Environmental Sustainability

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OXFORD CITY COUNCIL

Greenhouse Gas Emissions from Local Authority own estate and operations

Reporting year 2021-22

Oxford City Council

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Greenhouse Gas Emissions (GHG) from Local Authority own estate and operations covering financial year 2021/22

Foreword

This report includes our annual review of Oxford City Council's progress in reducing greenhouse gas emissions. Each year we publish our annual update on our work to reduce the Council's emissions – meaning our buildings and operations where we pay the energy, fuel and water bills.

In last year's report (2020/21) we saw the impact that the coronavirus pandemic and strict lockdowns had on our operations and therefore our annual emissions. Buildings are large contributor to our emissions as a Council, and the temporary closure of Council buildings such as leisure centres had a large impact on our annual emissions – resulting in a 31% decrease overall.

However, we knew that this figure was an outlier, and we anticipated that our 2021/22 report would see an increase in emissions, as we returned to near-normal business operations. And, that is exactly what we can see in this report.

As expected, this year we can see that there was a 27% increase in emissions compared to 2020/21 levels – with our annual emissions at 6,314 CO2e in 2021/22.

However, when this figure is compared with pre-pandemic levels, we can see a much more positive, and accurate representation of our progress as a Council – with a 15% decrease in emissions compared to 2019/20 levels.

When taking a wider look at our journey, we can observe a 26.3% decrease in emissions over the past five years (2017/2018 - 2021/22), and if we look at longer term trends, since our first annual report in 2014/15, we have achieved a 54% reduction in emissions.

We publish this annual data in order to be transparent and open about our journey to net zero and the work that we are doing within our own organization to address the climate emergency.

In 2021/22 we commenced a £14 million programme to install heat pumps at several of our leisure centres, including Hinksey Outdoor Pool. We also saw the launch of Europe's most powerful electric vehicle charging hub at Redbridge Park & Ride. While it is still too early to see the impact of these two significant projects in this year's report, they are both indicators of our ongoing ambition and commitment to achieving a Net Zero Carbon Council by 2030.

However, as an organization, Oxford City Council is responsible for just 1% of Oxford's overall emissions. That why it is critical for the Council to continue to work together with partners, such as via the Zero Carbon Oxford Partnership to tackle emissions as a city towards meeting the Net Zero Carbon City by 2040 goal..

I am pleased with our progress in this reporting year, and I am looking forward to working with officers, partners, councilors, and members of the public on continuing to tackle the climate emergency in Oxford.

Councillor Anna Railton, Cabinet Member for Net Zero and Climate Justice

Greenhouse Gas Emissions (GHG) from Local Authority own estate and operations covering financial year 2021/22

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 (https://www.oxford.gov.uk/news/article/2010/oxford_to_zero).

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 – *note average petrol car - unknown fuel conversion factor used for staff vehicles - due to not being materially significant to total CO2 emissions reported to determine fuel type for each individual vehicle*)

- 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 2021/22 (as well as including details of emissions from the previous 3 years

2018/19, 2019/20 and 2020/21). CO_2e is a metric measure used to compare the emissions from various greenhouse gases on the basis of their global warming potential (GWP), by converting amounts of other greenhouse gases (methane, nitrous oxide etc) to the equivalent amount of carbon dioxide with the same global warming potential. A summary of 2021/22 GHG emissions included in this report are outlined in Table 1 below. 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 2021/22)

Table 1: Total GHG emissions for the period 2021/22

Total GHG emissions for period 1 April 2021 to 31 March 2022		
	Tonnes of CO_2	**Tonnes of CO_2e**
Year	**2021/22**	**2021/22**
Scope 1	4,673	4,695
Scope 2	1,428	1,442
Scope 3	136	177
Total core GHG emissions	**6,236**	**6,314**

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 2021 – 31 March 2022.

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 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="5">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 (transmission 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>
<tr><td></td><td>Half-hourly metered and non-half-hourly metered electricity supplies (ie HH, P272 meters and Unmetered Supplies)</td><td></td><td>Emissions from goods and services purchased and employed to conduct council business and operations. Council financial investments.</td></tr>
</table>

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 (2021/22) 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 2021 to 31 March 2022

2021/22	Total Units	tCO2	tCO2e
Scope 1			
Gas consumption (kWh)	15,299,817	2,808	2,802
Gas Oil (litres)	17,407	85	86
Kerosene (litres)	0	0	0
LPG (litres)	0	0	0
Diesel (litres) - average biodiesel blend	710,857	1,759	1,786
Petrol (litres) – (average biofuel blend)	9,394	20	21
	Total Scope 1	***4,673***	**4,695**
Scope 2			
Purchased Electricity (kWh)	6,793,611	1,428	1,442
Scope 3			
Electricity - Transmission and distribution	6,793,611	126	128
Average petrol car (miles) - unknown fuel	32,741	9	9
Passenger travel – train, national rail (km)	4,847	0	0
Passenger travel – average local bus (km)	426	0	0
Water supply(m3)	94,531		14
Water treatment(m3)	94,531		26
	Total Scope 3	***136***	**177**
	Totals	**6,236**	**6,314**

Heating degree days *(to base 15.5°C) for the Thames Valley Region for the 2021/22 reporting period were 1945.*

* Defra emissions factors guidance – published June 2021 used https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting

We have referenced heating degree day figures (to base 15.5 °C) for each reporting year as a rough indication of the severity of the heating season. Heating degree days are a measure of how much (in degrees), and for how long (in days), the outside air temperature was below a certain level. They are commonly used in calculations

relating to the energy consumption required to heat buildings[1]. 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 or electricity if used for heating.

		2017/18	2018/19	2019/20	2020/21	2021/22
Scope 1	Gas consumption	3,140	3,008	3,138	1,758	2,802
Scope 1	Gas Oil	92	94	86	92	86
Scope 1	Kerosene	10	10	11	0	0
Scope 1	LPG	0	0	0	0	0
Scope 1	Diesel	1,943	1,986	1,869	1,715	1,786
Scope 1	Petrol	43	42	42	30	21
Scope 2	Electricity - Purchased	2,916	2,259	1,995	1,210	1,442
Scope 3	Electricity - Transmission and distribution	273	193	169	104	128
Scope 3	Average petrol car - unknown fuel	41	22	19	19	9
Scope 3	Passenger travel – train, national rail	3	3	3	3	0
Scope 3	Passenger travel – average local bus	1	1	1	1	0
Scope 3	Water supply	36	41	30	17	14
Scope 3	Water treatment	74	84	62	36	26
	Total	**8,572**	**7,741**	**7,425**	**4,985**	**6,314**
	Scope 1	**5,229**	**5,140**	**5,146**	**3,595**	**4,695**
	Scope 2	**2,916**	**2,259**	**1,995**	**1,210**	**1,442**
	Scope 3	**427**	**342**	**284**	**180**	**177**

Table 4: Summary of annual underlying GHG emissions (tCO2e) for period 1 Apr 2017 to 31 March 2022

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:

[1] https://www.degreedays.net/introduction

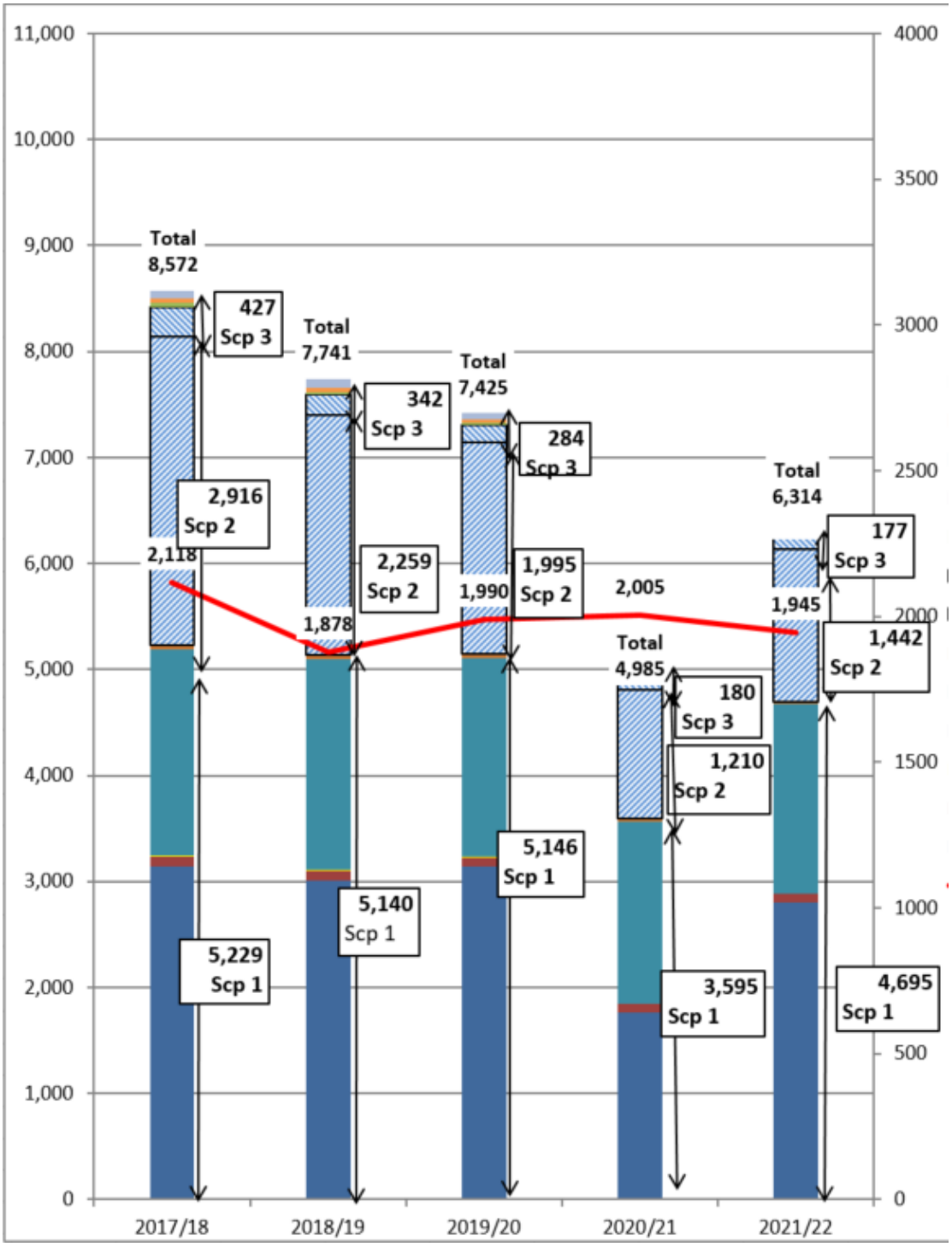

Chart 1: Stacked bar chart showing GHG emissions (tCO2e) from all three scopes for the past five reporting years (2017/18 to 2021/22). *Note: Red line shows heating degree day level for each reporting year. A higher figure indicates more days during the year when building heating demand was required which can impact on gas consumption and related carbon emissions.*

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.

In terms of year-on-year assessment of underlying emissions, our total GHG emissions in 2021/22 (scopes 1, 2, and 3 as outlined in Sections 5 and 6 above) **increased by ca 27% compared to the previous year 2020/21**. This increase was expected and significantly impacted by the COVID 19 lockdowns with buildings (in particular Leisure centres) being closed for long periods of time during 2020/21.

Comparing emissions against the previous business as usual year (2019/20) shows a ca 15% reduction in tCO2e and associated reductions in electricity and gas consumption of 13% and 10.4% respectively. Heating degree days (at 15.5 degree base temperature) were quite closely matched during these two reporting years 2019/20 = 1995 compared with 2021/22 = 1945 - a ca 2.5% reduction in heating degree days in 201/22 which could have assisted in reducing gas related carbon emissions due to lower external temperatures.

Over the period 2017/2018 to 2021/22 our underlying CO_{2e} emissions have decreased by 26.3%. Chart 2 below maps current progress towards the Net Zero by 2030 target.

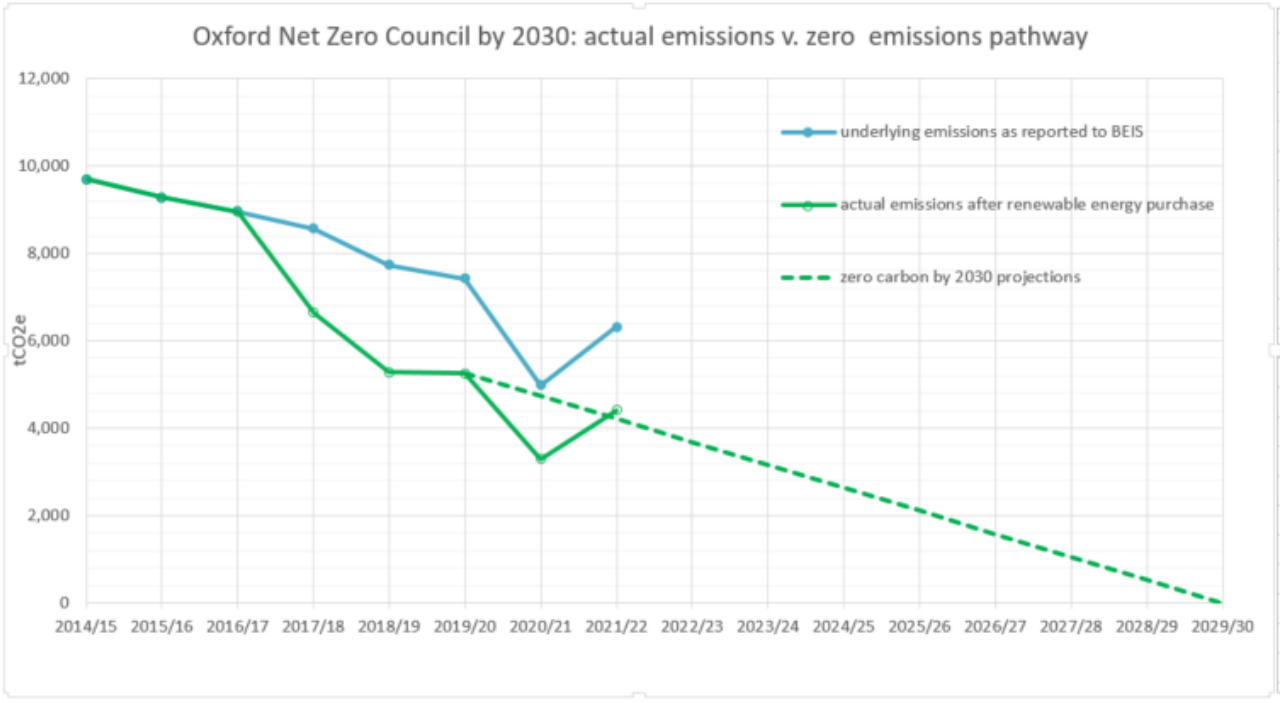

Chart 2: Net Zero by 2030 progress and required trajectory. The firm blue line highlights the underlying emissions progress (i.e. not factoring in green energy purchase). The green line shows progress accounting for green energy purchase with the dotted line showing the trajectory required to meet Net Zero.

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 2021/22 the council's total installed Solar PV capacity exceeded 1MW. Further Solar PV installations are planned in 2022/23 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. However the council has since taken the decision to stop these purchases until provenance of these REGO supplies improves demonstrating greater transparency, additionality and preferably sourced from local renewable energy sources. The current price for purchasing REGOs and equivalent gas certificates (RGGOs) has increased significantly in recent years and the premiums for these are now being diverted in to internal funds to tackle carbon emissions within the direct estate and operations at the council. As such standard REGO purchases will not be counted in future years reporting until provenance/accessibility of higher quality REGOs can be sourced in line with current guidance[2]. Towards this end the Council is now actively seeking electricity purchase options through power purchase agreements (PPAs) or related arrangements with local renewable energy generators and through investment in local renewable energy generation. It is only these latter supplies where the council is receiving and retiring REGOs that will be counted towards net emissions in future reporting years or until standard REGO provenance improves and/or the grid fully decarbonises.

tCO2e	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	% change since 2014/15
Total gross emissions	9,703	9,286	8,955	8,572	7,741	7,425	4,985	6,314	-34.93%
Renewable energy purchase (REGO)	0	0	0	1,922	1,997	2,164	1,314	1,570	
Green Gas purchase (RGGO)	0	0	0	0	0	0	381	337	
Total net emissions	**9,703**	**9,286**	**8,955**	**6,650**	**5,744**	**5,261**	**3,290**	**4,407**	**-54.58%**

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

[2] https://ukgbc.s3.eu-west-2.amazonaws.com/wp-content/uploads/2021/03/08140719/Renewable-Energy-Procurement-Carbon-Offsetting-Guidance-for-Net-Zero-Carbon-Buildings.pdf

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).

Governance: Mish Tullar, Head of Corporate Strategy has overall accountability and is responsible for the achievement of the target. Councillor Anna Railton, Cabinet Member for Net Zero and Climate Justice 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 and relevant steering groups (eg Net Zero Carbon Steering Group).

Appendix 1: Total GHG emissions for the last three reporting years (2018/19, 2019/20 and 2020/21)

Table a: 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 published June 2018 used https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting

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

Table b: 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°C) for the Thames Valley Region for the 2019/20 reporting period were 1990.*

* Defra emissions factors guidance – published June 2019 used https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting

Heating degree days (to base 15.5°C) for the Thames Valley Region for the 2019/20 reporting period were 1990.

Table c: Total GHG emissions for the period 1 April 2020 to 31 March 2021 **(the main COVID-19 impact year so unreflective of business as usual consumption/emissions)**

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°C) for the Thames Valley Region for the 2020/21 reporting period were 2005.*

* Defra emissions factors guidance – published June 2020 used

https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting

Heating degree days (to base 15.5°C) for the Thames Valley Region for the 2020/21 reporting period were 2005 .