of our wider value chain emissions. This data collection process is one we will gradually undertake to improve the accuracy of our value chain emissions baseline, and we will use this to update our emissions trajectory to provide a more granular representation of how and when our value chain emissions will decrease.

Embedding carbon into decision-making at tendering stage

To enable us to make real emissions reductions through our value chain, we will integrate questions and considerations on carbon emissions into our specifications, evaluations, and contract management processes. For example, we may ask suppliers to provide EPDs so we can understand the lifecycle carbon emissions associated with the goods and services we purchase. Asking for EPDs for the rolling stock we lease from rolling stock companies (ROSCOs) will help to reduce not only operational emissions, but also embodied emissions within the rolling stock itself, especially in those sub-systems that require regular replacement, such as wheels. In addition to this, we will map contract review timings and opportunities, for example, including rolling stock renewals periods or end dates of other key contracts are in our plans.

Our planned and potential interventions in the short term, medium term, and beyond are detailed below.

Our current waste management performance:

- We currently recycle 75-80% of all waste collected.
- This is done through on-site separation and processing, and collection of recycled items from our waste partners.
- Any waste not recycled is incinerated for energy, fly ash is recycled.

Short-term actions – 2022/23

The next two years are vital in setting the foundation for long-term decarbonisation to meet our targets. There are several broad areas in which interventions and enabling activities can be undertaken to do this. Interventions already planned in the short term include:

Procurement: When equipment is life expired, we will replace these for more energy efficient / less carbon intensive models such as CCTV equipment and TVMs.

Water: Continue to upgrade washroom facilities to a more sustainable specification which uses less water through aerated taps and dual flush toilets.

Waste: We will build on our current waste management plan by increasing efficiency in recycling collection and reducing generation of general waste.

Travel:

- We aim to upgrade our fleet of 55 leased vehicles to 100% hybrid or battery electric vehicles.
- Installation of EVCPs to reduce fuel use and emissions from travel to stations and depots. This includes rapid charger trial phase along with installation of fast charging points in our stations and depots. Further details will be launched in the 12 months as we finalise our EV strategy.



Changes in procurement processes

Additional interventions largely involve changes in the procurement process. In the short term, we will investigate the following interventions:

- work with specific suppliers to collect data on their emissions to improve data accuracy of our emissions baseline and also to provide more support to suppliers to reduce their emissions, for example, encouraging them to source local products and materials where possible
- include specific questions in tenders e.g. inclusion of EPDs and carbon-related objectives, such as the use of low-carbon products and materials embed carbon into procurement decision-making
- work with retailers at stations to reduce waste and/or contamination of waste increase recycling. This could be in the form of a take-back scheme for coffee cups, which we have observed to be a significant source of external waste and contamination, and methods to reduce the use of single-use plastics.

Alignment with FirstGroup Governance

There are several enabling activities that can be undertaken within the next 1-2 years:

- apply the FirstGroup supplier code of conduct
- align actions with FirstGroup activities to ensure that broader targets are met
- apply the Power BI tool to match FirstGroup systems and deliver consistency in reporting.

Engagement with the sector and supply chain

We will also engage with Network Rail to collaborate on supply chain decarbonisation, working together to engage our supply chain in setting Science Based Targets. We will discuss opportunities with Network Rail at regular meetings of our joint Alliance Environment and Sustainability Steering Group.

We will continue to update our roadmap to improve the granularity of modelling as we gather more specific data on our value chain. For example, we will update our modelling for business travel and employee commuting as we increase the number of EVCPs and leased EVs in our vehicle fleet, and update modelling of our purchased goods and services as we gather more data from our supply chain, to re-evaluate our roadmap towards the 2040 net zero target.

Medium-term actions – 2023/2024

In the medium term, more resource-intensive interventions can be undertaken to build on the immediate actions discussed. For example, continued and enhanced engagement will be key to create change particularly around net technology like EVCPs. Additional interventions include closing loops on leased items by, for example, combining waste collection, as targets in this category are achievable in the medium-term.

We aim to commence the roll-out of EVCPs across our estate.

Additional procurement-related interventions we will investigate include:

- obtain EPDs for rolling stock when renewing or taking out a new leasing contract as discussed in our traction emission decarbonisation action plan – there may be an opportunity to request EPDs for stock that has not yet been ordered
- using tools such as the RSSB carbon calculator to measure our embodied carbon footprint to enable appropriate action to reduce carbon across our business
- obtain information on the energy efficiency of equipment from suppliers early on, during the initial design stage
- investigate the use of lower emissions rail replacement services (including investigating alternatives for MPVs and buses as they make up the majority of rail replacement travel emissions).

Longer-term actions – beyond 2024

Possible interventions include:

- further scaling up of fast charger installations for EVs, subject to the revised strategy.
- continue to improve accuracy of purchased goods and services carbon footprint, and integrating carbon emissions as a decision factor in our procurement processes so that we reduce the embodied carbon of our purchased goods and services.
- measure and reduce emissions from customers travelling to stations; as part of this, review the use of electric scooters and other new modes of transport and how these changes may impact on customer and staff travel emissions for business travel and employee commuting.

We will continue to update our modelling as we gather more specific data on our value chain, to re-evaluate our roadmap towards the 2040 net zero target.



How we will achieve our targets

Enabling activities to reduce carbon

Training, engagement and communication

To reduce emissions, training and engagement with our supply chain, customers, and staff is essential for creating a low-carbon culture, and in turn helping to achieve our decarbonisation goals.

We have already undertaken stakeholder benchmarking and engagement across the rail industry as part of the development of our sustainability strategy. We will continue to engage and communicate with our stakeholders in line with existing communications and reporting channels identified and managed as part of our ISO50001 certification.

We will communicate with customers to develop a wider understanding of individual impacts, for example, from waste brought onto trains and emissions associated with travelling to and from stations. Other TOCs and FirstGroup will be engaged as part of data collection and as a collaborative opportunity in which options for carbon reduction can be shared.

Creating awareness among employees and customers to influence behaviour and improve energy efficiency is also critical to success. We will provide staff with information and regular updates outlining key targets and current performance, and deliver training and campaigns such as 'switch off' events. This will support the development of a culture of energy efficiency and low-carbon behaviours.

Engagement with Network Rail Southern Region throughout our decarbonisation journey will be essential, including how we can come together to generate a combined route map for the Southern Region, to decarbonise our estate and to support emission reductions in our value chain.

Minimisation to reduce emissions

Before investing in other decarbonisation measures we will first focus on the energy we use, in line with the principles of the carbon hierarchy.

This includes focusing on the products and services we purchase and the waste we produce, creating a culture of efficiency.

For example, encouraging rail travel over air travel for business where possible, reducing the mileage travelled by staff to reduce business travel emissions at the same time as switching to EVs, and reducing energy and fuel used in our operations through energy-efficiency measures, before investing in other decarbonisation measures.

Harnessing innovations

We will continue to work with others across the industry to identify, trial, and implement innovations that could benefit the whole industry and support rail decarbonisation.

For example, in the repair and maintenance of wheels and axles, we will utilise suitable innovations in areas such as condition monitoring, use of novel materials, asset repair to reduce energy requirements in our value chain.

We will work with our suppliers, as well as others in the industry, such as other TOCs and Network Rail, to investigate new manufacturing techniques and innovations to safely reduce the frequency of maintenance activities and extend the lifespans of the products we use.

We will maintain our engagement with the ongoing development of the Rail Technical Strategy, working with industry bodies and suppliers to support innovations that will help us to pioneer new low-carbon technologies and interventions.

Monitoring our progress

Progress against the actions identified in this roadmap will be monitored as part of our ISO50001 EnMS; this will include regular tracking of specific actions, our ongoing energy and carbon performance, as well as an annual review by the senior leadership team.

Risks and mitigation

Given the interdependencies within the rail sector, as well as state of certain technologies, the trajectories, carbon, energy, and cost savings presented in this roadmap are based on many assumptions and estimations; these create inherent risks for delivery of this plan. We have identified an initial set of risks (see Table 2 below) and plan to review these as part of our annual energy review.

Risk Description	Mitigation
Substantial financial investment required in the next decade for decarbonisation, with funding critical to support decarbonisation interventions.	A comprehensive decarbonisation plan informed by cost and benefits analysis ensures value for money is considered as part of the decision-making process when selecting interventions.
Availability and accuracy of carbon and energy data, particularly as we integrate our Scope 3 emissions into the targets.	The decarbonisation plan includes enabling actions considered and planned. The plan includes actions to improve data. ISO50001 EmS and annual external audit of the data.
Volatile energy prices and maintaining security of energy supply may affect the overall business case for specific interventions.	Monitor energy prices and train staff to consider the longer-term impacts of energy security. Consider renewable energy where feasible.
Increase in electricity consumptions at stations, with an increasing need for A/C being installed or added to existing stations, associated with climate change. An increase of electricity consumption is also likely with the installation of EVCP.	Monitor energy consumption & procure energy efficient A/C units. Smart EV charging with optimisation for EV charging during times of the day when there are lower demands on electricity or at times of high onsite renewable generation
Not delivering the decarbonisation plan.	Strong project management, proactive planning, resource management, and investment in high-performing people and teams.
Accelerating pace of change.	Good corporate governance with Executive Leadership Team ownership and strong communication. The management systems in place to respond to and adapt to changes in technology and policy.
Lack of progress to decarbonise across our supply chain means that we don't hit our Scope 3 reduction targets.	Collaboratively driving change and empowering the supply chain to decarbonise, driving value and decarbonisation across our supply chain.
Dependence on third party technology and innovation; this applies across many areas of our decarbonisation plan from the decarbonisation of the grid through to availability of technology to decarbonise heat.	Ongoing review to track our interventions, the resulting energy and carbon performance as reviewing and updating this risk register as we developed more detailed interventions and actions plan.
Potential increase in investment costs in comparison to costs modelled for interventions after the completion of the tender process.	Upon completion of the tender process for each intervention, the project benefits to be re-assessed.
Lead-in time for installation of BMS and LED lighting longer than anticipated.	Early agreement on procurement process and discussion with the preferred supplier and confirmation of programme requirements.
Replacement and maintenance costs higher than modelled.	Costs monitoring through the project.
Lack of skills and engagement across staff to support delivery of the decarbonisation plan.	Staff support through training and effective internal communications to develop culture that delivers the right outcomes.

Table 2: Risk and mitigation

Collaboration with the rail industry

We recognise that we can't decarbonise our operations working in isolation. We need to engage and collaborate with multiple parties to achieve our trajectory and therefore contribute to the overall decarbonisation of the UK rail sector. Key stakeholder groups and areas of collaboration/engagement are shown in Table 3.

In particular, collaborating closely with Network Rail Southern Region will be essential, including how we can come together to generate a combined route map for the Southern Region. Additionally, to explore the feasibility of potential options of and sites for fabric improvements, the removal of existing gas asset, and onsite renewable electricity generation.

Stakeholders	Engagement to support SWR and industry decarbonisation – carbon emissions from our stations and depots	Engagement to support SWR and industry decarbonisation – carbon emissions associated with running our trains	Engagement to support SWR and industry decarbonisation – carbon emissions associated with our value chain
Government/Regulatory (DfT)	Engaging with DfT to secure funding for decarbonisation interventions. Maintain regular reporting activities and communications channels.	Engagement to support the rail industry target of removing all diesel-only trains from the network by 2040 as outlined in the Transport Decarbonisation Plan published in July 2021. Maintain regular reporting activities and communications channels.	Support the Government in implementing low-carbon procurement considerations through supply chains. Maintain regular reporting activities and communications channels.
Network Rail	Collaborating with Network Rail Southern Region to explore feasibility for onsite renewable energy and as technology advances potential interventions to decarbonise heat. Further engagement to increase energy-efficiency and building-related emissions associated with Network Rail-owned stations and depots leased by SWR, potential measures include e.g. fabric improvements, usage of low-carbon construction materials.	Engagement in delivery of TDNS. Engagement to improve efficiency and reduce traction losses at substations. Engagement on traction battery charging and hydrogen.	Collaborating with Network Rail and their supply chain to help them achieve their target of 75% of supplier setting Science Based Targets, which in turn will support our value chain emissions reductions targets. This will form part of the regular meetings SWR sit in on with the Network Rail alliance environment and sustainability steering group.
Railway Safety Standards Board (RSSB)	Engagement with RSSB on opportunities to decarbonise stations and depots, aligning with their current and planned research initiatives.	Engagement with RSSB and Network Rail on the potential safe third rail extension between Salisbury and Basingstoke. Engagement and collaboration to develop new standards which will be required on battery and hydrogen fleet.	We have calculated our value chain emissions to support RSSB recommendations set out in the RSSB T1197 report, to improve the accuracy of the carbon footprint of the rail sector in the UK. We will continue to improve the accuracy of our value chain emissions footprint and engage with RSSB on further developments in this area.

Table 3: Stakeholders mapped to collaborate with to drive decarbonisation

Stakeholders	Engagement to support SWR and industry decarbonisation – carbon emissions from our stations and depots	Engagement to support SWR and industry decarbonisation – carbon emissions associated with running our trains	Engagement to support SWR and industry decarbonisation – carbon emissions associated with our value chain
Rail Delivery Group (RDG)	Engagement with RDG members to understand how others in the industry are reducing their stations and depots emissions.	Engagement with RDG members to understand how others in the industry are reducing their traction emissions.	Engagement with RDG members to understand how others in the industry are reducing their value chain emissions.
Rolling stock companies (ROSCOs)	n/a	Request rolling stock EPDs for leasing in new period contracts to drive emissions reduction in operational carbon. Engagement and collaboration on financing and specifying rolling stock and its technology.	Request rolling stock EPDs for leasing in new period contracts to drive emissions reduction in embodied carbon.
FirstGroup	Aligning with FirstGroup business commitments, and carbon accounting and reporting methodologies.	Aligning with FirstGroup business commitments, and carbon accounting and reporting methodologies.	Aligning emissions reduction activities, for example, relating to rail replacement contracts at group level as well as aligning carbon accounting and reporting methodologies.
Local authorities	Engagement with local authorities with the installation and launch of EVCPs at stations, which will support impact on electricity-related emissions at stations.	n/a	Engagement with local authorities with the installation and launch of EVCPs at stations, which will support reduction of travel and commuting emissions of our staff and customers.
Communities and local businesses	n/a	n/a	Working with local businesses and small and medium sized enterprises (SMEs) to introduce measures to reduce value chain emissions, for example, sourcing materials locally where possible.
Supply chain	n/a	Working with our supply chain of rolling stock and energy providers to continually improve the efficiency of our trains and reduce carbon emissions.	Working with our suppliers, in particular those that represent a significant proportion of our spend and/or carbon emissions such as ROSCOs to help them set carbon targets of their own. We will ask them to provide us with data on lifecycle carbon emissions for their products and services, and support them in minimising these emissions as much as possible.
Our people	Fault any equipment and look for steps to increase efficiency.	Use eco driving techniques and fault any unnecessary energy consumption.	Follow the SWR sustainable procurement processes. Seek to increase recycling and reduce water use. Seek to reduce emissions from commuting by switching to a cleaner mode of transport.
Our customers	Fault any examples of unnecessary energy consumption.	n/a	Seek to recycle waste by using the facilities in place. Look for opportunities to switch commuting to and from the station to a cleaner alternative.

Table 3: Stakeholders mapped to collaborate with to drive decarbonisation (continued)

The next steps on our journey to net zero

To implement this strategy, we must work collaboratively with all our stakeholders to help mitigate risk and reduce the uncertainty of the future. The next steps include:

Supply chain

We will conduct a deep dive into our Scope 3 emissions, to build a better understanding of carbon in our value chain and enable us to set robust reduction targets for the future. We will set engagement targets and involve all our major suppliers, such as the rolling stock companies.

Infrastructure development

We will work closely with Network Rail as they seek to deliver the electrification of the rail network in the West of England. Any decision will have a direct effect on the traction model we use to replace our diesel fleet. Furthermore, any infrastructure upgrades to our stations and depots will in turn require Network Rail's involvement and consent.

Energy security

The current volatile energy environment requires us to improve our energy security which will in turn enable us to reach a number of the milestones on our roadmap. Any changes in the energy market will have an impact on our model so we must continue to engage with NR in the shaping of traction energy contracts (EC4T). The potential of alternative energy sources such as power purchase agreements (PPA) and renewable power generation will be explored in this process.

Collaboration

We will work closely with the stakeholders outlined above on a one railway approach to decarbonisation, sharing knowledge and experience and aligning our objectives and processes to collectively manage the future risks facing our industry. We will also work closely with our holding group, First Group and MTR, ensuring that we maximise our knowledge base and overall contribution to the net zero agenda.

Funding

As part of SWR's National Rail Contract all funding for the Net Zero roadmap will be allocated by the Department for Transport (DfT). We will work closely with the DfT to provide transparent data to support proposed initiatives, while continually striving to deliver best value for the taxpayer.

Feedback and engagement

Our roadmap to net zero by 2040 is both ambitious and robust, but we also know we don't have all the answers. We would welcome thoughts, comments and suggestions from all parties to help us achieve our goal – please feel free to email us at sustainability@swrailway.com



This decarbonisation modelling and target setting has been undertaken by carbon and sustainability experts at AECOM. AECOM is the world's trusted infrastructure consulting firm and we support clients across sectors and geographies to understand and reduce their carbon emissions. The work undertaken is aligned with best practice in Greenhouse Gas accounting and target setting methodologies including the WRI GHG Protocol and the Science Based Targets Initiative guidance

Journey to a Better Future

South Western
 Railway