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OXFORD CITY COUNCIL

Zero Carbon Council by 2030

4th Carbon Management Plan

2021/22 – 2029/30

Foreword

The science is clear that our future is in our hands. We can choose rapid decarbonisation or an insufficiency of action. If we choose the latter, we do so in full knowledge that the climate impacts which result will deepen inequality and create new suffering.

This new Carbon Management Plan sets out how the City Council chooses decarbonisation and seeks to achieve it with all necessary speed and seriousness. We do so because we care about Oxford being a fairer, healthier, and prosperous city. We recognise the need to fuel an environmentally sustainable recovery from COVID-19 in the lifetime of this Plan.

In this Plan, we set a course to net zero carbon for direct activities in 2021 and zero carbon in all underlying emissions by 2030 or sooner. We respond to Oxford's Citizens' Assembly on Climate Change in 2019 and the Corporate Plan priority to build a Zero Carbon Oxford.

By 2030, the activities of Oxford City Council will no longer contribute to a worsening climate crisis from our use of gas, electricity, water, and fuel (Scope 1, Scope 2, and some Scope 3 emissions), with annual carbon emissions reduced to zero. We will no longer burn fossil fuels in our vehicles, which will have transitioned to electric or zero emission, and so not contribute to local air pollution which has negative impacts on public health. This is our commitment, our way to play our part in meeting the climate emergency, and galvanise similarly rapid and serious decarbonization by the city's other emitters.

This Plan does not start from scratch. We are not creating a new ambition, we're upping it. In the time between 2014/15 to 2019/20, our underlying CO_{2e} emissions decreased by 23.5% and 45.8% in emissions after the purchase of only certified grid renewable electricity. But, business as usual - with a 5% year on year reduction target - will get us about half of the way to zero carbon by 2030. Therefore, we up our ambition in this report to get the job done.

Getting the job done will not be easy. Zero Carbon by 2030 will be extremely challenging in a time of Government underfunding, particularly when that time has involved extra costs as we meet the needs of our city during COVID-19. Our funding gap to meet zero carbon by 2030 is estimated to be ca £2.2million ***each year*** to 2029/30. The recent procurement of £10.9m is encouraging, particularly as it will fund decarbonization of our leakiest buildings, but we must continue to procure more external funding and in ever-large amounts. This requires a whole Council approach and involves each team in bidding for funding and delivering Zero Carbon.

Getting the job done is not just a case of doing the right thing. It is also a case of growing Council income. We could benefit from sustainable and low carbon revenue streams and Oxford Direct Services (ODS) will deliver and build expertise in high-growth areas, which increases income and company dividend returns to the Council.
The enormity of tackling global climate change feels overwhelming. Many say that it can feel disempowering. By publishing this Plan, we break down the actions that will deliver our aims. Not only will this help the Council to play our civic role in tackling climate change, it—and our reporting on our progress—shows the outside world that the challenge need not be so scary.

That matters. Our carbon emissions account for only 1% of citywide emissions but getting to Zero Carbon can help to galvanise others to follow our lead. With the launch of our Zero Carbon Oxford partnership, our new Carbon Management Plan enables us to honour our pledges to partners, so that, together, we can meet our climate crisis.

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

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1. Part 1: Why does Oxford City Council need to act?

a. Context

Oxford City Council declared a climate emergency in January 2019. Following the Oxford's Citizens' Assembly on Climate Change, the Council set out its commitment to become net zero carbon, while developing detailed plans "for further projects to accelerate the reduction in the Council's underlying emissions to achieve a Zero Carbon Council by 2030 or sooner".[1]

In 2021, the City Council will become "net zero carbon" for its direct activities – i.e. where it pays the bill, delivered through the purchase of renewable energy and offsetting (in line with the Council's offsetting policy). This target will accompany an acceleration of existing and new programmes to reduce the Council's underlying emissions.

This plan focuses on how the Council will achieve zero emissions by 2030 across its estate and operations.

Zero Carbon and Net Zero Carbon

Net zero Council

Until the City Council is zero carbon, it will be net zero carbon via purchase of green electricity, green gas and offsetting emissions from vehicle fuel use.

Zero carbon Council

Zero carbon will require a reduction in the City Council's underlying emissions, primarily by the electrification of heat and fleet vehicles. In the absence of a fully decarbonised electricity grid, the Council will rely on green electricity purchase and local renewable energy generation to provide zero carbon electricity to power electrified heat and fleet vehicles. The transition to zero carbon will mean that, year on year, the Council reduces its purchase of both green gas (as boilers are replaced) and of offsets (as fleet vehicles are electrified). It is possible that a small amount of offsetting will be required in 2030 such as from irreducible emissions sources like water and public transport that currently make up ca. 1% of the total emissions footprint. The Council's ambition is to reduce offsetting to near zero, if it is technically and financially possible to do so.

[1] Cabinet Paper 19 December 2019

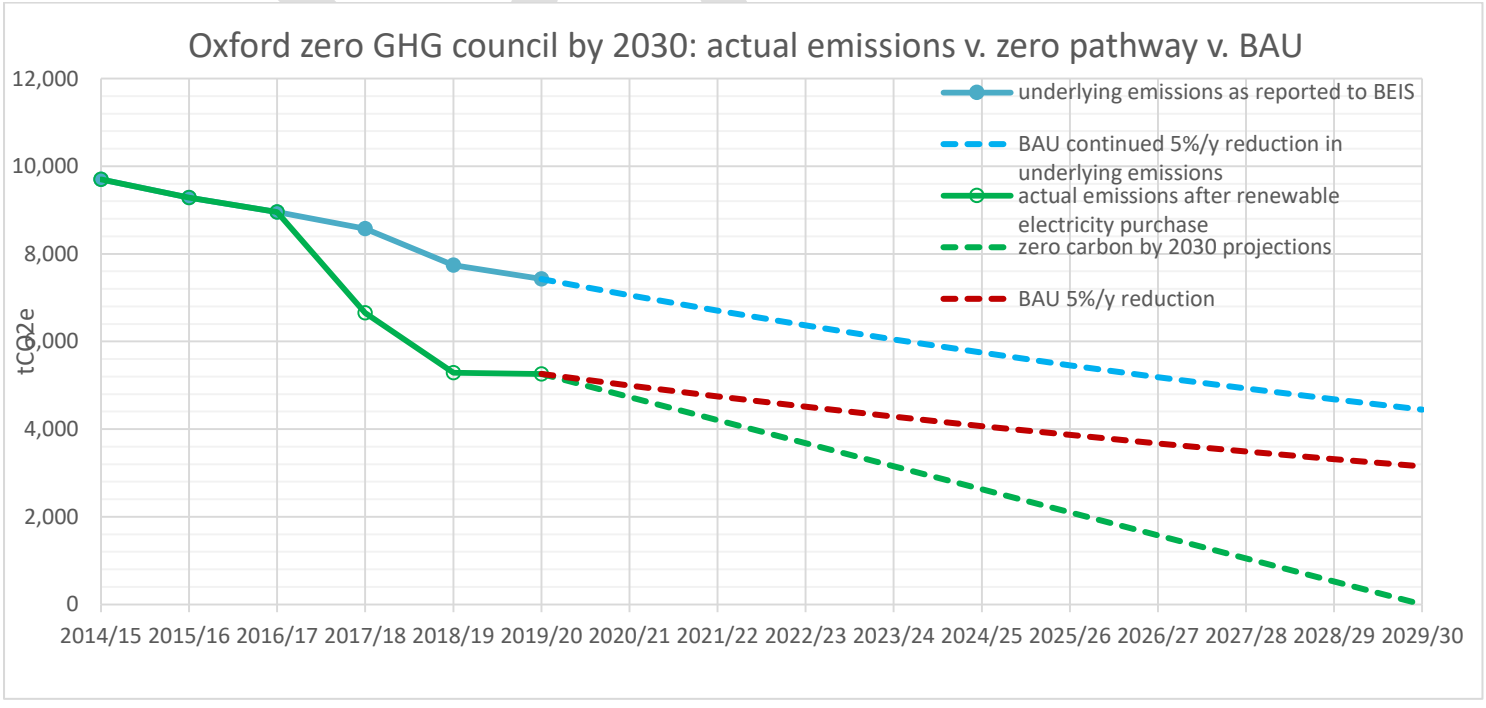
The City Council's carbon emissions are around 1% of the total for the city, but the Council has an important role to play in leading by example across the city and further afield, and working together with others, sharing approaches to decarbonisation. By showing leadership, the City Council can galvanise the acceleration of emissions reductions by partners, which can underpin the establishment and strengthening of a Zero Carbon Oxford partnership from 2021.

Zero Carbon by 2030 represents a significant step-change in the Council's ambition and requires a doubling of the current rate of progress. Business as usual - with a 5% year on year reduction - will only get us about half of the way to zero carbon by 2030, as illustrated in Figure 1 below. The Council's vision for zero carbon by 2030 requires an average annual absolute emissions cut of 10% or 526tCO2e per year.

The plan covers all buildings and operations where the council pays the energy, fuel and water bills. It is aimed across the council as a road map to delivery – every service area, team and member of staff has an active role to play in delivering the zero-carbon plan.

Oxford City Council's 2030 goal applies to scope 1 and scope 2 greenhouse gas emissions (expressed as carbon dioxide global warming equivalence, in units of tonnes CO2e) as well as scope 3 emissions associated with the transmission and distribution of standard grid electricity, business travel and water use. See Appendix 1 and Appendix 2 for a full breakdown.

Figure 1: Oxford City Council's emissions - business as usual compared to a zero carbon by 2030 pathway



b. Vision

The zero carbon council vision is that by 2030 the activities of Oxford City Council will no longer contribute to a worsening climate crisis from its use of gas, electricity, water and fuel (Scope 1, Scope 2 and some Scope 3 emissions), with annual carbon emissions having been reduced to zero. It will no longer burn fossil fuels in its vehicles, which will have transitioned to electric or zero emission, and so not contribute to local air pollution which has negative impacts on public health.

Oxford City Council's operational buildings will not burn fossil fuel gas for heating or hot water – services for buildings will use electricity or other energy from renewable sources. Gas boilers will have been replaced by alternatives, such as heat pumps – or be using renewable fuels. Renewables will power the Council's estate and local renewable projects will be supported by the Council through the use of Power Purchase Agreements.

The Council will have minimised greenhouse gas (GHG) emissions arising from spend on supplies and services, staff commuting and operational waste (Scope 3 emissions).

This is consistent with the declaration of a Climate Emergency by the Council in January 2019, the outcomes of the Citizens' Assembly on Climate Change held in late 2019 and the ambitious commitments and corporate priorities that emerged as a result.

c. Successes to date

The Council has been managing energy and carbon emissions from across its estate and operations since 2008. Significant progress has been made towards zero carbon, with an average 5.4% per year reduction in underlying emissions over a five year period to 31 March 2020 - see Figure 2 below.

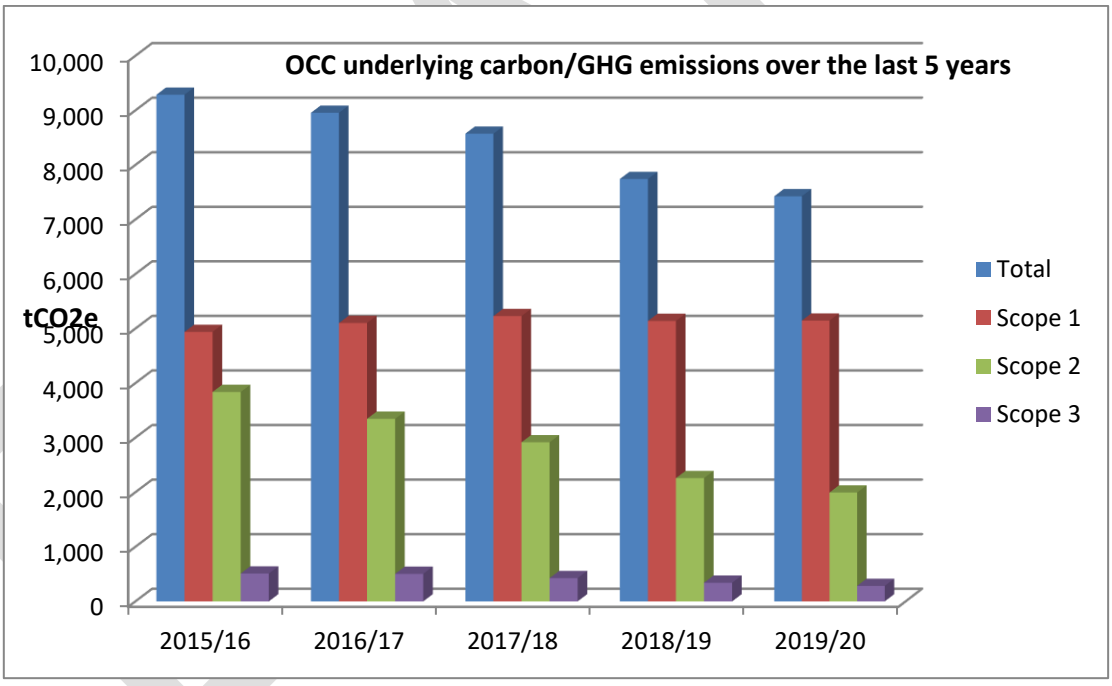
Highlights include:

- **Investing to reduce carbon emissions using the Salix recycling loan fund**, which has delivered a range of carbon reduction projects to a value of £1.8m, saving an estimated £440k/year in energy bills and an estimated reduction of CO2 emissions by 2000tCO2. The net benefit to date from Council's £0.5m investment is £6.4m and growing
- **Dynamic energy management** - eliminating excess energy/water consumption through monitoring and targeting, saving the council in excess of £50k per year in unnecessary energy spend and CO2 emissions.
- **Solar PV across the City Council's estate -** over 1000kWp of Solar PV installations, equivalent to over 10% of the council's current rate of electricity consumption.
- **Electrification of the Council's fleet of vehicles -** plans to switch over 25% of the ca320 vehicles in the fleet to electric by 2023
- **Energy Bureau service key facts/examples -** paperless processing of £1.6m worth of energy and water bills per year and saving on average over £80k/year in corrected billing errors.
- **Business efficiency gains**: The value of electronic bill processing to the organisation saving c.£210,000 per year from the estimated total paper invoice processing cost
- **The purchase of 100% certified REGO renewable electricity**, helping to create a market for the installation of additional renewable capacity on the grid.
- **Participating in world leading energy/carbon reduction related initiatives** such as Energy Super Hub Oxford (ESO) and Local Energy Oxfordshire (LEO). These projects will install the World's largest commercial hybrid energy storage system (saving an estimated

10,000 tonnes of CO2 per year by 2021, rising to 44,000 tonnes per year by 2032) and ease regional constraints on the electricity grid by smoothing the peaks and troughs in demand and enable more renewable energy capacity.

- **Supporting Oxford's Low Carbon Hub** and helping enable many local community projects to go ahead. E.g. the Solar Schools Programme.
- **Oxford City Council won the Local Energy Leadership Award –** December 2019 – REGEN Renewable Futures and Green Energy Awards

Figure 2: Oxford City Council's underlying greenhouse gas emissions since 2015/16



3. Part 2: Path to 2030 – how will Oxford City Council achieve zero carbon emissions?

a. Framework

Many of the straightforward carbon reduction measures have been implemented through lighting upgrades, insulation measures, heating plant upgrades and installing solar PV on many of our buildings. The council has also made good use of its £1m Salix recycling loan fund to help fund many of these measures investing over £1.8m to date, reducing CO2 emissions by an estimated 2000tCO2 and associated energy spend by over £400k/y. The Council's investment of £0.5m into the SALIX fund has resulted in a net benefit of £6.4m to date.

In 2017/18 Oxford City Council committed to buying certified green electricity for all of its electricity supplies, through Renewable Energy Guarantee of Origin (REGO) certified supplies. This decision to purchase green grid electricity resulted in a steep drop in our carbon/GHG emissions**. See Figure 1.

**** Green energy purchasing and offsetting**

Green electricity purchase through standard REGOs is a first step along the pathway to zero carbon but 'darker green' approaches to electricity purchase are becoming more accessible and will be pursued. For example, traceable power purchase agreements (PPAs) of electricity supply linked to local solar farms (as well as council investment in such installations) will be a darker green option. This is because the Council will be more directly influencing the uptake of additional installed renewable energy capacity in the UK than currently possible through standard REGO electricity supplies available on the market.

Achieving zero emissions will require investment in technically harder – and expensive – measures, as we move to decarbonise fleet vehicles and replace hundreds of gas boilers with electric heat pumps, or other heat decarbonising approaches. The main focus of activity will require a rapid switch to decarbonising our heating systems and fleet vehicles. Replacing existing heating technologies (primarily fuelled by gas) will be technically and financially challenging and may require significant adaptation of many existing operational buildings as it moves to electrification of heat or use of alternative heating fuels (eg hydrogen and/or biogas).

It will be also very important for the Zero Carbon Council plan and the Asset Management Plan to align ever closer in coming years and for relevant teams to continue to work collaboratively to achieve the challenging collective aims of both plans.

As part of the implementation of this plan, the City Council will consider the introduction of an internal carbon price mechanism to inform decisions that will lessen the impact on the worsening climate crisis. This would support the council to make decisions which account for their carbon impacts and provide an ongoing funding source for future decarbonisation in the Council estate and operations. A full proposal will be developed in the first year of this plan.

Over the course of the next decade technologies and policies will change. This plan doesn't set out a definitive route to zero carbon emissions. Instead, it focuses on what the council is doing in the short term to plan the route and achieve this zero carbon goal. The focus in years one and two will be to establish the feasibility of deep emissions cuts, while continuing (and accelerating) the implementation of the existing pipeline of carbon reduction projects making use where appropriate and possible of external funding opportunities such as the Public Sector Decarbonisation Scheme (PSDS) Fund.

This document will be reviewed at the end of each financial year to assess progress against our goals. The plan will evolve and develop the Council's pathway to zero carbon as carbon reduction technologies, approaches and opportunities develop – and also as funding to accelerate the road to zero carbon potentially emerges.

The Council will prioritise emissions reduction based on the significant energy use hierarchy, i.e. targeting the biggest energy and fuel consumers, and therefore carbon dioxide emissions sources, first. This will include:

- Carrying out detailed investment grade energy audits in our highest energy consuming buildings to rapidly advance carbon reductions

- Decarbonising heat in our highest gas consuming buildings through building fabric and air tightness improvements, as well as a shift to high efficiency electric heating systems such as heat pumps
- Installing more solar PV across our estate and operations and investing and purchasing electricity from local solar farms on longer term PPA contracts
- Electrifying the fleet and moving to low carbon forms of transport

b. Scope

This plan deals primarily with Scope 1 emissions (gas and fuel use), Scope 2 (electricity purchased from the grid) and Scope 3 for transmission and distribution of grid electricity, water consumption and business travel. These are the council's operational emissions – where the council pays the bills for its consumption and they can be more directly measured and reduced.

Scope 3 emissions include less directly measurable emissions such as emissions from the goods and services the council procures, waste sent to landfill and staff commuting. These emissions can represent a significant proportion of total GHG emissions - sometimes of the order of an additional 100% compared to core emissions. The targets outlined in this plan do not include all Scope 3 emissions.

However, the Council will seek to better understand, tackle and measure Scope 3 emissions during the course of this plan recognising the significance of this emission source. Activity depends on the availability of data and the ability to control and reduce these emissions. This work will also be aligned with development of a wider approach to tackling Scope 3 emissions through the Zero Carbon Oxford partnership.

Prioritisation of action across the council's own stock
In response to the Citizen's Assembly recommendations and subsequent commitments the council has commissioned the updating of its information held about its buildings through revision of stock condition surveys including more targeted energy information.

This information will enable strategic planning and optimisation of actions in respect of that stock. In general however, the following matrix sets out the thinking about prioritisation until that deeper strategy is developed.

	Control	Data	Savings flow to OCC	Capital Funds for Investment	Access to External Funding
Operational Buildings	High	High	Yes	Limited	Yes
Housing Stock	Medium	Medium	No	Some	Yes
Commercial Stock	Low	Low	No	Limited	No

c. Funding

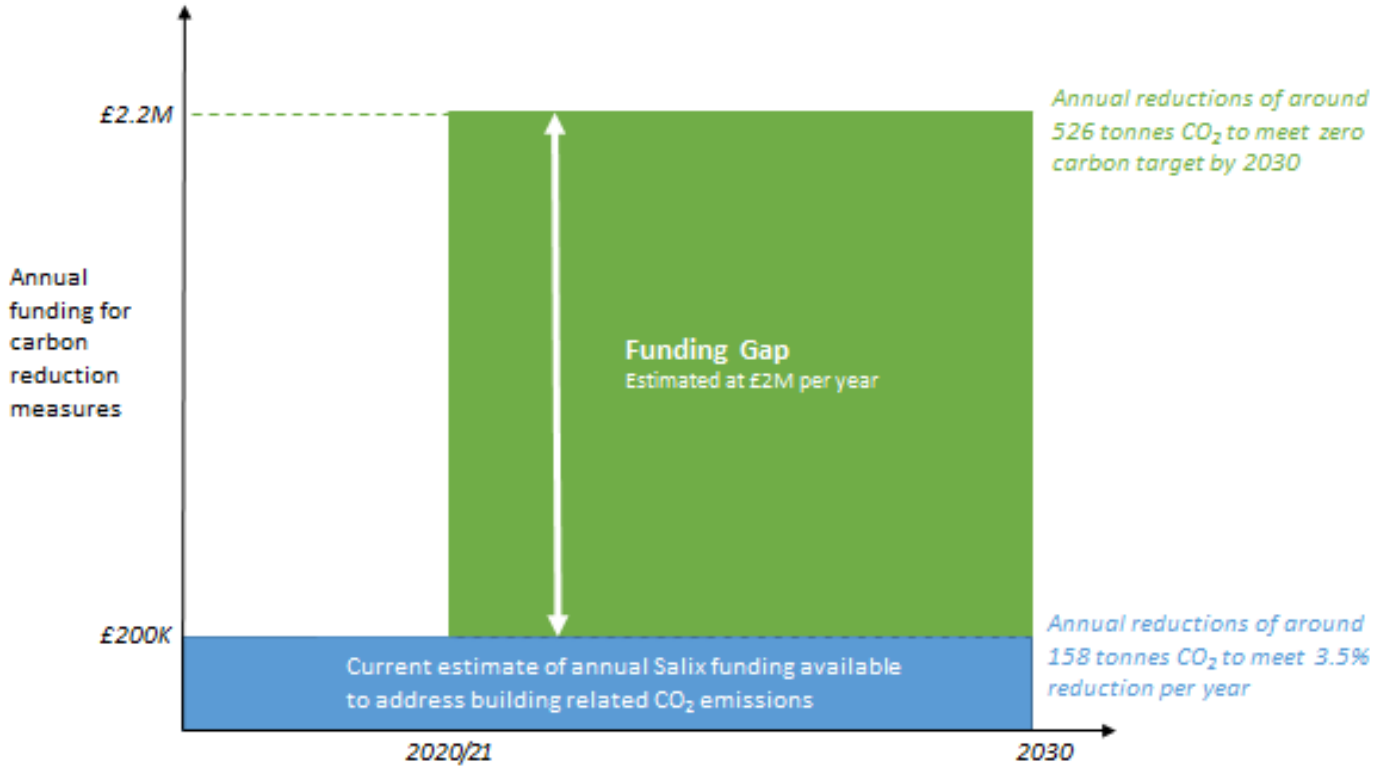
The Council will commission investment grade energy and zero carbon surveys to inform costed assessments and budget bids for large-scale emissions reduction in specific large emitters on our carbon footprint.

The Council's vision to be zero carbon by 2030 requires a significant injection of funding. Zero carbon by 2030 equates to an approximate doubling of current rates of carbon reduction, from 5% per year – which would get us to zero carbon by about 2039 - to 10% per year to get to zero by 2030 (10% of 19/20 carbon emissions equates to 526tCO2). This means a reduction of absolute carbon emissions by about 526 tonnes each year, on average, for the next 10 years (assuming the council's estate and operations remains broadly the same).

At the time of writing, the cost of this is estimated to be several thousands of pounds for each tonne of CO2e per year reduced, which means a multi- million pound per year funding stream is required to get the Council on track to meet its 2030 goal.

Figure 3 below provides an illustrative view of the scale of the estimated funding gap for the council to meet zero carbon by 2030. Based on a recent exercise to cost up a combined heat pump/photovoltaic project at a key leisure site, the chart below provides an illustrative view of the scale of the estimated funding gap for the council to meet zero carbon by 2030 estimating a ca £2.2million investment required ***each year*** to 2029/30.

Figure 3: Indicative scale of funding gap to meet zero carbon by 2030



The Council's **Salix+** fund (subject to approval at the time of writing) or similar enabling funds, will continue to play a critical role in enabling the decarbonisation of the estate and will need to be significantly bolstered between 2020 and 2030. This fund will allow the Council to scope and pilot the relevant capital intensive technologies needed to get at the more difficult carbon emissions reductions – such as heat pumps to replace gas boilers, and renewable energy generation. Some

of this fund may be needed for enabling works to be carried out to allow the appropriate low carbon technology to be installed – these enabling works (such as construction of platforms to house extensive air source heat pump plant) could be outside eligible costs for any external grant funding we may be successful with. Some additional funding may be required because external grant funding does not always meet 100% of eligible costs.

The role of external funding: The Council will apply for any viable external funding that emerges from central government or other routes to assist with achieving its carbon reduction aims. An example of such funding that has emerged partly as a COVID economy boosting response as well as to tackle the UK's carbon emissions, includes a £1bn Public Sector Decarbonisation Scheme (PSDS) Grant announced in early October 2020. It is aimed at decarbonising the public sector estate. The Council submitted a number of bids to the scheme and was successful in being offered grant money in 2020 for an innovative heat pump and Solar PV project and further grant 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 1,500tCO2 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. The PSDS is a one-off as far as has been announced by government to date with projects currently stated as needing to be completed by September 2021. The Council cannot be sure similar sources of funding will be available beyond the current tranche but should be ready to react quickly to similar funding opportunities in future. Successful bids could also provide valuable revenue streams for Oxford Direct Services if they are able to deliver any of the proposed works.

Risk from lack of funding: After more than a decade of working on carbon reduction, the Council now needs to address the more difficult carbon savings to get to zero - so, without additional funding, the current rate of progress may slow from ca.5% per year. At 4% per year then the zero carbon goal will not be met until 2045. At a rate of 3% per year, the Council would not hit zero carbon until 2054. This illustrates the level of challenge to meet the Council's vision for a zero carbon estate and operations by 2030.

Zero Carbon presents a large funding challenge – but also possibly an opportunity. The city council could benefit from sustainable and low carbon revenue streams, for example – from sales of excess green electricity. On the other hand the Council now needs need to address hard-to-reach carbon that does not give a financial payback – for example replacement of gas boilers for heating with electric heat pumps – a lower carbon option but with higher capital and running costs at present based on current UK energy costs and policies.

<u>The city council will take the following actions:</u>

- Use Salix and increased Salix + funds where possible to implement carbon reduction measures across the Council's estate – see Salix key facts below for progress to date in use of the Salix fund.
- Lobby for the extension of Salix usage and payback
- Ensure that all capital spending and internal budgets support the reduction of carbon in line with our zero carbon goal
- Apply for any new funding, policies or incentives as they become available from central Government
- Make budget bids for internal funding, to cover deep dive audits for big hitters on our carbon footprint and to fund costed measures recommended
- Explore zero carbon financing models such as a contract through an Energy Services Company (ESCO) or community ownership funding model
- Make a proposal for an internal carbon price mechanism to inform decisions that will lessen the impact on the worsening climate crisis.

Salix key facts : Size of revolving loan fund: £1m

The Council has contributed £0.5m with the other half won from government (Salix Finance)

Total loaned out to invest in carbon reduction measures since inception: £1.8m

Annual CO2 saving as a result - c.2,000 tCO2/year

Annual saving on energy bills as a result:£440,000/year

Total value of energy bill savings to date: £6.9m

Net benefit to date from Council's £0.5m investment is £6.4m and growing.

Of the £0.5m that the Council has put into this fund over the years, annual return is currently running at £440,000/y– 88%/y return -and will continue to grow as the fund is used for loans for new investments.

d. Monitoring and reporting

The City Council's plan to achieve zero emissions by 2030 relies on the ongoing decarbonisation of the national electricity grid. It is not anticipated that the grid will be decarbonised by 2030, which means the City Council will rely on green electricity purchase and increased local renewables generation to provide green electricity to electrified fleet vehicles and heat across the Council's estate and operations.

Table 1 below provides a breakdown of emissions in order to provide a clear picture of the Council's process toward zero emissions. It outlines **a)** the Council's underlying emissions, including emissions from the national electricity grid, and **b)** the Council's emissions excluding national grid electricity emissions, in order to highlight progress towards decarbonisation of the Council's heat and fleet vehicles. Alongside this, the Council's pathway (or carbon targets) to zero emissions have been provided, against which we will monitor progress.

External reporting

Oxford City Council will report each year on progress against the targets outlined in the Table 1 below. Annual updates will be published on the Council's website.

The City Council will move towards quarterly reporting of carbon emissions for fleet vehicles and the larger sites which have half hourly metering (this would cover ca80% of our overall carbon footprint). This will demonstrate progress on absolute CO_2 emission reductions against previous years and enable comparison with the same quarter on the previous year.

As a step towards this, half-yearly reporting will be targeted in the first year of the plan dependent on availability of metering and fuel data.

Internal reporting

The Council will continue reporting monthly on measures implemented and the carbon emissions they will reduce through its internal reporting systems (eg CorVU).

Table 1: Projected route to Zero Carbon by 2030 and interim provisional targets

tCO2e	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	% reduction since 2014/15
City Council underlying consumption emissions (including national grid electricity emissions)	9,703	9,286	8,955	8,572	7,741	7,425											23.00%
City Council emissions (excluding electricity)	9,703	9,286	8,955	6,650	5,289	5,261											46.00%
Carbon targets/City Council pathway to zero emissions by 2030						5,261	4,735	4,209	3,683	3,157	2,631	2,104	1,578	1,052	526	0	100.00%

(See Appendix 6 for data on Council progress towards ***net*** zero carbon, detailing the underlying emissions and emissions after purchase of green electricity, green gas and offsetting.)

4. Part 3: Action plan to 2030

a. Current emissions profile

In 2019/20 the council's underlying emissions were 7,425 tonnes of carbon dioxide and other greenhouse gas emissions (CO2e) from heating and powering our buildings, fuelling our fleet vehicles and plant, business travel and water consumption. By 2030 the council will have reduced its carbon/GHG footprint to near zero compared with a baseline year of 2014/15.[2] See Appendix 3 and Appendix 4 for a full breakdown of Oxford City Council and Oxford Direct Services (ODS) emissions by scope.

The majority of Oxford City Council's emissions originate from buildings (73%) and fleet vehicles (27%) - see Figure 4 below.

While underlying emissions from electricity have reduced, gas and fleet emissions have increased or flat-lined – see Figure 5 below. Accordingly, the priority areas for emissions reduction will be heating and transport, both of which will present technical and funding challenges.

The priority in years 1 and 2 will be to develop fully-costed programmes of work to deliver faster and deeper annual reductions in absolute carbon emissions than has been possible to date setting the council on a realistic pathway to being a zero carbon council by 31 March 2030. Further details are outlined below.

Figure 4: Oxford City Council's emissions by source 2019/20

[2] 2014/15 has been chosen as a baseline year to align it with the Paris Climate Change agreement targets.

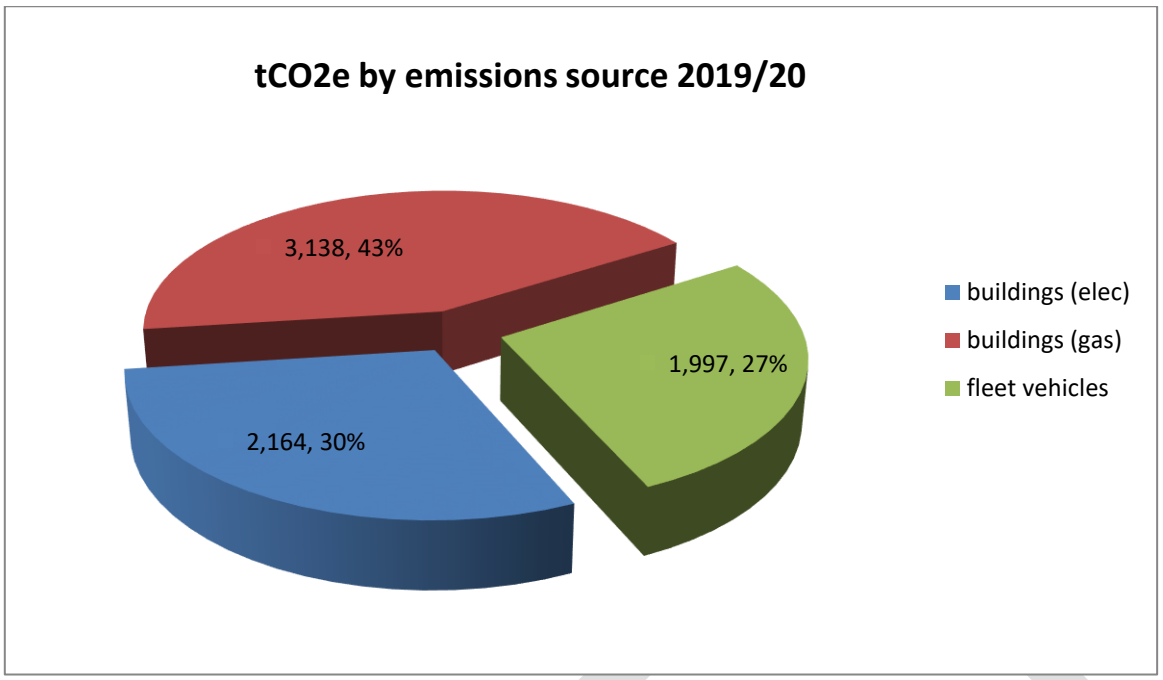
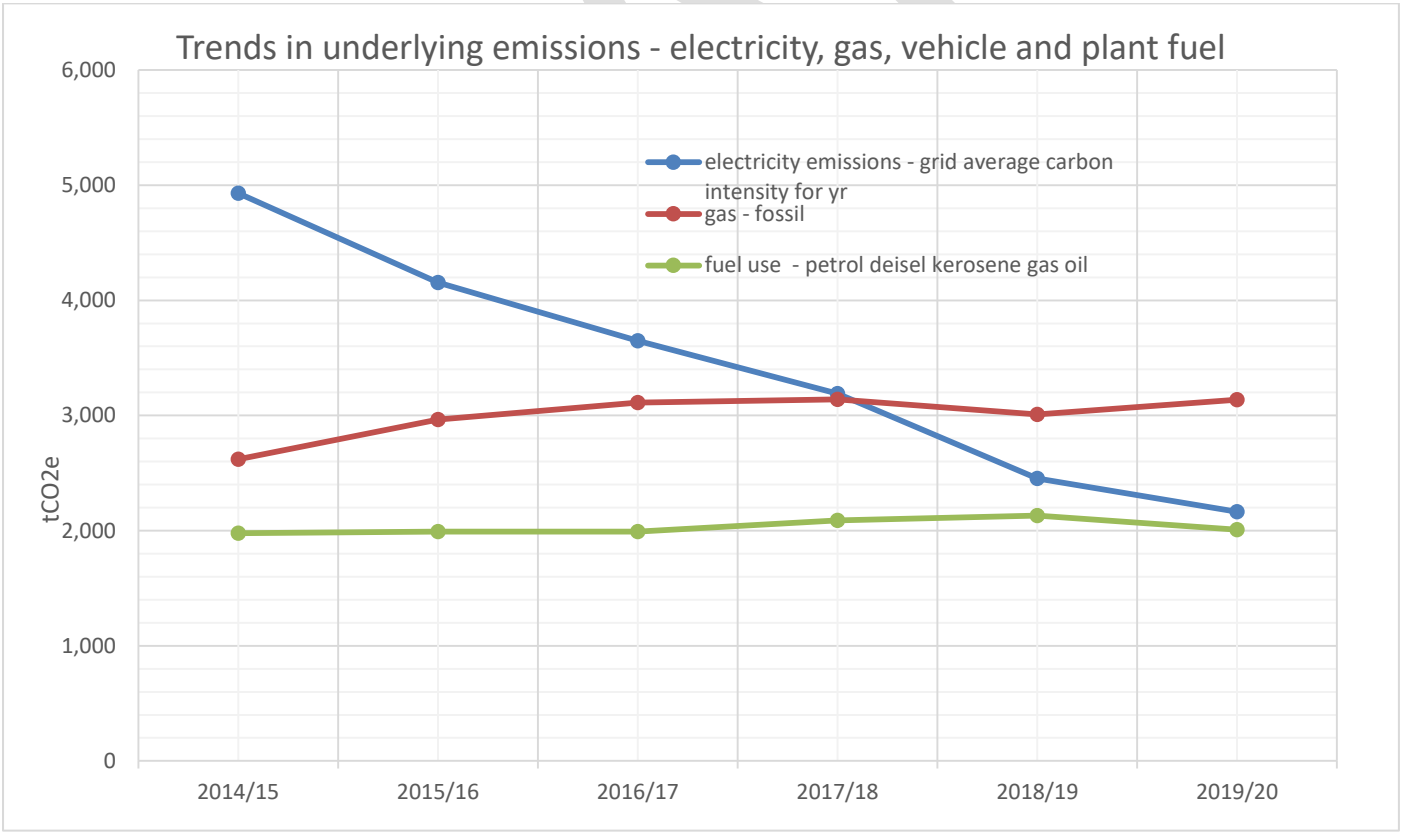


Figure 5: Oxford City Council's emissions trends



b. Buildings

Buildings are by far the largest emissions source of in-scope underlying emissions for Oxford City Council (as they are for the wider city). The council spends approximately £1.6m per year on

electricity, gas and water across its buildings and estate. See Appendix 5 for a full breakdown of the Council's energy bills.

Leisure centre buildings are the council's biggest underlying emissions sources accounting for over 44% of building related GHG emissions - see Table 2 below. The biggest emitting buildings are ranked in Table 3 below, which will inform areas of focus in the early stages of implementation of this plan.

Table 2: Building emissions by type 2019/20 tCO2e footprint

Emissions source	**tCO2e**	**%**
Car parks	139	2.6%
Community Centres	235	4.4%
Corporate Property	103	1.9%
High-rise housing blocks	82	1.5%
Leisure Centres	**2366**	**44.2%**
Low-rise Housing blocks	225	4.2%
Main Offices & Depots	**721**	**13.5%**
Parks and cemeteries	31	0.6%
Public space lighting	16	0.3%
Public toilets	87	1.6%
Sheltered Housing blocks	**665**	**12.4%**
Sports Pavilions	153	2.9%
Temporary Accommodation	**479**	**9.0%**
Misc other	44	0.8%
Total – sites/buildings	**5348**	100%

Table 3: Underlying carbon emissions by sites/buildings – biggest emitters in 2019/20

Rank	**Site**	**tCO2e**

1	Leys Pools & Leisure Centre	760
2	Hinksey Outdoor Pool	518
3	Oxford Ice Rink	422
4	Ferry Leisure Centre	406
5	Oxford Town Hall	263
6	Barton Leisure Centre	261
7	Cowley Marsh Depot	174
8	St Aldate's Chambers	136
9	Cardinal House – sheltered housing	130
10	Horspath Depot	119
11	Rose Hill Community Centre	84
12	Singletree - sheltered housing	82
13	Barton Neighbourhood Centre	73
14	Bradlands - sheltered housing	69
15	Atkyns Court - sheltered housing	60
	Total – sites/building emissions	**3,558**

Electricity

Electricity related emissions account for 30% of the Council's total emissions.

Emissions from electricity have steadily reduced over recent years, due to the Council's investment in solar PV, improvements to energy efficiency, a reduction in electricity demand, and procurement of low carbon electricity – see Figure 4. This has been aided by the decarbonisation of the national grid, which is on a trajectory to zero carbon before 2050.

The Council will take the following approach to renewable energy generation:

- First, developing more of our own onsite renewable energy and feeding this into buildings that we own and operate where possible
- Second, investing in and purchasing electricity from a local renewable energy source via a direct Power Purchase Agreement (PPA)
- Third, purchasing electricity from a traceable renewable energy installation through a virtual PPA
- Fourth, purchasing standard REGO backed supplies (not traceable to any particular renewable energy installation as currently procured)

<u>Zero Carbon will require:</u>

1. **Increasing renewable energy generation:** install as much renewable electricity as possible from technologies installed across our estate and land assets; invest in and purchase renewable electricity from local large scale solar farms via long term power purchase agreements (PPAs).
2. **Purchase of electricity from renewable (REGO) sources:** the Council will continue to purchase green electricity, to stimulate investment in renewables including prioritising PPAs (power purchase arrangements) via local renewable energy sources where possible.
3. **Reduce electricity demand:** accelerate improvements to reduce electricity demand in buildings and operations.
4. **All service areas, teams and staff need to play a part in reducing carbon emissions:** Raising awareness of measures staff can take themselves to reduce electricity

consumption (including whilst home working) – use of carbon literacy toolkits and support from government to get key messages across and encourage action.

Actions:

Objective	Action 2020 – 2030
Increasing renewable energy generation	The Council will continually seek opportunities for the installation of solar PV installed on Council buildings, estate and the Park and Rides (ground mounted or solar canopies) and feed this electricity into the City Council's buildings where possible.
	Assess the case for local Anaerobic Digestion using city sourced food waste not currently going to Cassington AD
	Scope the opportunities for wind turbines, including - large scale horizontal access wind turbines (HAWTs) and multiple smaller scale Vertical Axis Wind Turbines (VAWTs) across its estate and operations
	Develop and use battery storage to maximise the use of onsite renewable energy installations and load shifting, through a feasibility study.
	Develop opportunities for green hydrogen to heat buildings and power larger vehicles.
	Optimise the performance of existing on-site renewable energy generation through remote monitoring to maximise energy generation and income from Feed in Tariffs/Renewable Heat Incentive or equivalent
	Deliver and accelerate Salix funded project works, identifying where additional funds and investment is required
Purchase of electricity from renewable sources	Target and develop power purchase agreements (PPAs) with local solar farms and gain the associated renewable energy guarantee of origin (REGO) for electricity supplied to the council.
Reduce electricity demand	Continue and accelerate improvements to energy efficiency in use of electricity (e.g. LED lighting, controls, variable speed drives, updated electric motors (EC motors) etc.). Identify where additional funding will be required.
Staff Carbon Awareness and action	Raise awareness of measures staff can take themselves to reduce electricity consumption (including whilst home working) – use of carbon literacy toolkits and support from government to get key messages across and encourage action. Understanding the net carbon impacts of increased home-working due to COVID and new ways of working

Gas

Gas combustion accounts for 43% of Oxford City Council's emissions. Emissions have increased due to the addition of extra properties on our estate carbon footprint and through increased usage in our leisure centres. See Figure 4.

Carbon reduction measures related to gas consumption are harder to implement in older (and historic) buildings and where gas boilers are already in place. Buying green gas will help the Council get to net zero carbon but should not be counted towards the zero carbon goal as there is currently not the same national trajectory of decarbonisation for the green gas network as there is for the electricity network.

At the current time, gas is much cheaper than electricity, which means that moving to electric forms of heating are not only expensive upfront but also do not produce a cost saving to repay that investment.[3]

Zero Carbon will require:

1. **Decarbonising heating systems:** Switching over 600 gas heating systems to low carbon electricity heating systems like heat pumps and investigating alternative heating fuels such as green hydrogen as technology for and availability of this fuel source develops.
2. **Reducing heating demand/Improved energy efficiency:** For example improving the energy performance of buildings through building fabric improvements including additional insulation, glazing; waste heat recovery; Building energy management systems improvements, LED lighting and controls throughout all buildings; upgrading pumps and motors
3. **Improving energy and water consumption monitoring and targeting systems**: Increase the reliability and coverage of our energy and water use data to better monitor performance and target unexpected consumption by continuing to roll-out smart-metering across the estate and installing sub-metering within our larger buildings. Implementing exception alert systems to identify unexpected energy and water consumption events and respond quickly to correct issues identified.
4. **All service areas, teams and staff to play a part in reducing carbon emissions:** Raising awareness of measures staff can take themselves to reduce gas consumption (including whilst home working) – use of carbon literacy toolkits and support from government to get key messages across and encourage action.

Actions:

Objective	Action 2020 – 2030
Decarbonising heating systems	Commission deep dive energy audits to investment grade for major energy using buildings, to identify carbon reduction measures and optimum ways to transition from gas to electric based and other low carbon heating – targeting significant energy users (see Table 2 and 3).

[3] In November 2020, the City Council pays c.14.5 p/kWh for electricity from renewables and c.1.5p/kWh for fossil fuel gas.

	The deep dive energy surveys will generate a list of carbon reduction project ideas for implementation in the above core buildings. It is anticipated that there will not be a payback period within 10 years (given the current relatively cheap gas and expensive electricity price) to be compliant with the Council's Salix recycling loan fund criteria as it is under the scheme rules at the moment. Funding options will therefore need to be scoped (see part 2 of this plan). Develop policy statements to guide the improvement, refurbishment and replacement of council occupied buildings and their energy usage.
	Deliver pipeline projects that will be assessed, quantified and implemented as soon as possible and informed by investment grade audits and feasibility studies undertaken.
	Lobby for central Government support for the decarbonisation of existing heating systems.
	Scope opportunities for an internal shadow carbon price to improve the business case for heating electrification.
Reducing heat demand/Improved energy efficiency	Deliver – and accelerate – the Salix pipeline projects
	Undertake feasibility studies and costings to inform the implementation of further energy efficiency projects.
Better controls	Building controls are in need of urgent upgrade along with other related plant/fabric improvements to start to reduce gas related emissions in these buildings.
Explore opportunities for new, innovative technologies	Explore and implement innovations such as more use of alternative fuels such as biomethane (potentially from anaerobic digestion of Oxford food waste), through a feasibility study to establish an outline case.
Staff Carbon awareness and action	Raise awareness of measures staff can take themselves to reduce gas consumption (including whilst home working) – use of carbon literacy toolkits and support from government to get key messages across and encourage action. Understanding the net carbon impacts of increased home-working due to COVID and new ways of working.

c. <u>Fleet</u>

Fleet vehicles represent 27% of Oxford City Council's emissions, primarily from the operation of refuse trucks, vans, tipper trucks, and miscellaneous plant in delivering its services and operations.

Fleet fuel related carbon emission trends are currently flat due to competing pressures – with downwards pressure from improvements in vehicle efficiency, and upwards pressure due to more miles being travelled due to commercial activity by Oxford Direct Services (ODS). There is the need for a more rapid transition to electric or hydrogen fleet.

At present the council has 46 electric vehicles (mainly cars, small vans and tipper trucks) in its fleet with plans to switch over 25% of the fleet to electric by 2023 resulting in a similar percentage reduction in fleet fuel CO_2 emissions. Project ESO (Energy Superhub Oxford) is progressing and will have an impact on the Council's carbon footprint, that will be quantified as part of the activities carried out in the period of this new CMP. The ESO project will assist with funding additional fleet electric vehicles in the Council's fleet with an estimated 40 e-vehicles added in the initial phase of ESO.

An electric refuse truck has been successfully trialled in 2020 with plans in process to add further electric refuse trucks to the fleet in future. Replacing all refuse trucks with electric versions will significantly drive down CO_2 emissions from this high emission area of the council carbon footprint and help accelerate further transitioning to an EV fleet.

For the bulk of our fleet vehicles there is a clear technology route that aligns with reduced overall costs over the medium term – that is a transition to zero emission vehicles such as electric vehicles. Alternative fuel technologies such as hydrogen and bio-methane from food waste should also be explored

Zero Carbon will require:

1. **Conversion of all 320 fleet vehicles to electricity or alternative low carbon fuelled vehicles**: including refuse trucks, vans and other vehicles, which make up ca 95% of the fleet emissions contribution.
2. **A fleet carbon champion and zero carbon delivery team to develop a fully costed action plan to get to zero fleet emissions**

Actions:

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Objective	Action 2020 – 2030
Convert all 320 fleet vehicles to electricity or alternative low carbon fuelled vehicles:	Publish a plan outlining steps toward full decarbonisation of fleet vehicles
	Feasibility study undertaken to assess opportunities for electrification, costings and opportunities for funding and delivery. Assigning a fleet carbon reduction champion and delivery team to focus on rapid tackling of reduction of carbon emissions across entire Council fleet (including Oxford Direct Services vehicles).
	Explore and implement innovations such as more use of alternative fuels

d. Innovation

Oxford City Council will build on its experience and leadership in innovative carbon reduction projects - Local Energy Oxford (LEO) and the Energy Super Hub Oxford (ESO). This will include:

- Taking opportunities that arise out of project LEO such as use of the smart grid to manage energy loads through demand side response measures; and the use of heat/electricity storage for temporal shift in loads.
- Exploring opportunities presented by ESO for the installation of more heat pumps across its estate, support the further roll out of electric vehicles and using innovation opportunities from battery storage and smart grid to drive down its own emissions.

e. Scope 3 emissions

Oxford City Council will develop a greater understanding of ways to reduce Scope 3 emissions such as from the goods and services we procure and will develop a Scope 3 emissions reduction plan. Addressing Scope 3 emissions will support the Council's ambition for the city to reach net zero before 2050. Furthermore, it has a huge potential to prevent the worst impacts of climate change and lead to significant business benefits – mitigating risks within value chains and unlocking innovation.[4] Key areas of focus for Scope 3 will be procurement and staff commuting, with some of the changes resulting from Covid19 in relation to travel being a basis for action.

The priority for the Council in year 1 and 2 of this plan will be to develop a baseline and reduction pathway, to better understand this emissions source and the ways in which these emissions could be measured and reduced. A study will be commissioned to develop our understanding of this area and work will continue with defining a wider approach to Scope 3 emissions working with partners in the Zero Carbon Oxford partnership

This will address the following areas:

- **Services used and products consumed by the Council**: this constitutes a potentially huge area of the council's CO2 emissions and perhaps the hardest to measure and control. We will scope options for employing circular economy principles in the Council's activities, designing out waste and pollution – and recycling as a last resort. Reducing emissions will require sourcing more local food and products, reducing the amount of goods and equipment sourced from overseas where practical and reducing, reusing and recycling.
- **Staff commuting**: the City Council's commuting carbon footprint is baselined at approximately 820tCO2/y, (covering the City Council and ODS). This assumes commuting every week day (with allowance for bank holidays, leave, sick leave), with data from the south east for modes of travel pre-pandemic. If post-Covid onset, working-from-home averages 4 days per week, this would reduce by c.560tCO2e. (The Council encourages sustainable travel by: Cycle-to-work Scheme; mileage for using bike for workplace travel; interest free loans to buy public transport season tickets; ability to work from home/flexible working policies.)
- **Staff Home working**: linked to the carbon reduction from reduced staff commuting is the increase in home energy use for staff working from home rather than the office – carbon emissions from this will be quantified
- **Waste to landfill**: reduce City Council generated waste to landfill as much as possible. This will require robust data to baseline the current situation.

[4] https://sciencebasedtargets.org/wp-content/uploads/2018/12/SBT_Value_Chain_Report-1.pdf

- **Waste and recycling**: Oxford currently goes well beyond the minimum legal requirements in what it does with waste and recycling collected, but could go further. The legally compliant baseline can be quantified and options for improvement assessed.
- **Other significant Scope 3 areas that may emerge or be identified during the course of this work and as the methodologies and approaches to tackling scope 3 emissions evolve and develop.**

5. Appendices

Appendix 1

Definitions and sources of emissions

Item	Definition
Carbon emissions (effective) - CO2e	Emissions of the six greenhouse gases covered by the Kyoto Protocol expressed in terms of equivalent impact on global heating as CO2
Scope 1	Direct greenhouse gas emissions from energy sources owned by Oxford City Council – e.g. fuel used in combustion processes like heating buildings and moving fleet vehicles
Scope 2	Indirect greenhouse gas emissions from consumption of purchased electricity, heat, or steam
Scope 3	Other indirect emissions related to waste, water,travel, and procurement

This plan covers the following sources of emissions

- All Council (operational) buildings (existing and new) – including swimming pools, sports facilities, car parks, pavilions, and public conveniences.
- Vehicles/Fleet
- Staff travel/Travel at Work (i.e. business travel/staff owned cars used to conduct council business [grey fleet])
- Communal areas of Oxford City Council Housing stock that are the billing responsibility of the Council (including Temporary Accommodations sites)
- Other miscellaneous buildings/sites that now are the billing responsibility of the Council (e.g. new sites, misc. smaller sites not previously included in previous baseline)
- Water consumption (and related carbon emissions)

Appendix 2

Zero Carbon by 2030: scope detail

Included in the City Council's 2030 goal			**Not included**
Scope one	**Scope two**	**Scope three**	**Scope three**
Fuel used for heat in our buildings and facilities (e.g. natural gas, gas oil, kerosene and liquid petroleum gas) Fuel used in Council vehicle fleet and also to power non-road vehicles and plant such as lawn-mowers and, chippers. Fuel used in waste collection vehicle fleet	Purchased standard grid electricity for our buildings and other electricity consuming sites (e.g. offices, leisure centres, depots, car park and public conveniences). *This does not include purchased electricity certified to be from renewable sources (e.g. REGO).* Half-hourly metered and non-half-hourly metered electricity supplies (i.e. Meter profile classes 01-08, HH and Unmetered Supplies)	Electricity (transmission and distribution factors). *This does not include transmission and distribution factors for certified green electricity.* Business mileage by car Business mileage by public transport (bus and train) Water consumed (supply and treatment)	Perfluorocarbons (PFC), hydrofluorocarbons (HFC) and sulphur hexafluoride (SF_6) Staff commuting Emissions from Council operational waste deposited in landfill sites. Emissions from leased commercial properties or housing stock where tenants are paying energy/water bills. Total indirect emissions: e.g. due to upstream emissions from production and delivery of fuel to power stations or transport fuel stations. Emissions from the goods and services that we procure. Emissions from construction methods employed/embodied carbon from construction.

Appendix 3

2019/20 GHG underlying emissions breakdown by scope including emissions from Oxford Direct Services Ltd (ODS)

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**

Appendix 4

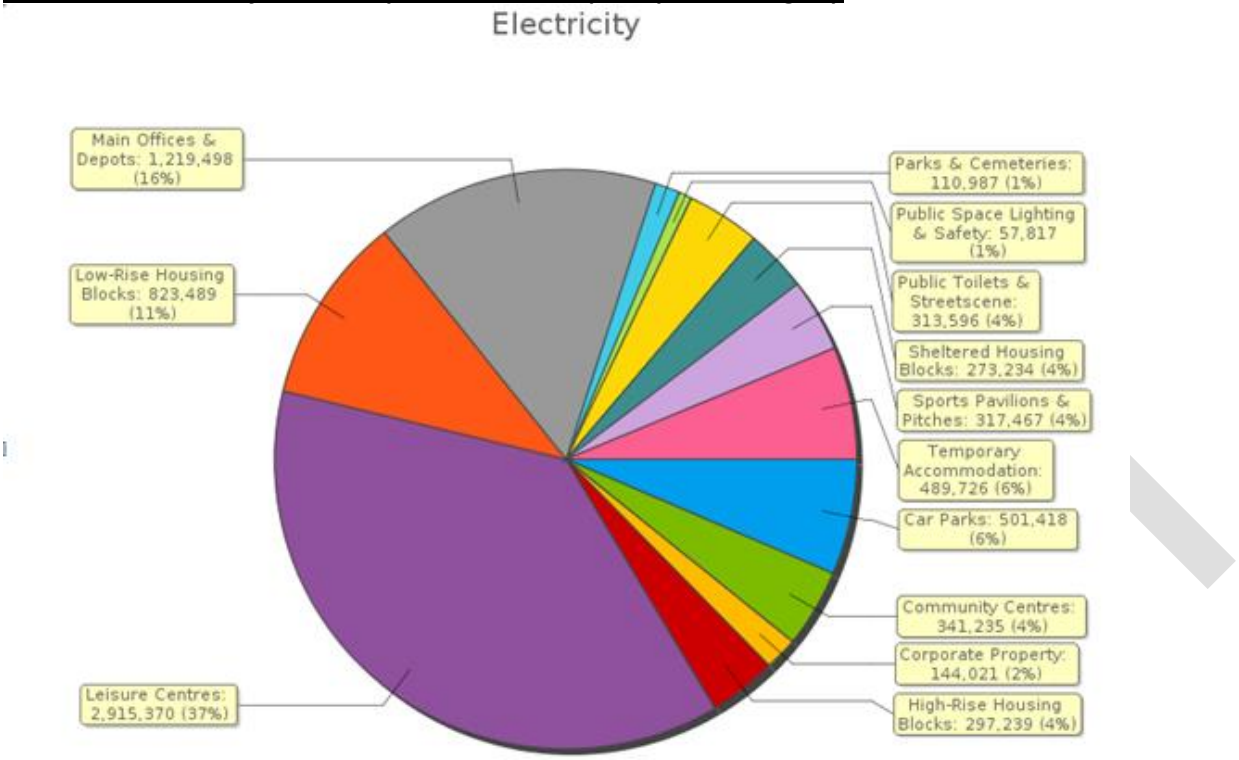
ODS emissions break down 2019/20

Scope 1	**tCO2**	**tCO2e**
Gas/kWh	176	177
Diesel	1,832	1,857
Gasoil	85	86
unleaded	31	32
total scope 1	**2,125**	**2,151**
Scope 2		
elec/kWh	143	144
Scope 3		
T&D/kWh	12	12
Totals	**2,280**	**2,307**

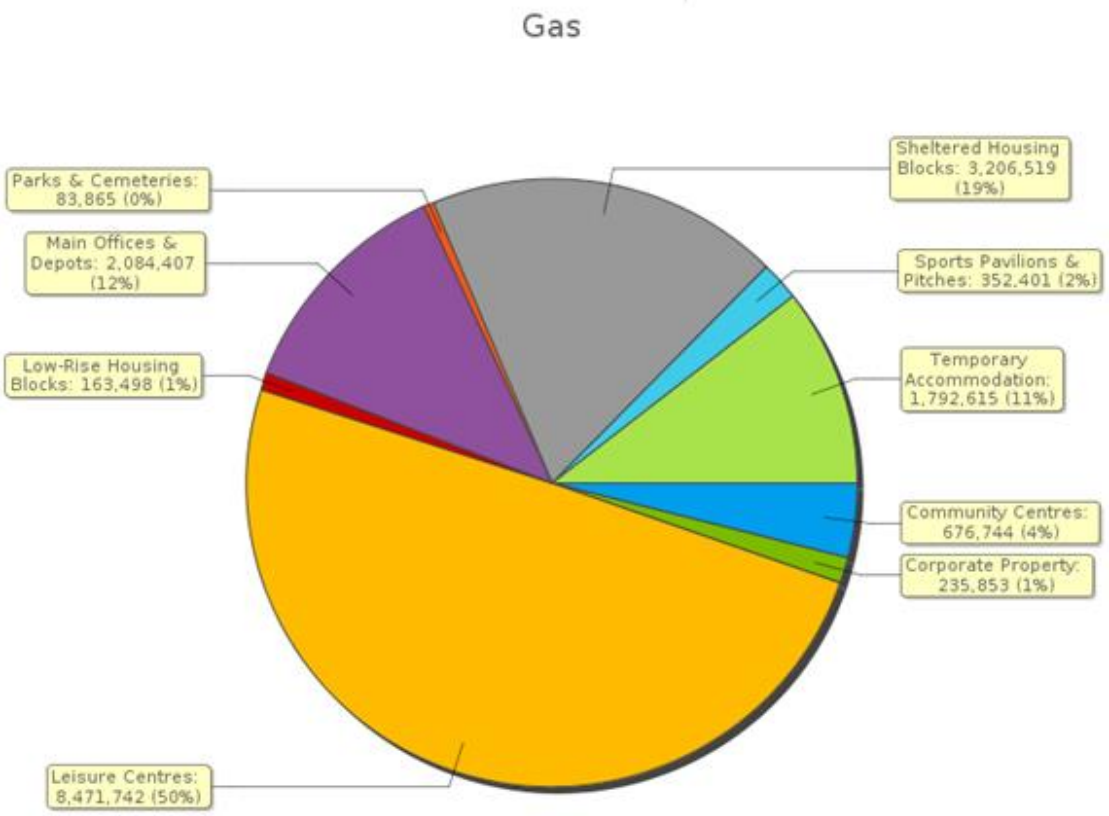
Appendix 5

2019/20 Breakdown of electricity and gas consumption in kWh and percentages based on type/areas (including ODS)

2019/20 Electricity consumption* in kWh (and percentages)



2019/20 Gas consumption* in kWh (and percentages)



**Note: housing related energy consumption does not include housing occupied by Council tenants where they are paying the energy bills*

Appendix 6

Council progress reaching *net* zero carbon, detailing the underlying emissions and emissions after purchase of green electricity, green gas and offsetting

Reaching Net Zero Carbon, detailing purchase of green electricity, green gas and offsetting

tCO2e	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	% reduction since
Gross underlying consumption emissions (as required to report to BEIS)	**9,703**	**9,286**	**8,955**	**8,572**	**7,741**	7,425											**23.00%**
Commitment to buy renewable electricity (REGO, PPAs etc) – ongoing	0	0	0	1,922	2452	2164											
Consumption carbon emissions after purchase of renewable electricity	**9,703**	**9,286**	**8,955**	**6,650**	**5,289**	**5,261**											**46.00%**
Commitment to buy Renewable gas (RGGO) – while we move away from combustion of gas for heat	0	0	0	0	0	0	start - @10% from Oct 20										
Commitment to carbon offsetting while we move away from combustion engine vehicles, fossil gas use	0	0	0	0	0	0	?										
Net carbon emissions (after purchase of renewable electricity, gas, and offsetting	**9,703**	**9,286**	**8,955**	**6,650**	**5,289**	**5,261**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**46.00%**