

ENVIRONMENTAL SUSTAINABILITY

Rail is already the most sustainable form of mass transport, but we want to be even more sustainable to become the cleanest, greenest form of mass transport in Great Britain. We published a new environmental sustainability strategy in September and have developed a strong plan to deliver it.

This is our most ambitious and forward-looking strategy to date and sets out the action we'll be taking over the next 30 years. It has four pillars: to make the railway low emissions by reducing our greenhouse gas emissions and improving air quality; to make the railway more resilient to the impacts of climate change; to improve the biodiversity that lives on our estate; and to reduce waste and use precious natural resources more carefully.

To complement our new environmental sustainability strategy, we've also been working on a new social value framework. This will help us optimise the benefits we deliver to our passengers, neighbours and the communities we serve. (See the Our People section on pages 67 to 70.)

Reducing our greenhouse gas emissions

Travelling by rail is already a low-emissions form of transport, as the rail industry contributes 1.4 per cent of the UK's total greenhouse gas emissions. However, it's important that Network Rail supports the UK Government's legal target of net-zero greenhouse gas emissions by 2050 and the Scottish Government's target of net-zero greenhouse gas emissions by 2045.

We produced the traction decarbonisation network strategy (TDNS) interim programme business case in response to the Government's challenge to the rail industry to get diesel-only trains off the network by 2035 in Scotland and 2040 in England and Wales.

We also published a plan which sets out our pathway to net-zero greenhouse gas emissions. We scientifically analysed all greenhouse gas emissions emitted during construction, maintenance and operational activities and set ourselves science-based targets to follow over the next 30 years to reduce emissions in line with what the latest climate science says is needed to prevent the worst impacts of climate change.

Streamlined Energy & Carbon Reporting 2020/21

Energy consumption used to calculate emissions	Amount	Units
Total electricity used	476,700,546	kWh
Total gas used	56,790,853	kWh
Total fuel for company fleet	276,499,071	kWh

Emissions breakdown – conversion factor kgCO₂e

Scope	Emission category	Amount	Units	Conversion factor
Scope 1	Emissions from combustion of gas	10,442.1	tCO ₂ e	0.18387 natural gas
Scope 1	Emissions from combustion of fuel transport purposes	66,947.9	tCO ₂ e	2.16802 unleaded 2.54603 diesel 1.55537 LPG
Scope 2	Emissions from purchased electricity	111,138.0	tCO ₂ e	0.23314 UK Grid mix
Total gross CO ₂ e based on the above		188,528.0	tCO ₂ e	

Intensity Metrics		Intensity ratio
Number of employees	43,850	4.03 tCO ₂ e / employee
Passenger kilometres (billions km)	12,502	15,079 tCO ₂ e / bn passenger km

Methodology

We have used the EMA SECR tool which follows the GHG Reporting Protocol, populated with invoiced consumption and metered data.

Principal energy efficiency measures (PEEMs)

In 2020/21 we have delivered a half-day energy management training to 128 members of staff and also delivered the sustainability leadership training to 2 cohorts, consisting of the executive team and senior leaders across the business.

Our energy and carbon policy, which forms part of the environment and social performance policy, highlights energy reduction as central to Network Rail's responsibility to conduct its operations in a sustainable manner.

We are carrying out a rolling programme of installation of low power air-cooling systems at 315 GSM-R cabins to reduce their energy consumption, with 61 sites completed so far.

To implement our science-based targets we've set up our decarbonisation programme which is now in its second year. We're installing public electric vehicle charging points in our managed station car parks, with plans to install more in the future. We developed a renewable energy strategy which involved analysing our estate to identify locations where renewable energy can be fed into our power network. We've installed more than 900 smart utility meters to help improve our energy management and carried out more than 120 energy audits identifying potential savings of £3.8 million and the equivalent of more than 6,000 tonnes of carbon dioxide.

We're delivering energy management training to key Network Rail colleagues to help us manage energy more efficiently. We've begun to use new more environmentally friendly components during platform refurbishments helping to reduce the greenhouse gas footprint of the railway infrastructure. Beyond the programme we're also making good progress on other aspects of our greenhouse gas emission reduction plans and engagement with key stakeholders.

All of our non-traction electricity – this is the electricity that powers our offices and depots – now comes from renewable

sources, and our traction electricity – the electricity used to power electric trains – is generated by nuclear power stations and therefore produces near-zero emissions. This completes the first stage of our energy strategy which aims to feed in 100 per cent renewable energy to our non-traction consumption by 2030. As part of our plans to phase out internal combustion engine vehicles in our road fleet, our fleet team has already begun to install electric vehicle charging points and replace our road fleet with electric vehicles as breaks in lease agreements allow.

A large element of our greenhouse gas footprint is produced by our supply chain. Tackling the greenhouse gases produced through the goods and services we need to build, maintain and operate the railway infrastructure will go a long way to helping us achieve our net-zero greenhouse gas targets. We've written to more than 75 of our major suppliers to explain the importance of reducing greenhouse gas emissions, encouraging them to set their own science-based targets, and asking them to work closely with us to deliver significant greenhouse gas reductions.

Improving air quality

Air quality forms a major part of our environmental sustainability strategy and our ambition is to continually improve it so that our passengers, neighbours and employees breathe healthier air.

We've listened to feedback that air quality in some of our managed stations could be better and have committed to air quality monitoring across our managed locations to establish baselines. From these baselines we'll develop management plans to reduce harmful levels of pollutants in locations where they are identified by at least 25 per cent by 2030.

We're working closely with the Rail Safety and Standards Board (RSSB) to implement a 100-station network wide programme for air quality monitoring. This programme will start later in 2021.

A reliable railway that is resilient to climate change

The reduced passenger services during the pandemic have led to reduced weather-related performance impacts on adverse and extreme weather days. However, we still experienced major disruptions due to flooding and

landslips with the highest profile being at Carmont, Scotland in August 2020.

Last year we made good progress in assessing climate change vulnerability and formulating action plans for the remainder of Control Period 6 (CP6) with the publication of regional weather and climate change action plans (2019 – 2024) and finalisation of the chief engineer's asset climate change risk assessment and action plan. Implementing the regional plans will improve on-the-ground resilience and the asset plan will update policies, standards, procedures, and specifications to improve asset safety, reliability and performance.

The tragic derailment at Carmont has brought the devastating effects of climate change to the fore. Although Britain has one of the best safety records among European railways, and we generally manage extreme weather well, a fatal derailment in August 2020 has had a profound impact on the GB rail sector and further accelerated the work we are doing to keep our network resilient.

Immediately after the incident, we mobilised our engineers, specialist contractors and aerial surveying team to inspect earthworks with similar features. We conducted an intensive audit of assets across the country and reported in detail the state of resilience of our network. Pledging to learn lessons from the tragedy we also commissioned two separate taskforces led by independent specialists.

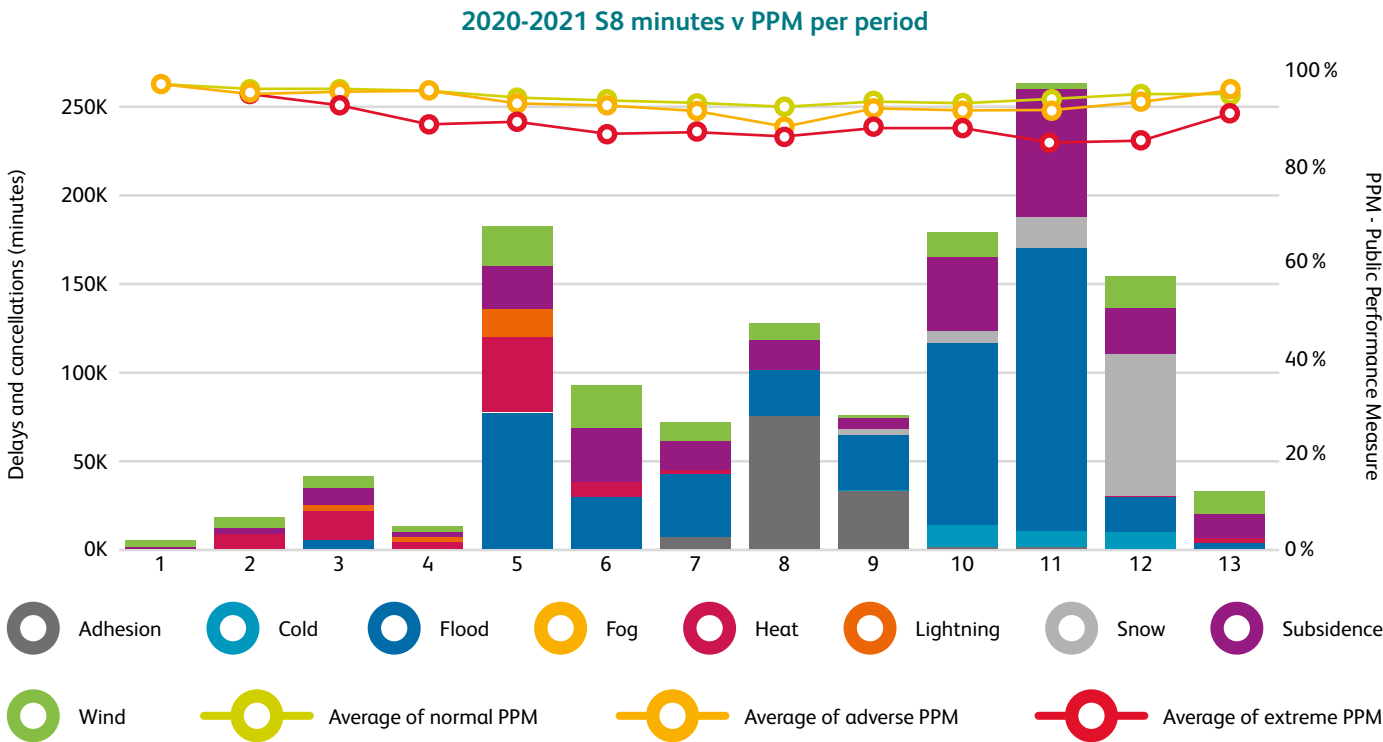
One review, led by Lord Robert Mair, looked at how to improve the management of our earthworks portfolio, looking at past incidents, the latest technologies, innovations, and best practice from across the globe. The other, was a weather advisory taskforce, spearheaded by Dame Julia Slingo, former chief scientist at the Met Office and a world-renowned expert in climatology. This looked at the risk rainfall poses to our infrastructure, drawing on the latest scientific developments in monitoring, real-time observations and forecasting. The outputs and recommendations from both taskforces will guide our work and help us make improvements to our asset management and operational preparedness.

Our research programme aims to understand the factors affecting asset resilience, vulnerability and criticality and the cost of making them more resilient. Our third adaptation report under the Climate Change Act will be submitted to Government by the end of 2021.

We continue to engage with Government, regulators, rail, transport and wider infrastructure sectors to share knowledge, collaborate on research, manage interdependencies and improve climate adaptation action and co-ordination.

Over the remainder of CP6, we'll implement the recommendations of the earthworks and weather advisory taskforces and continue to work on improved guidance, tools and research to support decision making on climate change risk including embedding the latest climate change projections (UKCP18) in risk assessments and designs.

The graph below provides an overview of the impact of different weather-related events for each of our thirteen, four-week periods in the financial year 2020/21. Weather events don't always cause drops in performance (e.g. extreme rainfall may not flood the railway) therefore, performance on adverse/extreme days can be higher than expected.



Biodiversity

We manage a nationally important wildlife corridor with responsibility for over 200 sites of special scientific interest (SSSI). While vegetation management must be carried out for maintenance and safety reasons, it's important we look after the plants and animals that live on our land while doing so.

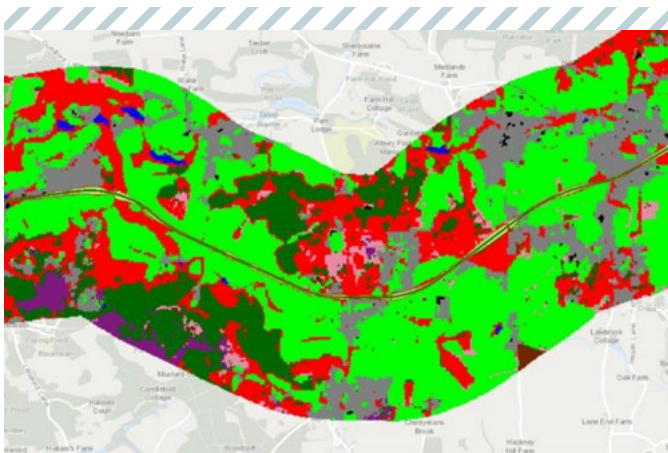
Following the publication of the Varley Review in 2018, we've made great progress in improving the way we

manage biodiversity on our estate. Working through our sustainable land use programme, we're putting the building blocks in place to achieve our ambition to be an exemplar of sustainable land management .

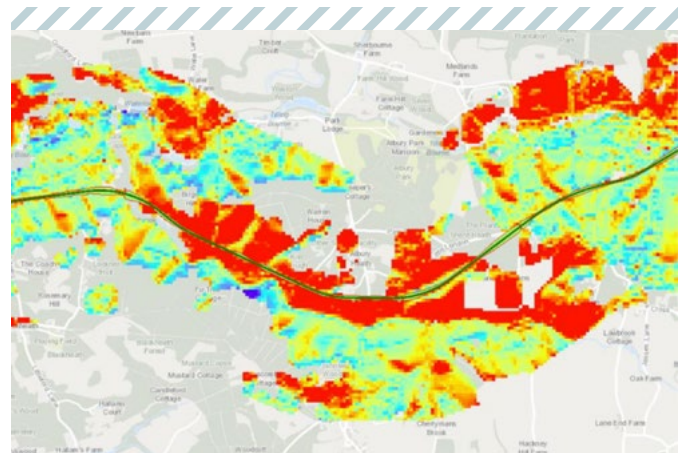
Central to this vision is our recently published biodiversity action plan along with new procedures to protect and enhance biodiversity. Using satellite technology, we've mapped the different habitats on our estate to create

a baseline so we can measure progress against our targets of no-net biodiversity loss by 2024 and biodiversity net gain by 2035. This biodiversity database, which is a first for Network Rail, will help us strategically manage our biodiversity and contribute to the recovery of nature across Great Britain. The database has revealed that our estate holds twice the national average of woodland cover, and that there are many areas where we can support the local conservation objectives by connecting isolated habitats.

We've rolled out training and awareness on how to manage our land sustainably. The training will help colleagues improve biodiversity through their daily duties alongside their important frontline activities. Our sustainable railway design guide will provide useful reference material for colleagues and help them manage our land more sustainably. We're also increasing the numbers of biodiversity and environmental experts across the business.



Map of habitat types within 1km of the railway



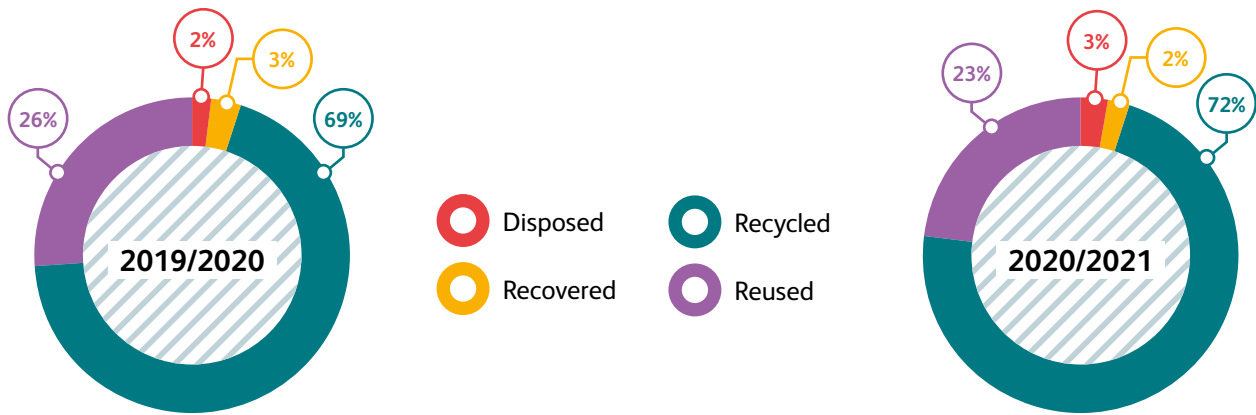
Map of net gain potential for pollinating species within 1km of the railway

Llangennech derailment

The derailment event at Llangennech in August 2020, as described on page 53, caused a significant environmental incident with over 300,000 litres of diesel spilled in a protected area, impacting the adjoining intertidal Special Area for Conservation (SAC) and Site of Special Scientific Interest (SSSI) sited in the Loughor Estuary. Specialist contractors were quick to respond to the incident and much of the fuel was recovered. Ongoing remediation over six months was necessary to extract and remove contaminated soil and monitoring is still taking place to check there is no further contamination. Investigations into the event and the subsequent environmental response are ongoing, with expected regional and national actions required to improve future response to significant events, but overall the multi-agency collaboration and the swift frontline response was successful in avoiding a significant environmental disaster.

Circular Economy and Waste Management

We continue to get better at waste management. This year the amount of waste we generated decreased by 20 per cent compared to 2019/20. We increased our recycling rate (72 per cent of total waste) and reduced the amount that we send to energy from waste plants (3 per cent of total waste).



	Eastern	North West & Central	Scotland's Railway	Southern	Wales & Western	Property	Route Services	Network Rail
Reused	47%	75%	20%	19%	20%	0%	8%	23%
Recycled	46%	16%	73%	66%	25%	61%	92%	72%
Recovered	3%	7%	2%	12%	4%	39%	0%	2%
Disposed	4%	1%	5%	2%	51%	0%	0%	3%

Sustainable use of materials is an important element of our strategy, and this year has seen a change in the way we manage our waste. Instead of buying and using products or materials and then either recycling or disposing of them at the end of their life, we'll begin to embed life cycle, or circular economy thinking into our business. This means that we'll aim to minimise use of resources, design out waste wherever we can and then reuse, repurpose or redeploy all surplus resources. We've embarked on a research project that will identify all the products and materials we use and opportunities to reduce their environmental impact.