

Enfield's Carbon Emissions Review - 2022/23



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Overview

This report presents the annual greenhouse gas emissions for Enfield Council as an organisation and Enfield Borough. The purpose of this report is to transparently present progress against Climate Action targets and analyse the progress to date, with the aim to utilise data to monitor the impact of projects and policies and help inform ongoing priorities. The report sets out the methodologies and data sources used, indicating where there are gaps in data or proxies have been used in absence of more accurate data sources. The aim is to continue to improve methodologies and reporting year on year, particularly relating to hard to monitor emissions such as Scope 3.

The Council committed to Enfield becoming a carbon neutral borough by 2040. This means reducing Scope 1 & 2 emissions by 64% with residual emissions offset locally (Climate Action Plan 2020). The annual report presents the latest data against this target, utilising data published by the GLA.

The Council has committed to becoming a carbon neutral organisation by 2030. This means reducing Scope 1 & 2 emissions by 73% with residual emissions offset locally (Climate Action Plan 2020). The annual report presents the latest data against this target, and represents the Council’s commitment to transparency on our Climate Action journey.



Enfield Borough-wide Emissions

Introduction

Borough emissions are greenhouse gas emissions (GHG) from within the Borough's geographic boundary. This is consistent with the GHG protocol for cities (<https://ghgprotocol.org/>). Scope 1 emissions which are direct emissions from sources located within the borough and Scope 2 emissions which are GHG emissions occurring because of grid-supplied electricity, heat and/or cooling from within the borough (where the generation may occur elsewhere). This includes:

- Stationary emissions from buildings, such as fuel for heating and hot water and electricity
- Transport emissions, primarily from fuel and electricity used on-roads, but also rail and water

Borough data follows a 2-year data lag, this is linked to the timeframes of source data released by central government. In 2021, London Councils agreed with all London boroughs to adopt the GLA's LEGGI dataset as the preferred reporting methodology for borough emissions. Enfield's baseline was set in 2019 utilising the SCATTER tool based on 2017 data, last year dual reporting was provided. Going forward only LEGGI data will be published for consistency, this includes a revised 2017 baseline per the LEGGI data set.

Waste data is currently only reported London-wide, and has not been attributed to boroughs, the London-wide data has been provided in this report but is not included within footprint calculations due to the difference in reporting boundary.

Summary

The borough-wide scope 1 & 2 emissions remain driven by energy use in buildings, accounting for **63%** of the Borough's footprint, with **41%** relating to domestic buildings ([Climate Action Plan 2020](#)). The Borough's carbon emissions are largely driven by Scope 1 emissions from gas and fuel used for heating and hot water in buildings and on-road transport, together equating to approximately **79%** of all borough-wide emissions, with only **21%** relating to electricity consumption.

The Borough's combined Scopes 1 and 2 for 2022/23, based on 2020 data show:

- **7% decrease** in Borough greenhouse gas emissions from last year
- **6% decrease** in Borough greenhouse gas emissions from baseline

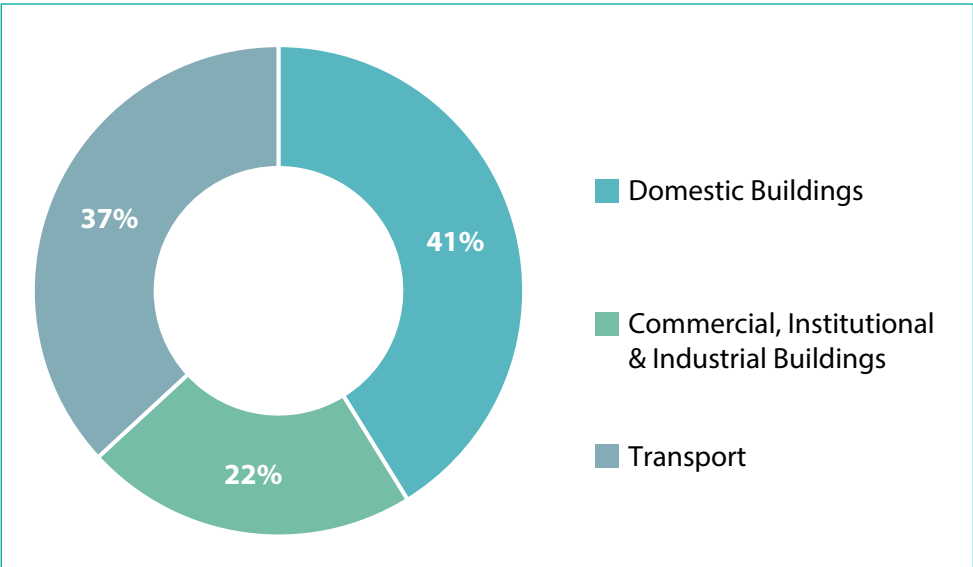


Figure 1 - 2022/23 Borough emissions by category



Borough emissions by category (ktCO2e)								
-	Reporting Year [Data Year]	2019/20 [2017]	2021/22 [2019]	2022/23 [2020]	% year	% BL year	-	% of total
Scope 1 & 2	Domestic Buildings	438	414	409	-1%	-7%	▼	41%
Scope 1 & 2	Commercial, Institutional & Industrial Buildings	253	232	218	-6%	-14%	▼	22%
Scope 1	Transport	370	427	366	-14%	-1%	▼	37%
Total Scope 1 & 2		1061	1073	993	-7%	-6%	▼	

Table 1 – Borough emissions by category

The trajectory since setting a baseline from 2017 data (2019/20 reporting year) has generally been a downward trend for buildings, primarily driven by reduction in electricity related emissions, which can largely be attributed to the decarbonisation of the grid. Transport emissions have remained consistent, with 2019 looking to be an anomaly year.

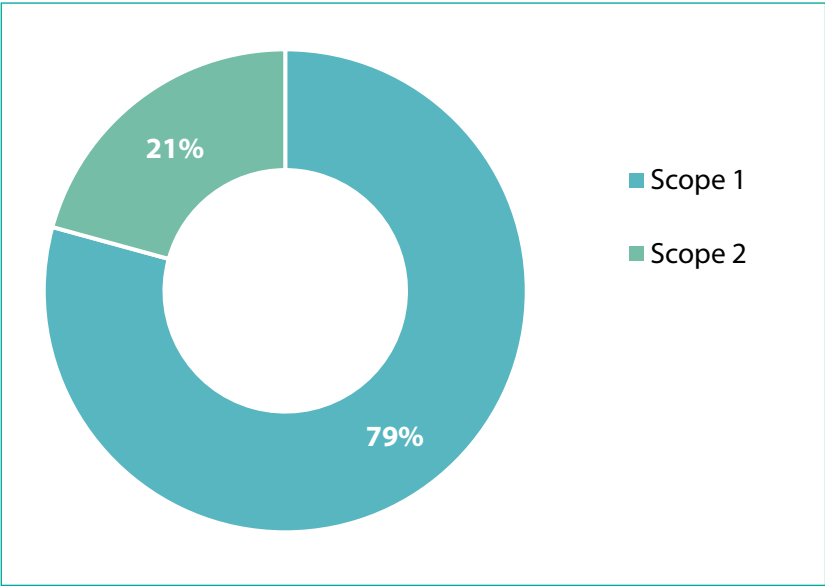


Figure 2 – 2022/23 Borough emissions by scope

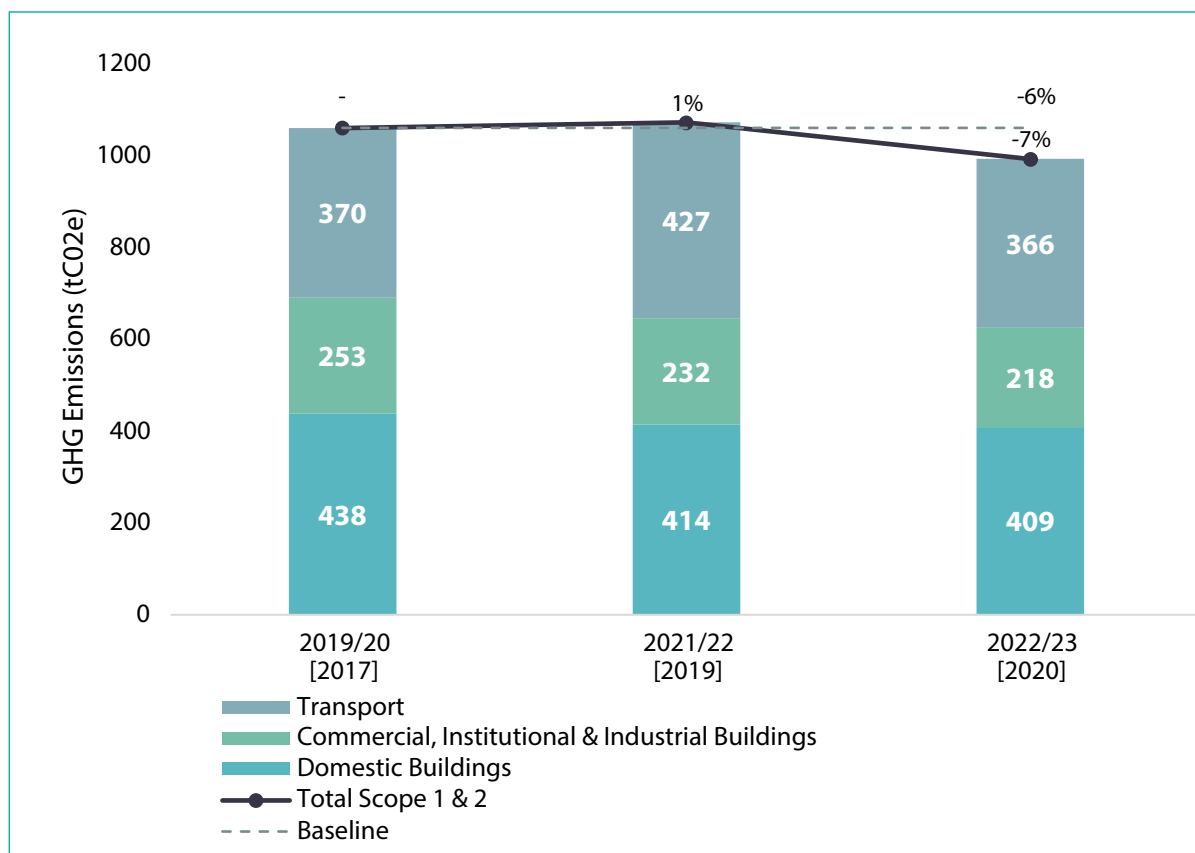


Figure 3 – Borough emission by category (scope 1 & 2 - LEGGI)

Emissions in detail

This section reviews a breakdown of emissions including the underlying consumption data and looks at patterns to inform priorities. As the data continues to lag, the impact of policies and measures implemented over the last 2 years will not be reflected in the reporting. Monitoring will continue to ensure reductions in emissions relating to buildings, transport and waste continue in line with climate action commitments.

Borough emissions by scope (ktCO ₂ e)								
-	Reporting Year [Data Year]	2019/20 [2017]	2021/22 [2019]	2022/23 [2020]	% year	% BL year	-	% of total
Scope 1	Domestic Buildings	303	305	305	0%	1%	▼	31%
	Commercial, Institutional & Industrial Buildings	118	122	125	2%	6%	▼	13%
	Transport & NRMM	358	416	357	-14%	0%	▼	36%
Scope 1		779	843	787	-7%	1%	▼	79%
Scope 2	Domestic Buildings	135	109	104	-5%	-23%	▼	10%
	Commercial, Institutional and Industrial Buildings	135	110	93	-15%	-31%	▼	9%
	Transport & NRMM	12	11	9	-18%	-25%	▼	1%
Scope 2		282	230	206	-10%	-27%	▼	21%
Total Scope 1 & 2		1061	1073	993	-7%	-6%	▼	

Table 2 - Borough emissions by scope

Domestic Buildings

Domestic building emissions make-up **41%** of borough carbon emissions, with **31%** of all borough emissions being due to natural gas use in homes. This huge challenge relates to priority areas in our climate action response, identifying and promoting alternative heat sources such as heat networks and heat pumps.

Commercial, Institutional and Industrial Buildings

Energy from the commercial, institutional and industrial building sector is a significant proportion of borough emissions. The balance of energy used for natural gas and electricity consumption is closer, likely due to lower heating demands and also a higher proportion of electrically heated buildings and use of air conditioning. Decarbonising heating system is still a challenge and priority for this building sector. There remains significant consumption of oil in these building types, which requires further investigation to understand and identify opportunities to phase out.

Road Transport

Fossil-fuel use from road-based transport remains a significant challenge and is the largest single emissions source by fuel type at **36%** of total emissions. This is from a combination of private vehicles and commercial vehicles. Mode shift to sustainable and active transport, in addition to electrification of vehicles will be the main priority areas to reduce this consumption.

Grid Decarbonisation

The decarbonisation of the UK electricity grid has continued to have a positive effect of reducing the carbon intensity of electricity and therefore the resultant Scope 2 emissions. The UK grid carbon factor (greenhouse gas emissions per unit of energy) decreased a further **9%**, with a total emissions factor of reduction of **34%** from the baseline year (2017).

Borough Scope 1 & 2 Consumption (MWh)							
Column1	Reporting Year [Data Year]	2019/20 [2017]	2021/22 [2019]	2022/23 [2020]	% year	% BL year	-
Scope 1 - Buildings	Natural Gas	2,148,879	2,147,158	2,207,832	3%	3%	▲
	Oil	80,453	76,707	95,420	24%	19%	▲
	Coal	7,635	10,532	4,841	-54%	-37%	▼
	Bioenergy & Waste	2,278	73,269	5,709	-92%	151%	▲
Scope 1 - Transport	Fossil fuel	1,432,273	1,603,660	1,366,744	-15%	-5%	▼
	Diesel	2,223	5,587	4,597	-18%	107%	▲
	Aviation	1,258	1,109	418	-62%	-67%	▼
Scope 2 - Buildings	Electricity	977,115	950,140	933,487	-2%	-4%	▼
Scope 2 - Transport	Electric	43,414	48,338	43,360	-10%	0%	▼

Table 3 – Consumption by fuel type

Waste

Waste is currently not able to be reported at a borough level, due to a change in dataset and the information being provided for all of London. In Enfield, local authority collected refuse waste is managed by the combined North London Waste Authority (NLWA). Waste is sorted and sent for recycling/composting, incineration, and landfill, with solid-waste disposal (landfill) contributing towards borough-wide emissions. It should be noted that emissions from waste remain a very small proportion of all emissions due to non-recyclable waste in London predominately being incinerated rather than sent to landfill. Where waste is utilised to produce energy (electricity or heat), then these emissions will be reflected in the grid carbon factor and therefore reflected in end use emissions. This is similar to where emissions from recycling are picked up in the embodied carbon of the material.

The chart below (Figure 4) shows London-wide waste data as provided by the GLA, utilising the LEGGI data set. This is showing a London-wide downward trend in waste emissions, particularly solid waste disposal for waste going to landfill.

London waste emission data (ktCO ₂ e)							
	2019/20 [2017]	2021/22 [2019]	2022/23 [2020]	% year	% BL year	BL	% of Total
Solid waste disposal	305	274	232	-15%	-24%	▼	48%
Biological treatment of waste	53	67	58	-13%	11%	▲	12%
Wastewater treatment and discharge	189	192	193	0%	2%	▲	40%
Total London Waste Emissions	547	533	483	-9%	-12%	▼	

Figure 4 – London waste emissions (unapportioned)

Enfield Council Organisational Emissions

Introduction

Council emissions are greenhouse gas emissions from within the Council’s organisational boundary which include assets which the Council own and operate such as buildings, fleet and street lighting, defined as Scope 1 and 2 emissions. Scope 3 emissions are from sources the Council either does not own or control but has influence over including staff travel, council homes and capital goods. This is consistent with the GHG protocol for corporate emissions (<https://ghgprotocol.org/>).

A baselining exercise was undertaken in late 2019 as part of our Climate Action Plan development for which emissions are continued to be assessed against. The current reporting year is 2022/23, aligning with the financial year.

Summary

The Council’s combined Scopes 1 and 2 for 2022/23 show:

- **14% decrease** in Council greenhouse gas emissions from last year
- **30% decrease** in the Council’s direct emissions over the baseline

The Council is exceeding our carbon neutral trajectory, having reduced emissions by 30% in the last 4 years. The Council’s Scope 1 & 2 emissions remain largely driven by energy use in buildings, accounting for **77%** of the Council’s footprint (Figure 5). This is largely driven by gas used for heating and hot water in buildings equating to almost half the emissions (46%), this is followed by electricity in buildings (30%). Diesel in fleet account for 16% of emissions with remaining emissions from electricity for street lighting (5%).

Maintained schools are the largest emission sector by building portfolio (32%), following by corporate operational buildings (24%).

The largest carbon savings this year for the first time has been from the reduction in natural gas in buildings for heating and hot water. This may both be a result of initiatives to address the impact of the energy crisis and high energy costs and also investment in heat decarbonisation technology. As the electricity grid continues to decarbonise year on year, this is reflected in the Council’s Scope 2 carbon emissions which also capture energy savings from solar PV investment. More detailed breakdown of emissions and consumption can be found in the following sections.

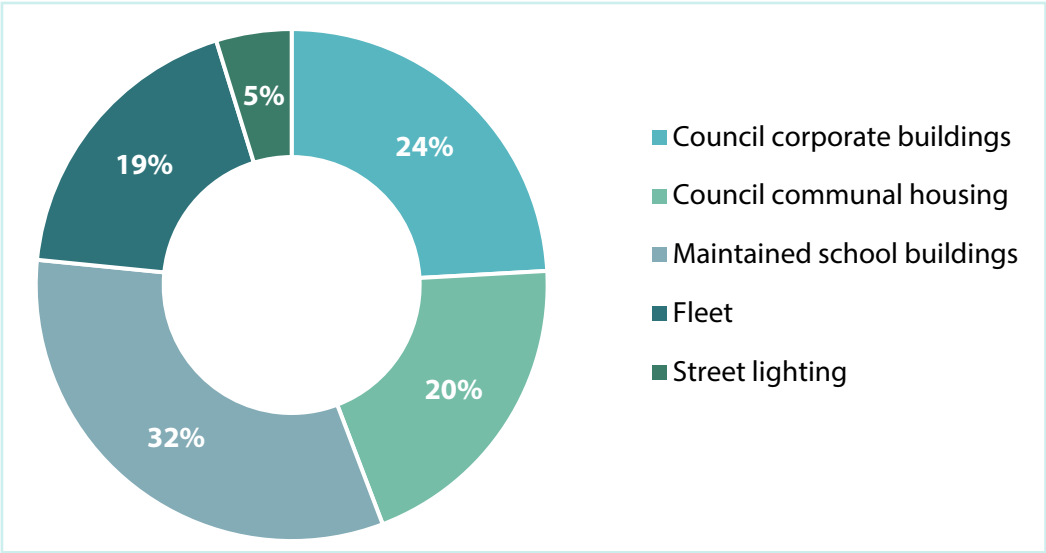
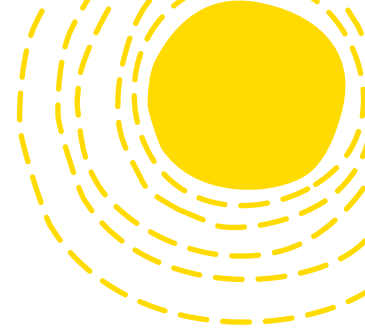


Figure 5 - 2022/2023 Council Scope 1 & 2 emissions



Council direct & Indirect emissions								
Council Scope 1 & 2 (tCO ₂ e)		2018/19 Baseline	2021/22	2022/23	% year	% BL year	BL	% of total
Scope 1 & 2	Council corporate buildings	16,960	4,422	3,675	-17%	-78%	▼	24%
Scope 1 & 2	Council communal housing	Included	3,588	3,061	-15%	0%	-	20%
Scope 1 & 2	Maintained school buildings	Included	5,976	4,931	-17%	0%	-	32%
Scope 1 & 2	Fleet	2,470	2,862	2,843	-1%	15%	▲	19%
Scope 2	Street lighting	2,478	815	726	-11%	-71%	▼	5%
Total Scope 1 & 2 (tCO₂e)		21,908	17,662	15,237	-14%	-30%	▼	

Table 4 - Scope 1 & 2 emission by asset category

Council direct & Indirect emissions								
Council Scope 1 & 2 (tCO ₂ e)		2018/19 Baseline	2021/22	2022/23	% year	% BL year	BL	% of total
Scope 1	Buildings (Natural Gas)	8,729	8,666	7,064	-18%	-19%	▼	46%
	Building (Gas Oil)	No data	No data	No data	0%	0%	-	NA
	Buildings (Fugitive)	No data	No data	0	0%	0%	-	NA
	Fleet (Diesel-GTL)	2,470	2,862	2,843	-1%	15%	▲	19%
Total Scope 1 (tCO ₂ e)		11,199	11,527	9,908	-14%	-12%	▼	65%
Scope 2	Buildings (Electricity)	8,231	5,319	4,603	-13%	-44%	▼	30%
	Building (Heat)	No data	No data	13	0%	0%	-	0%
	Street Lighting (Electricity)	2,478	815	726	-11%	-71%	▼	5%
Total Scope 2 (tCO₂e)		10,709	6,134	5,347	-13%	-50%	▼	35%
Total Scope 1 & 2 (tCO₂e)		21,908	17,662	15,255	-14%	-30%	▼	

Table 5 - Scope 1 & 2 emission by fuel type

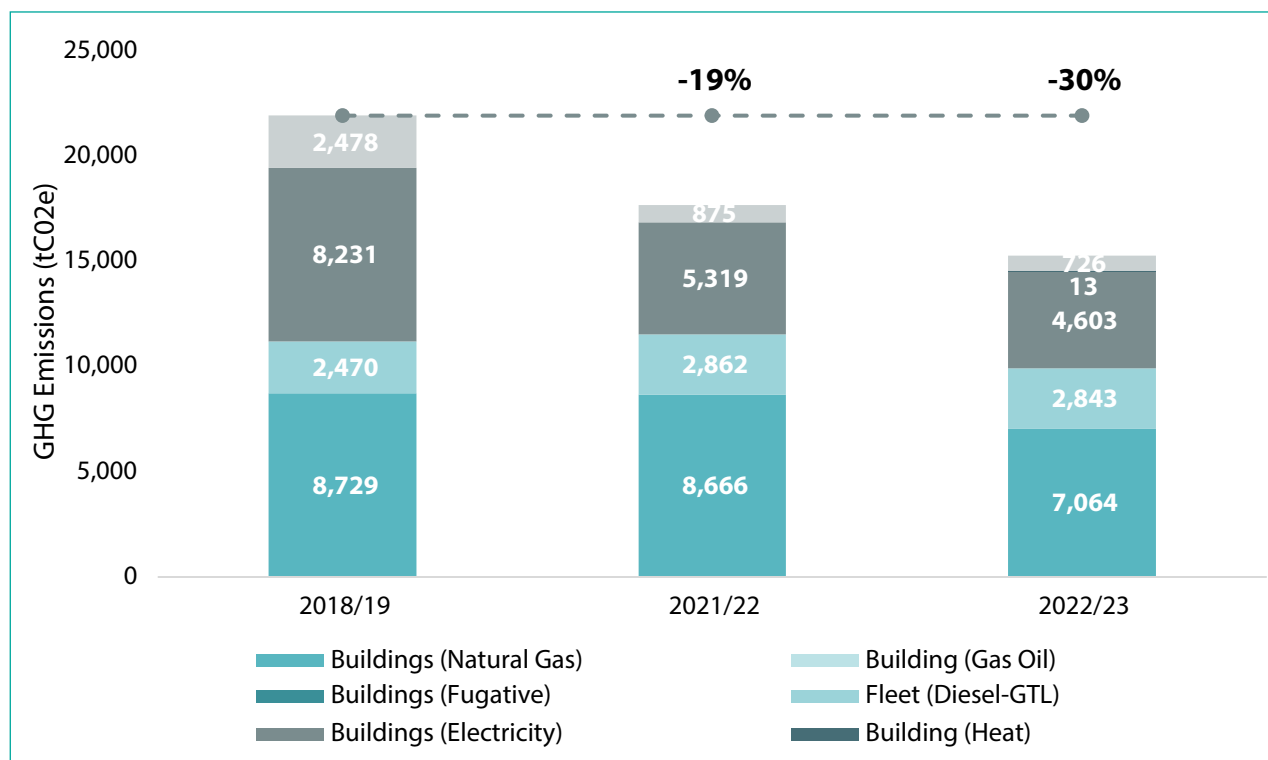


Figure 6 – Council Scope 1 & 2 emissions

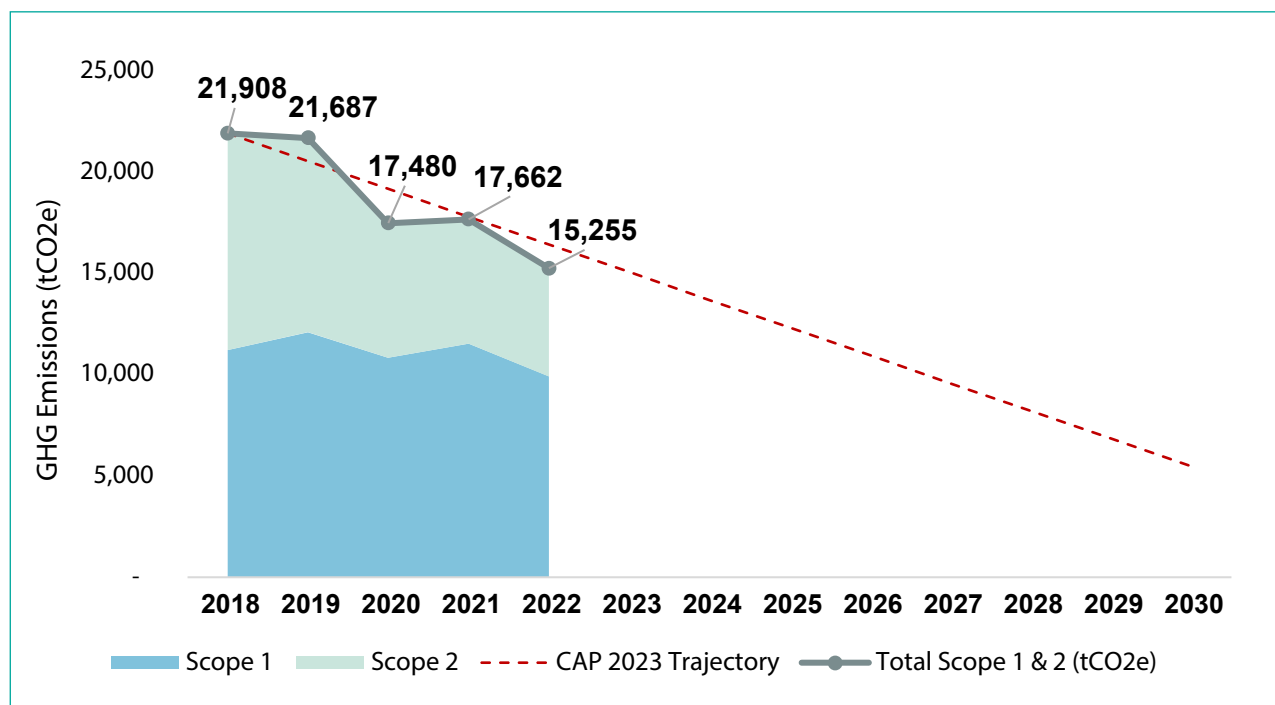
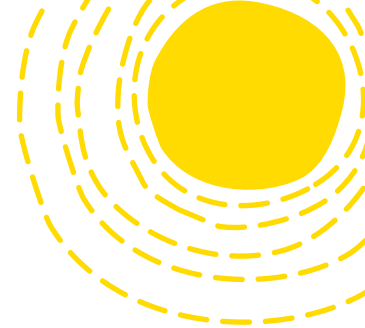


Figure 7 – Council Scope 1 & 2 emissions 2030 trajectory



Council Scope 1 & 2 (by fuel type)						
Fuel		2018/19 Baseline	2021/22	2022/23	% year	% BL year
Natural Gas (kWh)	Buildings	47,451,529	47,311,507	38,699,869	-18%	-18%
Diesel (litres)	Fleet	918,915	1,139,121	1,157,890	2%	26%
Gas Oil (Litres)	Gas oil	No data	No data	No data	0%	0%
Electricity (kWh)	Buildings	29,076,639	25,052,129	23,804,574	-5%	-18%
Electricity (kWh)	Street Lighting	8,754,884	3,838,980	3,755,512	-2%	-57%
Electricity	Fleet	NA	NA	25,757	0%	0%
Heat (kWh)	Buildings	-	-	93,078	0%	0%
Fugitive Emissions (kg)	Buildings	No data	No data	No data	0%	0%

Table 6 – Scope 1 & 2 consumption by fuel type

Scope 1 Emissions in detail

Scope 1 emissions are direct emissions occurring at the source, from council owned or controlled assets, such as gas combustion from boilers in council operated buildings and fuel usage in fleet vehicles, this can also include fugitive emissions from refrigerant use.

In 2022/23 reporting period Scope 1 emissions reduced by 14% when compared to the previous year, this has largely been a result of a decrease in natural gas in buildings with a 18% in year reduction.

Fleet

Fleet carbon emissions increased 2% from the previous year, which is likely due to continued insourcing of vehicles and a resultant increased fleet number through the introduction of services back-in house. This does not directly translate to more vehicles are on the road, it reflects the expansion of the Council's operational control of fleet vehicles. The Council has also switched fuel from Diesel to GTL, with the benefit of reducing pollutants, it is estimated to be approximately 4% lower carbon emissions, in addition to be a cleaner fuel for air quality. The Council has now procured its first electrical vehicles as part of the fleet, these are being charged at Council key sites and have been separated out for the purpose of reporting.

Buildings

Natural gas used in buildings for heating and hot water decreased 18% from the previous year, with savings being seen across corporate, housing and school sites. These savings have likely been driven by energy saving behaviour in light of the energy crisis. In this reporting year the 9% less natural gas was used in the Civic Centre, which as a building equates for 40% of all corporate natural gas usage.

A review of the mean air temperature (Figure 8 – Mean air temperature) shows that both the autumn and spring period was colder than the previous year, which of had the impact of extending the heating season.

This year was a much warmer on average year than 21/22 (Figure 8 – Mean air temperature) including a much milder Spring an Autumn, which would have positively impacted a shorter heating season, and a reduction in natural gas. Further, the reductions may also have been driven by a response to the energy crisis, and efforts made to reduce costs through consolidating office space. Further in 2022 a number of heat decarbonisation initiatives were completed including heat pump installations at a number of sites.

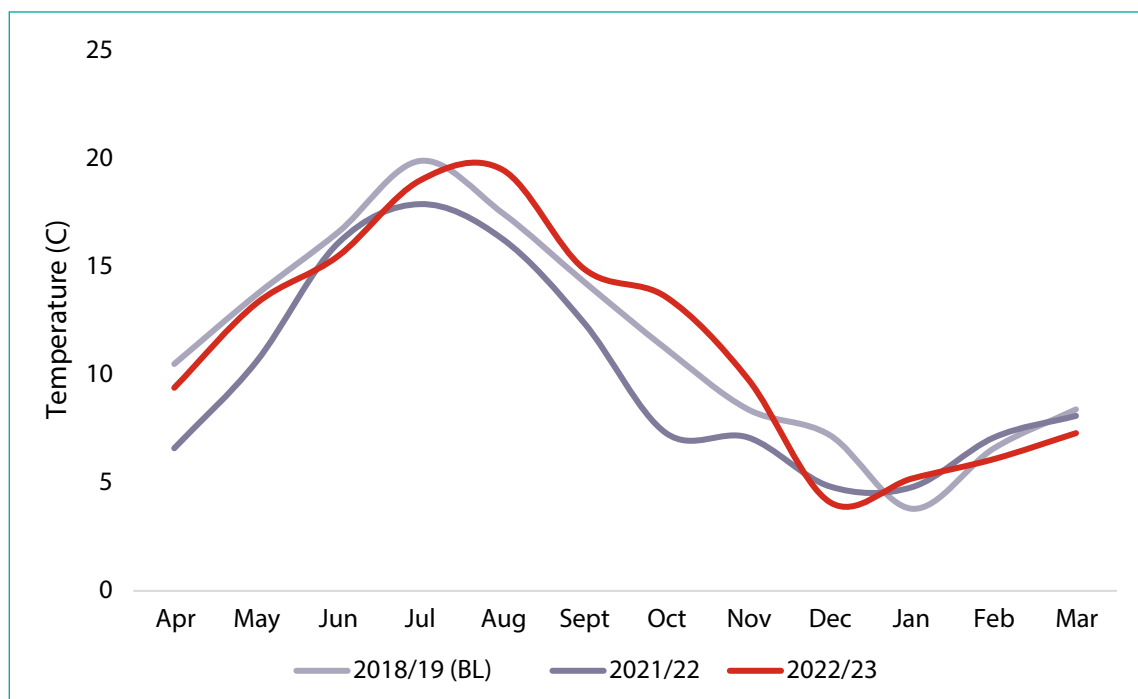


Figure 8 – Mean air temperature

Scope 2 emissions in detail

Scope 2 emissions are those from the generation of purchased electricity consumed by the council. Scope 2 emissions physically occur at the facility where the electricity is generated rather than at the asset. The Council's Scope 2 emissions broadly relate to electricity used in buildings and for street lighting. The Council is continuing to see carbon savings in this scope with a further **13%** annual reduction in carbon emissions.

Grid decarbonisation and market-based emissions

The decarbonisation of the UK electricity grid has continued to have a positive effect of reducing the carbon intensity of electricity and therefore the resultant Scope 2 emissions. The UK grid carbon factor (greenhouse gas emissions per unit of energy) has decreased a further 9% from 2021/22 reporting year, and 32% from the 2018/19 baseline year.

From October 2020, the Council has procured REGO-certified renewable energy for the Council's corporate and communal housing portfolio and procured green energy for street lighting. In line with GHG protocol Scope 2 guidance, location-based and market-based emissions have been reported separately, with location-based emissions remaining the default. The market-based emissions reflect the Council's investment in REGO and renewable energy and represent a contribution of almost 4000 tCO₂e in offsetting.

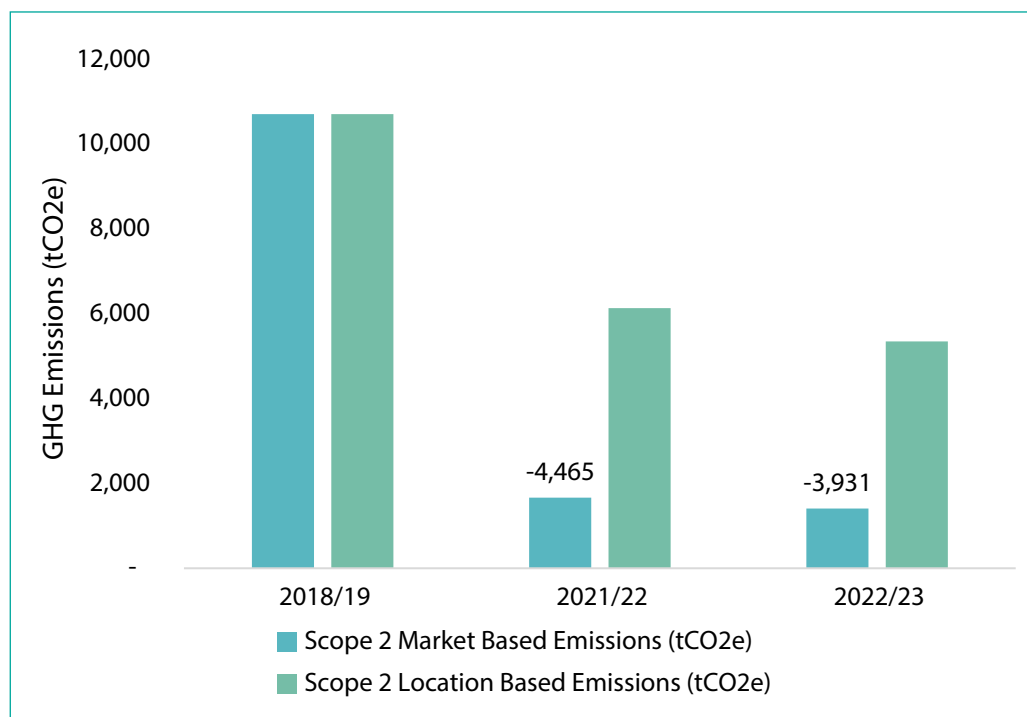
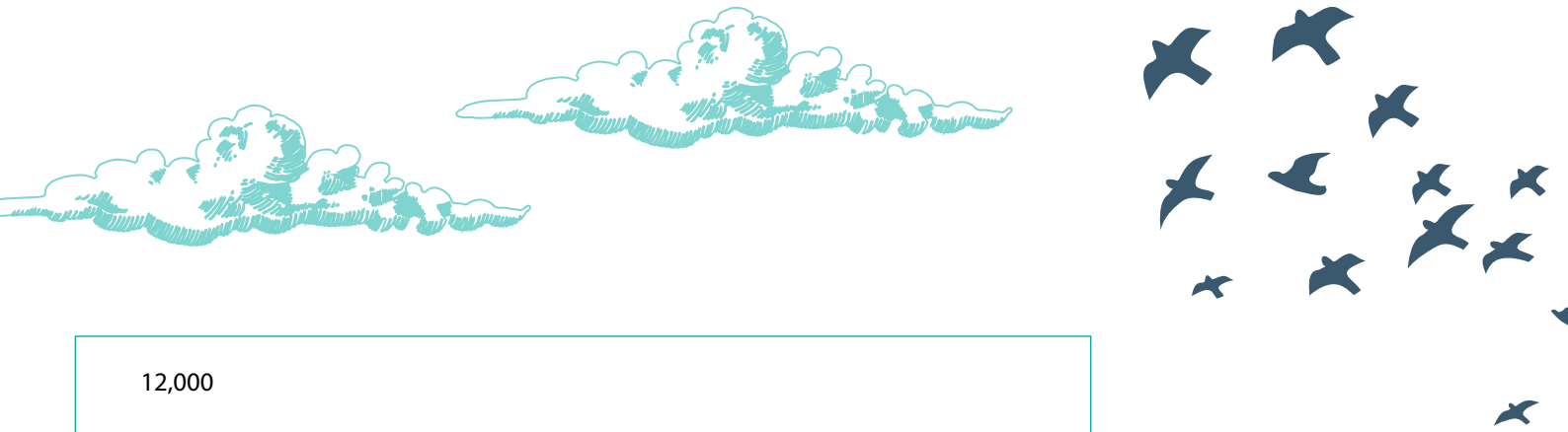


Figure 9 - Location & market-based emissions reporting

Buildings

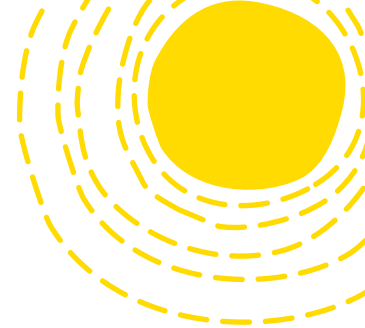
The Council is demonstrating 5% electrical energy savings from the previous year. These savings may, again, be driven by behaviour change and efficiencies in response to the energy crisis but also reflect a large investment in Solar PV panels across corporate sites in 2021/22.

Street Lighting

Following the success of the LED street lighting programme that completed in March 2021, our streetlighting is continuing to decarbonise alongside the electricity grid, along with securing operational energy savings were possible.

Scope 3 emissions in detail

Scope 3 emissions are the consequence of council activity but occur from sources not owned or controlled directly by the council. Scope 3 emissions can be difficult to account for, however, we are committed to following international best practices and taking steps to better understanding and transparently report on Scope 3 emissions. This includes developing new processes and methodologies for gathering data and making emissions assessments. Through improving data collection and analysis processes we will be able to better identify opportunities for emissions reductions from areas within the Council's influence, including council housing, employee commuting and construction. As we work to analyse our Scope 3 emissions more robustly, year-on-year comparison may not accurately reflect improvements made. The first stage is estimating scale, data collection and transparency to be able to better monitor change and impact.



Council influencing emissions							
Council Scope 3 (tCO2e)	2018/19	2021/22	2022/23	% year	% BL year	BL	% of total
(1) Purchased goods & services	No data	No data	No data	0%	0%	-	NA
(2) Capital Goods	45,440	588	7,721	1213%	-83%	▼	19%
(3) Fuel and energy related activities	913	543	488	-10%	-47%	▼	1%
(4) Water	48	62	68	9%	41%	▲	0%
(6) Business Travel	139	96	104	8%	-25%	▼	0%
(7) Employee commuting	No data	2,230	2,040	-9%	0%	-	5%
(8) Upstream leased assets	No data	237	243	3%	0%	-	1%
(13) Downstream leased assets	32,237	38,057	27,402	-28%	-15%	▼	69%
(14) Franchises	2,479	1,919	1,855	-3%	-25%	▼	5%
Total Scope 3 Emissions (tCO2e)	81,256	43,732	39,920	-9%	-51%	▼	100%

Table 7 – Council scope 3 emissions

As shown in Figure 10 - Scope 3 emissions breakdown summary, our largest Scope 3 emissions challenge is gas and electricity consumption of council housing. This continues to be an area of focus and investment for the Council. This will also be an area where we hope to improve our Scope 3 emissions accounting and understanding.

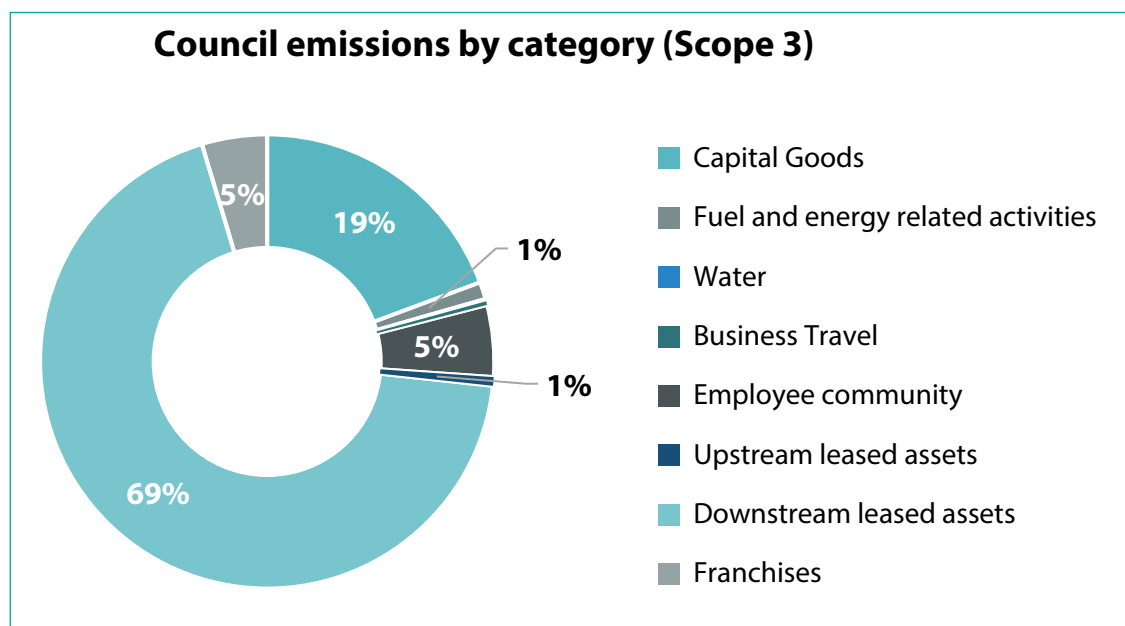
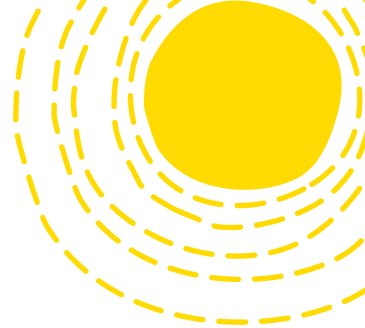


Figure 10 - Scope 3 emissions breakdown



Capital goods

Emissions have been calculated utilising the methodology established in 2020/2021, based on benchmark embodied carbon factors against completed units within the accounting period retained by the Council. A number of schemes were completed this year, which reflect the increase in emissions. These are expected to follow a similar trend to the current programme of housing delivery which can be found here: <https://www.enfield.gov.uk/services/housing/housing-schemes>

Fuel and energy related activities

Transmissions and distribution related emissions are directly related to electricity consumption and reflect reduction in Scope 2 electricity consumption from the street lighting retrofit programme and energy reductions from buildings.

Business travel

Business travel mileage by car increased from last year, but remains below the base year. Further work is required to gather better data which will enable insights and opportunities for policies that may target emissions decrease in this area.

Employee commuting & work from home emissions

This methodology provides an estimation of commuting and home working emissions, now utilising the new carbon factors for home working. This reflects the Council's 'Smart Working Policy' with a large proportion of Council employees classed as 'flexible workers'. It is identified as a priority to undertake more accurate surveying to understand commuting to improve accounting and identify opportunity for behaviour change and incentive schemes.

Upstream leased assets – Temporary accommodation

Temporary accommodation is served by the corporate contract has been reported. These are sites where influence over energy use is limited due to the sites being leased out. Opportunities to better capture emissions associated with temporary accommodation is an area that needs to be explored alongside council housing, as gathering this type of data comes with challenges and considerations.

Downstream leased assets

The emissions data for council housing has been estimated using the Parity Projects tool, which estimates emissions based on RdSAP data, gathered through the EPC process. Emissions data is not live and utilise SAP 10.2 carbon factors. This provides a good estimate of scale of the emissions from this category, and highlights this area need to be a continued area of attention for the council.

Outsourced services - Leisure Centres

Leisure Centres are continuing to benefit like other buildings from the decarbonisation of the electricity grid. Natural gas continues to make up 71% of the total emissions, reflecting the majority of energy is likely going towards hot water generation for heating swimming pools and use in showers.

