Carbon Reduction Plan for First Rail

External Document

First Rail Consultancy

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Version History

Version	Summary	Author	Date
1.0	Draft for review	HL	01/12/23
1.1	Minor edits/changes	HL	06/12/23
1.2	Avanti edits	HL	07/12/23
1.3	Voyager to 221	HL	08/12/23
1.4	Signed	EA	13/12/23

Contents

1 Introduction

First Rail, in line with its dedication to environmental sustainability, is committed to a goal of reaching Net Zero emissions by the year 2050. This aligns with the government's own targets, particularly the goal of having all diesel-only trains phased out by 2040. To achieve this, First Rail has developed a Carbon Reduction Plan (CRP).

This plan serves as our comprehensive strategy towards reducing our carbon footprint and has been produced in accordance with the guidelines outlined in the Technical Standard for Completion of Carbon Reduction Plans[1]. These guidelines ensure a stringent and standardised approach to managing and reducing carbon emissions in an effective and measurable manner.

FirstGroup, of which First Rail is a subsidiary, has set Science Based Targets validated by the Science Based Targets initiative (SBTi). FirstGroup will reduce scope 1 and 2 greenhouse gas emissions by 63% by 2035 as well as scope 3 emissions by 20% by 2028, compared to a 2020 baseline year. First Rail itself aspires to set its own Science Based Targets at each of our train operating companies (TOCs) as part of our journey to Net Zero. South Western Railway (SWR), one of our TOCs, has already had its near-term targets validated by the SBTi. It is the first rail company to set out a robust, transparent, and cost-effective roadmap to Net Zero.

2 Baseline Emissions Footprint

First Rail's baseline emissions are shown in Table 1 below. The baseline year has been chosen as FY 2020 since this reflects normal business practices before the Covid-19 pandemic and also coincides with the time when Avanti West Coast was incorporated into First Rail. We have readjusted the historic figures to account for the loss of the TransPennine Express contract.

Our figures include the emissions from all our TOCs. We have excluded figures from Island Line and those from subsidiaries such as Mistral and evo rail due to their negligible impact.

Scope 1 emissions from diesel are a majority of First Rail's overall total emissions within the scope of the technical standard. We are committed to reducing these emissions by removing all diesel-only trains from service by 2040 in line with government targets. And by introducing bi-modes and battery trains.

The market-based scope 2 emissions for First Rail are close to zero. This is because all our owned premises are powered by REGO-backed renewable energy and all electric traction energy procured through Network Rail is procured through zero-carbon nuclear sources.

Our Scope 3 calculations do not include category nine emissions (downstream transportation and distribution) since they are not relevant to our operations.

[1] Microsoft Word - PPN 0621 Technical standard for the Completion of Carbon Reduction Plans.docx (publishing.service.gov.uk)

Baseline Year: FY 2020 (1st April 2019 – 31st March 2020)	
Emissions	**Total (tCO_2e)**
Scope 1	316,384
Scope 2 (Market based)	1,534
Scope 2 (Location based)	298,429
Scope 3 - Cat 4: Upstream transportation and distribution - Cat 5: Waste generated in operations - Cat 6: Business travel - Cat 7: Employee commuting	12,099
Total Emissions (Market Based)	330,017
Total Emissions (Location Based)	626,912
Out of scope emissions[2]	11,629

Table 1: First Rail baseline year carbon footprint

3 Current Emissions Reporting

Current Year: FY 2023 (1st April 2022 – 31st March 2023)	
Emissions	**Total (tCO_2e)**
Scope 1	248,475
Scope 2 (Market based)	252
Scope 2 (Location based)	191,722
Scope 3 - Cat 4: Upstream transportation and distribution - Cat 5: Waste generated in operations - Cat 6: Business travel - Cat 7: Employee commuting	7,458
Total Emissions (Market Based)	256,184
Total Emissions (Location Based)	447,654
Out of scope emissions	15,419

Table 2: First Rail current year carbon footprint

[2] Out of scope emissions cover emissions produced by the combustion of biofuels.

4 Emissions Reduction Projects

First Rail's pledge to attaining Net Zero emissions by 2050 is reflected in its strategic approach. The CRP concentrates on achieving 'quick wins' by implementing short and medium-term interventions for assets under its control, hastening significant impact.

Working hand in hand with its suppliers, First Rail aims to stimulate substantial emission reductions throughout the broader supply chain. This collaborative endeavour is a testament to the fact that realising environmental goals demands collective effort.

Equally paramount is the commitment to economic prudence. The plans framed are cost-effective and flexible, ensuring they deliver excellent value for taxpayers' money. This balance between environmental responsibility and fiscal efficiency underscores First Rail's comprehensive approach towards achieving its ambitious Net Zero target. Our historic and projected emissions are reported in figure 1. These figures include emissions from scope 1 and 2 data from Avanti West Coast, Great Western Railway (GWR) and SWR, and exclude open access operations due to lack of data. We are looking towards calculating full scope 3 emissions for each of our TOCs.

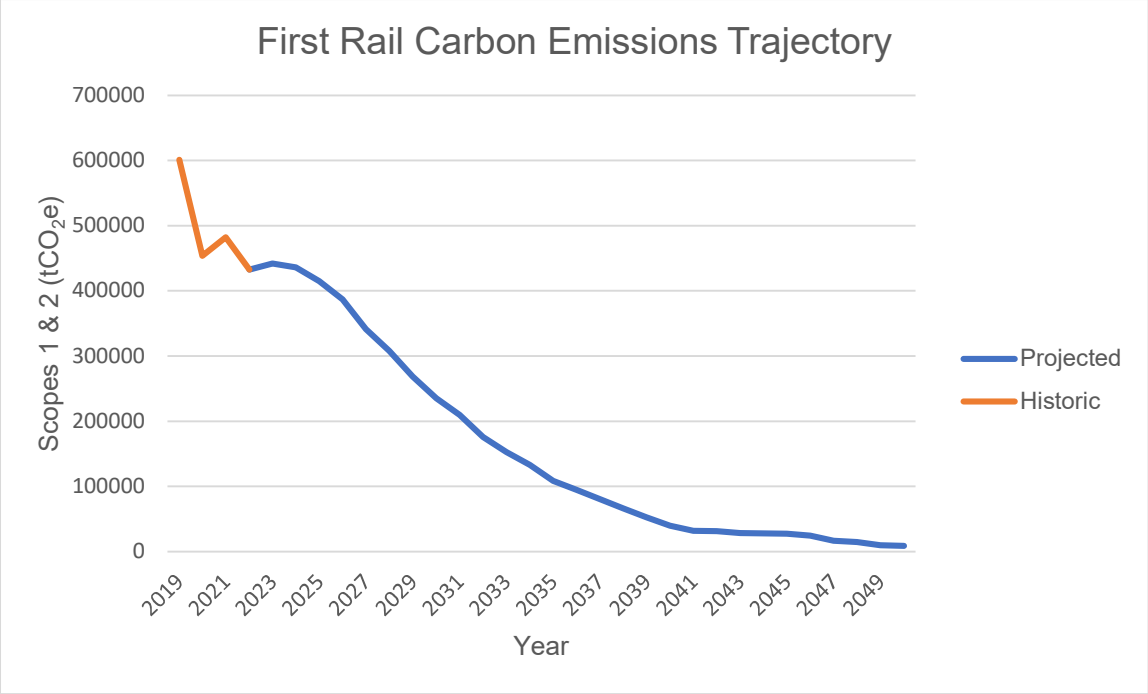

Figure 1: Carbon emissions figures for Avanti West Coast, GWR and SWR

The assumptions involved in the calculation of our emissions trajectory include the gradual decarbonisation of the UK electricity network and the implementation of our existing carbon reduction schemes. Our current projection shows we need further interventions to achieve Net Zero by 2050. Further emissions reductions may be achieved with either carbon offsetting and/or more initiatives to lessen our environmental impact.

4.1 Avanti West Coast Fleet Renewal

At Avanti West Coast, the ambition is to achieve Net Zero by 2031. This goal encompasses efforts to reduce emissions from various operational aspects, including traction, stations, and offices. The primary focus is on reducing emissions produced by traction, which involves a careful, phased approach to eliminating the use of diesel fuel in operations.

In line with this intention, it plans to introduce a new fleet of Class 805 and 807 trains, which will replace the current diesel-only Class 221 fleet in 2024. These new trains will significantly reduce reliance on diesel fuel. The Class 807s will be powered solely by electricity, creating a clean mode of operation. Similarly, the Class 805s, designed as bi-mode vehicles able to switch between diesel and electric power, will mainly operate on electric traction when available, further reducing the need for diesel. This fleet upgrade is a critical step toward reaching Net Zero by 2031.

4.2 GWR Battery Electric Trials

At GWR, we have invested in innovation through the purchase of assets from emissions-free and hybrid trains manufacturer Vivarail. We will trial fast-charging battery electric technology on the Greenford to West Ealing line with the aim of replacing the use of diesel in running trains on the line. The Class 230 battery trains to be used in the trial have been made from repurposed ex-London Underground trains, with trial operations to begin by the end of March 2024.

4.3 Reducing Emissions at our Facilities

To meet our commitments, we must reduce emissions across the sites we run as well as from the operation of traction. In the previous financial year (FY 2023), SWR installed Building Management Systems (BMS) at our Wimbledon and Salisbury depots as well as Basingstoke and Winchester stations. These systems allow us to control our facilities intelligently and remotely, increasing energy efficiency by controlling heating and lighting more effectively. Our BMSs also make the detection of faults easier and give crucial data about a building's performance and energy usage.

By installing BMSs, we have the potential for savings of up to 30% of the gas consumption at depots and stations as well as 30% and 20% savings in electricity consumption in depots and stations respectively. This system will save an estimated 1,100MWh of energy and 6,000 tCO_2e of carbon emissions by 2040.

Another completed intervention is the installation of LED lighting at all SWR's 'front-of-house' locations. This includes all buildings that a customer would interact with, such as at stations. SWR aims to extend this scheme to 'back-of-house' premises including offices and depots, subject to funding.

4.4 Digitalisation of our Railway

For our open-access operators Lumo and Hull Trains, we are planning to introduce new connected Driver Advisory Systems (c-DAS) on our trains. This system is programmed with route knowledge, such as the line speed and gradients, as well as vehicle capabilities such as the acceleration and braking. c-DAS crucially has data on the locations of other traffic on the network, which we can then use to calculate an appropriate speed for a train to travel at. This reduces the number of conflicts at junctions and hence the need for braking and acceleration. Therefore, our trains coast more often allowing for more efficient driving and consuming less energy during operations - hence reducing our carbon emissions.

5 Declaration and Sign Off

First Rail is committed to meeting the forecasted carbon reductions outlined in this plan.

"We recognise and welcome opportunities to invest in sustainable rail initiatives and support innovations such as this which create solutions to help improve rail's emissions and air quality, accelerating the transition to a zero-carbon world. Working with our industry partners ensures that we achieve a better environment for our customers and will further encourage them to switch from cars to trains, which have a lower environmental impact per passenger mile."

Steve Montgomery, Managing Director, **First Rail Holdings**

This Carbon Reduction Plan has been reviewed and approved by:

Steve Montgomery, Managing Director, First Rail

Date: 13/12/2023

Chris Maxwell, Safety and Environment Director, Great Western Railway

Date: 13/12/2023

Alex Foulds, Projects and Change Director, South Western Railway

Date: 13/12/2023

Barry Milson, Executive Director Operations & Safety, Avanti West Coast

Date: 13/12/2023

Martijn Gilbert, Managing Director, Hull and Lumo Trains

Date: 13/12/2023