

# Greenhouse Gas (GHG) Emissions Report 2022-2023



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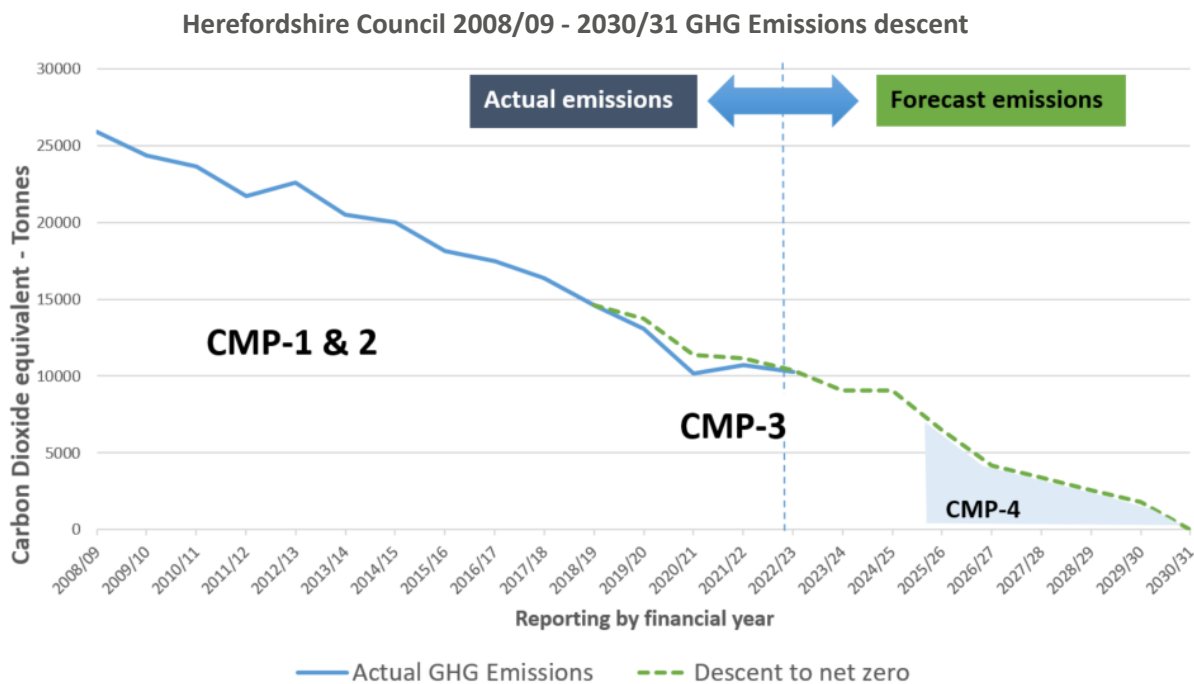
# 1. Footprint at a glance



Herefordshire Council	2008-2009 Emissions tCO <sub>2</sub> e	2022-2023 Emissions tCO <sub>2</sub> e	Emissions change	Reduction %
Scope 1	6,531	2,745	-3,786	-58.0%
Scope 2	8,517	5	-8,512	-99.9%
Scope 3	10,866	7,527	-3,339	-30.7%
<b>Total</b>	<b>25,914</b>	<b>10,277</b>	<b>-15,637</b>	<b>-60.3%</b>

Total emissions are now **10,277 tCO<sub>2</sub>e**.

This is a decrease of **15,637 tCO<sub>2</sub>e** or **60.3%** since 2008/09 baseline year.



## Summary of changes to reporting process for 2022-23

- Data collection process has been improved to increase accuracy
- Methodology used to produce estimates has been revised to increase accuracy
- Additional emissions sources have been included now that data is available
- Previous years' emissions have been recalculated to ensure consistency with the additional emissions sources and revised reporting process

## 2. Overview



### 2.1 Background

This report quantifies the Greenhouse Gas (GHG) emissions produced by Herefordshire Council between 1st April 2022 and 31st March 2023.

It has been produced in accordance with the Greenhouse Gas Protocol (revised edition) and under DEFRA's Guidance on how to measure and report greenhouse gas emissions (2009).

The organisational boundary determines which emissions should be included within the report. An Operational Control approach was used to determine this boundary, being those functions over which the Council has some operational control. This includes direct Council operations and those delivered under major contracts.

Emissions figures are produced from a combination of consumption volume multiplied by a conversion factor determined by the type of fuel consumed. All conversion factors used are those produced by BEIS/DESNZ in the 2022 data release. Where applicable, Gross CV (Calorific Value) has been used for fuels. All emissions are measured in tCO<sub>2</sub>e.

### 2.2 Objectives

The primary purpose of reporting is to track progress towards stated national and local targets for GHG emissions reduction. Progress is tracked from a fixed baseline and for Herefordshire Council this is 2008/09, the first year GHG emissions were reported.

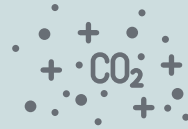
### 2.3 Re-calculating the baseline

The reporting process evolves over time in response to both organisational and operational changes within the Council and the availability of data from which to calculate emissions. To maintain a consistent record of progress from the baseline, it is necessary to periodically re-calculate the baseline emissions to include any new emissions sources or any changes in assumptions or estimations upon which past reporting has been based. The baseline was recalculated this reporting year as detailed in section 4.1.

### 2.4 What are Greenhouse Gases? (GHG's)

Greenhouse Gases (GHG's) are a range of different gases that all have a measurable impact on atmospheric warming. While carbon is the largest contributor, other gases also have a warming effect. Some of these gases have a warming effect far greater than carbon, but are quantified in terms of the equivalent mass of carbon. Collectively the GHG emissions are quantified in 'Carbon dioxide equivalent – CO<sub>2</sub>e.'

## 3. Herefordshire Council: Emissions 2022/23



In order to correctly track emissions sources, the GHG Protocol divides emission sources into Scopes.

### Scope 1

These are direct emissions produced by:

- Council owned/controlled mobile combustion sources (e.g. petrol and diesel fuel consumed in buses and cars for transportation purposes)
- Combustion of fuels in stationary sources (e.g. natural gas, burning oil, gas oil and LPG consumed within Herefordshire Council buildings)

### Scope 2

These are indirect emissions from the generation of:

- Purchased electricity
- Purchased heat or steam that is consumed in the Council's owned or controlled equipment or operations

**Note:** Herefordshire Council do not purchase heat or steam. Almost all electricity is 100% REGO backed renewable. Non renewable supplies served some tenanted properties, where HC covers utility costs between tenancies.

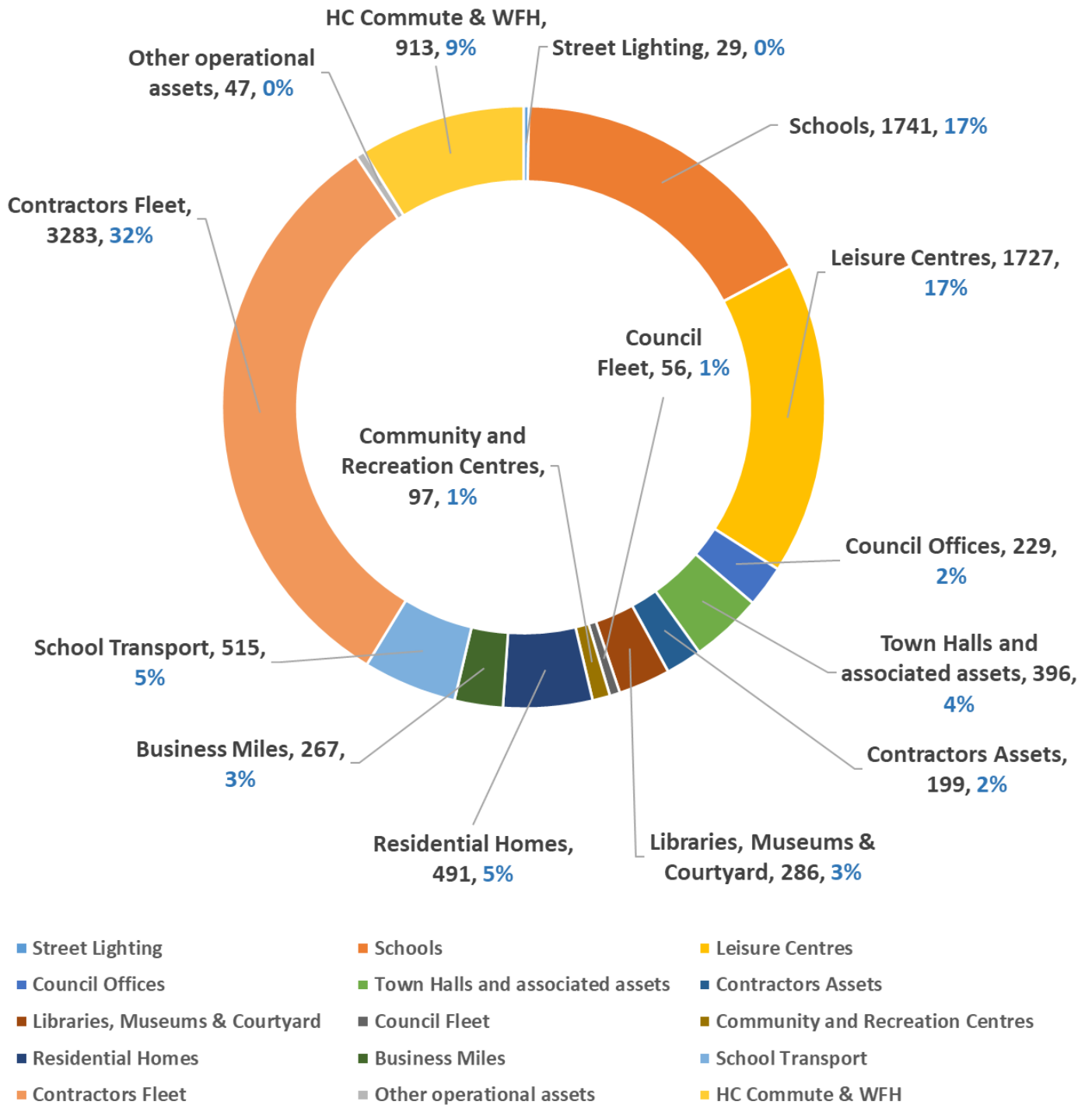
### Scope 3

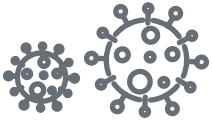
These are indirect emissions that aren't produced directly by the Council but are part of the upstream and downstream value chain. They are the emissions produced by other organisations and individuals delivering functions that are within the Councils' operational boundary.

- Business travel (staff mileage for business purposes)
- Staff commuting
- Staff working from home
- Electricity, gas, burning oil and LPG consumption in buildings operated by outsourced services for waste management, highways, leisure, cultural services and residential care homes
- Petrol and diesel consumption by contracted fleet vehicles
- Fleet and staff mileage undertaken by main outsourced contractors on behalf of Herefordshire Council

As well as placing emissions into the three Scopes, Herefordshire Council allocates the emissions to one of 15 categories. These are easy to understand categories to aid a wide audience understand the emissions sources and the relative quantity of emissions produced by different functions. The categories referring to outsourced services are entirely Scope 3 emissions. For those direct Council services they include emissions from Scopes 1, 2 and 3.

## 2022-23 GHG Emissions by source category (tCO<sub>2</sub>e, %)





## Interpretation of changes from 2021-22

### Pandemic impact

The Councils' services were impacted between 2020-22 by the pandemic. The closure of schools and offices and the reduction in normal operational services reduced carbon emissions. This also impacted the collection and accuracy of data in ways that are difficult to fully assess. Emissions data from activity during the pandemic can be considered a statistical outlier to emissions before and after the pandemic.

#### Changes in emissions can be attributed to the following:

##### Emissions factors

These measure the carbon intensity of fuel. As more renewable sources provide energy to the UK Grid the carbon intensity drops as this increased generation replaces more carbon intensive fuels such as coal and gas. Reduction from 2021 dataset was 9% and this is reflected in Scope 3 emissions for electricity (T&D losses). As Scope 2 emissions are almost 100% renewable, the emissions factor changes have little impact on the Scope 2 emissions.

An overview of the emissions factors changes is available at: [2022 Government greenhouse gas conversion factors for company reporting: Major changes to the Conversion Factors \(publishing.service.gov.uk\)](#)



##### Council Offices

The pandemic required additional measures to be implemented, including increased ventilation in offices. This has now been reduced to previous operational levels.



##### School Transport

With such a wide reaching and complex service, accurate and reliable data is difficult to obtain. Reporting in recent years has included a number of assumptions and estimations and the impact of Covid likely had a greater impact than could be reliably estimated. The data on school transport was updated and improved this year. While this indicates a large annual reduction it is likely that the reduction has been more gradual over the preceding years.



##### Council fleet

The small increase is likely from increased operational demands and improvements in the accuracy of data collection.





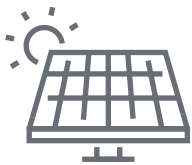
### Business miles

The emissions from recorded business mileage has increased by 11% and likely reflects changes to home working practices and operational requirements.



### Contractors Fleet

Contractors are now providing data in accordance with the Streamlined Energy and Carbon Reporting SECR and have revised how data is provided to Herefordshire Council for GHG reporting. This has potentially included additional sources that have been previously absent from data returns.



### Other operational assets

Electricity supplied by WME now 100% renewable.



### Schools

There has been a significant drop in schools emissions that can be attributed to; energy efficiency measures; installation of solar PV; reduced ventilation requirements; improved energy management.



## 4. Targets



### 4.1 Recalculation of the baseline

The baseline year is a reference point from which progress can be measured. The year 2008/09 has formed a fixed base year for previous reports. However, as the Councils' operations evolve it is necessary to recalculate the baseline to ensure it is aligned with the current reporting process. This is in line with the Protocol and ensures that the baseline shifts as a response to changes in operational activity and data collection methodology.

Each years' report is accurate at the time of reporting and collectively the annual reports track emissions reduction over time. This is the primary purpose of reporting. When the baseline is recalculated, all subsequent years can be recalculated based on the reported percentage emission reduction. This revises the actual figures, but maintains the accurate tracking of emissions change.

The 2008/09 baseline year was recalculated to include the following:

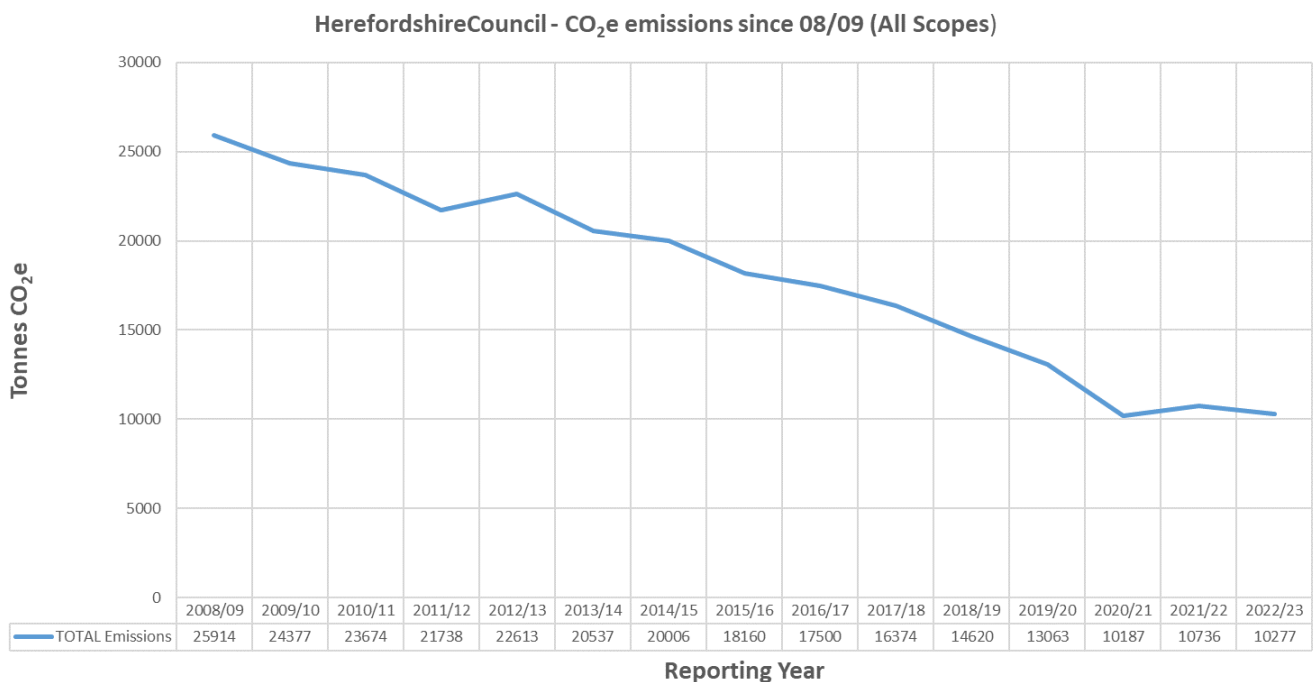
**Transmission & Distribution Losses:** These have not previously been reported. The electricity use in kWh from 2009 was used to calculate T&D losses using the 2009 emissions factor.

**Commuting miles:** The new process (detailed in Appendix III) was repeated with data from 2009 to ensure consistency in the approach. No working from home was factored in and so all staff were considered to have commuted into the office every day.

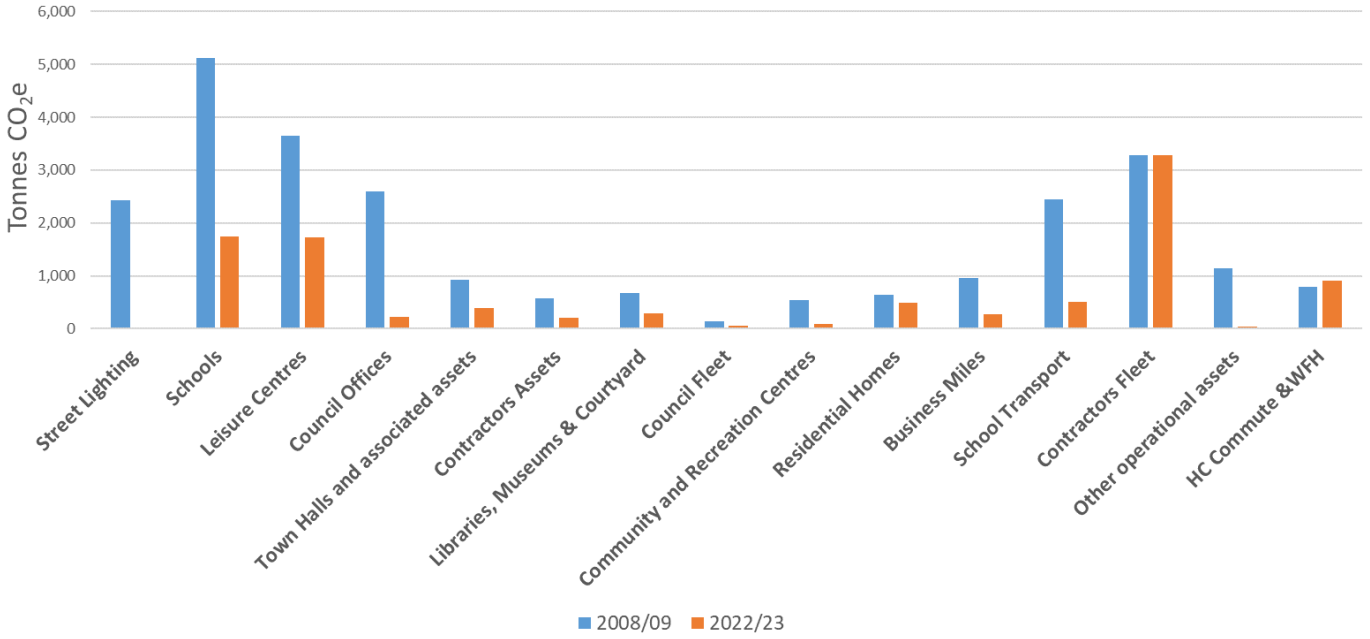
**Working from home:** A figure was not added to the baseline as homeworking was not common on 2008/09. The 2008/09 baseline does include numerous Council offices and other places of work that are no longer in operational use by the Council.

### 4.2 Progress to date – change from 08/09 baseline

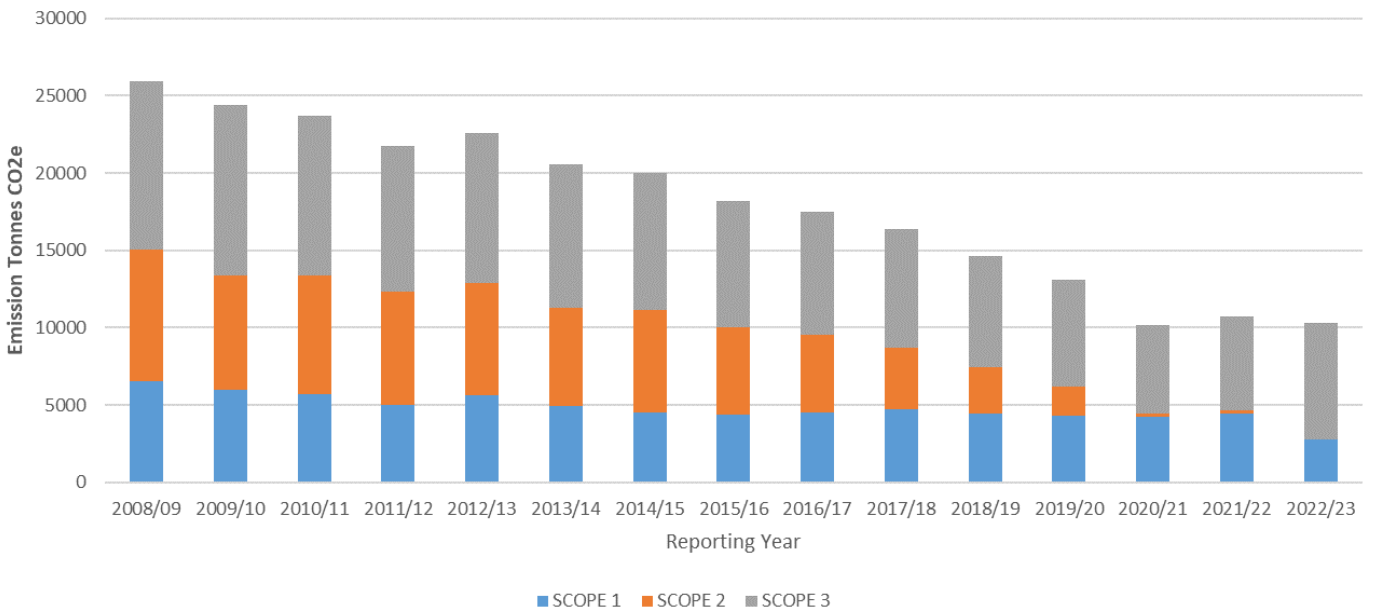
Total emissions are now 10,277 t CO<sub>2</sub>e. This is a decrease of 15,637tCO<sub>2</sub>e or 60.3%.









Emissions change by category - 2008/09 to 2022/23



GHG Emissions Sources 2008/09 to 2022/23



## 5. Areas of work

Area of work	CMP-3 Reduction Target -tCO <sub>2</sub> e	Saving achieved to date - tCO <sub>2</sub> e	Progress in 2022-23
<b>Renewable Energy</b> 	-1652	-1594	<ul style="list-style-type: none"> <li>Most Council properties are now on 100% renewable electricity including street lighting.</li> </ul>
<b>Projects (efficiency and generation)</b> 	-563	-479	<ul style="list-style-type: none"> <li>LED lighting and controls installed at Ryefields Community Hub.</li> <li>Setting of heating and ventilation systems across a number of Council properties were reviewed and changed to reduce energy consumption. Additional ventilation had been required due to the Covid-19.</li> <li>Decarbonisation surveys undertaken across Council properties.</li> </ul>
<b>Better Ways of Working</b> 	-273	-57	<ul style="list-style-type: none"> <li>Despite increases in business mileage, there is still an overall reduction since 2018/19 and reduced commuting miles.</li> <li>CMP-3 Targets did not account for significant increase in homeworking and the GHG emissions are now included, which has partially offset savings achieved in previous years due to office closures.</li> </ul>
<b>Schools</b> 	-2271	-1104	<ul style="list-style-type: none"> <li>Schools receiving 100% renewable electricity.</li> <li>Solar PV systems installed at Fairfield High School, John Masefield School and Marlbrook Primary &amp; Nursery.</li> </ul>
<b>Contracts</b> 	-363	-160	<ul style="list-style-type: none"> <li>There has been a significant reduction in the emissions from School Transport, though this is mostly from increased accuracy of data collection.</li> <li>Emissions from waste collection have increased due to increase in housing stock since 2018/19.</li> </ul>
<b>Partners</b> 	-1753	-652	<ul style="list-style-type: none"> <li>Fleet and building emissions have reduced by partners working in the public realm, healthcare, leisure centres and Courtyard.</li> </ul>
<b>TOTALS</b>	<b>-6874</b>	<b>-4047</b>	

# GHG protocol scopes

## Scope 1

- Council owned/controlled mobile combustion sources (e.g. petrol and diesel fuel consumed in buses and cars for transportation purposes)
- Combustion of fuels in stationary sources (e.g. natural gas, burning oil, gas oil and LPG consumed within Herefordshire Council buildings)

## Scope 2

- Emissions from the generation of purchased electricity, heat or steam that is consumed in the Council's owned or controlled equipment or operations (e.g. buildings and street lighting)

## Scope 3

- Business travel (staff mileage, rail travel by HC staff for business purposes)
- Staff commuting
- Electricity, gas, burning oil and LPG consumption in buildings operated by outsourced services for waste management, highways, leisure, cultural services, education (academies) and residential care homes
- Petrol and diesel consumption by contracted fleet vehicles
- Fleet and staff mileage undertaken by main outsourced contractors on behalf of Herefordshire Council

### Notable exclusions (also excluded from previous reporting periods):

- Emissions from Hill and Moor landfill site. Waste emissions are mainly from county residences and businesses which are represented in the county emission figures rather than the Council's.
- Fugitive emissions from air-conditioning systems. Fugitive emissions from intentional or unintentional releases, e.g., leaks or spills of hydrofluorocarbon (HFC) emissions during the use of refrigeration and air conditioning equipment.

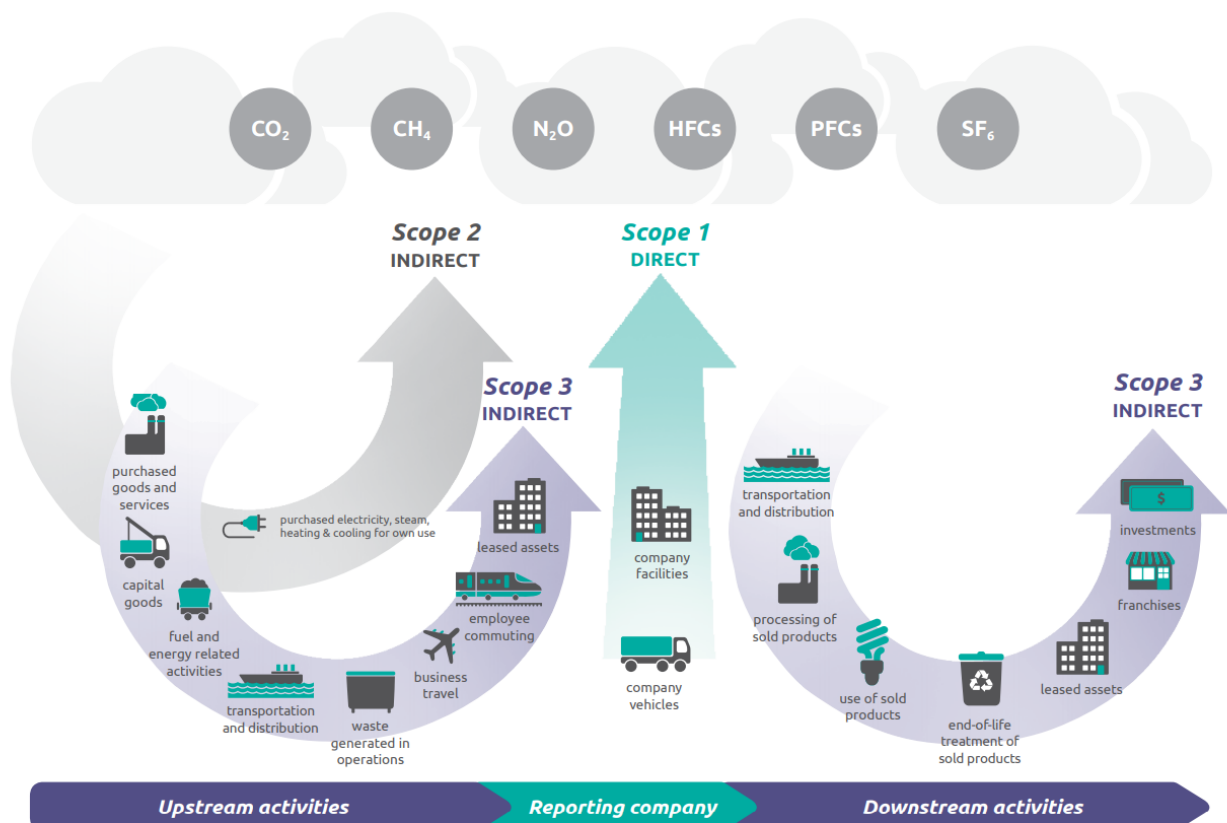


Figure 1: Overview of GHG Protocol scopes and emissions across the value chain  
(Source: [www.ghgprotocol.org](http://www.ghgprotocol.org))



## Appendix I: Methodology

### Principles of emission reporting

There are five established principles that underpin how GHG emissions should be reported:



#### **Relevance**

Ensure the GHG inventory appropriately reflects the GHG emissions of the company and serves the decision-making needs of users – both internal and external to the company.



#### **Completeness**

Account for and report on all GHG emission sources and activities within the chosen inventory boundary. Disclose and justify any specific exclusions.



#### **Consistency**

Use consistent methodologies to allow for meaningful comparisons of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.



#### **Transparency**

Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.



#### **Accuracy**

Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information.

[ghg-protocol-revised.pdf](#) ([ghgprotocol.org](http://ghgprotocol.org))



## Appendix II: Assumptions and Limitations

### Assumptions

It is necessary to make some assumptions regarding the energy consumption for some emissions sources. Where consumption is recorded directly such as supply through a Council buildings' electricity meter the data can be considered highly accurate and no assumptions are required. However, there are a number of known emissions sources that cannot be directly measured and so some reasoned, logical assumptions are required to produce an estimate.

**Schools - Heating oil:** This is not purchased centrally and each school would need to provide delivery information. Historic data that was provided in previous years has been used. This is a very small element of the total emissions.

**Commuting/Homeworking division:** The proportioned estimate of commuting and homeworking time must be consistent to ensure every staff member is accounted for as doing one or the other on each working day. A division of 40% commuting days and 60% homeworking has been used.

**Commuting:** It is not possible to accurately track the travel habits of every staff member on every day, given the hugely variable nature of travel choices and distances. Logical assumptions have been made regarding travel distances and the modes of transport used and this is detailed in Appendix III.

**Weather correction:** Annual variances to heating and cooling periods impact on energy consumption. Taking these variances into account is useful for tracking the energy performance of an individual building as annual changes can be accounted for and year-to-year comparisons made. This is of limited use in GHG emission reporting as emissions result from the actual measured fuel consumption. Therefore no weather correction has been applied to any building consumption.

**Vehicle mileage figures:** Readings from the vehicles' odometer are collected annually. Annual mileage figures can be produced by comparing the reading from one year to the next. However, it is not practical to collect the odometer readings for every vehicle precisely 365 days apart. Therefore, the reporting period for individual vehicle mileage across the entire vehicle fleet will vary.

The data collection, calculations and estimation methodology used in this report have not been evaluated by external sources.



## Exclusions

It is essential to be transparent and identify those known sources of GHG emissions that have not been included in the report. In accordance with the Protocol, all Scope 1 and 2 emissions have been recorded. For Scope 3 emissions, there is more flexibility for the reporting organisation to determine which are appropriate to include.

The following Scope 3 emissions sources have been excluded on the basis that it is not yet possible to collect an accurate dataset.

**Purchase of goods and services:** This includes everything from office supplies and laptops to vehicles and building materials. Emissions factors are provided based on broad categories of goods but a reliable and consistent data collection process for the quantity and type of goods purchased across the entire Council is not yet in place.

**Waste emissions:** The emissions released directly from the waste itself as it is burnt or processed are not included. Waste produced directly at Council buildings and during operations is not yet quantified and so is excluded. However, emissions from the Councils contractors operating the waste facilities and refuse collection are included.

**Fugitive emissions:** This emission source covers a range of synthetic gases commonly used for refrigeration and in air conditioning systems. While these are closed systems, some gas can escape during maintenance and replacement of gas storage. These have not been measured.

**Bus, rail, sea and air business miles.** Unable to obtain accurate data, this will be pursued for future reporting.

**Well-to-Tank WTT emissions:** These are the supply chain emissions associated with the extraction, refining, transportation and delivery of fuels and are in addition to the GHG emissions produced when that fuel is burned.

**Biogenic factors:** Some biogenic elements are present within fossil fuels such as the limited proportion of biodiesel included in regular forecourt filling stations. While this does reduce the emissions factor of that fuel, it does not account for emissions generated in producing the biogenic elements. These are currently excluded.

**Working from home – Councillors.** The working from home figures include only Council staff, though this does include any agency staff as there is an operational requirement for those staff hours regardless of whether the individual is employed directly or not. However, no figures have been included for the hours worked by Councillors at home. Mileage claimed by Councillors is included with the staff business mileage figures.

**Water Supply and Treatment:** Emissions factors for water supply and treatment have only recently been included in the BEIS/DESNZ data. Further work is required to capture an accurate dataset covering all Council supplies.



## Appendix III: Data collection

The following describes the data collection in terms of the source supplying the data, the units used and any assumptions made for sources that require estimation. A data register records the date and source (individual officer) that provided the data.

### Electricity – Supply to buildings and operational assets

Consumption data was retrieved from the West Mercia Energy web portal for Council premises. Monthly data is totalled for each building across the 12 month period and each building placed within a suitable category.

A correction factor of 0 is applied to account for 100% renewable energy. **Units are kWh.**

### Electricity – street lighting

The total of the unmetered supply is entered as a single entry and the emissions factor supplied. Some metered supplies to street furniture is also included with the data obtained via the West Mercia Energy web portal.

**Units are kWh.**

### Electricity – Transmission & Distribution Losses

Transmission and Distribution losses are not calculated for each individual supply, but instead on the total electricity supplied for each category.

**Units are kWh.**

### Electricity – Herefordshire Council tenants

The Council is responsible for some bill payments for tenanted properties, usually when properties become occupied or vacant. Properties use different suppliers and so REGO certificates cannot be confirmed as supplying 100% renewable electricity. Electricity consumption emissions were calculated at the standard carbon intensity for the UK grid. **Units are kWh.**

### Mains Gas

Data retrieved from the West Mercia Energy web portal for Council premises. Monthly data is totalled for each building across the 12 month period and each building placed within a suitable category. **Units are kWh.**

### Mains Gas – Herefordshire Council Tenants

Consumption data is from suppliers bills and will not necessarily cover the entire 12 month reporting period due to tenant occupation. **Units are kWh.**

### LPG

Data for this fuel is provided by West Mercia Energy. Each site is placed into one of the categories. **Units are in litres.**

### Heating Oil

The few Council properties still using heating oil used the previous years' consumption data. **Units are in litres.**



## Herefordshire Council Fleet

Mileage readings are collected from vehicle managers across April/May. Each vehicle is then recorded separately to account for vehicle class (car, van etc) and fuel (diesel, petrol, electricity) and this allows a more accurate emissions conversion factor to be used. Vehicles are then grouped by category.

Electric vehicles that are charged at Council premises have been given a 0.00 emissions factor as the electricity supplied to the vehicle is already recorded in the building's supply meter. This avoids double-counting the energy. Vehicles are sorted by fuel and size category. **Units are in miles.**

## Business mileage

All business mileage is recorded for staff expense claims and a data record is provided by Hoople. This includes mileage claimed for cycling and motorcycle use and for mileage claimed by Councillors as well as staff. The unknown vehicle type is used. **Units are in miles.**

## Commuting

Commuting forms a significant element of Scope 3 emissions and is difficult to measure accurately. Distance and potential modes of transport vary between employees and can change regularly. A new methodology was used to estimate emissions from commuting and this provides a logical basis for ensuring that a number of the variables are accounted for.

The Plough Lane offices were assumed to be the location staff travel to from home. While staff might well travel to a number of locations, Plough Lane can be reasonably considered as central. It is assumed that staff members homes are distributed evenly around the counties housing stock.

A concentric search area was created from central Hereford that defined 3 zones at 6, 12 and 18 miles from the centre point. This effectively covers the whole County and some parts of neighbouring counties. The number of recorded address points within each area was queried to produce figures for the number of buildings in each zone. While this does include commercial properties, it creates a suitable figure for the proportion of residential properties in each zone. This proportion was then applied to the total number of FTE staff. The commuting distance for each staff member was set at centre of each zone, creating to/from journey distance figures of 6, 18 and 30 miles.

Of those within the 6 mile zone, the average single commuting distance was 3 miles. This total was reduced by 1/3rd to account for those staff that live within 1 mile of Plough Lane and can be reasonably assumed to walk or cycle to work. 5% of the staff within each zone were also removed to account for those using public transport. A further 5% within the 12 and 18 mile zones were removed to account for car sharing.

This creates a total mileage figure for the number of staff within each zone proportioned to the distribution of housing stock and some allowances for non-car travel.

With Working from Home now a significant part of the Council's operations, a figure of 40% (2 days per week) of the working week was used for commuting. The unknown vehicle type was used and the units are in miles.

## Working from Home

The UK Government has added a Working from Home figure to the carbon emissions factors. This was based upon a research white paper and accounts for heating, lighting and appliance use. This paper provided a carbon figure for each staff hour worked and is included in the BEIS/DESNZ dataset.

As staff were considered to be commuting for 40% (2 days) of the week, a figure of 60% (3 days) was applied to the total number of worked staff hours in a year. This is derived from the number of FTE staff x no. of working days x 7.4 hours/day.

However, this assumes that staff are always at home when not in the office and does not account for times when staff are at meetings, site visits and the travel between home and another location. A 10% reduction in the homeworking hours was applied to account for these periods.

Units are in Hours.

## Courtyard

The Courtyard produces a detailed set of energy figures each year and these are entered manually and the most suitable carbon emissions factors applied.

## Halo

Halo provide electricity and gas consumption data within the leisure centres and a mileage figure for fleet use.

## Severn Waste

Severn Waste provide electricity and gas consumption data, vehicle fleet data and total fuel consumption in litres. For service elements shared with Worcestershire County Council, fuel use is proportioned on a 30/70 split between the two Councils.

## FCC

FCC provide a monthly record of diesel vehicle fuel use for refuse collection.

## Shaw

Shaw provided a breakdown of monthly gas and electricity use records for the reporting period, for each site they operate.

## Balfour Beatty Living Places (BBLP)

BBLP provide data for fuel use captured as direct bulk fuel purchases, purchases on fuel cards, staff business mileage and electricity and gas supplied to operational premises.

## School Transport

The Herefordshire Council School transport team provided details on the journey distances and vehicle types used for school transport. This included part of the HC fleet record for Transport and Access services.



**For more information please contact:**  
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