Cambridgeshire County Council

Annual Carbon Footprint Report

2021 - 2022

DRAFT – 16 November 2022

www.cambridgeshire.gov.uk/climate-change

Contents

1. Introduction

1.1 About this report

This is Cambridgeshire County Council's annual carbon footprint report for the period April 2021 to March 2022. This report examines both the carbon footprint of Cambridgeshire County Council as an organisation, and that of the geographical area of Cambridgeshire as a whole.

Cambridgeshire County Council updated its Climate Change and Environment Strategy in 2022, setting a number of targets relating to reducing greenhouse gas emissions, including reducing the Council's own 'scopes 1 and 2' (direct) emissions to net zero by 2030, reducing 'scope 3' (indirect) emissions by 50.4% by 2030, and to deliver net zero for the county of Cambridgeshire by 2045. In order to monitor progress against these targets, it is necessary to measure the Council's carbon footprint each year.

Recovering from COVID-19

The previous year, 2020-21, was an exceptionally unusual year. The global COVID-19 pandemic led to nationwide lockdowns, reduced travel and changed ways of working for many people, combined with unprecedented demands on public health and social care services. The associated carbon emissions therefore also saw dramatic reductions, both in Cambridgeshire and across the UK.

In 2021-22, as we start to recover from the impacts of COVID-19, there have inevitably been some increases in emissions in 2021-22, compared to 2020-21, as services began to return to pre-pandemic levels. However, we have not yet seen a full return to the pre-pandemic situation, and emissions from some sources remained lower than before the pandemic.

1.2 What is a carbon footprint?

A carbon footprint is a measure of greenhouse gases (GHGs) emitted into the atmosphere. The most common GHG is carbon dioxide (CO_2), which makes up around 80% of UK GHGs. Other GHGs such as methane (CH_4) or nitrous oxide (N_2O) are measured in 'carbon dioxide equivalent' (CO_2e), which takes into account the different global warming potential (GWP) of different gases.

GHGs are produced by a variety of activities, including energy generation (burning fossil fuels such as coal, oil and gas), transport (burning fossil fuels like petrol and diesel), agriculture (such as methane from livestock and nitrous oxide from fertilisers), waste management (such as methane from landfill sites) and land use (such as soil erosion or deforestation).

We can measure the carbon footprint of a geographical area, or of an organisation, or of a product or an activity. In this report we have included both the carbon footprint of Cambridgeshire County Council as an organisation, and that of the geographical area of Cambridgeshire.

2. Cambridgeshire County Council's Carbon Footprint

The carbon footprint of Cambridgeshire County Council (as an organisation) comprises of emissions that occur from the Council's own operations. We have calculated the carbon footprint of the County Council's own operations for the financial year 1 April 2021 to 31 March 2022.

The Council's own carbon footprint has been calculated in line with the UK Government's Environmental Reporting Guidelines for Voluntary Greenhouse Gas Reporting (BEIS & DEFRA, 2019). For further details on the methodology, scope, boundary of reporting and exclusions, please see section 2.15.

2.1 Key findings - all scopes

The vast majority (95%) of the Council's emissions fall under 'scope 3', which means these are indirect emissions from assets outside of the Council's direct control.

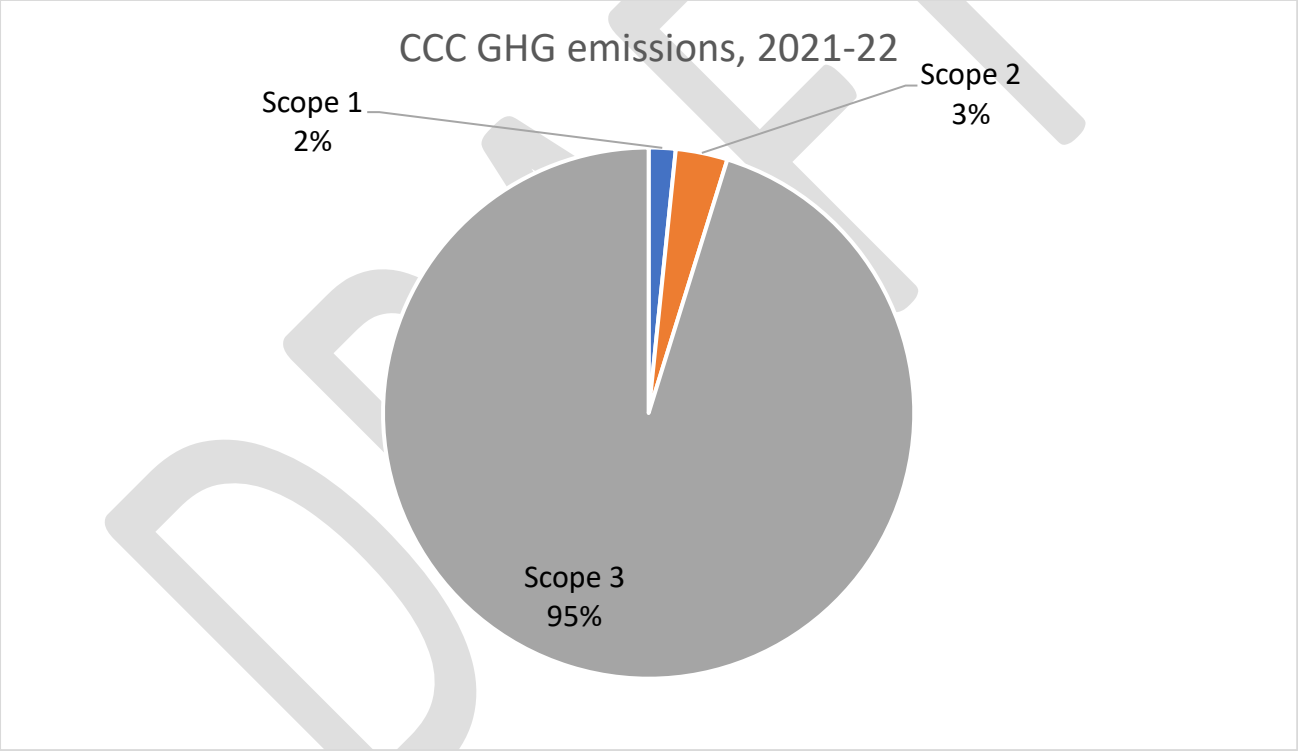


Figure 1

The Council's total GHG emissions in 2021-22 for all 3 scopes amounted to **131,610 tonnes CO_2e** (gross). This is 3% higher than the previous year, but 44% lower than our baseline year of 2018-19.

The breakdown of all these known emissions sources is shown in Figure 2,**Error! Reference source not found.** and there is also a more detailed breakdown in Table 1 on page 11. The largest share of emissions was from waste, largely due to the Council's statutory duty as the Waste Disposal Authority.

Net GHG emissions for all scopes, after deducting the emissions offset through our renewable electricity generation assets (saving 2,861 tonnes CO_2e) and for purchasing 100% renewable electricity (saving 4,131 tonnes), were **124,619 tonnes CO_2e**.

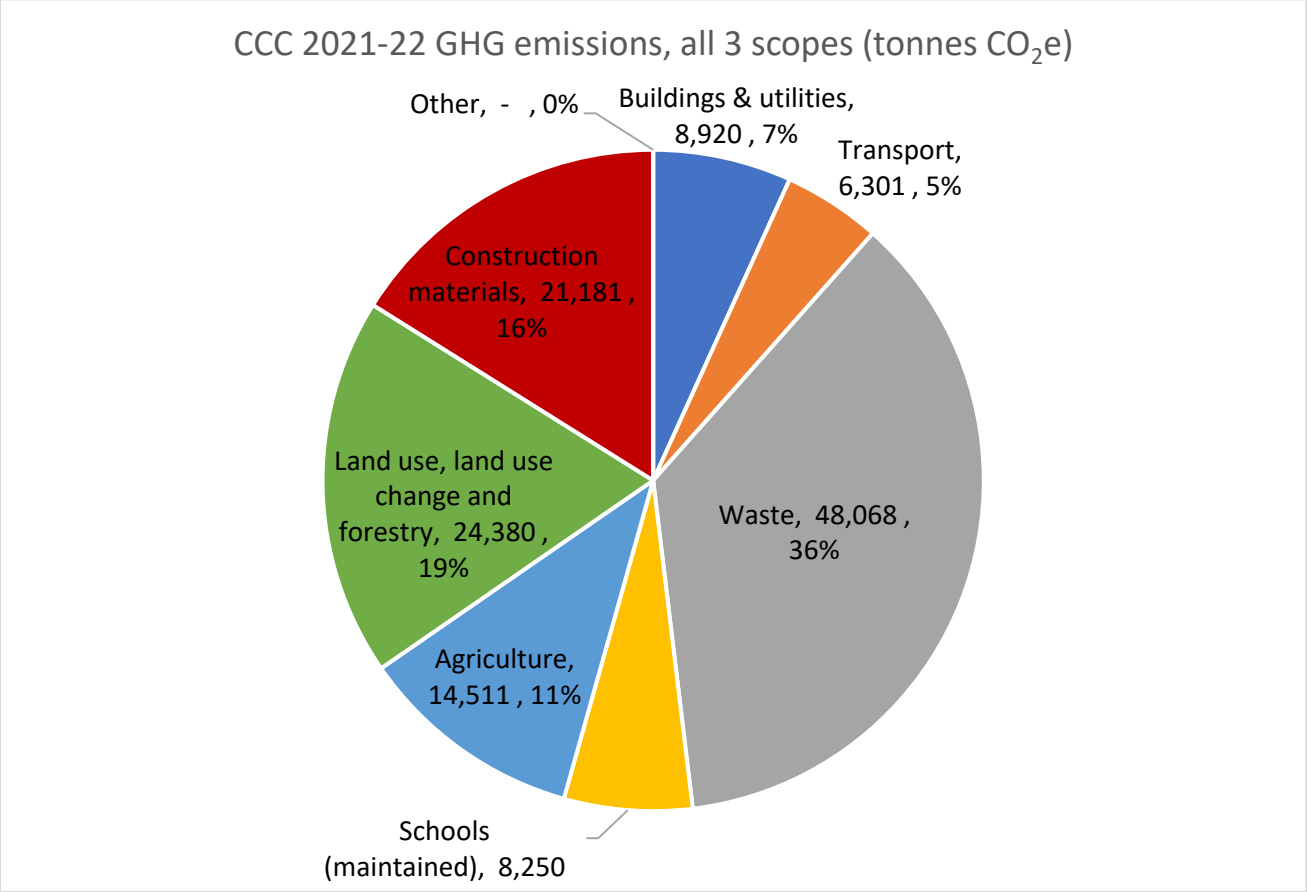


Figure 2

There were also 15,131 tonnes CO_2e emissions outside of scopes, from biological carbon sources such as biofuels.

A full list of what has been included and what is excluded, together with reasons for exclusions, is in section 2.15.

2.2 Key findings – scopes 1 and 2

We found that our scopes 1 (direct) and 2 (purchased electricity) emissions amounted to **6,272 tonnes CO_2e** (gross). Scopes 1 and 2 includes emissions from gas and oil for heating our buildings, electricity for our buildings and street lighting etc., fugitive refrigerant gases and emissions from fleet vehicles. The breakdown of this is shown in Figure 3. The largest share was for purchased electricity. This shows gross emissions, before any reductions or offsets.

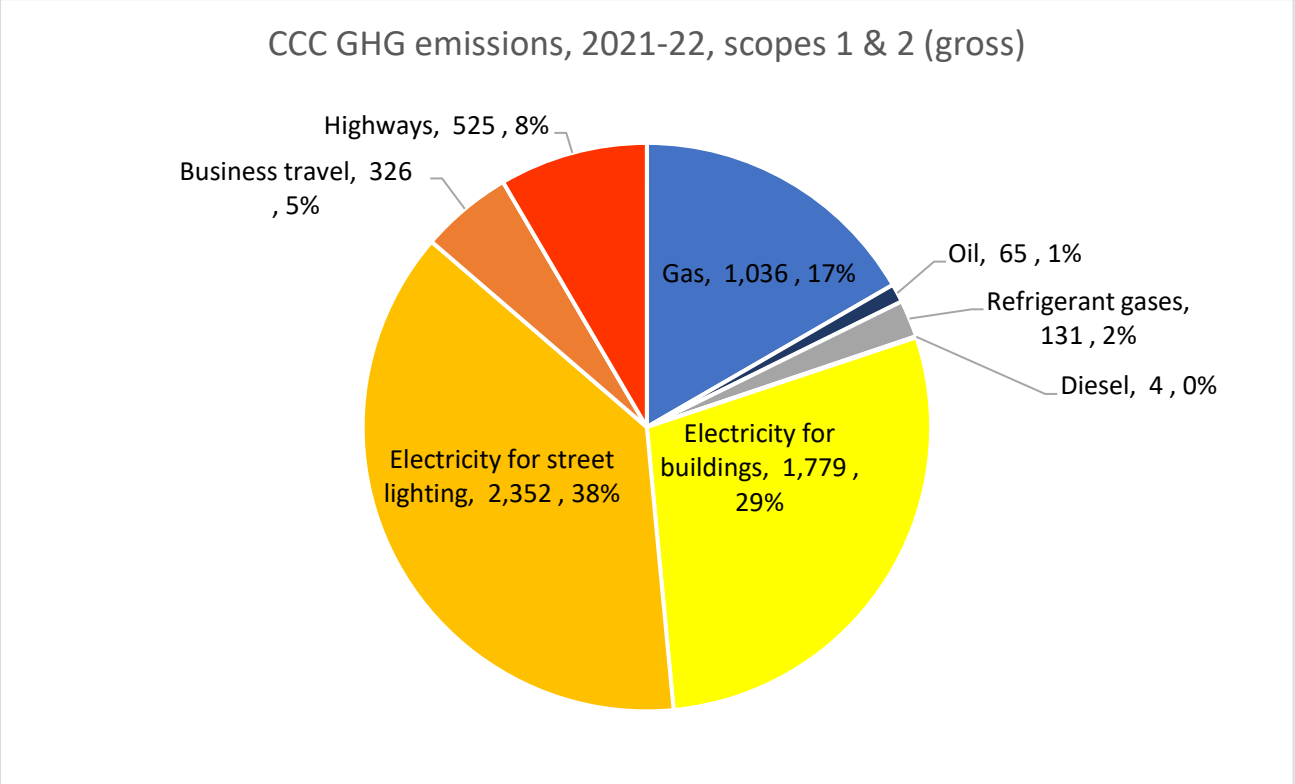


Figure 3

Our scope 1 and 2 emissions together were 1% higher than the previous year. However, the scope 1 and 2 (gross) emissions were 19% lower in 2021-22 than in our baseline reporting year of 2018-19. Much of this reduction is due to the lower carbon intensity of UK grid electricity.

Scopes 1 and 2 (gross) emissions **down 19%** since 2018-19 baseline

Net GHG emissions for scopes 1 and 2, after taking into account purchasing of 100% renewable electricity, were reduced to 2,141 tonnes CO_2e. The breakdown of this is shown in Figure 4 below, with the largest share coming from gas to heat our buildings.

Scope 1 emissions were slightly higher in 2021-22 than in 2020-21, mainly because emissions in 2020-21 were unusually low due to the COVID-19 restrictions in place that year. As we recover from the impacts of the pandemic, increased transport and energy use in buildings were needed compared to the previous year.

We have started a programme of low carbon heating projects in order to further reduce gas and oil usage in future. This low carbon heating programme is expected to reduce gas usage by about one third by 2023, with further reductions in future years as more sites switch to using low carbon air source heat pumps.

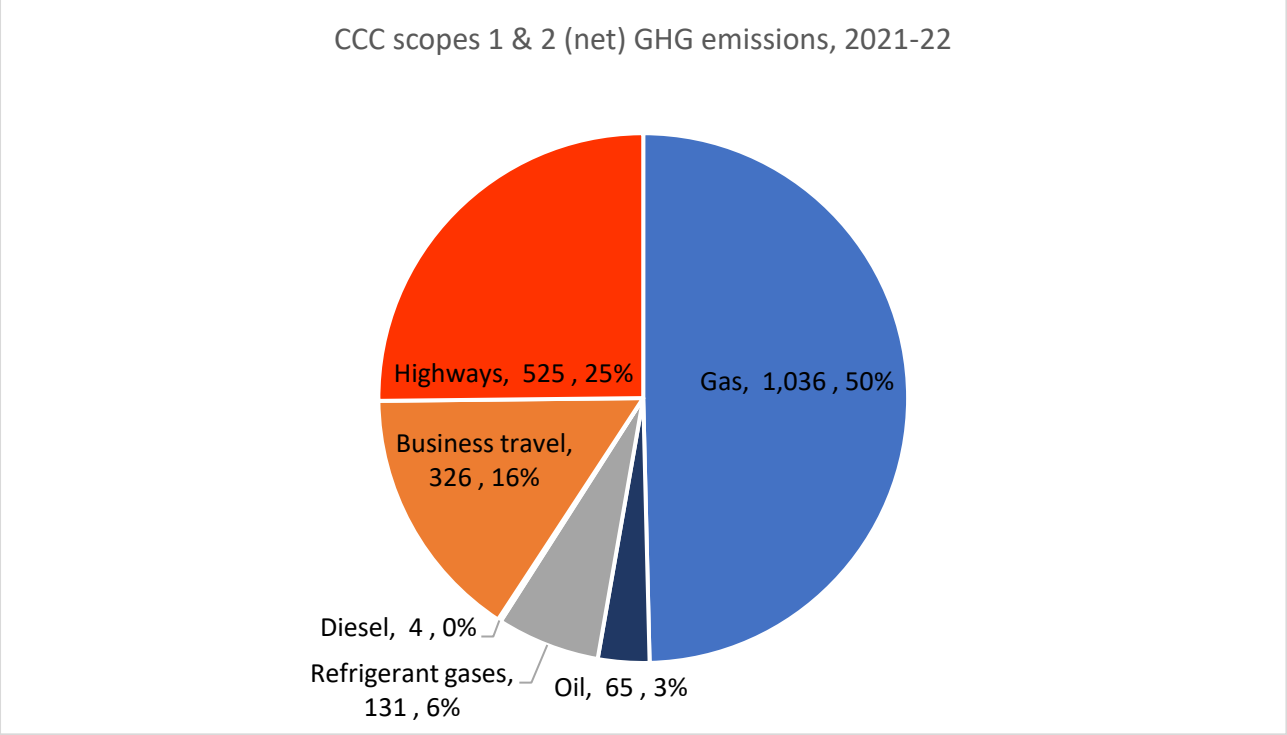


Figure 4

2.3 Key findings - scope 3

We have also calculated our scope 3 emissions where we can. Scope 3 means indirect emissions from assets outside of the Council's control, such as those of our contractors and suppliers.

The vast majority (95% or **125,339 tonnes CO_2e**) of all known emissions were scope 3 (indirect). This includes transport emissions from vehicles not under Council control (such as employee's own cars or contractors' vehicles), emissions from county waste disposal and treatment, emissions from Local Authority maintained schools' energy usage, agricultural emissions from the County Farms estate, emissions from land use, land use change and forestry (LULUCF) for land owned by the Council, and emissions associated with purchased goods and services delivered by third parties, such as capital construction works.

Scope 3 emissions were slightly (4%) higher in 2021-22 than in 2020-21, but 45% lower than in our baseline year of 2018-19. The largest reduction is due to reduced construction work.

Scope 3 emissions
down 45%
since 2018-19 baseline

Some additional emissions associated with purchased goods and services are not included, because we do not have the relevant data to calculate these. However, this could potentially account for a significant quantity of additional unknown scope 3 emissions. Our action plan includes steps to identify more of this data in future.

2.4 Changes in Council GHG emissions over time

Emissions from our baseline year of 2018-19 have been recalculated in order to be more consistent with emissions reported now. For example, LULUCF was not included in our original report for 2018-19 (published in March 2020), but we have now made an estimate of these emissions. We have also recalculated the emissions from waste due to having an improved methodology now available. These changes along with some other minor updates mean that the baseline year emissions for 2018-19, in total for all three scopes, are now calculated at 233,842 tonnes CO_2e.

The graphs below show how the Council's GHG emissions for 2021-22 compare to previous years and to the Council's relevant targets.

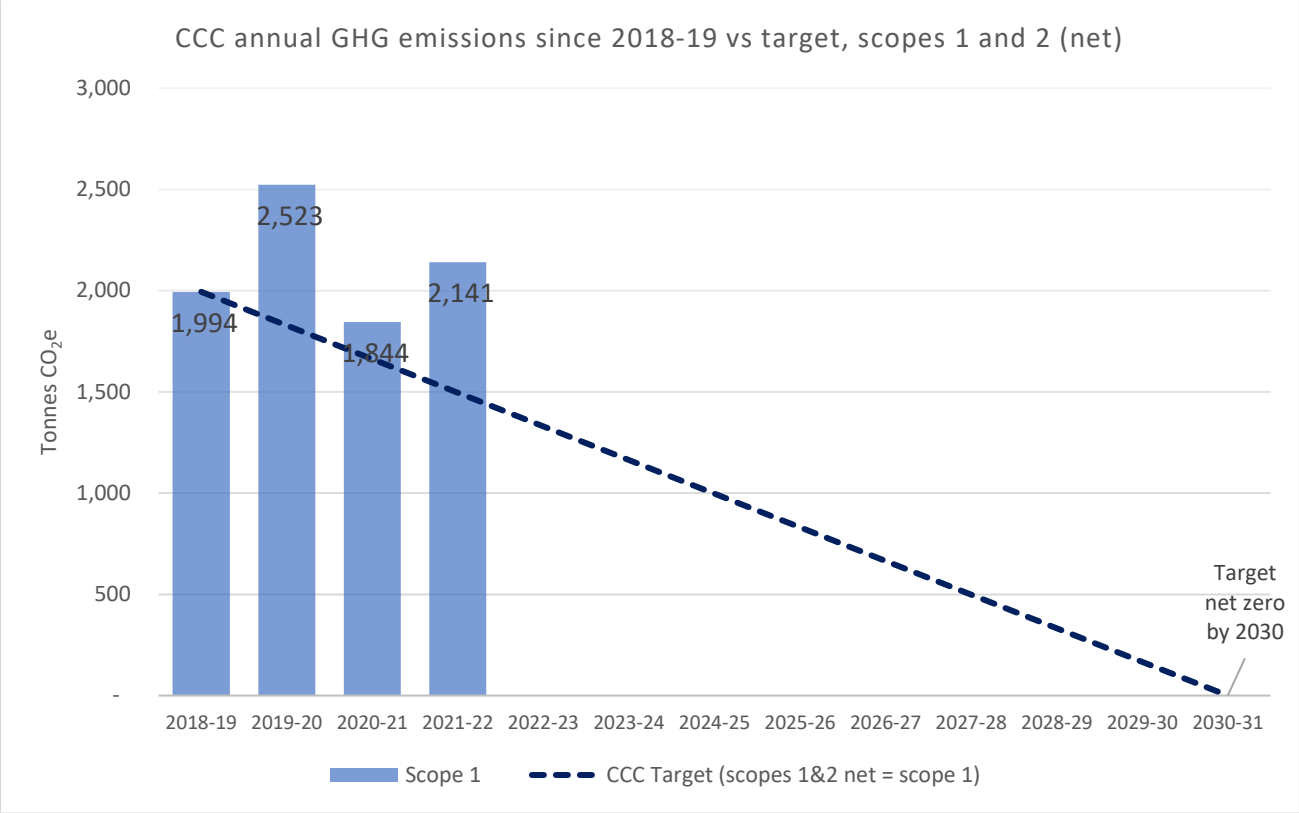


Figure 5

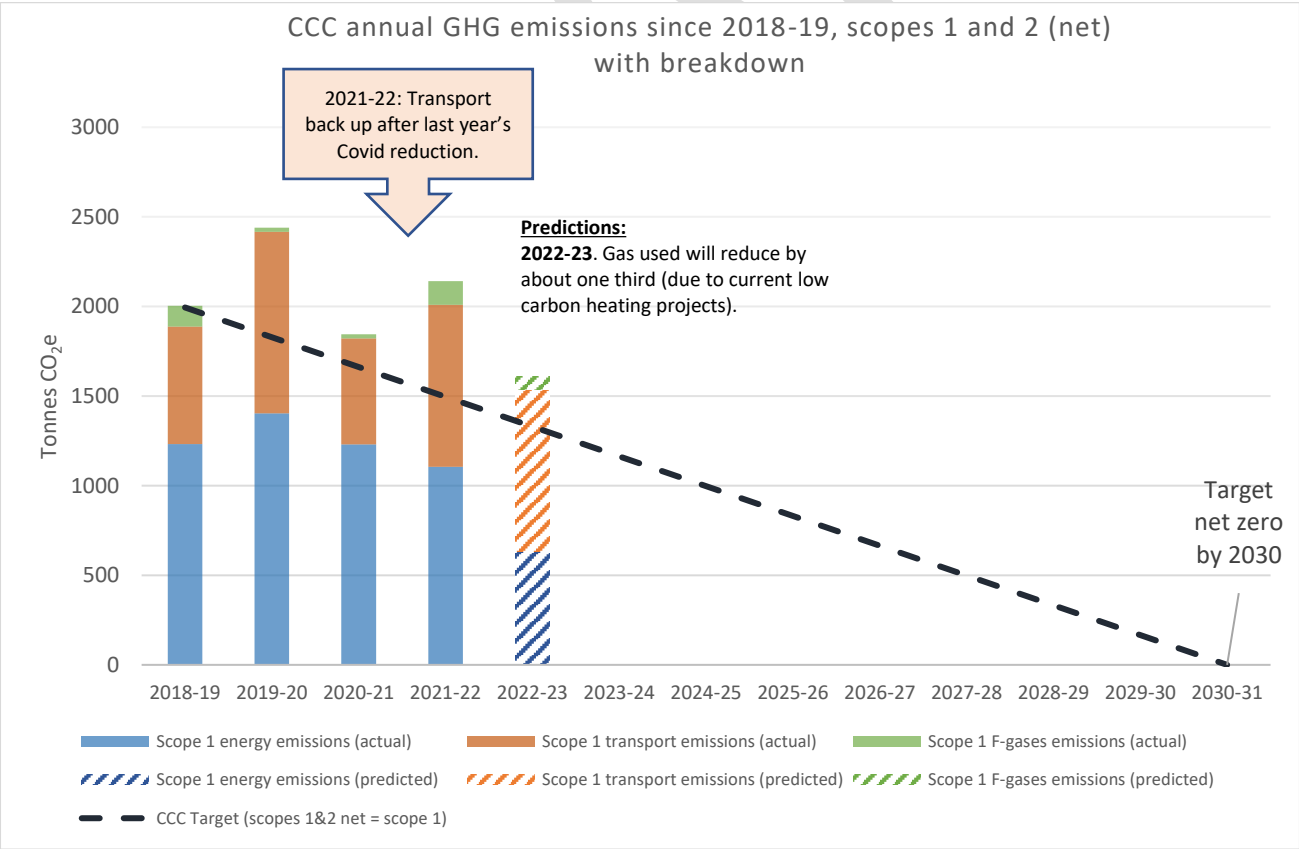


Figure 6

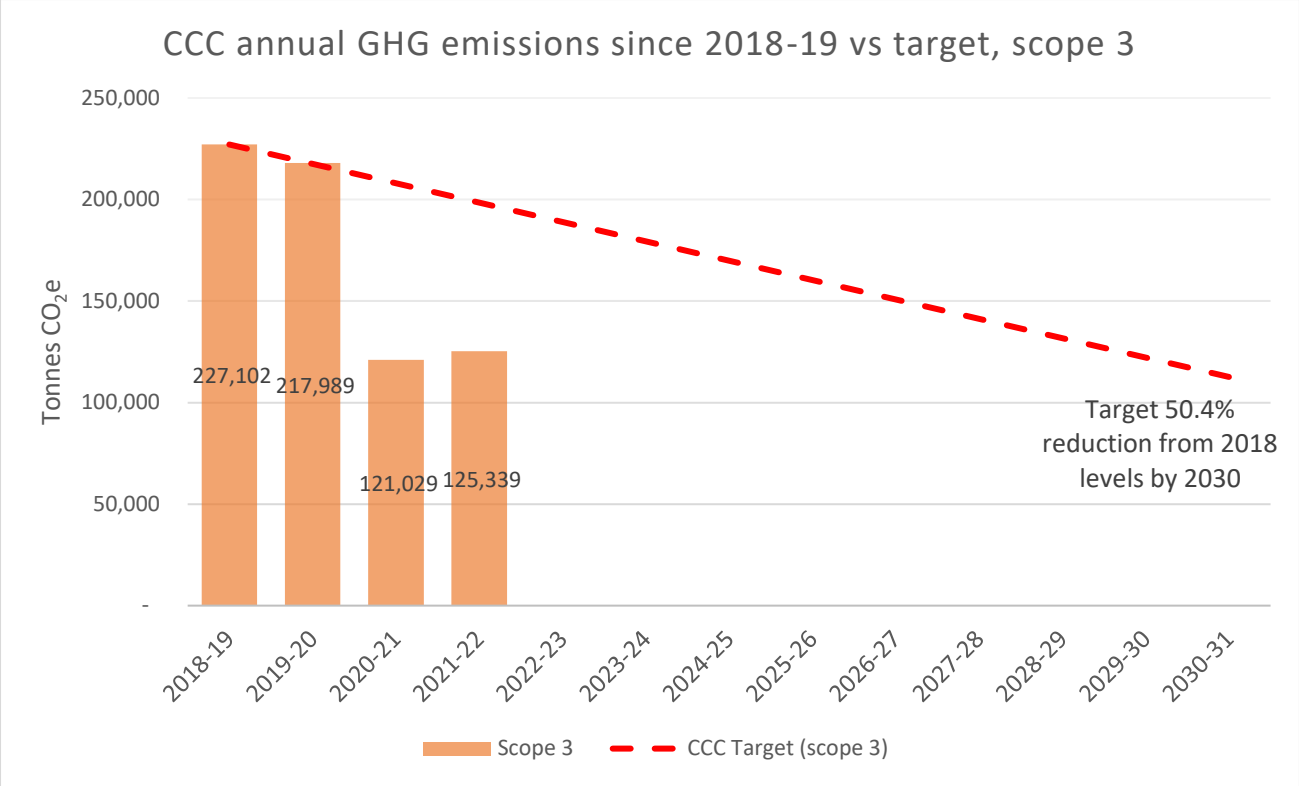


Figure 7

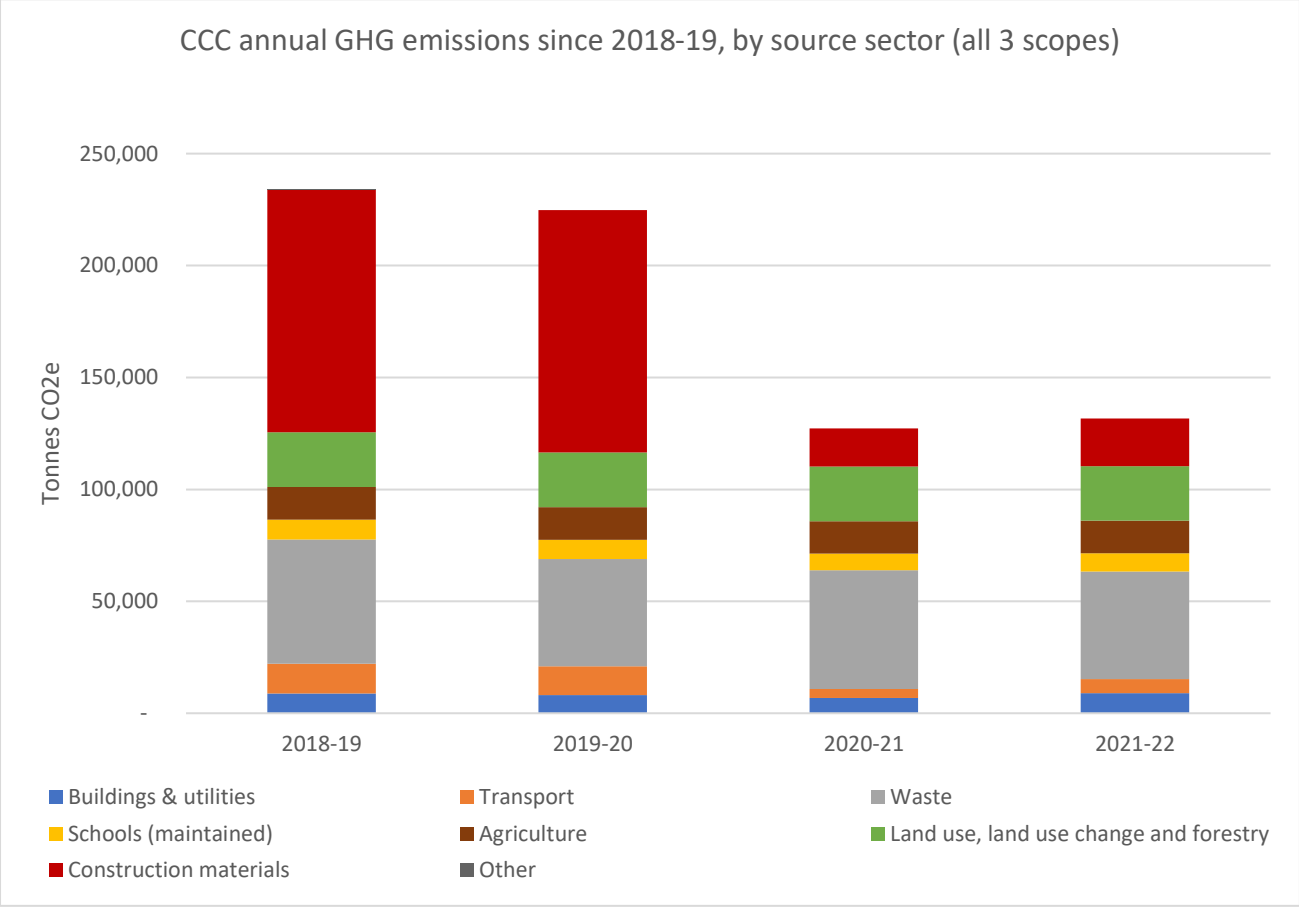


Figure 8

2.5 Full breakdown

Table 1: Cambridgeshire County Council Greenhouse Gas emissions 2020-21, breakdown by source and scope

Category	GHG emissions (Tonnes CO_2e), 2021-22				
	Scope 1	Scope 2	Scope 3	Total in scope	Outside of scopes
Buildings & utilities	1,236	4,131	3,553	**8,920**	0
Gas	1,036	0	177	**1,213**	0
Oil	65	0	14	**79**	0
Refrigerant gases	131	0	0	**131**	0
Diesel	4	0	1	**5**	0
Electricity for CCC buildings	0	1,779	662	**2,441**	0
Electricity for street lighting	0	2,352	875	**3,226**	0
Electricity for data centre	0	0	1,801	**1,801**	0
Water and sewerage	0	0	24	**24**	0
Transport	905	0	5,396	**6,301**	113
Business travel	326	0	1,266	**1,592**	0
Highways vehicles	525	0	140	**665**	113
Social & education transport	54	0	2,541	**2,595**	0
Employee commuting	0	0	1,157	**1,157**	0
Construction transport	0	0	291	**291**	0
Waste	0	0	48,068	**48,068**	15,018
CCC site waste	0	0	116	**116**	0
Construction waste	0	0	16	**16**	0
County waste disposal - landfill and MBT	0	0	45,466	**45,466**	0
County waste disposal - other	0	0	2,469	**2,469**	15,018
Highways waste	0	0	2	**2**	0
Schools (maintained)	0	0	8,250	**8,250**	0
Electricity	0	0	2,684	**2,684**	0
Gas	0	0	4,763	**4,763**	0
Oil	0	0	582	**582**	0
Other heating fuels	0	0	221	**221**	0
Construction materials	0	0	21,181	**21,181**	0
Highways and infrastructure	0	0	19,329	**19,329**	0
Education capital	0	0	1,839	**1,839**	0
Minor works	0	0	13	**13**	0
Agriculture	0	0	14,511	**14,511**	0
Livestock farming	0	0	324	**324**	0
Arable farming	0	0	14,187	**14,187**	0
Land use, land use change and forestry	0	0	24,380	**24,380**	0
CO_2 emissions from LULUCF	0	0	25,390	**25,390**	0
CO_2 removals from LULUCF	0	0	-1,009	**-1,009**	0
Total (gross, before reductions)	**2,141**	**4,131**	**125,339**	**131,610**	**15,131**
Reductions	0	-4,131	-2,803	**-6,934**	0
Net total emissions	**2,141**	**0**	**122,478**	**124,619**	**15,131**

2.6 Buildings and utilities

Buildings and utilities were responsible for 8,920 tonnes CO_2e (7%) of the Council's GHG emissions in 2021-22 (across all 3 scopes).

The biggest source of *gross* greenhouse gas emissions within the buildings and utilities category is electricity usage, using the location-based method, accounting for 4,131 tonnes CO_2e in scope 2 (including both buildings and street lighting). The Council purchased 19,453,893 kWh of electricity in 2021-22, 57% of which was for street lighting.

However, all of the gross CO_2e for scope 2 is reduced to zero in the *net* emissions, using the market-based method, by purchasing 100% renewable electricity through our supply contract. For transparency we are reporting both methods.

The next biggest source of GHG emissions related to buildings and utilities is gas, which accounts for 1,213 tonnes CO_2e. Gas is currently used to heat many of our buildings. The Council purchased 5,653,698 kWh of mains gas in 2021-22. This is 11% less gas than the previous year, with the reduction likely to be due to the replacement of fossil fuel heating with low carbon air source heat pumps in some buildings, such as those at Cottenham Library (pictured below). More low carbon heating projects completed in 2021-22 and 2022-23 will lead to further reductions in future years.

Figure 9. Air source heat pumps at Cottenham Library

Oil, although more carbon intensive than gas, accounts for only 79 tonnes CO_2e, because there were only four CCC sites that use oil. These used 265,421 kWh of heating oil in 2021-22.

Fugitive emissions of refrigerant gases from air conditioning units accounted for 131 tonnes CO_2e, and diesel for generators led to 5 tonnes CO_2e emissions.

This section does not include school buildings, which have been counted separately.

2.7 Transport

Transport accounts for 6,301 tonnes CO_2e (5%) of council GHG emissions in 2021-22. This includes some scope 1 emissions (from CCC fleet vehicles) and some scope 3 emissions (from vehicles not under the control of the Council, such as vehicles belonging to CCC employees or contractors).

Transport emissions in 2021-22 appear to have increased by 56% compared to the previous year, but this is partly due to exceptionally low transport emissions in 2020-21 due to the impact of the Covid-19 pandemic. In 2021-22 we have seen the start of a return towards normal pre-pandemic levels, but 2021-22 transport emissions were still 53% lower than in our baseline year of 2018-19.

However, the biggest reason for the apparent increase is that home to school transport emissions were not included in 2020-21 due to a lack of relevant data, but we have been able to make an estimate of these emissions for 2021-22. This accounts for the majority of the difference between 2020-21 and 2021-22 for transport, so this increase is mainly due to a methodology improvement and not all a genuine increase. (The baseline year did also include an estimate of emissions from home to school transport.)

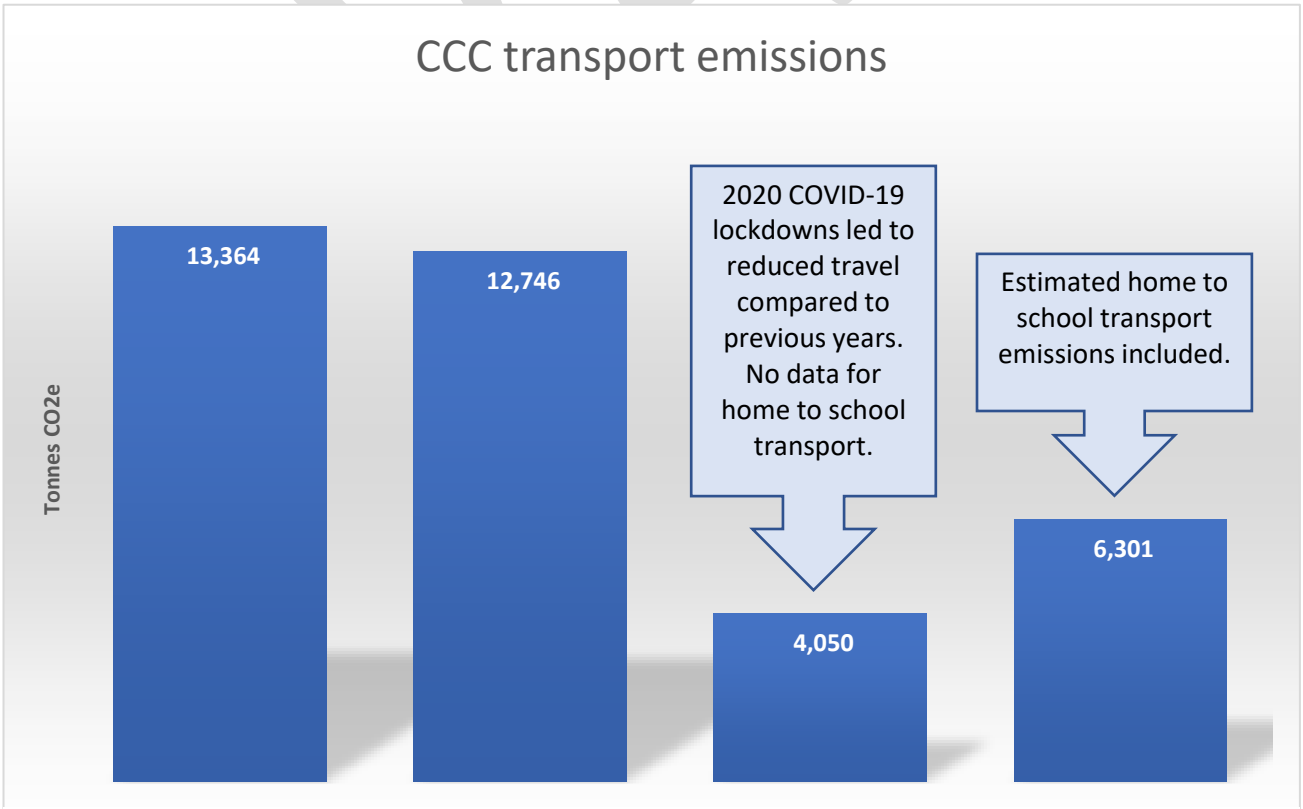


Figure 10

Of all the Council's transport emissions in 2021-22, the largest share (2,595 tonnes CO_2e) was from our social and education transport service, which includes social care transport as well as home to school transport.

Highways services transport (such as the road gritters pictured in **Error! Reference source not found.**) accounted for 665 tonnes CO_2e, and construction transport was 291 tonnes CO_2e.

Figure 11

Business travel accounted for 1,592 tonnes CO_2e. This includes emissions associated with our pool cars, vans and other fleet vehicles as well as business travel in employees' own vehicles and travel by public transport (trains, buses and taxis).

Employees commuting from home to work has been estimated at 1,157 tonnes CO_2e.

Travel by contractors other than those mentioned above was not included due to not having access to this data.

2.8 Maintained schools

Schools emissions (which are all counted as scope 3) for all the Local Authority maintained schools in Cambridgeshire account for 8,250 tonnes CO_2e. This is 12% higher than the previous year, but 7% lower than our baseline year 2018-19.

The largest share of this is 4,763 tonnes CO_2e from mains gas, followed by 2,684 tonnes CO_2e from electricity, and 582 tonnes CO_2e from heating oil.

This includes data for all Cambridgeshire maintained schools that either purchase their utilities through the ESPO contract or have provided their utilities data to us directly.

We do not currently have any data for schools' water and sewerage services or air conditioning gases in schools.

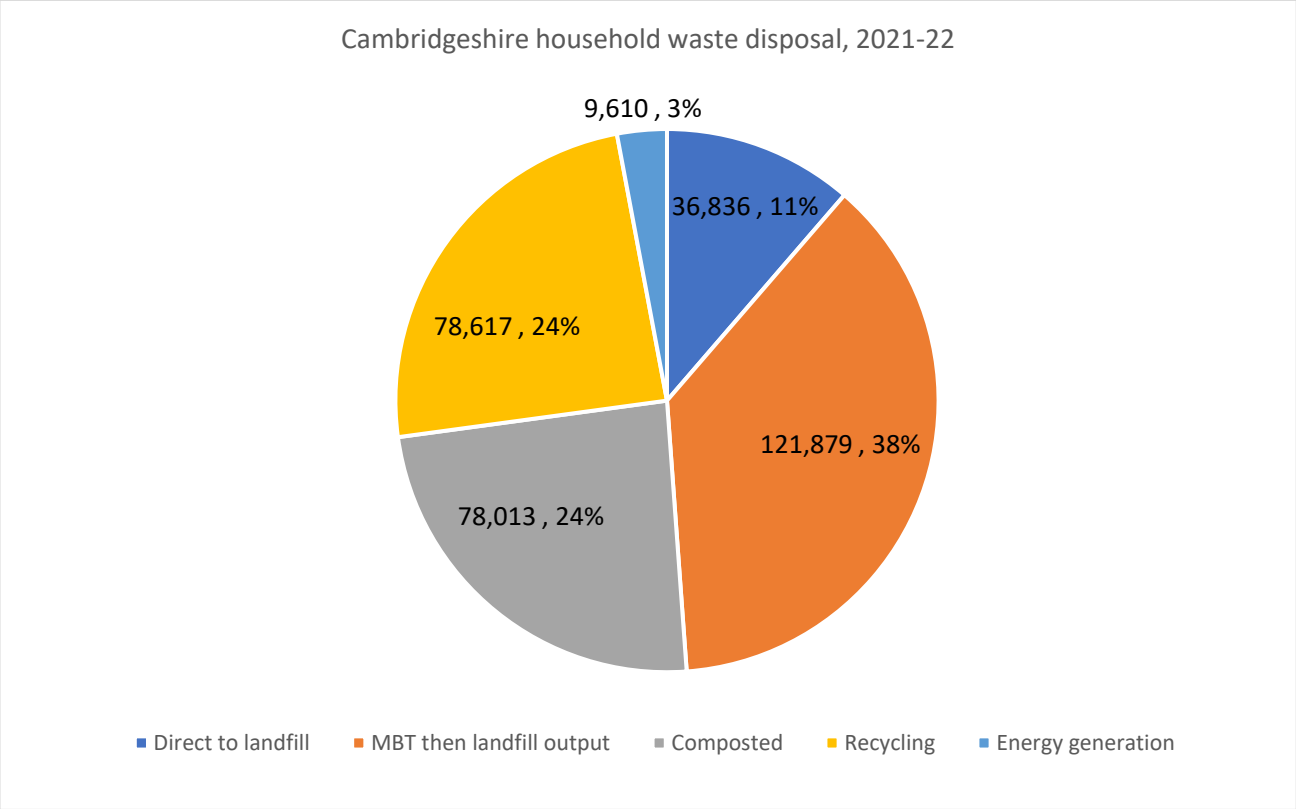
Academy schools are not included in these figures since these are not under the Council's control.

2.9 Waste

Waste accounts for the largest share (36%) of our known emissions in 2021-22, at 48,068 tonnes CO_2e.

The vast majority of this (estimated at 47,934 tonnes CO_2e) is due to the Council's statutory responsibility as the Waste Disposal Authority for treatment and disposal of waste from Cambridgeshire residents.

In 2021-22 there were 324,955 tonnes of waste collected from both the household kerbside collections and the Council's nine Household Waste Recycling Centres. Of that, 11% went directly to landfill, and 38% was processed through a Mechanical-Biological Treatment (MBT) plant to reduce the volume before the resulting compost-like output was landfilled, whilst 24% was composted, 24% was recycled and 3% was used for energy generation.



Note that waste collection is the responsibility of the City and District Councils, therefore transport of waste is not included in these figures, whereas treatment and disposal is the responsibility of the County Council and is included.

Over the past year, Cambridgeshire County Council have been working in partnership with researchers from University College London (UCL) as part of a Local Government Association (LGA) and Local Partnerships grant-funded Net Zero Innovation project, to develop a custom carbon calculator for local authorities for the waste sector. This calculator has been used to provide a much more accurate estimate of carbon emissions from waste than has been possible in previous years. For this reason, we have re-run the calculations of emissions from waste for every year since our baseline year of 2018-19, using the updated methodology, and updated our baseline data accordingly.

We have found that emissions from waste were 9% lower than the previous year, and 13% lower than our baseline year 2018-19.

The small remainder of the waste category is from the waste generated at the Council's own sites, accounting for 116 tonnes CO_2e emissions, construction waste (16 tonnes CO_2e) and highways waste (2 tonnes CO_2e).

Figure 12

2.10 Agriculture

Agricultural emissions from the County Farms estate are estimated at 14,511 tonnes CO_2e, which is 11% of the Council's GHG emissions for 2020-21. The vast majority of the County Farms estate is cropland, with a small area allocated to livestock. This figure is very similar to the previous year.

2.11 Land use, land use change and forestry (LULUCF)

Land use, land use change and forestry (LULUCF) can either be a source of GHG emissions (for example from soil erosion) or a sink where GHGs are removed (for example through tree growth). In Cambridgeshire, LULUCF is often a source of emissions due to the types of land in our region.

This sector accounts for an estimated 24,380 tonnes CO_2e in the CCC carbon footprint, which is 19% of all our known emissions. This comprises an estimated 25,390 tonnes CO_2 from Council-owned cropland (arable farms) and built-up land (buildings and highways) and deducting an estimated 1,009 tonnes CO_2 removed from Council-owned grassland (including livestock farms and parkland) and forest / woodland.

2.12 Construction projects and materials use

A 16% share of the Council's 2021-22 carbon footprint (21,181 tonnes CO_2e) is from construction materials used for building projects, highways and major infrastructure. This comprises of emissions associated with extraction/mining, production/manufacture and transportation of materials to the point of purchase. These emissions are also known as 'embodied carbon'. Use of fuels for equipment on site is also included in the construction category.

Construction emissions were 25% higher in 2021-22 than in the previous year, but 80% lower than in our baseline year 2018-19. This is reflective of the very low emissions in 2020-21 due to the impacts of the COVID-19 restrictions and their impact on the construction sector, followed by a partial recovery in 2021-22.

19,329 tonnes CO_2e of this was for highways and transport work, including roads maintenance, resurfacing works, projects completed through the Council's highways framework contracts, and some major infrastructure projects such as the Histon Road improvements and the Kings Dyke project. There were a small number of projects for which we could not obtain data, but the vast majority of highways and major infrastructure projects that were on site during 2021-22 have been included.

1,839 tonnes CO_2e was for education capital projects such as building new schools and extensions, and 13 tonnes CO_2e was for minor works such as renovations and maintenance of existing buildings.

Minor capital works have been included in these figures for the first time this year, but at the moment we are only able to calculate the emissions from some of these works, because we do not have access to the relevant data on materials to be able to calculate the remaining emissions. Although this is a very small share of overall emissions, we are working with our contractors to try to obtain more of this data in future.

2.13 Other purchased goods and services

Emissions from other purchased goods and services are unknown. This includes:

- Social care provision (other than our own buildings and staff travel);
- Legal, consultancy, insurance, pensions, investments, banking, telecommunications, post and other business services (other than our own buildings and staff travel);
- Education services (other than energy use in maintained schools);
- Office machinery, IT equipment, furniture and the like;
- Food and drink;
- Other goods and services not mentioned elsewhere.

Since the emissions data for these goods and services lies with other organisations it is more difficult to collect the relevant data. However, we are working to improve this.

2.14 Reducing our carbon footprint

There are two reasons for the difference between gross and net emissions; a reduction of 6,992 tonnes CO_2e.

Firstly, because we buy electricity generated from 100% renewable sources, although the gross emissions for electricity (based on grid-average carbon intensity – known as the location-based method) are 4,131 tonnes CO_2e, the net emissions (based on the supplier fuel mix for the tariff we purchase – the market-based method) are zero.

Secondly, our solar assets, including the 12MW solar farm in Soham and several rooftop solar PV installations across Council buildings, generated enough electricity to offset 2,861 tonnes CO_2e in 2021-22.

Cambridgeshire County Council also already has several other key measures in place to reduce our gross carbon footprint and help mitigate against climate change. These include a range of energy efficiency projects across our property portfolio, such as on-site renewable generation assets (e.g. rooftop solar PV), Building Energy Management Systems (BEMS), and installation of LED lighting.

Our programme of low carbon heating works will see our scope 1 carbon footprint reduce further over the next few years, as we replace gas and oil heating with low carbon Air Source Heat Pumps at more sites.

Without these projects, the Council's carbon footprint would have been higher.

However, we recognise that there is more work to do. This is set out in our Climate Change and Environment Strategy and Action Plan.

Figure 13. CCC's Triangle Farm solar park in Soham

Figure 14. Solar panels on the roof of March Library

2.15 Methodology

A carbon footprint is a measure of the greenhouse gases (GHGs) emitted into the atmosphere from sources in a specified region or organisation. The most common GHG is carbon dioxide (CO_2). Emissions of other GHGs such as methane (CH_4) or nitrous oxide (N_2O), are measured in 'carbon dioxide equivalent' (CO_2e), which takes into account the different global warming potential (GWP) of different gases. Quantities of GHGs are multiplied by their GWP to give results in units of carbon dioxide equivalent (CO_2e).

Different activities emit different gases, for example, burning fossil fuels releases carbon dioxide, methane and nitrous oxide into the atmosphere.

Nationwide, emissions of CO_2 make up about 80% of GHG emissions, with the remainder from methane (12%), nitrous oxide (5%) and fluorinated gases (3%), when weighted by GWP, as shown in Figure 15.

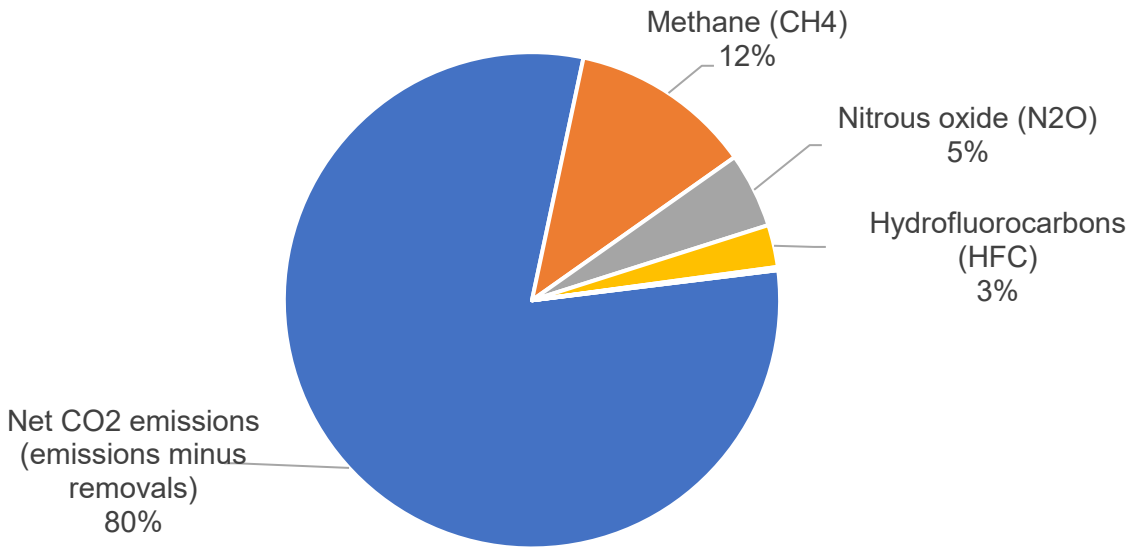


Figure 15: UK-wide Greenhouse Gas Emissions, 2019, by type of gas (tonnes CO_2e) (data from BEIS)

The Council's own carbon footprint has been calculated in line with the UK Government's Environmental Reporting Guidelines for Voluntary Greenhouse Gas Reporting[1], which is based on internationally-recognised standards from the World Resources Institute and World Business Council for Sustainable Development: the GHG Protocol Corporate Accounting and Reporting Standard, and the GHG Protocol Scope 3 standard.

Broadly, the methodology used was as follows:

[1] 2019 Environmental Reporting Guidelines, Chapter 3

1. Collect data on all activities under Cambridgeshire County Council control that emit GHGs (e.g. energy used, miles travelled, materials purchased). Actual data has been used wherever it is available.
2. Assumptions and estimates are only used where actual data was not available. Some activities have been excluded in cases where there was no data available and no basis upon which to estimate. Where this is the case, this is clearly stated below.
3. Convert data to metric tonnes of carbon dioxide equivalent (CO2e), to calculate gross emissions using appropriate carbon conversion factors.
4. Note actions taken to reduce emissions (e.g. green energy tariff, solar generation), then also report net emissions.

The reporting period is the financial year 1 April 2021 to 31 March 2022.

The carbon conversion factors used for this reporting period are mostly the 2021 UK Government published carbon conversion factors, except where there is no appropriate emissions factor given, or a more accurate conversion factor is available. Where alternative methodologies have been used, these are explained in Table 3 in section 2.15.2 below.

2.15.1 Scopes

Emissions-releasing activities of organisations are classified into three groups known as scopes. These are defined in the GHG Protocol Corporate Standard and are described in Table 2 below.

Table 2: Scopes

Scope	Definition
Scope 1 (Direct)	Emissions that occur directly from sites or assets owned or controlled by the organisation (e.g. gas boilers at own premises, fleet vehicles).
Scope 2 (Energy indirect)	Emissions from purchased electricity, heat or steam.
Scope 3 (Other indirect)	Emissions that occur due to the organisation's activities / products / services, but at assets not owned or controlled by that organisation (e.g. travel in employee-owned vehicles or public transport, purchased goods and services).

Activities in all three scopes have been included in this report. However, Scope 3 emissions are more difficult to account for, because the required data often lies with other organisations. As a result, there is a higher degree of estimation in the scope 3 categories.

Carbon dioxide produced from biologically-sequestered carbon, e.g. from the combustion of biomass for electricity and / or heat generation, is not included in either scopes 1, 2, or 3. However, this is reported separately as 'outside of scopes'. This is because an equivalent amount of carbon dioxide would have been absorbed from the atmosphere during the plant growth phase. This carbon dioxide would have been emitted when the plants - from which the biomass is derived - decayed naturally at the end of their life. However, two other GHGs – nitrous oxide and methane – are commonly emitted when biomass is combusted. These

would not be emitted during natural decay and any nitrous oxide or methane emissions from biomass / biofuel consumption is included in the emissions under the three scopes. This is in line with the approach generally taken in international carbon accounting standards.

2.15.2 Boundary of reporting, and data sources

All activities under the operational control of Cambridgeshire County Council are within the boundary of reporting, including those outsourced to third parties in cases where the overall control or responsibility still lies with the County Council. A complete list of emissions sources included is shown below in Table 3.

Table 3: CCC Emissions Sources Included

Area	Activity	Methodology / Data source	Accuracy / Confidence level
Buildings and utilities	Gas burned for heating and hot water at CCC buildings	Usage data from utility bills	High
Buildings and utilities	Oil burned for heating and hot water at CCC buildings	Usage data from utility bills	High
Buildings and utilities	Electricity used at CCC buildings	Usage data from utility bills	High
Buildings and utilities	Electricity used for CCC street lighting, traffic signals etc.	Usage data from utility bills	High
Buildings and utilities	Refrigerant gases leakage from air conditioning units in CCC-controlled buildings	Based on leakage assumed from top-ups at servicing, applied to CCC list of A/C units, type of refrigerant gas and capacity.	High
Buildings and utilities	Diesel used for on-site generators	Litres of fuel purchased	High
Buildings and utilities	Water supply and wastewater collection and treatment	Usage data from utility bills. Some of this is estimated.	Medium
Buildings and utilities	Energy used for data centre at non-CCC sites	Energy usage data from sub-metering on site	High
Buildings – maintained schools	Gas burned for heating and hot water at Cambridgeshire schools, where purchased through ESPO.	Gas usage data.	High
Buildings – maintained schools	Electricity used at Cambridgeshire schools, where purchased through ESPO.	Electricity usage data.	High
Buildings – maintained schools	Oil and LPG used for heating at some Cambridgeshire schools. Other heating fuels not purchased through ESPO.	Heating fuels usage data provided by the schools.	Medium
Transport	Travel in CCC pool cars. Travel in hire cars.	Data from mileage reports and invoices. Based on miles travelled and type of car where known.	High
Transport	Social and education transport in own fleet.	Data from fuel usage.	High

Area	Activity	Methodology / Data source	Accuracy / Confidence level
Transport	Social and education transport by contractors (including home to school transport).	Estimated based on known number of journeys made, estimated distances, and assumed vehicle types for each supplier.	Low
Transport	Social and education transport by volunteer drivers.	Mileage claims	Medium
Transport	Highways maintenance vehicles and gritting fleet.	Data from fuel usage.	High
Transport	Employee travel on CCC business in own vehicles	Data from miles claimed on employee expenses system.	High
Transport	Travel by public transport incl flights, trains, buses and taxis, where known	Currently only have partial data on this. Some train and bus travel estimated from spend.	Low
Transport	Hotel stays on CCC business	Currently only have partial data on this. Estimated from spend.	Low
Transport	Employee home to work commuting	Estimated based on previous year's data, as no travel survey was carried out in 2021-22.	Low
Waste	Waste produced from CCC sites – general waste, recycling and confidential paper waste	Data from waste transfer notes / invoices.	High
Waste	Disposal / treatment of Cambridgeshire waste (as the statutory waste authority)	Based on waste volumes collected by all the City and District Councils in Cambridgeshire, and from all the Household Waste Recycling Centres, and proportions of waste recycled, composted and landfilled. Emissions calculated using custom carbon calculator developed with the LGA and UCL.	Medium
Agriculture	County farms / rural estates	Estimated based on area of land used for livestock, number of cattle, number of sheep, and area of land used for crops, with UK average GHG emissions rates for these uses (based on UK GHG inventory) applied.	Low
Land use, land use change and forestry (LULUCF)	Area of land used as cropland, grassland, wetlands, forestland and settlements	Estimated based on area of land owned by CCC of each type, and emissions factors calculated from the UK GHG Inventory.	Low
Purchased goods and services	Construction and buildings works – major capital projects	Inventory of each material used and quantity (tonnes) data from project information and/or capital works contractors (where available).	Medium
Purchased goods and services	Highways works	Data provided by our highways contractors for the works they did on our behalf.	Medium

2.15.3 Exclusions

The following activities have been excluded from this carbon footprint calculation:

Table 4: Exclusions

Area	Activity	Reason for exclusion
Buildings and utilities	Energy used at other sites outside of CCC control e.g. space in a shared building, third party premises, and CCC-owned sites let to commercial or private tenants. (other than those mentioned as included above)	We do not have access to this data.
Buildings and utilities	Biomass	There are currently no biomass facilities at any CCC sites or maintained schools.
Schools	Energy used at those schools that do not purchase energy through ESPO and have not provided data directly.	We do not have access to this data.
Schools	All data for Academy schools.	These schools are outside of Council control.
Transport	Subsidised public bus routes	No longer Responsibility of CCC. This is now the C&P Combined Authority.
Transport	Travel by public transport other than that included in scope above.	We do not have access to this data.
Transport	Other travel by third parties, contractors and suppliers (other than those mentioned in scope)	We do not have access to this data.
Waste	Other waste streams from CCC sites not mentioned in scope above e.g. batteries, WEEE, skip waste, green waste.	We do not have access to this data.
Waste	Collection and transport of Cambridgeshire household waste	This is not CCC's responsibility.
Purchased goods and services	All other goods and services purchased or used by CCC not accounted for elsewhere	Only spend data available. No accurate method available to convert spend to emissions.
All	All other activities not mentioned in scope above.	No known GHG emissions other than those already listed.

3. Cambridgeshire's Carbon Footprint

The carbon footprint of the geographical area of Cambridgeshire comprises GHG emissions from commercial and industrial sources, domestic homes, transport, agriculture, waste and land use. The vast majority of this is outside of the control of the Council.

We have used the data published by the UK Government (BEIS) on GHG emissions by local authority area to identify the carbon footprint of the geographical area of Cambridgeshire.

3.1 Latest GHG emissions data for Cambridgeshire

The Government Department for Business, Energy and Industrial Strategy (BEIS) publishes detailed data at a local authority (district) level, on emissions of certain greenhouse gases. Previously, this dataset only included carbon dioxide (CO_2), which accounts for around 80% of nationwide GHG emissions. This year, the dataset has been expanded to include emissions of methane (CH_4) and nitrous oxide (N_2O) as well. This means that about 97% of all GHG emissions are now included. F-gases (the missing 3%) are still not included (these are included in the UK-wide statistics but no breakdown by local authority area is available).

The inclusion of CH_4 and N_2O means that emissions from the agriculture and waste sectors are now more fully accounted for.

2020 is the most recent year of data currently available at the time of writing. The new totals for CO_2, CH_4 and N_2O have been given for the past three years of data, 2018 to 2020. However, the data for the years 2005 to 2017 still includes CO_2 only.

In 2020, the total GHG emissions (CO_2, CH_4 and N_2O) for the geographical area of Cambridgeshire were **6.89 million tonnes CO_2e**. This is a **5.9% reduction** compared to 2019.

2020 is the year that the global COVID-19 pandemic hit, and some of the reductions will therefore be due to reduced transport and business activity as a result of the UK-wide lockdowns during that year.

Land use, land use change and forestry (LULUCF) remains the highest emitting sector in the county, followed by transport.

The graph below shows a breakdown of the county's CO_2 emissions by sector and District. This illustrates some of the differences between the different parts of the county. For example, there is a higher share of LULUCF emissions in East Cambridgeshire and Fenland, due to the peatland areas there. Huntingdonshire and South Cambridgeshire have higher emissions from the transport sector, due to major roads in those areas. The city of Cambridge has a smaller footprint due to being a smaller size and more urban area.

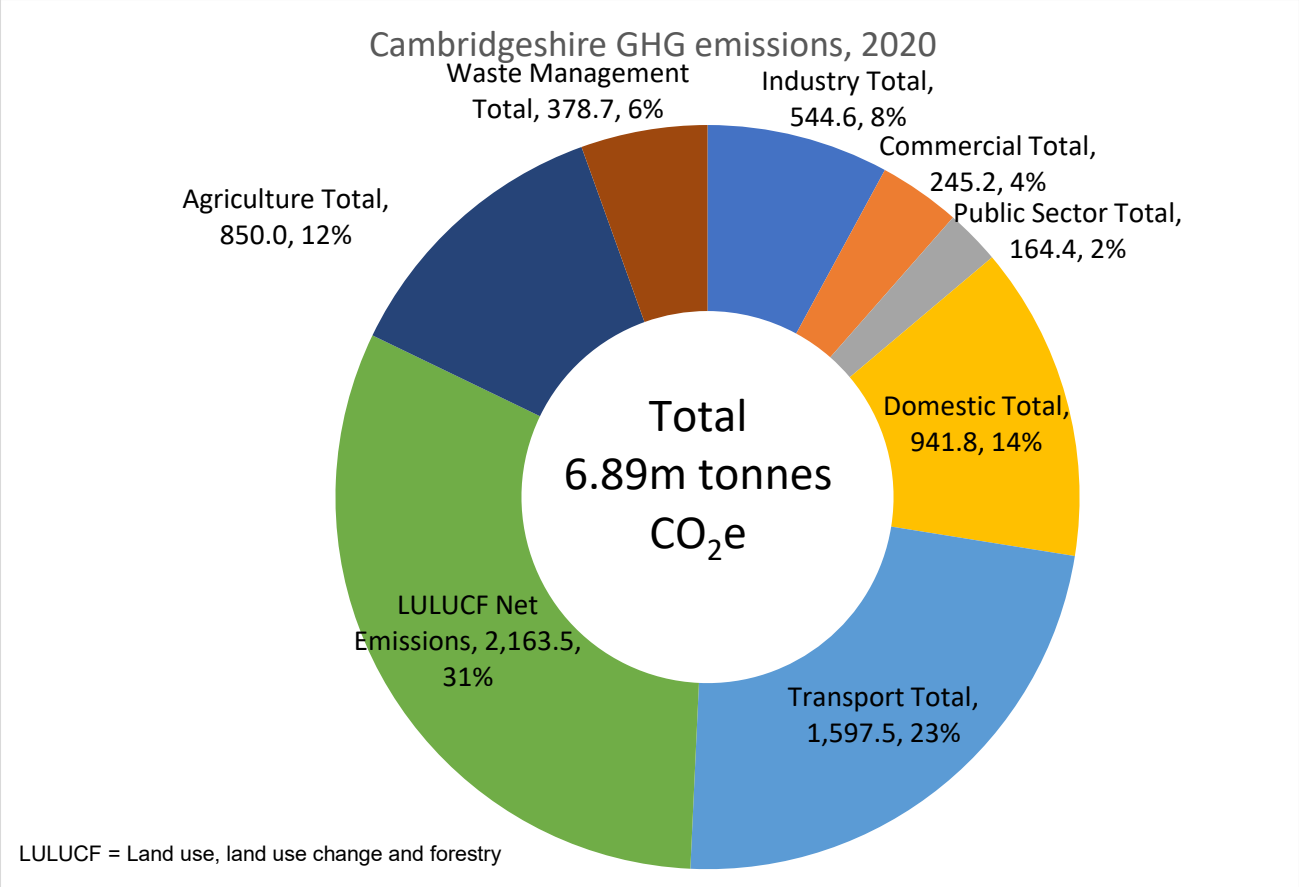


Figure 16

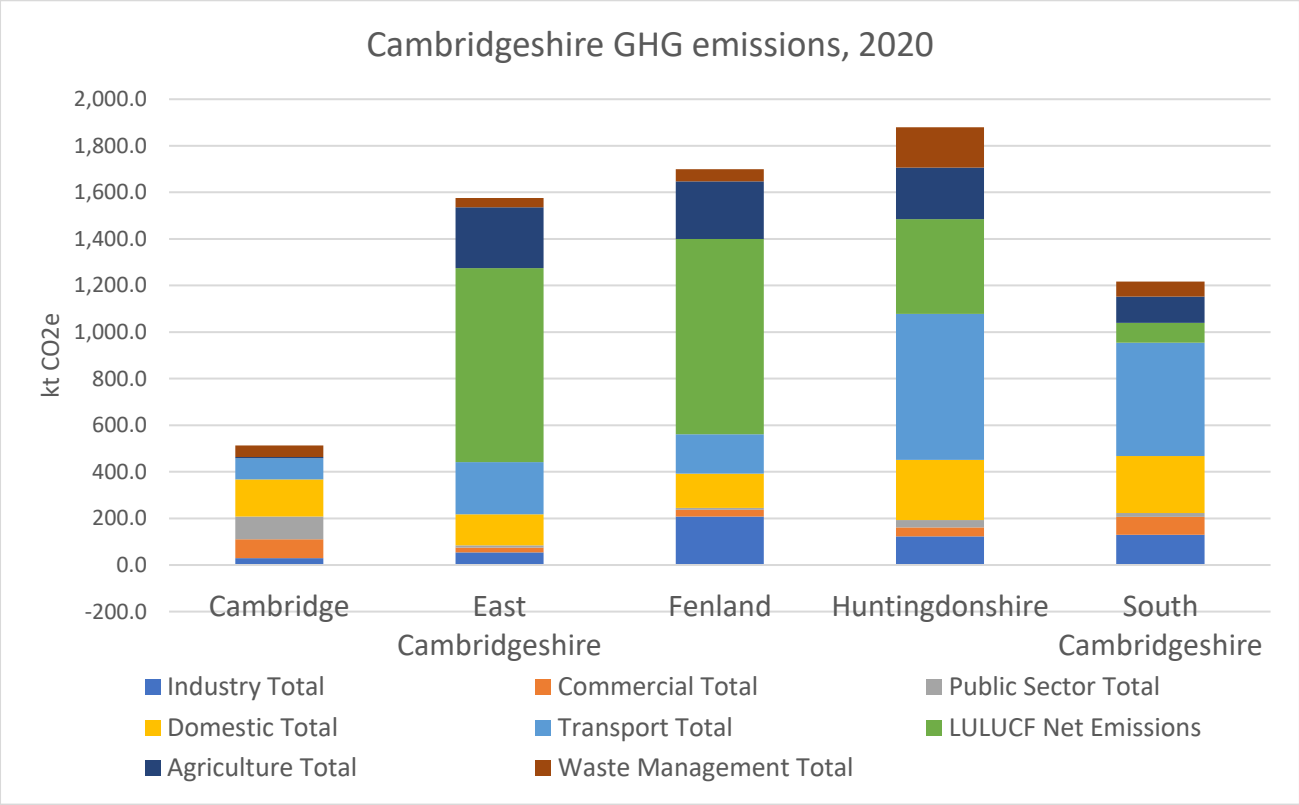


Figure 17

3.2 Change in Cambridgeshire's GHG emissions from 2005 to 2020

There has been a 29% reduction in CO_2 emissions in Cambridgeshire between 2005 and 2020. This includes a 6.1% reduction in CO_2 emissions in 2020 since the previous year.

Since emissions of other GHGs were not reported for years prior to 2018, a comparison cannot be made of the emissions of all gases prior to that.

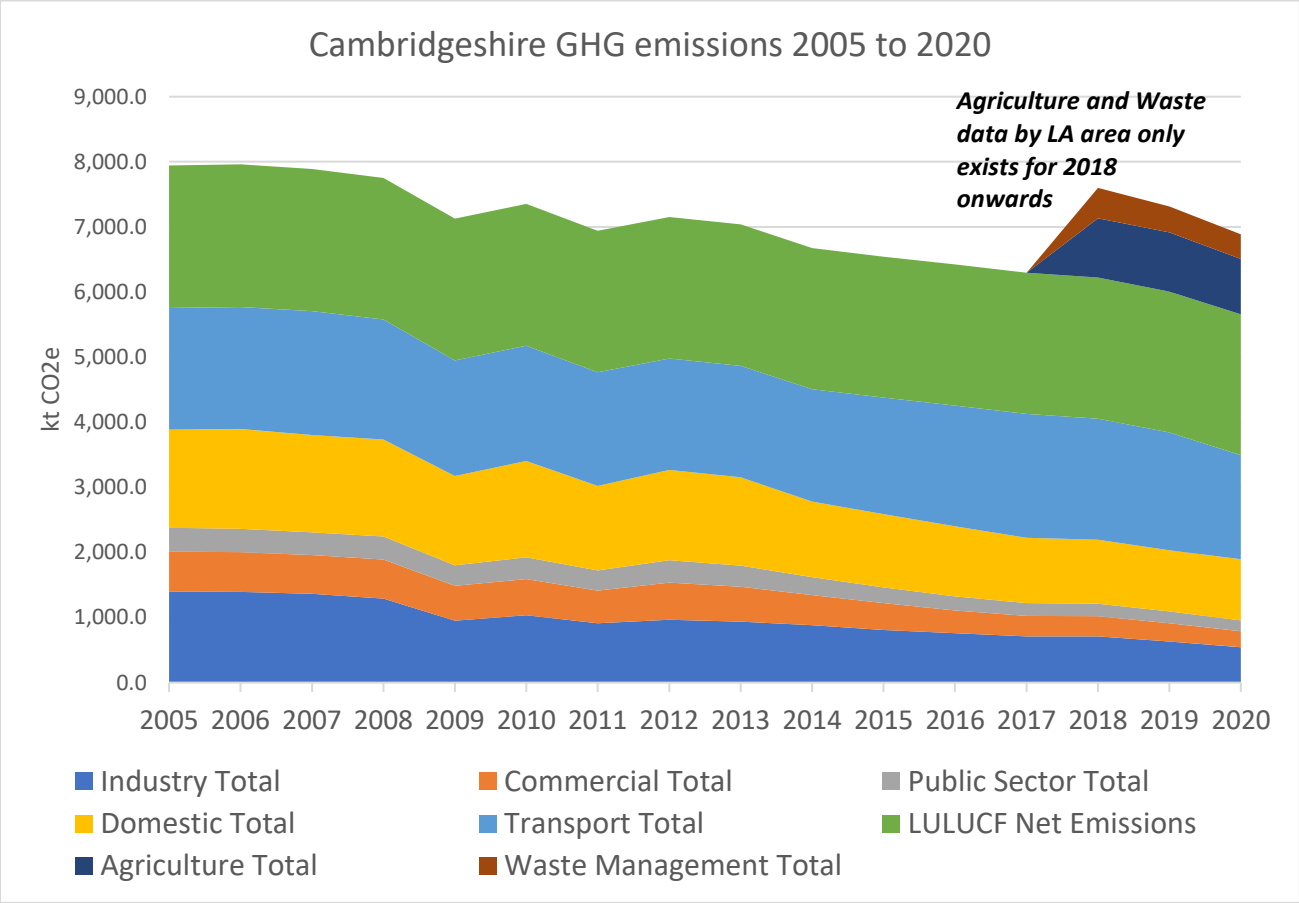


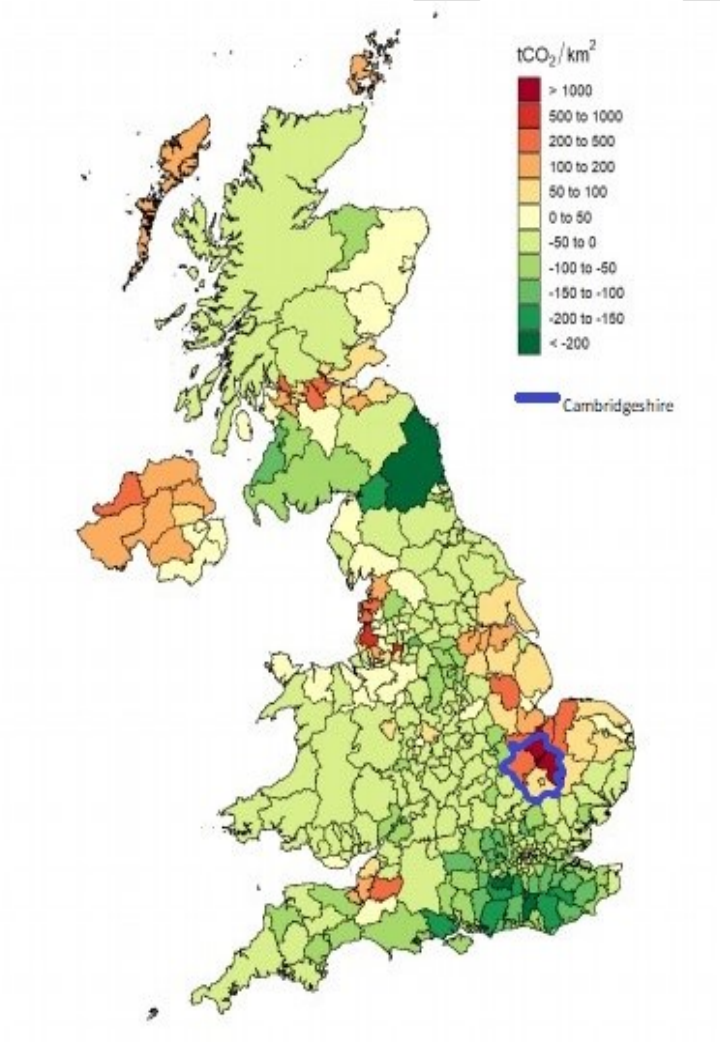
Figure 18

3.3 Note on Land Use, Land Use Change and Forestry (LULUCF)

The CO_2 emissions statistics by local authority area, have included peatland for the last two years, when there was a significant revision in the methodology used by BEIS. This makes land use the highest emitting sector in Cambridgeshire. The high emissions from the LULUCF sector is mostly due to the large areas of drained peatland in the region, where the wasted peat loses carbon from the soil as CO_2. However, LULUCF is a net sink in many other regions of the UK, where CO_2 is removed from the atmosphere through forest growth and conversion of cropland to grassland.

In Cambridgeshire, CO_2 emissions per capita and per km^2 area were considerably higher than the national average, with much of the excess due to the LULUCF sector.

Aside from LULUCF, the trend in Cambridgeshire is reflective of the national trend: emissions are slowly and steadily declining over the last few years, due mainly to the decarbonisation of the electricity grid.



Emissions or removals of CO_2 from LULUCF per LA area (tCO_2/km^2) in 2019 (data from BEIS)

Figure 19

4. Glossary

Expression	Meaning
BEIS	The UK Government Department for Business, Energy and Industrial Strategy
Carbon	Used as abbreviation for carbon dioxide or carbon dioxide equivalent
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent: A standard unit for measuring carbon footprints. It expresses the impact of each different greenhouse gas in terms of the amount of CO_2 that would create the same amount of warming, using GWPs.
GHG	Greenhouse gas: a gas that absorbs and emits radiant energy within the thermal infrared range. Greenhouse gases cause the greenhouse effect.
Greenhouse effect	The heating of the earth's surface caused by solar radiation trapped by atmospheric gases (rather like a greenhouse roof).
GWP	Global Warming Potential: this is a measure of how efficient a chemical is at trapping heat in the atmosphere relative to carbon dioxide. For example, methane has a GWP of 34 and nitrous oxide has a GWP of 298. (Intergovernmental Panel on Climate Change, 2014) By definition, CO_2 has a GWP value of 1. Quantities of GHGs are multiplied by their GWP to give results in units of carbon dioxide equivalent (CO_2e).
Kt	kilotonne = 1000 metric tonnes
LULUCF	Land Use, Land use change and forestry.
Net zero	Achieving an overall balance between emissions produced and emissions taken out of the atmosphere. This can take place on different scales and is often achieved through offsetting.
Offset	An action intended to compensate for GHG emissions by an equivalent quantity of reductions elsewhere or removals.
Sequestration	The long-term removal, capture or sequestration of carbon dioxide from the atmosphere to slow or reverse atmospheric CO_2 pollution and to mitigate or reverse global warming.
WTT – Well to tank	The emissions associated with extracting, refining and transporting fuels to the point of purchase.
Zero carbon	No emissions of GHGs at all

5. Further information

Please visit https://www.cambridgeshire.gov.uk/climate-change