Greenhouse Gas Report

Reporting Year 2022 - 2023

Oxfordshire County Council

Date: **July 2024**
Owner: **Climate Action Team**

Contents

1. Executive Summary

OCC's 2030 Carbon Neutrality target.

1.1. **The emissions from the scope of our carbon neutrality 2030 target** (corporate estate and activities, see red boundary in figure 1 below) reduced by 14.8% (1,535 tonnes CO_2e) from 10,391 in 2021/22 to 8,857 in 2022/23.

1.2. This represents a 66.6% reduction against our baseline in 2010/11. Since 2019/20 these emissions reduced by 33.5%, this is an average reduction of 11% annually in the last three years.

1.3. The 1,535 tonnes CO2e reductions can be broken down in the following contributions:

- **Highways Electrical Assets**: OCC's LED Street lighting replacement contributed a reduction of 1,583 tonnes of CO_2e, a 32% reduction compared to 2021/22.
- **Property emissions** decreased by 405 tonnes, this is a 12.5% compared to 2021/22 resulting mostly from a 15% reduction in gas demand in corporate buildings.
- **Fleet and staff business mileage emissions** increased by 112 and 342 tonnes respectively, this is 8.1% and 39.8% respectively compared to 2021/22. However, the level of emissions in these categories reduced by 1.6% and 7.3% respectively in comparison with 2019/20.

Figure 1 OCC Carbon Neutrality target by 2030 boundary.

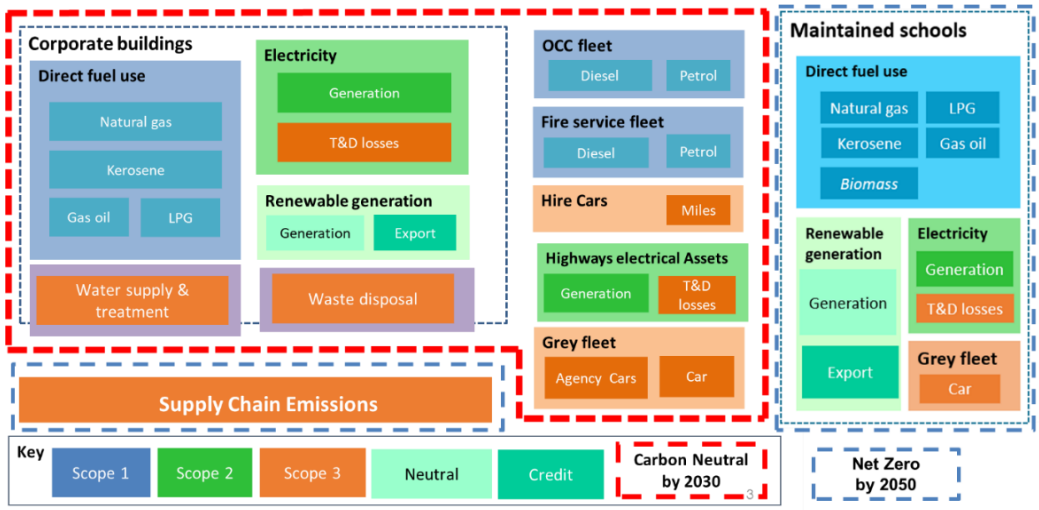

Figure 1 shows the boundary of our **2030 Carbon Neutrality** target, this boundary includes the greenhouse emissions of our corporate buildings related with direct fossil fuel emissions produced in heating and OCC fleets, the indirect emissions related with electricity use which including the electricity we use in our buildings and highway electrical assets. Some of these electricity related emissions are balanced with the renewable energy electricity we supply to the grid through our onsite renewable energy generation installations. Also inside our Net Zero 2030 boundary we include the emissions related to grey fleets and cars we hire, which we calculate from the mileage our employees report.

Emissions from Maintained Schools

1.4. OCC supports **Maintained Schools'** goal to achieve Net Zero greenhouse gas emissions by 2050 (see reporting boundary in Figure 2). In 2022/23, GHG emissions decreased by 16.6% (959 tonnes CO2e) from 5,766 tonnes CO2e in 2021/22 to 4,807 tonnes CO2e in 2022/23. Not included in these reductions are 4 tonnes of CO2e from a school converted to academy.

1.5. In 2022/23 there was an emissions reduction of 17% in relation to 2019/20 (pre-covid). This equates to an average reduction of 5.7% annually in the last three years. (more details in section 7).

Emissions from Supply Chain

1.6 OCC has committed to reduce Scope 3 Supply Chain Emissions to Net Zero by 2050. In 2022/23 Oxfordshire County Council expanded its scope of greenhouse gas reporting to include supply chain emissions (see reporting boundary in Figure 4).

1.7 Using expenditure data, a preliminary assessment estimated that OCC Scope 3 emissions (about 150,000 tCO_2e in 2020/21) account for 91% of OCC's total emissions (Scope 1, 2 and 3).

Figure 2. OCC GHG emissions boundary

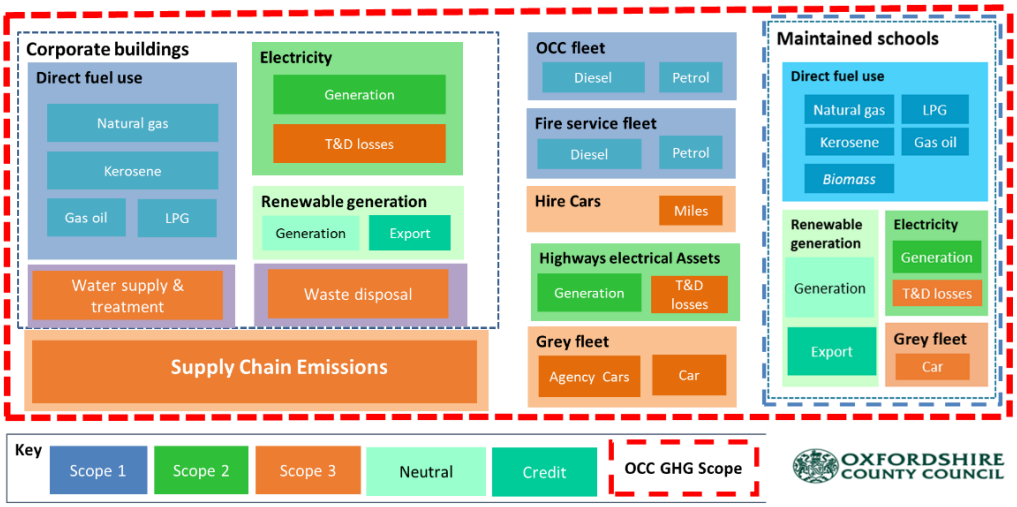

Figure 2 shows the boundary of OCC GHG emissions reporting target, this boundary includes the greenhouse emissions of our corporate 2030 Carbon Neutrality target described in Figure 1 plus the emissions of OCC Supply Chain and Oxfordshire's Maintained Schools that are part of OCC county wide 2050 Net Zero target.

1.8 **Purchased Goods and Services** has been identified as the largest emissions category (~73-81% of total scope 1,2,3), followed by Capital Goods (~13-15% of total scope 1,2,3) (see Figure 3 below showing the 15 categories that integrate Scope 3 emissions).

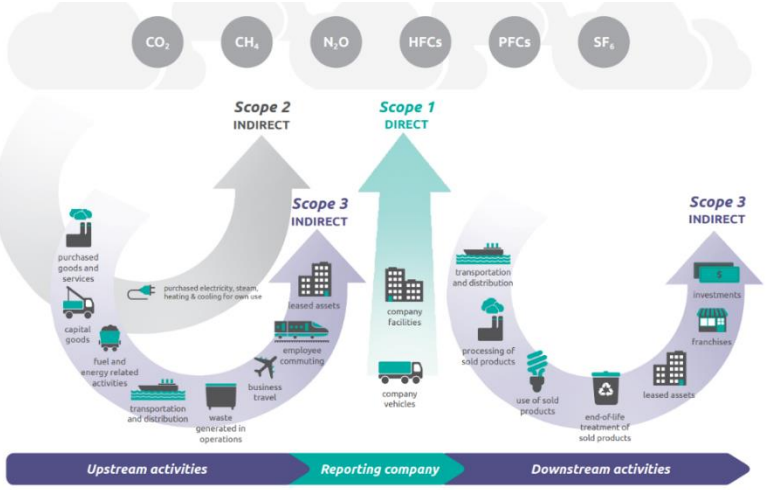

Figure 3. Overview of GHG protocol scopes 1 (direct GHG emissions) and 2 (indirect energy emissions) and the 15 categories of indirect emissions that integrate Scope 3 which are: Purchased Goods and Services, Capital Goods, Fuel and energy related activities, Upstream transportation and distribution,

Waste generated and operations, Business travel, Employee commuting, Upstream leased assets, Downstream transportation and distribution, Processing of sold products, Use of sold products, End of life treatment of sold products, Downstream leased assets. Source: Corporate Value Chain (Scope 3) Standard, GHG Protocol

1.9 We also identified **the top ten emitter suppliers** accounting for about 17-20% of OCC's purchased goods and services supply chain emissions. Based on engagements with three out of OCC's top ten emitter suppliers, we can report based on activity data that their combined GHG emissions to account for 13,971 tonnes of CO2e in 2022/23, which account for about 9% of OCC's purchased goods and services supply chain emissions.

1.10 Our **future plans** for Purchased Goods and Services include expanding our reporting based on activity data in an incremental manner year on year given the council's large and diverse supply chain (more than 3,500 suppliers), prioritising the top ten emitter suppliers. During 2024/25 we will develop and implement a strategy to address in quicker and efficient way the emissions of those suppliers beyond our top ten emitter suppliers.

1.11 To address **OCC's Scope 3 Capital Goods emissions**, we are currently working in adopting principles of whole life carbon governance in built infrastructure through the standard PAS2080:2023 and assessing methods for accounting the whole life carbon impact of infrastructure projects that can be used in OCC's decision making. The decision to prioritise built infrastructure carbon governance is because 71% of the long term OCC capital investment programme corresponds to infrastructure.

2. Context

2.1 Oxfordshire County Council provides services to residents, businesses, and communities across the whole county. We are responsible for around 80% of local government spending in Oxfordshire. The following core services are provided by the Council:

- adult social care
- children's services
- services for public health including mental health
- fire and rescue
- roads and transport planning
- waste disposal
- libraries and museums
- coroners' and registration services
- trading standards

2.2 The Council either provides these services directly or commissions them from other organisations. Most of these services are statutory – things we are obliged by law to do.

3 Reporting Period

3.1 This report covers GHG emissions from **April 2022** to **March 2023**

4 Introduction, boundary, and conversion factors

4.1 Each year, Oxfordshire County Council publishes details of its greenhouse gas (GHG) emissions in accordance with guidance published by the Department for Energy Security and Net Zero (DESNZ) and international GHG reporting best practice.

4.2 The Council is committed to improving our GHG reporting in line with the latest DESNZ guidance.

4.3 Figure 4 shows the scope of our reported GHG emissions boundary**.**

The council reports on emissions from its:

- Corporate estate and activities (Scope 1, 2 and Scope 3 "operational", i.e. excluding supply chain)

- Maintained schools.
- Scope 3 Supply chain emissions: in this report we are including our first assessment of 2022/23 supply chain GHG emissions inventory corresponding to three out of our top ten emitter suppliers. A supply chain emissions baseline will be included in this boundary in next year's reporting as we progress in expanding our Scope 3 emissions assessments based on obtaining from supplier's real activity data. This baseline will be used to track our progress in emission reductions in the following years.

Figure 4 OCC GHG emissions boundary

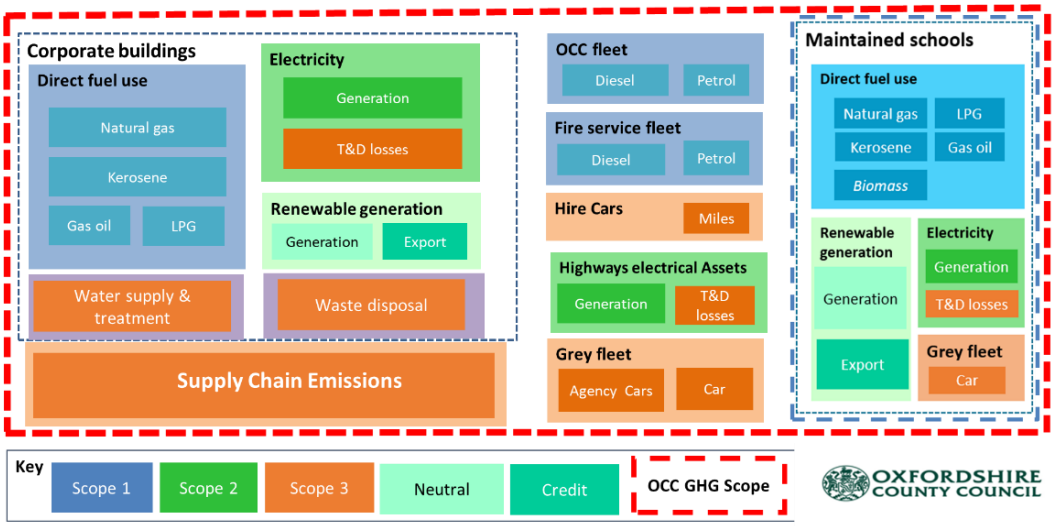

Figure 4 shows the boundary of OCC GHG emissions reporting target, this boundary includes the greenhouse emissions of our corporate 2030 Carbon Neutrality target described in Figure 1 plus the emissions of OCC Supply Chain and Oxfordshire's Maintained Schools that are part of OCC county wide 2050 Net Zero target.

4.4 In 2019 the council committed to become carbon neutral for its corporate estate and activities (excluding maintained schools and supply chain) by 2030. This report includes a section to show the emissions in scope for this target. (see Section 6)

4.5 The carbon factor methodology applied are the 2022 carbon factors for the emissions generated in financial year 2022/23 which can be found at: Greenhouse gas reporting: conversion factors 2022 - GOV.UK (www.gov.uk)

5 Greenhouse Gas (GHG Emissions) 2022/23

5.1 Table 1 shows that for 2022/23 emissions from Oxfordshire County Council estate, activities, maintained schools and OCC Supply Chain (three suppliers from top ten emitter suppliers) were 27,635 tonnes of CO_2e equivalent (CO_2e) split across the three scopes. This includes offsetting from solar exports.

OCC GHG Emissions 2022/23 (tCO_2e)	Corporate Estate & Operations	Maintained Schools	Supply Chain Emissions (progress so far)	Total (progress so far)
Scope 1	3,194	3,316		6,509
Scope 2	4,075	1,397		5,472
Scope 3 Operational	1,590	149		1,739
Scope 3 Purchased Goods and Services			13,971	13,971
Total Operational Emissions	**8,858**	**4,862**	**13,971**	**27,691**
Solar Export (offset)	- 2	- 54		- 56
Total Emissions (after solar offset)	**8,857**	**4,807**	**13,971**	**27,635**

Table 1: Total GHG Emissions

5.2 Our corporate estate and activities (the scope of our carbon neutrality target for 2030) amounted to 8,857 tonnes CO_2e (32%) of the total GHG emissions reported this year.

5.3 Emissions from maintained schools were 4,807 tonnes CO_2e, 17% of the total emissions reported this year.

5.4 The policy framework for supporting supply chain emissions reductions has been outlined in OCC's Supply Chain GHG emissions policy, approved by cabinet on June 2023. During 2023/24 we have started the implementation of this policy.

5.5 In 2022/23 Supply Chain Emissions reporting (Purchased Goods and Services) based on activity-based data resulting from engagement with three out of our top ten emitter suppliers accounted for 13,971 tonnes CO_2e. In following years, as we progress in engaging with more suppliers, we will progress in reporting the total emissions of our supply chain purchased goods and services through combining direct data from the activities of our suppliers and estimations based on indirect data such as OCC's expenditure.

5.6 As we progress in obtaining direct data from suppliers, we will replace indirect emissions calculations based on expenditure data and therefore have a more

accurate assessment of our supply chain emissions. Based on this method in the following years GHG reports, we will calculate historical emissions on a year-by-year basis and therefore we will establish a baseline against which we can measure GHG emissions reduction progress of our supply chain emissions in the future.

5.7 In relation to our Capital Goods emissions, since more than two thirds of OCC's capital long term capital portfolio is in built infrastructure, in 2024 OCC has decided to engage in a process of adopting the principles of PAS2080:2023 standard, a world leading whole life carbon management standard for built infrastructure.

5.8 In 2024 we will be working in adopting a whole life carbon assessment calculation method to account for the long-term carbon impact of infrastructure projects.

5.9 Since October 2020 we pay a premium to purchase OCC's electricity from certified renewable sources (REGO - Renewable Electricity Guarantee of Origin) to support national investment in renewable energy. Although we are purchasing REGO backed energy we have chosen not to count this as a carbon offset as we are committed to reduce our reliance on grid electricity. We have an energy hierarchy approach to energy reduction as set out in our 2020 Climate Action Framework.

6 Carbon Neutrality Target 2030

6.1 In **2019** the council committed to become carbon neutral for its corporate estate and activities (excluding supply chain and maintained school's emissions) by **2030**[1].

Figure 5 OCC Net Zero by 2030 target boundary

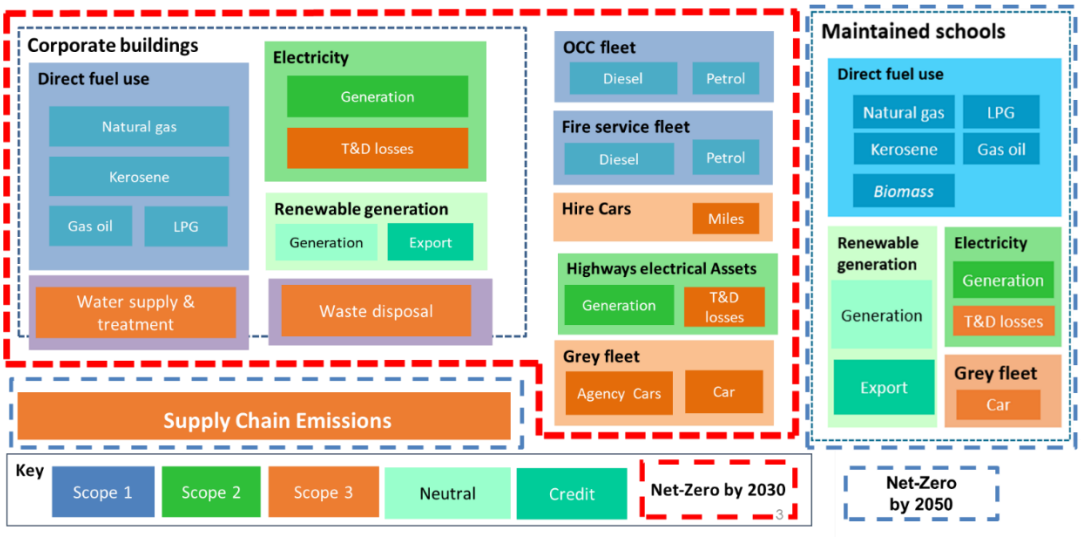

Figure 5 shows the boundary of our Net Zero **2030** target, this boundary includes the greenhouse emissions of our corporate buildings related with direct fossil fuel emissions produced in heating and OCC fleets, the indirect emissions related with electricity use which including the electricity we use in our buildings and highway electrical assets. Some of these electricity related emissions are balanced with the renewable energy electricity we supply to the grid through our onsite renewable energy generation installations. Also inside our Net Zero 2030 boundary we include the emissions related to grey fleets and cars we hire, which we calculate from the mileage our employees report.

6.2 **In 2023**, Oxfordshire County Council approved an updated Carbon Management Plan for OCC 2030 Carbon Neutrality target which extended our original plan for the period 2022-2025 to the year 2030. This new plan sets out activities for property, highways electrical assets, fleet, and staff travel to reduced emission between **2022 and 2030**. It includes a trajectory of planned reduction up to 2030 against business as usual (see figure 6 below)

[1] Further information about the council's carbon reduction strategy:
Climate action in Oxfordshire | Oxfordshire County Council
What we are doing to reduce our greenhouse gas emissions | Oxfordshire County Council
2020 Climate Action Framework (oxfordshire.gov.uk)

Figure 6 Carbon Management Plan trajectory up to **2030/31.**

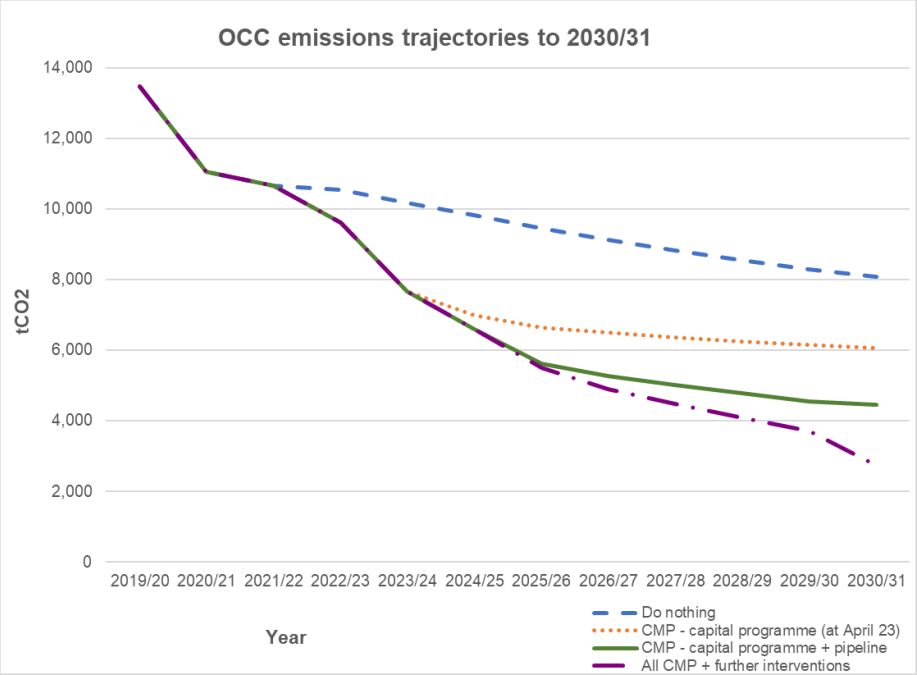

Figure 6 describes the different emission reduction trajectories that are part of OCC Carbon Management Plan. The first trajectory describes a "do nothing" trajectory which is based on not implementing any further decarbonisation actions from the reporting year onwards. Three additional trajectories describe three scenarios of implementing different groups of decarbonisation actions. The first corresponds to the Carbon Management Plan actions included in the capital program up to April 2023, the second corresponds to the actions of the capital programme up to April 2023 plus additional actions identified in our decarbonisation project pipeline, finally the third trajectory corresponds to all the actions of the CMP plus further interventions such as innovation activities.

6.3 The council is in the process of reviewing its annual targets to meet this objective. Based on the projects included in the Carbon Management Plan 2022-30 (approved July 2023), we expected an 8.6% reduction for 2022/23. We exceeded this target and saw a 14.8% reduction in emissions between 2021/22 and 2022/23.

Figure 7: Carbon Neutrality performance

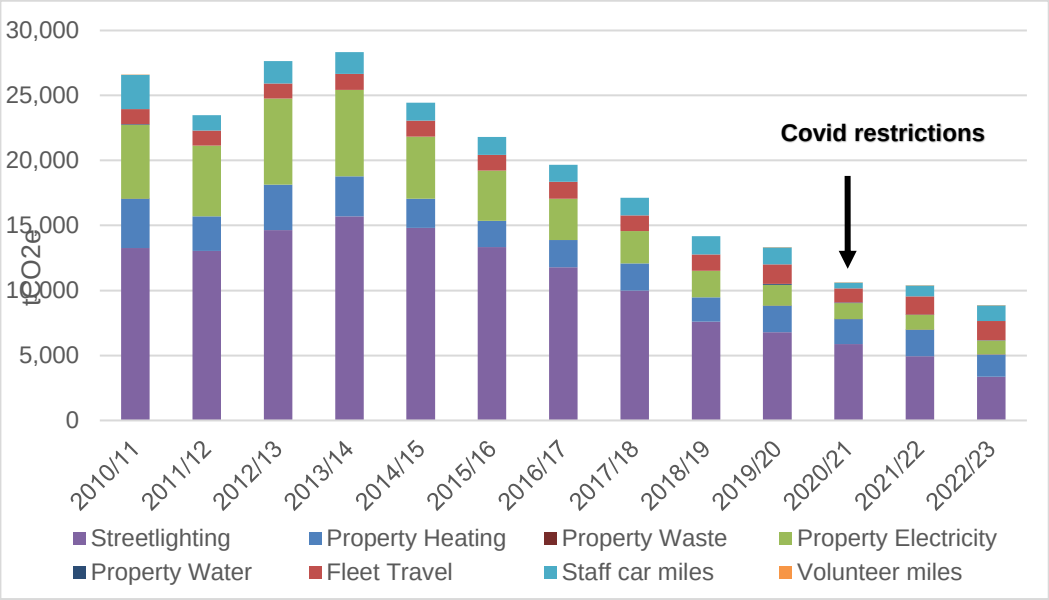

Figure 7 shows carbon neutrality performance since baseline year **2010/11.** Our performance shown in this table indicates that OCC corporate emissions including property emissions (including heating, electricity, water and waste emissions), emissions related with street lighting, fleet emissions and business mileage peaked in 2013/14 at 27,644 tCO2e and have been reducing since then up to 2022/23 at the level of 8,857 tCO2e. Furthermore, OCC corporate emissions since Covid Restrictions in 2020/21 have continued declining and have not returned to pre-Covid levels.

6.5 **The emissions from the scope of our carbon neutrality 2030 target** (corporate estate and activities see red boundary in figure 6 above) had a net reduction of 14.8% (1,535 tonnes CO_2e) from 10,391 in 2021/22 to 8,857 in 2022/23. These emissions reductions represent a 66.6% reduction against our baseline in 2010/11. This net reduction is the balance of emissions increases in some activity areas (fleets and staff mileage) being balanced by larger emission reductions in others (highways electrical assets and property). In addition 2022/23 electric grid decarbonisation accounted for a reduction of 430 tonnes CO_2e from OCC's estate and activities electricity demand.

6.6 The breakdown of the 1,535 tonnes CO2e emissions reductions by area of OCC activity is presented below.

6.7 **Highways Electrical Assets** activities was the largest contributor to emissions reductions in 2022/23 as a result of OCC's LED street lighting replacement program resulting in 26% reduction in electricity demand in relation to 2021/22. In 2022/23 this program contributed a reduction of 1,583 tonnes of CO_2e, a 32% reduction compared to 2021/22. UK electricity grid decarbonisation contributed with 319 tonnes of CO_2e reductions in highways electrical assets. The LED replacement program has continued after March 2023, therefore further emissions reductions will be reported in 2023/24.

6.8 **Property emissions** in 2022/23 decreased by 405 tonnes, this is a 12.5% compared to 2021/22. This reduction is the result of a 15% reduction in gas demand in corporate buildings. There was a small increase in electricity demand of 2%, however carbon emissions did not increase since the UK electricity grid saw a 9% decrease in carbon intensity in 2022. UK electricity decarbonisation contributed with 111 tonnes of CO_2e reductions OCC properties[2].

6.9 On site renewable energy generation in OCC estate increased by 77% from 52,560 kWh in 2021/23 to 92,997 kWh in 2022/23. Measured as percentage of OCC's total estate electricity demand, on site renewable energy generation in OCC estate increased from 1% in 2021/22 to 2% in 2022/23. Renewable energy produced in OCC estate and exported to the UK electricity grid declined by 61% from 2021/22 to 2022/23. These renewable energy exports, measured as percentage of OCC's total on site electricity generation, decreased from 41% in 2021/22 to 9.14% in 2022/23 signalling an increased energy consumption of renewable energy generated on site.

6.10 The reduction in gas demand in OCC properties is partly related to remote working practices. In addition, warmer temperatures in some months during the winter of 2022/23 may have contributed to further gas demand reductions. We will continue to monitor these trends. In addition, multiple decarbonisation equipment installations in OCC buildings took place during 2023 and their reductions are expected to materialise during 2023/24 onwards.

6.11 Emissions from our **fleet and staff business mileage** increased by 112 and

[2] The reader needs to bear in mind that UK GHG reporting methodologies use electricity grid factors that have a two-year lag in relation to electricity grid fuel mix. As a result the factors used in this 2022-2023 report uses a factor published in 2022 related to the UK electricity grid fuel mix in 2020.

342 tonnes respectively, this is 8.1% and 39.8% respectively compared to 2021/22. However, the level of emissions in these categories remains below pre-Covid levels; fleet and staff business mileage reduced emissions by 1.6% and 7.3% respectively in comparison with 2019/20.

6.12 In the future, the approach to fleet decarbonisation will prioritise avoidance of emissions by rationalising the fleet, encouraging sharing of resources, and replacing fossil fuels with zero tailpipe emission vehicles.

6.13 In relation to staff mileage, staff will be encouraged to apply a hierarchy of low carbon transport modes and when car use is needed to use electric pool vehicles and to car share.

6.14 The strict COVID lockdown from March 2020 through to spring 2021 resulted in a significant reduction in emissions due to building closures and other reductions in activities. In the three years since then, emissions of the operation of buildings, fleets and staff mileage have not returned to pre-COVID levels and have decreased in relation to 2019/20, partly due to a rise in home working and less face-to-face meetings due to the rise in usage of virtual meetings.

6.15 Overall, our corporate estate and activities (the scope of our 2030 carbon neutrality target) carbon emissions reduced by 33.5% since 2019/20, this is an average reduction of 11% annually in the last three years.

6.16 During 2022/23 additional data sources were added to our GHG report:

- Volunteer mileage emissions included in staff mileage category.
- Corporate water supply and treatment emissions included in property category
- Corporate waste disposal emissions included in property category
- Supply chain emissions preliminary estimations and progress so far in improving the quality of this data through direct engagement with top emitter suppliers.

See annex A for complete breakdown of emission by category.

6.17 To allow a direct comparison, 2019/20, 2020/21, 2021/22, 2022/23 figures now include these new emission sources. The exemption is the preliminary

estimation of supply chain emissions which have been accounted only for the year 2022/23. In our next report 2023/24 we will include a baseline for supply chain emissions for tracking progress on carbon emissions reductions.

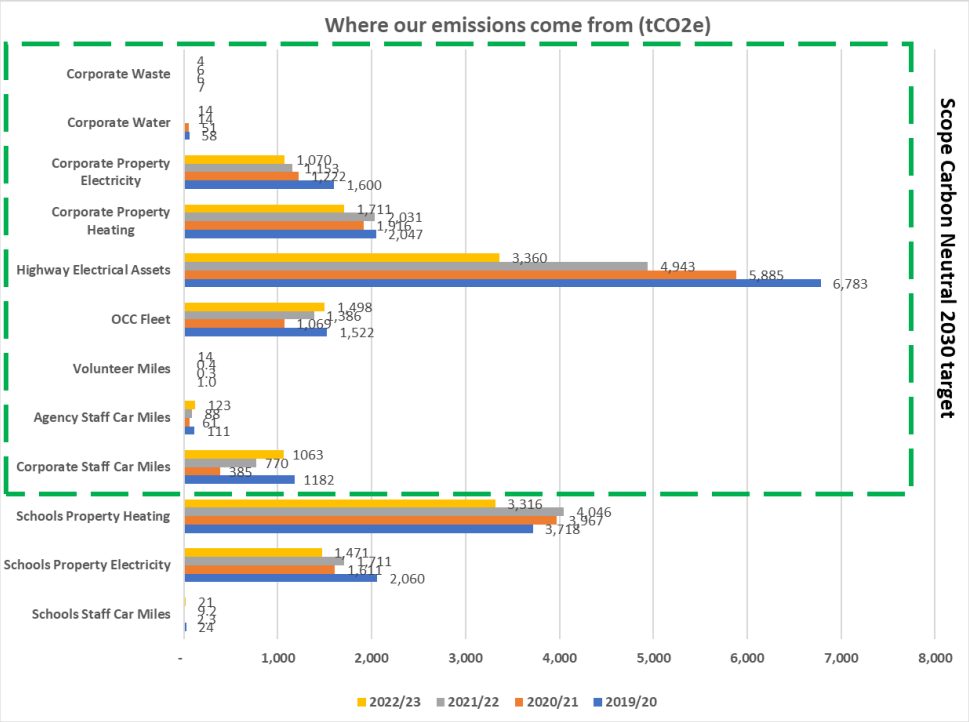

Figure 8 Tonnes of CO_2e split by sector by year from 2019/20 to 2022/23. (Green boundary refers to OCC's 2030 carbon neutrality target). The figure shows how different sectors of emissions have reduced from 2019/20 to 2022/23. The largest reductions have been achieved in highways electrical assets.

7 Maintained schools' emissions reduction progress

7.5 In 2022/23 there was an overall reduction of 17% **in maintained schools'** emissions in relation to 2019/20 (pre-covid). This equates to an average reduction of 5.7% annually in the last three years.

7.6 Emissions from 2010/11 list of 285 maintained schools have reduced by 88.1% since the baseline year 2010/11, an 7.3% per year. 159 schools converting to academies and therefore falling outside the Council's reporting has contributed significantly to this change.

7.7 Emissions from the remaining 126 maintained schools (adjusted to remove the effect of schools converting to academies) have reduced by 34.6%, an average

of 2.9% per year.

7.8 **Maintained schools'** greenhouse gas emissions in 2022/23 decreased by 16.6% (959 tonnes CO_2e) from 5,766 tonnes CO_2e in 2021/22 to 4,807 tonnes CO_2e in 2022/23.

7.9 Not included in these reductions are 4 tonnes of CO_2e that correspond to the conversion of one school to academy during the reporting period (2022/23).

7.10 Electricity grid decarbonisation accounted for 15.1% of these reductions (145 tonnes CO_2e).

7.11 Also contributing to emissions reductions is the increase in renewable energy on-site generation in schools by 7%, from 641,953 kWh in 2021/22 to 683,942 kWh in 2022/23. On site renewable energy generation in maintained schools, measured as percentage of total maintained schools' electricity demand, increased from 8% in 2021/22 to 9% in 2022/23.

7.12 Renewable energy exports from maintained schools to the UK electricity grid, measured as percentage of total electricity demand, increased from 38% in 2021/22 to 41% in 2022/23.

7.13 Gas demand in schools reduced by 17% in 2022/23 in relation to 2021/22, contributing with 575 tonnes of CO_2e of these reductions. We think this gas demand reduction may be related to the mildly higher temperatures during the winter in 2022.

7.14 Table 2 below shows the comparison of emissions in 2022/23 against baseline year 2010/11. A further breakdown of consumption at source is detailed in Annex C.

Table 2: Emissions Comparison 2022/23 and 2010/11

2022/23 and 2010/11 Baseline Comparison tonnes CO_2e.			
	2010/11	**2022/23**	**Reduction**
Academies	32,937	-	100.0%
Maintained Schools	7,430	4,862	34.6%
Solar Export Schools (offset)	-	-54	-
Total Schools	**40,368**	**4,807**	**88.1%**

Table 2 compares emissions of academies, OCC maintained schools in 2010/11 and 2022/23 including the contribution of solar exports offsets based on exporting energy to the grid. This tables helps to breakdown the emission reductions resulting from academisation of schools and those emissions related to emissions reductions in remaining maintained schools. Maintained Schools have reduced their own emissions by 34.6% in 2022/23 in relation to 2010/11.

8 Expanding the scope of OCC reporting: Supply Chain emissions

8.1 During 2022/23 Oxfordshire County Council, conducted a preliminary assessment of our supply chain emissions by calculating them through what is known as an 'expenditure based' approach using 2020/21 expenditure data.

8.2 This method entails the use of carbon factors that account the amount of emissions produced per pound spent in our procurement of goods and services[3].

8.3 Based on this initial assessment we estimated that OCC's 2020/21 Scope 3 emissions account for an approximate 150,000 tonnes of CO_2e. Based on this estimation we have also identified the top emitting suppliers in our supply chain.

8.4 Expenditure based carbon assessments are a good way to produce a quick estimations of supply chain emissions, but it is not the most accurate method[4]. Therefore in 2023/24 we initiated a program of supplier engagement with the objective of replacing expenditure-based estimations with carbon assessments based on real activity data.

8.5 In this year's report we have included the 2022/23 emissions of three of our top ten emitter suppliers, but not yet their corresponding historical emissions of previous years. The emissions from these three suppliers accounted for 13,971 tCO_2e in 2022/23 and based on our initial expenditure-based estimation we estimate that these suppliers may account for 9% of OCC's Supply Chain Scope 3 Purchased Goods and Services emissions.

8.6 It should be noted that this percentage is based on estimating our total supply chain emissions based on the expenditure method. As we progress with obtaining supplier activity data, we have noticed that the expenditure method tends to underestimate emissions. Therefore, it is expected that the supply chain emissions estimates may change in future reports as we progress in replacing expenditure estimates with real

[3] Expenditure carbon factors are calculated based on environmental economics models known as 'environmentally extended input-output' models - produced by British universities and the Department for Environment, Food and Rural Affairs. This technique combines macro-economic data on the output of industries and the trade between them with data on the total emissions arising directly from each industry to make estimates of the direct and supply chain emissions attributable per unit of output of each industry.

[4] This method is not perfect as changes in prices as well as inflation, will affect these calculations. It also doesn't account for the improvements that each sector may implement before these factors are updated (these are published by DEFRA every year with a three-year lag, 2020 figures were published in 2023). Nevertheless, they provide a time-efficient method to make a first assessment of a supply chain's carbon impact.

activity data from our suppliers.

8.7 Adding the emissions from these three suppliers to those corresponding to OCC's Corporate Estate, Activities and Maintained schools results in a total of 27,635 tonnes of CO_2e in 2022/23 (see table 3).

OCC GHG Emissions 2022/23 (tCO_2e)	Corporate Estate & Operations	Maintained Schools	Supply Chain Emissions (progress so far)	Total (progress so far)
Scope 1	3,194	3,316		6,509
Scope 2	4,075	1,397		5,472
Scope 3 Operational	1,590	149		1,739
Scope 3 Purchased Goods and Services			13,971	13,971
Total Operational Emissions	**8,858**	**4,862**	**13,971**	**27,691**
Solar Export (offset)	- 2	- 54		- 56
Total Emissions (after solar offset)	**8,857**	**4,807**	**13,971**	**27,635**

Table 3. OCC GHG Emissions 2022/23

9. Measurement, data quality, methodology and refinements

9.1. Oxfordshire County Council wish to collect high-quality data and has invested in AMR (Automatic meter reading), loggers and meter upgrades.

9.2. Our data quality is as follows:

9.3. 96% of our electricity data is from actual meter data and the remaining 4% is based on invoiced annual consumption. Some of our energy suppliers correct their invoicing once they obtain meter measurements. When some properties become vacant, there is often a delay in updating status by energy suppliers resulting in subsequent billing corrections. Sometimes we need to recalculate emissions of previous reporting periods based on these corrections.

9.4. 100% of our oil data is from delivered fuel invoices/ Fuel card data

9.5. 93% of our gas data is from actual meter data and 7% is based on invoiced annual consumption. Some of our energy suppliers correct their invoicing once they obtain meter measurements. When some properties become vacant, there is often a delay in updating status by energy suppliers resulting in subsequent billing corrections.

9.6. Sometimes we need to recalculate emissions of previous reporting periods based on these corrections.

9.7. Street lighting data is calculated from *Elexon BSCP520 –Unmetered supplies Registered in SMRS*

9.8. Fleet fuel data is collected from petrol stations.

9.9. Fire Service fuel is collected from both on site storage and petrol stations.

9.10. Mileage data for business miles is collected from claim forms (as is cycle mileage) through staff expenses claims.

9.11. We also collect motorbike business mileage through staff expenses claims.

9.12. Agency staff mileage data is collected from the agencies expenses claims.

9.13. Hire car mileage data is provided monthly by our contracted hire car company.

9.14. 91% of our Scope 3 Supply Chain Purchased Goods and Services emissions is estimated through expenditure data and applying DEFRA expenditure carbon factors[5]. The 9% remaining has been calculated through real activity based on engagement with suppliers. As we continue to engage with more suppliers we will increase the percentage of activity based data to build an increasingly accurate Scope 3 inventory and baseline.

9.15. The 2021/22 reported emissions for our Corporate estate and activities and Schools in our GHG 2021/22 report were recalculated in this report (Corporate S&O from 10,652 to 10,391 tCO_2e; Schools from 5,966 to 5,766 tCO_2e) to a total change of -461 tCO_2e that reflects the following corrections:

- Traveller sites (Corporate E&O change= -102 tCO_2e): we reported all emissions from electricity used in Travellers sites. This year we have deducted the electricity used by travellers and included only street lighting in these sites. Travellers are billed for their electricity

[5] This method entails the use of *carbon factors* that account the amount of emissions produced per pound spent in our procurement of goods and services. Carbon factors are calculated based on environmental economics models known as 'environmentally extended input-output' models - produced by British universities and the Department for Environment, Food and Rural Affairs. This technique combines macro-economic data on the output of industries and the trade between them with data on the total emissions arising directly from each industry to make estimates of the direct and supply chain emissions attributable per unit of output of each industry. This method is not perfect as changes in prices as well as inflation, will affect these calculations. It also doesn't account for the improvements that each sector may implement before these factors are updated (*these are published by DEFRA every year with a three-year lag, 2020 figures were published in 2023*). Nevertheless, they provide a time-efficient method to make a first assessment of a supply chain's carbon impact.

consumption.

- Deduction of energy in shared used buildings (Corporate E&O change= -83 tCO_2e): we consider shared use of buildings and therefore deduct the proportion that does not correspond to OCC consumption.
- Energy rebilling: energy suppliers corrected invoices based on meter measurements in both Corporate S&O (-76 tCO_2e) and schools (-200 tCO_2e), resulting in reduced energy consumption.

9.16. The methodology for calculating renewable energy exports in OCC estate and maintained schools changed in this report. In previous reports, renewable energy exports were estimated by assuming that 50% of on site renewable energy generation was exported to the grid. In this report for 2022/23 we report the actual exports of renewable energy to the grid based on actual meter measurements, rather than assumptions. In the following report 2023/24 we will recalculate the historical data on renewable energy exports from 2021/22 backwards by using renewable energy export measurements available.

10. Energy Efficiency measures and carbon reduction projects 2022/23

10.1 Below is a list of a some of the energy efficiency projects undertaken to reduce both energy and carbon emissions.

10.2 During 2022/23 27,670 street lighting lanterns were replaced with LEDs as part of an ongoing program to convert 51,000 lanterns by 2025/26. This has resulted in savings 5,767,527 kWh in electricity usage (1,583 tonnes CO2e). Note: some of this CO_2 saving is due to grid decarbonisation.

10.3 Projects funded by the Public Sector Decarbonisation Fund were expected to reduce CO2e by around 234 tonnes during 2022/23. However, some of these projects were not completed until into the financial year and a few are yet to be completed. Additional savings will be made in 2023/24.

Annex A – GHG Data Breakdown at Source

			2021/22 Totals		2022/23 Totals	
			2021/22		**2022/23**	
Scope	**Energy source**	**Units**	**Quantity**	**CO^2**	**Quantity**	**CO^2**
Scope 1	Corporate gas	kWh	11,403,796	2089	9,741,291	1778
	Corporate Vacant Gas	**kWh**	18,738	3	41,908	7.6
	Corporate Shared Use Gas	**kWh**	-453,225	-83	-441,815	-81
	Maintained Schools	kWh	17,705,122	3243	14,616,400	2668
	Total gas	**kWh**	**28,674,430**	**5252**	**23,957,783**	**4373**
	Corporate gas oil	litres	2,002	5.5	1,500	4.1
	Schools Oil	litres	199,968	552	157,998	436
	Total gas oil	**litres**	**201,970**	**557**	**159,498**	**440**
	Corporate burning oil (Kerosene)	litres	0	0	0	0
	Schools burning oil (Kerosene)	litres	76,567	194	70,043	178
	Total burning oil	**litres**	**76,567**	**194**	**70,043**	**178**
	Corporate LPG	litres	10,735	17	1,110	1.7
	Schools LPG	litres	36,656	57	21,616	34
	Total LPG	**litres**	**47,391**	**74**	**22,726**	**35**
	SCHOOLS MINIBUS FUEL	litres	68,453	185	68,389.34	185
	Corporate diesel - fire service	litres	177,031	479	191,312	516
	Corporate diesel - OCC fleet	litres	244,290	661	271,229.39	732
	Total diesel	**litres**	**489,775**	**1325**	**530,930**	**1433**
	Corporate petrol - OCC fleet	litres	5,141	12	1,079.37	2.3
	Corporate petrol - Fire service	litres	2,362	5.5	2,007	4.3
	Total petrol	**litres**	**7,503**	**18**	**3,087**	**6.7**
	HVO Fleet	**litres**	**0**	**0**	**271**	**0.01**
	Hire Car Unknown Fuel	Miles	1,021	0.28	0	0
	Hire Car Diesel	Miles	26,887	7	24,239	6.7
	Hire Car Petrol	Miles	90,250	25	126,975	35
	Hire Car Elec	Miles	159	0.02	4,853	0.4
	Hire Car Hybrid Unknown Fuel	Miles	5,246	1.0	4,617	0.9
	Hire Car Hybrid Diesel & Petrol	Miles	3,290	0.6	0	0
	Total Hire Car	**Miles**	**126,853**	**35**	**160,684**	**43**
	Fire Service Fuel Oil	litres	0	0	0	0
	Corporate Fuel Oil	litres	28.5	0.09	44	0.14
	Vehicle Fuel Oil	**litres**	**28.5**	**0.09**	**44**	**0.14**
	Scope 1 Corporate			**3409**		**3194**
	Scope 1 Schools			**4,046**		**3,316**

The table above includes for transparency purposes all data used to calculate OCC Scope 1 emissions for years 2022/23 and 2021/22 used to produce the analysis included in this report.

			2021/22		2022/23	
Scope	**Energy source**	**Units**	**Quantity**	**CO^2**	**Quantity**	**CO^2**
Scope 2	Corporate electricity	kWh	5,024,224	1067	5,083,596	983
	Corporate Vacant Elec	kWh	20,523	4.4	28,662	5.5
	Corporate Shared Use Elec	kWh	-36,775	-7.8	-35,914	-6.9
	Travellers Sites	kWh	2,424	0.5	2,436	0.47
	Schools Electricity	kWh	7,626,417	1619	7,223,547	1397
	Highway Electrical Assets	kWh	21,388,773	4541	15,920,204	3079
	Total Electric charging (OCC sites)	kWh	36,973	7.9	72,503	14
	Total Scope 2 Corporate			5613		4075
	Total Scope 2 Schools			1619		1397
	Total electricity	**kWh**	**34,062,560**	**7233**	**28,295,033**	**5472**
Scope 3 Operational	Corporate Average unknown car (miles)	Miles	796,173	220	3,298	0.9
	Agency Average unknown Car	Miles	318,334	88	94,008	26
	Agency Diesel	Miles	0	0	156,030	43
	Agency Hydrogen	Miles	0	0	594	0
	Agency LPG	Miles	0	0	5,481	1.7
	Agency Petrol	Miles	0	0	186,977	51
	Agency Hybrid Diesel & Petrol	Miles	0	0	4,354	0.8
	Agency Electric	Miles	0	0	3,068	0.3
	Corporate Diesel Miles	Miles	835,314	226	1,546,654	425
	Corporate Petrol Miles	Miles	1,094,737	307	2,190,513	601
	Corporate Hybrid Diesel Miles	Miles	2,051	0.39	8,978	1.7
	Corporate Hybrid Petrol Miles	Miles	68,169	13	123,908	24
	Corporate Plug in Hybrid Petrol Miles	Miles	1,008	0.16	16,506	2.5
	Corporate Electric Miles	Miles	15,420	1.36	59,860	5.4
	Corporate LPG Miles	Miles	2,019	0.64	2,817	0.90
	Corporate Push Bike	Miles	1,541	0	4,390	0
	Schools Average unknown car (miles)	Miles	4,336	1.2	0	0
	Schools Diesel Miles	Miles	10,533	2.86	25,825	7.1
	Schools Petrol Miles	Miles	18,285	5.13	50,892	14
	Schools Hybrid Diesel Miles	Miles	0	0	82	0.02
	Schools Hybrid Petrol Miles	Miles	70	0.01	1,373	0.3
	Schools Plug in Hybrid Petrol Miles	Miles	0	0	0	0
	Schools Electric Miles	Miles	34	0.003	738	0.1
	Schools LPG Miles	Miles	0	0	0	0
	Volunteer miles	Miles	1,530	0.42	50,009	14
	Total business travel Car	**Miles**	**3,169,554**	**866**	**4,536,355**	**1220**
	Agency Motorbike	Miles	0	0	0	0
	Corporate business travel Motorbike	Miles	3,643	0.67	6,617	1.2
	Total business travel Motorbike	**Miles**	**3,643**	**0.67**	**6,617**	**1.2**
	Corporate Electricity Transmission losses	kWh	5,010,397	94	5,078,780	90
	Highways Electricity Transmission losses	kWh	21,388,773	402	15,920,204	282
	EV Transmission losses	kWh	36,973	0.7	72,503	1.3
	Schools Electricity Transmission	kWh	7,626,417	143	7,223,547	128
	Data Centre Electrictiy Transmission losses	kWh	140,765	2.6	154,494	2.733
	Total Electricity Transmission losses	**kWh**	**34,203,326**	**643**	**28,449,527**	**503**
	Corporate Water Supply	**CMtrs**	32,109	4.8	32,294	4.8
	Corporate Water Treatment	**CMtrs**	32,109	8.7	32,294	8.8
	Waste	**kg**	284,571	5.8	204,029	4.1
	Operational Corporate Scope 3			**1,374**		**1,590**
	Operational Schools Scope 3			**152**		**149**
	Total Operational Scope 3			**1,526**		**1,739**
	Solar Export Corporate	kWh	-21,716	-4.6	-8,502	-1.6
	Solar Export Schools	kWh	-243,443	-52	-279,695	-54
	Total Solar Export	**kWh**	**-265,159**	**-56**	**-288,196**	**-56**
Total Emissions OCC estate, activities and			**0%**	**16,157**	**-15.4%**	**13,664**

			2021/22		2022/23	
Scope	**Energy source**	**Units**	**Quantity**	**CO^2**	**Quantity**	**CO^2**
Scope 3 Supply Chain	Highways Maintenance Supplier					9266
	Adult Care Supplier					4361
	Waste Handling Contractor					311
	Data Centre Contractor Elec	**kWh**	140,765	33	154,494	33
	Total Engaged Suppliers					13,971
	Spend-based Scope 3 Purchased Goods and Services (excl. engaged suppliers)					141,408
	Total Purchased Goods and Services					**155,379**
	Capital (Spend-based)					**25,162**
	WTT Corp. Fuels and Electricity (Spend-based)					2,307
	Upstream and Downstream Leased Assets (Spend-based)					927
Other Corporate Scope 3 categories						**3,234**
Total Corporate Scope 3				**1,374**		**185,365**
Total Corporate Scope 1,2,3 incl. solar						**192,632**
Total Corporate Scope 1,2,3 plus schools incl. solar						**197,439**

The table above includes for transparency purposes all data used in producing this report to calculate OCC Scope 2 emissions, Scope 3 operational emissions (excluding Supply Chain emissions) and Scope 3 Supply Chain emissions (including only the engaged suppliers in the reporting year) for years 2022/23 and 2021/22.

Annex B – Corporate Estate GHG emissions

Corporate GHG emissions for period 1 April 2022 to 31 March 2023					
2022/23	**Total Units**	**CO_2**	**CH_4**	**N_2O**	**Total**
		Scope 1			
Gas (kWh)	9,341,383	1,701,907	2,335	934	1,705,176
Gas Oil (litres)	1,500	4,086	4.2	47	4,138
Kerosene (litres)	0	0	0	0	0
LPG (litres)	1,110	1,726	1.3	1.1	1,728
Diesel (litres)	530,930	1,412,986	138	19,751	1,432,875
Petrol (litres)	3,087	6,630	22	20	6,673
HVO (Litres)	271	0	0	0	10
Hire Car Unknown Fuel	0	0	0	0	0
Hire Car Diesel	24,239	6,590	0.2	73	6,664
Hire Car Petrol	126,975	34,698	65	74	34,837
Hire Car Hybrid Unknown Fuel	4,617	883	1.2	8.1	892
Hire Car Hybrid Diesel	0	0	0	0	0
Hire Car Elec	4,853	430	1.7	3.0	435
Fuel Oil (litres)	44	138	0.2	0.3	138
Scope 1 Total		3,170,074	2,569	20,912	3,193,565
		Scope 2			
Electricity (kWh)	21,071,486	4,029,079	16,857	28,868	4,074,804
		Scope 3			
Electricity transmission and distribution (kWh)	21,071,486	368,751	1,475	2,529	372,755
Business Travel Average unknown car (miles)	97,306	26,528	26	171	26,725
Business Travel Diesel (miles)	1,702,684	462,926	17	5,159	468,102
Business Travel Petrol (miles)	2,377,490	649,697	1,213	1,379	652,288
Business Travel Hybrid Diesel (miles)	13,332	2,548	4	23	2,575
Business Travel Hybrid Petrol (miles)	123,908	23,685	33	218	23,937
Business Travel Plug in Hybrid Petrol (miles)	16,506	2,520	9	11	2,539
Business Travel Electric (miles)	62,928	5,580	23	39	5,642
Business Travel Hydrogen (Miles)	594	0	0	0	0
Business Travel LPG (miles)	8,298	2,635	0.7	5	2,641
Business Travel Motorbike (miles)	6,617	1,186	17	6	1,209
Water (cubic meters)	32,294				13,596
Waste (kg)	204,029				4,052
Volunteer miles	50,009	13,633	14	88	13,735
Scope 3 Total		1,559,689	2,830	9,629	1,589,796
Total (kg)		8,758,842	22,257	59,409	8,858,165
Offsetting (Solar)	-8,502				-1,644
Total (tonnes)		**8,759**	**22**	**59**	**8,857**

The table above includes 2022/23 OCC corporate Scope 1, 2 and 3 (operational) data used to calculate emissions categorised by type of fuel and activity.

Annex C - Maintained schools GHG emissions

Schools GHG emissions for period 1 April 2022 to 31 March 2023					
2022/23	**Total Units**	**CO_2**	**CH_4**	**N_2O**	**Total**
Scope 1					
Gas (kWh)	14,616,400	2,662,962	3,654	1,462	2,668,078
Gas Oil (litres)	157,998	430,413	444	4,991	435,849
Kerosene (litres)	70,043	177,056	422	441	177,918
LPG (litres)	21,616	33,611	26	21	33,658
Scope 1 Total		3,304,042	4,546	6,914	3,315,503
Scope 2					
Electricity (kWh)	7,223,547	1,381,214	5,779	9,896	1,396,889
Scope 3					
Electricity transmission and distribution (kWh)	7,223,547	126,412	506	867	127,785
Business Travel Average unknown car (miles)	0	0	0	0	0
Business Travel Diesel (miles)	25,825	7,021	0.3	78	7,100
Business Travel Petrol (miles)	50,892	13,907	26	30	13,963
Business Travel Hybrid Diesel (miles)	82	16	0.02	0.14	16
Business Travel Hybrid Petrol (miles)	1,373	262	0.37	2.4	265
Business Travel Plug in Hybrid Petrol (miles)	0	0	0	0	0
Business Travel Electric	738	65	0.27	0.46	66
Business Travel LPG (miles)	0	0	0	0	0
Scope 3 Total		147,684	533	978	149,194
Total (kg)		4,832,941	10,857	17,788	4,861,586
Offsetting (Solar)	-279,695				-54,087
Total (tonnes)		**4,833**	**11**	**18**	**4,807**

The table above includes 2022/23 Maintained Schools Scope 1, 2 and 3 (operational) data used to calculate emissions categorised by type of fuel and activity

Annex D – Carbon neutrality GHG CO2 Emissions Summary

Carbon Neutrality GHG emissions for period 1 April 2010 to 31 March 2023													
Tonnes of CO2e													
	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Scope 1													
Gas	3,652	2,502	3,335	2,933	2,153	1,970	2,006	2,061	1,867	2,002	1,888	2,009	1,705
Kerosene	100	10	9	9	5	7	-	-	-	-	-	-	-
Gas Oil	26	51	82	90	50	29	95	27	13	5.9	15	5.5	4.1
LPG	-	84	57	58	40	9	-	9	3	39	13	17	1.7
Fire Service Diesel	571	542	553	543	479	583	648	635	626	588	384	479	516
Fire Service Petrol	4.8	4.1	0.6	0.6	7.0	-	5.4	2.8	3.0	3.5	3.4	5.5	4.3
OCC Fleet Diesel	567	597	601	682	739	608	648	568	586	786	637	846	917
OCC Fleet Petrol	-	-	4	1	7	5	5	19	35	39	11	12	2.3
OCC Fleet HVO	-	-	-	-	-	-	-	-	-	-	-	-	0.01
Hirecar	-	-	-	-	-	-	-	-	-	105	33	35	43
Fire Service Fuel Oil	-	-	-	-	-	-	-	-	-	-	0.003	-	0
Corporate Fuel Oil	-	-	-	-	-	-	-	-	-	0.01	0.10	0.09	0.14
Scope 2													
Electricity Corporate Buidlings	5,215	5,014	6,162	6,190	4,412	3,580	2,916	2,280	1,881	1,478	1,130	1,064	982
Electricity Highways Assets	12,179	11,969	13,632	14,626	13,623	12,329	10,801	9,123	6,993	6,252	5,419	4,541	3,079
OCC Electric Fleet	-	-	-	-	-	-	-	-	-	-	-	7.9	14
Scope 3 Operational													
Corporate T&D losses	469	449	460	453	386	296	264	213	162	125	97	94	90
Highways Assets T&D losses	1,094	1,075	1,018	1,071	1,191	1,018	977	853	603	531	466	402	282
EV charging T&D losses	-	-	-	-	-	-	-	-	-	-	-	0.7	1.3
Grey Fleet (unknown / fuel type)	2,633	1,194	1,729	1,673	1,377	1,385	1,311	1,346	1,411	1,293	446	857	1,186
Volunteer Miles	14	-	-	-	-	-	-	-	-	1.0	0.3	0.4	14
Water	58	-	-	-	-	-	-	-	-	58	51	14	14
Waste	7									7	6	6	4
Carbon Offsetting													
Green tariff	-12,179	-	-	-	-	-	-	-	-	-	-	-	-
REGO backed electricity	-	-	-	-	-	-	-	-	-	-	-6,549	-5,613	-4,075
Renewable electricity generation	-	-	-	-	-	-	-	-	-	-	0	0	0
Renewable electricity export	0	0	0	0	-25.1	-5.0	-5.7	-4.7	-4.4	-4.1	-5.3	-4.6	-1.6
Total annual net emissions	**26,590**	**23,491**	**27,644**	**28,328**	**24,444**	**21,813**	**19,671**	**17,132**	**14,179**	**13,311**	**10,595**	**10,391**	**8,857**

The table above includes historical OCC corporate Scope 1, 2 and 3 (operational) data used to calculate emissions categorised by type of fuel and activity.

Annex E - Operational Scope breakdown

- Central Offices (Scopes 1 and 2)
- Fire Stations (Scopes 1 and 2)
- Libraries (Scopes 1 and 2)
- Highway Depots (Scope 1 and 2)
- EV Fleet (Scope 2)
- Fleet (Scope 1)
- Business miles (including cycling, agency workers and volunteers)- corporate estate and activities & schools (Corporate Scope 3 operational)
- Gypsy and Travelers sites communal lit areas (Scope 2)
- Maintained community schools (Schools Scope 1 and 2)
- VC and Foundation Schools (Schools Scope 1 and 2)
- Day Centers (Scope 1 and 2)
- Children's Homes (Scope 1 and 2)
- Highways electrical assets and car parks (Scope 2)
- Street lighting and traffic signals (Scope 2)
- Transmission and Distribution (Scope 3)
- Vacant properties (Scope 1)

Not included in current reporting and reasoning

We wish to increase the data we report in our GHG reporting. We do not currently include the following in our reporting:

- Leisure Centres - Scope 1 & 2 - complex use arrangements, in the main leased to Districts and reported in their scopes
- Academy Schools - not in scope - leased on 125-year leases to separate operational trusts. Data not Available.
- Staff Commuting to work - Scope 3 - no data available
- Business mileage from public transport and walking - Scope 3 - currently no data available.
- Homeworking emissions – Scope 3 - currently no data available