



# 2018-19 Carbon baseline report

London Borough of Lambeth

July 2020

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# Glossary

BEIS	UK Department for Business, Energy and Industrial Strategy
CO <sub>2</sub> e	Carbon dioxide equivalent, the standard unit for measuring carbon footprints based on global warming potential of various gases
End-user emissions	A methodology which allocates carbon emissions from energy transformation industries to those using final energy flows
EV	Electric vehicles, including hybrids
LA	Local Authority
Net zero/carbon neutral	Overall CO <sub>2</sub> e emissions are zero, through nil emissions and/or offsetting activities
Per capita	Per person, to normalise for differences in population size
T&D	Transmission and distribution, through which energy is lost in the process of sending electricity through the grid and to individual sites
Whole life-cycle carbon	Both operational (while a building is occupied or facility used) and embodied (from construction and materials production and transport) carbon emissions

## Units

Unit of carbon emissions	tCO <sub>2</sub> e	tonnes CO <sub>2</sub> e
	ktCO <sub>2</sub> e	kilotonnes CO <sub>2</sub> e (1,000 tCO <sub>2</sub> e)
Unit of energy	kWh	kilowatt hours
	MWh	megawatt hours (1,000 kwh)
	GWh	gigawatt hours (1,000,000 kwh)
Unit of volume	m <sup>3</sup>	cubic metres/1,000 litres

## Executive summary

### Background

In 2019 Lambeth published its [Corporate Carbon Reduction Plan](#), setting out the strategy to reach carbon neutrality in the council's operations by 2030. This was in response to the

declaration of a climate emergency and recognition of the contribution required by the council in reducing the borough's carbon emissions. Carbon neutral means that net emissions will be zero, which will be achieved by a combination of decreasing emissions and taking measures to offset remaining emissions which we aren't able to eliminate.

In the first section, the report outlines the wider borough's carbon emissions, covering emissions from transport, industry and commercial and domestic sectors, and the data shown are from end-user emissions which are calculated at the point of energy consumption and emission. This will inform the upcoming [Citizens' Assembly](#) (CA) and the subsequent borough-wide Climate Action Plan.

The rest of the report presents a 2018-19 baseline (1<sup>st</sup> April – 31<sup>st</sup> March) of the emissions arising from the council's operations and estate to provide a starting point for reduction measures and to allow measurement of progress to our 2030 target. The baseline covers our scope 1 and scope 2 emissions from gas and electricity use in buildings, and transport using council-owned fuel and electric vehicles. Scope 1 emissions are direct emissions from owned or controlled sources, and scope 2 emissions are indirect emissions from the generation of purchased energy (Table 1). Scope 3 emissions from water supply and treatment are also included. Scope 3 emissions from waste and from staff travel to and from work will be published in separate reports. We have not carried out a full scope 3 analysis as difficulty in developing a methodology for data collection and reporting for these emissions would mean that accuracy and reliability of the baseline would be compromised, as there is no standard methodology for scope 3 reporting by London Local Authorities. Also, whole life-cycle carbon isn't reported here as we don't have the information available to us to calculate this and include in the baseline.

The document aims to provide a baseline for 2018-19, and so does not make recommendations for actions nor forecast emissions or commit to any development to reduce emissions. A future baseline to forecast carbon emissions under different scenarios will be published at a later date. To monitor our progress towards reducing borough-wide emissions and achieving our carbon neutral target for council emissions, the data will be updated annually and the update will be made available on our website. This data and methodology used in this report have been peer-reviewed by the environmental consultancy AECOM in February 2020.

## Overall conclusions

### Council Emissions

- Emissions from energy use in council buildings, including housing, is the most significant contributor to overall corporate emissions.
- Overall emissions from buildings' energy use were 32.33 ktCO<sub>2</sub>e in 2018-19. Gas is the source of 67.2% of total emissions from building energy use, with the remainder from electricity.

- Council-owned housing was the significant contributor to total electricity and gas consumption in council buildings (68.1%), and to total emissions from electricity and gas (65.7%).
- The council's vehicle fleet generated 298.02 tCO<sub>2</sub>e, of which diesel vehicles were the source for 81.7%.
- Over a 48-week working year, staff travel emissions for the members of staff for whom we have data are estimated to be 407.33 tCO<sub>2</sub>e (see separate staff travel report), which is nearly 1.4 times as much as use of the fleet. It is also likely to be an underestimate as it isn't representative of the whole staff body.
- Emissions from EVs are much lower than those from fuel vehicles, partly due to the small fleet size and partly because EVs have lower emissions.
- Emissions from water supply and treatment, scope 3 corporate emissions, are small compared to scope 1 and 2 emissions, but still contribute 73.6 tCO<sub>2</sub>e.
- Scope 3 corporate emissions from waste treatment are 1.72 ktCO<sub>2</sub>e, from incineration and transport, but based on the methodology used (see separate waste report), 11.1 tCO<sub>2</sub>e of these are thought to be offset by diversion of waste from landfill and incineration to recycling processes.

### **Borough-wide Emissions**

- In 2017, 69.4% of domestic emissions across the borough were from gas use with 29.6% coming from electricity use and the remainder from use of other fuels.
- The decrease in our per capita emissions (44.9%) between 2005-2017 was comparable with the Greater London average.
- 41.2% of our borough-wide emissions in 2017 were from the domestic sector (homes), 33.9% from the industrial and commercial sector and 24.8% from transport.

## **Data and methodology**

For borough-wide emissions in Lambeth, local authority (LA) sub-regional data from the Department for Business, Energy and Industrial Strategy (BEIS) is used. Data is published two years in arrears, so the most recent data available is from 2017. Details of their methodology is available in the Technical Report and Methodology and Guidance documents at <https://www.gov.uk/government/collections/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics>.

For council operations, officers within the sustainability department calculated emissions using our own data from council records on electricity and gas, water use and treatment and vehicle use. Emissions are given in units of CO<sub>2</sub> equivalent (CO<sub>2</sub>e) gas emissions, using the BEIS conversion factors for 2018-19 to calculate CO<sub>2</sub>e from the available data which are given in relevant figure legends (available for download at <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2018>). A higher conversion factor means more carbon emissions per unit of raw data.



It is possible that new sources of data or approaches to measuring carbon emissions will develop over the life of our carbon reduction plan. Where these data help the council or residents, businesses and stakeholders to better understand and take action to reduce their emissions, we will incorporate them within our measurement framework.

## **Assumptions and exceptions**

Where housing is referenced, this includes communal areas of buildings in the housing department and individual residences where communal heating and/or hot water systems are in place. Floor data was not available at the time of publication. This means that efficiency could not be calculated.

Of the schools for which we have data, gas data is missing for 13 and electricity data is missing for 17, which could mean that the overall emissions are an underestimate.

Data is missing for gas or electricity use in particular buildings, such as where manual readings are taken and not provided to us. Additionally, measurements were taken monthly, but some are based on meter estimates (calculated using past readings and usage) rather than actual readings. The exact figures for number of estimates are given in the Gas and Electricity section of the report.

Date of fuel transactions are used to indicate when the fuel was burned and emissions generated, so emissions generated from fuel purchased in the baselining year April 2018 - March 2019 are assumed to be in the same year. The Parks Maintenance department has additional fuel use from fuel tanks in the council depot which is not included in emissions calculations as the data for the baseline year is not available to us. Non-conventional vehicles such as tractors and tippers are filled using these tanks, so although they are included in vehicle counts, some emissions from these vehicles are not included in the baseline. Using the current fleet list (April 2020), the number of vehicles owned as of April 2019 was known by the Parks Maintenance department for their own fleet, or was estimated based on vehicle registration date (included in the count if registered before April 2019).

'EVs' refers to hybrid and electric vehicles. A full year of mileage data were not available for all EVs as some of them were purchased throughout the baselining year (2018-19), so the mileage data for the dates available were scaled up to give a pro rata estimate. The mileage data for one hybrid vehicle was recorded at intervals which don't align with the baseline year, so the closest interval was selected (27/06/18 - 18/04/19) and scaled up to estimate use during the baseline year. Emissions from two electric buggies aren't included as mileage data were not available.

The water consumption data is incomplete, so emissions from water supply and treatment for council operations are an underestimate.

Separate assumptions for waste and staff travel can be found in the relevant documents which report on these scope 3 emissions ([here](#) and [here](#) respectively). Difficulty in developing a methodology for data collection and reporting for a full scope 3 analysis would mean that accuracy and reliability of the baseline would be compromised.

<b>Scope 1</b>	Direct emissions from petrol and diesel fuel vehicles and use of gas boilers.
<b>Scope 2</b>	Indirect emissions generated off-site from the electricity used in buildings and in electric vehicles (EVs).
<b>Scope 3</b>	Further indirect emissions from an organisation's entire value chain, including those generated from transmission and distribution (T&D) losses with electricity for EVs, water supply and treatment and waste disposal.

Table 1. Explanation of the different types of carbon emissions. Further detail can be found on page 25 of [The Greenhouse Gas Protocol](#).

## Carbon emissions in Lambeth

The most recent year for which borough-wide data are available is 2017, provided by BEIS Local Authority and Regional Carbon Dioxide Emissions National Statistics for Lambeth. Data from 2005-2017 from BEIS are available [here](#), and analysis of the national data is available in the statistical release [here](#).

Total emissions in Lambeth in 2017 were 909.1 ktCO<sub>2</sub>e. 41.2% of these were from the domestic sector (homes), 33.9% from the industrial and commercial sector and 24.8% of these are from transport (Figure 1). The industrial and commercial sector was classified as any meter reading over a threshold of gas and electricity consumption, and domestic was any meter reading under this threshold.

The borough has seen a 35.7% decrease in total CO<sub>2</sub> emissions since 2005. The data available for 2017 shows a 7.26% decrease from the previous year (Figure 2). If this rate of decrease were to be maintained, in 2030 Lambeth would emit 341.2 ktCO<sub>2</sub>. However, this is partly due to improvements in infrastructure such as vehicle efficiency, and decarbonisation of energy generation as coal use decreases and renewables increase, and so further radical policy change and drastic action will be required to reduce our emissions further. We won't solely rely on further changes in the energy mix and in infrastructure to drive a decrease.

Lambeth's per capita emissions in 2017 were 2.8 tCO<sub>2</sub> (Figure 3). Figure 4 gives a comparison of per capita emissions across all LAs in Greater London, showing that our per capita emissions were equal to those of Sutton, Greenwich, Brent, Croydon and Barking and Dagenham. Our per capita emissions have decreased by 44.9% since 2015, compared with a Greater London average of 45.3%.



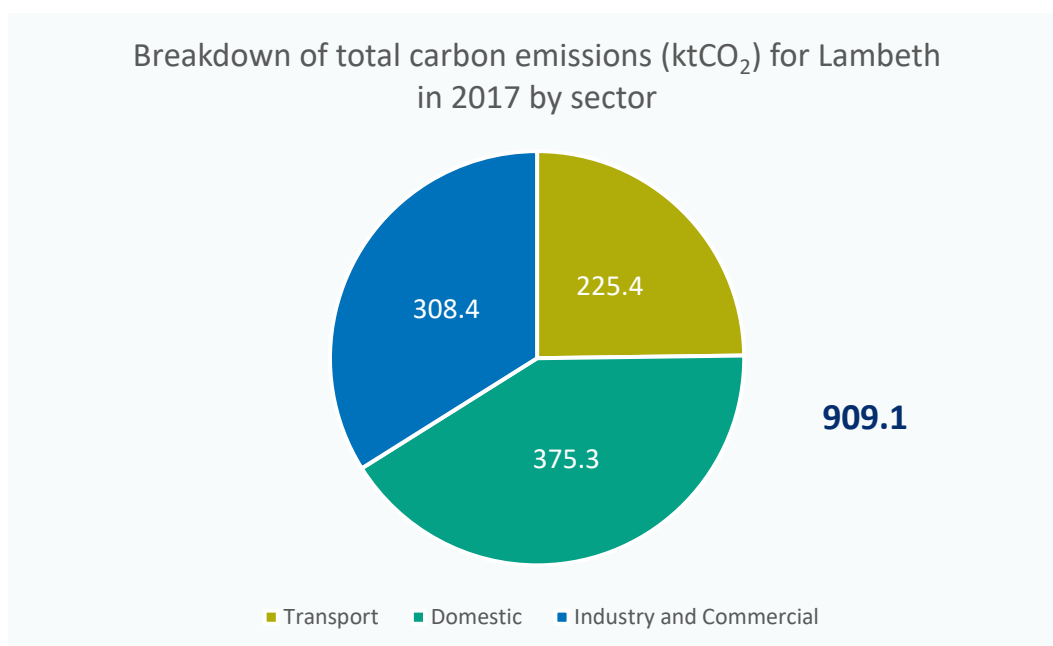


Figure 1. Estimates of carbon emissions (ktCO<sub>2</sub>) for each sector and total emissions (909.1 ktCO<sub>2</sub>) for Lambeth in 2017.

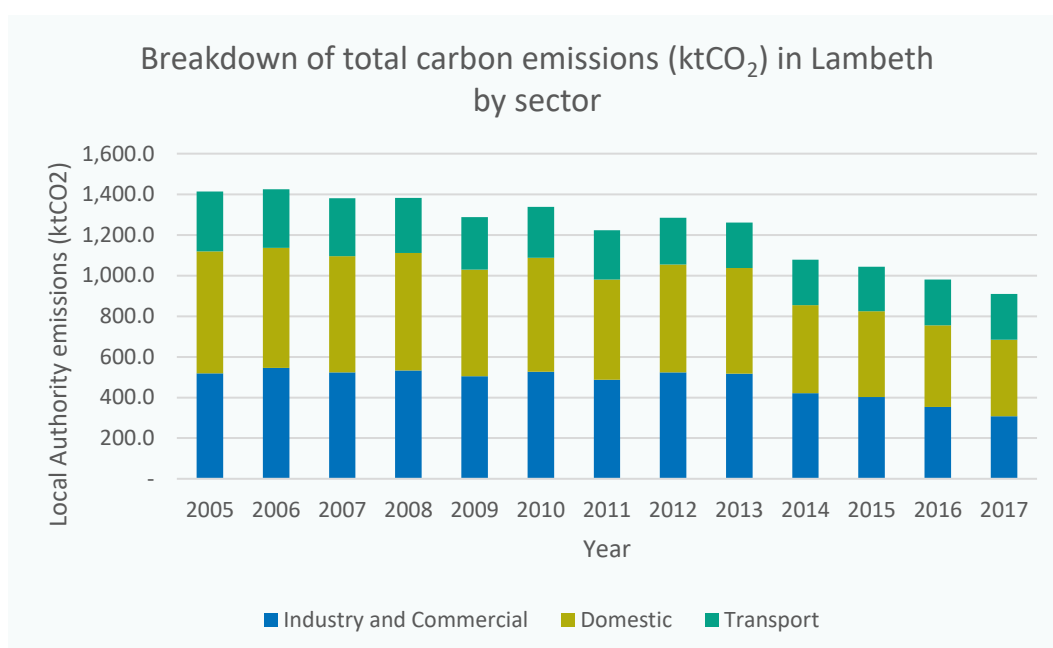


Figure 2. Estimates of carbon emissions (ktCO<sub>2</sub>) from 2005 to 2017 for Lambeth. Contributions of each sector to the total emissions are given.

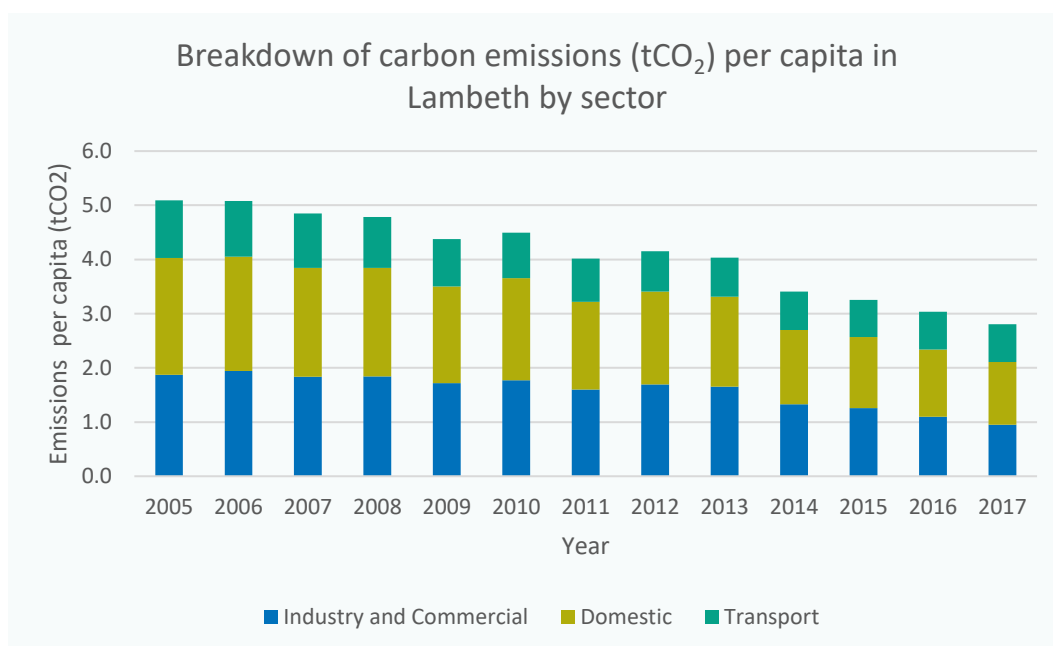


Figure 3. Estimates of carbon emissions (tCO<sub>2</sub>) from 2005 to 2017 per capita for Lambeth. Contributions of each sector to the total emissions are given.

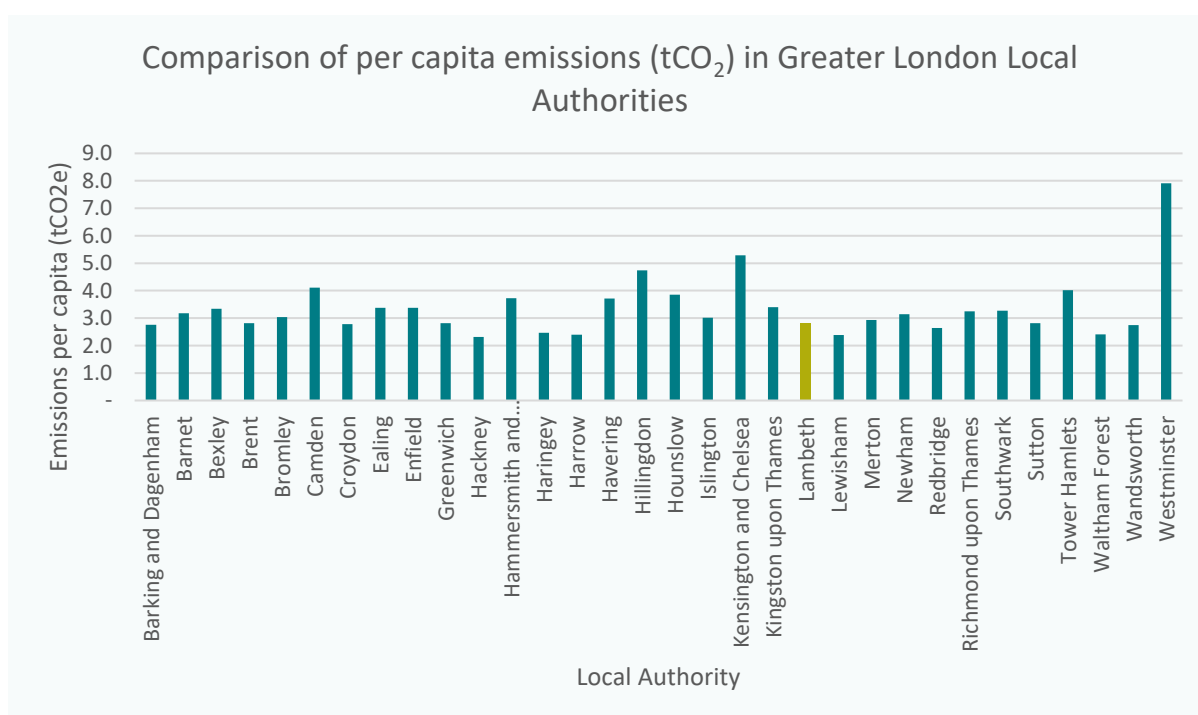


Figure 4. Estimates of carbon emissions (tCO<sub>2</sub>) per capita for Greater London LAs for 2017, the most recent year for which data was available. Lambeth has the joint 15<sup>th</sup> greatest emissions per capita, equal to Sutton, Greenwich, Brent, Croydon and Barking and Dagenham. City of London is not shown here as the emissions are so high (97.9 tCO<sub>2</sub>) they don't allow visual comparison with other boroughs.

The greatest contribution to emissions reductions from all sectors is from the industrial and commercial sector, having decreased by 40.6% (Figure 5). Where there were no major industrial facilities decommissioned during this time, as is the case for Lambeth, this follows the national trend due to a change in fuel for electricity generation as use of renewables increased and use of coal decreased, causing the electricity emissions factor to decrease. A decrease of 37.5% was seen in the domestic sector (Figure 6), while reduction in transport emissions was significantly lower at 23.4% (Figure 7). Activity data for transport are from traffic flows and average regional flows, and emissions from average fleet mix and average speeds.

Since 2005, there has been a 47.4% decrease in per capita industrial and commercial emissions, a 45.5% decrease in per capita domestic emissions and a 36.4% decrease in per capita transport emissions (Figure 8). 2017 saw a 6.7% decrease in per capita emissions from the previous year. Gas use for heating buildings also decreased in 2017 due to the warmer weather in early 2017. Overall transport emissions have increased slightly since 2015, this has been attributed to an increase in movement on A Roads (which largely belong to TfL), whereas movements on minor roads have stayed relatively the same. Since 2015, overall transport emissions have increased slightly, but per capita emissions have remained constant. However, estimates may be skewed by through-traffic or part trips in or out of the area by residents and non-residents. Please see the Local and Regional Carbon Dioxide Emissions Estimates for 2005–2017 Technical Report for more detail on methodology, available [here](#).

Despite a population increase since 2005 of 16.7%, we have still seen this net decrease in carbon emissions (Figure 9).

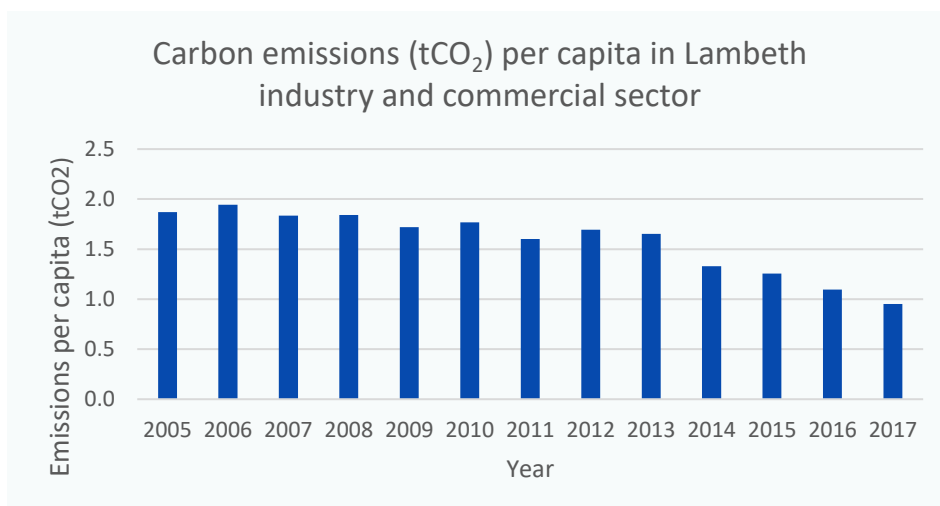


Figure 5. Estimates of carbon emissions (tCO<sub>2</sub>) per capita in Lambeth from 2005 to 2017 for the industry and commercial sector.

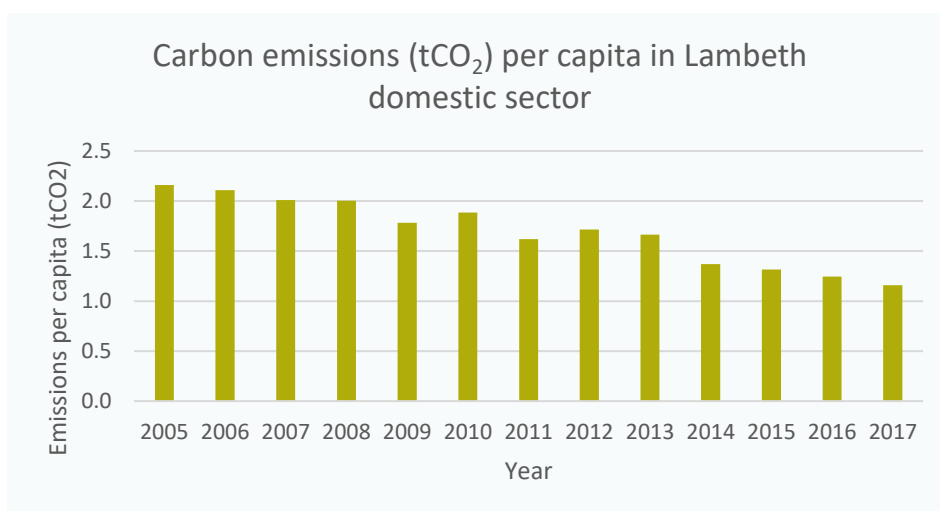


Figure 6. Estimates of carbon emissions (tCO<sub>2</sub>) per capita in Lambeth from 2005 to 2017 for the domestic sector.

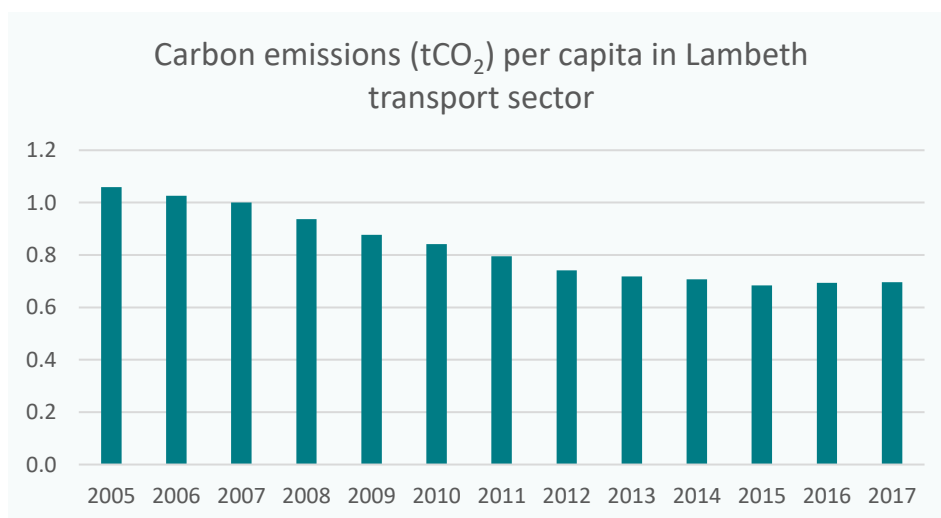


Figure 7. Estimates of carbon emissions (tCO<sub>2</sub>) per capita in Lambeth from 2005 to 2017 for the transport sector.

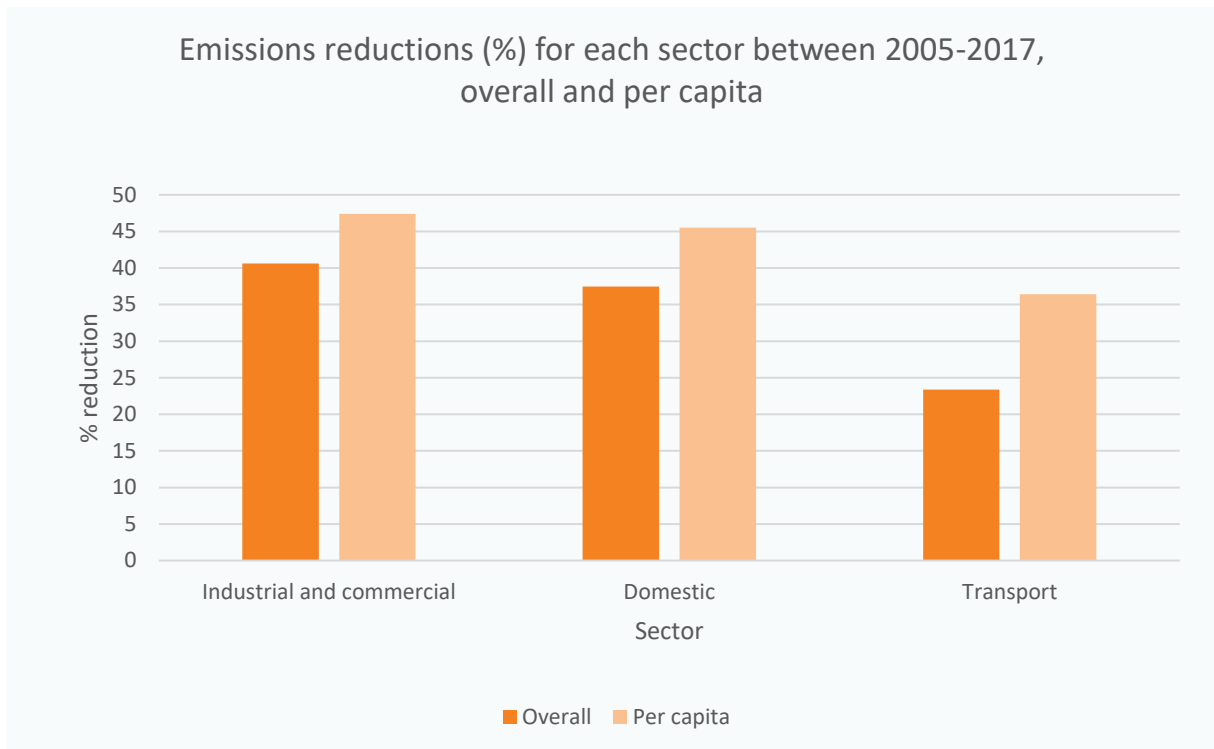


Figure 8. Comparison of overall and per capita emissions reductions in emissions in each sector for the years where data is available.

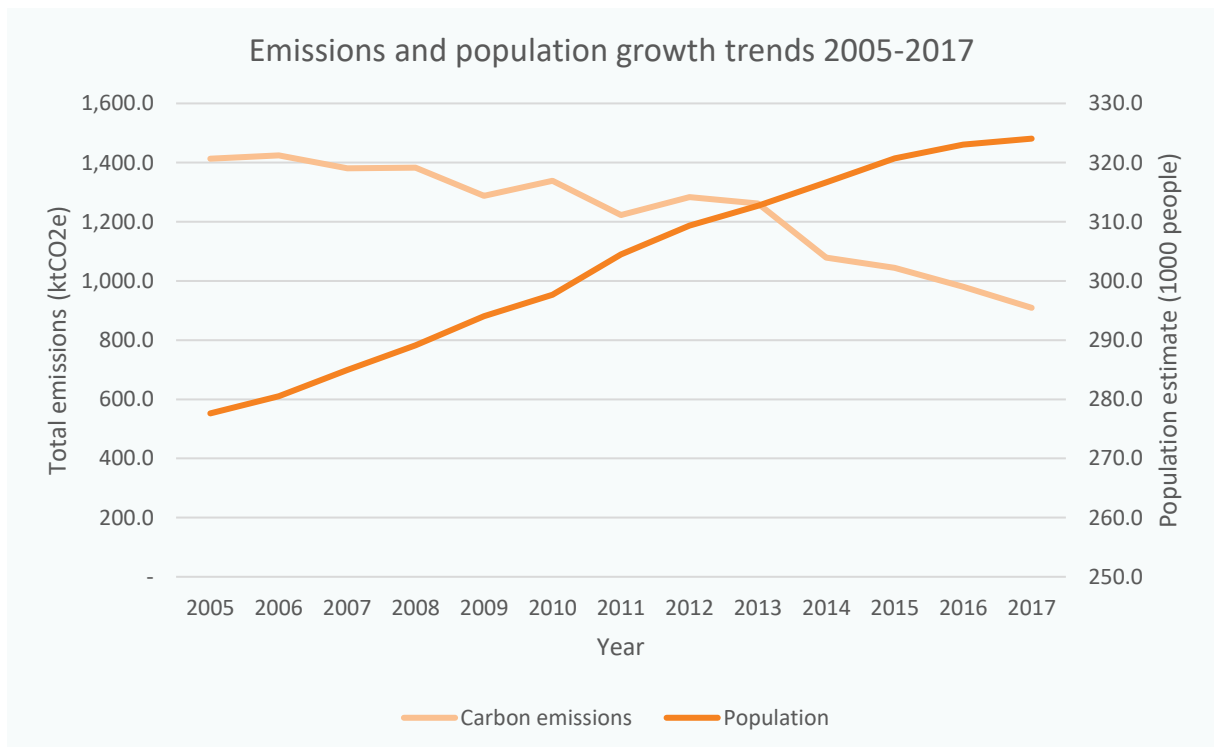


Figure 9. Borough-wide carbon emissions trends compared with population size from 2005 to 2017.

In 2017, 51.8% of industry and commercial emissions were from electricity and 46.8% were from gas. The contribution to emissions in this sector from agriculture was negligible (Figure 10). The majority (69.4%) of domestic emissions across the borough were from gas use. 29.6% were from electricity use and the remainder from use of other fuels (Figure 11). In the transport sector, 59.8% of emissions were from transport on A roads (which largely belong to TfL) and 39.8% from minor roads (Figure 12).



Breakdown of industry and commercial emissions (ktCO<sub>2</sub>) by fuel type for Lambeth in 2017

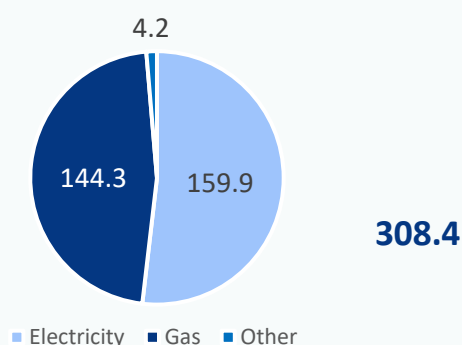


Figure 10. Breakdown of carbon emissions (ktCO<sub>2</sub>) for the industry and commercial sector, and total industrial and commercial emissions (308.4 ktCO<sub>2</sub>). 'Other' includes large industrial installations (0 ktCO<sub>2</sub>e), other fuels (4.1 ktCO<sub>2</sub>) and agriculture (0.1 ktCO<sub>2</sub>).

Breakdown of domestic emissions (ktCO<sub>2</sub>) by fuel type for Lambeth in 2017

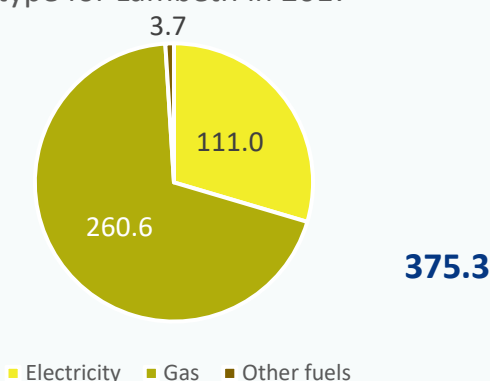


Figure 11. Breakdown of carbon emissions (ktCO<sub>2</sub>) for the domestic sector, and total domestic emissions (375.3 ktCO<sub>2</sub>).

Breakdown of transport emissions (ktCO<sub>2</sub>) by road type for Lambeth in 2017

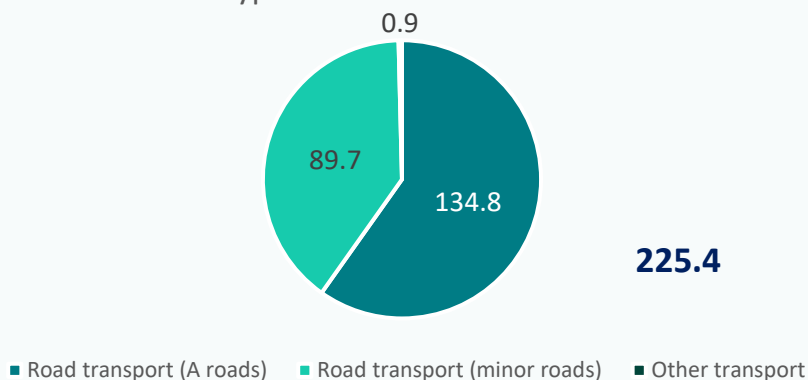


Figure 12. Breakdown of carbon emissions (ktCO<sub>2</sub>) for the transport sector, and total transport emissions (225.4 ktCO<sub>2</sub>). Other transport includes rail, water and air.

# Lambeth Council operations

The following sections show emissions from council operations including energy and water use in buildings and transport using Lambeth's vehicle fleet. Whilst every effort has been made to obtain and report on the council's operations, in some cases data may be unavailable or incomplete. Use of electricity and gas to power buildings is the greatest contributor to total emissions for which we currently have data, at 98.9% (Figure 13), followed by transport using the council fleet. The contribution by scope 3 emissions for water use is small comparatively, and scope 3 emissions from waste and staff travel have been omitted from this report (available [here](#) and [here](#)).

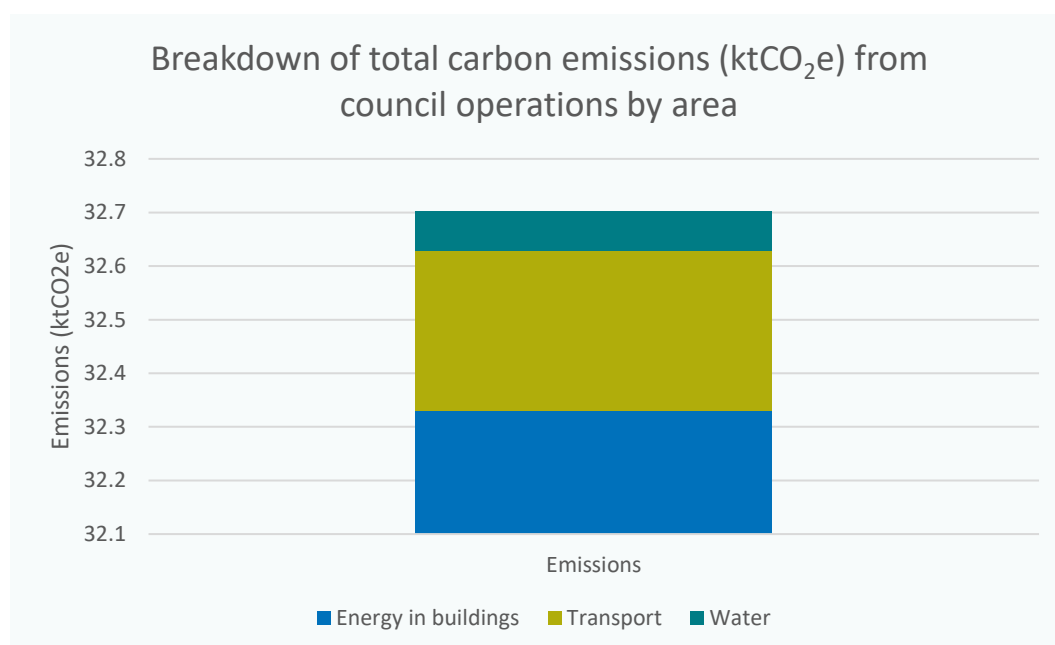


Figure 13. Total estimated CO<sub>2</sub>e emissions (32.70 ktCO<sub>2</sub>e) for council operations and breakdown by sector, given in ktCO<sub>2</sub>e. Note vertical axis does not start at 0. Transport includes use of the council fuel fleet in the baselining year and electric vehicle fleet which is calculated pro rata based on data for less than one year.

## Gas and electricity

This section outlines the emissions from gas and electricity use in council-owned buildings for the baseline year, which is the highest emitting sector across council operations. Council buildings include corporate buildings; communal areas of housing excluding individual units and residences served by communal heating and/or hot water; council-funded schools, colleges and nurseries; libraries; and parks and cemeteries. Corporate buildings are those which are central to the council's operations for citizens, such as offices, customer service

points and resource facilities. Streetlighting, which is fully electric, is also included in analysis here. In some instances and at the time of publication, data was not available for gas or electricity consumption of particular buildings, such as where manual readings are taken. Of the schools for which we have data, gas data was not available for 13 and electricity data was not available for 17, but we are working with schools' management teams and colleagues in the relevant council departments to obtain this. Additionally, measurements for consumption data for buildings were taken monthly, but some are based on meter estimates (calculated using past readings and usage) rather than actual readings:

- For 57% (226) of the 396 sites from which gas readings were taken, and for 33% (1,952) of the 5,879 sites from which electricity readings were taken, half or more are based on estimates. This is where actual readings were not available.
- For 4% (17) of the 396 sites from which gas readings were taken, and for 43% (2,511) of the 5,879 sites from which electricity readings were taken, fewer than six readings were taken over the twelve months. In these instances, the final figure may not accurately reflect the true energy consumption for the site.

Gas and electricity use in buildings contributed 32.33 ktCO<sub>2</sub>e (98.9% of total emissions). This high proportion of total emissions can partly be attributed to the high number of buildings for which the council is responsible, as well as energy inefficiencies. Gas is the source of 67.2% of total emissions from building energy use, with the remainder from electricity (Figure 14). Council-owned housing was the most significant consumer of electricity and gas (68.1%; Figure 15), and to total emissions from electricity and gas (65.7%; Figure 16). All street lighting is powered by electricity so there are no emissions from gas use.

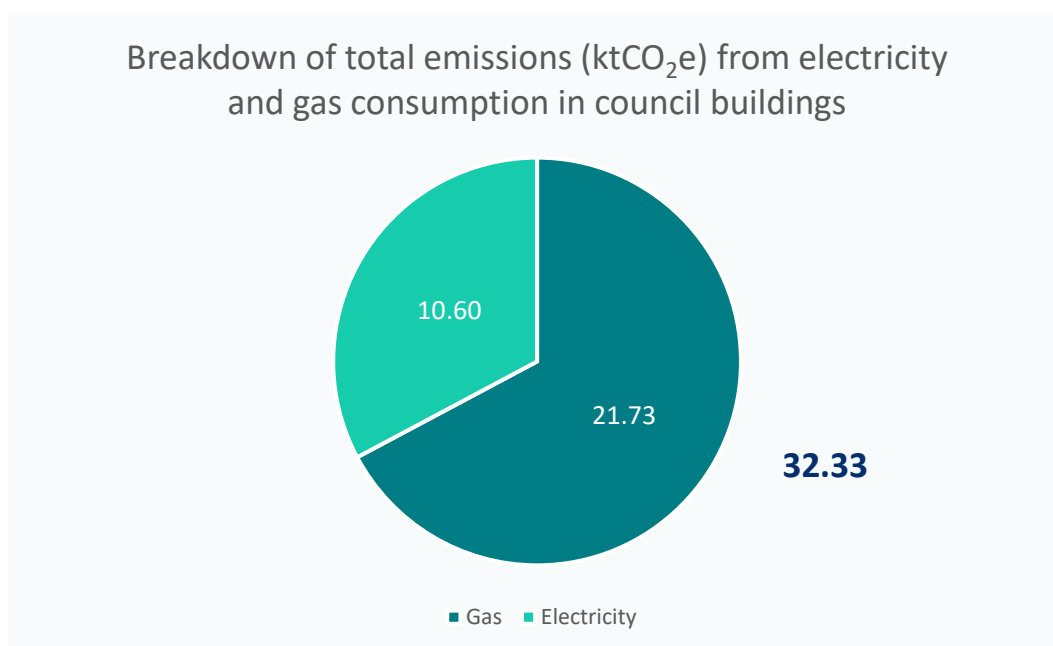


Figure 14. Estimates of CO<sub>2</sub>e emissions (ktCO<sub>2</sub>e) from electricity and gas used in all Lambeth council buildings in 2018-19, plus total combined emissions (32.33 ktCO<sub>2</sub>e). Consumption data was multiplied by conversion factors 0.18396 kgCO<sub>2</sub>e/kWh for gas and 0.28307 kgCO<sub>2</sub>e/kWh for electricity and converted from kgCO<sub>2</sub>e to ktCO<sub>2</sub>e.

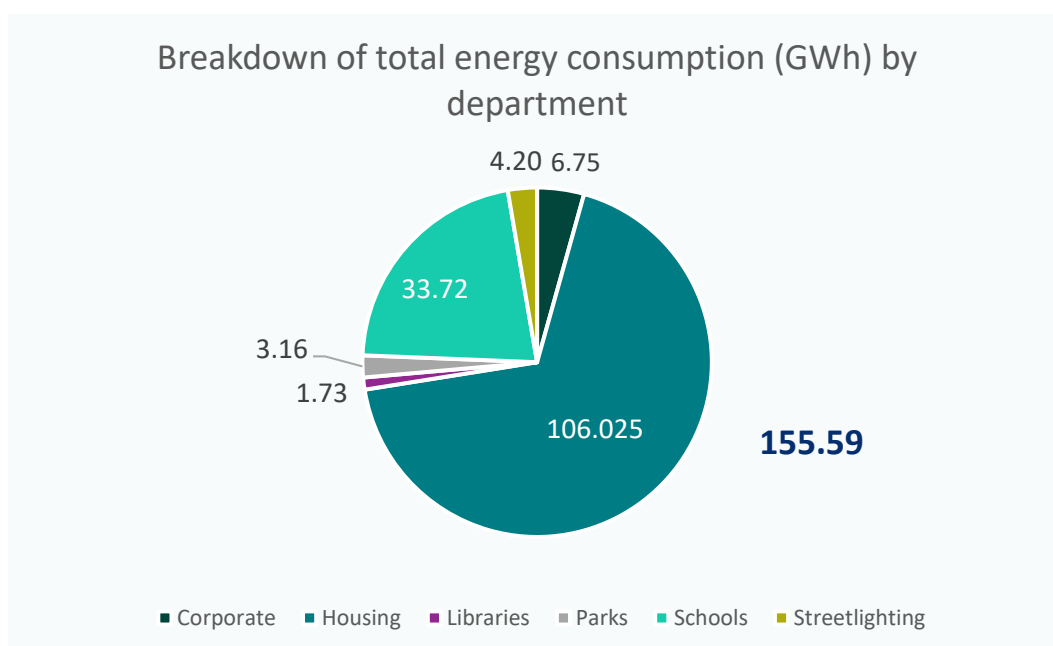


Figure 15. Estimates of electricity and gas use (GWh) in 2018-19, broken down by consumption by building type plus total combined consumption (155.59 ktCO<sub>2</sub>e). Consumption data was multiplied by conversion factors 0.18396 kgCO<sub>2</sub>e/kWh for gas and 0.28307 kgCO<sub>2</sub>e/kWh for electricity and converted from kgCO<sub>2</sub>e to ktCO<sub>2</sub>e.

Breakdown of total emissions (ktCO<sub>2</sub>e) from gas and electricity use by department

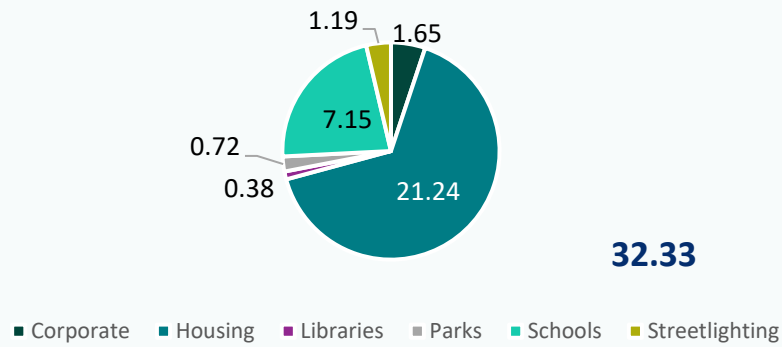


Figure 16. Estimates of CO<sub>2</sub>e emissions (ktCO<sub>2</sub>e) from electricity and gas used in 2018-19, broken down by consumption by building type plus total combined emissions (32.33 ktCO<sub>2</sub>e). Consumption data was multiplied by conversion factors 0.18396 kgCO<sub>2</sub>e/kWh for gas and 0.28307 kgCO<sub>2</sub>e/kWh for electricity and converted from kgCO<sub>2</sub>e to ktCO<sub>2</sub>e.

Breakdown of total emissions (ktCO<sub>2</sub>e) from electricity use by department

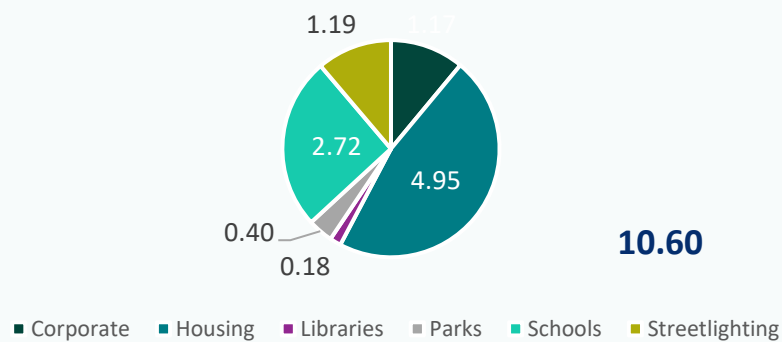


Figure 17. Estimates of CO<sub>2</sub>e emissions (ktCO<sub>2</sub>e) from electricity used in 2018-19, broken down by consumption by building type plus total combined emissions (10.60 ktCO<sub>2</sub>e). Consumption data was multiplied by conversion factors 0.18396 kgCO<sub>2</sub>e/kWh for gas and 0.28307 kgCO<sub>2</sub>e/kWh for electricity and converted from kgCO<sub>2</sub>e to ktCO<sub>2</sub>e.

Breakdown of total emissions (ktCO<sub>2</sub>e) from gas use by department

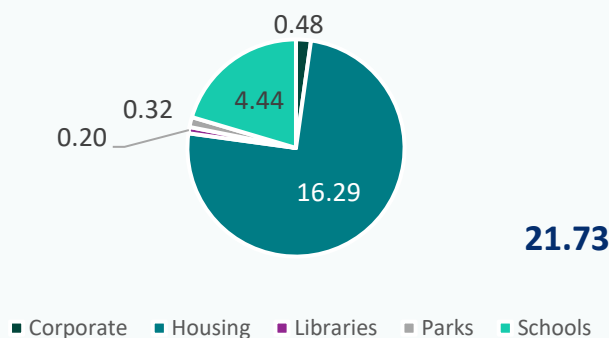


Figure 18. Estimates of CO<sub>2</sub>e emissions (ktCO<sub>2</sub>e) from gas used in 2018-19, broken down by consumption by building type plus total combined emissions (21.73 ktCO<sub>2</sub>e). Consumption data was multiplied by the conversion factor 0.18396 kgCO<sub>2</sub>e/kWh and converted from kgCO<sub>2</sub>e to ktCO<sub>2</sub>e.

Tables 2 and 3 show the carbon emission and energy consumption data, respectively, for all council buildings' use of electricity and gas by department. Emissions just from gas use in housing contributed 50.4% of the total emissions from both gas and electricity for all types of buildings (Table 2), and consumption of gas in housing contributed 56.9% of the total consumption (Table 3). To control for the differences in the number of buildings between different departments and give a clearer picture of where the areas for significant improvement lie, the top ten highest emitting buildings are shown in Table 4; six of these ten are in the housing department.

Building type	Carbon emissions from electricity (ktCO <sub>2</sub> e)	Carbon emissions from gas (ktCO <sub>2</sub> e)	Total emissions from electricity and gas (ktCO <sub>2</sub> e)
Corporate	1.17	0.48	1.65
Housing	4.95	16.29	21.24
Libraries	0.18	0.20	0.38
Parks	0.40	0.32	0.72
Schools	2.72	4.44	7.16
Streetlighting	1.19	0.00	1.19
Total	10.60	21.73	32.33

Table 2. Estimates of total emissions from gas and electricity used in council buildings from April 2018 to March 2019. Consumption data was multiplied by conversion factors 0.18396 kgCO<sub>2</sub>e/kWh for gas and 0.28307 kgCO<sub>2</sub>e/kWh for electricity and converted from kgCO<sub>2</sub>e to ktCO<sub>2</sub>e. For some properties electricity or gas data is not available and so not included in total figures. Streetlighting is powered by electricity.



Building type	Total electricity consumption (GWh)	Total gas consumption (GWh)	Total electricity and gas consumption (GWh)
Corporate	4.13	2.62	6.75
Housing	17.49	88.54	106.03
Libraries	0.63	1.11	1.73
Parks	1.40	1.76	3.16
Schools	9.60	24.11	33.72
Streetlighting	4.20	0	4.20
Total	37.45	118.14	155.59

Table 3. Total consumption of electricity and gas (GWh) used in council buildings from April 2018 to March 2019. For some properties electricity or gas data is not available and so not included in total figures. Of the schools for which we have data, gas data is missing for 13 and electricity data is missing for 17.

The top ten sites, out of approximately 2,318 for which we have data, contributing the highest level of emissions from April 2018 to March 2019 for each department are shown in tables 5-9.

- The top ten emitting properties in the housing estate (Table 5) contribute 26.1% of the total emissions for all buildings' electricity and gas use and 39.7% of the total emissions for housing.
- The top ten schools (Table 6) contribute 34.3% of the total emissions from electricity and gas from all schools' and 7.6% of all buildings' electricity and gas use. The two highest-emitting schools for which we have data (Fenstanton Primary School and Platanos College) have significantly higher emissions than the next highest emitting school, at more than 420 tCO<sub>2</sub>e compared with less than 250 tCO<sub>2</sub>e. However, some schools energy usage data was not available so these emissions may be an underestimate.

- The top ten parks buildings (Table 7) contribute 67.1% of the total emissions from electricity and gas from all parks' buildings and 1.5% of all buildings' electricity and gas emissions.
- The area D parking meters, the fourth highest-emitting facility in the parks department, have been decommissioned and so demonstrate how progress to reducing emissions has already been made.
- Libraries contribute only 1.2% of all buildings' emissions, and the top ten emitters are shown in Table 8.
- The top ten corporate buildings (Table 9) contribute 99.6% of the total emissions from electricity and gas from all corporate buildings due to the smaller number of council assets classified as 'corporate', and 5.1% of all buildings' electricity and gas emissions.

It's important to consider that some buildings are much larger than others and so have a larger operational energy demand and so may emit more carbon. For this reason, where floor area data is available for the top ten emitting buildings in each category, the energy use per square metre is included to give a measure of efficiency and a more accurate reflection of energy performance. For example, Fenstanton Primary School has higher emissions than Julian's Primary School but similar efficiency (Table 6). This information will allow us to focus our carbon reduction efforts on the sites with the most potential for improvement.

The Civic Centre has an Excellent BREEAM rating due to its high energy efficiency specification, but currently we are not able to separate the gas consumption data from the Civic Centre and Town Hall combined, and so an overall figure for both buildings is given here.

All Buildings				
#	Name	Department	Total CO <sub>2</sub> emissions (ktCO <sub>2</sub> e)	Total energy use (GWh)
1	Ethelred Estate	Housing	1.58	8.38
2	Roupell Park Estate	Housing	1.53	8.13
3	Notre Dame Estate	Housing	1.19	6.15
4	Southwyck House	Housing	1.07	5.60
5	China Walk Estate	Housing	0.78	4.08
6	Lambeth Town Hall and Civic Centre	Corporate	0.77	3.25
7	William Bonney Estate	Corporate	0.61	3.14
8	Fenstanton Primary School	School	0.47	2.09
9	Holst Court	Housing	0.45	2.40
10	Platanos College	School	0.44	1.98
			8.89	45.19

Table 4. The council-owned buildings with the highest estimated CO<sub>2</sub> emissions (ktCO<sub>2</sub>e) from consumption of gas and electricity from April 2018 - March 2019, plus energy consumption (GWh). Streetlighting is not included. Consumption data was multiplied by conversion factors 0.18396 kgCO<sub>2</sub>e/kWh for gas and 0.28307 kgCO<sub>2</sub>e/kWh for UK electricity, and converted from kgCO<sub>2</sub>e to ktCO<sub>2</sub>e.

Housing						
#	Name	CO <sub>2</sub> emissions (tCO <sub>2</sub> e)	Total MWh	No of dwellings	CO <sub>2</sub> emissions per dwelling (tCO <sub>2</sub> e)	MWh per dwelling
1	Ethelred Estate	1,575.70	8,375.21	364	4.33	23.01
2	Roupell Park Estate	1,527.83	8,126.95	496	3.08	16.38
3	Notre Dame Estate	1,191.03	6,145.52	380	3.13	16.17
4	Southwyck House	1,072.20	5,604.77	176	6.09	1,072.20
5	China Walk Estate	782.57	4,078.87	484	1.62	8.43
6	William Bonney Estate	610.59	3,144.70	182	3.35	17.28
7	Holst Court	448.49	2,396.40	32	14.02	74.89
8	129 Coburg Crescent	429.00	2,166.37	38	11.29	57.01
9	Falmouth House	428.85	2,323.26	68	6.31	34.17
10	Burchell and Bland Houses	375.22	2,011.16	37	10.14	54.36
		8,441.49	4,4373.22			

Table 5. The council-owned buildings in the housing department with the highest estimated CO<sub>2</sub> emissions (tCO<sub>2</sub>e) from consumption of gas and electricity from April 2018 - March 2019, plus energy consumption (MWh). This includes communal areas and individual residences where communal heating and/or hot water systems are in place. All of the top ten listed here have communal heating and hot water. Floor areas were not available for housing and so energy per square metre isn't shown, instead efficiency is shown through emissions and energy use per dwelling where this data was available. Where more than one house or an estate is named, one boiler room provides the gas supply for several buildings and combined number of dwellings is given for all.

Schools					
#	Name	CO <sub>2</sub> emissions (tCO <sub>2</sub> e)	Total MWh	Floor area (m <sup>2</sup> )	Energy per square metre (kWh/m <sup>2</sup> )
1	Fenstanton Primary School	466.57	2,091.96	3,647	573.54
2	Platanos College	444.82	1,975.22	N/A	N/A
3	Loughborough Primary School	233.14	1,120.57	3,792	295.51
4	Norwood School	207.94	849.79	N/A	N/A
5	Julians Primary (Grant)	196.22	944.74	1,810	521.96
6	Rosendale Primary School	195.42	1,062.27	7,856	135.22
7	Elm Court School	192.16	941.18	N/A	N/A
8	Henry Cavendish School (Balham)	176.09	863.70	4,787	180.43
9	Sunnyhill Primary & Nursery School	172.26	781.41	3,664	213.27
10	Stockwell Primary School	171.20	805.91	4,784	168.46
		2,455.81	11,436.74		

Table 6. The council-owned schools with the highest estimated CO<sub>2</sub> emissions (tCO<sub>2</sub>e) from consumption of gas and electricity from April 2018 - March 2019, plus energy consumption (MWh). All buildings owned by the school are included, but of the schools for which we have data, gas data is missing for 13 and electricity data is missing for 17. Consumption data was multiplied by conversion factors 0.18396 kgCO<sub>2</sub>e/kWh for gas and 0.28307 kgCO<sub>2</sub>e/kWh for UK electricity, and converted from kgCO<sub>2</sub>e to ktCO<sub>2</sub>e. Energy used (kWh) per square metre is also shown. N/A indicates where the council doesn't have a record of floor area data and so efficiency isn't given.

Parks					
#	Name	CO <sub>2</sub> emissions (tCO <sub>2</sub> e)	Total MWh	Floor area (m <sup>2</sup> )	Energy per square metre (kWh)
1	West Norwood Cemetery	140.50	726.59	1,477	491.94
2	Lambeth Cemetery and Crematorium	135.29	684.27	1,043	656.06
3	Lambeth Area D Parking Meters	42.83	151.32	N/A	N/A
4	Brockwell Park Gardens	39.44	214.41	N/A	N/A
5	Clapham Common Bandstand Cafe	24.39	132.59	228	581.55
6	Kennington Park Conveniences And Dressing Rooms	22.54	122.50	17	7206.16
7	Rommany Road Depot Office	21.05	74.38	N/A	N/A
8	Air Quality Monitoring Stations	21.03	74.30	N/A	N/A
9	Max Roach Open Space Opposite 234 Brixton Road	19.15	67.65	N/A	N/A
10	Kennington Park Artificial Grass Pitch	17.13	60.50	N/A	N/A
		483.35	2,308.52		

Table 7. The council-owned buildings in the parks department with the highest estimated CO<sub>2</sub> emissions (tCO<sub>2</sub>e) from consumption of gas and electricity from April 2018 - March 2019, plus energy consumption (MWh). Consumption data was multiplied by conversion factors 0.18396 kgCO<sub>2</sub>e/kWh for gas and 0.28307 kgCO<sub>2</sub>e/kWh for UK electricity, and converted from kgCO<sub>2</sub>e to ktCO<sub>2</sub>e. Energy used (kWh) per square metre is also shown. N/A indicates where floor area data was not available and so efficiency isn't given. Lambeth Area D Parking Meters cover the Brixton area. Air Quality Monitoring Stations refers to Brixton, Vauxhall and Streatham automatic air quality monitoring stations.



Libraries					
#	Name	CO <sub>2</sub> emissions (ktCO <sub>2</sub> e)	Total MWh	Floor area (m <sup>2</sup> )	Energy per square metre (kWh)
1	Streatham Tate Library	72.53	366.23	962	380.70
2	Black Cultural Archives	67.01	285.85	N/A	N/A
3	Brixton Tate Library	63.91	294.82	1718	171.61
4	Clapham Library	58.62	243.60	594	234.52
5	Carnegie Library	39.13	176.75	1,720	102.76
6	Durning Library	32.68	161.19	645	249.91
7	Minet Public Library	26.20	92.55	938	98.67
8	South Lambeth Tate Library	20.89	112.41	483	232.73
		380.97	1,733.41		

Table 8. The council-owned buildings in the libraries department with the highest estimated CO<sub>2</sub> emissions (tCO<sub>2</sub>e) from consumption of gas and electricity from April 2018 - March 2019, plus energy consumption (MWh). There are only eight buildings in the libraries department in Lambeth for which we have data. Energy used (kWh) per square metre is shown. Consumption data was multiplied by conversion factors 0.18396 kgCO<sub>2</sub>e/kWh for gas and 0.28307 kgCO<sub>2</sub>e/kWh for UK electricity, and converted from kgCO<sub>2</sub>e to ktCO<sub>2</sub>e. N/A indicates where floor area data was not available and so efficiency isn't given. Only 8 months of gas data were available for Clapham Library, and so these were scaled up to estimate 1 year of data.

Corporate					
#	Name	Total CO <sub>2</sub> emissions (tCO <sub>2</sub> e)	Total energy use (MWh)	Floor area (m <sup>2</sup> )	Energy per square metre (kWh/m <sup>2</sup> )
1	Civic Centre and Town Hall	770.40	3,246.90	15,354	211.47
2	Olive Morris House	397.92	1,538.09	5,070	303.37
3	Phoenix House	278.42	991.42	5,778	171.58
4	Landmark Ld Daycentre	59.90	290.63	768	378.43
5	Blue Star House	53.06	247.96	2092	118.53
6	Lambeth Walk Daycentre	35.61	168.60	756	223.02
7	Aspire Health and Wellbeing	21.29	115.75	940	123.14
8	Wanless Road Disinfection Centre	20.04	97.97	722	135.69
9	Commercial Unit Buckner Road	4.68	18.30	167	109.56
10	Kennington Park Daycentre	3.85	13.59	N/A	N/A
		1,645.17	6,729.20		

Table 9. The council-owned buildings in the corporate department with the highest estimated CO<sub>2</sub> emissions (tCO<sub>2</sub>e) from consumption of gas and electricity from April 2018 - March 2019, plus energy consumption (MWh). Consumption data was multiplied by conversion factors 0.18396 kgCO<sub>2</sub>e/kWh for gas and 0.28307 kgCO<sub>2</sub>e/kWh for UK electricity, and converted from kgCO<sub>2</sub>e to tCO<sub>2</sub>e. Energy used (kWh) per square metre is shown. N/A indicates where floor area data was not available and so efficiency isn't given. Corporate buildings are those which are central to the council's operations for citizens, such as offices, customer service points and resource facilities. The Civic Centre and Town Hall gas meter also feeds the shower facilities room in the staff bicycle store. The Blue Star House floor area includes the floors we occupy, plus estimates for communal areas of the building as exact data was not available. Aspire Health and Wellbeing was previously Lambeth Resource Centre 27 and is being transferred to the NHS.

## Transport

Emissions from staff travel using the council vehicle fleet for operations, including external meetings and site visits, are shown here. Emissions from staff travel to and from work and from the refuse fleet for waste isn't included here, but can be found in separate reports, [here](#) and [here](#), respectively. While we recognise that scope 3 emissions from staff commuting to and from the workplace are important, it is difficult to obtain a complete dataset of these emissions as this would require every member of staff to complete travel surveys and provide accurate and detailed breakdown of commutes. We have used data on staff travel collected through a series of staff surveys to calculate emissions and made this publicly available, but until the data is improved, it will not be incorporated as part of the baseline.

Fuel transaction information on volumes of fuel purchased has been used, with dates of purchases as a proxy to indicate the approximate time that the fuel was burned. The assumption is made that fuel is burned close to the time of purchase, so transactions between April 2018 and March 2019 reflect a full year's data set of emissions. Total fuel vehicle emissions were 290.3 tCO<sub>2</sub>e. The majority of these, 84.0%, are from those using diesel (243.51 tCO<sub>2</sub>e; Figure 19). More than four times as many litres of diesel were purchased as petrol, but it should be noted that the council fleet comprised 181 diesel vehicles and 27 petrol vehicles, both owned and leased, during the baseline year (supplementary data). This number is approximate, and does not include hybrids, the emissions for which are counted along with EVs. This includes non-conventional vehicles such as tractors owned by the Parks Maintenance department, but some of these are typically filled at a depot using fuel tanks rather than at stations using fuel cards from which we acquired our data. Data on volumes of fuel from these tanks were not available for the baseline year and so emissions are not included in the baseline. One vehicle classed as petrol is an LPG-petrol bi-fuel vehicle which is run only on petrol.

The Parks department was responsible for 43.3% of all fuel purchased.

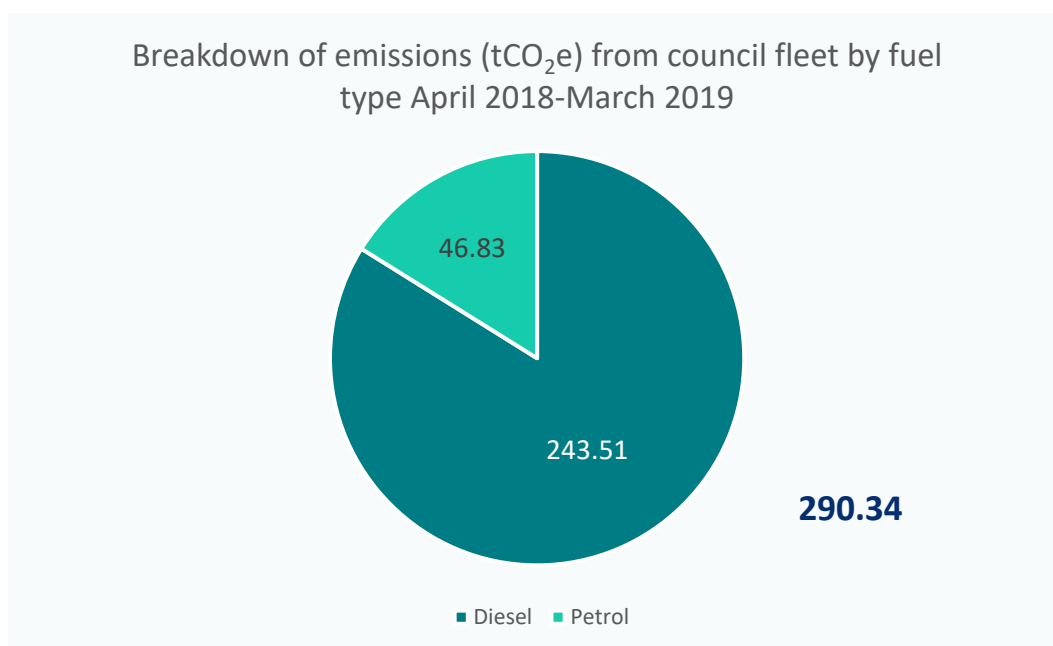


Figure 19. Estimates of CO<sub>2</sub>e emissions (tCO<sub>2</sub>e) from use of council fuel vehicle fleet and breakdown of diesel and petrol contributions to total scope 1 emissions from direct consumption of fuel, plus total emissions (290.34 tCO<sub>2</sub>e), between April 2018 and March 2019. Volumes of petrol and diesel purchased were multiplied by conversion factors 2.30531 kgCO<sub>2</sub>e/l and 2.68779 kgCO<sub>2</sub>e/l respectively and converted to tCO<sub>2</sub>e. Petrol includes unleaded, super unleaded and premium unleaded fuel. Diesel includes diesel and premium diesel.

Fuel vehicle data is shown from April 2018 to March 2019, whereas a full year's data is not available for most EVs as the eight vehicles within the fleet for which we have mileage data (5 electric, 4 hybrid) have been acquired at various times throughout the baseline year. The mileage data for the dates available within the baseline year were therefore scaled up to give a pro rata estimate to ensure that the amount of vehicle usage is reflected in the baseline. The mileage data for one hybrid vehicle, leased in 2017, was recorded at intervals which don't align with the baseline year, so the closest interval was selected (27/06/18 - 18/04/19) and scaled up to estimate use during the baseline year.

Lambeth has two additional electric buggies used in West Norwood Cemetery, but mileage data is not available for these vehicles.

Scope 2 emissions from use of EVs and hybrid vehicles (7.07 tCO<sub>2</sub>e) contribute 92.1% of the total EV emissions (Figure 20), but only 2.4% of the total vehicle emissions (Figure 21). Total emissions from transport for council operations were 298.02 tCO<sub>2</sub>e. Of this, 97.4% were from fossil fuel vehicles and 81.7% from diesel vehicles specifically, with the remainder comprising scope 2 emissions (7.07 tCO<sub>2</sub>e, and scope 3 emissions from losses through T&D (0.60 tCO<sub>2</sub>e; Table 10).

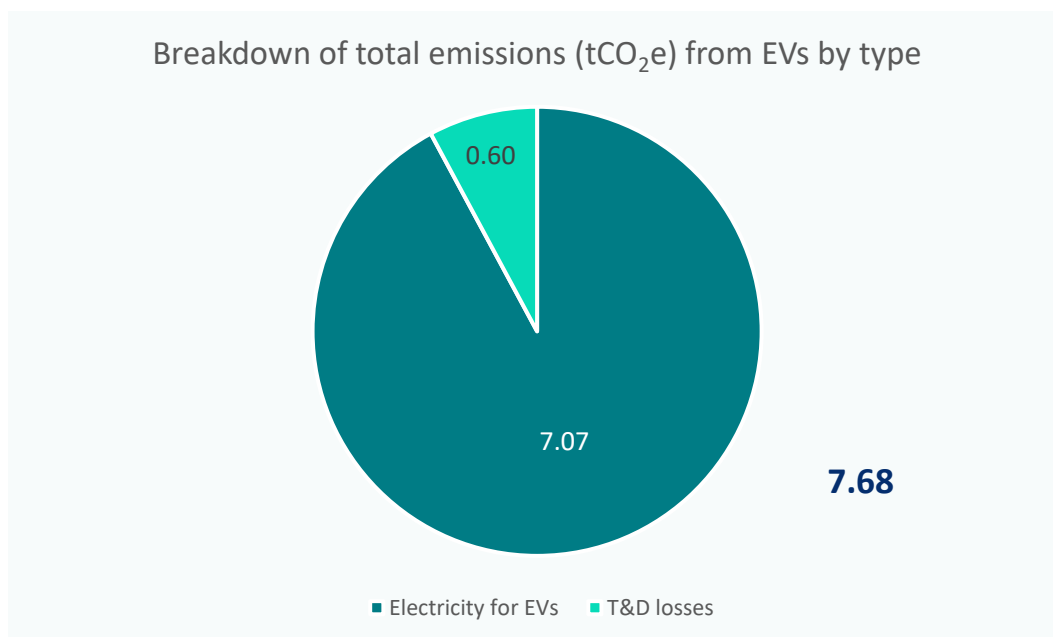


Figure 20. Breakdown of emissions (tCO<sub>2</sub>e) from use of EVs by type, plus total estimated emissions from use of EVs (7.68 tCO<sub>2</sub>e). Indirect emissions from generation of electricity are scope 2, and indirect emissions from loss of electricity during transmission and distribution are scope 3. Emissions from EVs were scaled up to estimate a year of figures where the vehicles weren't purchased at the beginning of the baseline year or where intervals at which mileage was recorded don't coincide with the baseline year. Emissions from two electric buggies aren't included as mileage data were not available.

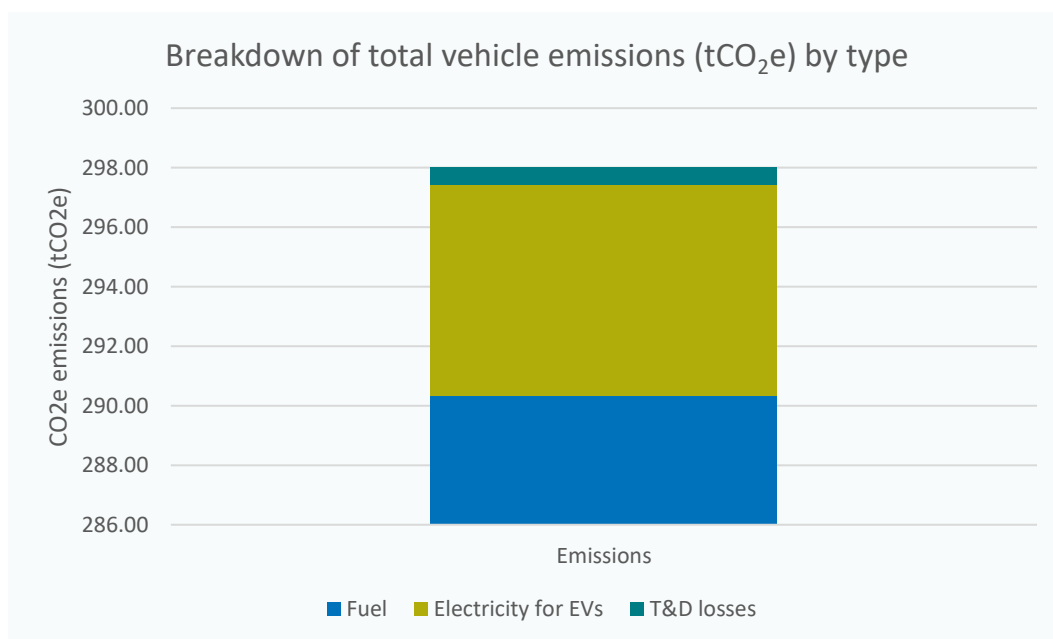


Figure 21. Total emissions (298.02 tCO<sub>2</sub>e) from all vehicles and contribution by fuel vehicles (scope 1), electricity for EVs (scope 2) and T&D losses from EVs (scope 3). Emissions for EVs were scaled up to estimate a year of figures where the vehicles weren't purchased at the beginning of the baseline year or where intervals at which mileage was recorded don't coincide with the baseline year. Emissions from two electric buggies aren't included as mileage data were not available. Note vertical axis does not start at 0.

Scope	Emissions source	CO <sub>2</sub> e emissions (tCO <sub>2</sub> e)
1	Diesel	243.51
	Petrol	46.83
2	Electricity used in EVs (scope 2)	7.07
3	T&D losses for EVs (scope 3)	0.60
	Total fossil fuel vehicles	290.34
	Total EVs	7.68
	Total vehicles	298.02

Table 10. Breakdown of council fleet CO<sub>2</sub> emissions (tCO<sub>2</sub>e), including from diesel and petrol fuel vehicles, scope 2 from EVs and scope 3 from T&D losses through electricity generation for EVs. Emissions for EVs were scaled up to estimate a year of figures where the vehicles weren't purchased at the beginning of the baseline year or where intervals at which mileage was recorded don't coincide with the baseline year. Emissions from two electric buggies aren't included as mileage data were not available.



## Water

This section shows the emissions from supply and treatment of water in council buildings and facilities, for buildings for which we have data. Estimates of volumes of water used annually in all council-owned buildings for 2018-19 were used to calculate carbon emissions from supply and treatment, both of which are classified as scope 3. The water consumption data is incomplete, so emissions from water supply and treatment presented here are an underestimate.

Treatment emissions constitute 67.6% of the total emissions from council water use (Table 11 and Figure 22). The top ten sites contributing the highest level of emissions for 2018-19 are shown in Table 12. These ten contribute 69.5% of the total emissions from water use in council buildings.

	Carbon emissions (tCO <sub>2</sub> e)
Water supply	23.81
Water treatment	49.76
Total	73.57

Table 11. Total scope 3 CO<sub>2</sub> emissions (tCO<sub>2</sub>e) from supply and treatment of water for council use for 2018-19. Breakdown of emissions is given, plus the total emissions, in tCO<sub>2</sub>e. Volume of water used annually in all council-owned buildings was multiplied by conversion factors 0.344 kgCO<sub>2</sub>e/l and 0.708 kgCO<sub>2</sub>e/l for supply and treatment respectively.

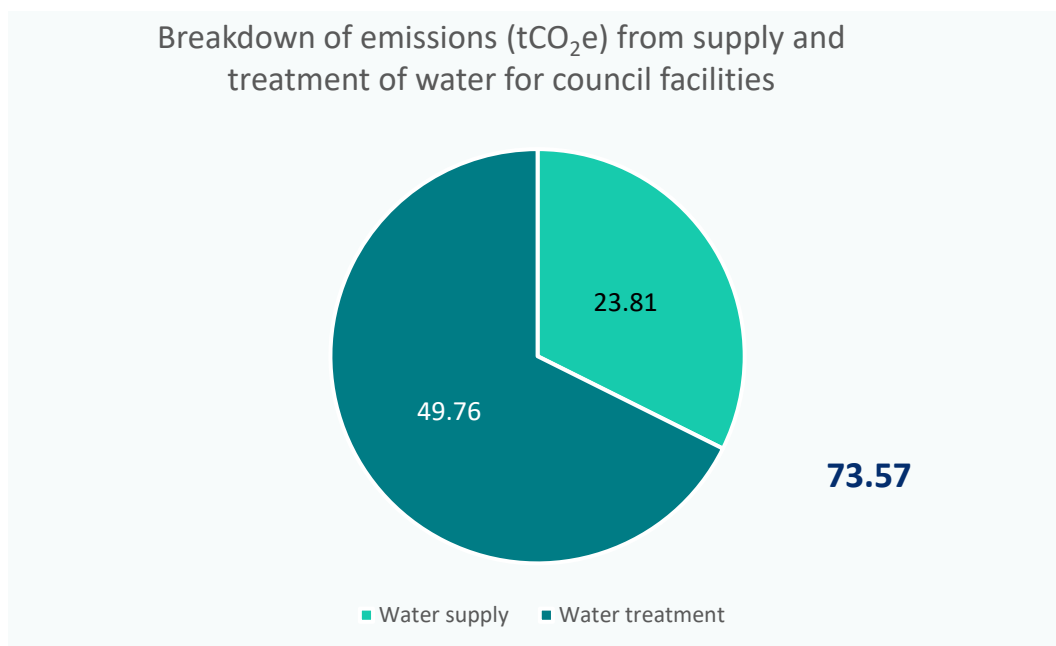


Figure 22. Breakdown of scope 3 CO<sub>2</sub>e emissions from supply and treatment of water for council buildings and facilities, plus total emissions (73.57 tCO<sub>2</sub>e). Volume of water used annually in all council-owned buildings was multiplied by conversion factors 0.344 kgCO<sub>2</sub>e/l and 0.708 kgCO<sub>2</sub>e/l for supply and treatment respectively.

#	Name	Yearly Volume Estimate (m³)	CO <sub>2</sub> emissions for water supply (tCO <sub>2</sub> e)	CO <sub>2</sub> emissions for water treatment (tCO <sub>2</sub> e)	Total emissions (tCO <sub>2</sub> e)
1	Brockwell Park	7,460	2.57	5.28	7.85
2	Kennington Park Road Astro turf & Changing Rooms	6,411	2.21	4.54	6.74
3	Windmill Road Site	5,902	2.03	4.18	6.21
4	Streatham Cemetery	5,258	1.81	3.72	5.53
5	Olive Morris House	5,170	1.78	3.66	5.44
6	Windrush Square Tate Gardens Fountain	4,980	1.71	3.53	5.24
7	Lambeth Cemetery	4,620	1.59	3.27	4.86
8	Popes Road Public Conveniences	3,200	1.10	2.27	3.37
9	Tooting Bec Gardens Hostel	3,005	1.03	2.13	3.16
10	Vauxhall Park	2,597	0.89	1.84	2.73
Total		48,603	16.72	34.41	51.13

Table 12. The buildings with the greatest carbon emissions (tCO<sub>2</sub>e) from water treatment and supply of those for which we have data. Volume of water used annually in all council-owned buildings was multiplied by conversion factors 0.344 kgCO<sub>2</sub>e/l and 0.708 kgCO<sub>2</sub>e/l for supply and treatment respectively.

## Supplementary data

	Total (l)	Emissions factor (tCO <sub>2</sub> e/l)	Total emissions (tCO <sub>2</sub> e)	Number of vehicles
Diesel	90,600	0.00268779	243.51	181
Petrol	20,312	0.00230531	46.83	27
Total	11,0912		290.34	

Table 13. Volumes of diesel and petrol purchased for the council fuel vehicle fleet between April 2018 and March 2019 and raw data for Figure 19 showing carbon emissions breakdown. Purchases of Adblue and oil are not included. The Parks Maintenance department has additional fuel use from fuel tanks which is not included here as the data for the baseline year is not available to us. Number of vehicles was available for April 2020 and estimated for the baseline year based on date of registration, and is an approximate as numbers of leased vehicles change throughout the year. Vehicle counts for different fuel types are of the entire fleet and so include tractors, buggies, mowing machines, tippers, light 4x4 utilities, flat lorries, lift trucks and JCBs. However, these are typically filled using the fuel tanks in the Parks depot so their emissions would not be included.