

Cambridge City Council Climate Change Strategy



2021-2026

Contents

Executive Summary	page 3
Introduction	page 8
OBJECTIVE 1 Reducing carbon emissions from City Council buildings, land, vehicles and services	page 22
OBJECTIVE 2 Reducing energy consumption and carbon emissions from homes and buildings in Cambridge	page 31
OBJECTIVE 3 Reducing carbon emissions from transport in Cambridge	page 38
OBJECTIVE 4 Reducing consumption of resources, reducing waste, and increasing recycling in Cambridge	page 42
OBJECTIVE 5 Promoting sustainable food	page 47
OBJECTIVE 6 Supporting Council services, residents and businesses to adapt to the impacts of climate change	page 50
Glossary	page 55
APPENDIX A Potential future reductions in City Council carbon emissions	page 58
APPENDIX B Doughnut Economics model	page 59



Executive Summary

There is clear scientific evidence that our climate is changing as a direct result of human activity, and the impacts of climate change are already being felt across the world. If the current rate of global heating continues, the effects for humanity and biodiversity will be catastrophic, and the window for taking action to limit these effects is reducing rapidly.

The whole world will need to change what it produces and consumes, and how, and Cambridge City Council is conscious of the role it can play in this global effort. The Council is clear that this should be a just transition to a zero carbon world, ensuring that those most vulnerable and at risk from climate change are engaged and supported.

Climate change has been a key priority for the Council for at least fifteen years, since signing the Nottingham Declaration on Climate Change in 2006, and over this period we have delivered a wide range of projects and activities to help reduce carbon emissions. This strategy sets out the Council's revised and updated approach for the Council's work over the next 5 years to help mitigate climate change and build local resilience in Cambridge to the impacts of climate change.

We have taken a thorough, evidence-based approach to this revised strategy, building on national research and data, and commissioning our own studies and modelling on low carbon homes and buildings and wider issues such as water, biodiversity and trees.



Electric refuse collection vehicle

Leading local action on climate change

The Council is keen to play a community leadership role on climate change issues including through taking action to reduce our own emissions, which is where we have the greatest degree of control and impact. Over the past 6 years (from 2014/15 – 2019/20), emissions from our corporate buildings, fleet and business travel reduced by **28.9%**.

This reduction was partly achieved by greening of the national grid, and partly through the Council investing over £1.4m in 66 carbon reduction projects, including significantly reducing electricity usage through solar PV panels and LED lighting at 10 key buildings, and starting to electrify our vehicle fleet. The Council is one of the first in the UK to purchase an electric refuse collection vehicle, and we have introduced 12 electric vans to our fleet so far.

In this strategy we set an ambitious target to reduce the Council's direct carbon emissions from our corporate buildings (including swimming pools, office buildings, car parks, sheltered housing schemes, community centres, arts venues and the crematorium) our fleet vehicles (including vans, trucks and refuse vehicles), and business travel to **net zero carbon emissions by 2030**. Some parts of the Carbon Management Plan to achieve this are costed and funded – others will need development and exploration in coming years.

The Council can also provide community leadership by reducing carbon emissions from procured good and services, from property it owns (including Council homes and commercial properties), and by using its policy and regulatory powers (such as planning policy, building control and licensing) to promote high standards.

While the Council can show community leadership by taking action in the areas where it has greatest control or influence, our direct carbon emissions account for just **1.1%** of the total in Cambridge. The actions and choices of residents, businesses and institutions in Cambridge – in relation to energy use in homes and buildings, transport, food and



waste make the greatest contribution to carbon emissions in the city. These choices are made within the context of national and international governmental policies and private sector business models. A collective effort will therefore be needed by everyone in the city and beyond if we are to reach net zero carbon.

Over the next 5 years, we will focus on encouraging more residents to make more choices and decisions with low carbon impacts through increased engagement and communication activities, and cooperating and collaborating with communities, businesses and institutions in Cambridge to develop shared solutions to climate change.

While carbon emissions from Cambridge are reducing steadily (by 33% from 2005-2018), they need to reduce much more rapidly if the city is to make its contribution to limiting global temperature increases and averting the worst effects of climate change. In this strategy we share:

a vision for Cambridge to be net zero carbon by 2030, subject to Government, industry and regulators implementing the necessary changes to enable the city and the rest of the UK to achieve this

This vision recognises that it will be extremely challenging for Cambridge as a city to reach net zero carbon without national Government putting in place a much more ambitious policy framework and greater investment to drive the changes needed to reach net zero carbon. As part of this strategy, we will work with others, including the UK100 grouping of local authorities to lobby Government for greater, more co-ordinated and more rapid action. For example:

- Retrofitting private homes in Cambridge to a net zero standard could cost around **£1.75 billion**, but to date Government has only allocated £2 billion funding for the whole UK for the Green Homes Grant.
- Government has announced that all new production cars will have to be electric by 2030, but many cars on the road will still be petrol or diesel long after this, so a much earlier implementation date would be needed if Cambridge (and the UK) were to be able to reach net zero carbon by 2030.

- Government intervention is needed in sectors where a city council like Cambridge's has little or no influence, such as aviation, shipping, agriculture and power generation.

Our strategic approach, and the detailed actions within it, will continue to evolve and develop as more information and opportunities emerge in the coming years, not least from the Cambridgeshire and Peterborough Independent Commission on Climate; Government policies and investments, including those arising from the COP26 inter-governmental conference; the Cambridge-Oxford Arc spatial framework; and our collaboration with local partners such as Cambridge Zero.

Objectives and Action

Through this revised and updated strategy, we have set 6 key objectives, informed by our understanding of our spheres of influence, and a wide range of ambitious actions to help deliver them:

OBJECTIVE 1

Reducing carbon emissions from City Council buildings, land, vehicles and services

Our new Carbon Management Plan 2016-2021 sets out a broad approach to reducing the Council's direct carbon emissions to net zero by 2030, primarily through shifting from gas heating to low carbon heating in our corporate buildings, and a commitment to purchase ultra-low emission vehicles (vans, trucks and refuse collection vehicles) when they are due for replacement (where viable), which could lead to a fully electric Council fleet by 2028.

In January 2021, we secured £1.7m funding from Government for a major scheme to install heat pumps, additional solar PV panels and other energy efficiency funding at Parkside Pools and Abbey Pools, which will reduce carbon emissions from the Council's swimming pools, which are the single biggest source of energy use on our estate, by more than 440 tonnes per year.

We know that some of our buildings will be extremely challenging to decarbonise, particularly where their site, structure and listed building status mean current low-carbon

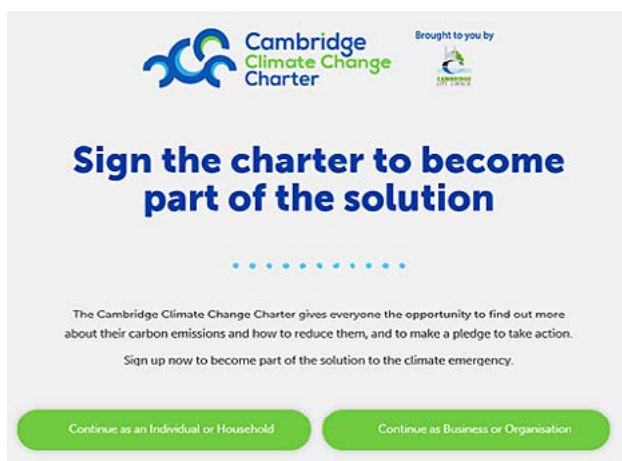


heating solutions may not be viable. We will work to explore more innovative solutions with local partners for those hard-to-treat buildings.

There may be a limit to the decarbonisation that can be achieved, and in this case we will seek to identify credible carbon offsetting or carbon sequestration actions to achieve net zero carbon. The Council has committed to using a percentage of the Council's reserves to invest in innovative "green investments" to facilitate measures to offset climate change.

OBJECTIVE 2

Reducing energy consumption and carbon emissions from homes and buildings in Cambridge



The Cambridge Climate Change Charter

Homes in Cambridge account for around 31% of total carbon emissions from the city¹. Businesses and institutions are responsible for 49% of carbon emissions from the city, primarily from buildings. We will help reduce emissions from homes and buildings by:

- Improving existing Council homes by investing £2.5 million from 2020/21 to 2022/23 to improve the energy efficiency of the lowest-rated Council homes.
- Building 1000 new homes to Passivhaus standards (where technically feasible and subject to funding) and targeting net zero carbon standards for Council homes built from 2030 onwards.

- Bidding for funding to retrofit private homes. In December 2020, we led a successful £2 million Cambridgeshire-wide partnership bid to the Government's new Green Homes Grant Local Authority Delivery (LAD) scheme, which will fund energy efficiency improvements to 278 properties including 66 Cambridge City Council homes.
- Promoting group-buying schemes, such as the Cambridgeshire-wide Solar Together scheme, which enables Cambridge residents to purchase solar PV panels and battery storage at significant discounts.
- Carrying out an innovative net zero carbon study to consider the planning policies and targets that would be needed to achieve net zero carbon new homes and buildings in the new Greater Cambridge Local Plan (subject to the constraints of the national planning policy framework).
- Supporting residents to make well-informed low carbon choices about their home and other emissions, through the Cambridge Climate Change Charter and a broader engagement programme.
- Engaging and encouraging businesses to invest in their buildings through meetings, workshops, communications materials and the Climate Change Charter.

OBJECTIVE 3

Reducing carbon emissions from transport in Cambridge



Electric taxi charging point, Newmarket Road

¹ Department for Business, Energy & Industrial Strategy (BEIS), 2020, UK local authority and regional carbon dioxide emissions national statistics: 2005-2018



Transport accounted for 20% of carbon emissions in Cambridge in 2018.² We will help reduce carbon emissions from transport through:

- Existing regulations requiring all taxis to be Ultra Low Emission Vehicles (ULEVs) or zero emissions vehicles by 2028, which is the earliest date set by any UK Council.
- Completing installation of 18 rapid and 3 fast electric charge points for taxis in Cambridge by 2021, with funding from Government, the Council and the Greater Cambridge Partnership (GCP).
- Installing electric vehicle charging points in Council car parks and property and working with Cambridgeshire County Council to pilot on-street charging for residents.
- Promoting walking, cycling and the use of public transport across a range of settings including schools, colleges, workplaces and communities.
- Acting as a key partner in the GCP, which is implementing a major programme of sustainable transport improvements, including: public transport and active travel corridor schemes, 12 cycling and walking 'greenways', cross-city cycling routes, improved park and ride connections, and investment in zero emission buses.



Sustainable transport in Cambridge

OBJECTIVE 4

Reducing consumption of resources, reducing waste, and increasing recycling in Cambridge

Solid waste disposal accounts for 3.7% of carbon emissions in Cambridge, but this figure is much higher when taking into account the production and transport of goods which are ultimately thrown away. We will help reduce carbon emissions from waste by promoting a more circular economy based around reusing, repairing and recycling materials:

- Rolling out a large-scale trial of separate food waste collections in the north of Cambridge and considering extending this to other areas of the city.



The 'food waste punt'

- Continuing communications campaigns to encourage residents to recycle and reduce contamination, linking these to national campaigns and messaging.
- Encouraging businesses to take up recycling collections and re-use food waste and engaging with companies to reduce packaging and make it more recyclable.
- Supporting local voluntary groups to run community events on repairing and re-using goods and materials.

² Department for Business, Energy & Industrial Strategy (BEIS), 2020, UK local authority and regional carbon dioxide emissions national statistics: 2005-2018



OBJECTIVE 5**Promoting sustainable food**

The food system as a whole accounts for between 21% and 37% of total global greenhouse gas emissions.³ As part of its community leadership role, the Council aims to work to promote sustainable food in Cambridge. We will take a range of action including:

- Supporting the efforts of the Cambridge Sustainable Food Network to secure Sliver Award status for the city from the national Sustainable Food Cities Network.
- Continue to fund local voluntary and community groups to deliver community events and activities to promote sustainable food to local communities and businesses.
- Maintain existing occupancy rates of allotments and community gardens, support meanwhile growing spaces and use planning policies to secure additional food growing spaces in new developments.
- Working in partnership with local voluntary and community groups to address food poverty, including working with Cambridge Food Poverty Alliance and Cambridge Sustainable Food to develop a food re-distribution hub.

OBJECTIVE 6**Supporting Council services, residents and businesses to adapt to the impacts of climate change**

The Council has an important role to play in building the resilience of communities and businesses to the predicted local impacts of climate change, including water shortages, overheating and flooding. We will take a range of actions, including:

- Implementing existing Local Plan policies on water efficiency, sustainable drainage

systems (SuDS), and permeable paving and surfaces, and developing policies in the new Greater Cambridge Local Plan to manage water-supply and flood risks and address potential overheating in new developments.

- Measures to increase water efficiency (including the potential use of communal rainwater harvesting/reuse schemes) and reduce overheating in new Council homes.
- Developing an Environmental Management System for the Environmental Services activity including reducing water consumption on open spaces and public toilets.
- Increasing the number of trees in Cambridge through tree planting activities, including a major tree canopy project.
- Commissioning a biodiversity audit and developing a new Biodiversity Strategy to increase biodiversity at Local Nature reserves, Council land and private landholdings.
- Making improvements to local watercourse habitats as part of the Greater Cambridge Chalk Stream project.

In addition to these committed actions, we will continue to explore new, more complex and ambitious approaches to monitoring, understanding and reducing emissions and adapting to change, including potentially data-led and AI projects and models such as “doughnut economics”.

Most importantly, it is clear that Cambridge City Council cannot realise our vision on our own – all businesses, organisations and households will need to play their part – and we are keen to work co-operatively, collaboratively and in partnership with all those who share our ambition for practical joint action to deliver tangible benefit, and to lobby collectively for change from national and regional governments and businesses.

³ IPCC, 2019, Summary for Policymakers. In: Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems



Introduction

Evidence of climate change

The scientific evidence that the Earth's climate is changing as a direct result of human activity is clear and incontrovertible. Average global temperatures reached 1 degree above pre-industrial (1850) levels for the first time in 2015. Temperatures have been rising most rapidly since the millennium, with the UN's World Meteorological Office (WMO) identifying that 20 of the hottest years on record occurred during the past 22 years¹. The Met Office has reported that the 10 hottest years in the UK since 1894 have all occurred since 2002².

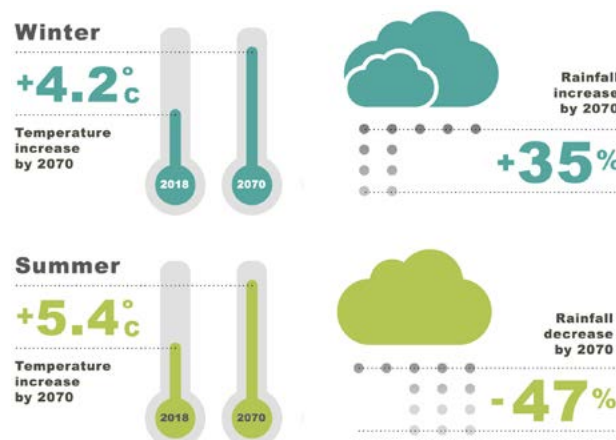
If the current rate of global heating continues, the effects for humanity and biodiversity will be catastrophic, and the window for taking action to limit these effects is reducing. At the twenty first session of the Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) in 2015 in Paris, national governments committed to limit global temperature increases to well below 2°C above pre-industrial levels, and to pursue efforts to limit increase to 1.5°C³. To achieve this, parties to the agreement agreed to reach net zero global emissions of greenhouse gases in the second half of this century.

With policies currently put in place by national governments, it is projected that temperatures will reach about 3.0°C above pre-industrial levels by 2100⁴. In June 2019, the UK Government amended the 2008 Climate Change Act to include a commitment to a 100% reduction in greenhouse gas emissions by 2050.

The impacts of climate change

At a global level, projected global temperature increases over the next 80 years would lead to mass species extinctions, food and water insecurity, further increases in extreme weather events, flooding of coastal cities as a

result of sea levels rising, and health impacts such as increasing prevalence of malaria.



The effects of climate change by 2070

The effects of climate change are already being felt in Cambridge. For example, Cambridge experienced the highest temperature ever recorded in the UK of 38.7°C during the July 2019 heatwave. The three most likely effects of climate change for Cambridge include⁵: increases in flood events; water shortages and droughts; and increased summer temperatures. The likely impacts of these changes include decreases in human and non-human health and wellbeing, damage to built and green infrastructure, and increased demand and costs for public services. These all create an imperative for action on the part of all those who have agency over energy consumption production and distribution, carbon emissions and mitigation and adaptation interventions.

Opportunities

While climate change presents very significant challenges, there are a number of opportunities to respond with greater impact created by recent developments:

- Building on an increased **public awareness and acceptance that climate change is**

¹ www.telegraph.co.uk/news/2019/02/06/last-four-years-have-hottest-record-un-says/

² www.itv.com/news/2019-07-31/uks-10-hottest-years-on-record-have-occurred-since-2002-met-office

³ UNFCCC, 2015, Paris Agreement, Article 2, p2

⁴ UK Climate Change Committee. 2019, Net Zero: The UK's contribution to stopping global warming p13

⁵ Climate UK, A Summary of Climate Change Risks for East England: to coincide with the publication of the UK Climate Change Risk Assessment (CCRA), 2012



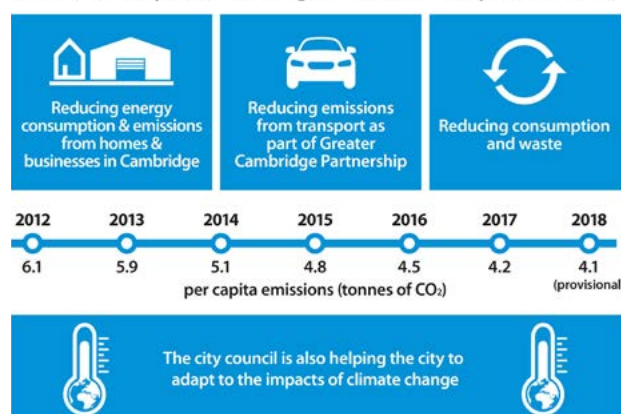
occurring, and that change is needed to reduce carbon emissions. For example, a survey in October 2019 found that almost two-thirds of people agreed that the climate emergency was the biggest issue facing humankind, with only 7% disagreeing⁶. The twenty-sixth session of the Conference of the Parties (COP26) to the United Nations Framework Convention on Climate Change (UNFCCC) in Glasgow in 2021 is likely to further raise public awareness and influence national policy on climate change.

- Building on increased **public awareness of the effects of climate change** and the need to adapt to them. For example, in the context of both the climate emergency and Covid-19, the health and wellbeing benefits of trees, green space and other green infrastructure received high levels of public interest and support.
- Sustaining the low-carbon **impacts of changes in behaviour during the Covid-19 lockdown**. As the recovery from Covid-19 begins, there is potentially an opportunity to build on and sustain impacts such as reduced emissions from transport, increased home working in some sectors of the economy, and the public health benefits of reduced air pollution.
- Building a **green recovery** from the impacts of Covid-19 and furthering the transition to a low carbon economy. The national Climate Change Committee notes that the pandemic (and measures taken to respond to it) have led to significant job losses, falls in GDP and drops in business investment, both in the UK and globally. This suggests that there is considerable spare capacity in the economy and that investing in a low carbon economy could help support the UK's recovery. For example, the Committee's proposed programme to retrofit buildings alone would require over 200,000 extra full-time workers in that sector.⁷ Cambridge is potentially well placed to play a role in this transition, given the presence of Cleantech businesses and University research expertise and capacity in the city.

- **Falling costs of key low-carbon technologies**, such as the price for electricity generated by offshore wind and the cost of solar PV panels and electric vehicles. These cost reductions are driven by scale manufacturing, investor confidence and 'learning-by-doing' during deployment⁸.
- Increasing **national net zero carbon commitments**. Since the UK Government announced a national target for net zero carbon emissions by 2050, China, the EU, Japan and South Korea have all announced net zero emissions targets for 2050 or soon after (2060 in the case of China). The US also recommitted to the Paris Agreement in January 2021. These commitments should help drive greater climate action, help demonstrate future markets in low-carbon products, and drive down the costs of low-carbon technologies⁹.

Carbon emissions in Cambridge

What is the city council doing to reduce the city's emissions?



As shown in the charts on the next page, the latest available carbon dioxide emissions estimates, produced by BEIS show that total emissions in Cambridge have declined steadily over the last 13 years. As shown in Figure 1, total emissions from Cambridge reduced by a third (33%), from 779.7 ktCO₂ in 2005 to 521.5 ktCO₂ in 2018.

⁶ Guardian, 2019, 'Climate Crisis affects how majority will vote in UK election – poll' www.theguardian.com/environment/2019/oct/30/climate-crisis-affects-how-majority-will-vote-in-uk-election-poll

⁷ UK Climate Change Committee, 2020, The Sixth Carbon Budget: the UK's path to Net Zero, p23 www.theccc.org.uk/publication/sixth-carbon-budget/

⁸ UK Climate Change Committee, 2020, The Sixth Carbon Budget: the UK's path to Net Zero, p20

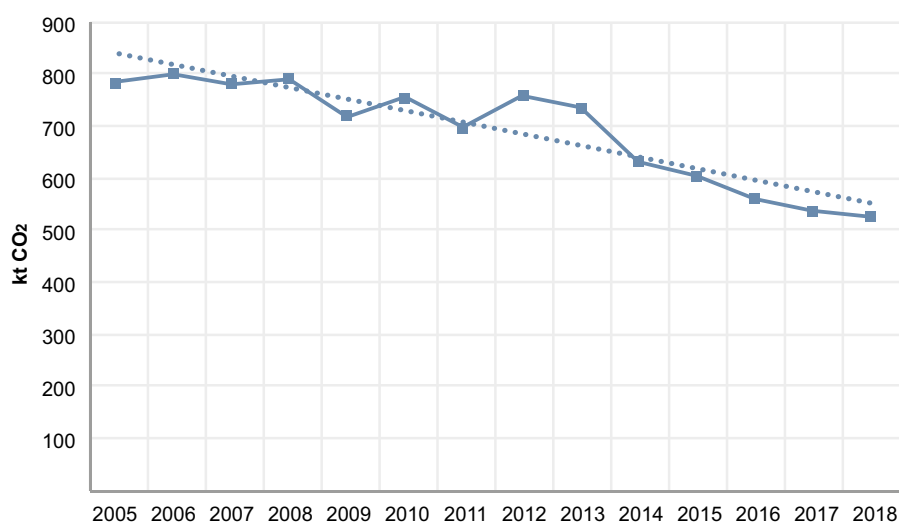
⁹ UK Climate Change Committee, 2020, The Sixth Carbon Budget: the UK's path to Net Zero, p20



Figure 1: Total Carbon Emissions in Cambridge 2005-2018 (ktCO₂)

Source: Department for Business, Energy and Industrial Strategy (BEIS), 2020, UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2018¹

¹ www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2018



As shown in Figure 2 below, per capita emissions have reduced by 38% over the same period in Cambridge, from 6.6 ktCO₂ to 4.1 ktCO₂. The chart uses population estimates for Cambridge produced by Cambridgeshire County Council¹⁰, which take account of population growth in the city as a result of new housing development, rather than estimates by the Office for National Statistics, which do not.

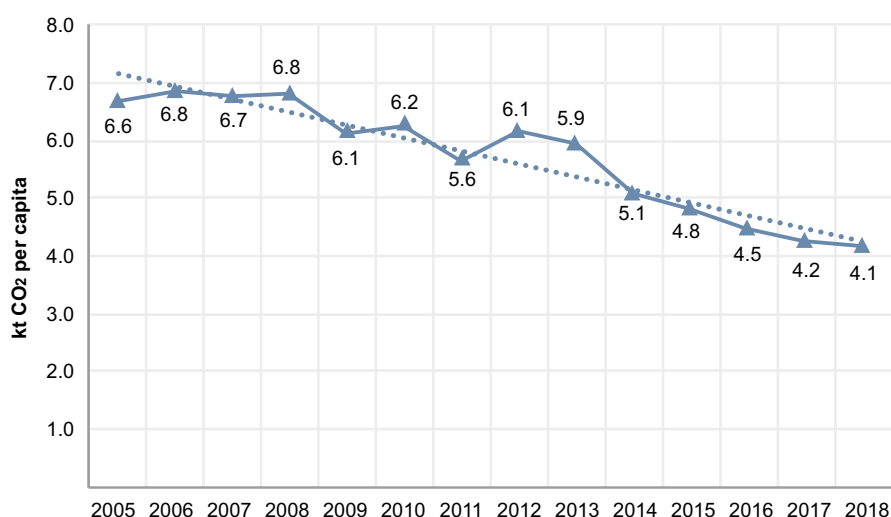
It should be noted that, while the Council, residents and partners in the city have taken a

range of action over this period, the reduction in emissions from Cambridge (and other cities) in more recent years has been driven primarily by reduced use of coal in electricity generation and the increased use of renewable energy generation at a national level. By 2019, 48.5% of electricity in the national grid was generated from zero carbon sources (wind, solar, hydro and nuclear)¹¹, and this share is likely to increase further given planned investments in North Sea off-shore wind and the Government's commitment to turn off all UK coal fired power stations by 2024.

Figure 2: Per Capita Carbon Emissions in Cambridge 2005-2018 (ktCO₂)

Source: Department for Business, Energy and Industrial Strategy (BEIS), 2020, UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2018¹

¹ www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2018



¹⁰ Cambridgeshire County Council population estimates for Cambridge can found here:

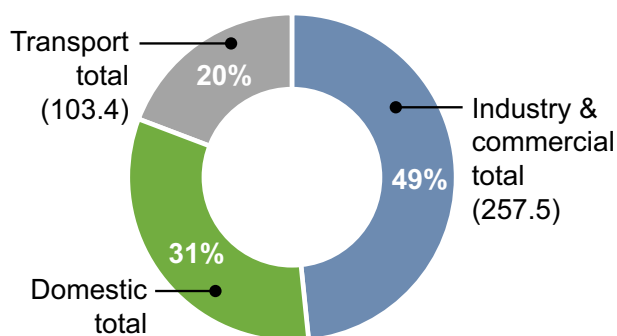
cambridgeshireinsight.org.uk/population/population-forecasts/?geographyId=3f57b11095784e27969369a52f7854ef&featureId=E05002702

¹¹ news.sky.com/story/more-power-came-from-renewable-energy-than-fossil-fuels-in-uk-in-2019-11898806



Sources of carbon emissions in Cambridge

Figure 3: Sources of Carbon Emissions in Cambridge in 2018 (ktCO₂) – BEIS data



Source: Department for Business, Energy and Industrial Strategy (BEIS), 2020, UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2018¹²

As shown by Figure 3 above, the carbon emissions estimates produced by BEIS suggest that the three main sources of emissions in 2018 in Cambridge were:

- **49%** - energy consumption from **industrial and commercial** properties (including businesses, the two universities and public sector bodies such as councils, health and other education bodies).
- **31%** - **domestic** sources (primarily heating, lighting and appliances in homes).

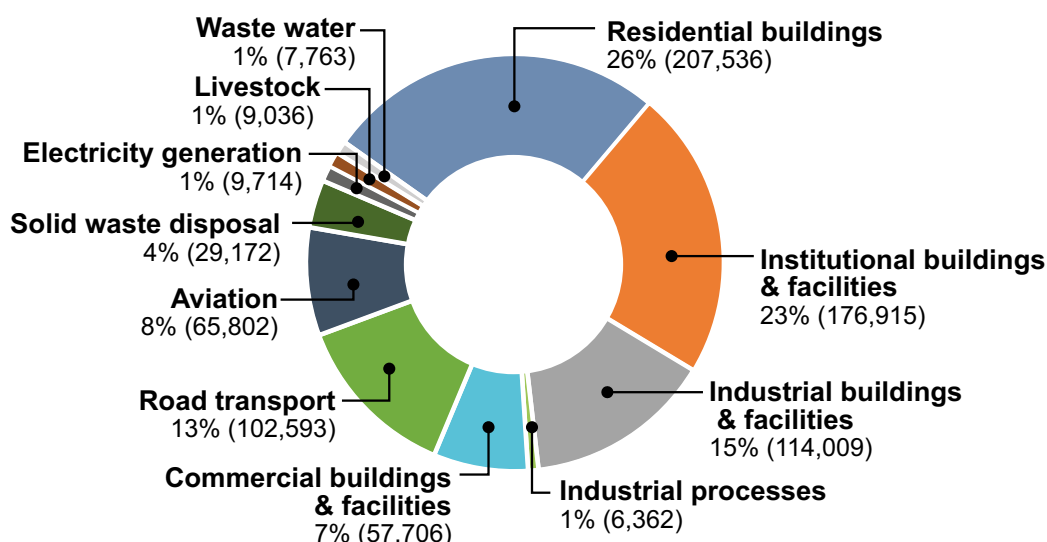
- **20%** - emissions from **transport** (including cars and other private vehicles, goods traffic and public transport).

We have also used the SCATTER¹³ tool to provide a more detailed breakdown of emissions by different subsectors in Cambridge. The data is slightly different to the BEIS data presented above, because it includes emissions from subsectors such as aviation, waste disposal, electricity generation. The SCATTER inventory shows that the biggest contributors to carbon emissions from the industrial and commercial sector are:

- **23%** - Institutional buildings, including the Universities, Colleges, hospitals, local authorities, museums, and other public organisations.
- **16%** - Industrial buildings facilities and processes
- **7%** - Commercial buildings and facilities

The independent national Climate Change Committee advises national Government on targets and delivery, and measures progress towards net zero. The Committee suggests that, with recent UK carbon emissions reductions coming primarily from the transition away from coal-fired power to renewable energy sources, future UK reductions must come from buildings, industry, transport, agriculture and phasing out gas-fired power.¹⁴

Figure 4 – Sources of carbon emissions by subsector in Cambridge (kt CO₂e)



Source: SCATTER carbon emissions inventory for Cambridge, 2017

¹² www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2018

¹³ SCATTER was developed by BEIS, Nottingham City Council, the Greater Manchester Combined Authority and the Tyndall Centre for Climate Research at the University of Manchester and Anthesis Group. It generates a local greenhouse gas emissions inventory following the Global Protocol for City-wide Greenhouse Gas emissions. For more information see: <https://scattercities.com/>

¹⁴ UK Climate Change Committee, 2020, The Sixth Carbon Budget: the UK's path to Net Zero, p14



This Cambridge City Council Climate Change Strategy focusses on reducing carbon emissions from the key sources of emissions in the city, including homes, institutional buildings, industrial and commercial buildings, transport, and waste disposal.

Net zero carbon vision for Cambridge

While carbon emissions from Cambridge have reduced steadily in recent years, we recognise they will need to reduce much more rapidly in future years to help avert the worst impacts of climate change, and in the context of planned future growth of the city. It is clear that the climate emergency requires action now to reduce global emissions.

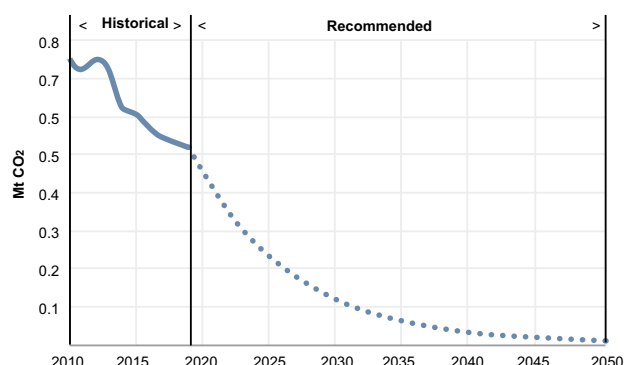
In agreeing its previous Climate Change Strategy in March 2016, the Council set an aspiration for the city of Cambridge to achieve net zero carbon status by 2050. This timescale is consistent with:

- the United Nations' Intergovernmental Panel on Climate Change (IPCC) special report in 2018, which found that in order to limit global temperature increases to 1.5°C "global net human-caused emissions of carbon dioxide (CO₂) would need to fall by 45% from 2010 levels by 2030, reaching 'net zero' around 2050."¹⁵
- the revised, legally-binding target for the UK to be net zero carbon by 2050 announced by the Government in June 2019. The current national target was informed by the recommendations of the UK's independent Climate Change Committee, which found that 2050 was the most credible date for achieving net zero carbon emissions across the whole of the UK economy¹⁶. In its sixth carbon budget report, the Climate Change Committee recommended that, in order to achieve net zero carbon by 2050, the UK reduce its carbon emissions by 68% by 2030 and 78% by 2035 (from 1990 levels)¹⁷.

As part of the development of this new Climate

Change Strategy, we have considered the latest evidence on whether the Council's net zero carbon aspiration should be revised.

Figure 5 – CO₂ reductions pathway in Cambridge proposed by the Tyndall Centre



Source: Tyndall Centre, 2021, *Setting Climate Commitments for Cambridge*

Researchers at the University of Manchester's Tyndall Centre for Climate Change Research have calculated a carbon budget and a net zero carbon target for Cambridge¹⁸. The budget and target are based on Cambridge making a "fair" contribution to achieving the Commitments in the Paris Climate Change Agreement to limit global temperature increases to well below 2°C above pre-industrial levels, and to pursue efforts to limit increase to 1.5°C¹⁹. The Tyndall Centre identifies that Cambridge would need to reach **zero or near zero carbon emissions** no later than 2043 (Figure 5 shows a 95% reduction by this date). It notes that this reduction would require national and local action.

As part of the public consultation on this strategy, we sought residents' views on their net zero carbon aspirations for the city. 77% of the 242 respondents to the public consultation survey felt that Cambridge should aim to be net zero carbon by 2030.

Whilst this is likely to be extremely challenging (and would require a very significant step change in Government policy, investment and regulation), it is consistent with the council's ambition as expressed in the February 2019

¹⁵ See: www.un.org/en/sections/issues-depth/climate-change/

¹⁶ UK Climate Change Committee, 2019, Net Zero: The UK's contribution to stopping global warming

¹⁷ UK Climate Change Committee, 2020, the Sixth Carbon Budget: the UK's path to Net Zero, p13
www.theccc.org.uk/publication/sixth-carbon-budget/

¹⁸ Kuriakose, Jones, Anderson, Broderick & McLachlan, 2021, Setting Climate Commitments for Cambridge
carbonbudget.manchester.ac.uk/reports/E07000008/print/

¹⁹ UNFCC, 2015, Paris Agreement, Article 2, p2



declaration of a Climate Emergency, in which the Council adopted a motion calling on Government, industry and regulators to implement the necessary changes to enable Cambridge and the rest of the UK to reach net zero carbon by 2030.

To show community leadership, in this revised Strategy we are:

- **Setting a target to reduce the Council's direct carbon emissions (from our corporate buildings, our vehicles and business travel) to net zero by 2030.**²⁰

We are also:

- **Sharing vision for Cambridge to be net zero carbon by 2030, subject to Government, industry and regulators implementing the necessary changes to enable the city and the rest of the UK to achieve this.**²¹

While the Council will play a community leadership role, and can use its policies and regulatory powers to influence emissions in specific sectors, this vision recognises that achieving net zero in Cambridge will require:

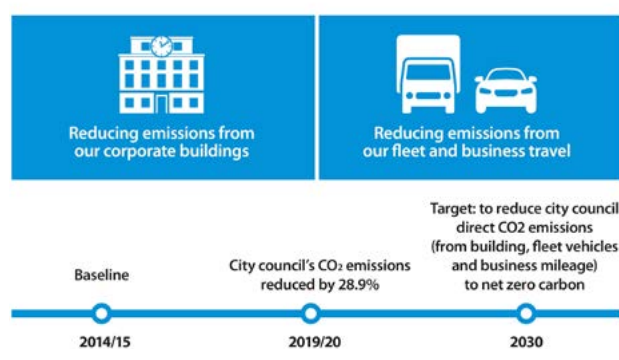
- businesses, institutions and individuals in the city to make radical changes and make hard choices about how they do business and how they live their lives.
- national Government to adopt much more ambitious and coordinated policies on climate change making much greater use of its regulatory and market-shaping powers and provide much greater investment in low carbon solutions.

Pathway to net zero carbon for the Council's direct emissions

We are taking an evidence-based approach to identify a potential pathway to net zero carbon, both for the Council's direct carbon emissions and for carbon emissions from the city of Cambridge.

What is the city council doing to reduce its own emissions?

The council's Climate Change Strategy 2021-26 target is to reduce its direct carbon emissions from our corporate buildings, fleet and business travel to net zero carbon emissions by 2030.



With regard to the Council's direct carbon emissions (from our corporate buildings and our vehicles), we:

- have carried out a review of our fleet vehicles and committed to procure Ultra Low Emission Vehicles (ULEV) when replacing vans and trucks in the Council's fleet (where there is a suitable ULEV alternative and the infrastructure allows).
- will seek to replace all Refuse Collection Vehicles (RCVs) with low carbon alternatives (electric or hydrogen) at the point when they are due for replacement.



Electric recycling collection vehicle

- have commissioned Bouygues Energies & Services to carry out a high-level study to establish what types of carbon reduction measures would be needed to reduce the Council's direct carbon emissions to net zero carbon, and what level of capital investment would be required. The study focused on the 29 biggest buildings in the Council's estate, which are responsible for 83.6% of

²⁰ Our corporate buildings are ones which the Council owns and is responsible for the energy usage, including swimming pools, office buildings, car parks, sheltered housing schemes, community centres, the Corn Exchange and the crematorium. The target does not include buildings which the Council owns but where tenants are responsible for the energy usage, such as Council homes and commercial properties. See Objective 1 for further information on the Council's direct carbon emissions and our plans to reduce them to net zero

²¹ This vision is consistent with the Council's declaration of a climate emergency in February 2019



total emissions from Council buildings and 63% of the Council's total carbon emissions (including emissions from fleet vehicles and business mileage).

The commitments above could lead to a fully electric Council van and truck fleet by 2028, and a fully electric or hydrogen fleet of Greater Cambridge Shared Waste Service of RCVs by 2028. This would address the vast majority of direct carbon emissions from the Council's vehicle fleet, which accounted for 23% of the Council's total direct carbon emissions in 2019/20. There may be some residual carbon emissions from specific types of vehicles (such as ride-on lawn mowers) where there are currently no alternatives to diesel engines available in the market.

The Bouygues high-level study found that it would be possible for the Council to reduce its direct emissions from its 29 largest buildings by 69% by 2030 and 87% by 2050, primarily through major capital investment in low carbon heating measures (such as Ground Source and Air Source Heat Pumps) where feasible, with additional LEDs, solar PV, BEMS and other measures at some sites. The focus on heat pumps would help switch energy consumption from gas (which generates high levels of carbon emissions) to electricity (which will progressively be decarbonised at a national level through renewable energy).

The chart at Appendix A provides an indicative illustration of what the impact on the Council's carbon emissions could be, if we were able to implement all the potential carbon reduction measures identified by Bouygues, and assuming that these have the impact suggested by the modelling in the high-level study. The chart also provides an indication of how these reductions could compare with the carbon emissions pathway proposed by the Tyndall Centre above.

The Bouygues study suggests that, while the majority of the Council's current carbon emissions can be removed, it will be challenging to reach absolute zero carbon emissions across all the buildings in the scope of the study. This is primarily because the site, structure and listed status of some buildings (the Guildhall and Corn Exchange) mean that low-carbon heating solutions are not currently viable at these buildings, and there

is likely to be residual gas consumption at the crematorium from the existing gas-powered cremators until viable, low carbon alternatives become available in the market

We will actively pursue all feasible opportunities to decarbonise our buildings over the next 10 years and have set out a range of planned projects for the next 5 years in the Council's new Carbon Management Plan. However, once carbon emissions have been reduced as far as possible within the constraints of existing buildings, it is likely that the remaining carbon emissions from buildings identified through the Bouygues study will need to be addressed through credible carbon offsetting or carbon sequestration measures in order for the Council to reach net zero carbon by 2030.

There are a range of potential carbon off-setting approaches, which we will explore in more detail as part of the implementation of the new Climate Change Strategy. In the Budget Setting Report for 2021/22, the Council committed to using a percentage of the Council's reserves to invest in innovative "green investments" to facilitate measures to offset climate change. The Council will announce the percentage during the course of the coming financial year when we have greater certainty as to our future financial position post Covid.

Developing a pathway to net zero carbon for city-wide emissions

To help develop a pathway to net zero carbon for wider emissions from Cambridge, the Council has also commissioned a number of studies looking at how we can achieve zero carbon homes in Cambridge:

- **Existing Council homes** – we have commissioned an external consultancy to carry out a study to establish how existing Council homes could be retrofitted to meet three different carbon emissions standards (Local Plan Plus, Passivhaus, and net zero carbon).
- **New Council homes** – we commissioned Buro Happold to assess the implications of building new Council homes to different



carbon emissions standards. Based on this work, the Council has agreed to target the Passivhaus standard for new Council homes built from 2021 onwards where feasible and viable, and to target net zero carbon homes standards for new Council homes built from 2030 onwards.

- **Existing homes and buildings** - we will shortly be commissioning a study to identify what energy efficiency and renewable energy measures would need to be retrofitted to different types of private homes in Cambridge to reach different carbon emissions standards.
- **New homes and buildings** – as part of the development of the new Greater Cambridge Local Plan, the Greater Cambridge Shared Planning Service has commissioned Bioregional and Etude to carry out a net zero carbon study, which is considering the planning policies that would be needed to achieve net zero carbon new homes and buildings (subject to the constraints of the national planning policy framework). The first element of this study was completed in November 2020²².

We have also used the ClimateView system²³ to help identify the broad changes that would be needed in Cambridge in different subsectors of carbon emissions (e.g. housing, transport, industry and waste) if the city is to reach net zero carbon. In this strategy we have referred to ClimateView data for Cambridge, to illustrate how different interventions by the Council and other stakeholders relating to housing, transport and waste could help the city to reach net zero carbon emissions.

Unlike the BEIS carbon emissions data referred to above, which uses national data on carbon emissions and disaggregates this to provide an estimate of local carbon emissions, ClimateView provides a “bottom-up” approach. It takes local data on housing, transport and waste, and uses this to model the potential impact of different interventions (e.g. heating homes using renewable energy sources, shifting journeys from cars to cycling, walking and public transport etc) on total direct carbon emissions

from the city. Where local data is not currently available, ClimateView uses assumptions based on data from comparable cities.

Carbon budgets for Cambridge

The Tyndall Centre identifies that Cambridge would need to:

- Stay within a maximum cumulative **carbon budget** of 3.6 million tonnes of carbon dioxide (MtCO₂) from energy only for the period of 2020 to 2100. Limiting total carbon emissions in this period to this amount would enable Cambridge to achieve its share of the carbon budgets needed to deliver the commitments of the Paris agreement²⁴. If emissions from Cambridge continue at 2017 levels, this budget would be reached by 2027.
- Stay with a maximum cumulative **carbon budget** of 4.6 million tonnes of carbon dioxide (MtCO₂) from energy only for the period of 2018 to 2100. Limiting total carbon emissions in this period to this amount would enable Cambridge to achieve its share of the current national carbon budgets set by the Climate Change Act. 4.2 MtCO₂ of this budget would be for the period from 2018 to 2032, during which time carbon emissions would need to fall rapidly.

This strategy sets out how the Council can provide leadership in relation to reducing carbon emissions from the city of Cambridge. As part of the implementation of this strategy we will work partners to understand the implications of these suggested carbon budgets for the city and identify collaborative actions to reduce carbon emissions from the city.

Cambridge City Council approach to tackling climate change

Climate change has been a key priority for the Council for more than a decade. The Council made a formal commitment to tackling climate

²² Bioregional, 2020, Greater Cambridge Local Plan - Strategic spatial options appraisal: implications for carbon emissions www.greatercambridgeplanning.org/media/1421/gclp-strategic-spatial-options-assessment-implications-for-carbon-emissions-nov2020.pdf

²³ www.climateview.global/

²⁴ Based on a global carbon budget of 900 GtCO₂, taken from the Intergovernmental Panel on Climate Change (IPCC) Special Report



change by signing the Nottingham Declaration on Climate Change in September 2006 and reaffirmed this commitment by signing the LGA's Climate Local Commitment in 2012. In February 2019, the Council declared a Climate Emergency.

The Council has produced three Climate Change Strategies to date, covering the periods from 2008-2012, 2012-2016 and 2016-2021. These strategies set out the Council's strategic approach to reducing its own carbon footprint, and supporting residents, businesses and organisations in the city to reduce their emissions.

We recognise the scale and urgency of the challenge. Achieving net zero carbon will require a step change in the Council's approach, but it will also require much greater investment and regulation by Government, action by businesses across all sectors and significant behaviour change by residents.

Community leadership and our spheres of influence

It is important that the Council's new Climate Change Strategy shows ambition and leadership, whilst recognising its sphere of influence and the role that other organisations and individuals need to play. The Council itself is only directly responsible for **1.1%** of carbon emissions in Cambridge, so we will need to work with central Government, other tiers of local government, businesses, organisations and residents to reduce city-wide carbon emissions, including in the context of the Cambridgeshire & Peterborough Independent Commission on Climate's reports and the UK Government's work in preparation for the COP26 inter-governmental conference in December 2021.

The diagram on the next page (see Figure 6) illustrates the levels of influence that the Council has over different factors that impact on climate change. Given the varying degrees of influence highlighted in Figure 6, the Council can provide community leadership on climate change mitigation and adaptation issues in a number of different ways. These include:

1. Direct action – taking action to reduce carbon emissions and adapt to climate change in the areas where it has most

direct control or influence, including the Council's corporate buildings and vehicles, and in criteria for procurement and grant funding.

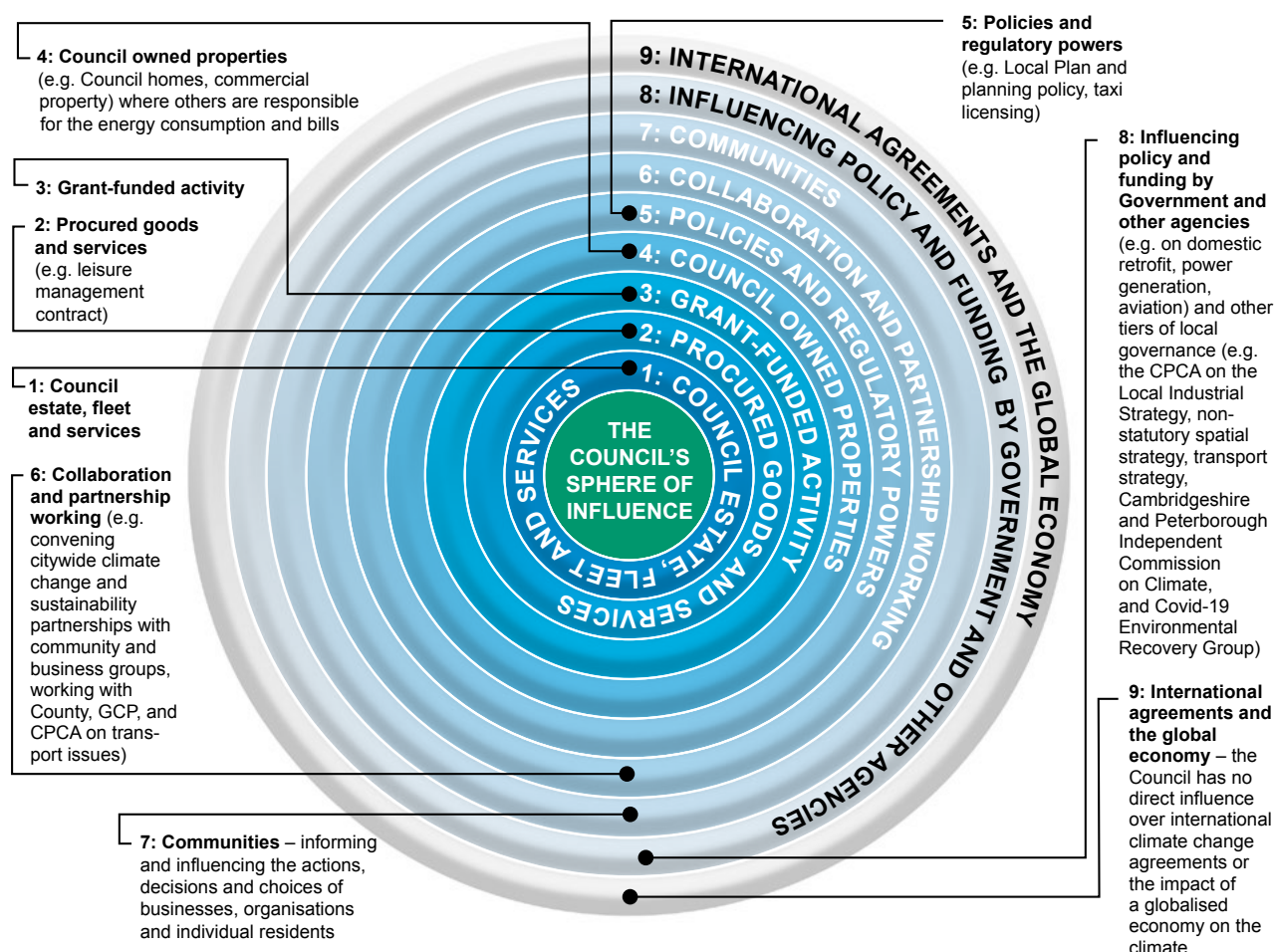
2. Property improvement - making energy efficiency improvements to Council homes and commercial properties, which will help reduce carbon emissions by housing and commercial tenants; and building new council homes to ambitious environmental standards.



New council homes

- 3. Service delivery** – taking action through the services it delivers (including managing Council homes, planning, environmental health, and recycling and waste collection).
- 4. Place-shaping** – using the Council's policy and regulatory powers (including planning policy, licensing, building control, and environmental health regulations) to require particular standards to help reduce emissions and adapt to climate change, as far as national policy and guidance allows.
- 5. Cooperation and collaboration** – working closely with partners in the city, including communities, businesses, voluntary groups and academics.
- 6. Communicating and engaging** – encouraging and support businesses and residents to make choices and take actions to reduce their emissions and adapt to climate change.
- 7. Influencing** – Seeking to influence policy and funding decisions by national Government, the CPCA and GCP, and local partners; and to encourage local partners and groups to join forces in making our case to Government and others.



Figure 6: Cambridge City Council's spheres of influence in relation to climate change

The following chapters of the strategy will set out how the Council will use this approach to address its key objectives on climate change.

Influencing Government Investment and Policy on Climate Change

Reaching net zero carbon in Cambridge and the UK will require the Government to lead a much greater national programme of investment. The independent national Climate Change Committee recommends that low carbon investment by Government, private companies and individuals must scale up to £50 billion each year to deliver Net Zero.²⁵ The largest investment increases are needed for

low-carbon power capacity, retrofit of buildings and batteries and infrastructure for electric vehicles.²⁶ While this requires up-front capital investment, the Committee suggests that more efficient, low carbon technologies will ultimately generate significant fuel savings, which in time will cancel out the investment costs entirely²⁷.

There is also a need for national Government to put in place a much more ambitious policy framework to drive the changes needed to reach net zero carbon. The UK Climate Change Committee states that a net-zero carbon target “is not credible unless policy is ramped up significantly”²⁸ and recommends that Government policy “must provide a clear direction to millions of people and businesses in the UK, shifting incentives to favour low-carbon options and tackling barriers to

²⁵ UK Climate Change Committee, 2020, the Sixth Carbon Budget: the UK's path to Net Zero, p13

²⁶ UK Climate Change Committee, 2020, the Sixth Carbon Budget: the UK's path to Net Zero, p20

²⁷ UK Climate Change Committee, 2020, the Sixth Carbon Budget: the UK's path to Net Zero, p5

²⁸ UK Climate Change Committee, 2019, Net Zero: The UK's contribution to stopping global warming



action.”²⁹ Policies need to provide long-term clarity to consumers and give confidence to investors.

There is a need for more significant Government investment and more ambitious policies in the following areas, if Cambridge and the UK are to reach net zero carbon:

- **Retrofitting existing private homes** – The UK Climate Change Committee recommends that a 30-year national investment programme is needed to fully decarbonise the UK's homes. Estimates of the average investment needed to fully decarbonise each home ranges from £10,000³⁰ to £35,000³¹ per home. It would therefore cost in the order of **£440 million to £1.75 billion** to retrofit all 44,000 private properties in Cambridge to a net zero carbon standard. In autumn 2020, the Government made available £2 billion for the whole country to retrofit the poorest performing homes.
- **Electric vehicles** – Government has recently introduced a requirement for all new cars to be electric from 2030. However, petrol and diesel cars will still be on sale for the next nine years, and existing polluting vehicles will continue to be on the roads long after this date³². A much earlier date for new car production would be needed for Cambridge and the rest of the UK to reach net zero carbon by 2030. The Council is taking a range of action to increase the number of electric vehicle charging points in Cambridge, but much greater national policy interventions are needed to help overcome barriers such as higher purchase prices and ‘range anxiety’ and to stimulate market provision of consistent and coherent deployment of EV infrastructure.
- **Decarbonisation of energy generation** – the national Climate Change Committee has recommended that UK electricity production would need to be net zero carbon by 2035 for the UK to reach net zero by 2050.³³ While significant progress has been made towards

decarbonising electricity generation through investment in renewable energy sources, the Committee recommends that continued investment in offshore wind is needed to achieve this, growing from the Government's promised 40GW by 2030 to 100GW or more. Significant investment will also be needed in low carbon heating systems in buildings to reduce carbon emissions from gas consumption.

If Cambridge and the UK is to reach net zero carbon, there is also a need for more ambitious Government policy and investment to drive decarbonisation of sectors of the economy which Councils have little or no influence over. These include:

- **Agriculture and food** – There is a need for greater policy intervention by Government to reduce carbon emissions from agriculture and food. While the Council is working with local partners to encourage consumers and businesses in Cambridge to purchase sustainable, local food, as an urban district Council, we cannot directly influence, to any significant extent, carbon emissions from agriculture and food production, which range from excessive use of fossil-fuel based fertilisers and insecticides, to emissions from food transportation.
- **Aviation and shipping** – There is a need for greater policy intervention in transport sectors that are regulated at the national level, such as aviation and shipping. The UK Climate Change Committee recommends that Government should provide support for the aviation sector to develop sustainable fuels, electrified planes, and limit aviation growth³⁴. There is also a need for investment in carbon-capture and storage technology to offset sectors such as aviation and shipping which will be very hard to fully decarbonise. The Committee estimates that the annual costs of removing emissions from the atmosphere are potentially between £10 billion and £20 billion annually by 2050³⁵.

29 UK Climate Change Committee, 2020, the Sixth Carbon Budget: the UK's path to Net Zero, p13 and p21

30 UK Climate Change Committee, 2020, the Sixth Carbon Budget: the UK's path to Net Zero, p23

31 Green Alliance, 2020, Reinventing Retrofit: how to scale up home energy efficiency in the UK, page 15

www.green-alliance.org.uk/resources/reinventing_retrofit.pdf – the report notes that costs of the Energie Sprong whole house retrofit approach could reduce to £35,000 per home by 2025

32 Cars stay on the road an average of 14 years from their first sale to scrapping.
www.smmf.co.uk/industry-topics/sustainability/average-vehicle-age/

33 UK Climate Change Committee, 2020, the Sixth Carbon Budget: the UK's path to Net Zero

34 UK Climate Change Committee, 2020, the Sixth Carbon Budget: the UK's path to Net Zero, page 30

35 UK Climate Change Committee, 2020, the Sixth Carbon Budget: the UK's path to Net Zero, page 29



- **Industry** – the UK Climate Change Committee estimates that decarbonising UK industry would cost between £5 billion and £10 billion annually. While companies could make this investment and pass on some of these costs to consumers, there is a need for incentives to encourage the transition and financial support for companies that are exposed to international competition to ensure a level playing field³⁶.

The Council will seek to influence Government policy on these and other issues through collaborating with other Councils through partnerships such as UK100, a network of local authority leaders which is campaigning on climate change issues. For example, in September 2020, the Council joined 23 other Councils in supporting the UK100's five-point Resilient Recovery Declaration³⁷, which was being submitted to the Chancellor's Spending Review and called for:

1. A long-term government led plan to retrofit homes across the country, which are some of the leakiest in Europe.
2. A new duty for Ofgem to support the delivery of Net Zero as part of a renewable, locally planned electricity grid.
3. Creation of a Net Zero Development Bank to increase private investment in renewable technologies.
4. A commitment to providing seamless access to electric vehicle charging infrastructure across the UK and to ensure the UK is world leader in developing low emissions vehicles.
5. New powers for mayors and local authorities to deliver Net Zero.

Cooperating and collaborating with communities, businesses and institutions

While the Council will show community leadership by taking action in the areas where it has greatest control or influence, it is the actions and choices of residents, businesses and institutions in Cambridge in relation to

heating, lighting and energy use in homes and buildings, transport, food and waste that make the greatest contribution to carbon emissions in the city.

Over the next 5 years, the Council will focus on cooperating and collaborating with communities, businesses and institutions in Cambridge to develop shared solutions to climate change.

Since July 2017 the Council convened 6 meetings of a City Leaders Climate Change Group, which brought together businesses, universities, public sector organisations and voluntary and community groups to explore how emissions in the city can be reduced. Through themed meetings, members of the group shared good practice, opportunities and challenges relating to different aspects of the climate change emergency, including housing, waste and the circular economy. In future we will explore opportunities to build citywide climate change and sustainability partnerships and deliver more collaborative projects and initiatives.

As part of the development of the strategy, we have started the process of working more collaboratively with key sectors of our community, including:

- **Businesses** – organising a consultation workshop with major businesses and institutions on 28 January 2021.
- **Voluntary and community groups** – establishing a "Cambridge Climate Change Forum" with local groups including Cambridge Carbon Footprint, Transition Cambridge, Cambridge Sustainable Food, Carbon Neutral Cambridge, and Friends of the Earth and holding 3 meetings since August 2020.
- **Academics** – meeting regularly with Cambridge Zero (the University of Cambridge's new climate change initiative) and securing a Cambridge Zero post-doctoral intern to assist with the development of the strategy.

Going forward we anticipate further developing these collaborative strands, and in due course potentially bringing them together in an annual **Cambridge Climate Summit** or similar event.

³⁶ UK Climate Change Committee, 2020, the Sixth Carbon Budget: the UK's path to Net Zero, p29

³⁷ https://uk100.gn.apc.org/projects/resilient_recovery_taskforce



A number of major institutions in Cambridge have already made commitments to reduce their carbon emissions. For example:

- **Anglia Ruskin University** has committed to reduce its carbon emissions to zero by 2045, including indirect emissions³⁸.
- **Cambridgeshire County Council** has committed to taking all 69 buildings that it owns or occupies off fossil fuel heating by 2023³⁹.
- The **University of Cambridge** has set a Science Based Target for carbon reduction, committing to reduce its energy-related carbon emissions to absolute zero by 2048, with a steep 75% decrease on 2015 emissions by 2030⁴⁰.

Communicating and engaging with residents and businesses

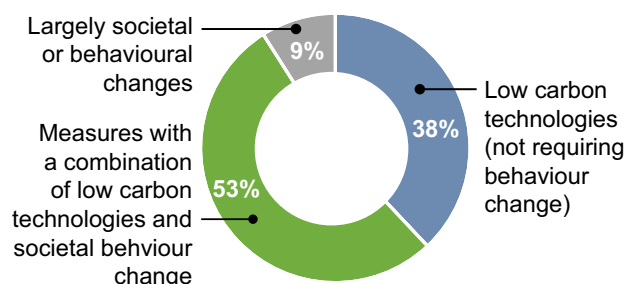
The Climate Change Committee notes that, while “a large part of reaching Net Zero is a technological and investment challenge”, it also “requires a fundamental response from *people*: as consumers, workers, homeowners, tenants and landlords, motorists, farmers, citizens and families.” The Committee notes “many people can make low-carbon choices, about how they travel, how they heat their homes, what they buy and what they eat.”⁴¹

As shown by Figure 7, the UK Climate Change Committee has identified that 60% of the scenarios needed to achieve net zero carbon would require a combination of low carbon technologies and behavioural or societal changes.

The Council and other public sector partners have a clear role in helping to provide the infrastructure needed to support behaviour change towards lower carbon living, ranging from supporting the roll-out of electric charging infrastructure to help accelerate the switch to electric vehicles, to making improvements to cycling and walking routes around the city. However, as part of this strategy we

will also explore further innovative ways of communicating and engaging with residents and businesses to encourage positive behaviour change and low-carbon living, building on the Cambridge Climate Change Charter that the Council commissioned Cambridge Carbon Footprint to develop.

Figure 7 - Proportion of emissions reductions from technologies and societal/behavioural changes



Source: UK Climate Change Committee

Communications and engagement methods may include:

- Continuing to use existing corporate communications channels (e.g. social media, Council residents' magazines Cambridge Matters and Open Door, and the Council website) to highlight steps that residents and businesses can take.
- Continuing to promote the Cambridge Climate Change Charter⁴², which enables residents and businesses to calculate their carbon footprint, access resources and make specific pledges to reduce their emissions. The Council commissioned Cambridge Carbon Footprint (CCF) to develop the Charter, and the website was launched on 7 September 2020. CCF have since carried out a range of resident and business events to promote the Charter.
- Producing bite-size films and animations. We recently commissioned a net zero animation⁴³ to help engage residents in the public consultation on this strategy, and we will explore opportunities to use similar films in future to engage residents and encourage behaviour change.

³⁸ <https://aru.ac.uk/news/aru-pledges-to-cut-carbon-to-zero-by-2045>

³⁹ www.cambridgeshire.gov.uk/news/plans-to-make-carbon-reduction-one-of-councils-top-strategic-objectives

⁴⁰ www.cam.ac.uk/news/university-of-cambridge-adopts-science-based-target-for-carbon-reduction

⁴¹ UK Climate Change Committee, 2020, the Sixth Carbon Budget: the UK's path to Net Zero, p13 & 25

⁴² For more information and to sign the Charter, please visit: <https://cambridgecarbonfootprint.org/charter/>

⁴³ Animation: www.cambridge.gov.uk/consultations/climate-change-strategy-consultation





Still from a consultation net zero animation. Animation by Reuben & Jamie. Illustration by Pam Wishbow.

- Carrying out communications campaigns on specific issues. For example, the Greater Cambridge Shared Waste service will continue to carry out communications campaigns with messaging linked to national campaigns such as 'Love Food Hate Waste'.
- Using frontline Council staff to promote key climate change messages to residents and businesses. For example, 3C Building Control staff visit 15,000 sites per year and can engage with homeowners and landlords on energy efficiency matters, while housing officers will be progressively visiting all Council tenants to carry out tenancy audits and could highlight energy and carbon reduction messages.
- Working with voluntary and community groups to hold joint virtual and in-person engagement events for residents on climate change issues.
- Promoting sources of external grant funding for climate change measures to residents (such as the Green Homes Grant) and businesses (such as the Eastern New Energy grant scheme for SMEs).

We will explore the use of Citizens Assemblies and Citizens Juries on climate change at the national and local level to assess whether these models, or others, would be likely to significantly add to our understanding of the issue or secure widescale public engagement on climate change; and at what cost.

Climate change, social justice and “doughnut economics”

Through our work to deliver this strategy, we will also explore how the “doughnut economics” model⁴⁴ can help us build on our work with businesses, partners, academics and community groups to develop a shared understanding and approach to address climate change, and its relationship with the council's Anti-Poverty Strategy objectives. The key concepts relating to doughnut economics are summarised at Appendix B.

This strategy recognises and responds to social justice issues relating to climate change (represented by the inner ring of the doughnut). The UK Climate Change Committee suggests it will be essential to secure public support for a just transition to a low carbon future, and that this will only be possible if people and communities perceive the transition to be “fair”. This means that vulnerable people will need to be supported to meet the costs of the transition, employees in carbon intensive industries will need to be supported to develop skills needed in new low carbon industries, and businesses are supported to meet the costs of the transition⁴⁵. It will also be important to support vulnerable people to reduce risks posed by climate change, as they are likely to be most affected.

We will also use the “doughnut economics” model to explore the links between climate change and other aspects of the “ecological ceiling” represented by the outer ring of the doughnut, including planning, natural capital, biodiversity net gain, and air pollution.

Objectives

The objectives for the Council's action to address climate change for 2021-2026 are listed below.

1. Reducing carbon emissions from City Council buildings, land, vehicles and services
2. Reducing energy consumption and carbon emissions from homes and buildings in Cambridge

⁴⁴ For more information on Doughnut Economics see: www.kateraworth.com/doughnut/

⁴⁵ UK Climate Change Committee, 2020, the Sixth Carbon Budget: the UK's path to Net Zero, p23



3. Reducing carbon emissions from transport in Cambridge
4. Reducing consumption of resources, reducing waste, and increasing recycling in Cambridge
5. Promoting sustainable food
6. Supporting Council services, residents and businesses to adapt to the impacts of climate change

The following sections of the strategy and the actions in the action plan set out in more detail how the Council will work towards these five objectives, in collaboration with local residents, communities, businesses and institutions. However, we recognise that this does not represent the complete jigsaw, and we will remain very open to learning from other Councils, institutions and research and building additional actions into our plan, where these would make a tangible difference and can be delivered within our resources, or those of other stakeholders.

In particular this will include exploring further the following issues:

- Carbon budgets, building on the Tyndall Centre research outlined above.
- Science-based targets, learning from the experience of the University of Cambridge and others.
- Carbon offsetting and carbon sequestration – as outlined above, exploring what the most viable and credible options might be, if needed, for any residual carbon emissions that cannot be addressed through carbon reduction measures.
- Hydrogen as an alternative energy source, including engaging with Hydrogen East to develop our understanding of what may be feasible in due course in this region.
- Community energy schemes (subject to market/regulatory/technological developments).



OBJECTIVE 1

Reducing carbon emissions from City Council buildings, land, vehicles and services



Solar panels on the Guildhall roof

Council direct emissions from buildings

As outlined above, one of the ways that the Council can show community leadership on climate change is to reduce carbon emissions from the sources that it controls directly. These include Council buildings and land (where the Council owns the building or land and pays the energy bills), Council vehicles and business travel (travel by staff in their own vehicles for business purposes).

The Council has produced two previous Carbon Management Plans, covering the periods from 2012-2016 and 2016-2021. Through these plans, the Council has implemented 66 carbon reduction projects on its own buildings, land and vehicle fleet. These projects have been funded through a total of over £1.4m in contributions from the Council's dedicated Climate Change Fund since

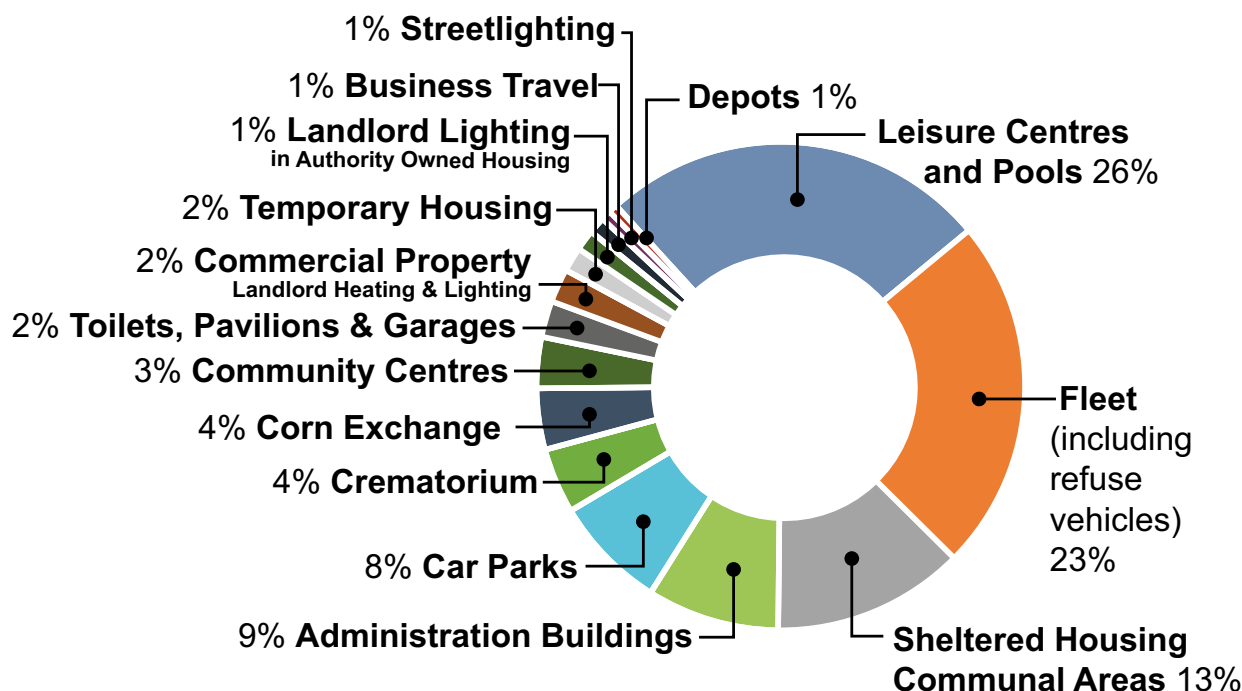
2008/09, as well as investment from planned maintenance and service budgets.

We have targeted carbon reduction projects in the areas of activity which contribute most to the Council's emissions. As shown by Figure 8 on the next page, in 2019/20 the largest sources of emissions were the Council's 5 swimming pool and leisure facilities (26%), the council's vehicle fleet (23%), sheltered housing communal areas (13%), offices and administrative buildings (9%), and car parks (8%).

The 66 Carbon Management Plan projects implemented to date have included:

- **Solar PV installations** at 11 buildings (Guildhall, Mandela House, Waterbeach Depot, Parkside Pools, Abbey Pools, Kings Hedges Learner Pool, the Crematorium, Buchan Street Neighbourhood Centre, Brandon Court, Whitefriars, and New Street Hostel).



Figure 8 – Percentage of total City Council Scope 1, 2 and 3 emissions from different assets 2019/20

Source: Cambridge City Council Greenhouse Gas Report 2019/20

- A **solar thermal system** at Abbey Pools, which heats water for the swimming pools, showers and other facilities.



Solar thermal system at Abbey Pools

- **LED lighting** at 10 buildings and sites (the Guildhall, Mandela House, Grand Arcade car park, Grafton East car park, the Corn Exchange, Abbey astroturf pitches, Stanton House, School Court, Rawlyn Court and Whitefriars). Motion sensors were also installed at many of these sites.
- **Voltage optimisation** at 4 sites (the Guildhall, Mandela House, Abbey Pools and Grafton East car park).
- Comprehensive **energy efficiency works** at the Guildhall, including a Combined

Heat and Power plant (CHP), new Building Energy Management System (BEMS), mechanical works to improve the efficiency of the heating and hot water system, roof insulation and secondary glazing.

- A range of different **energy efficiency improvements** at different swimming pools including installing an air source heat pump at Kings Hedges Learner Pool, pool covers; Building Energy Management Systems (BEMS), Variable Speed Drives, refurbishment of an existing Combined Heat and Power (CHP) plant and heating units in the air ventilation systems.
- **Upgrading boilers** at Mandela House, Abbey Pools, Cherry Hinton Village Centre, the Meadows Community Centre and Ross Street Community Centre to condensing boilers.

From October 2016, the Council signed up to a green energy tariff. This means that 100% of the electricity used in Council buildings (except outsourced leisure centres, other than Parkside Pool) comes from renewable sources, which includes solar, wind and hydro/wave energy. In 2019/20 our green tariff saved 1,432 tonnes of CO₂. However, we have not included this saving in our total reported carbon emissions, as



Government guidance recommends that local authorities report gross emissions rather than net emissions. In future the Council will explore the potential to source lower carbon gas.

We have developed a new Carbon Management Plan for 2021-2026, which sets out how the Council intends to reduce carbon emissions from its buildings, land and vehicles over the next five years. The plan identifies a list of projects to be implemented or explored during for the next five years and a broader approach for reaching net zero carbon emissions by 2030.

As part of the development of the new Carbon Management Plan, we commissioned Bouygues to carry out a high-level study to establish what types of carbon reduction measures would be needed to reduce the Council's direct carbon emissions from buildings to net zero carbon, and what level of capital investment would be required.

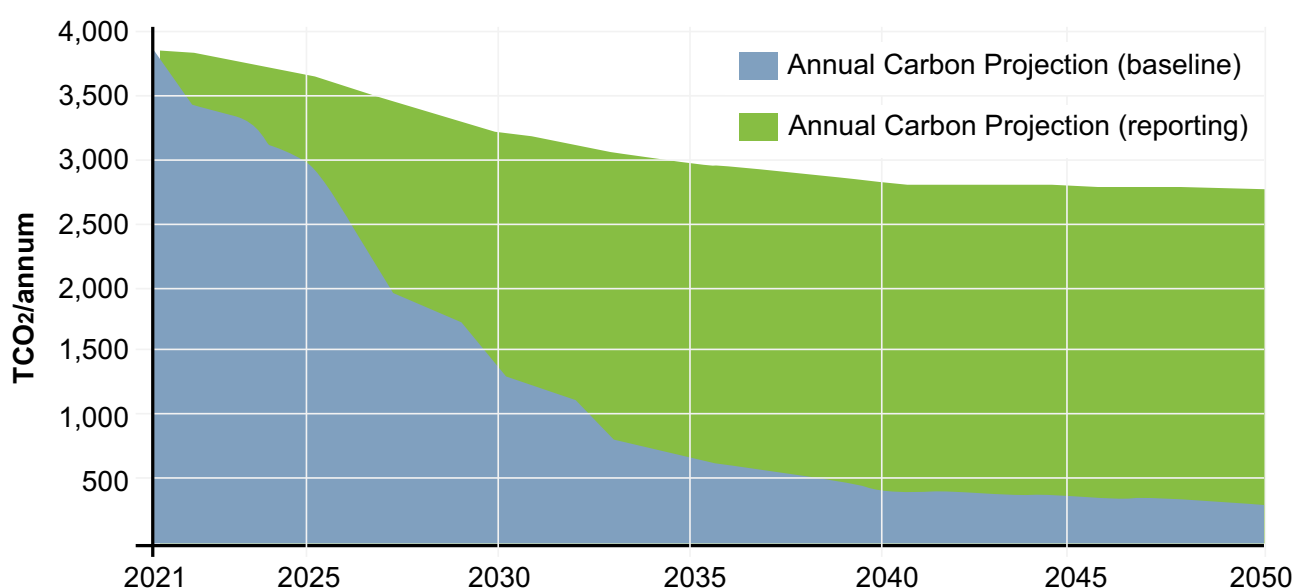
The study focused on the 29 largest buildings in the Council's estate, which are responsible for 83.6% of total emissions from Council buildings and 63% of the Council's total carbon emissions (including emissions from fleet vehicles and business mileage). As shown by Figure 9 below, the Bouygues high-level study found that it would be possible for the Council to reduce its direct emissions from these 29 buildings by 69% by 2030 and 87% by 2050.

As the Council has already invested in measures to reduce electricity consumption from its buildings (e.g. LED lighting, solar PV, voltage optimisation), Bouygues recommended major capital investment in low carbon heating measures (such as Ground Source and Air Source Heat Pumps) where feasible, with additional LEDs, solar PV, BEMS and other measures at some sites. The focus on heat pumps would help switch energy consumption from gas (which generates high levels of carbon emissions) to electricity (which will progressively be decarbonised at a national level through renewable energy).

The Bouygues study suggests that, while the majority of the Council's current carbon emissions can potentially be removed, it will be challenging to reach absolute zero carbon emissions across all the buildings in the scope of the study. This is primarily because the site, structure and listed status of some buildings (the Guildhall and Corn Exchange) mean that low-carbon heating solutions are not currently viable at these buildings, and there is likely to be residual gas consumption at the crematorium from the existing gas-powered cremators until viable, low carbon alternatives become available in the market

The study also suggests that, while over the next 10 years the national electricity grid will be decarbonised to a very significant extent through the replacement of fossil-fuels with

Figure 9 – Bouygues estimates of potential carbon emissions reduction from City Council corporate buildings (compared against current baseline position)



renewable energy generation, it is unlikely that electricity generation will be fully decarbonised within this period. It is likely therefore, that there will be some limited, residual emissions associated with electricity from the national grid used by the Council.

We will actively pursue all feasible opportunities to decarbonise our buildings over the next 10 years, including exploring potential opportunities for partnership projects to address carbon emissions from the hardest-to-treat buildings. However, once carbon emissions have been reduced as far as possible within the constraints of existing buildings, it is likely that the remaining carbon emissions from buildings identified through the Bouygues study will need to be addressed through credible carbon offsetting or carbon sequestration measures in order for the Council to reach net zero carbon by 2030.

There are a range of potential carbon off-setting approaches, which we will explore in more detail as part of the implementation of the new Climate Change Strategy. In the Budget Setting Report for 2021/22, the Council committed to using a percentage of the Council's reserves to invest in innovative "green investments" to facilitate measures to offset climate change. The Council will announce the percentage during the course of the coming financial year when we have greater certainty as to our future financial position post Covid.



Parkside Pools

The study carried out by Bouygues found it would cost approximately **£10.5m** to implement the carbon reduction projects needed for the Council to reach net zero carbon for its buildings. Once the running costs and maintenance costs of these schemes are included, Bouygues estimate that the total cumulative additional costs of the carbon reduction measures will broadly be around **£38.4m** between 2021 and 2050. This is because the ongoing maintenance costs and electricity costs to run the pumps are higher than the maintenance and running costs of gas boilers.



Abbey Leisure Complex

In December 2020, the Council successfully applied for **£1.7m** from the Government's Public Sector Decarbonisation Fund for projects that would significantly reduce carbon emissions at Parkside and Abbey Pools and pave the way for potential future projects to bring those facilities' emissions down towards net zero. Measures will include air source and ground source heat pumps and solar panels to provide low carbon heating and renewable energy, alongside energy efficiency measures such as LED lighting, insulation, digital fans, and upgrades to the buildings' energy management and control systems. The Council will apply for any future funding that is available from Government and other sources for low carbon heating and other solutions, but if such external funding is not forthcoming the Council will need to consider how it can meet the costs of such schemes at the swimming pools and other Council buildings.



Council direct carbon emissions from fleet vehicles and business travel

As part of our previous Carbon Management Plans, we have taken steps to reduce carbon emissions from our fleet vehicles and business travel, including:

- Replacing existing fleet vehicles with more **fuel-efficient Euro 6 vehicles** at the end of their life span and introducing 12 **electric vehicles** to the Council's fleet. 10 of these vehicles are vans and trucks used by the Council's Environmental Services and Repairs and Maintenance service. The Greater Cambridge Shared Waste service has purchased one of the first electric Refuse Collection Vehicles (RCVs) in the country.
- Using **software solutions to implement more efficient routes** and reduce fleet mileage and associated fuel consumption and carbon emissions in the Greater Cambridge Shared Waste Service and the Council's Environmental Services.
- Taking steps to reduce carbon emissions from **business travel** by Council staff, including improving the condition of 22 existing pool bikes, purchasing 4 electric pool bikes and installing electric vehicle charge points at Waterbeach depot for use by staff.



Recharging an electric vehicle from the Council's fleet

As highlighted above, the Council:

- Committed in June 2020 to procure Ultra Low Emission Vehicles (ULEV) when replacing vans and trucks in the Council's fleet (where there is a suitable ULEV alternative and the infrastructure allows). This could lead to a fully electric van and truck fleet by 2028.
- Will seek to replace all Refuse Collection Vehicles (RCVs) with low carbon alternatives (electric or hydrogen) at the point when they are due for replacement.

The Greater Cambridge Shared Waste Service is planning to purchase 3 further electric RCVs in 2021/22 for use in Cambridge. The service is also working with a vehicle manufacturer that is currently trialling hydrogen-fuelled RCVs in mainland Europe to explore the option of extending the trial to Greater Cambridge.

Progressively replacing existing fleet vehicles with electric vehicles (particularly electric RCVs) will require a higher initial capital investment compared to purchasing replacement diesel, but it is anticipated that the "whole life" costs for electric vehicles are likely to be comparable to diesel vehicles, due to lower running costs for electric vehicles.

Carbon emissions reduction targets for the Council's buildings, land and vehicles

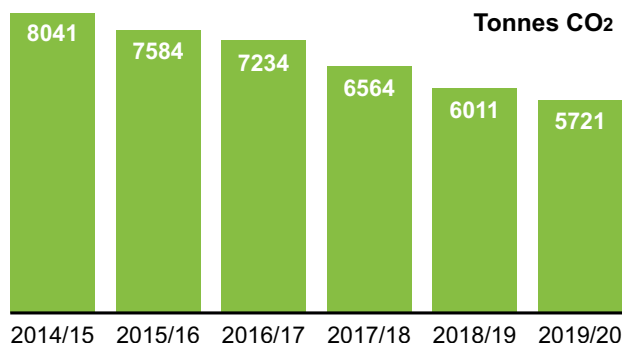
In March 2016, we set a target to reduce the Council's own emissions by 15-20% between 2014/15 and 2020/21 in the Carbon Management Plan 2016-2021. As shown by Figure 10 on the next page, the Council's greenhouse gas emissions reduced by **28.9%** from 2014/15 to 2019/20. Total gross emissions reduced by 2,320 tCO₂e in this period, from 8,041 tCO₂e in 2014/15 to 5,721 tCO₂e in 2019/20.

The reduction in the Council's emissions from 2014/15 to 2019/20 is partly due to steps that the Council has taken, including rationalising its office accommodation, investing in energy efficiency and renewable energy measures in its buildings, and reducing carbon emissions from its fleet vehicles. The reduction in the Council's emissions was also partly due to



decarbonisation of the electricity supply at the national level in recent years, which meant that the electricity used by the Council became steadily greener.

Figure 10 - Cambridge City Council Greenhouse Gas Emissions (tCO₂e)



Source: Cambridge City Council Greenhouse Gas Report 2019/20

We know that we will need to reduce the Council's direct carbon emissions rapidly in the coming years in order to reach net zero carbon. We have set a **target to reduce the Council's direct carbon emissions (from our corporate buildings and our vehicles) to net zero by 2030.**

Commercial property

The Council can also show community leadership on climate change by making improvements to Council-owned commercial buildings. These are occupied by tenants who control energy usage and pay the energy bills, other than some communal areas. The Council owns a range of such properties in Cambridge, and it has developed a Commercial Property Energy Efficiency Plan, which aims to make all of its commercial property compliant with the current requirements in the national Minimum Energy Efficiency Standards (MEES) regulations. The regulations currently require that:

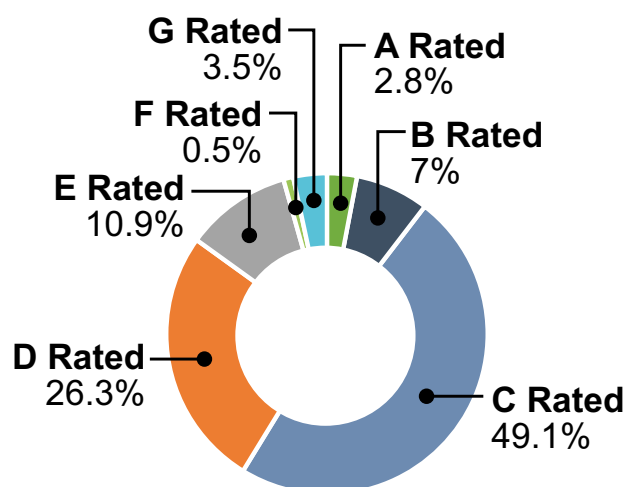
- From April 2018, landlords must ensure that any vacant property that will be let in future must have an Energy Performance Certificate (EPC) rating of band E or above.
- From 1 April 2023, landlords must not continue letting a non-domestic property which is already let if it has an EPC rating below band E.

The Government consulted in early 2020 on raising the minimum requirement in the MEES

regulations. The outcome is a proposal that all commercial property should achieve an EPC rating of B rating by 2030. This may be phased over the next 10 years, but this is subject to further consultation.

As shown by Figure 11, data from properties where an EPC has been carried out shows that 96% of the Council's commercial property floorspace was above the MEES standards in 2020, with the majority having a C rating (49.1%) or D rating (23%).

Figure 11 - EPC rating of total commercial property floorspace in Sept 2020



As part of the Energy Efficiency Plan, we have carried out draft EPCs for those properties that did not have them and implemented energy efficiency improvements and EV charging points at a number of buildings. In recent years, most new strategic purchases of commercial property have had EPC ratings of C or above.

The Council will also be undertaking a redevelopment programme for some of its commercial property portfolio over the next 10 years. This will see many older, poorly performing properties replaced with modern equivalents or differing uses. The environmental implications will be assessed on a scheme by scheme basis, but it is likely that redevelopments will have significant positive environmental impacts as new buildings replace much older, poorly performing buildings. An agreed standard (with the aim to achieve as close to net zero carbon as possible) will be set out for each scheme.



Consideration will be given to using green leases with tenants so that tenant fit out supports the agreed environmental performance target. For example, these have been used at the retail units at the Virido development.

As part of the Climate Change Strategy, we will identify and assess:

- Improvements to the 8 commercial properties where the Council is responsible for the energy bills for communal spaces (such as reception areas and stairwells).
- The improvements possible to the remaining existing commercial properties (that will not be redeveloped as part of the commercial property redevelopment programme) to achieve net zero carbon, and obtain costs estimates for the improvement works.
- The performance standards required to achieve net zero carbon for any new commercial buildings or redevelopment of existing buildings.

Procurement

The Council can show community leadership on climate change through its procurement policies and practice. When procuring goods and services, Council services currently use the Social Value Act to require contractors to provide environmental sustainability benefits and commitments, where these are appropriate and achievable. When tenders are evaluated, on average 5% of marks are awarded on the basis of Social Value criteria. There is an aim to build a library of questions that can be used in tender processes with model answers and ongoing monitoring suggestions.

As part of this strategy, the Council will take the following steps to help ensure that its procurement policies and practice help to mitigate climate change:

- Review standard tender packs to include the Council's expectations around climate change.
- Provide written guidance for contract managers on climate change measures that could be included in contracts and include this information in procurement and contract management training for staff. This will

include considering how the commitments made in the tender process are captured as developed as the contract progresses.

- Explore the potential for a review of climate change and sustainability commitments by the Council's existing suppliers, and work with these suppliers to improve their performance.

Pensions

Cambridge City Council's pension funds are held in The Cambridgeshire Pension Fund, governed by the Pensions Committee and administered by Northamptonshire County Council. The proportion of the fund in fossil fuel holdings reduced from 5.2% in March 2018 to just 1.7% of the fund in June 2020. Cambridge City Councillors on the Pension Board will continue to press for further reductions in this holding.

The Fund adopts a policy of active share ownership and engagement rather than disinvestment or exclusion. Individual investment selections are made by professional external fund managers appointed by the Fund, in accordance with an overall asset allocation strategy set by the Pensions Committee of the Fund.

The Pensions Committee have a responsibility to maximise investment returns while taking an appropriate level of risk and in doing so minimise pension costs to hundreds of participating scheme employers and approximately 30,400 active scheme members.

The Committee considers that the financial impact arising from Environmental, Social and Governance ("ESG") risks to be an integral part of the risk assessment made by its investment managers in selecting any investment. The Committee instructs external investment managers to engage with the companies in which the assets of the Fund are invested. This engagement is on a range of issues from executive remuneration to health and safety and environmental impact.

The Committee also recognises that effective management of "Sustainable Responsible Investment" ("SRI") issues can enhance long-term financial performance of investments.



The Fund has been reviewing its Sustainable Responsible Investment Policy, receiving a number of committee reports and information workshops focussing on climate change risk.

The Fund has recently consulted with all key stakeholders, including Local Pension Board members, on their investment beliefs with the intention to formally update the Funds Investment Strategy Statement.¹ The Fund has agreed to:

- Establish Responsible Investments Beliefs Statement reflecting stakeholder feedback

and align other governance documents with the statement.

- Establish processes that ensure investment decisions refer back to the relevant belief.
- Integrate ESG into investment decisions, including manager selection and strategic portfolio construction decisions.

The Fund is currently working with its investment consultants to explore how to improve ESG reporting, monitoring and engagement to a standard that would meet Stewardship Code requirements.

¹ The Cambridgeshire Pensions Fund Investment Strategy Statement: <https://tinyurl.com/yb4yqm2v>



OBJECTIVE 2

Reducing energy consumption and emissions from homes and buildings in Cambridge

The national Climate Change Committee has identified homes and buildings as one of the key sectors which will need to be decarbonised if the UK is to reach net zero carbon emissions¹. In this chapter, we outline how homes and institutional, industrial and commercial buildings in Cambridge could be decarbonised.



Open Eco Homes event

Opportunities for reducing carbon emissions from homes in Cambridge

As noted above, homes in Cambridge account for around 31% of total carbon emissions from the city², primarily from energy used in heating, lighting and domestic appliances. The data from ClimateView suggests that there are a range of solutions that could potentially help reduce carbon emissions from homes in the city, including:

- Improving the energy efficiency of existing homes (8% of total carbon emissions)

- Installing alternatives to gas heating in existing homes, including heat pumps, biofuels, hydrogen, and district heating schemes (15% of total carbon emissions)
- Installing solar PV on existing roof space (12% of total carbon emissions³)
- Construction of zero carbon new homes (4% of total carbon emissions)

The Council's role in reducing carbon emissions from homes in Cambridge

The Council can show community leadership in reducing carbon emissions by:

- Making energy efficiency improvements to existing council homes.
- Building new council homes to ambitious environmental standards.
- Supporting homeowners and landlords to "retrofit" energy efficiency and renewable energy measures to their homes.
- Using the Council's planning policy and building control powers to require high environmental standards in new private housing (as far as national policy allows).

Council properties – Reducing carbon emissions from existing Council homes

The Council owns 7,106 homes⁴, which represents 13.9% of the 51,240 homes in Cambridge⁵. Available data suggests that

¹ UK Climate Change Committee, 2020, The Sixth Carbon Budget: the UK's path to Net Zero, p14

² Department for Business, Energy and Industrial Strategy (BEIS), 2020, UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2018

³ N.B. this figure represents the total carbon emissions reduction from homes and non-residential buildings combined

⁴ Cambridge City Council Orchard data, April 2020

⁵ Cambridgeshire Insight, 2015, Local population and dwelling stock estimates & forecasts:
<https://cambridgeshireinsight.org.uk/population-estimates-old/>



Council homes (71.9) have a significantly higher average SAP rating (a measure of energy efficiency) than private rented homes (55.0), owner-occupied homes (57.0) and housing association homes (62.0)⁶.

Over the period of the Council's previous climate change strategies, we invested £4.3 million in energy efficiency improvements to Council homes, focussing on bringing the lowest rated properties up to an EPC rating of C. This included replacing 1,543 older boilers with more energy efficient condensing boilers, installing external wall insulation, and insulating the loft and cavity walls of more than 600 properties. From 2020/21 to 2022/23, we have committed to investing a further £2.5 million to improve the energy efficiency of the remaining Council homes with EPC ratings of D to G, with the aim of bringing these up to a C rating or above where feasible. This includes installing measures such as external wall insulation and solar PV panels.

However, we recognise that we will need to do much more if we are to decarbonise existing Council homes, and we are exploring options for achieving this. We have commissioned a company to carry out a high-level study by April 2021 to establish how existing Council homes could be retrofitted to meet three different carbon emissions standards (Local Plan Plus, Passivhaus, and net zero carbon).

The report will focus on different property archetypes within the Council's housing stock and identify how they could be improved to reach these standards. The study will help quantify the costs of reaching different standards, in terms of initial capital investment and ongoing maintenance costs for the Council, and running costs for Council tenants, and will inform the Council's future approach.

Council-owned properties - Reducing carbon emissions from new Council homes

While strong economic growth in Cambridge has brought investment into the area and created employment, it has also created a high demand for houses, leading to high housing

costs. The Centre for Cities found that in 2018 Cambridge had the third most unaffordable housing of any city after Oxford and London. Housing is particularly unaffordable for people on lower incomes in Cambridge; lower quartile house prices in Cambridge were 16.3 times lower quartile earnings in March 2018.

The Council is building new homes for rent to help address the housing affordability crisis in the city. We are building 500 new Council homes for rent, using £70m Government funding via the Cambridgeshire and Peterborough Devolution Deal. All the homes in this programme are being built to carbon emissions standards set out in the 2017 Cambridge Sustainable Housing Design Guide (SHDG), which stated a target of a 19% reduction on carbon emissions compared to standards required in the 2013 national building regulations. In practice an average of 8 out of 10 schemes in the programme are expected to attain carbon emissions standards of 35% below those required by building regulations. Some developments under construction as part of the programme are gas free and use air source heat pumps for heating.

Following the current new homes programme, the Council has an ambition to develop a further 1000 net additional council homes. During 2020, the Council commissioned a study by Buro Happold, which assessed the implications of building the new programme to higher sustainability standards to reduce carbon emissions. The study considered: initial capital costs and maintenance costs for the Council, running costs for tenants, and carbon emissions reductions.

In January 2021⁷, the Council committed to build homes in this new 1000 homes programme to Passivhaus standards, where technically feasible and subject to funding. The Council will target net zero carbon standards for Council homes built from 2030 onwards. This approach will make the Council's new housebuilding programme amongst the most sustainable in the country – few – if any – other local authorities in the UK that are building new homes to this scale are building to comparable carbon emissions standards.

⁶ Source: Cambridge Private Sector House Condition Survey, 2014 (for private homes) and Energy Performance Certificate data (for 2,200 out of 7,106 Council homes)

⁷ For further information, see the report to the Council's Environment and Community Services Committee:
<https://democracy.cambridge.gov.uk/documents/s54468/HSC%20new%20programme%20update%20report%20Jan%2021.pdf>



The Cambridge SHDG will be updated to reflect the carbon emissions standards agreed for the 1000 homes programme. The guide will also include updated targets for electric vehicle charging, car parking spaces, water efficiency, overheating, and biodiversity. It will also require a Sustainability Options appraisal to be produced for every development, to include details of future proofing all schemes to net zero carbon, where technically feasible and when funds permit.

Partnership working and communities – reducing carbon emissions from existing private homes

Reducing carbon emissions from private homes in Cambridge represents the biggest challenge. There are currently more than 44,000 homes that are owned by residents, private landlords and housing associations. Considerable investment will be needed to decarbonise private homes in the city, as they currently have an average EPC rating of D, and very few properties in the city are close to reaching net zero carbon standards.



Retrofitted external wall insulation

The Council has successfully secured funding from Government to support retrofit activity in the past. Over the period of the Council's previous climate change strategies, we have:

- Delivered 1402 insulation measures through a combination of the national CERT scheme and the Council-funded Cambridge Home Insulation Scheme
- Retrofitted 433 homes in Cambridge with loft, cavity wall and/or solid wall insulation using £2million from the national **Green**

Deal for Communities programme from 2014-2016. This programme was part of a wider £7.8 million Cambridgeshire-wide partnership programme called Action on Energy, which was one of the most successful Green Deal delivery programmes in the country.



- Funded Cambridge Carbon Footprint through the Council's Sustainable City Grants to run annual **Open Eco Homes** events, which provide opportunities to attend energy efficiency workshops and visit low carbon homes in Cambridge. In 2020, 517 residents attended Open Eco Homes events.

Over the next 5 years, the Council will seek opportunities to support homeowners and landlords to reduce carbon emissions from private homes, including:

- Commissioning a **retrofit study** to identify what energy efficiency and renewable energy measures would need to be installed for different property archetypes in Cambridge to reach different carbon emissions standards. The study would provide an evidence base for bids for Government funding and would provide guidance for residents on what measures would be most effective in their property. We will also explore the scope for utilising satellite and drone thermal imaging techniques being developed by researchers at the University of Cambridge.



Loft insulation



- Bidding for funding available to retrofit private homes. In December 2020, we led a successful £2 million Cambridgeshire-wide partnership bid to the first round of the Government's new **Green Homes Grant Local Authority Delivery (LAD)** scheme. The grant award will part fund improvements to 278 properties, including: external wall insulation and solar PV to 66 Council homes, energy efficiency improvements to 62 housing association homes, and external wall insulation to 150 private homes.
- Promoting group-buying schemes, such as the Cambridgeshire-wide **Solar Together** scheme. This enables residents to purchase solar PV panels and battery storage at significant discounts. In autumn 2020, 999 Cambridge residents registered for the first round of the scheme, of which 293 accepted offers for solar PV and/or battery storage.
- Taking **enforcement action** against landlords and property managers whose properties do not meet the national Minimum Energy Efficiency Standards (MEES) for privately rented homes. From April 2021, the standards require a minimum EPC rating of E, but Government is considering increasing these standards over time. We will work with other local authorities to lobby for a more rapid increase in standards and greater enforcement powers for councils.



Fitting cavity wall insulation (© Aran Services)

While the Council can take some steps to support retrofit activity in Cambridge, fully decarbonising homes will require huge investment by homeowners and landlords

that can afford to invest in properties, or through Government-funded energy efficiency programmes.

National funding to date has primarily focussed on energy efficiency measures such as loft, cavity and external wall insulation. For many properties in Cambridge these measures are still needed, but to fully decarbonise existing homes it will be necessary to: replace gas heating with low carbon heating such as Ground Source or Air Source Heat Pumps; install solar PV panels and battery storage to provide on-site renewable electricity; and install mechanical ventilation with heat recovery (MHVR) systems.

Estimates of the average investment needed to fully decarbonise each home in the UK range from £10,000⁸ to £35,000⁹ per home. It would therefore cost in the order of £440 million to £1.75 billion to retrofit all 44,000 private properties in Cambridge to a net zero carbon standard.

The UK Climate Change Committee recommends that a 30-year national investment programme is needed to fully decarbonise the UK's homes, but in autumn 2020 the Government only made available £2 billion nationally through the Green Homes Grant scheme, of which local authorities will be able to bid for a total of £500m for improvements to the least energy efficient homes (with an EPC rating below D). As part of this strategy, the Council will bid for retrofit funding that is available in future, while working with other Councils to lobby Government for increased funding for domestic retrofit

The UK Climate Change Committee estimates that a national retrofit programme could create 200,000 additional construction jobs, but the existing construction workforce lacks the necessary skills, and the national construction supply chain is not yet ready for zero carbon retrofit. The Government is providing funding for companies to train staff to meet the PAS2035 certification standards, which require a whole-house retrofit approach, but there may be a role for the Cambridgeshire and Peterborough Combined Authority to promote local skills development in this area.

⁸ UK Climate Change Committee, 2020, the Sixth Carbon Budget: the UK's path to Net Zero, p23

⁹ Green Alliance, 2020, Reinventing Retrofit: how to scale up home energy efficiency in the UK, page 15

www.green-alliance.org.uk/resources/reinventing_retrofit.pdf – the report notes that costs of the Energie Sprong whole-house retrofit approach could reduce to £35,000 per home by 2025



Regulatory powers – Reducing carbon emissions from new private homes



New home at Clay Farm with integrated Photovoltaics

Over the past 50 years, Cambridge has experienced strong economic growth, driven by its world-renowned Universities and a globally significant cluster of hi-tech and bio-technology businesses. Research shows that the 'Cambridge phenomenon' has been driven by companies locating in the city due to high skill levels in the local workforce and access to University research expertise. In the wider Greater Cambridge¹⁰ sub-region, there are currently over 5,000 knowledge intensive companies with a combined revenue of over £15.5bn.¹¹ The associated employment growth in Cambridge has led to house affordability issues and significant levels of commuting into the city.

Local Plans are prepared by Local Planning authorities to set out a vision and a framework for the future development of an area. They establish the number of new homes and jobs that should be planned for in the local area, where this development should take place, and the services, facilities and infrastructure that should accompany development. Following extensive public engagement and participation, they are tested as part of the public examination of the Local Plan by an independent planning inspector.

The current Cambridge Local Plan sets out the number of new homes and jobs that should be planned for based in the current period from 2011 to 2031. This local Plan is currently under review. The Council is working jointly with South Cambridgeshire District Council to prepare a Greater Cambridge Local Plan. The new Local Plan will set policies for new development from the date of adoption to 2041.

Through Local Plan policies on new homes, the Council is seeking to reduce pressure on housing costs and commuting into the area, whilst seeking to ensure that development is environmentally sustainable. In a number of recent developments, the Council was able to require new housing developments to meet high environmental sustainability standards set out in the national Code for Sustainable Homes (CfSH). For example, the Eddington development in North West Cambridge was built to CfSH Level 5, Trumpington Meadows was built to CfSH Level 4 and homes at Clay Farm were built to a mixture of CfSH Levels 3, 4 or 5. These standards, along with local planning authorities' ability to set construction standards for new homes, were abolished by Government in 2015.



Apartments with 'Winter Gardens' at Clay Farm

¹⁰ The Greater Cambridge sub-region includes the districts of Cambridge City and South Cambridgeshire

¹¹ University of Cambridge, September 2019, Cambridge Innovation in Numbers
www.cam.ac.uk/sites/www.cam.ac.uk/files/inner-images/innovation_in_numbers_sep_2019.pdf?ucam-flow=business-and-enterprise



The current Cambridge Local Plan, adopted in 2018, includes a number of policies that are designed to limit carbon emissions from new housing developments in the city, including:

- A 44% reduction in on-site carbon emissions (relative to 2006 building regulations).
- A requirement to prepare sustainability statements as part of planning applications, which set out how developers will achieve carbon reductions through reducing energy demand, energy efficiency measures and on-site renewable energy generation, as well as integrating measures into developments to enable them to adapt to our changing climate and water efficiency measures.
- Support for the provision of renewable and/or low carbon energy generation, including community energy networks, district heating schemes and solar energy.
- A policy on “consequential improvements”, which requires any planning applications for extensions to existing homes (or the conversion of ancillary residential floor space to living accommodation) to include energy efficiency improvements to the existing home (where these have not already been installed).

The current Local Plan also supports the use of standards such as Passivhaus and encourages proposals to exceed existing policy requirements. The Greater Cambridge Sustainable Design and Construction Supplementary Planning Document (SPD) sets out more detailed guidance on issues such as renewable energy and encourages developers to switch to electric heating ahead of government proposals to ban gas boilers in new homes from 2025. In response to Local Plan policy and the SPD guidance, we are already seeing a switch to technologies such as ground source heat pumps and air source heat pumps in new housing developments.

One of the overarching themes proposed for the new Greater Cambridge Local Plan is: “Climate change – how the plan should contribute to achieving net zero carbon, and the mitigation and adaptation measures that should be required through developments.”

As part of the evidence base for the new Local Plan, the Shared Planning Service has commissioned Bioregional and Etude to

carry out an innovative net zero carbon study, which is considering the planning policies and targets that would be needed to achieve net zero carbon homes and buildings (subject to the constraints of the national planning policy framework). In addition to energy usage, the study will also consider transport emissions from new development and “embodied carbon” from the construction of new buildings, as well as wider policies related to climate change.

As part of this work, a comparative carbon assessment of the possible locations for growth has identified that, if ambitious zero carbon policies are brought in, very limited carbon emissions would be produced by the energy used in new homes, and less than one tonne of carbon dioxide would be generated in constructing each home. However, the transport-related carbon emissions from development are likely to be far more significant.

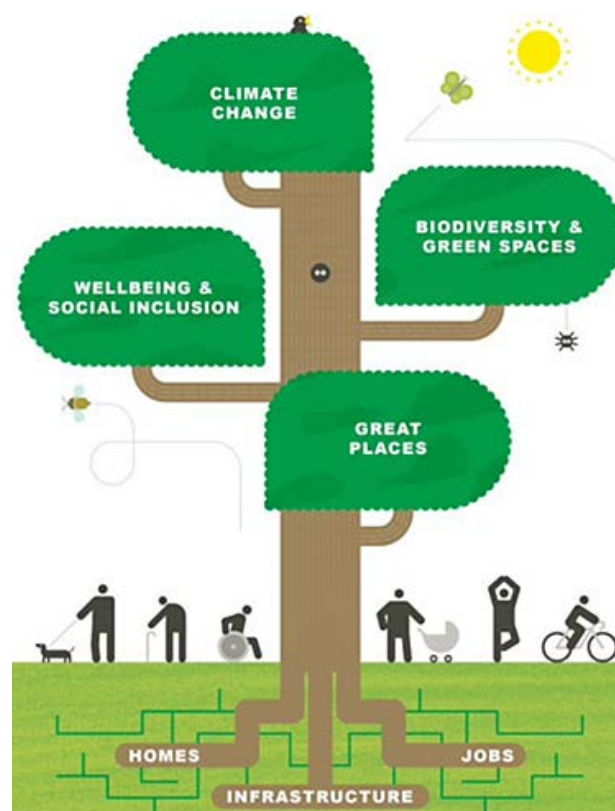


Diagram illustrating the proposed big themes of the Greater Cambridge Local Plan

The level of transport-related carbon emissions is likely to vary considerably depending on the location of development, with development in the existing urban area of Cambridge likely to generate the lowest levels emissions, because people would be closer to existing public transport and active travel infrastructure.



Influencing institutions and businesses to reduce carbon emissions from buildings

As shown by Figure 3 on page 11, carbon emissions estimates produced by BEIS suggest that the industrial and commercial sector is responsible for **49%** of emissions¹². As shown by the more detailed sub-sectoral analysis provided by the SCATTER tool in Figure 4, the majority of these emissions come from non-residential buildings. **23%** of emissions come from institutional buildings (including the Universities, hospitals, local authorities, museums, and other public organisations) and **22%** of emissions come from industrial and commercial buildings.

If Cambridge is to reach net zero carbon emissions, it is vital for institutions and businesses in the city to reduce carbon emissions from their buildings. The ClimateView systems suggests that the following interventions could potentially significantly reduce emissions from institutional, industrial and commercial buildings in the city:

- Energy efficient non-residential buildings (5% of total carbon emissions)
- Low carbon heating of non-residential buildings, including district heating schemes, heat pumps, hydrogen, biogas, or biofuels (18% of total carbon emissions)
- Solar PV on roof-space (12% of total carbon emissions for homes and non-residential buildings combined).

The Council is taking a range of steps to encourage institutions and businesses to reduce their carbon emissions from buildings, including:

- Using planning policy to ensure high standards in on new non-residential buildings in Cambridge. The current Local Plan requires all new non-residential development to meet the BREEAM Excellent standard. As part of the developing Greater Cambridge Local Plan, the Shared Planning Service is exploring the policies needed to achieve net zero carbon non-residential buildings in future.

- Hosting workshops to support SMEs to reduce their energy use. For example, we have hosted workshops delivered by Peterborough Environment City Trust (PECT) in 2018 and the Carbon Trust and the Business Energy Efficiency Cambridge and Peterborough (BEECP) programme in 2019. Both sessions advised SMEs on energy efficiency measures and opportunities to apply for energy-related grant funding.
- Targeting communications to businesses. For example, in 2020 and 2021 we sent a flyer to over 4,000 businesses (alongside requests for Council Tax payment) highlighting the key steps they can take to reduce their carbon footprint, including energy efficiency and renewables in buildings.
- Commissioning Cambridge Carbon Footprint to produce the Climate Change Charter, which enables businesses and institutions to commit to reduce their carbon emissions.



- Convening meetings of the City Leaders Climate Change Group, which has been attended by major institutions and businesses, including Cambridgeshire County Council, the University of Cambridge, Anglia Ruskin University, Cambridge University Hospitals Trust, Arm, Astra Zeneca, Hill, RG Carter and Stagecoach.
- Setting up a new destination management organisation (DMO), using the existing name Visit Cambridge and Beyond. The immediate focus of the DMO will be on the recovery of the tourism sector in Cambridge, which has been heavily impacted by Covid-19 lockdowns, but the new business plan will also focus on sustainable tourism.

The Council is keen to work with institutions and businesses in future, including exploring the potential for city-wide sustainability partnerships and collaborative projects.

¹² Department for Business, Energy & Industrial Strategy (BEIS), 2020, UK local authority and regional carbon dioxide emissions national statistics: 2005-2018



OBJECTIVE 3

Reducing carbon emissions from transport in Cambridge

The national Climate Change Committee has transport as one of the key sectors which will need to be decarbonised if the UK is to reach net zero carbon emissions¹. In this chapter we outline how the Council will work with key partners to help reduce carbon emissions from transport in Cambridge.



Opportunities for reducing carbon emissions from transport in Cambridge

As shown by Figure 3 above, transport accounted for 20% of carbon emissions in Cambridge in 2018². This includes carbon emissions from cars and other private vehicles, but also goods traffic and public transport. This is a smaller proportion than for the country as a whole, but given the air quality dimension too, it remains a high priority for Cambridge.

The data from ClimateView suggests that there are a range of solutions that could help reduce carbon emissions from transport in Cambridge, including:

- Shifting personal petrol and diesel vehicles to electric vehicles (6% of total carbon emissions)
- Shifting to alternative fuels for goods vehicles, including electric light trucks, and hydrogen, biofuel or electric powered heavy goods vehicles (4% of total carbon emissions)
- Increasing the proportion of travel by walking, cycling and public transport (4% of total carbon emissions)
- Increasing remote working (2% of total carbon emissions)
- Changing logistics for goods vehicles, including improved load factors, route optimisation and eco driving of trucks (2% of total carbon emissions)
- Improvements in vehicle and engine technology in personal and goods vehicles (1% of total carbon emissions)

Policy and regulatory powers and partnership working – Electric vehicle infrastructure

The national Climate Change Committee suggests that shifting petrol and diesel vehicles to electric vehicles will make significant contribution to decarbonising transport. This is because electric vehicles are more energy efficient and electric power is increasingly being generated from renewable sources. The ClimateView model suggests that promoting a shift from petrol and diesel vehicles to electric vehicles could reduce total carbon emissions in Cambridge by 6%.

¹ UK Climate Change Committee, 2020, The Sixth Carbon Budget: the UK's path to Net Zero, p14

² Department for Business, Energy & Industrial Strategy (BEIS), 2020, UK local authority and regional carbon dioxide emissions national statistics: 2005-2018



An increasing number of car manufacturers are producing electric and hybrid vehicles, the findings of public consultation on this strategy and consultation by the Cambridgeshire and Peterborough Independent Commission on Climate show that factors such as higher prices, limited range and the limited availability of electric vehicle charging points currently constrain take-up in Cambridge and the wider region.

Central government recently announced that all new vehicles in the UK will be electric from 2030 onwards, and it is currently providing subsidies of up to 75% of the cost of installing off-street EV charging points. However, there is also a clear role for the Council in helping to accelerate the installation of electric vehicle infrastructure in Cambridge, as this will increase the viability of electric vehicles for residents and businesses.

The Council produced an Electric Vehicle and Infrastructure Strategy in October 2019, which identifies how the Council and its partners can help to increase the number of electric charging points available within the city. Council activity to date has included:

- Installing **18 rapid and 3 fast electric charge points for taxis** in Cambridge by 2021, with funding from Government (£426,000), the Council (£100,000) and the Greater Cambridge Partnership (£100,000).



Electric taxi recharging point

- Introducing regulations requiring all new taxis to be Ultra Low Emission Vehicles

(ULEVs) or zero emissions vehicles from 2020, and **all taxis to be ULEVs or zero emissions vehicles by 2028**. This has led to a significant increase in the number of electric taxis, with 35 electric and 66 hybrid taxis licenced in the city in 2020.

- including **electric charging points in existing car parks** and in the plans for the redevelopment of Park Street Car Park.
- The Council's Environmental Health policies and guidance in the Sustainable Design and Construction Supplementary Planning Document to require provision of **electric vehicle charging points in new housing and non-residential developments**.
- working with Cambridgeshire County Council to jointly procure a **new 5-year car club contract** to provide vehicles for use by residents and businesses in Cambridge. 75% of the car club vehicles provided by Enterprise are currently ultra-low emissions hybrid vehicles, and Enterprise will establish an electric vehicle charging steering group with the aim of providing the infrastructure required to achieve a 100% electric vehicle car club fleet in the future.

The Council is currently revising its Electric Vehicle and Infrastructure Strategy to reflect new opportunities and developments in technology. Future actions are likely to include:

- Procuring a commercial partner by 2022 to deliver **new electric vehicle charging infrastructure in Council car parks** and other Council-owned land and sites.
- Working with Cambridgeshire County Council and UK Power Networks to facilitate **on-street residential electric charge points** where there is no scope for off-street charging. 3 initial pilot schemes for 'charging collectives' will be procured during 2021.
- Working with Cambridgeshire County Council and the CPCA on a **wider electric vehicle charging strategy**.

Partnership-working and influencing – walking, cycling and use of public transport

Cambridge has an existing trend towards sustainable transport, particularly cycling.



The 2011 Census highlighted that about 33 per cent of residents in the city cycle to work, the highest proportion in the United Kingdom. However, to reduce carbon emissions from transport in Cambridge, we need significantly more people to travel by public transport, cycling and walking, and significantly fewer people to travel by car.



Cycle lane in a new development

Public transport journeys need to be competitive, sustainable and reliable and active travel alternatives need to be safe and easy to encourage people to move away from cars. The impact of coronavirus on the public's willingness to use shared transport modes may make this more challenging in the short-medium term.

The Council is taking a number of actions directly to help increase walking, cycling and use of public transport, including:

- Appointing a new **Active Travel Officer** to develop and undertake a programme of activities in the city to promote walking, cycling and the use of public transport across a range of settings including schools, colleges, workplaces and communities from 2021.
- Increasing **cycle parking provision** at Council car parks.
- Working with Cambridgeshire County Council to provide 30 **electric cargo bikes** for use by residents and businesses in Cambridge using Government funding.
- Developing a **Local Lettings Plan** framework for new Council housing

developments, which will give priority to people working within an agreed geographical radius of the development. This measure is intended to help reduce commuting by car by tenants.

- Building new Council housing developments in Cambridge with less than one **car parking space** per home to encourage travel by walking, cycling or public transport.
- **Policies in the current Local Plan** to support housing and non-residential development which prioritises access by walking, cycling and public transport³.
- Encouraging attendees and contractors at the **Cambridge Folk Festival and Corn Exchange** to consider more sustainable transport options when travelling to events and working with the County Council transport team to ensure the city evening economy is served by sufficient bus transport taking people to surrounding towns and villages.
- Working with the **Active Lifestyles** team to promote healthy walking and cycling activities and promotion of safer routes to schools.

While the Council is taking the above actions, there are a number of local government bodies which have a much greater role in relation to walking, cycling and public transport infrastructure. The Council works as part of a partnership with these organisations and influence their decision-making to ensure that transport schemes in Cambridge contribute to a reduction in carbon emissions from the city:

- The **Cambridgeshire and Peterborough Combined Authority (CPCA)** develops the Local Transport Plan for the wider Cambridgeshire and Peterborough area and is responsible for passenger transport services.
- **Cambridgeshire County Council** is responsible for maintaining highways in the Cambridgeshire area.
- The **Greater Cambridge Partnership (GCP)** is the delivery body for the Greater Cambridge City Deal, which is providing up to £500 million funding from Government for transport, skills and housing.

³ Policy 80: Supporting Sustainable Access to Development in the Cambridge Local Plan – October 2018
www.cambridge.gov.uk/media/6890/local-plan-2018.pdf



The Council is one of the key partners in the GCP, alongside Cambridgeshire County Council, South Cambridgeshire District Council and business. The GCP is delivering a comprehensive programme of sustainable transport initiatives, working with local authority partners to create a world-class transport network that can meet the needs of the area now and into the future. Improvements to key routes into and across Cambridge include:

- Four **corridor schemes** (Cambourne to Cambridge, Waterbeach to Cambridge, Cambridge Eastern Access and Cambridge South East) will offer better public transport and active travel routes to link growing communities to the north, south east, east and west.
- A network of **12 Greenways** will create safe and easy cycling, walking and equestrian routes into the city.
- Several inner-city active travel schemes are already underway. The **Cross City Cycling scheme** has delivered improvements to 5 key cycle routes across the city (Arbury Road, Ditton Lane, Fulbourn Road, Hills Road, and links to Cambridge North Station and Cambridge Science Park). The **Chisholm Trail** will provide a mostly off-road cycling and walking route between Cambridge Station and Cambridge North Station, with a new bridge across the River Cam connecting Abbey and Chesterton.



New jetty which connects the footpath between Stourbridge Common and Ditton Meadows allowing people to walk and cycle across the common

- Further improvement schemes at **Milton Road** and **Histon Road** will lead to faster and more reliable public transport journeys and better walking and cycling links into the city.
- Enhancing **Travel Hub** capacity on routes into the city, connecting park and ride

facilities with bus, walking and cycling networks so people can easily switch to sustainable transport. New facilities will be equipped with charging points for electric vehicles and future-proofed to evolve over time as technology changes how we travel.

- Investment in **zero emission buses**. As part of a pilot funded by the GCP, two zero-emission buses, have been operating on the 6 bus routes serving the city centre, Girton and Oakington. GCP's Future Investment Strategy has prioritised allocations to further zero emission buses.



Electric bus

- As part of a **digital wayfinding** project, updated wayfinding signage and a new map identifying walking routes to the city centre via either Station Road or Mill Road have been installed.

Alongside these infrastructure programmes, the GCP's **City Access** project is promoting measures to encourage commuters away from cars, reduce city centre congestion, and improve access by sustainable transport to the city centre and key employment sites. Current projects include trials to restrict traffic through trips and a scheme to better manage goods vehicle deliveries. The GCP have developed a Future Bus Network concept which demonstrates their vision for a competitive, reliable future network.

The GCP is also working to address local energy grid capacity constraints. This work will address electricity distribution capacity and remove a barrier to take-up of electric vehicles and other renewable technologies. This will help facilitate the electrification (and thereby decarbonisation) of heat and transport in the city and surrounding area.



OBJECTIVE 4

Reducing consumption of resources, reducing waste, and increasing recycling in Cambridge

The national Climate Change Committee identifies that management of waste directly accounts for 6% of total UK greenhouse gas emissions¹. As shown by the SCATTER data in Figure 4 on page 11, solid waste disposal accounts for 3.7% of carbon emissions in Cambridge. However, the carbon emissions associated with waste are much higher if the carbon emissions associated with producing and transporting goods are taken into account, a significant proportion of which are ultimately thrown away.

In this chapter, we outline how the Council will work with residents, communities, businesses and other organisations to reduce consumption of goods, reduce waste and increase recycling rates.

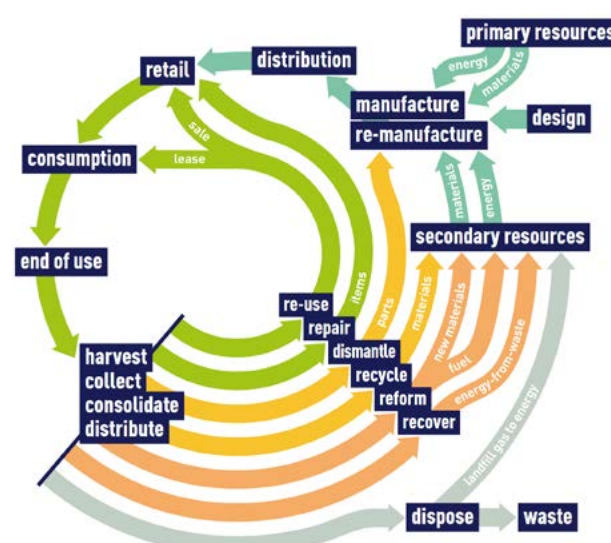


Opportunities to reduce waste and carbon emissions

Waste and carbon emissions can be significantly reduced through adoption of a circular economy approach. As shown by Figure 12, the circular economy approach involves a system where goods are constantly in circulation. It involves reducing the consumption of finite resources and increasing the use of renewable materials through reuse,

repair and recycling. A shift to a circular economy needs a combination of consumer awareness and action, national policy changes, and new business models.

Figure 12 – The Circular Economy



Source: SUEZ, A vision for England's long-term resources and waste strategy

Council services and communities – Increasing recycling rates

We can reduce waste and greenhouse gas emissions by recycling materials. Recycling waste diverts it from landfill, where organic material decomposes and releases methane, a powerful greenhouse gas. Recycling waste materials also reduces the need for manufacture of virgin materials to produce new goods.

The UK Climate Change Committee recommends that national recycling rates should be increased to 70% by 2030 if the UK is to reach net zero carbon emissions. This is significantly above the recycling rate Greater

¹ UK Climate Change Committee, 2020, The Sixth Carbon Budget: the UK's path to Net Zero, p30



Cambridge, which was 51% in 2019. The Greater Cambridge Shared Waste Service collected 102,474 tonnes of waste from households in the Greater Cambridge area in 2019, 52,253 tonnes of which was dry mixed recycling and organic waste for composting.

There is potentially scope to increase recycling rates in Greater Cambridge, but this would require significant buy-in from residents. As shown by Figure 13 below, recent analysis by the Shared Waste Service shows that 34.2% of waste in household general waste bins in 2019 was food waste, which could be recycled. A further 33% of material in general waste bins was material that potentially could have been recycled, including paper (12.6%), plastic film (8.9%), garden and organic waste (5.3%), textiles (3.6%) and glass (2.6%).

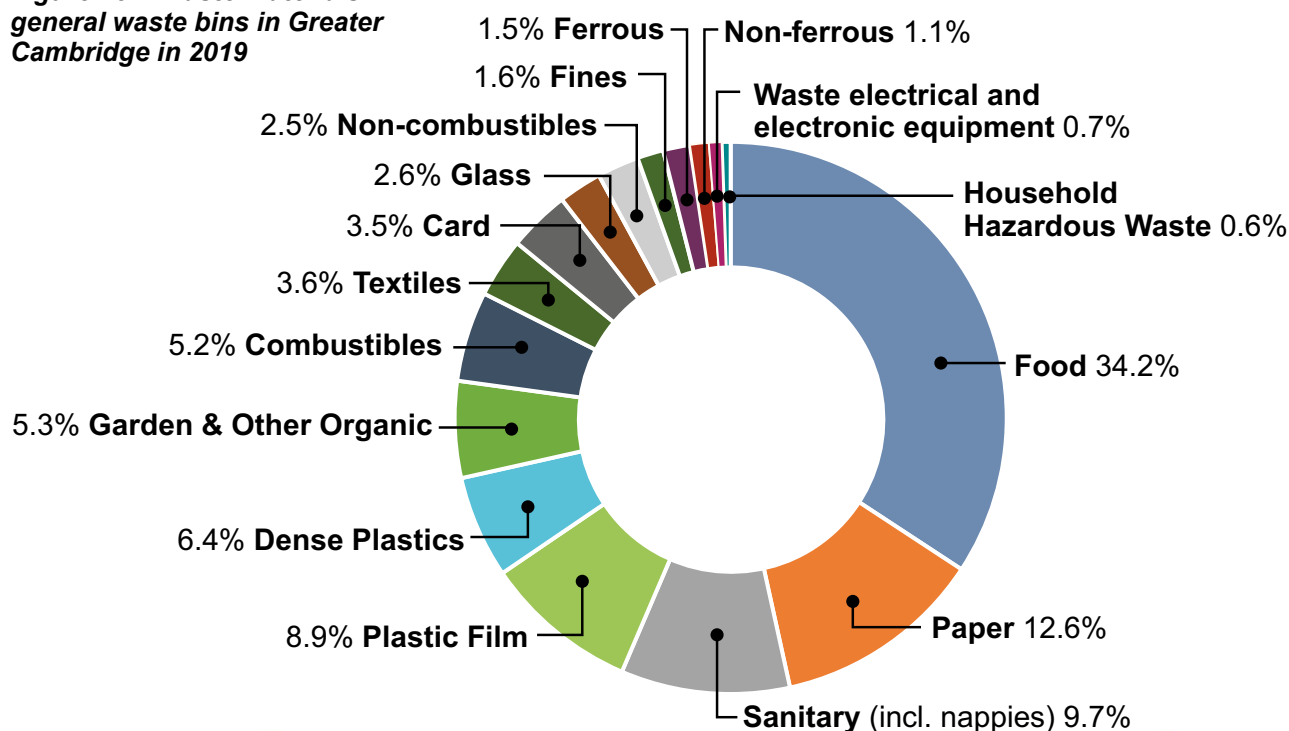
During 2020 the Shared Waste Service has carried out trials of separate food waste collections from selected households and is considering extending the trials to more households. These trials have shown that separating food waste can help increase recycling rates (by removing food waste from residual waste collections) and reduce waste (by showing people how much food they are throwing away, how much food they could have eaten, and how much food they didn't need to buy in the first place).



Caddies used to collect waste food in trial

The forthcoming Environment Bill and the Government's related new National Strategy on Recycling and Waste are likely to set out a more standardised approach for Councils to collecting waste in future. It is likely that all Councils will be required to collect food waste separately from 2023 onwards, and Government may provide funding to support this. To encourage more recycling, Councils may also need to consider separate collections for different materials and potentially restrictions on residual waste (through either smaller bins or less frequent collections).

Figure 13 – Waste materials in general waste bins in Greater Cambridge in 2019



The Shared Waste service will also continue communications campaigns to raise awareness and encourage residents to recycle more, using communications channels such as events, social media, leaflets and residents' magazines. The service has delivered campaigns on a regular basis using the national "Love Food Hate Waste" campaign. The latest 3 stage campaign is "Keep Crushing Food Waste", "Wasting Food: It's Out of Date" and, most importantly National Food Waste Action Week in March 2021, which is the first campaign specifically designed to highlight the link between food waste and climate change.

Some of these campaigns have been delivered in partnership with local voluntary and community groups such as Cambridge Sustainable Food. Other campaigns have focussed on increasing the quality of recycling collected by reducing the amount of food waste and other non-recyclable materials in recycling bins, which compromises the ability to recycle everything that is collected.



Home composting

Partnership working – Encouraging institutions and businesses to reduce waste and increase recycling

The Shared Waste Service also provides waste collection services on a commercial basis for over 3,000 institutions and businesses in the Greater Cambridge area.

The remaining businesses in the area use private waste collection companies to collect their waste. The recycling rate amongst businesses served by the Shared Waste Service tends to be between 24% and 26%, which is comparable to the amount of mixed recycling collected from households. The majority of commercial recycling collected is mixed dry recycling, with a significant proportion being organic material such as paper and card. The service also operates a food waste service, although no garden waste service is provided.

The Shared Waste Service is encouraging businesses to take up recycling collections, and currently charges less for recycling collections to increase take-up. Most commercial waste tends to be packaging and food waste, so the Shared Waste Service is working with Cambridge Sustainable Food on schemes to recycle and re-use food waste.

Businesses - Reducing packaging and make products more recyclable

Reducing waste and increasing recycling will require significant action by business. Manufacturers will need to design products so that they use fewer materials and components and are easier to re-use and recycle as a result. The National Waste Strategy is likely to incentivise this by producers have to pay for waste resulting from their products.

The Greater Cambridge Shared Waste service will work with businesses to reduce packaging and make products more re-useable and recyclable. The Shared Waste Service is a member of RECOUP, the industry body working with businesses on these issues, and the Service has also recently had meetings with a number of leading manufacturers about making specific products and packaging more recyclable.

Communities – Reducing consumption and re-using and repairing goods

We can reduce waste and carbon emissions by reducing the amount of new products and virgin materials that we purchase and use. This can be achieved by reducing the number of



non-essential new products that we purchase, and by making full use of the products that we do buy. A good example of this is food: 70% of the 6.6 million tonnes of food that was thrown away in the UK in 2018 could have been eaten.² This could be reduced if we only purchased what we needed and used all the food that we do purchase.



The Arbury Swap, Collect and Fix-Fest run by Cambridge Carbon Footprint

We can also reduce waste by re-using or repairing products rather than disposing of them. For example, doubling the number of times that a garment is worn can reduce its carbon footprint by 44%³. This could be achieved by wearing clothes for longer, repairing clothes, or swapping or buying clothes second hand.



Poster for CCF's Biggest Repair Cafe

For many years the Council has organised Community Actions Days that actively encourage re-homing and reuse of household items within neighbourhoods. As part of our previous climate change strategies, the

Council has also worked with local community groups to encourage residents to reduce consumption, and re-use or repair existing goods. For example, through its Sustainable City Grants fund, the Council has funded Cambridge Carbon Footprint (CCF) to run a series of events as part of their Circular Cambridge project, including:



CCF celebrating breaking the record at the Repair Cafe

- The world's largest **repair café** in 2017, which was attended by 550 people. There were a record-breaking 232 successful repairs of household items at the event.



Poster for the Sustainable Fashion Festival

- Cambridge's **first sustainable fashion festival** in November 2018, which was attended by 850 people and included a sewing repair café, a clothes swap, upcycling workshops and a pop-up clothes market.
- Further **engagement activities** in 2019/20 including stalls at local festivals, repair cafes and clothes swaps at Cambridge University events, and upcycled art displays.

² WRAP, 2020, Food surplus and waste in the UK - key facts, page 13

<https://wrap.org.uk/sites/files/wrap/Food-surplus-and-waste-in-the-UK-key-facts-Jan-2020.pdf>

³ Ellen McArthur Foundation, 2019, Completing the Picture: How the Circular Economy Tackles Climate Change, page 23



The Council also delivered or funded a number of activities in to encourage staff, residents and businesses to reduce consumption of single-use plastics, including:

- Supporting the national **Refill campaign** by promoting over 100 free drinking water taps in Cambridge, including drinking taps and fountains provided by the Council.
- Reducing plastics usage at **Cambridge Folk Festival** by using reusable polycarbonate glasses at the festival's bars, requiring traders to use bio-degradable cutlery, cups, and straws, and not to offer plastic bags and single serve condiments to customers.
- Reducing plastics usage at the **Big Weekend** event by providing drinking water stand pipes; provided free refillable water bottles in partnership with Cambridge Water; using returnable pint cups and a deposit scheme at the onsite bar; and a marketing campaign to encourage people to use re-useable water bottles and coffee cups.
- Regulations requiring that all **Cambridge Market traders** use cardboard or paper cups, trays, dishes or other biodegradable/ re-usable packaging for their products.
- Funding **Cambridge Eco-Living Initiative** through the Council's Sustainable City Fund to deliver an event at the Judge Business School to help SMEs to reduce plastic waste.

Over the next five years, the Council will continue to work with community groups to help reduce consumption and increase the repairing and re-use of goods and materials.



Cambridge Market



OBJECTIVE 5

Promoting sustainable food

The national Climate Change Committee identifies that agriculture was responsible for 10% of UK carbon emissions in 2019.¹ The Committee has highlighted agriculture as one of the key sectors which will need to be decarbonised if the UK is to reach net zero carbon emissions.² In particular, it identifies the need for a reduction in meat and dairy farming and an accelerated shift in diets away from meat and dairy products as key to reaching net zero carbon emissions³. This could facilitate a change in land use and reforestation of parts of the UK.



Poster for Cambridge Pumpkin Fest

If a wider food systems approach is taken, it is clear that the production, transportation, storage and retail of food makes a much greater contribution to climate change than agriculture alone. The United Nations' Intergovernmental Panel on Climate Change (IPCC) estimated that in 2019 food systems accounted for between 21% and 37% of total global greenhouse gas emissions.⁴

As part of its community leadership role, the Council aims to work to promote sustainable

food in Cambridge as part of its efforts to address climate change. The Council also recognises the key role that food can play in dealing with other pressing issues in the city, such as biodiversity loss, food poverty, and diet related ill-health.

Council services and policies – promoting sustainable food

The Council has limited direct powers and responsibilities in relation to food. The Council's statutory responsibilities in relation to food primarily relate to food hygiene and food safety, and through its mainstream activities, the Council seeks to promote public health and healthy lifestyles. As a district Council, we procure limited amounts of food (principally in sheltered housing schemes, and some community centres and leisure centres).

However, the Council published a Sustainable Food Policy statement⁵ in June 2018, setting out the steps it will take to help promote sustainable food in Cambridge. The council has also set out a number of actions in its Anti-Poverty Strategy and previous Climate Change Strategies that make a contribution to food health and sustainability issues. Some of the key actions that the Council is taking to deliver the commitments in these policies and strategies include:

- Incorporating sustainable food principles in council catering contracts and food procurement where possible.
- Encouraging providers at events in Cambridge, where we have an influence, to use sustainable food practice, where appropriate. The Cambridge Folk Festival has won the Green Festival award, and the Council has reviewed its approach to sustainability at the Big Weekend and Corn Exchange events.

¹ UK Climate Change Committee, 2020, The Sixth Carbon Budget: the UK's path to Net Zero, p30

² UK Climate Change Committee, 2020, The Sixth Carbon Budget: the UK's path to Net Zero, p14

³ UK Climate Change Committee, 2020, The Sixth Carbon Budget: the UK's path to Net Zero, p14

⁴ IPCC, 2019, Summary for Policymakers. In: Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems

⁵ Cambridge City Council, 2018, Sustainable Food Policy statement www.cambridge.gov.uk/media/6869/sustainable-food-policy-statement.pdf



- Maintaining occupancy rates at the 120 existing allotments at 8 sites managed by the Council. There are a further 14 sites managed by allotment societies. The Council also supports growing spaces at Queen Edith's and Cherry Hinton allotments and take-up of new allotments and community gardens in new housing developments to encourage residents to grow their own food.
- Using guidance in the Sustainable Design and Construction Supplementary Planning Document (SPD) to encourage developers to incorporate food growing in new housing and non-residential development (e.g. providing fruit trees, roof top gardens and growing space as part of landscape design).
- Encouraging residents to choose sustainable, local food and to reduce meat consumption through corporate communications messages.
- Supporting the Cambridgeshire Healthier Options⁶ awards initiative, which promotes healthy produce to small and medium food businesses. The Council engages businesses during routine food hygiene inspections to gauge interest, supports them in applying and undertakes assessment visits. There are currently 6 businesses in Cambridge that have achieved the award.
- Working in partnership with local voluntary and community groups to address food poverty, including working with Cambridge Food Poverty Alliance and Cambridge Sustainable Food to develop a food re-distribution hub.
- Working in partnership with communities and the voluntary sector to develop long term, sustainable food solutions that help to tackle food poverty and food waste. In 2020, 120 tonnes of food was redistributed to residents affected by the Covid-19 pandemic.
- Working with local churches and community organisations to provide free lunches for families during the school holidays. Wherever possible the holiday lunches group has sought to reduce use of meat and dairy products, minimise journey miles for lunch ingredients, and minimise food waste.

Partnership working – promoting sustainable food

In addition to the direct activity outlined above, the Council is keen to work with partners across the public, private and voluntary and community sectors who are already taking forward many valuable food initiatives in the city.

The Council has been an active member of the Cambridge Sustainable Food Network. We have supported the successful efforts of partners in the network to secure Bronze Award status for the city under the framework provided by the national Sustainable Food Cities Network and their award scheme. The partnership is currently aiming to achieve the Silver Award during 2021, which has more challenging targets for local partners to achieve, and ultimately hopes to pursue the Gold Award in future.



Receiving the Sustainable Food Cities Bronze Award

The Council has also recognised local voluntary group Cambridge Sustainable Food (CSF) as the lead organisation on sustainable food issues (a requirement of the Bronze Award), and has provided grant funding to CSF from its Sustainable City Grants and Community Grants for a number of projects since 2017, including:

- Organising a Summer Vegetable Festival in July 2019, which was attended by 3,365 people and involved 41 partners delivering 13 events.
- Running an annual Cambridge Pumpkin Festival from 2014 to 2017. The Festival has grown in popularity each year, reaching 3,700 attendances in 2017. The 10-day

⁶ For more information on Cambridgeshire Healthier Options visit: <http://www.healthier-options.org.uk/about/>



programme of festival events has included a 'Meet the Suppliers' pop-up farmers' market event, which proved particularly popular.

- A World War 2 rationing challenge in 2017, which 90 residents participated in.
- Holding community engagement stalls providing advice on food footprints at events such as Arbury Carnival, Chesterton Festival, Abbey Big Lunch and Council-organised Community Action Days.
- Developing community fridges to redistribute surplus food from local small and medium-sized food businesses.
- Providing a programme of more than 100 cookery sessions in areas of deprivation over 3 years, helping participants to prepare healthy, low cost meals.
- Developing and promoting a Sustainable Food Pledge and supporting 26 businesses to work towards the award from 2015/16 to 2017/18.
- Engaging with businesses to encourage them to reduce food waste, including media activity, developing online resources and working directly with 10 businesses, 6 of which implemented food waste reduction policies.



OBJECTIVE 6

Supporting Council services, residents and businesses to adapt to the impacts of climate change

The Council has an important role to play in managing the risks associated with climate change and preparing for and adapting to the impacts of severe weather. Climate change will increasingly impact on Cambridge residents, particularly those who are most vulnerable, and businesses. It will also affect council services, from the buildings that we manage through to open spaces and our role in emergency planning.

Action to develop climate resilience can also deliver wider environmental benefits, including protecting and enhancing landscapes and biodiversity and providing open space, which can support the delivery of health and wellbeing objectives.



Permeable paving at Abode on Clay Farm

Global and national climate change risks

At a global level, projected global temperature increases over the next 80 years would lead to mass species extinctions, food and

water insecurity, further increases in extreme weather events, flooding of coastal cities as a result of sea levels rising, and health impacts such as increasing prevalence of malaria. Even if the Paris agreement goals are delivered in full and global temperature rise is limited to 1.5°C, there will be further impacts from climate change beyond those already occurring today.¹

The most recent UK Climate Change Risk Assessment (CCRA) CCRA² produced in 2017 identifies six priority risk areas for the UK:

- flooding and coastal change
- to health and well-being from high temperatures
- water shortages
- to natural capital
- to food production and trade
- from pests and diseases and invasive non-native species

Climate change risks in Cambridge

While it is difficult to accurately project exactly how the climate in Cambridge will change, in 2009 the UK Climate Projections programme (UKCP09) provided projections of how the climate will change in the East of England, based on different carbon emissions scenarios. The three most likely effects of climate change for the East of England include:³

- Higher winter rainfall and increases in intense rainfall, leading to increased risk of flooding from rivers and watercourses or surface water flooding.⁴

¹ UK Climate Change Committee, 2020, The Sixth Carbon Budget: the UK's path to Net Zero, p16

² Department for Environment, Food and Rural Affairs (DEFRA), 2017, UK Climate Change Risk Assessment www.gov.uk/government/publications/uk-climate-change-risk-assessment-2017

³ Climate UK, 2012, A Summary of Climate Change Risks for East England: to coincide with the publication of the UK Climate Change Risk Assessment (CCRA),

⁴ Cambridgeshire Flood Risk Partnership 19, 2011, Cambridge and Milton Surface Water Management Plan (2011), and Cambridge and South Cambridgeshire Level 1 Strategic Flood Risk Assessment, 2010



- Drier summers, leading to water shortages and droughts.
- Increased summer temperatures, leading to overheating. For example, Cambridge experiencing the highest temperature ever recorded in the UK of 38.7°C in July 2019.

The likely impacts of these changes include decreases in human and non-human health and wellbeing; damage to built and green infrastructure; and increased demand and costs for public services.

Policy and regulatory powers – Existing Local Plan policies on adaptation

The national Climate Change Committee identified adaptation as one of the areas where local authorities have scope to influence by:

- using planning policies to ensure that development is located in low flood risk areas.
- using planning policies to ensure that new buildings and infrastructure are resilient to heat stress; and
- managing natural resources to promote biodiversity and reduce the risk of flooding.



A green roof helps slow down rainwater run-off

The Council has used policies in the current Local Plan, which was adopted in 2018, to ensure that new housing and non-residential developments in Cambridge include measures to manage climate change risks. Key policies in the Local Plan include:

- A requirement for major developers of new properties and redevelopment of existing floorspace to prepare a **sustainability**

statement which includes a focus on climate change adaptation. This includes focus on efficient water use, water re-use and recycling, and water management and conservation. Further guidance on climate change adaptation is included in the Greater Cambridge Sustainable Design and Construction SPD.

- A **water efficiency** policy requiring new housing developments to meet a standard of 110 litres/person/day or lower. Some developments are going beyond this standard utilising rainwater harvesting systems to further reduce potable water use.
- Policies on **flood risk** to ensure that new developments are not at risk from flooding, and that they do not increase the risk of flooding elsewhere.
- Policies on surface **water management** to reduce flood risk from new developments. This includes requirements for measures such as Sustainable Drainage Systems (SuDs), permeable paving and surfaces, and green and brown roofs on all flat roofs, which can help slow down surface water run-off and reduce the risk of flooding. There are many examples where these policies have been implemented, including new Council housing at the Ironworks on Mill Road and the Nine Wells private housing development includes.
- Policies on **paving over front gardens**, which permit paving only where there will be no adverse impact on surface water run-off, particularly for those areas of the city with high risk of surface water flooding



Sustainable drainage scheme providing biodiversity benefits at Nine Wells © Greater Cambridge Shared Planning Service



Policy and regulatory powers – new Local Plan policies on adaptation

It is anticipated that, subject to the outcomes of the current national consultation on planning reforms, the new Greater Cambridge Local Plan will also include policies on climate change adaptation. This could include water efficiency policies to help reduce water consumption and manage water resources; Sustainable Urban Drainage (SuDs) measures to help reduce flood risk; designing buildings that are simple to keep cool; and the role of cool building materials and green infrastructure.



'Brise soleil' help to control solar warming

As part of the evidence base for the new Greater Cambridge Local Plan, the Greater Cambridge Shared Planning Service has commissioned an Integrated Water Management Study.⁵ The initial findings of this work have found that in relation to water supply, the current level of water abstraction is unsustainable and needs to be significantly reduced to safeguard natural river flow. Depending on the level of future housing growth in Greater Cambridge, potential interventions range from greater water efficiency levels in new developments and existing housing, to a need for longer-term investment in new regional scale infrastructure, such as water supply reservoirs and transfer schemes.

Council services, businesses and residents – managing climate change risks

In addition to planning policies, we are taking a range of other steps to help Council services, residents and businesses to adapt to the impacts of climate change, including:

- Developing an Environmental Management System (EMS) for Environmental Services activity and seek ISO40001 accreditation. This will include a focus on reducing water consumption, potentially through reduce plant watering and sourcing water through rainwater harvesting systems for plant watering and public toilets.
- Moving to perennial plants which require less watering on Council-owned and maintained parks and open spaces.
- Measures to increase water efficiency (including the potential use of communal rainwater harvesting/reuse schemes) and reduce overheating in the Cambridge Sustainable Housing Design Guide, which sets standards for new Council homes and is promoted to private developers
- Working with Cambridge Water to promote water saving messages to residents and businesses.



A garden water butt to save water

⁵ Stantec, 2020, Greater Cambridge Local Plan Strategic Options assessment: Integrated Water Management Assessment



- Encouraging low income residents to switch to water meters (where this will achieve a bill saving) and promoting water saving measures to vulnerable and low-income residents.
- Working with Cambridgeshire County Council and other partners in the Cambridgeshire Flood Risk Management Partnership to manage climate change-related flood risks.
- Retrofitting flood measures at some vulnerable privately-owned homes.
- Providing advice to vulnerable residents on how to reduce health risks during heatwaves on the Council website and in Cambridge Matters (the Council residents magazine) and Open Door (the Council's magazine for its housing tenants).

Council land, residents, businesses and institutions – increasing tree canopy cover

As well as helping to absorb carbon emissions, trees can help reduce climate change impacts, such as overheating (by providing shade and cooling and reducing the Urban Heat Island effect) and flooding (by slowing surface water run-off). The Council is helping to enhance tree canopy cover and other “green infrastructure” in Cambridge by:

- Implementing the Council's tree strategy⁶, which focuses on managing over 30,000 trees on Council land sustainably and protecting and enhancing the 210,000 trees that exist on land owned by universities, hospitals, institutions, businesses, individual householders and other landowners. The strategy sets out 56 actions relating to the protection, management and enhancement of the urban forest
- Increasing the number of trees in Cambridge through tree planting activities. In 2019/20 the Council planted 500 trees and gave away a further 350 trees to residents as part of the ‘Free Trees for Babies’ scheme.
- Launching a major Cambridge Canopy Project⁷ which aims to significantly increase the tree canopy in Cambridge from 17%

to 19% of the area of the city (the average canopy cover in England is 16%).

Council land, residents, businesses and institutions – increasing biodiversity

Climate change is contributing to extinction of species and loss of biodiversity at a global level. As well as the huge environmental impacts, biodiversity loss due to climate change is predicted to impact on food security and the health, incomes and wellbeing of millions of people across the world.

At a local level, the Council has taken a range of action over the past 5 years to promote biodiversity, and to help the local environment to respond to climate change:

- Designating and managing 12 Local Nature Reserves to protect the best wildlife habitats in the city. We have delivered a number of projects to improve these reserves in recent years. For example, in autumn 2020 we worked with the newly formed Friends group to consult on proposals to double the area of Logan's Meadow Local Nature Reserve (LNR). This would include the creation of new fen and floodplain habitats, including wet woodland, grassland, reedbeds and scrapes.



The Rush, a natural bypass channel to aid fish passage at Sheep's Green

⁶ Cambridge City Council, 2015, Tree Strategy 2016-2026 www.cambridge.gov.uk/tree-strategy

⁷ For more information on the Cambridge Canopy Project see: www.cambridge.gov.uk/cambridge-canopy-project



- New back water habitats have been created along the River Cam at Trumpington Meadows, Paradise Local Nature Reserve (LNR) and Logan's Meadow LNR and natural bypass channels allowing fish passage at Byron's Pool LNR and Sheep's Green and Coe Fen LNR. Additional water course related projects are being developed at Jesus Green and Logan's Meadow LNR.
- Ceasing use of herbicides in maintenance of Council-owned parks and green spaces.
- Creating long grass and meadow areas across 15 acres of formal parks to create habitats for insects and predators and connect with other habitats.
- Using a new "cut and collect" machine to maintain road verges, which will reduce cuttings left on verges and improve the fertility of the soil for wildlife (subject to BSR)
- Watercourse restoration projects to improve their flow and storage capacity and deliver wider biodiversity benefits, including work at Cherry Hinton Brook and Sheep's Green Nature Reserve.

The Council declared a Biodiversity Emergency in May 2019⁸ and is currently developing a new Biodiversity Strategy for 2021 to 2030 (to replace its existing Nature Conservation Strategy⁹ for 2006-2026). The Strategy will focus on:

- Commissioning a biodiversity audit for the city to provide a baseline for measurement of future increases in biodiversity.
- Delivering a measurable biodiversity net gain on the City Council's land. This will be achieved through enhanced management of Council-owned land to make it more hospitable to wildlife, including existing

designated Local Nature Reserves and parks, open spaces, road verges and incidental spaces.



Cuckoo flower on Sheep's Green

- Engaging and influencing individuals, institutions and businesses to implement similar measures on their land to create a citywide network around the core LNRs.

The Greater Cambridge Chalk Stream project will be a key focus of the new strategy. Cambridge and the surrounding area has internationally rare chalk stream habitats, but these are affected by water extraction from the aquifers to provide drinking water for homes and other properties in the city. The Council and Cambridge Water has undertaken an assessment of the pressures facing our chalk streams and prioritised action for investment and community involvement. The Council will initially be focussing on making improvements to Cherry Hinton Brook, Vicars Brook at Coe Fen, and Coldhams Brook on Stourbridge Common.

⁸ For more information the Council's Biodiversity declaration see: www.cambridge.gov.uk/biodiversity-emergency

⁹ Cambridge City Council, 2006, Nature Conservation Strategy www.cambridge.gov.uk/nature-conservation-strategy



Glossary

Term	Meaning
BREEAM	BREEAM is an international sustainability scheme that provides independent third-party certification of the assessment of the sustainability performance of individual buildings and infrastructure projects. The BREEAM rating benchmark levels enables stakeholders to compare an individual building's performance with other BREEAM-rated buildings and the typical sustainability performance of new non-domestic buildings in the UK.
Building Energy Management System (BEMS)	Building Energy Management Systems (BEMS) are integrated, computerised systems for monitoring and controlling energy-related building services plant and equipment such as heating, ventilation and air conditioning (HVAC) systems.
Cambridge Sustainable Housing Design Guide	The 2017 Cambridge Sustainable Housing Design Guide set out key design principles for the development of council owned land and new social housing delivered by/for the Greater Cambridge Housing Development Agency (HDA) in Cambridge. For some areas, such as energy, water and space, the Guide includes performance specifications and minimum requirements. The Guide is currently being updated to reflect the standards agreed for new City Council homes to be built from 2021 onwards.
Cambridgeshire and Peterborough Combined Authority (CPCA)	The Cambridgeshire and Peterborough Combined Authority was established in 2017. It is made up of a directly elected Mayor, seven local authorities and the Business Board (Local Enterprise Partnership). The Combined Authority works with local councils, the Business Board, local public services, Government departments and agencies, universities and businesses to grow the local and national economy.
City Deal (Greater Cambridge)	The Greater Cambridge City Deal is a deal between central Government and local authorities in the Greater Cambridge areas which is providing up to £500 million funding over 15 years for transport, jobs, skills and homes.
Code for Sustainable Homes (CfSH)	The Code for Sustainable Homes (the Code) was an environmental assessment method for rating and certifying the performance of new homes. It was a national standard for use in the design and construction of new homes with a view to encouraging continuous improvement in sustainable home building. It was launched in December 2006 and withdrawn by Government in 2015.
Combined Heat and Power plant (CHP)	Combined heat and power (CHP) is a highly efficient process that captures and utilises the heat that is a by-product of the electricity generation process. By generating heat and power simultaneously, CHP can reduce carbon emissions by up to 30% compared to the separate means of conventional generation via a boiler and power station.



Term	Meaning
Energiesprong	Energiesprong is a whole-house approach to retrofitting homes developed initially in the Netherlands, and currently being introduced to other European countries including the UK. Energiesprong aims to achieve net zero energy in homes, by generating the total amount of energy required for its heating, hot water and electrical appliances onsite. This is achieved by using new technologies such as prefabricated facades, insulated rooftops with solar panels, and smart low-carbon heating and ventilation and cooling installations.
Energy Performance Certificate (EPC)	An Energy Performance Certificate (EPC) rates the energy efficiency and environmental impact of a property. It is rated on a scale from A to G (where A is the most efficient and G the least efficient).
Greater Cambridge Partnership (GCP)	The Greater Cambridge Partnership is the delivery body for the Greater Cambridge City Deal. The 4 partners are Cambridge City Council, Cambridgeshire County Council, South Cambridgeshire District Council and the University of Cambridge.
Greater Cambridge Shared Planning Service	The Greater Cambridge Shared Planning Service is the joint planning service for Cambridge City Council and South Cambridgeshire District Council. The service is currently developing a new Local Plan for the Greater Cambridge area and the North East Cambridge Area Action Plan.
Greater Cambridge Shared Waste Service	The Greater Cambridge Shared Waste Service is a joint service responsible for waste collection from domestic properties for Cambridge City Council and South Cambridgeshire District Council. It also provides a commercial waste collection service for businesses and institutions in the Greater Cambridge area.
Green Deal	The Green Deal was a government scheme that provided loans to households to finance energy-efficiency improvements. The loan was designed to be paid back through the savings made on energy bills. The original scheme ran from 2013 to July 2015, when the government stopped supporting the Green Deal Finance Company.
Green Homes Grant	The Green Homes Grant is a government scheme which provides funding up to £5,000 (or £10,000 for low-income homes) to homeowners for energy efficiency improvements to their homes, including the installation of heat pumps and new insulation. The scheme was launched in 2020, with total funding of £2 billion made available, including £500 million for the Green Homes Grant Local Authority Delivery (LAD) scheme, which provides funding for local authorities to improve the poorest performing properties.
Heat Pumps – Ground Source Heat Pumps (GSHP) and Air Source Heat Pumps (ASHP)	Heat pumps are a form of electric heating where energy is extracted from the environment in order to provide space or water heating at a high efficiency. They operate via a cycle of vaporization and subsequent condensation of a refrigerant and typically transfer an amount of heat energy 3-4 times larger than the electrical energy used. Air source heat pumps (ASHP) extract heat from the outside air, while ground source heat pumps (GSHP) use heat from the soil or ground water.



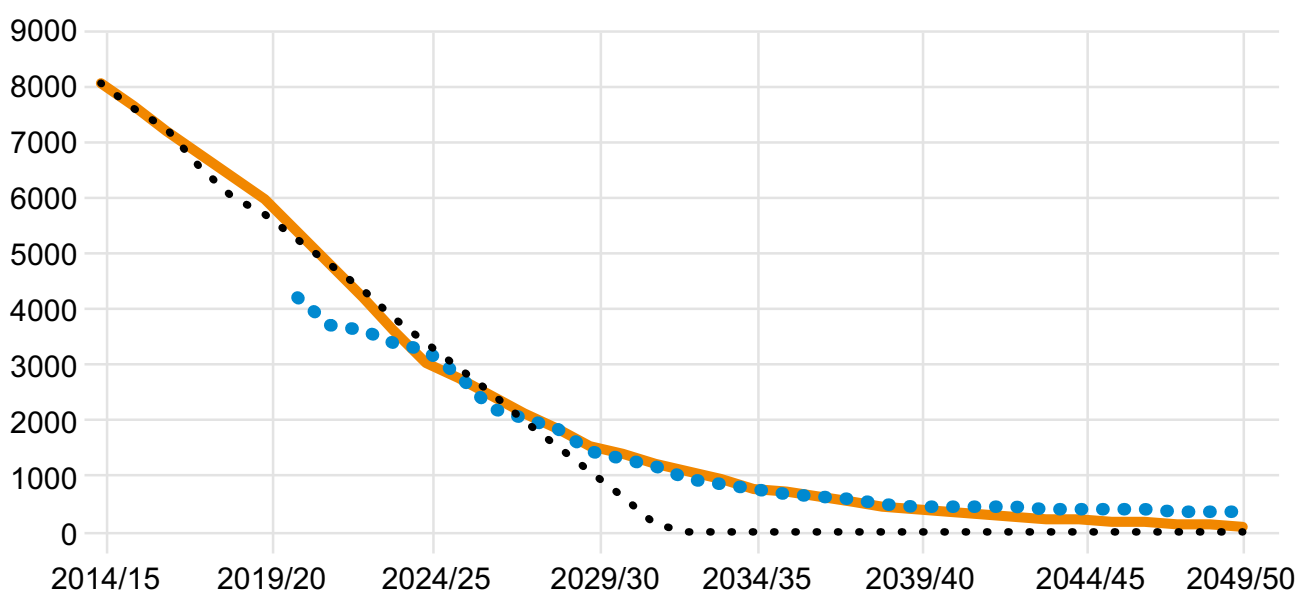
Term	Meaning
LED	A light-emitting diode (LED) is a semiconductor light source that emits light when current flows through it. LED lighting products produce light up to 90% more efficiently than traditional incandescent light bulbs.
Local Plan	Local Plans are prepared by Local Planning authorities to set out a vision and a framework for the future development of an area. They establish the number of new homes and jobs that should be planned for in the local area, where this development should take place, and the services, facilities and infrastructure that should accompany development.
Passivhaus	Passivhaus is a voluntary standard of energy efficiency in homes and other buildings. It focusses on a fabric-first approach to minimising energy consumption from space heating and cooling. Passivhaus buildings are well constructed, insulated and ventilated, so that they retain heat from the sun and the activities of occupants, requiring very little additional heating or cooling.
SAP rating	A SAP rating is a way of comparing energy performance of different homes – it results in a figure between 1 and 100. The higher the SAP rating, the lower the fuel costs and the lower the carbon emissions.
SCATTER	The SCATTER tool generates a local greenhouse gas emissions inventory following the Global Protocol for City-wide Greenhouse Gas emissions. It was developed by BEIS, Nottingham City Council, the Greater Manchester Combined Authority and the Tyndall Centre for Climate Research at the University of Manchester and Anthesis Group. For more information see: https://scattercities.com/
SMEs	Small and Medium-sized Enterprises (SMEs) are companies with 250 employees or less.
Solar PV	Solar electricity panels, also known as photovoltaics (PV), capture the sun's energy and convert it into electricity for use.
Solar thermal	Solar water heating (also known as solar thermal), is the process of capturing energy from the sun via the use of solar panels, to heat water for use.
Ultra-Low Emission Vehicles (ULEVs)	Plug-in hybrid vehicles (PHEV) or extended range electric vehicles (E-Rev) with carbon dioxide emissions less than 75g per km
Variable Speed Drives	A device that can vary the speed of a fixed speed motor or pump.
Voltage optimisation	Voltage management devices that reduce energy consumption by regulating incoming electricity supplies
Zero-emission vehicles	Vehicles those that emit no emissions during their operation. These include battery electric vehicles, hydrogen fuel cell vehicles, and electric vehicles



APPENDIX A

Potential future reductions in City Council carbon emissions

The chart below seeks to provide an indicative illustration of what the impact on the Council's carbon emissions could be, if we were able to implement all the potential carbon reduction measures identified by Bouygues, and assuming that these have the impact suggested by the modelling in the high-level study. The chart also provides an indication of how these reductions could compare with the carbon emissions pathway proposed by the Tyndall Centre above.



The chart takes the Council's total direct carbon emissions in 2014/15 (which were 8,041 tCO2e) as the starting point. The lines on the chart represent:

- The solid orange line shows what the 5-year percentage reductions in carbon emissions in the Tyndall Centre pathway for Cambridge would look like if they were applied to the Council's total direct carbon emissions from a 2014/15 starting point.
- The black dotted line shows the Council's actual total direct carbon emissions for the period from 2014/15 to 2019/20, and then what the Council's emissions would look like if the average rate of reduction for this period was sustained to 2030.
- The blue dotted line shows the total carbon emissions from the 29 buildings included in the net zero carbon study (a subset of the Council's total direct carbon emissions) and Bouygues estimates of how these could be reduced if the measures identified in the study were implemented.



APPENDIX B

Doughnut Economics model

