Environmental Sustainability

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OXFORD CITY COUNCIL

Greenhouse Gas Emissions from Local Authority own estate and operations

Reporting year 2020-21

Oxford City Council

Date: March 2022
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Greenhouse Gas Emissions (GHG) from Local Authority own estate and operations covering financial year 2020/21

1. Introduction

Oxford City Council is currently delivering its fourth Carbon Management Strategy and Implementation Plan (Carbon Management Plan 4: Zero Carbon Council by 2030) covering the 9 years from 2021/22 to 2029/30 mapping a route to a Net zero carbon council, driving down energy, fuel and water costs and their associated carbon dioxide emissions.

The council unanimously approved a motion in January 2019 declaring a climate emergency and subsequently held the UK's first Citizens' Assembly on Climate Change to be held at city level.

The Council has set the following targets and ambitions:

1. **Net Zero Carbon council by 2030 or sooner**: delivered by an acceleration of the reduction in the Council's underlying emissions. This applies to greenhouse gas emissions (CO2e) from heating and powering our buildings, fuelling our fleet vehicles and plant, through to our business travel and water consumption.

2. **Net Zero Carbon City by 2040** recognising that the Council is responsible for 1% of city-wide emissions, this vision is to be delivered by working in partnership with key stakeholders in the city to galvanize action on climate change, with an emphasis on the two largest sources of emissions - buildings and road transport. Roadmaps have been developed (https://www.oxford.gov.uk/news/article/1918/roadmap_outlines_oxford_s_journey_to_net_zero_carbon_emissions_by_2040) and the Zero Carbon Oxford Partnership – ZCOP - has been formed (zerocarbonoxford.com).

This report deals with the Council's emissions from its own estate and operations.

The bulk of the Council's CO_2 emissions come from:

- Heating and electricity consumption in Council operational sites (e.g. office buildings, depots, leisure centres, car parks, sports pavilions, public conveniences and other miscellaneous sites)

- Fuels consumed in Council fleet vehicles (e.g. refuse trucks, vans and pool cars), non-road going vehicles and plant (e.g. lawnmowers, chippers, and portable heaters)

- Travel for business purposes (e.g. use of public transport, fuel consumed in staff-owned vehicles to conduct Council business)

- Operational waste deposited in landfill sites (generated from Council operations) and associated with water use.

This report provides GHG emissions data (in tCO_2e and tCO_2) for the reporting period 2020/21 (as well as including details of emissions from the previous 3 years 2017/18, 2018/19 and 2019/20). CO_2e gives the global warming effect of the mass of GHG in terms of what mass of carbon dioxide would produce the equivalent effect. A

summary of 2020/21 GHG emissions included in this report are outlined in Table 1 below.

It should be noted that the Covid strict lockdown period began in March 2020 and continued to a greater or lesser extend throughout the reporting period.

Sections 5 and 6 outline the scope of emissions coverage in this report. Section 6 onwards outlines carbon emissions trends over the past 5 reporting years (including the current reporting year 2020/21)

Table 1: Total GHG emissions for the period 2020/21

Total GHG emissions for period 1 April 2019 to 31 March 2020		
	Tonnes of CO_2	**Tonnes of CO_2e**
Year	**2020/21**	**2020/21**
Scope 1	3,567	3,595
Scope 2	1,199	1,210
Scope 3	126	180
Total core GHG emissions	**4,892**	**4,985**

2. Organisation Information

Oxford City Council is a non-metropolitan district council as defined by Section 1(4) and Schedule 1 Part II of the Local Government Act 1972. The Local Authority main contact details are: Oxford City Council, Town Hall, St Aldates, Oxford, OX1 1DS.

3. Reporting period

1 April 2020 – 31 March 2021.

4. Reporting approach

We have based this report on the Government's Guidance on how to measure and report greenhouse gas emissions as outlined in communications from The Department for Food, Environment and Rural Affairs.
https://www.gov.uk/measuring-and-reporting-environmental-impacts-guidance-for-businesses

5. Organisational boundary

The scope of this report covers all Council buildings and operations as well as water consumption and disposal.

The following emissions sources are covered:

- Electricity and gas consumed in all buildings and sites (e.g. emissions from our operational buildings and other sites office buildings, depots, leisure centres, car parks, sports pavilions, public conveniences and other miscellaneous sites).

- Fuel consumption from fleet vehicles, non-road going vehicles and plant.

- Miles or kilometres travelled in staff-owned vehicles and estimated to be travelled in public transport for business purposes.

- Water consumed in Council operational buildings and other miscellaneous sites within the scope of the Council's influence and operations.

In future years, as data quality improves and availability expands, we propose to expand the scope to cover other emissions sources across the Council estate and operations such as Scope 3 emissions that the Council has direct influence over (e.g. operational waste deposited in landfill sites, staff commuting and procurement related emissions such as the goods and services bought to carry out its business and deliver services for the city). Other scope 3 emissions not yet included in the scope of this report include emissions from leased commercial properties (such as retail outlets) or council owned housing stock where the tenants are paying the energy/water bills.

6. Operational scopes

We have measured our total scope 1, 2 and some scope 3 emissions covering the areas outlined in the organisational boundary (see above). Further details of the emissions we are reporting on here are outlined in Table 2 below.

Table 2: Operational scopes

<table>
<tr><th>Scope One</th><th>Scope Two</th><th>Scope Three</th><th>Not included</th></tr>
<tr><td>Fuel used to heat our buildings (e.g. natural gas, gas oil, kerosene and liquid petroleum gas)</td><td rowspan="4">Purchased electricity for our buildings and other electricity consuming sites (e.g. offices, leisure centres, depots, car park and public conveniences).</td><td rowspan="2">Electricity (transmissions and distribution factors)</td><td>Perfluorocarbons (PFC), hydrofluorocarbons (HFC) and sulphur hexafluoride (SF_6)</td></tr>
<tr><td rowspan="2">Fuel used in council vehicle fleet and also to power non-road going vehicles and plant such as lawn-mowers and, chippers.</td><td>Staff commuting</td></tr>
<tr><td>Business mileage by car</td><td>Emissions from Council operational waste deposited in landfill sites</td></tr>
<tr><td rowspan="2">Fuel used in waste collection vehicle fleet</td><td>Business mileage by public transport (bus and train)</td><td>Emissions from Leased commercial properties or housing stock where tenants are paying energy/water bills.</td></tr>
<tr><td>Water consumed (supply and treatment)</td><td>Total indirect emissions: e.g. due to upstream emissions from production and delivery of fuel to power stations or transport fuel stations.</td></tr>
</table>

	Half-hourly metered and non-half-hourly metered electricity supplies (ie Meter profile classes 01-08, HH and Unmetered Supplies)		Emissions from goods and services purchased and employed to conduct council business and operations. Council financial investments.

We seek to widen the scope of reported emission sources in future years and are exploring methods for achieving this.

A summary of underlying GHG emissions for the current reporting year (2020/21) is outlined in Table 3 below. Headline figures over the last five years (including the current reporting year) are detailed in Table 4 and the stacked bar chart (Chart 1). A more detailed breakdown of underlying GHG emissions and sources for the previous three years can be found in Appendix 1.

Table 3: Underlying GHG emissions for the period 1 April 2020 to 31 March 2021

2020/21	Total Units	tCO2	tCO2e
Scope 1			
Gas consumption (kWh)	9,559,915	1,754	1,758
Gas Oil (litres)	33,330	91	92
Kerosene (litres)	0	0	0
LPG (litres)	0	0	0
Diesel (litres) - average biodiesel blend	673,729	1,692	1,715
Petrol (litres) – (average biofuel blend)	14,009	30	30
	Total Scope 1	***3,567***	**3,595**
Scope 2			
Purchased Electricity (kWh)	5,190,503	1,199	1,210
Scope 3			
Electricity - Transmission and distribution	5,190,503	103	104
Average petrol car (miles) - unknown fuel	66,802	19	19
Passenger travel – train, national rail (km)	74,262	3	3
Passenger travel – average local bus (km)	5,757	1	1
Water supply(m3)	50,250		17
Water treatment(m3)	50,250		36
	Total Scope 3	***126***	**180**
	Totals	**4,892**	**4,985**

Heating degree days *(to base 15.5^{o}C) for the Thames Valley Region for the 2020/21 reporting period were 2005.*

We have referenced heating degree day figures (to base 15.5 ^{o}C) for each reporting year as a rough indication of the severity of the heating season. This is not a precise assessment on a building per building basis accounting for heating loads, building fabric and other factors that may influence heating related consumption but solely used as an indicator of general heating demand. A lower degree day number indicates a less severe heating requirement and may have an influence on quantity of gas used.

Table 4: Summary of annual underlying GHG emissions (tCO2e) for period 1 Apr 2016 to 31 March 2021 with scopes indicated in brackets ( )

Scopes in ( )	2016/17	2017/18	2018/19	2019/20	2020/21
Gas (1)	3,112	3,140	3,008	3,138	1,758
Gas Oil (1)	96	92	94	86	92
Kerosene (1)	10	10	10	11	0
LPG (1)	0	0	0	0	0
Diesel (1)	1,838	1,943	1,986	1,869	1,715
Petrol (1)	47	43	42	42	30
Electricity (2)	3,347	2,916	2,259	1,995	1,210
Electricity T&D (3)	303	273	193	169	104
Average petrol car - unknown fuel (3)	44	41	22	19	19
Passenger travel – train (3)	4	3	3	3	3
Passenger travel bus (3)	1	1	1	1	1
Water supply (3)	50	36	41	30	17
Water treatment (3)	103	74	84	62	36
Total tCO2e	**8,955**	**8,572**	**7,741**	**7,425**	**4,985**
Degree days	1995	2118	1878	1990	2005

The above data from Table 4 is further detailed in the stacked bar chart below to show the overall trends in underlying emissions at the appropriate annual conversion factors supplied:

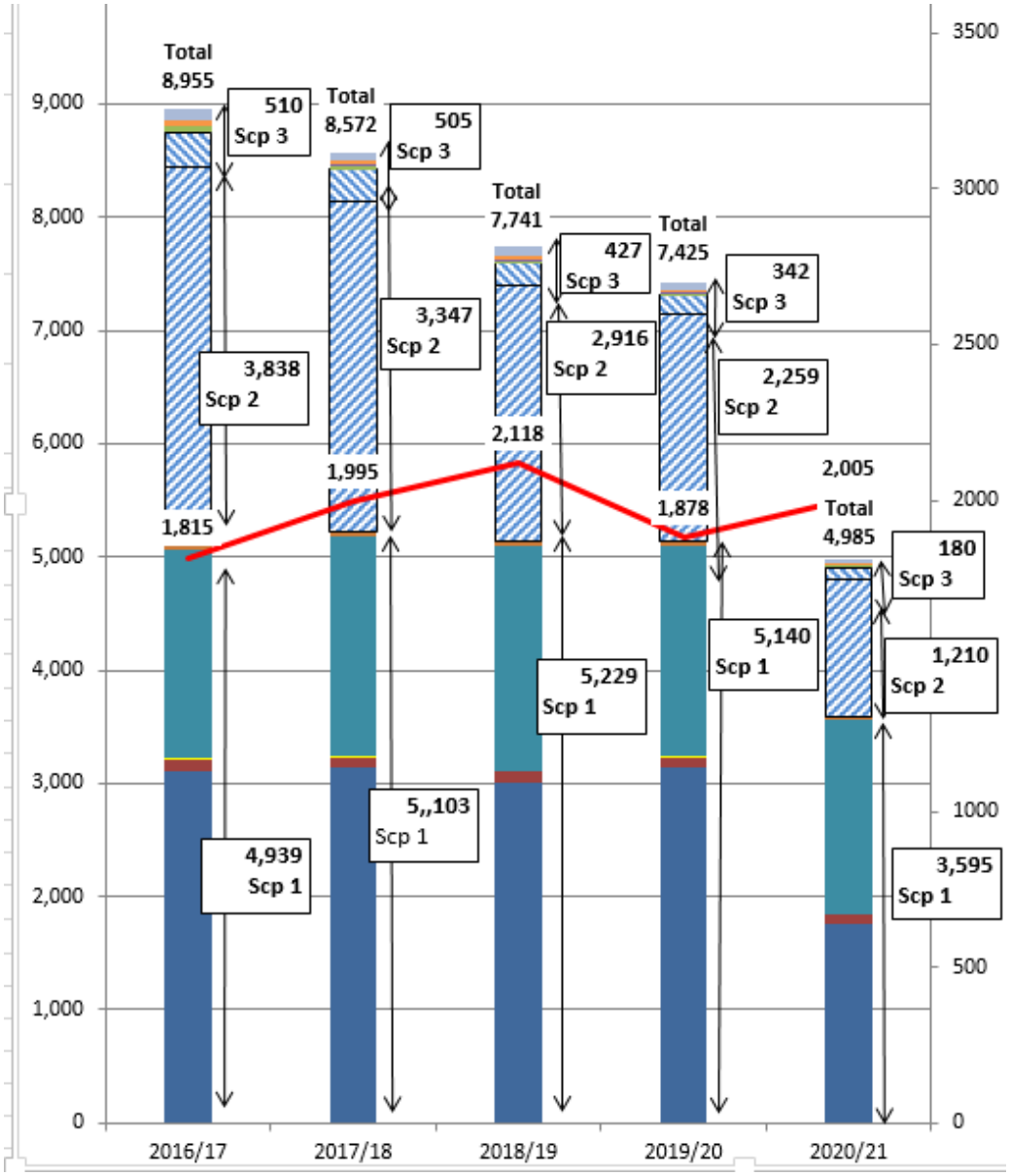

Chart 1: Stacked bar chart showing GHG emissions (tCO2e) from all three scopes for the past five reporting years (2016/17 to 2020/21).

7. Base Year

Our GHG reporting process follows the Net Zero by 2030 trajectory outlined in our Carbon Management Plan 4 approved in February 2021 ("Zero Carbon Council by 2030"). The plan commits to Net Zero by 2030 from a 2019/20 base year.

8. Targets and progress towards them

In the Carbon Management Plan covering this reporting period (2021 - 2030), the Council CO_2 reduction target for 2020/21 is to reach Net Zero Carbon by 2030 which translates to an equivalent trajectory of reducing emissions by 10% per year.

In terms of year-on-year reductions in underlying emissions, our total GHG emissions in 2020/21 (scopes 1, 2, and 3 as outlined in Sections 5 and 6 above) **were reduced,**

compared to the previous year 2019/20, by 32.9%(CO_2e). This reduction is significantly impacted by the COVID 19 lockdowns with buildings (in particular Leisure centres) being closed for long periods of time.

Over the period 2015/16 to 2020/21 our underlying CO_{2e} emissions have decreased by 46.3%.

In terms of estate-wide electricity and gas consumption, **a 33.5% decrease in electricity consumption** and **a 44% decrease in gas consumption** has been observed. A 0.7% increase in heating degree days was observed in 2020/21 compared to the previous year and will have led to increased demand on gas and heating related consumption in buildings due to lower external temperatures.

Chart 2 below maps current progress towards the Net Zero by 2030 target. Clearly the 2020/21 performance reflects the significant reduction in consumption due to building closures and other reductions in activities as a result of COVID lockdowns and cannot be attributed fully to carbon reduction progress. Emissions will likely increase in the following reporting year as buildings and activities return to near normal operation.

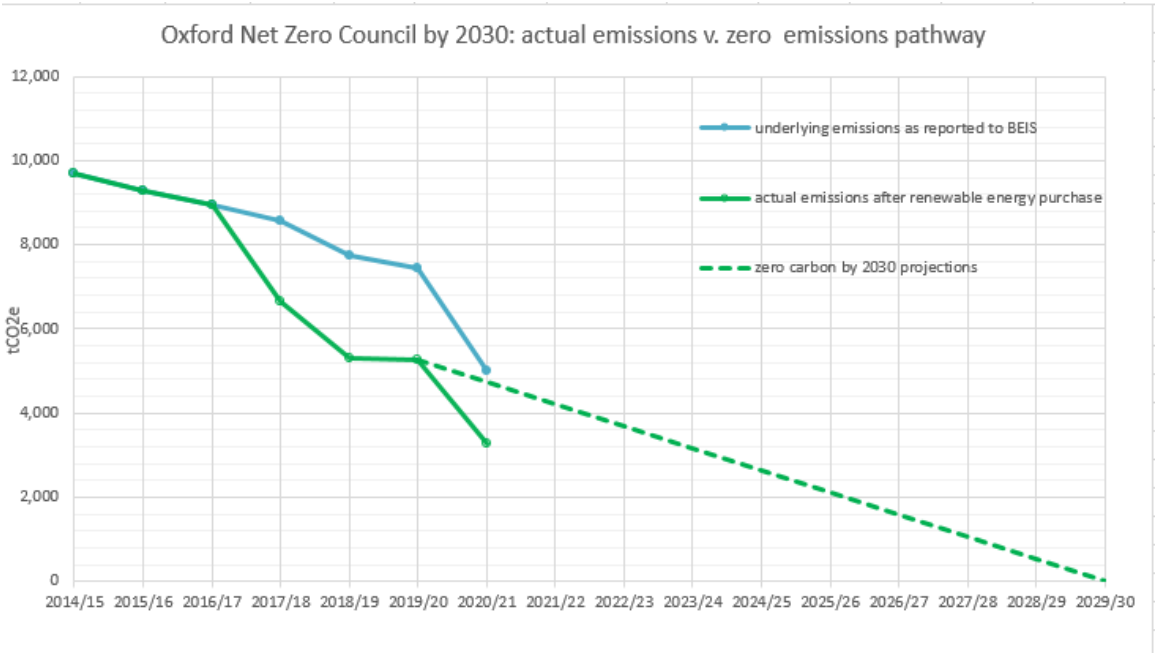

Chart 2: Net Zero by 2030 progress and required trajectory. The firm blue line highlights the underlying emissions progress (i.e. not factoring in green energy purchase); the firm green line highlights progress factoring in green energy purchase with the green dotted line showing required trajectory to meet the Net Zero by 2030 target. (Note: 2020/21 reporting year is affected by Covid lockdowns with many offices and leisure facilities closed or at reduced occupancy.)

9. Renewable energy installations

Oxford City Council has continued to implement renewable energy installations to generate on-site electricity and reduce its use of grid-sourced electricity. In 2020/21 the council's total installed Solar PV capacity exceeded 1MW. Further Solar PV

installations are planned in 2021/22 and beyond including investigating options around investment and purchasing electricity from local solar farms.

10. Purchase of renewable energy

The council has been purchasing 100% green electricity across its portfolio for the past four years from renewable energy guarantee of origin (REGO) sourced supplies. In 2020/21 the council also commenced purchased of ca 10% of its gas from renewable gas guarantee of origin (RGGO) sourced supplies (see Table 5 below). This does not impact the underlying emissions as reported above but demonstrates council support for the development of overall renewable energy capacity across the UK's energy mix, alongside its investment in onsite generation capacity across the Council's own estate. The Council is also actively looking to further green its electricity purchase options through power purchase agreements (PPAs) with local renewable energy generators and through investment in local solar farms.

tCO2e	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	% change since 2014/15
Total gross emissions	9,703	9,286	8,955	8,572	7,741	7,425	4,985	-48.62%
Renewable energy purchase (REGO)	0	0	0	1,922	1,997	2,164	1,314	
Green Gas purchase (RGGO)	0	0	0	0	0	0	381	
Total net emissions	**9,703**	**9,286**	**8,955**	**6,650**	**5,744**	**5,261**	**3,290**	**-66.09%**

Table 5: Total net emissions (tCO2e) allowing for renewable energy purchase

11. Sustainable Buildings

The Council continues to invest in the upgrade of its estate with a programme of refurbishments and new build projects. Where possible energy efficiency solutions that go beyond minimum building regulation requirements (and other sustainability measures) are implemented. The Council's own planning requirement for the city for new build developments requires a 40% reduction on regulated energy carbon emissions, compared to a Building Regulations compliant base case. This requirement influences new Council buildings as well as those built by other developers in the city, indeed the council wants its own development to go beyond the 40% target to demonstrate local leadership.

12. External Assurance Statement

Energy and water data is validated and managed via a market leading energy bureau database package (Team Sigma) coupled with in-house expertise in this area.

Team members managing the energy/carbon related programmes at the Council include a Certified Energy Manager and Certified Measurement & Verification

Professional, BREEAM Accredited Professionals, BREEAM-in-Use Assessor, Public Building Energy Assessor, professionals with Energy Institute qualifications and membership (eg TEMOL and MEI status) and membership of the Association of Energy Engineers (AEE) with one team member being a regular Board member for the UK Chapter of the AEE.

Governance: Mish Tullar, Head of Corporate Strategy has overall accountability and is responsible for the achievement of the target. Councillor Tom Hayes, Deputy Leader and Cabinet Member for Green Transport and Zero Carbon Oxford is responsible for this work area. Internal assurance and governance for the Carbon Management Programme and related work area is provided through engagement with the aforementioned officers.

Appendix 1: Total GHG emissions for the last three reporting years (2017/18, 2018/19 and 2019/20)

Table a: Total GHG emissions for the period 1 April 2017 to 31 March 2018

2017/18	Total Units	tCO2	tCO2e
Scope 1			
Gas consumption (kWh)	17,050,077	3,134	3,140
Gas Oil (litres)	31,284	85	92
Kerosene (litres)	4,000	10	10
LPG (litres)	0	0	0
Diesel (litres) - average biodiesel blend	747,373	1,927	1,943
Petrol (litres) –(average biofuel blend)	19,571	43	43
	Total Scope 1	***5,199***	**5,228**
Scope 2			
Purchased Electricity (kWh)	8,294,434	2,894	2,916
Scope 3			
Electricity - Transmission and distribution	8,294,434	270	273
Average petrol car (miles) - unknown fuel	141,074	41	41
Passenger travel – train, national rail (km)	62,049	3	3
Passenger travel – average local bus (km)	6,627	1	1
Water supply(m3)	104,266	0	36
Water treatment(m3)	104,266	0	74
	Total Scope 3	***315***	**428**
	Totals	**8,408**	**8,572**

* Defra emissions factors guidance – last updated June 2017 used https://www.gov.uk/measuring-and-reporting-environmental-impacts-guidance-for-businesses

estimated derived from financial data

a – Defra Emissions Conversion factor tool used (2017 data) http://www.ukconversionfactorscarbonsmart.co.uk/

Heating degree days (to base 15.5^{o}C) for the Thames Valley Region for the 2017/18 reporting period were **2118**.

Table b: Total GHG emissions for the period 1 April 2018 to 31 March 2019

2018/19	Total Units	tCO2	tCO2e
Scope 1			
Gas consumption (kWh)	16,350,720	3,002	3,008
Gas Oil (litres)	31,519	86	94
Kerosene (litres)	4,000	10	10
LPG (litres)	0	0	0
Diesel (litres) - average biodiesel blend	756,083	1,958	1,986
Petrol (litres) –(average biofuel blend)	19,153	42	42
	Total Scope 1	**5,098**	**5,140**
Scope 2			
Purchased Electricity (kWh)	7,979,685	2,241	2,259
Scope 3			
Electricity - Transmission and distribution	7,979,685	191	193
Average petrol car (miles) - unknown fuel	75,515	22	22
Passenger travel – train, national rail (km)	70,068	3	3
Passenger travel – average local bus (km)	5,356	1	1
Water supply(m3)	118,033		41
Water treatment(m3)	118,033		84
	Total Scope 3	**216**	**342**
	Totals	**7,556**	**7,741**

* Defra emissions factors guidance – last updated June 2018 used https://www.gov.uk/measuring-and-reporting-environmental-impacts-guidance-for-businesses

estimated derived from financial data

a – Defra Emissions Conversion factor tool used (2018 data) http://www.ukconversionfactorscarbonsmart.co.uk/

Heating degree days (to base 15.5ºC) for the Thames Valley Region for the 2018/19 reporting period were **1878**.

Table c: Total GHG emissions for the period 1 April 2019 to 31 March 2020

2019/20	Total Units	tCO2	tCO2e
Scope 1			
Gas consumption (kWh)	17,067,643	3,132	3,138
Gas Oil (litres)	31,196	85	86
Kerosene (litres)	4,000	10	11
LPG (litres)	0	0	0
Diesel (litres) - average biodiesel blend	720,318	1,844	1,869
Petrol (litres) - average biofuel blend	19,032	42	42
	Total Scope 1	***5,113***	**5,146**
Scope 2			
Purchased Electricity (kWh)	7,805,098	1,979	1,995
Scope 3			
Electricity - Transmission and distribution	7,805,098	168	169
Average petrol car (miles) - unknown fuel	66,802	19	19
Passenger travel – train, national rail (km)	74,262	3	3
Passenger travel – average local bus (km)	5,757	1	1
Water supply (m3)	87,415		30
Water treatment (m3)	87,415		62
	Total Scope 3	***191***	**284**
	Totals	**7,282**	**7,425**

Heating degree days *(to base 15.5^{o}C) for the Thames Valley Region for the 2019/20 reporting period were 1990.*