

Our environmental performance 2021



FirstGroup plc
Annex to the
Annual Report
and Accounts 2021

We provide easy and convenient mobility, improving quality of life by connecting people and communities.

FirstGroup is a leading private sector provider of public transport. Our services are a vital part of society – transporting customers for business, education, health, social or leisure purposes.

We create solutions that reduce complexity, making travel smoother and life easier.

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Executive summary



Matthew Gregory
Chief Executive

“Public transport networks are the lifeblood of vibrant towns and cities, and they are essential to achieving global net zero carbon ambitions. At FirstGroup, we are committed to helping deliver a more sustainable future for the communities we serve and to accelerate the transition to a zero carbon world.”

Message from our CEO

Our business has always been proud of the role we play as part of the critical infrastructure of society, crucial to connecting our local economies and communities. Governments worldwide recognise the vital role of public transport in helping to address the challenges of climate change. Our services make an important contribution to responding to the climate emergency in two ways:

- firstly, by facilitating a modal shift of passengers out of private cars and short-haul flights and onto public transport, because the per passenger kilometre emissions of a typical train or double-decker bus today are significantly lower than for other modes
- secondly, by committing to the acceleration of fleet transition to zero-emission vehicles, supporting a commensurate growth in green jobs and skills, manufacturing and sustainable innovation such as vehicle-to-grid power.

Our strategic sustainability framework ‘Mobility Beyond Today’ sets out our intentions for achieving this, including our commitments to transition to a zero emission bus fleet by 2035, to cease purchasing further diesel buses after December 2022 and to support the UK Government’s goals to remove all diesel-only trains from service by 2040 and to deliver a net zero railway network by 2050.

As the UK prepares to host the UN COP26 Climate Change Conference in Glasgow this November, corporate action on climate change has never been more vital. I’m proud that earlier this year, FirstGroup became the first public transport operator in the UK to formally commit to setting an ambitious, science-based target aligned with limiting global warming to 1.5°C and to reaching net zero emissions by 2050 or earlier. Our work to transform our Caledonia bus depot in Glasgow into the largest electric vehicle charging hub in the UK is just one example of our active commitment to accelerating the transition to a zero carbon world.

This report sets out our performance towards our ambitious goals, and should be read alongside our Annual Report and Accounts 2021. It should also be viewed against the backdrop of an unprecedented year of change. By the start of this financial year, the Group had experienced an average passenger volume reduction of c.90%, with lockdowns and social distancing measures in place. Recognising the essential nature of public transport connections to local economies, many of our customers and government partners worked with us to adjust capacity to fit demand while preserving our ability to restore service quickly as required. Since then, passenger activity has increased in all divisions,

albeit at differing rates, but remains substantially below pre-pandemic levels in many areas. Benchmarking our environmental performance in a year of such disruption from the pandemic is challenging, but we are confident that our carbon emissions and energy use are continuing to reduce at similar rates as seen in prior years, and can attribute initiatives, such as fleet changes, to a proportion of this year’s reductions.

We also progressed our strategic plans this year, culminating in the sale of First Student and First Transit which completed in July 2021. This transformational transaction refocuses the Group on our leading public transport operations in the UK and sets the scene for long-term sustainable value creation. This business change will be reflected in our environmental performance report next year.

Our environmental performance in 2020/21

The rapid escalation of the coronavirus outbreak in our key markets this year led to government-imposed lockdowns and a corresponding reduction in service volumes for our businesses. This contributed to a 40% annual reduction in our carbon emissions and a 35% reduction in our energy use. In addition, our analysis shows:

- The Group’s gross carbon emissions reduced by an average of 3% per year between FY16 and FY20 (vs a 40% reduction this year)
- Our carbon emissions and energy use per £m revenue reduced, on average, by c.8% per year between FY16 and FY20 (vs a 28% and a 23% year-on-year reduction respectively this year)
- Our energy use from renewable sources rose to represent 22% of our total this year (up 5% from FY20)
- First Rail and First Bus reduced their carbon emissions per vehicle km by 9% and 6% respectively this year; up to double the average rate of reduction in prior reporting years (6% and 3% average reduction from FY16 to FY20)
- We decreased the proportion of our waste sent to landfill by 15% and increased the proportion of our waste recycled by 23% this year.

Outside of the pandemic, the primary drivers of our performance were:

- increased electric train power in First Rail from the incorporation of Avanti West Coast (Avanti) and new electric and hybrid trains
- our First Bus fleet rationalisation programme which has removed over 500 of its oldest vehicles permanently from service in recent years
- a 9% annual reduction in carbon emissions from the UK’s national energy supply.

Introduction

Mobility Beyond Today is our Group-wide strategic framework for sustainability. Our ambition is to be the partner of choice for innovative and sustainable transport, accelerating the transition to a zero carbon world.

We have a critical role in creating a connected, healthy, zero carbon world, contributing to local prosperity and growth, reducing congestion on the roads, improving air quality, and helping to lower carbon emissions. For more information, see our [Mobility Beyond Today](#) strategic framework and our progress report in our [Annual Report and Accounts 2021](#).

FirstGroup is committed to simple and transparent disclosure of our performance against this framework and this Environmental Performance Report is an important disclosure for our investors, partners, employees and the customers we serve.

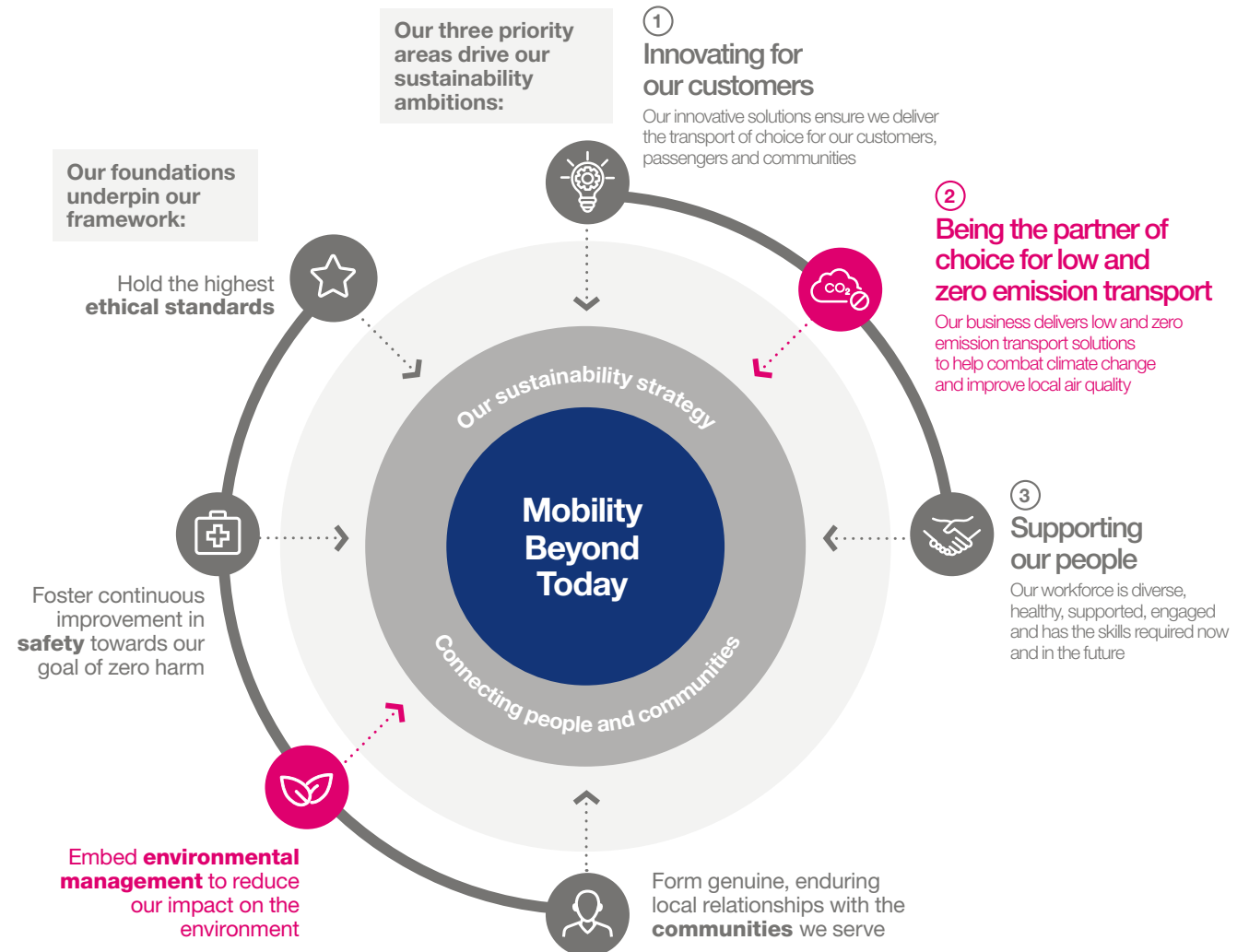
We communicate our overall sustainability performance in our [Annual Report and Accounts 2021](#) including information on corporate governance and risk, decarbonisation, social value, community engagement, employee-related metrics, ethics and human rights and safety.

This Environmental Performance Report expands upon the information provided in our Annual Report, providing 16 metrics that track our material issues in relation to carbon, energy and our environmental impacts, alongside comprehensive information on our calculation approach.

These metrics are most strongly aligned to two sections of our strategic sustainability framework (shown on the right):

- Priority area: Being the partner of choice for low and zero carbon transport
- Foundation: Embedding environmental management to reduce our impact on the environment.






Figure 1: Our strategic framework for sustainability – Mobility Beyond Today



Introduction continued

Figure 2: Environmental performance metrics; alignment to the Mobility Beyond Today framework

The following table gives a summary of the Group's most material environmental metrics, mapped against the sections that follow in this report, and the relevant areas of our Mobility Beyond Today (MBT) framework.

Report section	MBT alignment	Metrics
FirstGroup carbon and energy performance Our combined impact		 <ul style="list-style-type: none"> FirstGroup gross energy consumption and carbon emissions FirstGroup carbon and energy intensity per £m revenue
Zero emission transport Our fleet performance and modal shift		<ul style="list-style-type: none"> Divisional carbon intensity per vehicle km and passenger km Road division air quality emissions First Bus zero emission fleet percentage First Rail distance by electric and diesel traction
Our facilities and workforce The wider impacts of our business		<ul style="list-style-type: none"> FirstGroup gross energy (MWh) and carbon emissions (tCO₂e) from facilities FirstGroup waste and water consumption
Environmental management Setting a framework for effective environmental management		<ul style="list-style-type: none"> FirstGroup revenues covered by certified environmental management systems FirstGroup fines and violations relating to environment

Icons for MBT alignment can be referenced in Figure 1 on page 4 of this report. A more detailed list of metrics can be found on page 18 of this report.

Target development

FirstGroup understands the need for interim and longer-term target setting to enable decarbonisation, reduce energy, environmental impact and to mitigate climate risk.

This year we formally committed to becoming net zero by 2050 or earlier, and to publishing an interim science-based target to map our journey. This will enable clearer communication of our performance in line with international climate goals from our next financial year.

Underpinning our science-based target ambitions are divisional targets in alignment with their strategies and transition plans to net zero. Current divisional ambitions include the following:

- First Bus last year announced their 'Zero Emission Mission' to have a fully zero emission fleet by 2035
- First Rail supports the UK Government's goal to remove all diesel-only trains from service by 2040 and deliver a net zero railway network by 2050
- Within First Rail, Avanti West Coast has a 10-year sustainable development plan committing to be net zero by 2031 with an interim target of 61% reduction in carbon per vehicle km by 2026.

To ensure we are setting appropriate targets that account for our entire emissions profile, FirstGroup is screening its value chain (or Scope 3) emissions during FY22. This exercise will provide a better understanding of our significant and material value chain emissions, enabling us to set a science-based target and to deliver plans for monitoring and improving these in future years.

To ensure we are quantifying our efforts to mitigate climate risk and build climate resilience, our science-based targets work is aligned with our response to the Task Force on Climate-related Financial Disclosures (TCFD) framework. This year we have undertaken a review of our climate-related risks and opportunities against scenarios with a 1.5 and 4 degree average global temperature increase. Further information in this can be found in our Annual Report and Accounts 2021.

GHG inventory approach

Our carbon and energy reporting approach is prepared in accordance with the following standards and guidelines:

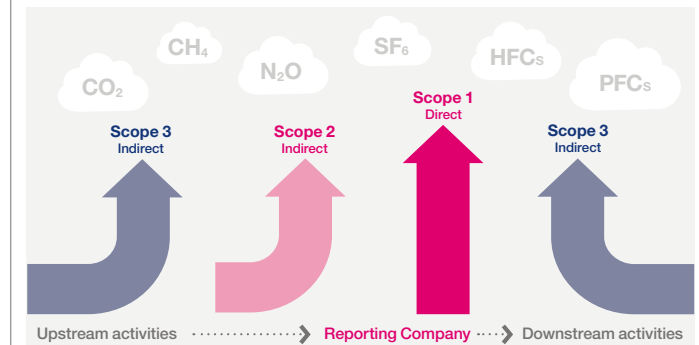
- Greenhouse Gas Protocol (GHG Protocol) for Corporate Accounting and Reporting Standard; and
- UK Government Streamlined Energy and Reporting (SECR) Guidelines.

FirstGroup has an operational control boundary covering 100% of its business activities with a materiality reporting threshold of 5%.

The term 'carbon emissions' in this report refers to GHG emissions as required for a GHG inventory. This includes carbon dioxide alongside six other greenhouse gases calculated in mass of carbon equivalent (CO₂e).

A detailed listing of our inventory methodologies, boundaries and exclusions can be found on page 17 of this report.

Figure 3: Greenhouse gas inventory 'Scopes'



Our GHG inventory is reported in four categories or 'scopes', listing our direct and indirect emissions in accordance with the GHG Protocol.

Scope 1: Direct emissions from road and rail vehicle fuel, heating fuel, fleet fuel and fugitive refrigerant gas emissions

Scope 2: Indirect emissions from the generation of electricity purchased for buildings and to power electric road or rail vehicles

Scope 3: Other indirect emissions inclusive of business travel, waste disposal, water supply and water treatment

Out of Scope: relating to the combustion of biofuels.

FirstGroup commissioned independent consultants Carbon Intelligence to verify the carbon and energy performance metrics within this report, to a limited level of assurance and to the ISO 14064-3 standard. This third-party verification has confirmed the data is materially accurate, complete, consistent and free from material error or omission. The statement of assurance can be found on page 16 of this report.

This year we have increased air quality reporting to include a First Bus inventory of NO_x and PMs. This enables us to better track and report our commitment to address both air quality and carbon emissions (see page 12).



Group carbon and energy performance

Summary carbon and energy performance

The rapid escalation of the coronavirus outbreak in our key markets this year led to lockdowns and a corresponding reduction in service volumes for our businesses. This contributed materially to a 40% annual reduction in our carbon emissions (see Table 1 on page 7). By comparison, the Group's gross carbon emissions reduced by an average of 3% per year between FY16 and FY20.

Our UK divisions have, for the first time, produced the majority (53%) of the Group's global emissions (see Graph 2). This is in part explained by the inclusion, for the first time, of a full year of data for Avanti (whereas only four months were included in FY20, as Avanti became part of FirstGroup in December 2019).

First Rail's increasing use of electric power continues to reduce the Group's overall emissions, while increasing the proportion of indirect emissions from electricity use (scope 2). Our scope 2 emissions now represent 18% of the total in FY21 (see Graph 1) up from 11% in FY20.

The underlying energy use which makes up our carbon footprint (see Graph 3) has reduced 35% since last year (see table 4), reflecting reduced service volumes during the coronavirus pandemic. Our renewable energy use was 1,359 GWh, which alongside reductions in non-renewable energy has increased our total proportion of renewable energy by 5% (22% in FY21, up from 17% in FY20).

In particular, the increase of renewable electricity purchased has a further impact on our carbon footprint in a market-based scenario; reducing our carbon emissions a further 16% to 1,292 mega-tonnes of CO₂e (see Table 2).

FirstGroup tracks and reports on energy-saving initiatives to ensure we continue to focus on energy efficiency alongside switching to low and zero carbon energy choices (see Table 4).

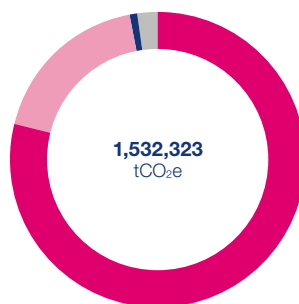
Outside of the pandemic, the primary drivers of our performance were:

- Increased electric traction in First Rail, from the incorporation of a full year of Avanti data, and new electric or hybrid rolling stock in TransPennine Express (TPE) and Hull Trains
- Our First Bus fleet rationalisation programme which has removed over 500 of its oldest vehicles permanently from service in recent years
- a 9% annual reduction in carbon emissions from the UK energy supply.

We reported a reduction in carbon and energy per £m revenue of 28% and 23% respectively this year. By comparison, in prior years, these reduced, on average, by 8% per year from FY16 to FY20 (totalling reductions of 34% and 29% against FY16 respectively - see Tables 5 and 6).

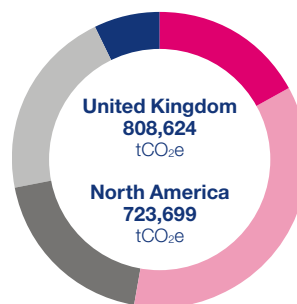
FY21 Carbon performance

Graph 1: Carbon emissions by scope



● Scope 1	79%
● Scope 2	18%
● Scope 3	1%
● Out of scope	2%

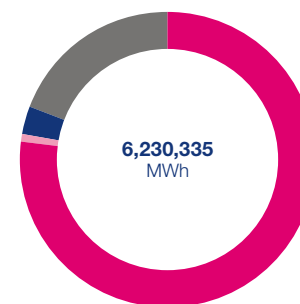
Graph 2: Carbon emissions by division



● First Bus	17%
● First Rail	36%
● First Student	19%
● First Transit	21%
● Greyhound	7%

FY21 Energy performance

Graph 3: Energy use by renewable or non-renewable source



● Non-renewable fuels	77%
● Non-renewable electricity	1%
● Renewable fuels	3%
● Renewable electricity	19%

Group carbon and energy performance continued

Table 1: Total carbon emissions by scope

The rapid escalation of the coronavirus outbreak in our key markets this year led to lockdowns and a corresponding reduction in service volumes for our businesses. This contributed materially to a 40% annual reduction in our carbon emissions. By comparison, the Group's gross carbon emissions reduced by an average of 3% per year between FY16 and FY20 (adjusted figures).

Outside of the pandemic, the primary drivers of our performance were:

- increased use of electric train power in First Rail from the incorporation of a full year of Avanti data, and new electric and hybrid trains
- our First Bus fleet rationalisation programme which has removed over 500 of its oldest vehicles permanently from service in recent years
- a 9% annual reduction in carbon emissions from the UK's national energy supply.

Table 1: Total carbon emissions by scope

Metric 1.1: Tonnes of carbon dioxide equivalent (tCO₂e):					
total by emission scope					
	2021	2020	2019	2018	2017
Scope 1: direct emissions from road and rail vehicle fuel, heating fuel, fleet fuel and fugitive refrigerant gas emissions	1,214,769	2,111,199	2,344,768	2,417,051	2,397,074
Scope 2: indirect emissions from the generation of electricity purchased for buildings and to power electric road or rail vehicles (location-based)	275,097	262,070	265,924	206,113	76,523
Scope 3¹: other indirect emissions inclusive of business travel, waste disposal, water supply and water treatment	16,905	19,670	18,179	8,784	9,031
Out of Scope: relating to the combustion of biofuels	25,551	27,532	14,654	10,065	9,530
Total All scopes	1,532,323	2,420,471	2,643,525	2,642,013	2,492,159
% change YOY	-37%	-8%	0%	6%	1%
% change (FY16)	-38%	-2%	7%	7%	1%
Adjusted total² All scopes	1,532,323	2,552,004	2,845,284	2,929,544	2,929,308
% change YOY	-40%	-10%	-3%	-18%	1%
% change (FY16)	-47%	-12%	-2%	1%	1%

1 Our reported scope 3 emissions do not include all material value chain categories (see page 17)

2 Adjusted totals reflect the equivalent emissions free from material business change, in this case the incorporation of South Western Railway (SWR) and Avanti West Coast into First Rail (see page 20)

Table 2: Market-based carbon emissions

Market-based emissions calculations use specific emission factors reflective of the energy tariff purchased from our energy suppliers. Contracts confirming the purchase of 100% renewable electricity, for example, have significantly lower tCO₂e compared to the average UK grid emissions.

The increase of renewable electricity purchased via such tariffs provides a market-based carbon emission total of 35,293 tCO₂e. Therefore, under a market-based calculation approach, our gross carbon emissions are reduced 239,804 tCO₂e, or a further 16%.

Table 2: Market-based carbon emissions

Metric 1.2: Tonnes of carbon dioxide equivalent (tCO₂e):					
reduction applied from market-based calculation					
	2021	2020	2019	2018	2017
Scope 2					
Indirect emissions saved from the purchase and generation of renewable electricity greater than the UK grid average (market-based)	(239,804)	(219,356)	(217,156)	(159,430)	(30,395)
Total All scopes (market-based)	1,292,519	2,201,115	2,426,369	2,482,583	2,461,763
% change YOY	-41%	-9%	-2%	1%	-1%
% change (FY16)	-48%	-11%	-2%	0%	-1%

Group carbon and energy performance continued

Table 3: Total carbon emissions by division

Our UK divisions have, for the first time, produced the majority (53%) of the Group's global emissions (see Graph 2). This is in part explained by the inclusion, for the first time, of a full year of data for Avanti (whereas only four months were included in FY20, as Avanti became part of FirstGroup in December 2019).

FY21 data is heavily impacted by significant changes to our service volumes during the coronavirus pandemic.

Previously, First Bus emissions reduced by 14% between FY18 and FY20, with First Rail increasing by 6% in the same period (due to the incorporation of two new rail businesses during this time).

Table 3: Total carbon emissions by division and geography

Metric 1.1: Tonnes of carbon dioxide equivalent (tCO₂e): total by division and geography (all scopes, location-based)					
	2021	2020	2019	2018	2017
First Bus	253,137	354,676	396,452	412,484	Data not available
First Rail	555,409	596,157	644,607	561,806	
First Student	292,354	693,206	741,854	802,683	
First Transit	316,011	513,499	573,608	575,296	
Greyhound	114,557	254,986	283,208	287,396	
Sub-total North America	47% 723,699	1,461,692	1,598,669	1,665,375	
Sub-total United Kingdom	53% 808,624	958,779	1,044,855	976,638	

Please note that small quantities of emissions not related to a division (e.g. FirstGroup Holdings) are included in the geographical sub-totals only, therefore our divisional sub-totals will not equal the reported emissions in Table 1.

Table 4: Total energy consumption

The underlying energy use which makes up our carbon footprint has reduced 35% since last year, reflecting reduced service volumes during the coronavirus pandemic.

Our renewable energy use is 1,359 GWh, which alongside reductions in non-renewable energy has increased our total proportion of renewable energy by 5% (22% in FY21 up from 17% in FY20).

FirstGroup tracks and monitors energy saving initiatives to ensure we continue to focus on energy efficiency alongside switching to low and zero carbon energy choices. The following examples are significant, approved initiatives that will be driving our continued energy and carbon performance in coming years:

- the introduction of 148 electric buses in Glasgow is expected to reduce overall energy intensity per vehicle km and significantly reduce carbon emissions in First Glasgow between FY22 and FY23
- new electric trains that replace Avanti's 'Voyager' diesel trains will remove 80% of their gas oil consumption and replace this with electric traction
- the TPE rail network is undergoing a significant programme of electrification between Manchester and York that will enable increased running of our trains under electric traction from FY24 onwards.

Table 4: Total energy consumption and renewable content

Metric 1.4 and 1.5: Kilowatt-hours of energy (kWh HHV): total by energy source and renewable content					
	2021	2020	2019	2018	2017
Non-renewable fuels comprising gas oil, diesel, petrol, LNG, LPG, natural gas and CNG	4,788,752,999	7,814,678,870	8,703,857,974	8,990,826,920	8,785,156,442
Non-Renewable Electricity purchased that is generated using non-renewable energy sources	82,216,434	99,454,549	107,262,676	79,717,633	97,302,045
Renewable fuels including green hydrogen, biomethane and biodiesel	170,474,197	834,558,286	327,212,861	379,790,719	99,390,653
Renewable Electricity purchased that is generated via renewable energy sources	1,188,891,651	859,292,498	767,915,974	453,448,650	82,230,975
Sub-total non-renewable sources	4,870,969,433	7,914,133,419	8,811,120,650	9,070,544,553	8,882,458,487
Sub-total renewable energy sources	1,359,365,847	1,693,850,784	1,095,128,835	833,239,369	181,621,628
Total all energy sources	6,230,335,280	9,607,984,203	9,906,249,485	9,903,783,922	9,064,080,115
% change YOY	-35%	-3%	0%	9%	0%
% change (FY16)	-31%	6%	9%	9%	0%

Group carbon and energy performance continued

Tables 5 and 6: Carbon and energy per £m revenue

We have reported a reduction in carbon and energy per £m revenue of 28% and 23% respectively this year.

The Group's carbon emissions and energy use per £m revenue reduced, on average, by 8% per year from FY16 to FY20 (totalling reductions of 34% and 29% against FY16 respectively).

Table 5: Carbon emissions per £m revenue

Metric 1.3: Grams of carbon dioxide equivalent per £m revenue (gCO ₂ e/£m): total by division and geography (all scopes, location-based)						
	2021	2020	2019	2018	2017	
First Bus	362	426	453	460	Data not available	
First Rail	153	187	242	283		
First Student	238	357	402	465		
First Transit	323	438	533	529		
Greyhound	355	392	439	408		
Sub-total United Kingdom		187	237	293	341	
Total all divisions		224	312	371	413	441
%						
	% change YOY	-28%	-16%	-10%	-6%	-7%
	% change (FY16)	-53%	-34%	-22%	-13%	-7%

Table 6: Energy intensity per £m revenue

Metric 1.6: Megawatt-hours of energy use per £m revenue (kWh/£m HHV): Total by geography						
	2021	2020	2019	2018	2017	
First Bus	1,452					
First Rail	661					
First Student	915					Data not available
First Transit	1,306					
Greyhound	1,311					
Sub-total United Kingdom	789	1,022	1,080	1,142		
Total All	910	1,185	1,390	1,548	1,603	
	% change YOY	-23%	-15%	-10%	-3%	-8%
	% change (FY16)	-48%	-29%	-20%	-11%	-8%



Low and zero emission vehicles

Vehicle efficiency

Transitioning to zero emission vehicles alongside efficient vehicle use (e.g. driving style) and high occupancy is vital if we are to decarbonise at pace. Therefore measuring our carbon and energy performance per vehicle kilometre is critical in tracking performance specific to our road and rail fleets.

This year, First Rail and First Bus reduced their carbon emissions per vehicle km 9% and 6% respectively, up to double the average rate of reduction in prior reporting years (6% and 3% average reduction from FY16 to FY20 – see Graphs 4 and 5).

The coronavirus pandemic has meant that our road and rail fleets have been running with lighter passenger loads and on emptier roads. This has contributed, in part, to our performance this year alongside the delivery of new zero emission vehicles and optimising the use of our existing electric fleet.

First Bus entered 15 hydrogen and 29 electric buses into service, increasing their zero emission vehicles proportion to 1.1% (0.3% in FY20 – see Table 9). A further 148 electric buses have been purchased this financial year for delivery in FY22 to FY23. This new metric will be monitored as a KPI in our Annual Report to communicate our progress in transitioning to a zero emission fleet.

First Student, First Transit and Greyhound have remained consistent in their carbon emissions per vehicle km since FY16. When combined with First Bus, our Road divisions provide a reduction of 3% carbon emissions per vehicle km this year (see Table 7). First Student and First Transit this year entered into a framework agreement with NextEra Energy Resources to pursue the electrification of tens of thousands of school and public transportation vehicles. First Student have since procured 290 electric school buses for delivery in FY22 and FY23.

In First Rail, TPE and Hull Trains both reported an increased use of electric traction, due to new or additional fleet that entered service in FY20. This has resulted in a 5% increase in electric traction as a proportion across First Rail compared to last financial year (73%, up from 68% in FY20 – see Graph 6).

First Rail anticipates continued improvement in rail fleet performance between now and FY24 as Avanti's new fleet of trains enter service (reducing their diesel use by 80% in favour of electric traction).

Passenger efficiency

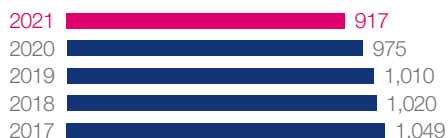
Public transport plays a critical role in decarbonising global transport emissions by providing services that can remove private car journeys from our roads. Normalising our carbon emissions by passenger use (passenger kilometres) monitors our vehicle decarbonisation alongside our ability to drive passenger growth, abating the downstream emissions of our customers in tandem with our own.

By the start of this financial year, the Group had experienced an average passenger volume reduction of c.90%, with lockdowns and social distancing measures in place. Since then, passenger activity has increased in all divisions, albeit at differing rates, but remains substantially below pre-pandemic levels in many areas.

First Bus and First Rail reported high double digit reductions in passenger km on average this year. This has increased our carbon emissions per passenger km by as much as 124% (in First Bus) and 314% (in First Rail) despite significant gross carbon reductions over the same period (see Table 8).

In future years this metric will provide important insight into the scale and speed of our post-pandemic recovery by measuring our ability to attract new customers on different types of journeys, alongside our zero emission vehicle transition plans.

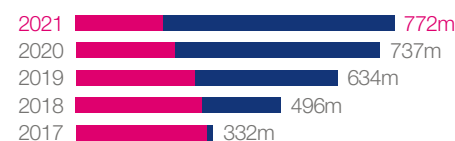
Graph 4: Grams of carbon dioxide equivalent per vehicle kilometre (gCO₂e/vkm) First Bus



Graph 5: Grams of carbon dioxide equivalent per vehicle kilometre (gCO₂e/vkm) First Rail



Graph 6: Distance travelled by traction type: First Rail (km)



● Diesel powered traction ● Electric powered traction

Low and zero emission vehicles continued

Table 7: Carbon emissions per vehicle distance

This year, First Rail and First Bus reduced their carbon emissions per vehicle km by 9% and 6% respectively; up to double the average rate of reduction in prior reporting years (6% and 3% average reduction from FY16 to FY20).

First Student, First Transit and Greyhound have remained consistent in their carbon emissions per vehicle km since FY16. When combined with First Bus, our Road divisions show a reduction of 3% in carbon emissions per vehicle km this year.

Table 7: Carbon emissions per vehicle distance

Metric 2.1 Grams of carbon dioxide equivalent per vehicle km (gCO₂e/vkm): by division and transport category

	% Change 1Yr	% Change (FY16)	2021	2020	2019	2018	2017
First Bus	-6%	-17%	917	975	1,010	1,020	1,049
First Rail	-9%	-32%	682	748	965	955	1,010
First Student	2%	-1%	783	767	807	808	810
First Transit	2%	0%	959	939	1,160	821	1,043
Greyhound	-5%	-5%	917	961	964	950	955
All road transportation	1%	-3%	885	872	950	870	945
All rail transportation	-10%	-38%	682	748	965	955	1,010

Note: 'Road Transport' and 'Rail Transport' aggregations have been restated following a calculation error and differ from the 2020 report

Table 8: Carbon emissions per passenger distance

First Bus and First Rail reported high double digit reductions in passenger km this year. This has increased our carbon emissions per passenger km by as much as 124% (in First Bus) and 314% (in First Rail) despite significant gross carbon reductions over the same period.

Table 8: Carbon emissions per passenger distance

Metric 2.2 Grams of carbon dioxide equivalent per passenger km (gCO₂e/pkm): by division

	% change 1Yr	% Change (FY16)	2021	2020	2019	2018	2017
First Bus	124%	99%	170	76	84	82	88
First Rail	314%	177%	140	34	43	45	51
Greyhound	15%	15%	39	34	33	32	32

Note: We do not collect passenger km for First Student or First Transit due to the nature of their contract focused business

Table 9: First Bus zero emission passenger fleet

First Bus entered 15 hydrogen and 29 electric buses into service, increasing their zero emission vehicles proportion to 1.1% (0.3% in FY20).

A further 148 electric buses have been purchased this financial year for delivery in FY22 to FY23. This new metric will be monitored as a KPI in our Annual Report to communicate our progress transitioning to a zero emission fleet.

Table 9: Percentage of low- and zero emission passenger fleet (First Bus)

Metric 2.3 Percentage of Low and Zero emission passenger fleet (First Bus)

	% Change 1Yr	2021	2020	2019	2018	2017
Low-emission bus (LEB): defined as a diesel or biomethane powered bus with at least 30% carbon saving from a standard diesel alternative	1%	21.6%	20.2%	Data not available		
Zero emission bus (ZEB): defined as electric or hydrogen powered bus	1%	1.1%	0.3%			
Total passenger fleet		5,189	5,619			

Low and zero emission vehicles continued

Air quality

The combustion of fuels alongside brake and tyre wear release air pollutants. Transitioning from diesel and biomethane road vehicles to zero emission hydrogen and electric vehicles eliminates exhaust air pollutants from being released into the environment.

In addition to vehicle transition, First Bus has installed more than 1,100 'exhaust after treatment' devices to older diesel vehicles which capture some air pollutants such as nitrogen oxides (NOx) and particulate matter (PM) before they can be emitted.

Using an 'air emissions inventory' approach, in alignment with UK government methodologies, First Bus can demonstrate a 22% reduction in NOx and PM2.5 emissions this year (compared to running a fleet that had not been fitted with this technology – see Graph 7).

First Bus is continuing their work on improving air quality with an additional focus on Non-Exhaust Emissions (NEE), from friction elements of vehicles, such as brake, tyre and road wear. Research funding has been secured via the Transition Clean Air Network to review opportunities to reduce NEEs.

First Student, First Transit and Greyhound have reduced their combined PM2.5 emissions by 67% and NOx emissions by 77% (see Graphs 8 and 9). Service reductions in relation to the coronavirus pandemic and

the removal of Greyhound services in Canada have contributed to this gross reduction in air pollutants. Prior to this year, our North American divisions were collectively reducing PM2.5 and NOx emissions by 16% and 13% a year (average annual reduction from FY16 to FY20) by increasing vehicle efficiency and utilising alternative fuels such as compressed natural gas and biofuel additives (see Graphs 8 and 9).

First Rail, in conjunction with rail industry-body RSSB, launched an air quality strategy framework in June 2020. The framework produced a series of recommendations including:

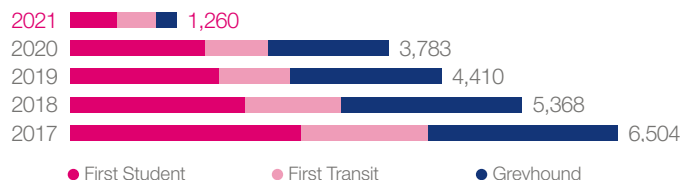
- modelling: improving our ability to understand risks at a local level
- mitigating: ensuring appropriate and effective measures are taken to reduce emissions
- monitoring: establishing a programme to measure emissions and ensure improvements.

The industry has committed to report on progress annually, and the first report is due summer 2021. Findings from these reports will be incorporated into First Rail's reporting framework.

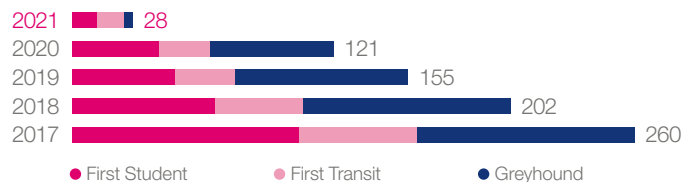
Graph 7: First Bus: Tonnes of nitrous oxide and particulate matter (tPM2.5/tNOx)



Graph 8: Tonnes of particulate matter (PM2.5) – North America



Graph 9: Tonnes of Nitrous oxides (NOx) – North America





Our facilities and workforce

Overview

The use and maintenance of our offices, depots, stations and the activities of our workforce combined represent 9% of our total reported footprint.

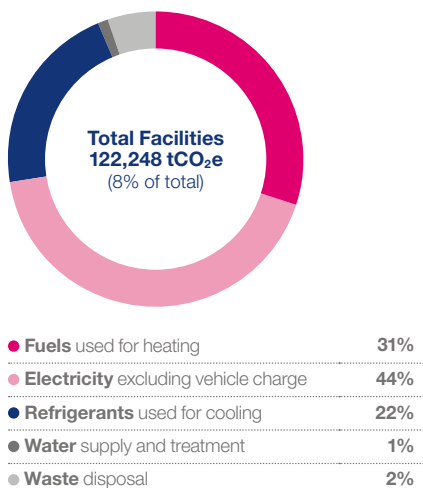
While our road and rail vehicle emissions are significantly higher, monitoring the efficiency of energy use in buildings, our use of water and disposal of waste, will support ongoing efforts to engage carbon-positive behaviours in our workforce in support of our journey to net zero.

Our facilities

FirstGroup owns and leases a sizable international estate, comprising depots, stations, offices, retail outlets and driver accommodation. These facilities provide amenities for our customers and operational areas for our workforce (e.g. vehicle servicing and cleaning) where the significant proportion of our waste is generated and/or disposed of each year.

Carbon emissions for facilities is 122,248 tCO₂e this year, representing 8% of our total gross carbon emissions. Heat and power are the primary contributors to this footprint, representing 75% of the total with an underlying energy use of 361,849 MWh (see Graph 10).

Graph 10: Carbon emissions relating to facility operations (tCO₂e)



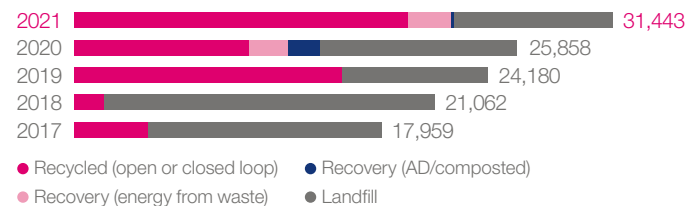
A number of energy and carbon efficiency schemes have, or are planned to be, implemented by our property, IT and energy departments to continue reducing our energy use. Primary examples of such schemes include:

- South Western Railway has reduced station energy consumption by 21% (4.9 million kWh or 1,164 tCO₂e) by installing over 16,180 new LED lights across their major consuming stations
- First Bus is installing building management systems with new LED light fittings in its 12 highest consuming depots in 2021 which is expected to reduce total electricity and heat consumption by at least 10%
- FirstGroup IT services continue to complete off-site server migrations and procure energy efficient equipment to reduce energy use.

This year, we have decreased our proportion of waste sent to landfill by 15% and increased our proportion of waste recycled by 23% (see Graph 11), primarily due to lower passenger volumes generating less waste at stations.

Water is a limited resource and we recognise the need to focus on water efficiency regardless of its contribution to our carbon emissions. Despite significant service reductions this year our water use has remained relatively stable (see Graph 12). Our water use includes vehicle washing/cleaning, sanitation and drinking water supply. We will focus on better understanding how our water is used, treated and disposed to drive meaningful change in this area going forward.

Graph 11: Waste disposal by route (tonnes)



Graph 12: Water use (m³)



Our facilities and workforce continued

Table 10: Water use

Our water use includes vehicle washing/cleaning, sanitation and drinking water supply. Despite significant service reductions this year our water use has remained consistent with the prior reporting year. We will focus on better understanding how our water is used, treated and disposed to drive meaningful change in this area going forward.

Table 10: Water use (m³)

Metric 3.2 Water use (m³): by division	2021	2020	2019	2018	2017
First Bus	508,634	346,677	380,276		
First Rail	470,926	435,808	343,596		
First Student	110,747	163,226	190,053	Data not available	
First Transit	82,386	105,678	134,690		
Greyhound	191,467	322,938	455,524		
Total used (tonnes)	1,380,628	1,374,327	1,505,484		

Note: an additional 16,467m³ of water consumption is added to the total which is associated with FirstGroup operations not within the core business divisions listed above

Table 11: Waste disposed

This year, we have decreased our proportion of waste sent to landfill by 15% and increased our proportion of waste recycled by 23% primarily due to lower passenger volumes generating less waste at stations.

Table 11: Waste disposed (tonnes)

Metric 3.3 Waste disposed (tonnes): by disposal route	2021	2020	2019	2018	2017
Recycled (Open- or Closed-loop)	19,455	10,211	15,604	1,746	4,295
Recovered (Energy from Waste)	2,544	2,225	0	0	0
Recovered (AD/Composting)	152	1,891	0	0	0
Landfill	9,292	11,531	8,576	19,316	13,664
Total disposed (tonnes)	31,443	25,858	24,180	21,062	17,959

Note: in FY17 to FY19 recovery and recycling were recorded together. Therefore the figure for recycling reflects recovery options in those years.



Environmental management

Our environmental framework

FirstGroup's [environment policy](#) outlines requirements for the Group and its divisions to reduce the impact of our operations and ensure legal compliance with regards to the environment. Our policy promotes the use of effective management systems to ensure our operations are identifying their impacts and putting robust systems into place to mitigate risks.

Supporting the environment policy are internal standards for incidents and complaints, internal audit, carbon and energy reporting to provide more clarity on our governance and assurance of environmental management.

Incidents and non-conformities

FirstGroup monitors non-conformities and incidents to identify trends, learn, develop and improve our systems. Incidents that are a breach of law, have caused significant harm and/or will incur a fine or other high costs are reported to the Executive Committee. This year FirstGroup was issued one penalty at a total of £44,838 (see Table 12).

Table 12: Fines and violations relating to breaches of environmental law

Environmental violations and fines from regulatory authorities	2021	2020	2019
Total fine value GBP (£)	44,838	8,306	17,830
Number of violations/penalties issued	1	4	6
Of which exceeding £10,000	1	0	1

Certified management systems

Certified environment and energy management systems are recognised as driving meaningful improvements to environmental performance. Therefore, the percentage of revenue covered by certified management systems (see Graphs 13 and 14) is reported here in order to benchmark this against improvements in our wider environmental performance.

The international standards for environment and energy management systems (ISO 140001 and ISO 50001) are built upon an ethos of:

- engaging top management to lead on business environmental performance
- having a suitably competent, skilled and resourced workforce to deliver environment and energy management improvements
- using incident, audit and data reporting to drive continual improvement of the management system and performance in tandem.

Management systems provide our businesses with a mature process to improve their performance and adapt in a timely manner to change.

In the UK, we are either certified or conform to ISO 140001 across a large proportion of First Bus and First Rail activities (excluding Hull Trains) and ISO 50001 within operating companies of First Rail.

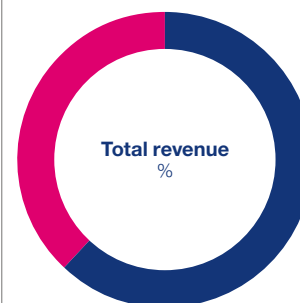
Bespoke management systems

FirstGroup focuses on providing frameworks and standards to our divisions and operates an internal environment and energy management system which is partially aligned to the ISO standard in support of our divisional requirements.

First Student, First Transit and Greyhound use a bespoke environmental management system focusing on fuel storage and wastewater compliance. This is audited and managed by a third-party specialist.

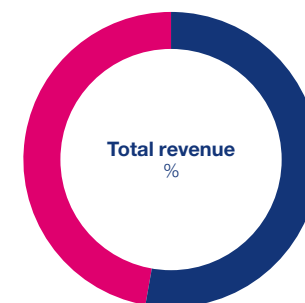
Coverage of environment and energy management systems (% total revenue)

Graph 13: Environmental management systems



● Externally certified management system **62%**
● Internal management system **38%**

Graph 14: Energy management systems



● Externally certified management system **52%**
● Internal management system **48%**

Assurance

Introduction and objectives

Carbon Credentials Energy Services Ltd (Carbon Intelligence) was commissioned by FirstGroup plc to provide verification of their FY21 environmental performance metrics detailed in this report 'Our Environmental Performance 2021' and the 'Annual Report and Accounts 2021', to a limited level of assurance and to the ISO 14064-3 standard.

The objectives of this verification exercise were, by review of objective evidence, to confirm whether any evidence existed that the GHG emissions, energy use and air quality as declared within the 'Annual Report 2021' and 'Our Environmental Performance 2021' report was not: accurate, complete, consistent, transparent and free of material error or omission.

Declaration and independence

No member of the verification team has a business relationship with FirstGroup, its directors or managers beyond that required of this assignment. We conducted this verification independently and to our knowledge there has been no conflict of interest.

Observations

Based on our work, Carbon Intelligence considers that material GHG sources are appropriately identified and reported on.

All material errors in reported data identified during the verification process have been duly corrected.

Opinion

Based on the data and information provided by FirstGroup and the processes and procedures conducted, Carbon Intelligence concludes with limited assurance there is no evidence that the GHG, energy and air quality assertion:

- is not materially correct; and
- is not a fair representation of their GHG emissions, energy information; and
- is prepared in accordance with the criteria listed within the Verification Statement.

It is our opinion that FirstGroup has established appropriate systems for the collection, aggregation and analysis of quantitative data for determination of these GHG emissions and energy use for the stated period and boundaries.

Verified data summary

The GHG and energy information for the period 1 April 2020 to 31 March 2021 was verified by Carbon Intelligence to a limited level of assurance. 100% of emissions by scope are verified as follows:

- Scope 1 – 1,214,769 tonnes of CO₂e
- Scope 2 (location-based approach) – 275,097 tonnes of CO₂e
- Scope 2 (market-based approach) – 35,293 tonnes of CO₂e
- Scope 3 – 16,905 tonnes of CO₂e
- 'Out of Scope' – 25,551 tonnes of CO₂e
- Total underlying energy consumption – 6,230,335,280 kWh
- First Bus: NOx and PM2.5 – 1,108.25 tonnes
- First Bus: zero emission fleet (% of total) – 1.1%

Recommendations

Continue to further expand accountability throughout FirstGroup's divisions with regards to reported performance metrics by:

- Increasing the frequency of data collation and reporting from all divisions to, at least, a quarterly basis to improve the accuracy and efficacy of reporting
- Introduce additional validation and assurance activities to improve data accountability and quality
- Use a value-based approach to capturing and reporting all relevant scope 3 categories as defined in the GHG Protocol.

Exclusions

Data in relation to environmental management systems (see Table 12 and Graphs 13 and 14) and air quality emissions of NOx and PM2.5 in the Group's North American divisions (see Graphs 8 and 9) have not formed part of this verification exercise and fall outside the limits of this assurance statement.

Assurance schedule

The following assurance activities cover the reported data in prior years:

2019-2020

Carbon Intelligence Energy Services Ltd conducted a limited level of assurance to the ISO 14064-3 standard

2017-2018

Carbon Clear Ltd conducted a limited level of assurance to the ISO 14064-3 standard

2016

KPMG LLP conducted a limited level of assurance to the ISAE 3000 and ISAE 3410 standards.

Prior assurance reports are available on the [FirstGroup website](#).



On behalf of Carbon Intelligence Energy Services Ltd

Lead Verifier: Oliver Smallman

Our reporting approach

A. Reporting year and time horizons

FirstGroup's financial year is 1 April to 31 March incorporating the First Bus reporting year which is 28 March 2020 to 27 March 2021.

FirstGroup uses a fixed 'base-year' (FY16) and the prior reporting year (FY20) to benchmark trends and change over time. In each report we provide five years continuous data where available. Where possible, new metrics are reported with at least one prior year for comparison.

B. Methodology and boundary

This Environmental Performance Report is prepared in accordance with the following standards and guidelines:

- Greenhouse Gas Protocol (GHG Protocol) for Corporate Accounting and Reporting Standard; and
- UK Government Streamlined Energy and Reporting (SECR) Guidelines.

FirstGroup has an operational control boundary covering 100%

of its business activities, with a materiality reporting threshold of 5%.

FirstGroup comprises of 222 wholly or non-wholly owned subsidiary businesses which are aggregated to six reporting 'divisions' (see Table 13). In this financial year no change has occurred that has affected this reporting boundary.

To ensure our boundary remains relevant and complete, annual reviews are undertaken to identify and indicate the scale and the significance of any change:

- legal entity review to ensure we continue to report a clear scope and coverage with regards to revenue and activity
- new or renewed materiality assessments for our operating subsidiaries that consider previously excluded data.

Data that is difficult to collect and/or immaterial has been excluded and disclosed (see Table 13). The exclusions reported are estimated at 1.5% of total annual carbon emissions for this financial year, well below our total materiality threshold of 5%.

Table 13: Reporting structure and exclusions

Geographical Group	Transport Group	Division	Exclusions
United Kingdom*	Rail Transport	First Rail	SWR Isle of Wight service and Tram Operations Avanti and TPE refrigerants First Customer Contact and First Rail office
	Road Transport	First Bus	First Transportation Claims and First Travel Solutions offices
North America		First Student	Emissions relating to facility refrigerants
		First Transit	Denton Rail Service Emissions relating to facility refrigerants
		Greyhound	Emissions relating to facility refrigerants

* 'FirstGroup – Other' is a reporting Group which is included within North America and United Kingdom geographical totals but not within transport group or divisional totals. This includes emissions specific to First Group America and FirstGroup Holdings corporate centres and other emission data which could not be aggregated into a business division. Each year these emissions cover less than 1% of the Group's total footprint.

Our reporting approach – appendix continued

C. Environmental metrics

This report contains 16 metrics relating to carbon, energy, air pollution and environmental management (see Table 14). This year new or expanded metrics were introduced to continually improve the monitoring of environmental performance and our journey to net zero.

These changes are summarised below:

- metric 1.3 and 1.6: Carbon and energy per £m revenue now includes a sub-total for UK businesses only
- metric 2.3: First Bus total zero and low emission fleet (%)
- metric 2.5: First Bus total nitrous oxide (NOx) and particulate matter (PM2.5) in tonnes
- metric 3.1: FirstGroup carbon and underlying energy related to facilities
- metric 4.1: FirstGroup coverage of revenue by certified environment and energy management systems

The First Bus zero emission fleet composition is a company KPI, reported in the Annual Report to track progress on the division's 'Zero Emission Mission' to 2035.

D. Emission sources

Our GHG inventory is reported in four categories or 'scopes', listing our direct and indirect emissions in accordance with the GHG Protocol.

Scope 1: Direct emissions from road and rail vehicle fuel, heating fuel, fleet fuel and fugitive refrigerant gas emissions

Scope 2: Indirect emissions from the generation of electricity purchased for buildings and to power electric road or rail vehicles

Scope 3: Other indirect emissions inclusive of business travel, waste disposal, water supply and water treatment

Out of Scope: relating to the combustion of biofuels.

The term 'carbon emissions' in this report refers to GHG emissions as required for a GHG inventory. This includes carbon dioxide alongside six other greenhouse gases calculated in mass of carbon equivalent (CO₂e). Table 15 provides a detailed understanding of the emission sources that have contributed to the scopes (see overleaf).

Table 14: Environmental performance metrics

Category	Reported level	Metric
FirstGroup carbon and energy performance: measuring our total impacts in relation to carbon emissions and energy use	Group	1.1 Tonnes of carbon dioxide equivalent (tCO ₂ e) – location-based
		1.2 Tonnes of carbon dioxide equivalent (tCO ₂ e) – market-based
		1.3 Tonnes of carbon dioxide equivalent per million revenue (tCO ₂ e/£1m)
		1.4 Megawatt-hours of energy (MWh) – by energy source
		1.5 Percentage of renewable energy consumed (%)
		1.6 Megawatt-hours of energy per million revenue (MWh/£1m)
Low and zero emission vehicles: monitoring the efficiency of our road and rail vehicles in terms of energy, carbon and key air pollutants (NOx and PM)	Division e.g. First Bus	2.1 Grams of carbon dioxide equivalent per vehicle kilometre (tCO ₂ e/vkm)
		2.2 Grams of carbon dioxide equivalent per passenger kilometre (tCO ₂ e/pkm)
		2.3 First Bus zero and low emission passenger fleet (%)
		2.4 First Rail distance travelled by electric and diesel traction
		2.5 Tonnes of nitrogen oxide (tNOx) and particulate matter (tPM2.5)
Our facilities and workforce: understanding the impacts of our offices, depots and staff travel	Group	3.1 Tonnes of carbon dioxide equivalent (tCO ₂ e) – facility total
		3.2 Metres cubed of water (m ³)
		3.3 Tonnes of waste (tns) – by disposal route
Management and planning: ensuring the effectiveness of management systems	Group	4.1 Business coverage with certified environmental and/or energy management systems (% of revenue)
		4.2 Total violations and fines relating to environmental protection

Our reporting approach – appendix continued

Table 15: Emission sources by scope

Scope	Statutory	Source
Scope 1	Yes	Liquid road and rail vehicle fuels: gas oil, diesel, biodiesel, petrol, LNG, LPG, hydrogen
		Gaseous road and rail fuels: CNG, biomethane
		Company vehicle fuels: petrol and diesel
		Heating fuels: gas oil, kerosene, propane and steam
Scope 2	Yes	Cooling: Kyoto protocol refrigerant use
		Electricity: for vehicle charge and rail traction
		Electricity: for use in facilities
Scope 3	Yes	Transport brokerage including rail replacement and third-party services procured outside our fleet
		Waste by disposal route
		Water use
		Staff Travel air/ rail/road travel and hotel stays
Out of Scope		Biogenic fuel content: fuels containing biogenic content including forecourt diesel, petrol, biomethane and biodiesel

E. Energy conversion factors

To determine underlying energy use some liquid and gaseous fuels were converted from a volume (e.g. litres) or weight (e.g. kg) into kilowatt hours (kWh) of energy at a gross calorific value. The following sources were used to calculate such conversions in this report:

U.S Department of Energy, Alternative Fuels Data Center: Fuel Properties Comparison	<ul style="list-style-type: none"> Conversions from US gallons to btu (gasoline, diesel, biodiesel, LNG, LPG) Conversion from gasoline gallons equ. (GGE) to btu (CNG)
UK Government GHG Conversion Factors for Company Reporting (BEIS 2020)	<ul style="list-style-type: none"> Conversions from litres into kWh HHV (diesel, biodiesel, petrol, gas oil, burning oil) Conversions of btu into kWh

F. Emission factor selection

Our primary sources for calculating carbon emissions are:

EPA Centre for corporate leadership: Emission factors for GHGs	<ul style="list-style-type: none"> USA average grid emissions Stationary combustion emission factors Mobile combustion emission factors for on-road vehicles Waste disposal
UK Government GHG Conversion Factors for Company Reporting (BEIS 2020)	<ul style="list-style-type: none"> Combustion of fuels UK average grid electricity Refrigerant emissions Waste disposal Water supply and treatment Business travel Out of Scopes

One emission factor is applied to each financial year, using the latest figures published as of the last day of each financial year. For example, UK Government GHG Conversion Factors 2020 were published in July 2020 and have been applied to this financial year (FY21) in its entirety.

Market based emission factors for electricity purchased are provided directly from energy suppliers, with evidence such as an assurance certification or renewable-backed certifications (e.g. REGO, RGGO).

Bespoke emission factors are used in First Travel Solutions to calculate the footprint of the vehicles they procure for transport contracts including rail replacement. The emission factors are provided from a 'car-web' software system that provides a specific emission factor per km using licence plate information. Average emission factors are then calculated and applied to vehicles whose licence plate numbers did not return a value.

G. Data methodologies and processes

FirstGroup ensures all divisions align their reporting processes for consistent and comparable data in accordance with best-practice and international guidelines. The following methodologies are detailed to provide transparency where complex calculation or reporting systems exist:

Traction electricity categorisation

Traction electricity (EC4T) is provided to trains via a 'third-rail' or 'overhead-line' distribution system owned and operated by Network Rail. As per our operating agreements, First Rail is billed for a

proportional amount of line-loss on these distribution systems in addition to the energy metered into the train. This reflects the losses of transporting the electricity through the distribution system.

Trains can also generate energy from braking and are able to provide this back into overhead-line distribution systems or use it to reduce train energy demand. This energy is known as 'regen'.

In accordance with the GHG reporting protocol we report EC4T without line-loss, and inclusive of regen (regen having no emissions as a renewable energy) as our scope 2 energy use and emissions. Line-loss is categorised as transmission and distribution of energy, which is the responsibility of the network owner, therefore, an upstream energy-related emission (scope 3 emission).

Carbon and energy intensities

All carbon emissions (scope 1-3 and out of scope) are normalised against revenue to derive tonnes of carbon by £m revenue. The underlying energy use comprising these emissions is normalised by revenue the same way.

Carbon emissions relating only to passenger vehicle fuels and electricity (scope 1-2 and out of scope) are normalised by vehicle kilometre or passenger kilometre.

Passenger kilometres

First Bus – calculated using total passenger journeys multiplied by the average journey length for a non-London metropolitan bus (Source: National Travel Survey Average Bus Journey length – NTS0303 (2019)).

Greyhound – calculated using ticket sales information which has a start and end destination.

First Rail – calculated using the Office for Rail and Road (ORR) statistical methodology for passenger km. This information is provided from a national rail system called LENNON.

Air quality

First Student, First Transit and Greyhound use the US Environmental Protection Agency: Smartways Truck-tool model to derive its NOx and PM2.5 emissions. The data provided is equal to that provided for fuel and mileage reports and from the same fleet systems and sources.

First Bus uses the National Air Emissions Inventory Methodology (NAEI) to determine its NOx and PM2.5 emissions assuming an average gradient of 0% and average speed of 24km/hour across its operations. The model assumes diesel particulate filters fitted to EURO VI standards are equal to EURO VI engines as-built. The source data used to determine air quality emissions is that provided for fleet fuel and mileage, excluding 0.1% of the data which couldn't be attributed to an air emission category. The inventory has excluded training and ancillary vehicles which comprise less than 1% of our fleet.

Our reporting approach – appendix continued

H. Accounting for estimation, error and structural change

FirstGroup operates a 5% materiality threshold, meaning we seek to report at least 95% of emissions each year using actual data. In each year some data may have been completely excluded due to it being unavailable or hard to obtain and estimated to be immaterial. We allow up to 2% of our threshold for exclusions each year.

Each reporting year some data is estimated where it isn't available by our reporting deadline. We allow 3% of our threshold for variation in our estimations and reporting or calculation errors. To ensure our materiality threshold has been met we apply actual data in the subsequent reporting year and validate our prior years reported data again to ensure the total variance hasn't impacted our total carbon footprint by more than 2%.

Where a material error (2%) is not found the variance is reported into the following reporting year. Where a material error is found the prior year's data is restated.

To ensure a meaningful comparison of emissions over time an 'adjusted total' is provided for our gross carbon figure. Known as re-baselining, an equivalent amount of carbon is applied retrospectively to each year to the 'base-year'. Re-baselining occurs where new developments, divestment, reorganisation or similar business changes gives rise to an absolute change of 5% total carbon in each reporting year.

Re-baselining calculations are undertaken in accordance with Appendix E of the GHG Protocol Corporate Accounting and Reporting Standards (2005).

Schedule of adjustments and restatements

2020 – Avanti West Coast was incorporated into First Rail on 8 December 2019. The adjusted total for FY20 includes the carbon footprint of Avanti from 1 April 2019 to 7 December 2019. The adjusted total for all prior years was increased to reflect this change.

2019 – Actual carbon and energy data was restated in FY18 to reflect a calculation error related to compressed natural gas (CNG) use in First Transit.

2018 – South Western Railway was incorporated into First Rail on 20 August 2017. The adjusted total for FY18 includes an estimated footprint for the period 1 April 2017 to 19 August 2017. The adjusted total for all prior years was increased to reflect this change.

A detailed breakdown of the emissions applied to these adjustments can be found in Table 16.

Table 16: Adjusted carbon emissions (tCO₂e): detailed breakdown

Adjustment by event	2021	2020	2019	2018	2017	2016
Avanti Incorporation	0	131,533	201,759	201,759	201,759	201,759
SWR Incorporation	0	0	0	85,771	235,390	235,390
Total adjustment (All events)	0	131,533	201,759	287,531	437,149	437,149
Adjustment by scope	2021	2020	2019	2018	2017	2016
Scope 1	0	43,656	74,121	88,435	113,408	113,408
Scope 2	0	86,772	126,501	197,361	320,966	320,966
Scope 3	0	1,105	1,138	1,735	2,776	2,776
Total adjustment (All scopes)	0	131,533	201,759	287,531	437,149	437,149

Glossary and frequently used terms

Glossary

- **Avanti** – Avanti West Coast
- **BEIS** – Department for Business, Energy & Industrial Strategy (UK)
- **CNG** – compressed natural gas
- **CO₂** – carbon dioxide
- **CO₂e** – GHG emissions as carbon dioxide (CO₂) equivalent (e)
- **EC4T** – Electricity to power trains or ‘traction electricity for trains’
- **EPA** – Environmental Protection Agency (US)
- **GHG** – greenhouse gas
- **GWR** – Great Western Railway
- **km** – kilometres
- **LNG** – liquefied natural gas
- **NO_x** – a generic term for collective nitrous oxides
- **pkm** – distance travelled by passengers (p) in kilometres (km)
- **PM2.5** – particulate matter (up to 2.5 micron diameter)
- **SWR** – South Western Railway
- **TOC** – Train Operating Company
- **TPE** – TransPennine Express
- **vkm** – distance travelled by vehicles (v) in kilometres (km)
- **RSSB** – Rail Standards and Safety Board (UK membership body)

Frequently used terms

- **All Scopes** – Inclusive of scope 1, scope 2, scope 3 and ‘out of scope’ emissions
- **Location-based carbon emissions** – reflecting the average carbon emissions relating to the generation of electricity in the country purchased (e.g. UK grid average)
- **Market-based emissions** – reflecting the emissions of the specific energy tariffs purchased as opposed to location-based averages
- **Out-of-scope** – indirect emissions from the combustion of biofuels
- **Scope 1 (direct emissions)** – emissions from activities owned or controlled by our organisation. Examples of scope 1 emissions include emissions from combustion in owned or controlled vehicles, boilers and furnaces
- **Scope 2 (energy indirect)** – emissions associated with our consumption of purchased electricity, heat, steam and cooling. These indirect emissions are a consequence of our energy use, but occur at sources we do not own or control
- **Scope 3 (other indirect)** – also known as value chain emissions they represent the carbon associated with our supply chain, energy generation, staff commute and travel, waste treatment and disposal, investments, pension and more. They are emissions we do not own or control but have been generated through our business needs
- **UK** – United Kingdom, referring to locations or operations in England, Scotland, Wales and Northern Ireland

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