Environmental Sustainability

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OXFORD CITY COUNCIL

Greenhouse Gas Emissions from Local Authority own estate and operations

Reporting year 2019-20

Oxford City Council

Date: January 2021
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Greenhouse Gas Emissions (GHG) from Local Authority own estate and operations covering financial year 2019/20

Foreword

This report includes our annual review of Oxford City Council's progress in reducing greenhouse gas emissions. In 2019-20, the City Council achieved a 4.1% reduction in underlying carbon emissions and an 8.4% reduction in emissions after allowing for the purchase of only certified renewable electricity, compared with the previous year.

The City Council has had an ongoing target of implementing measures to reduce CO2 emissions by 5% of its previous year's emissions. The Council has met this target in 2019/20 and, therefore, continued our trend of reducing emissions.

Our reductions in underlying emissions in this reporting period can be explained by a 6% decrease in CO_2e from vehicle fuel as the Council continues to transition to an electric vehicle fleet, a 3.5% decrease in CO_2e from leisure centres, and continued national grid decarbonisation. We have secured Salix funding to increase the size of our revolving loan fund to £1m to fund a range of energy efficiency measures, and in this reporting year, we have used it to install one of the UK's largest car park solar canopy installations.

We are generating the equivalent of about 11% of our total electricity consumption from solar PV installed on Council buildings. We buy all our electricity from certified renewable sources (REGO- Renewable Electricity Guarantee of Origin) to support national investment in renewable energy generation.

Since 2014/15, the City Council has achieved a 23.5% reduction in underlying CO_{2e} emissions and a 45.8% reduction in emissions after allowing for the purchase of only certified grid renewable electricity.

Business as usual—with a 5% year on year reduction target—will get us about half-way towards our zero carbon by 2030 vision. We want to turn this vision into reality, which requires a doubling of emissions reduction to 10% per year.

Our climate is changing faster, to a greater extent, and in new and unexpected ways. When we look at the science, it can be hard to find hope. But, when we go out to look for hope, we can find it in the work of citizens. This Council is proud to support local citizens and join them with our own decarbonisation.

Our emissions account for 1% of the city's emissions, but we strive to be zero carbon because protecting all our futures is the right thing to do and we seek to lead others down the same path through the power of our example. The Carbon Management Plan within which this report lies is, therefore, being updated.

That new update will be ambitious, in line with the Council's history of green ambition for our citizens. Indeed, it is the ambitious target that we set long before we declared a climate emergency which made possible the reductions that we see in this review. Ambition secures the further investment which will enable further reductions.

The Council has secured £1.6m for the installation of floating solar panels and water source heat pumps at Hinksey Outdoor Swimming Pool — estimated to reduce the site's carbon emissions by 50% per year from 2021 — and another £9.3million for heat pump and solar projects at five other sites on the council's carbon footprint. In total these projects could reduce carbon emissions by over 1,500tCO_2 per year which

is equivalent to about 3 years of carbon reduction progress the Council needs to achieve to meet its zero carbon by 2030 goal. And, from 2021, Oxford will become home to a Zero Emission Zone, the UK's largest public EV charging Superhub, and yet more EV charging infrastructure, including trials of technologies, all to reduce emissions from transportation. The city and the county will continue to be home to two of the four demonstrator energy projects funded across the UK, including smart energy grids to maximize the use of and further develop renewable energy as part of LEO (Local Energy Oxfordshire) and ESO (Energy Superhub Oxford).

If you want to feel optimistic about the power of government to address our problems and build a better future, look at local government. Councils up and down the country are leading the way in meeting our climate crisis. They do so in ways which produce economic and social co-benefits, and Oxford City Council has been in the vanguard of this national effort since we began managing carbon emissions from our estate and operations in 2008.

We publish annual updates about our progress against the Council's targets to build trust in politics and our commitment to our pledges, but also to identify the need and methods for improvement. This review brings good news at a time when everyone concerned by the worsening climate crisis needs to galvanise a redoubling of effort.

We are taking the opportunity presented by our annual update to call on partners and other emitters to set high ambition in responding to the climate emergency we face. This City Council is stepping up our ambition in line with what the science tells us is necessary and possible and we are setting a course for a Zero Carbon Council.

Councillor Tom Hayes, Deputy Leader and Cabinet Member for Green Transport and Zero Carbon Oxford

1. Introduction

Oxford City Council is currently delivering its third Carbon Management Strategy and Implementation Plan (Carbon Management Plan 3: Continual improvement in carbon and cost reduction) covering the 5 years from 2017/18 to 2021/22 mapping a route to continual improvement in carbon and energy management, driving down energy, fuel and water costs and their associated carbon dioxide emissions.

During the course of the third Carbon Management Plan, 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 council by the end of 2021**: delivered initially through the purchase of renewable energy and offsetting, followed by an acceleration of existing and new programmes to reduce the Council's underlying emissions.

2. **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 our business travel and water consumption.

3. **Zero Carbon City before 2045**: 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. A Zero Carbon Summit is set to be held on 4 February 2021 to review the zero-carbon target and map out five-yearly carbon budgets.

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 2019/20 (as well as including details of emissions from the previous 3 years 2016/17, 2017/18 and 2018/19). 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 2019/20 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 2019/20)

Table 1: Total GHG emissions for the period 2019/2020

Total GHG emissions for period 1 April 2019 to 31 March 2020		
	Tonnes of CO_2	**Tonnes of CO_2e**
Year	**2019/20**	**2019/20**
Scope 1	5,113	5,146
Scope 2	1,979	1,995
Scope 3	191	284
Total core GHG emissions	**7,282**	**7,425**

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 2019 – 31 March 2020.

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 significant 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 (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>
<tr><td></td><td>Half-hourly metered and non-half-hourly metered electricity supplies (ie Meter profile classes 01-08, HH 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 (2019/20) is outlined in Table 3 below. Headline figures over the last five years (including the current reporting year) are detailed in Table 3 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 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.*

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. 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 2015 to 31 March 2020 with scope 3 indicated in brackets ( )

Scopes in ( )	2015/16	2016/17	2017/18	2018/19	2019/20
Gas consumption (1)	2,946	3,112	3,140	3,008	3,138
Gas Oil (1)	106	96	92	94	86
Kerosene (1)	10	10	10	10	11
LPG (1)	0	0	0	0	0
Diesel (1)	1,832	1,838	1,943	1,986	1,869
Petrol (1)	44	47	43	42	42
Electricity – Purchased (2)	**3,838**	**3,347**	2,916	2,259	1,995
Electricity - Transmission and distribution (3)	317	303	273	193	169
Average petrol car - unknown fuel (3)	38	44	41	22	19
Passenger travel – train, national rail (3)	4	4	3	3	3
Passenger travel – average local bus (3)	1	1	1	1	1
Water supply (3)	49	50	36	41	30
Water treatment (3)	101	103	74	84	62
Total tCO2e	**9,286**	**8,955**	**8,572**	**7,741**	**7,425**
Degree days	1815	1995	2118	1878	1990

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:

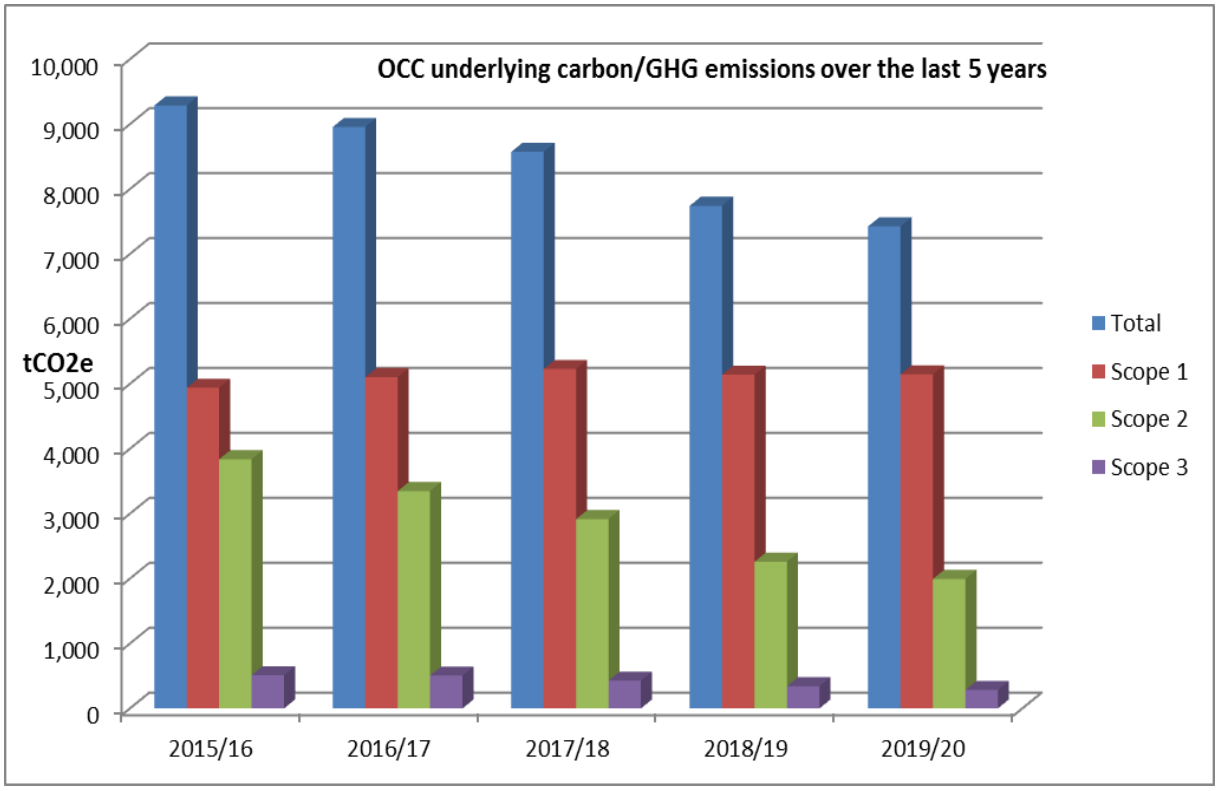

Chart 1: Stacked bar chart showing GHG emissions (tCO2e) from all three scopes for the past five reporting years (2015/16 to 2019/20).

7. Base Year

Our base year for this GHG reporting process is 2018/19 (the previous reporting year) as this is aligned with our 5% year on year target, outlined in our Carbon Management Plan 3 approved in February 2017 ("Continual improvement in carbon and cost reduction").

8. Targets and progress towards them

In the Carbon Management Plan covering this reporting period (2017 - 2022), the Council CO_2 reduction target for 2019/20 was to implement carbon reduction measures equivalent to a minimum of 5% of the previous year's emissions (equivalent to 408tCO_2). In this reporting period, this target was exceeded. A range of carbon reduction and energy conservation measures were implemented in 2019/20 and tracked during the reporting year delivering a total calculated reduction of 528tCO2/year.

Examples of carbon reduction measure implemented in 19/20		
LED lighting upgrades:	Barton Neighbourhood Centre, Barton Leisure centre Swimming pool hall and Ferry Leisure centre Swimming pool hall	27 tCO2

Monitoring & targeting savings	targeting and correcting excess consumption issues arising	7 tCO2
PV	Solar PV installations in council owned/operated buildings and assets	22tCO_2
Fleet	Fleet electrification	40 tCO_2
Land management	Tree planting	93 tCO_2
NB. The impact of measures implemented in 2019/20 will not be fully represented in the carbon emissions data for the 2019/20 reporting year - they were implemented at periods throughout the reporting year so would not have had a full year's impact during the 2019/20 reporting period. The full impacts will be realised in subsequent reporting years.		

In terms of year-on-year reductions in underlying emissions, our total GHG emissions in 2019/20 (scopes 1, 2, and 3 as outlined in Sections 5 and 6 above) **were reduced compared to the previous year 2018/19 by 4.1%(CO_2e)**. This reduction is likely to have been impacted by a combination of recently implemented carbon reduction measures and continued electricity decarbonisation. Our emissions after purchase of 100% REGO electricity have reduced by 8.4%.

Over the period 2014/15 to 2019/20 our underlying CO_{2e} emissions have decreased by 23.5%, and our emissions after purchase of REGO electricity have reduced by 45.8%

In terms of estate-wide electricity and gas consumption, **a 2.2% decrease in electricity consumption** and **a 4.4% increase in gas consumption** has been observed. A 6.0% increase in heating degree days was observed in 2019/20 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. Further analysis of GHG reduction performance is outlined in the following section against significant intensity measurements.

Governance: Tim Sadler, Executive Director has overall accountability and Jo Colwell, Environmental Sustainability Manager 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.

9. Intensity measurements

This section provides more detail on underlying trends in GHG emission data against significant intensity measurements related to areas of activity at the Council.

a. Leisure centre emissions

Leisure centre buildings are the council's biggest underlying emissions sources accounting for over 44% of building related GHG emissions.

Leisure centre related CO_2e emissions decreased by 3.5% in 2019/20 compared to the previous year. Some of this CO_2 reduction is accounted for by the reduction in electricity carbon intensity, however electricity consumption also reduced by 2.6% whilst gas consumption increased by 2.4%. The increased heating degree day impacts will account for a portion of the gas increase observed.

Four of the five leisure centres are in the top 5 of OCC buildings with the largest CO_2 emissions.

Focussing on building carbon emissions reductions - and **in particular leisure centres** - will therefore be strengthened with deeper carbon reduction measures targeted in this area of the council's emissions.

Decarbonising heat will also need to be a focus to tackle the large proportion of gas related emissions across the estate in particular focusing on leisure centres, offices, depots, sheltered housing blocks and temporary accommodation units.

b. Commercial operations - increasing trading activity

The City Council has an "arms-length" trading company called Oxford Direct Services Ltd (ODS) which contributes a significant proportion towards the Council's overall carbon footprint as reported here. ODS carries out a range of commercial operations including gas and electrical works, vehicle maintenance, maintaining roads, collecting refuse and general construction operations. In 2019/20 ODS contributed a total of 2,307tCO2e or (31.1%) to the overall council footprint of 7,425 tCO2e.

The largest contribution (86%) is from the fleet fuel emissions due to operation of its refuse trucks, vans, tipper trucks, and miscellaneous plant in delivering its services and operations. This area therefore features as a key target of focus for emissions reductions predominantly through efforts to electrify the fleet as refuse trucks, vans and other vehicles make up ca 95% of the fleet emissions contribution.

Increases in GHG emissions related to this activity have been limited by gradual upgrading of the fleet to modern lower emission (including electric), more fuel-efficient vehicles as well as rolling out advanced driver training to educate drivers on techniques to conserve fuel consumed in vehicles. Regular eco-driver training and investment in vehicle telemetry, giving on-board engine management systems/alerts, are assisting this work.

Table 6 outlines changes in the make-up of the vehicle fleet in the last five years. Twenty-eight electric vehicles (EV) have now been added to the fleet in recent times with plans to expand the number of EVs significantly in future years up to 25% by 2023. A 100% electric refuse truck (26tonne Dennis eCollect) is being trialled during 2020/21 to assess the viability of this type of vehicle as a replacement for diesel consuming trucks in the current fleet. As well as significantly reducing whole life costs of vehicle fleets this will also contribute towards assisting with the Council's aspirations for implementing a world first Zero Emission Zone in Oxford city centre and towards meeting its zero-carbon target by 2030.

Table 6: Vehicle fleet numbers over the last six years

	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Vehicle Types	**quantity**	**quantity**	**quantity**	**quantity**	**quantity**	**quantity**
Car and Car derived vans	64	83	79	71	69	67
Electric vehicles				14	22	28
Misc light/heavy plant and ride on machinery	319	451	532	570	474	382
Trucks and tippers up to 3500kg GVW	66	73	72	65	56	57
Vans up to 3500kg	80	99	92	111	93	92
Vans, trucks and tippers between 3501 and 7500kg	18	13	20	10	10	9
Vans, trucks and tippers between 7501 and 18000kg	9	8	11	8	5	4
Refuse Collection	26	28	32	36	29	36
Sweepers	15	17	18	17	12	12
Tractors, shovels and light	19	11	7	6	7	5
Trailers	46	51	46	50	37	36
Totals	**662**	**834**	**909**	**958**	**814**	**728**

Note: The vehicle type "Misc light/heavy plant and ride on machinery" listed in the table above includes unlicensed/non-road going vehicles and plant such as ride on lawn mowers, leaf blowers, and strimmers.

10. 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 2019/20 the council's total installed Solar PV capacity exceeded 1MW. This equates to solar providing the equivalent of about 11% of the Council's total electricity from renewable energy installations, representing a carbon emissions reduction of about 250tCO2e. Further Solar PV installations are planned in 2020/21 and beyond including investigating options around investment and purchasing electricity from local solar farms.

11. Purchase of renewable energy

The council has been purchasing 100% green electricity across its portfolio for the past three years from renewable energy guarantee of origin (REGO) sourced supplies. 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. The following table (Table 7) however highlights the net emissions impact from green energy purchasing (REGO certified supplies) in the context of total CO_2e emissions. The council is taking this a step further by committing to purchase of ca10% of its gas supplies from certified green gas sources (RGGO) from October 2020.

tCO2e	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	% change since 2014/15
Underlying emissions	9,703	9,286	8,955	8,572	7,741	7,425	-23.48%
Renewable energy purchase (REGO)	-	-	-	1,922	1,997	2,164	
Net emissions	**9,703**	**9,286**	**8,955**	**6,650**	**5,744**	**5,261**	**-45.78%**

Table 7: Renewable energy purchase and tCO_2e emissions

The CO_2e emissions reduction progress accounting for green electricity purchase is illustrated in Chart 2 below. The solid blue line shows the underlying emissions reduction progress as detailed in Chart 1 above. The solid green line from 2016/17 onwards shows the impact of renewable energy guarantee of origin (REGO) certified electricity purchase on emissions. The red dotted line shows the trajectory of progress that would be achieved if the council continued on a 5% per year reduction scenario and continuing to purchase green energy. The green dotted line shows the trajectory required to meet the council's zero carbon by 2030 goal requiring the council to reduce its emissions by approximately 526tCO_2e per year until 2029/30.

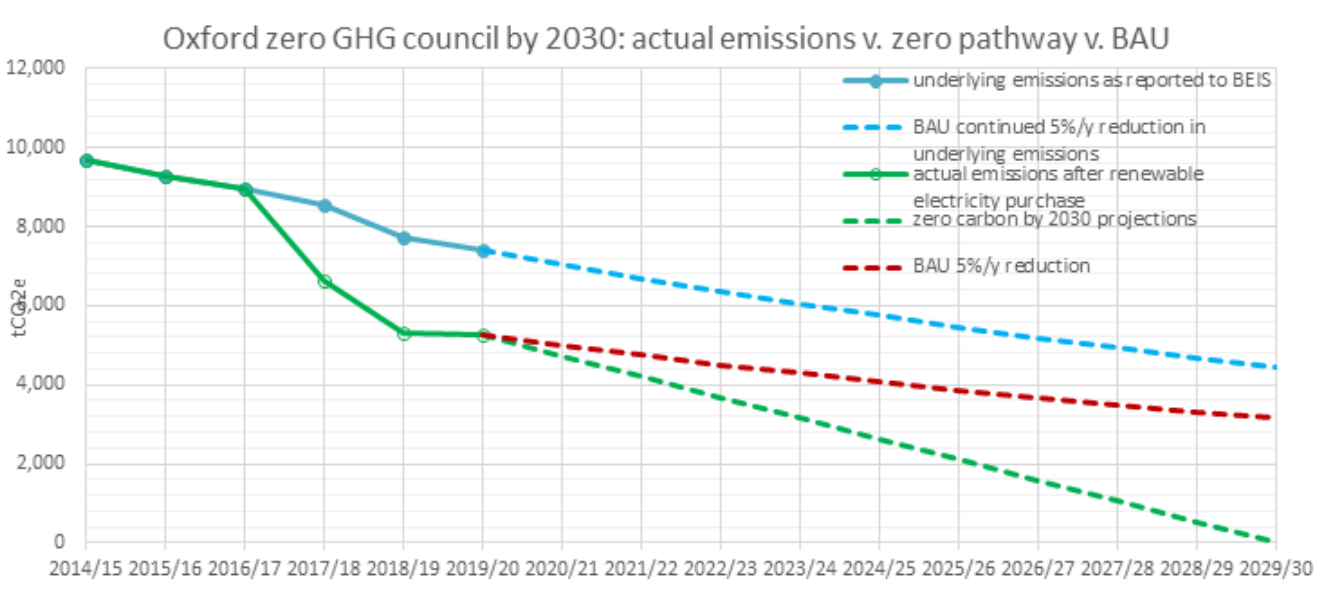

Chart 2: GHG emissions (tCO2e) progress from 2015/16 onwards including impact of green electricity purchase to date as well as trajectories under different emissions reduction scenarios.

12. 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.

13. 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.

Appendix 1: Total GHG emissions for the last three reporting years (2016/17, 2017/18 and 2018/19)

Table a: Total GHG emissions for the period 1 April 2016 to 31 March 2017

2016/17	Total Units	tCO2	tCO2e
Scope 1			
Gas consumption (kWh)	16,915,814	3,107	3,112
Gas Oil (litres)	32,412	88	96
Kerosene (litres)	4,000	10	10
LPG (litres)	0	0	0
Diesel (litres) - average biodiesel blend	703,669	1,823	1,838
Petrol (litres) –(average biofuel blend)	21,345	47	47
	Total Scope 1	***5,074***	**5,103**
Scope 2			
Purchased Electricity (kWh)	8,123,213	3,327	3,347
Scope 3			
Electricity - Transmission and distribution	8,123,213	301	303
Average petrol car (miles) - unknown fuel	147,119	44	44
Passenger travel – train, national rail (km)#	81,889	4	4
Passenger travel – average local bus (km)#	8,048	1	1
Water supply(m3)	145,136	0	50
Water treatment(m3)	145,136	0	103
	Total Scope 3	***350***	**505**
	Totals	**8,751**	**8,955**

* Defra emissions factors guidance – last updated June 2016 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 (2016 data) http://www.ukconversionfactorscarbonsmart.co.uk/

Heating degree days (to base 15.5^{o}C) for the Thames Valley Region for the 2016/17 reporting period were **1995**.

Table b: 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 c: 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 15.5^{o}C) for the Thames Valley Region for the 2018/19 reporting period were **1878**.