

# Horsham District Council

## Carbon Footprint Report – 2018/19

Hector Wilson, Robert Hatcher

October 2019



# Contacts

---

Prepared by:

**Hector Wilson**

Senior Analyst

[Hector.Wilson@carbontrust.com](mailto:Hector.Wilson@carbontrust.com)

+44(0)20 7832 4565

**Robert Hatcher**

Manager

[Robert.Hatcher@carbontrust.com](mailto:Robert.Hatcher@carbontrust.com)

+44(0)20 7832 4619

Prepared for:

**Helen Peacock**

Environmental Coordination Manager

[Helen.Peacock@Horsham.gov.uk](mailto:Helen.Peacock@Horsham.gov.uk)

01403 215513

**Adam Chalmers**

Director of Community Services

[Adam.Chalmers@Horsham.gov.uk](mailto:Adam.Chalmers@Horsham.gov.uk)

01403 215250

# Contents

---

- 1. Summary of Organisations**
- 2. Executive Summary**
- 3. Carbon Footprint Boundary**
- 4. Carbon Footprint Breakdown**
- 5. Methodology**
- 6. Next Steps**

# 1

## Summary of Organisations

# About The Carbon Trust

---

The Carbon Trust is an independent, expert partner of leading organisations around the world, helping them contribute to and benefit from a more sustainable future through carbon reduction, resource efficiency strategies and commercialising low carbon technologies.



# About Horsham District Council

---



Horsham District Council (HDC) is a second tier local authority based in West Sussex with 461 employees. It operates services including: Planning and building control; Environmental health; Housing; Parking; Parks and countryside; Waste management; and leisure facilities.

# 2

## Executive Summary

## Background

- The need for taking immediate and bold action on climate change is being increasingly recognised by businesses, government and the general population.
- The amount of action that needs to be taken, and the speed at which this must be done has been recognised by the UK through its ratification of the Paris climate agreement – to limit global temperature rise to well below 2°C.
- Consequently, the UK has declared a climate emergency, and the independent committee on climate change has laid out what needs to be done for the UK to become net-zero carbon by 2050.
- Horsham District Council has acknowledged their role in the need to take action and have themselves passed a motion to develop a strategy to achieve net zero carbon emissions.

# Executive Summary

---

## Drivers

---

### Climate Change Act

This act commits the UK government to reducing emissions by at least 80% in 2050 compared to 1990 levels. The 80% target includes GHG emissions from the devolved administrations, which currently accounts for around 20% of the UK's total emissions.

---

### Leadership

Taking strategic action towards reducing carbon emissions will ensure that Horsham can lead the way in developing effective mechanisms to tackle climate change. This will help stimulate low carbon transitions across the regions in which we operate.

---

### Cost savings

With increasing pressure on all councils to cut costs, reducing the amount spent on energy bills is a key driver for lowering our energy consumption.

---

### Reputation

With stretching national targets, there is increasing pressure on councils to be seen as "doing their bit" and playing a leadership role on climate change action. Failure to act could lead to reputational risks and adversely affect Horsham's public image.

---

### Building regulations

Building regulations contain requirements that relate to the conservation of both fuel and power. There are set minimum energy performance standards for new buildings and major refurbishments of existing buildings, which Horsham subsequently has to meet.

---

### Local area drivers

In addition to the above we are driven to take action on climate change adaptation measures.

---

## Local Plan

- Horsham District Council is in the process of finalising its next local plan for the years 2018-2036, this plan aims to show how the council will meet the social, economic and environmental needs of the district.
- A fundamental part of developing a local plan is gathering evidence to then direct strategy.
- A key driver for undertaking this project is the need for trusted, independent and clear evidence to feed in to the sustainability appraisal and strategic environmental assessment in order to develop the local plan.
- The results from this work will form a key part in ensuring that Horsham District Council have sustainability, reducing emissions, and climate change as a core element of their strategic plans for years to come.

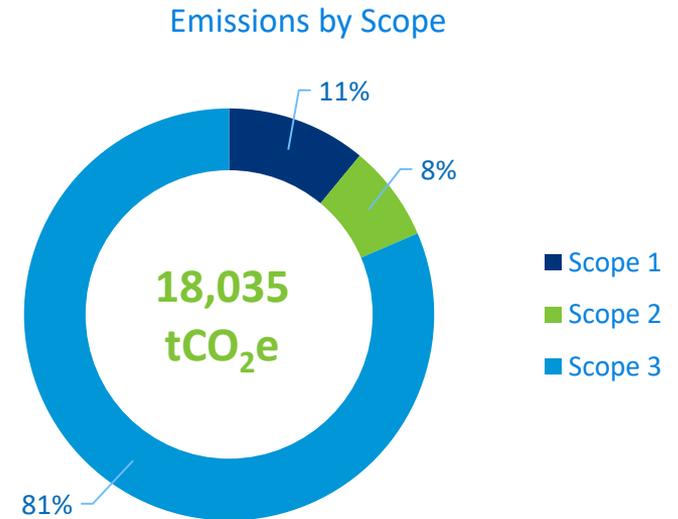
## Proposal

- The Carbon Trust have been contracted by Horsham District Council to support the first stage of their journey: to complete a comprehensive carbon footprint of their direct and indirect carbon emissions (scope 1, 2 and 3) for the most recent financial year (2018/19).
- Creating a carbon footprint is an essential first step in developing a carbon reduction strategy, and is key to understanding the scale of the challenge focussing efforts on the most impactful activities.
- This Carbon Footprint has been calculated in line with the Greenhouse Gas (GHG) Protocol emission Scopes; these are set out as follows:
  - Scope 1: Direct emissions from combustion of gas and other fuels
  - Scope 2: Emissions resulting from the generation of electricity and other energy purchased (but generated elsewhere)
  - Scope 3: Emissions made by third parties in connection with operational activities

# Executive Summary

## Key Findings

- The total measured carbon footprint for Horsham District Council for the FY2018/19 is **18,035 tCO<sub>2</sub>e**.
- The majority of this footprint is attributed to the council's operational activities, namely leased buildings and contracts. Emissions from the council's direct operations building use and fleet accounts for 19% of total measured emissions.



## Next Steps and Recommendations

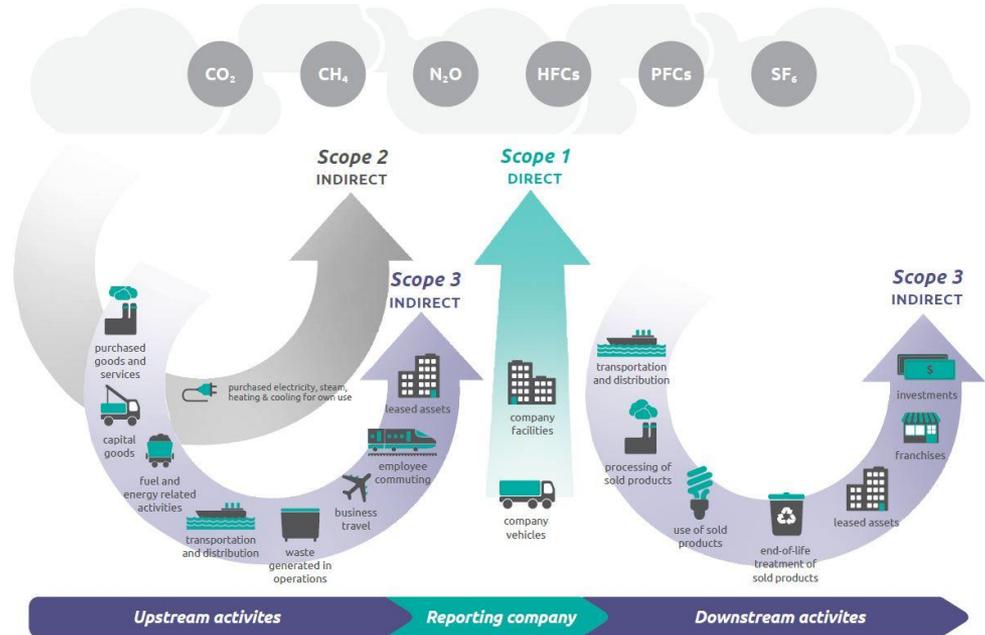
- The measured carbon footprint has highlighted key areas that the council can focus on to reduce its direct emissions, these involve electrifying its fleet, and upgrading to LED lighting wherever possible. Future ambitions include, electrifying heating supplies and installing renewables to fully decarbonise stationary assets.
- Indirectly, the council can reduce scope 3 emissions by expanding its selection criteria for contractors to include sustainability metrics.
- Setting a science based target will provide the council with the necessary drive to take action to reduce its carbon footprint.
- Horsham District Council should monitor carbon emissions on an annual basis, and source data to create an expanded and comprehensive scope 3 footprint.

# 3

## Carbon Footprint Boundary

# GHG Protocol

- The green house gas (GHG) protocol is the most widely used, and accepted methodology for greenhouse gas accounting.
- It provides a framework for businesses, governments and entities to measure and report greenhouse gas emissions that support ongoing reduction efforts in a consistent manner.
- The standard has been developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD)
- Carbon Trust has been working with and applying the mechanisms of the GHG protocol for almost 20 years including providing support to the WRI in developing Scope 3 accounting methods.



# Green House Gases

---

- Carbon dioxide is not the only green house gas, there are five other key green house gases that contribute to global warming, these are: Methane, Nitrous Oxide, Hydrofluorocarbons, Perfluorocarbons and Sulphur Hexafluoride.
- Not all of these gases arise from combustion of fossil fuels, with some originating from refrigeration/cooling, agriculture, chemical production and electrical applications.
- Each gas has its own global warming potential (GWP), by comparing each gas's GWP to that of Carbon Dioxide (CO<sub>2</sub>) we are able to derive a Carbon Dioxide equivalent value (CO<sub>2</sub>e).
- Example: CO<sub>2</sub> has a GWP of 1, Methane has a GWP of 24; therefore we can say that 1 ton of methane emissions is equal to 24tCO<sub>2</sub>e.
- Although CO<sub>2</sub> has the lowest GWP, with some other GHGs having a GWP tens of thousands of times higher, it is also by far the most abundant GHG emission. Hence the focus on CO<sub>2</sub> when discussing emissions reduction and climate change.

## Emissions

Scope 1

Scope  
2

Scope 3

Natural  
Gas

Fleet

Electricity

Water

Waste

Upstream  
Activities

Leased  
Buildings

Business  
Travel

Service  
Contracts

# Data Table of Included Emission Sources

Scope	Element	Example Data	HDC Data Sources & Notes
Scope 1	Organisation facilities	Billing data Natural Gas KWh and £	Utility consumption data and costs
	Organisation vehicles	Purchased fuel records	Fleet vehicles; type of fuel and consumption and cost
Scope 2	Purchased electricity	Billing data Annual KWh and £	Utility consumption data and costs
Scope 3 Upstream	Purchased goods and services	Scope 1 & 2 footprint of procured goods and services	Procurement information associated with largest contracts by value
	Fuel and energy-related activities	Upstream emissions from scope 1 & 2 emissions	Covered in scope 1 & 2 data collection, "Well To Tank" (WTT) and electricity grid transmission & distribution (T&D) losses
	Waste & water generated/supplied and disposed of operations	Waste type and volume Water supply m <sup>3</sup> and water treatment m <sup>3</sup>	Own operations waste generated (kg or tons) and water supply and treatment (m <sup>3</sup> ) excluding residential and business waste.
	Business travel	Distance and mode of travel	Mileage estimates on staff and leased vehicles
	Upstream leased assets	Leased building and leased vehicles	List of sites, description and floor area

# Data Table of Excluded Emissions Sources

Scope	Element	Example Data	HDC Data Sources & Notes
Scope 3 Upstream	Capital goods	Calculated capital assets emissions	Out of scope: HDC don't have easy access to capital goods data.
	Upstream transportation and distribution	Procured goods transport fuel	Out of scope: Data is considered unavailable for the transportation and distribution of procured goods.
	Employee commuting	Employee numbers and mileage	Out of scope: Data currently unavailable but to be included within future work.
Scope 3 Downstream	Franchises	Commercial arrangements	Out of scope: No franchises available
	Investments	Joint ventures property	Out of scope: To be considered in future work.

# Including and Excluding Data

There are several reasons why data may be included or excluded, the following criteria detail how and why data may be included/excluded.

Size	They contribute significantly to the company's total anticipated scope 3 emissions
Influence	There are potential emissions reductions that could be undertaken or influenced by the company
Risk	They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, and reputational risks)
Stakeholders	They are deemed critical by key stakeholders (e.g., customers, suppliers, investors or civil society)
Outsourcing	They are outsourced activities previously performed in-house or activities outsourced by the reporting company that are typically performed in-house by other companies in the reporting company's sector
Sector guidance	They have been identified as significant by sector-specific guidance
Spending or revenue analysis	They are areas that require a high level of spending or generate a high level of revenue (and are sometimes correlated with high GHG emissions)
Other	They meet any additional criteria developed by the company or industry sector

## Future Emissions Sources for Inclusion

---

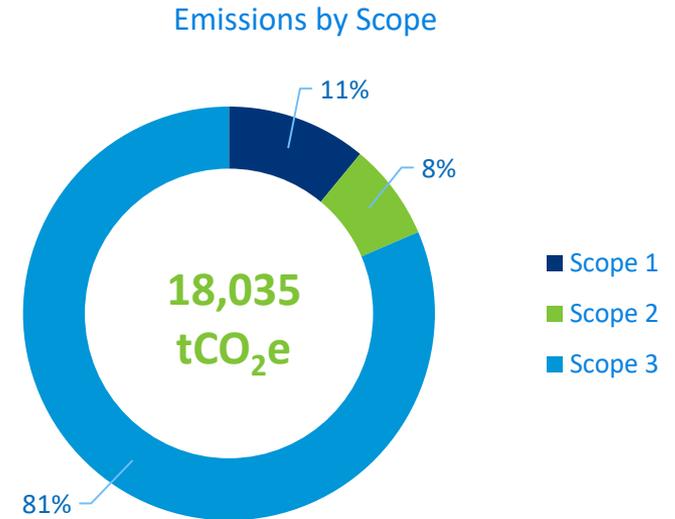
- Horsham District Council have worked closely alongside the Carbon Trust to ensure that their carbon footprint is as comprehensive and accurate as feasibly possible.
- This means that only emission sources with full and accurate data available have been taken in to consideration.
- Areas have thus been identified as future emissions sources that the council wish to include in future footprinting activities, these include:
  - Employee commuting – data is currently unavailable but efforts are being made for employee commuter surveys to be carried out.
  - Extended business travel – the council currently has access to business commuting by road transport, and is pursuing methods to capture data from rail and air travel.

# 4

## Carbon Footprint Breakdown

## 2018/19 Emissions

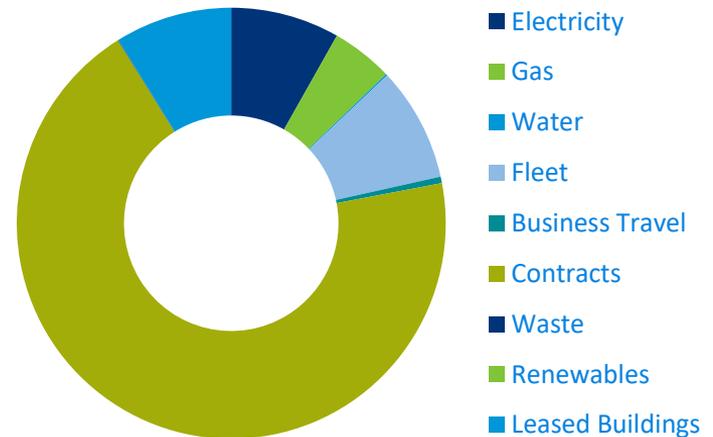
- The total green house gas emissions from Horsham District Council in the FY2018/19 are **18,035 tCO<sub>2</sub>e**.
- The vast majority (see right) of emissions fall under 'scope 3', these are indirect emissions that are predominantly a result of the contracts and leased buildings held by the council.
- The remaining 19% of emissions are scope 1 – direct burning of fuels, and scope 2 – purchased electricity.



## 2018/19 Emissions

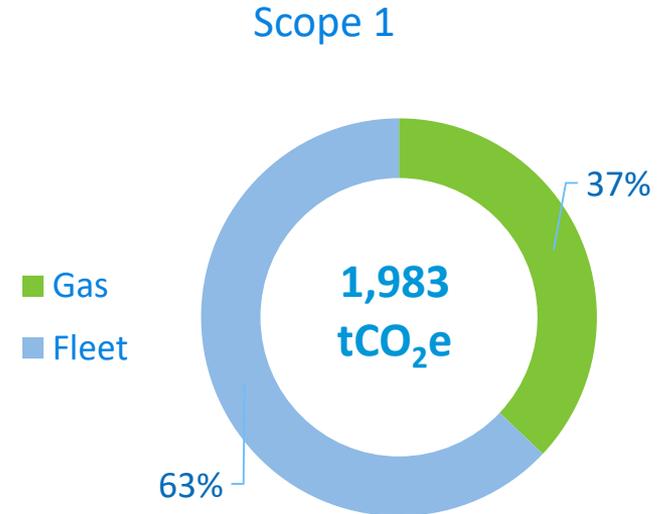
- The pie chart on the right further highlights the sources of emissions.
- It is clear how significant contracts and leased buildings held by the council are (77.9% of all emissions).
- Other significant sources are electricity and natural gas used within buildings (12.8%), as well as the transport fleet that the council operates (8.6%).

Emissions by Category



# Scope 1

- Scope 1 emissions are a result of the direct burning of fossil fuels by the council.
- This arises from two measured sources: natural gas burnt in boilers to provide heating and hot water; and the councils owned transport fleet which burns petrol and diesel within internal combustion engines.
- Electrification or switching to low/zero carbon fuels for the councils owned transport fleet will be the main option to move towards net zero in this area. Current UK government policy mandates that new petrol and diesel vehicles cannot be purchased after 2040. However, cost parity and the business case is likely to indicate Horsham should move to low carbon vehicles (LCVs) or EVs much sooner (e.g. 2024). Therefore we would advocate that Horsham thoroughly assess the potential for LCVs or EVs for any new vehicles purchased from this date.
- To reduce consumption of natural gas the council should investigate alternative heating and hot water technologies. This can be achieved through using heat pumps, electric boilers, or utilising biogas or hydrogen. Heat pumps and electric boilers require either the grid emissions to be less than natural gas (expected in the next few years) or make use of onsite renewables to achieve carbon emissions lower than those currently associated with natural gas.

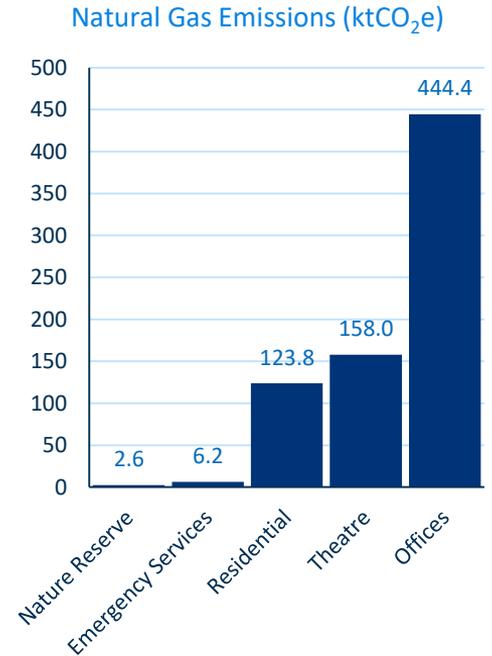


# Scope 1

Note: 1 kiloton (ktCO<sub>2</sub>) is equivalent to 1,000 tons (tCO<sub>2</sub>)

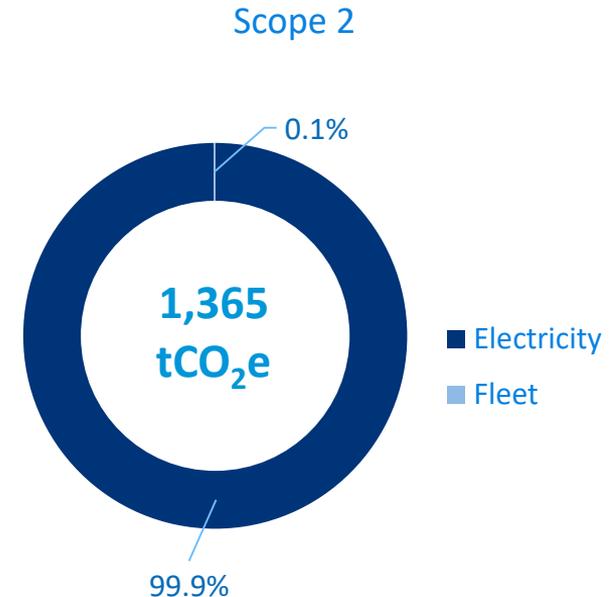
## Natural Gas Consumption in Buildings

- Scope 1 emissions arising from the combustion of natural gas have been recorded from 41 separate sites, and include a mix of residential, office and recreational spaces.
- The **top five highest emitting sites**, account for **87% of all natural gas emissions**. These include: **The main council offices, The Capitol theatre, Park house offices and, Drill Hall and Fiennes Court residences.**
- The most effective methods for reducing natural gas consumption and associated emissions are to upgrade building fabrics; service or replace aging boilers; adjust and monitor heating controls and temperature set points.
- Based on available data, the total annual spend on natural gas consumption equals £58,871.



## Scope 2

- Scope 2 emissions arise from purchased electricity, heating and cooling.
- The overwhelming majority of scope 2 emissions arise from the use of electricity in buildings, with a very small amount from two electric vehicles within the council's fleet.
- Scope 2 emissions will naturally decrease over time as a result of the decarbonisation of the UK grid. However, further efforts to reduce scope 2 emissions from on site renewables and energy efficiency measures are important – as this helps to mitigate any increases in electricity prices.



## Scope 2

---

### Electricity Consumption in Buildings

- Scope 2 emissions arising from electricity consumption have been recorded from 93 separate sites, and include a mix of office, residential, storage, public buildings and appliances and recreational spaces.
- **The top five highest emitting sites, account for 77% of all electricity emissions.** These include: **The main council offices, The Capitol theatre, The Forum, Park House Offices, and Swan Walk car park.**
- The most effective methods for reducing electricity consumption and associated emissions are to switch to LED lighting (this is of particular importance to car parks and street lighting, but also relevant to all other buildings); service or upgrade HVAC systems, upgrade appliances to energy efficient types and make sure to switch them off when not in use.
- The council should also consider installing renewable energy generation to provide zero carbon electricity. Building mounted and standalone Solar PV systems will provide the council with options to relatively cost effectively decarbonise scope 2 emissions (e.g. < 10 years simple payback)
- Total annual expenditure on electricity consumption equals £289,300; this high cost of electricity per kWh is further reasoning to deploy on-site renewables to provide electricity.

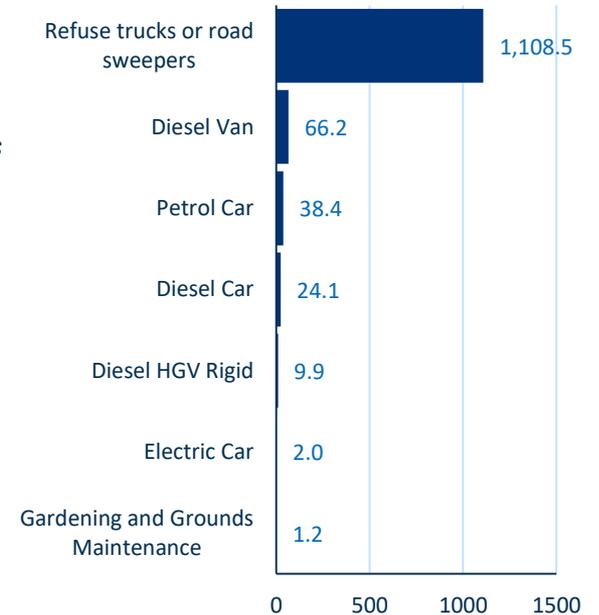
# Scope 1 and 2

## Fleet and Electric Vehicles

Note: electric vehicles are an effective way to improve air quality as well as reducing carbon emissions by decreasing harmful levels of particulate matter (PM)

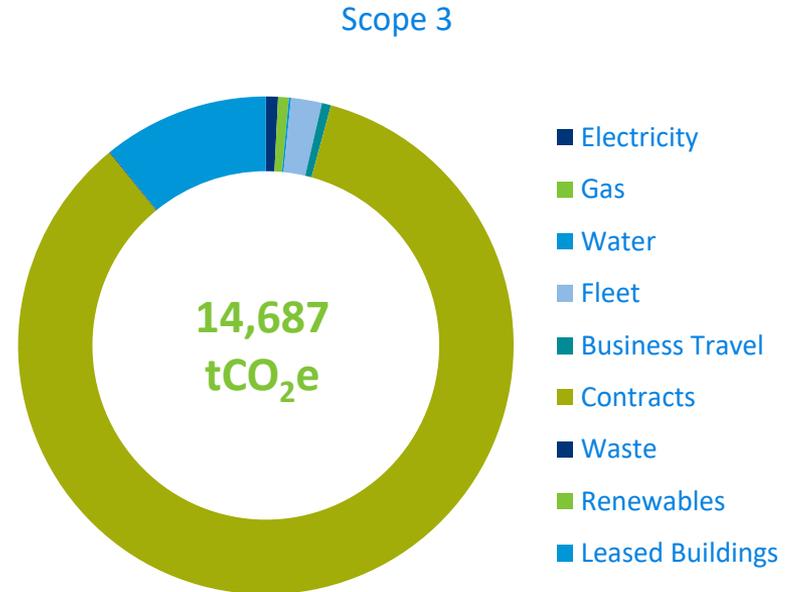
- 63 vehicles were recorded within the Horsham District Council fleet, two of which are electric vehicles.
- The overwhelming majority of emissions arise from the running of refuse trucks/road sweepers – forming 89% of all fleet emissions.**
- The council should consider moving from fossil fuel based transport to electric vehicles to radically reduce emissions; an electric vehicle *currently* emits 70% fewer emissions per mile compared to a diesel vehicle, this will increase further as the grid decarbonises.
- The assortment of electric vehicles is increasing, with electric HGVs and refuse trucks entering the market. Furthermore, range is no longer an issue for vehicles travelling locally and there is an increasingly strong business case for vehicles that conduct regular journeys.

Fleet Scope 1 & 2 Emissions (ktCO<sub>2</sub>e)



## Scope 3

- Scope 3 emissions arise from indirect council operations, sources include: waste collection, business travel, contracts, leased buildings, water usage, and upstream gas, fuel and electricity operations.
- 631 tCO<sub>2</sub>e arise from scope 3 activities excluding leased buildings and contracts.
- The largest sources of emissions from contractual activities relate to leisure centres, refuse collection, and maintenance.

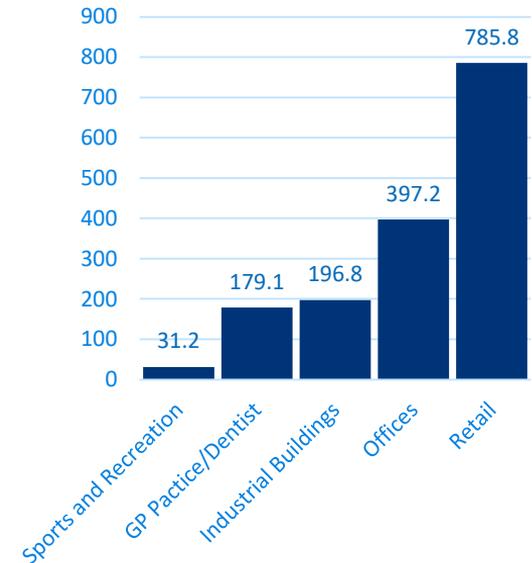


## Scope 3

### Leased Buildings

- Leased buildings are sites that are owned by the council but leased out to users; this means the council has no direct control over how energy is used on that site.
- The council currently lease 111 recorded sites, these comprise of industrial units, retail, office spaces, health clinics and sports and leisure facilities.
- Emissions for these sites are calculated from the provided floor area, and CIBSE benchmarks for typical energy consumptions per unit area of a range of different building types.
- 49% of emissions from leased buildings are from retail sites.
- The council can aim to reduce emissions from leased buildings by retrofitting them with energy efficient measures and leasing them at a premium cost, as well as encouraging energy efficient behaviour and green electricity tariffs from lessees.

Emissions from Leased Buildings  
(ktCO<sub>2</sub>e)



## Scope 3

---

### Contracts

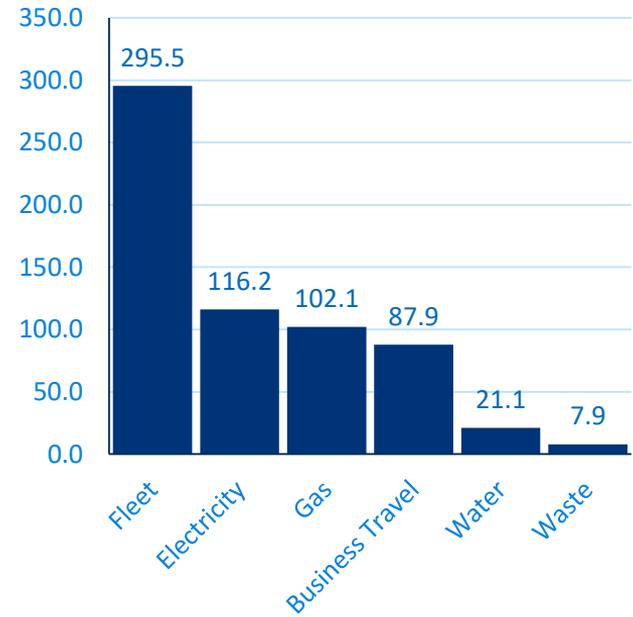
- Scope 3 emissions arising from contracts held by the council sum to 12,466 ktCO<sub>2</sub>e; comprising 20 different contracts.
- **Two contracts account for 65% of all contractual emissions**, these are large contracts for **refuse and waste collection and leisure facilities management**.
- The council is still able to influence contractual emissions, despite being an indirect source. This can be achieved through requiring minimum sustainability/environmental standards when procuring contracts; it is advised that sustainability be a core metric to consider when renewing all contracts.

# Scope 3

## Other sources

- The remaining scope 3 emissions sources combined count towards 4% of all scope 3 emissions. These sources include:
  - Electricity transmission and distribution
  - Water supply and treatment
  - Well to tank (WTT) fuel emissions; this includes the emissions created from the extraction, refining and transport of fossil fuels to the point of use.
  - Business travel, which thus far comprises only road based business travel
  - The removal and disposal of waste directly created by the council's own operations.
- Total annual spend on waste removal equals £54,029. It is cheaper per tonne of waste to dispose of recycling as opposed to sending waste to landfill.

Other Scope 3 Emissions (ktCO<sub>2</sub>e)



# Footprint Summary Table

Source	Scope 1 (tCO <sub>2</sub> e)	Scope 2 (tCO <sub>2</sub> e)	Scope 3 (tCO <sub>2</sub> e)	Total (tCO <sub>2</sub> e)
Electricity	0.0	1363.0	116.2	1479.2
Gas	734.9	0.0	102.1	837.0
Water	0.0	0.0	21.1	21.1
Fleet	1248.4	2.0	295.5	1545.8
Business Travel	0.0	0.0	87.9	87.9
Contracts	0.0	0.0	12466.2	12466.2
Waste	0.0	0.0	7.9	7.9
Renewables	0.0	0.0	0.0	0.0
Leased Buildings	0.0	0.0	1590.2	1590.2
<b>Total</b>	<b>1983.2</b>	<b>1364.9</b>	<b>14687.1</b>	<b>18035.3</b>

# 5

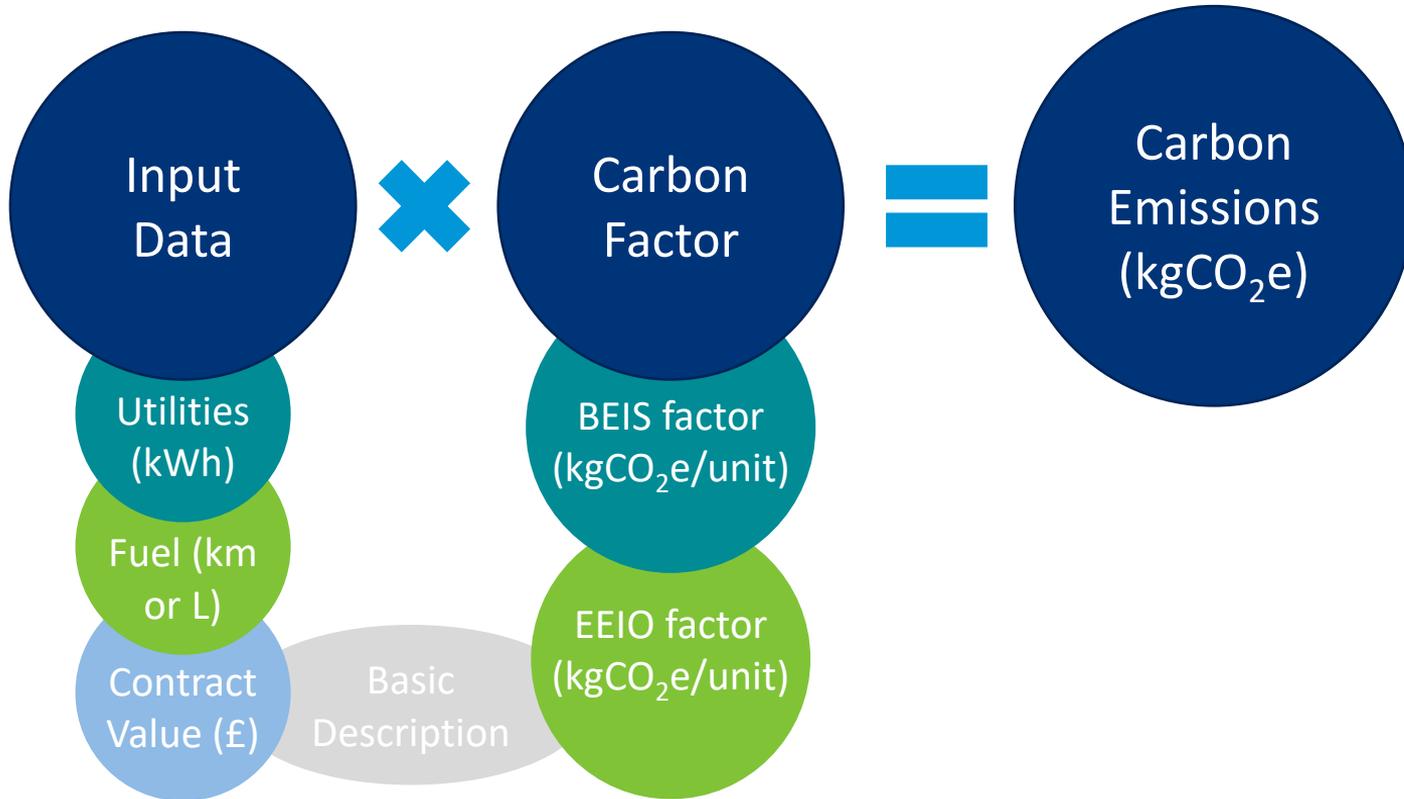
## Methodology

# Methodology

---

- Carbon Trust have structured this Carbon Footprint in alignment with the GHG Protocol, grouping emissions under each scope. The Carbon Footprint has been built up from numerous data sources, of varying detail and quality, with a specific calculation methodology applied to each. In addition Scope 1, 2 and 3, further categorization has been undertaken to aid understanding and analysis of the Carbon Footprint.

# How to Calculate Emissions



- All input data has been sourced by Horsham District Council and been reviewed and cleansed by Carbon Trust where necessary.
- Emission factors have been sourced from BEIS emission factors 2018, these have been used to calculate scope 1 and 2 emissions, as well as upstream scope 3 emissions (including fuel well to tank (WTT); grid transmission and distribution (T&D); water supply and treatment; and business travel.
- Scope 3 emissions arising from contracts have been calculated using EEIO values, a methodology developed by Carbon Trust and the World Resources Institute. These emission factors have been developed as a proxy, using contract values as opposed to activity data.
- Scope 3 emissions arising from leased buildings have been calculated from chartered institute of building service engineers (CIBSE Guide F 2013) benchmarks of energy consumption per floor area (kWh/m<sup>2</sup>/year) for buildings of different uses.

# Assumptions

---

- Assumptions must be made in order to calculate some aspects of the carbon footprint, these are laid out below:
  - Contract emissions are calculated from EEIO values, which are themselves a proxy to calculate emissions based on contract value. EEIO values are based on different activity categories which are then aligned as accurately as possible to the contract descriptions.
  - Assumptions regarding the final terminal/disposal method of the council's own waste were made.
  - Leased buildings have had their descriptions matched to a CIBSE building category, there are assumptions here that all leased buildings align with the 'typical' UK building of that category.
  - Water consumption has been extrapolated to a full year's worth of data, where data was missing.

## Drawbacks

---

- The primary drawbacks of using EEIO values and CIBSE benchmarks as assumptions is that they are fixed proxies.
- This means that although they are incredibly useful in being able to produce estimated values for scope 3 emissions, they will not reflect any actual changes that an organisation makes to reduce these emissions sources.

# 6

## Next Steps

# Monitoring and Reporting

---

- One of the most fundamental follow-on activities for an organisation that has completed a carbon footprint is monitoring and reporting.
- It is integral that an organisation aims to complete a carbon footprint at regular intervals in order to demonstrate progress in carbon reduction.
- As an organisation becomes increasingly familiar with the process required to complete a carbon footprint, and is able to instil a strong data collection framework, they can begin to look to expand their footprint to cover all emission sources and revisit existing sources to make them more accurate and less reliant on proxies.
- This also acts as a method to verify and validate previous footprints.

# Enhanced Scope 3 Footprinting

---

- As mentioned previously, Horsham District Council can aim to enhance their scope 3 footprint by moving away from proxy values (EEIO and benchmarks) to real, more precise data.
- Emission factors can be developed by doing a detailed scope 1 and 2 footprint of individual contractors, suppliers, and leased buildings. This creates an inventory of supply chain emissions, which can be updated at regular intervals.
- Furthermore, HDC could look to develop appropriate metrics for measuring the performance of key suppliers. By analysing the model and the results, it is likely that different metrics will be relevant for different Economic Sectors and/or key suppliers.
- For example, the performance metric for the waste collection and treatment sector should be kg CO<sub>2</sub>e/tonne of waste collected and treated, whereas the metric for passenger transport could be kg CO<sub>2</sub>e/km of service delivered, or passengers served. For construction, it could be kg CO<sub>2</sub>e/km of road laid or m<sup>2</sup> of building completed. For all suppliers however, there will always be the fall-back option of measuring kg CO<sub>2</sub>e/£ spent.

- Once a carbon footprint has been calculated, it can be used as a baseline to derive a target for emissions reduction that is in line with what science says is needed to limit warming to 1.5°C or well below 2°C. A science based target will still aim to reach a net zero target, the science tells us when this needs to be achieved for the planet as a whole and for certain sectors.
- Setting such a target shows that an organisation is not only ambitious in its plans for reducing carbon, but acknowledges its role within a global framework.
- Two methods can be used to calculate a science based target:
- **Sectoral decarbonisation approach (SDA)** is based on a “below 2°C scenario”
  - Aims to provide organisations with a sector-specific and research-backed method to set their emissions goals.
  - *Drawback* - SDA currently doesn't allow a calculation of a 1.5°C pathway
  - *Benefit* – Allows for organisations who have made strong progress so far to reduce emissions at a lower rate.
- **Absolute contraction (AC)** methodology requires organisation's to reduce their own emissions by the same percentage of absolute emission reductions as required for a given scenario (2°C or 1.5°C).
  - *Benefit* - AC does allow a calculation of a 1.5°C pathway
  - *Drawback* – All organisations must reduce emissions at the same rate, regardless of how much progress they have made so far.

# Carbon Reduction Strategy

---

- Once a target has been set, a detailed strategy should be produced that demonstrates how to reach the target.
- A strategy must be relevant to the organisation, and reflect current and future ambitions and projects.
- As part of a strategy, it is possible to determine the ease of reaching a science based target, or carbon neutral target; thereby also determining the likely level of offsetting the council must carry out too.
- Carbon Trust would be pleased to discuss the development of a bespoke strategy with Horsham based on the footprint work and potential science based targeting analysis.



Whilst reasonable steps have been taken to ensure that the information contained within this publication is correct, the authors, the Carbon Trust, its agents, contractors and sub-contractors give no warranty and make no representation as to its accuracy and accept no liability for any errors or omissions. All trademarks, service marks and logos in this publication, and copyright in it, are the property of the Carbon Trust (or its licensors). Nothing in this publication shall be construed as granting any licence or right to use or reproduce any of the trademarks, services marks, logos, copyright or any proprietary information in any way without the Carbon Trust's prior written permission. The Carbon Trust enforces infringements of its intellectual property rights to the full extent permitted by law. The Carbon Trust is a company limited by guarantee and registered in England and Wales under company number 4190230 with its registered office at 4th Floor Dorset House, Stamford Street, London SE1 9NT. Published in the UK: 2019. © The Carbon Trust 2019. All rights reserved.