East Cambridgeshire District Council

ENVIRONMENT PLAN (YEAR 2)

A Strategy And Action Plan To Boost The Environment And Help Mitigate Climate Change

June 2021

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Foreword

In recognition of our declaration of a climate emergency, East Cambridgeshire District Council published its first ever Environment and Climate Change Strategy and Action Plan in June 2020. I am very pleased to introduce this second edition, June 2021.

I am delighted that this Council, over its first action year, has achieved a huge amount despite, like you, having to deal with the devastating impact of the pandemic.

We've seen real progress on our environment ambitions these past 12 months. My personal highlights include:

- 100% of electricity used by the Council is now sourced from renewable energy;
- We've replaced all street lights that we are responsible for with low energy LED bulbs;
- Based on robust evidence we gathered over the past year, we have successfully been awarded over £1m for energy efficiency improvements. This is new money, to spent this year, partly on our own buildings (The Grange, Ely), but the vast majority allocated for low income households in the district; and
- New planning policies adopted, which will help make sure developers do their bit for the Natural Environment and Climate Change.

But we need to step up our activities, go further and achieve more. And we urge you to do the same. If 2020/21 was the year of the pandemic, let's make 2021/22 the year of the environment, globally and nationally, from cities to hamlets, and right down to our own homes.

I'm delighted that the UK will be the centre of global environment attention later this year, as we host the UN climate summit in Glasgow (November 2021), bringing leaders from around the globe to hopefully agree the next steps in tackling climate change and boosting our natural environment. And I congratulate the UK government for committing in April to set the world's most ambitious climate change target into law, in order to reduce carbon emissions by 78% by 2035 compared to 1990 levels. I am also thrilled to read of the Queen's Green Canopy, a national programme of tree planting launched in May to celebrate the upcoming Queen's platinum jubilee. Also, the Environment Bill going through parliament this year will bring significant natural environment benefits to our country.

But protecting our climate and our natural environment needs action by everyone, not just governments. It requires action by individuals, community groups, businesses and other organisations. And that includes this Council. This Council needs to demonstrate that it is doing all it can to make a difference, whether that is by reducing its own carbon footprint, or by using its own land to help boost the natural environment. And it needs to use its leadership role to help facilitate and encourage others to also act.

This updated Plan reports on what we achieved over the past 12 months, and what we plan to do over the next 12 months. We've created a new Top 20 set of actions we intend to deliver, which includes:

- planting more trees on our land (including a new hedge-based maze, designed by you!);
- putting in place energy efficiency measures in our own buildings;
- investigating whether we can install our own renewable energy infrastructure;
- doubling our efforts to work in schools to help educate the next generation of climate and environment leaders; and

- offering free fruit trees to schools, community groups and parish councils, to help create community orchards of the future.

And we've set some new targets in this Plan, including an ambitious target of reducing our carbon footprint by up to one-third by 2026, and by another third by 2030, with a view to being a truly net-zero carbon council by 2040, ten years earlier than our original commitment set in 2019. It will be tough, but we can do it: by reducing as much as possible the energy we use; by moving away from using fossil fuels to electricity; and by generating our own renewable energy.

I'm really excited about the future. Let's change the focus from tackling a pandemic crisis to tackling the climate and biodiversity crisis. I want this Council to be at the forefront of that 'green recovery' agenda, and I would urge all of you to join us and play your part.

Together we can make a real difference; we can achieve a clean, green, East Cambridgeshire; and we can do our bit to minimise global climate change.

Anna Bailey
Leader - East Cambridgeshire District Council

Acknowledgements

In preparing this Environment Plan, the Council wishes to acknowledge the help and support of the County Council. With its agreement, we have aligned our Plan with its similar environment strategy, and have included similar diagrams and statistical evidence.

1 Introduction

The overriding context

The current generation has a duty to protect and improve the health of our planet for those that follow.

The world is facing unprecedented challenges in population growth, climate change, pollution and ever increasing and competing demands on its land and natural resources. By 2050 the world population is expected to rise from its current level of 7.7 billion to 9.8 billion[1]. There is global consensus that climate change poses significant risk to the health of the planet and its ability to sustain life.

Local Authorities have a responsibility, both in their own activities and those undertaken with partners, as well as in the influence they can bring to bear, to reduce the adverse effects of their populations on the planet.

East Cambridgeshire, and Cambridgeshire as a whole, is a growing area. Increasing populations result in increasing need for businesses, houses, health, retail and leisure outlets, transport and other supporting infrastructure, all of which can lead to adverse impacts on the environment. With growth comes a responsibility to balance competing demands and mitigate the negative impacts of that growth as far as is reasonably possible.

We know, and fully support, that residents are calling for action. We acknowledge that this Council has a significant role to play in protecting and improving the environment for future generations.

What have we declared?

In October 2019, East Cambridgeshire District Council declared a climate emergency and committed to the development of an annual Environment and Climate Change Strategy and Action Plan (our 'Environment Plan'). We published our first Environment Plan in June 2020, and, following a full refresh, we are pleased to publish this second Plan.

This Council acknowledges that our natural and built environment is the most precious inheritance for which we act as caretakers for the next generation.

We also accept that greater rigour is needed now, and hereafter, to protect our environment and mitigate the effects of climate change. We accept that every day action is delayed it becomes more likely we will pass irreversible environmental tipping points. Human driven climate change is one of the most complex issues facing us today. It poses significant risk to our health, our economy, our environment, and endangers the wellbeing of future generations.

Pollution, in all forms, is also another global environmental concern. It involves many dimensions – science, economics, society, politics and moral and ethical questions – and is a global problem, felt on local scales, that will be around for decades and centuries to come. People of all ages, all walks of life and all social and economic backgrounds are becoming increasingly concerned they will leave or inherit an environment that is irreparably damaged, forcing others to live with the consequences of the decisions we make today.

Carbon dioxide, the greenhouse gas that has driven recent global warming, lingers in the atmosphere for hundreds of years, and the planet (especially the oceans) takes a while to respond to warming. So even if we stopped emitting all greenhouse gases today, global warming and climate change will

[1] United Nations, Department of Economic and Social Affairs
https://www.un.org/development/desa/en/news/population/world-population-prospects-2017.html

continue to affect future generations. All Governments (national, regional and local) have a duty to limit the negative impacts of environmental change by cutting carbon emissions, protecting biodiversity and reducing pollution. The necessity of reaching net-zero was enshrined in UK law on 27th June 2019, requiring the UK to bring all greenhouse gas emissions to net zero by 2050. More recently (in April 2021), Government has committed to amending the law to include a new interim target of a 78% cut in emissions by 2035.

Human activity contributes significantly to the increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level. The International Panel on Climate Change (IPCC) estimates that human activity has already caused 1°C warming above pre-industrial levels. If temperatures increase at the current rate, warming is likely to reach 1.5°C between 2030 and 2052, leading to regional scale changes to climate including dramatic increases in the frequency and intensity of flood or drought events across the world, including the UK. These risks are set to increase should warming reach 2°C, and the longer that temperatures remain high, the harder it becomes to reverse the damage.

Balancing growth and environmental protection

As one of the fastest growing counties within the UK, Cambridgeshire experiences increased demand for things like housing, food, water resources and efficient public transport, all of which compete for land use and put pressure on our natural environment. Some land use changes bring negative effects to our environment, for example, damage to landscape from minerals extraction for building materials, loss of natural habitat, increased air pollution from power generation, unsustainable travel and the impact of agricultural pesticides on water quality and biodiversity.

Saying 'no' to growth is not an option. There is a pressing need for new homes and infrastructure, but we recognise the need for ***sustainable growth*** such as minimising the need to travel, providing sustainable transport options and reducing the carbon emissions from buildings, whilst enhancing natural assets through restoring local heritage, providing increased green spaces for people and nature and increasing tree planting to assist with shade and urban cooling.

Imperatives for Action

There are three clear imperatives for action, as outlined by the Global Commission for Adaptation, which will directly impact our ability to serve our communities in the most effective way.

The Human Imperative: Climate change exacerbates existing challenges to our services and the communities we serve. Increasing frequencies of heatwaves, flooding and its contamination of water supplies pose a particular threat for our most vulnerable residents. Climate refugees, people displaced from their homes as a result of the impacts of climate change, are likely to bring increased pressure on our social care delivery by 2050. It also puts an unfair burden on future generations who will have to cope with the challenges we are leaving them.

The Environmental Imperative: The natural environment is our first line of defence against extreme environmental events such as floods, droughts and heatwaves. A thriving natural environment is fundamental to effective and lasting adaptation. Yet, one in four species is facing extinction, about a quarter of all ice-free land is now subject to degradation, and ocean temperatures and acidity are rising. Climate change will bring adverse effects on our natural environment everywhere. We must protect and work with nature to build resilience and reduce climate risks at all scales before the damage has gone too far. Humans are, after all, part of nature, not apart from nature.

The Economic Imperative: Mitigation and adaptation are now in our strong economic self-interest: the cost of doing nothing far outweighs the cost of taking positive action now. The Global Commission on Adaptation has demonstrated that the overall rate of return on investments in improved resilience

is high, with benefit-cost ratios ranging from 2:1 to 10:1, and in some cases even higher. Introducing climate adaptation considerations into our financial decision making will have commercial benefit to our economy in the long run.

What have we done so far?

We know we can and must do more. But we should not dismiss the good work and action we have already completed. In our first Action Plan (June 2020) we set out what we had already achieved as a Council up to June 2020. In the last 12 months we have achieved further real progress to help protect the environment - see Chapter 6 for details.

We need to build on this positive work, to further embed positive environmental thinking, behaviours, and action throughout the Council, as an organisation, and to seek to influence partners and others to do the same. This updated Plan aims to further facilitate that process.

Our Vision (updated for June 2021)

> *Our vision for 2040 is to deliver net zero carbon emissions for the Council's operations and, in partnership with all stakeholders, for East Cambridgeshire as a whole, with clear and demonstrable progress towards that target year on year. At the same time, we will support our communities and East Cambridgeshire's biodiversity and environmental assets to adapt and flourish as our climate changes.*

Our vision also fully aligns with that of the County Council, as follows:

(Source of graphics: Cambridgeshire County Council Climate Change and Environment Strategy)

Interim Targets

This Council recognises the need to act fast now to reduce our net emissions as quickly as possible, and as deeply as possible, on our journey to net zero emissions.

As such, and new for this second edition Plan (June 2021), the Council is bringing forward by 10 years, from 2050 to 2040, its own net zero carbon emissions target date, and for the first time has set the following interim targets:

- A 20-33% reduction in our net CO_2e emissions by year 2025/26.
- A 66-80% reduction in our net CO_2e emissions by year 2030/31.
- A near 100% reduction in our net CO2 emissions by year 2034/35.
- A truly net zero carbon emission organisation by 2040, with no fossil fuel consumption.

For further information on how these interim targets have been established, and the assumptions and definitions used, please see section 3.

Purpose of the Environment Plan

The purpose of the Environment Plan is to provide a clear statement of the Council's climate change and environmental objectives and to set out how the Council will continue to address environmental and climate change challenges.

It will describe how we will look to address our own impacts and how working together with our public sector partners and our communities we will support the transformation needed across East Cambridgeshire to tackle these challenges.

Objectives

Our Objectives are to:

- Reduce our own, and the district's as a whole, greenhouse gas emissions to mitigate the impacts of human-made climate change;
- Support our communities and biodiversity to adapt to a changing climate;
- Improve East Cambridgeshire's natural environment for the benefit of present and future generations;
- Empower East Cambridgeshire communities and businesses to buy-into and support the delivery of the Plan;

Our Approach

To deliver the vison and objectives of the Plan we will continue to step up our engagement with Officers, Members, partners, businesses and our communities to build a shared understanding of the challenges and grow our collective knowledge, capacity and skills to create the vision we have set ourselves.

This will include:

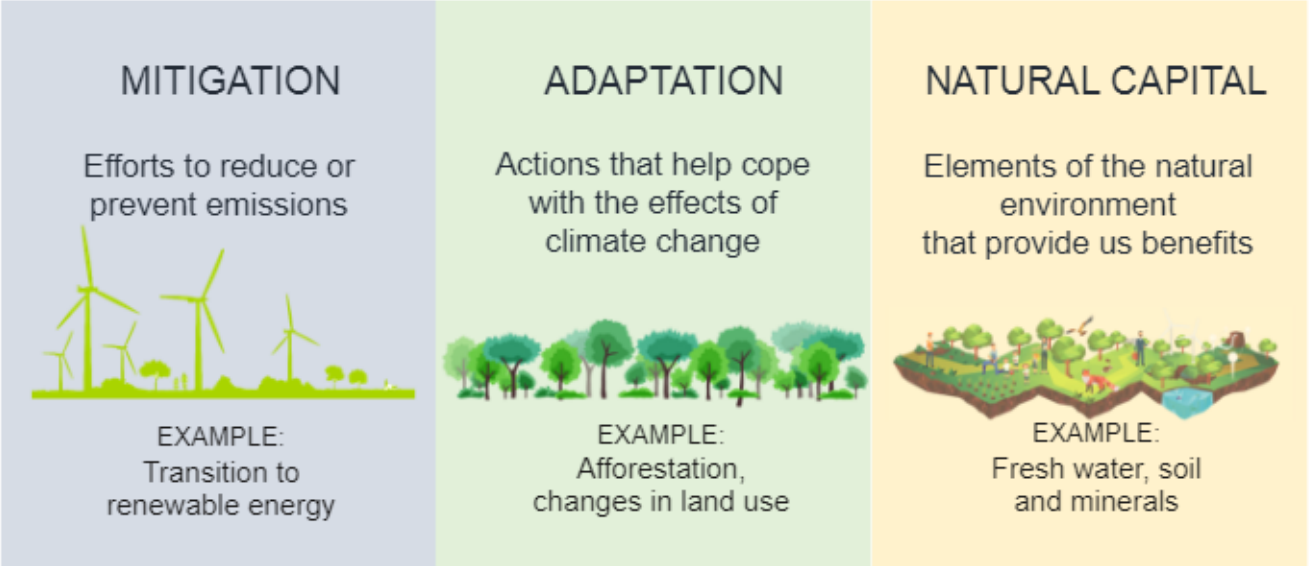
- Identifying, and keeping up to date (annually), the carbon footprint for the Council's operations and for the district as a whole;
- Monitoring and reviewing our carbon targets and tracking carbon emissions reductions for the Council's operational footprint and the broader impact of its activities and policies;
- Preparing and regularly updating an action plan with our staff, communities and partners that shows how we are going to deliver our Plan, where we will lead or where we must support or work with others to lead;
- Working closely with Cambridgeshire and Peterborough Combined Authority and Cambridgeshire County Council to support the implementation of county wide measures;
- Demonstrating leadership and setting a good example, through using our numerous statutory responsibilities and duties to bring forward positive change; and
- Financing the delivery of the Plan and providing a framework for the Council to inform its budget setting and delivery of its corporate priorities for the people of East Cambridgeshire.

Identifying the Key themes to build our Environment Plan

In preparing its own strategy, Cambridgeshire County Council identified, in 2020, three key themes covering technical, organisational and engagement aspects to provide the context and how we work with partners and our community. East Cambridgeshire District Council endorses these themes and, to assist with coordination of activities with the County Council, will use the same themes in this Plan.

They are:

- Quantifying our carbon footprints to inform and deliver climate change mitigation through efforts to reduce or prevent carbon emissions;
- Adaptation to cope with the existing and future impacts of climate change;
- Enhancing and conserving natural capital such as wildlife, plants, air, water and soils.



(Source: Cambridgeshire County Council Climate Change and Environment Strategy)

What is mitigation?

Mitigation of carbon emissions addresses the causes of climate change. It describes those actions which reduce, prevent or capture greenhouse gas emissions. Alongside the views of our communities, the current carbon footprints of both this Council as an organisation, and that of the entire geographical area of East Cambridgeshire as a whole, informs our action planning.

What is adaptation?

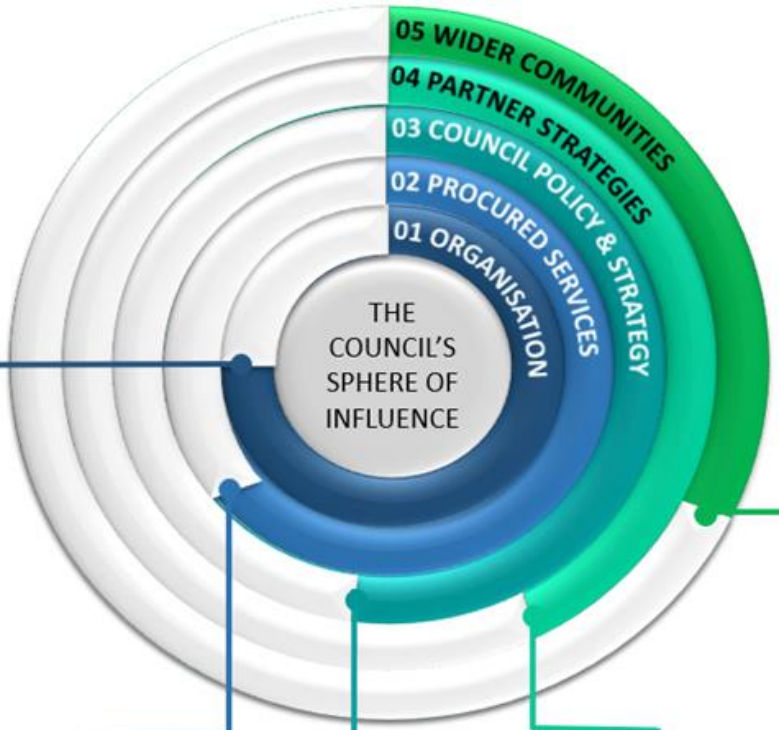
Adaptation consists of those actions that enable us to deal with the effects of climate change, such as flood risk management in response to heavier more frequent rainfall. We have commenced preparation of a separate document in relation to the adaptation actions the Council can take, though Appendix 3 has some preliminary views on how society can and will need to adapt.

What is natural capital?

Natural capital comprises our 'stock' of waters, land, air, species, minerals and oceans. This stock underpins our economy by producing value for people, both directly and indirectly. Goods provided by natural capital include clean air and water, food, energy, wildlife, recreation and protection from hazards. Improving our natural capital addresses how to enhance our existing nature reserves, improve biodiversity and tackle air, land and water pollution to keep our planet healthy for all species.

Control and influence of the strategy

This is a Plan for the Council (rather than the district of East Cambridgeshire) and identifies how we must work with our public and private sector partners and communities across East Cambridgeshire and beyond. As part of its strategy, the Council recognises what is under its direct control and wider influence. The diagram below was developed by the County Council, but is equally applicable to East Cambridgeshire District Council:



01 ORGANISATION

The Council has direct control over its carbon footprint

02 PROCURED SERVICES

The Council has direct control to set specifications for the procurement of goods and services

03 COUNCIL POLICY & STRATEGY

The Council has direct control of its policy making, but is influenced by community needs and partners

04 PARTNER STRATEGIES

The Council has influence on partner and governmental strategies, but no direct control

05 WIDER COMMUNITIES

The Council can influence our communities to share our vision and encourage them to take their own action

2 Mitigating Climate Change

Introduction

Mitigation can mean using new technologies and renewable energy, making older equipment more energy efficient, reducing consumption and waste, or changing management practices or consumer behaviour, to reduce or prevent emission of greenhouse gases and limit the magnitude or rate of long-term global warming due to human emissions of greenhouse gases.

It is important to understand that the sooner mitigation of carbon emissions occurs, the greater the overall reduction of carbon emissions generated by 2040. For example, if you reduce 20 tonnes of CO2 in 2020, this produces a cumulative impact of 400 tonnes reduction by 2040.

'Net Zero Carbon' means, first, the reduction of greenhouse gas emissions to the lowest possible level. Then, for any remaining emissions, offsetting them through carbon removal methods such as tree planting or carbon capture and storage, so we have 'net zero' emissions overall to the atmosphere.

However, offsetting should be seen as a last resort. Planting trees, even on a massive scale across East Cambridgeshire, will only go a tiny fraction of the way to balance out our current emissions.

For the UK as a whole, the net zero target legally must be reached by the end of 2050.

Pathway to Net Zero Carbon

(Source: Cambridgeshire County Council Climate Change and Environment Strategy)

Carbon Footprints

Before an individual, organisation or nation decides what it should do differently to reduce its emissions, it needs to properly understand what its current activities are emitting. This is sometimes known as working out a 'carbon footprint' which, in technical terms, is a measure of the greenhouse gases (GHGs)[2] emitted into the atmosphere from sources in a specified area or organisation. It usually includes all relevant greenhouse gases, the most common of which is carbon dioxide (CO_2). Emissions of other GHGs such as methane (CH_4) or nitrous oxide (N_2O), are measured in 'carbon dioxide equivalent' (CO_2e)[3].

[2] The main GHGs are: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6) and Nitrogen Trifluoride (NF3). The Kyoto Protocol – the international agreement addressing climate change - covers these seven main GHGs. The last four are fluorinated gases ("F-gases") which are a range of man-made compounds (including HFCs, PFCs, SF6 and NF3) used in a variety of industries including refrigeration, air-conditioning and the manufacture of cosmetics, pharmaceuticals, electronics and aluminium. F-gases are extremely potent greenhouse gases with some having GWPs of several thousand or more (BEIS, 2019a). The greenhouse gases covered by the Kyoto Protocol account for over 99% of global greenhouse gas emissions.

[3] By using CO_2e as a measuring tool means that the different global warming potential (GWP) of different gases are taken into account. Quantities of GHGs are multiplied by their GWP to give results in units of carbon dioxide equivalent (CO_2e)

Nationwide, emissions of CO_2 make up 81% of GHG emissions, with the remainder from methane (11%), nitrous oxide (4%) and fluorinated gases (3%), when weighted by Global Warming Potential (GWP)[4]. The biggest source of greenhouse gas emissions in the UK is transport, closely followed by energy supply.

To help set the wider context, this Environment Plan reports the carbon footprint of the geographical area of Cambridgeshire-Peterborough as a whole, then East Cambridgeshire as a whole, and finally that of East Cambridgeshire District Council as an organisation.

Whilst not an exact science, you can also have a go at calculating your own (or your family's) carbon footprint using an online tool such as https://footprint.wwf.org.uk/. Calculating a carbon footprint can provide a useful indicator of how much impact you or a business is having, and pointers to where action could be taken to reduce the footprint (and hence reduce your impact on the environment).

[4] Global warming potential. A factor describing the radiative force impact (degree of harm to the atmosphere) of one unit of a given GHG relative to one unit of CO_2.

Cambridgeshire-Peterborough's Carbon Footprint

In 2019, Cambridgeshire County Council's annual collaboration with the Cambridge University Science and Policy Exchange (CUSPE) brought a team of researchers together to develop an evidence base of current carbon emissions for Cambridgeshire and Peterborough (improving on the 'CO2-only' data published by the Department for Business Energy and Industrial Strategy), to provide a more accurate carbon footprint for the area.

This report found that Cambridgeshire and Peterborough communities together produced 6.1 million tonnes of carbon dioxide equivalent (CO_2e) in 2017. The breakdown of this is shown below (source: CUSPE) (LULUCF = land use, land use change and forestry).

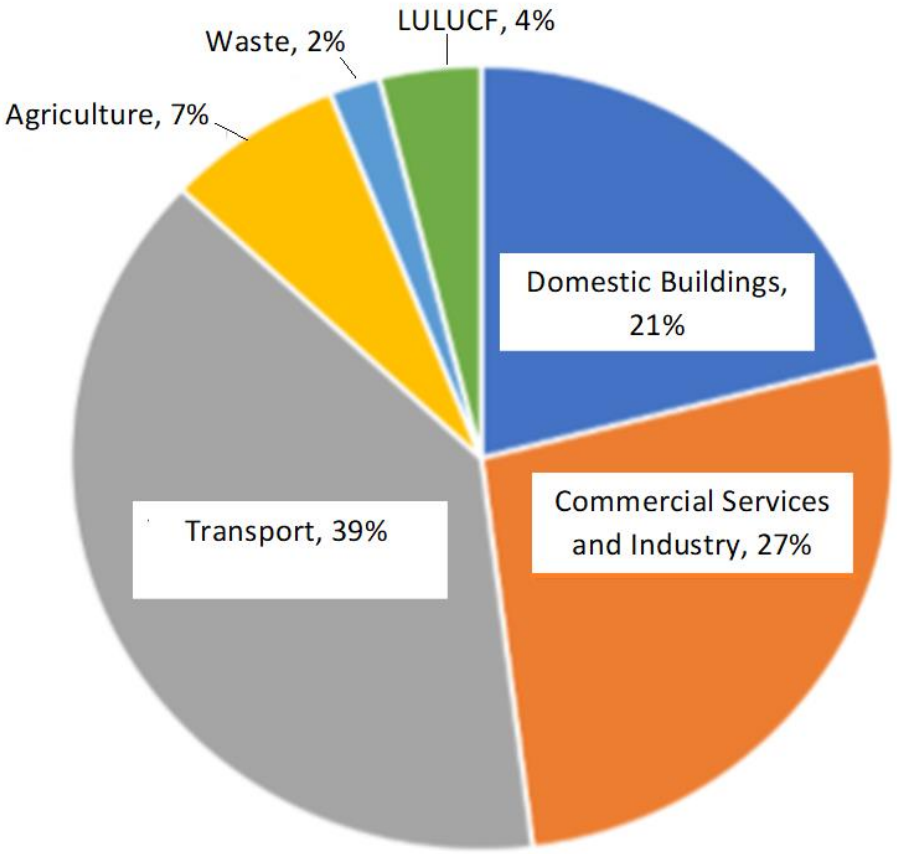


Figure: Breakdown of Cambridgeshire and Peterborough GHG emissions by source, 2017.

As well as looking at current emissions, the research team also modelled two scenarios projecting future emissions up to 2050; presented as: "business as usual" and "net zero emissions by 2050". The difference between the two scenarios highlights the policy gap to reach Government's ambition of net zero carbon by 2050.

This is illustrated on the following page.

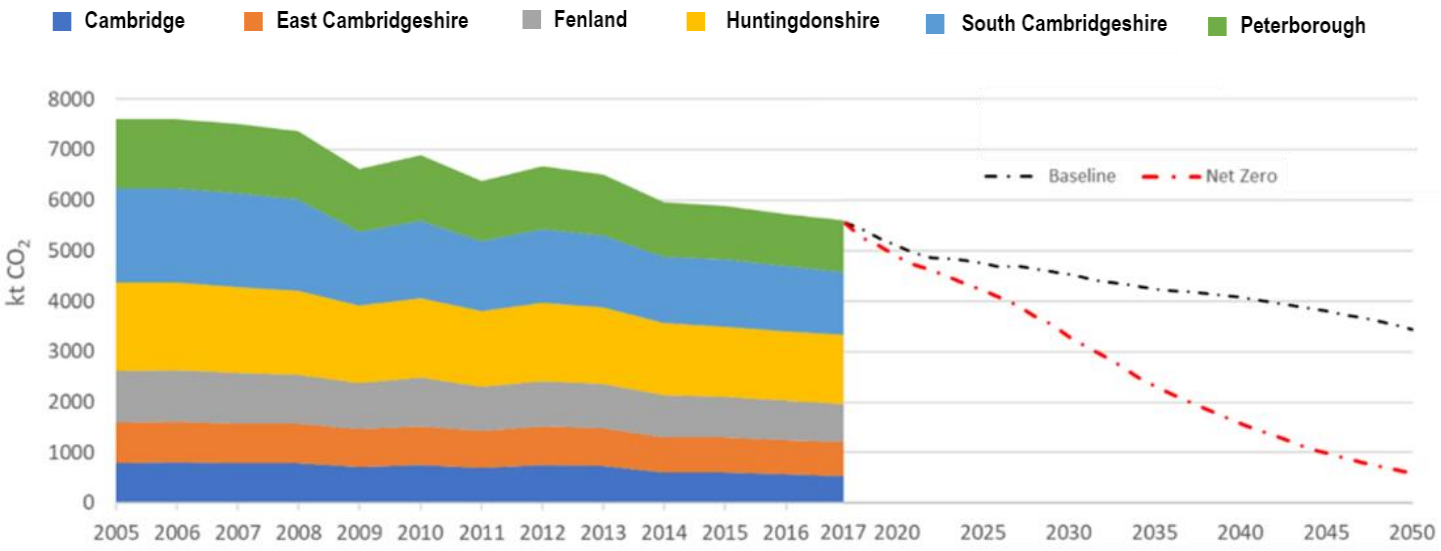


Figure: GHG Emissions Pathways to 2050 (Source: Cambridgeshire County Council Climate Change and Environment Strategy)

To achieve the ambitious reduction scenario, the report highlighted the key areas that Councils across Cambridgeshire, and their partners, should consider incorporating into new policy, including:

- Decarbonisation of heat and improvements to the energy efficiency of the housing stock;
- Implementation of low carbon heating and carbon capture and storage in commercial and industrial buildings;
- All cars, vans, buses and motorcycles and most HGVs to be electric, as well as shifting more transport away from cars to walking, cycling and public transport;
- A significant reduction of food waste, reduction of demand for red meat and dairy by 20%, and increased fertiliser efficiency, breeding measures, and livestock food additives;
- Deployment of carbon capture and storage on waste sites, increasing capture of landfill and compost gas emissions and electrification of waste transport;
- Extensive afforestation;
- Further research on peatland emissions and to work with experts to find the best solution to ameliorate the current impact of our peatland areas.

The full report from the CUSPE team can be viewed online here: CUPSE Report.

Cambridgeshire-Peterborough Independent Commission on Climate

More recently, and launched by the Combined Authority for Cambridgeshire-Peterborough in 2020, the Independent Commission on Climate produced its Initial Recommendations report in March 2021. That report puts a spot light on four key areas of transport, buildings, energy and peat. It also provides overarching recommendations, including the need for more investment into mitigating and adapting to climate change.

It gives some practical suggestions for how residents can take action themselves, and calls for Government to devolve more powers and funding to the Combined Authority and local authorities across Cambridgeshire to support the reduction in greenhouse gas emissions. A final report is due later in 2021. The Initial Recommendations report can be found at: https://f.hubspotusercontent40.net/hubfs/6985942/CLIMATE%20COMMISSION%20REPORT_Final.pdf .

East Cambridgeshire's Carbon Footprint

Ideally, the carbon footprint for the geographical area of East Cambridgeshire should comprise all GHG emissions that occur in the area – this includes commercial and industrial sources, domestic homes, transport, agriculture, waste and land use.

There is no simple 100% accurate way of calculating a carbon footprint, as it relies on a number of assumptions. The Government Department for Business, Energy and Industrial Strategy (BEIS) annually publishes detailed local authority level CO_2 emissions data. However, this does not provide data on the other recognised Kyoto Protocol GHGs emissions, collectively known as CO_2e emissions. As such, this data 'misses' 19% of all GHGs.

The data is published with a 2 year lag (year x-2), and therefore 2018 is the most recent data available. From this, it is evident the trend in East Cambridgeshire is reflective of the national trend: CO_2 emissions slowly and steadily declining over the last few years, due mainly to the decarbonisation[5] of the electricity grid. See figure below. Emissions from agriculture, waste and peatlands are not included in these figures because they primarily produce methane rather than CO_2, therefore are missed from these calculations (BEIS, 2020). The drying (due to intensive agriculture) of peatlands is also not included, but if they were included could increase the carbon footprint of East Cambridgeshire (more research is underway on this, by the Combined Authority and other partners).

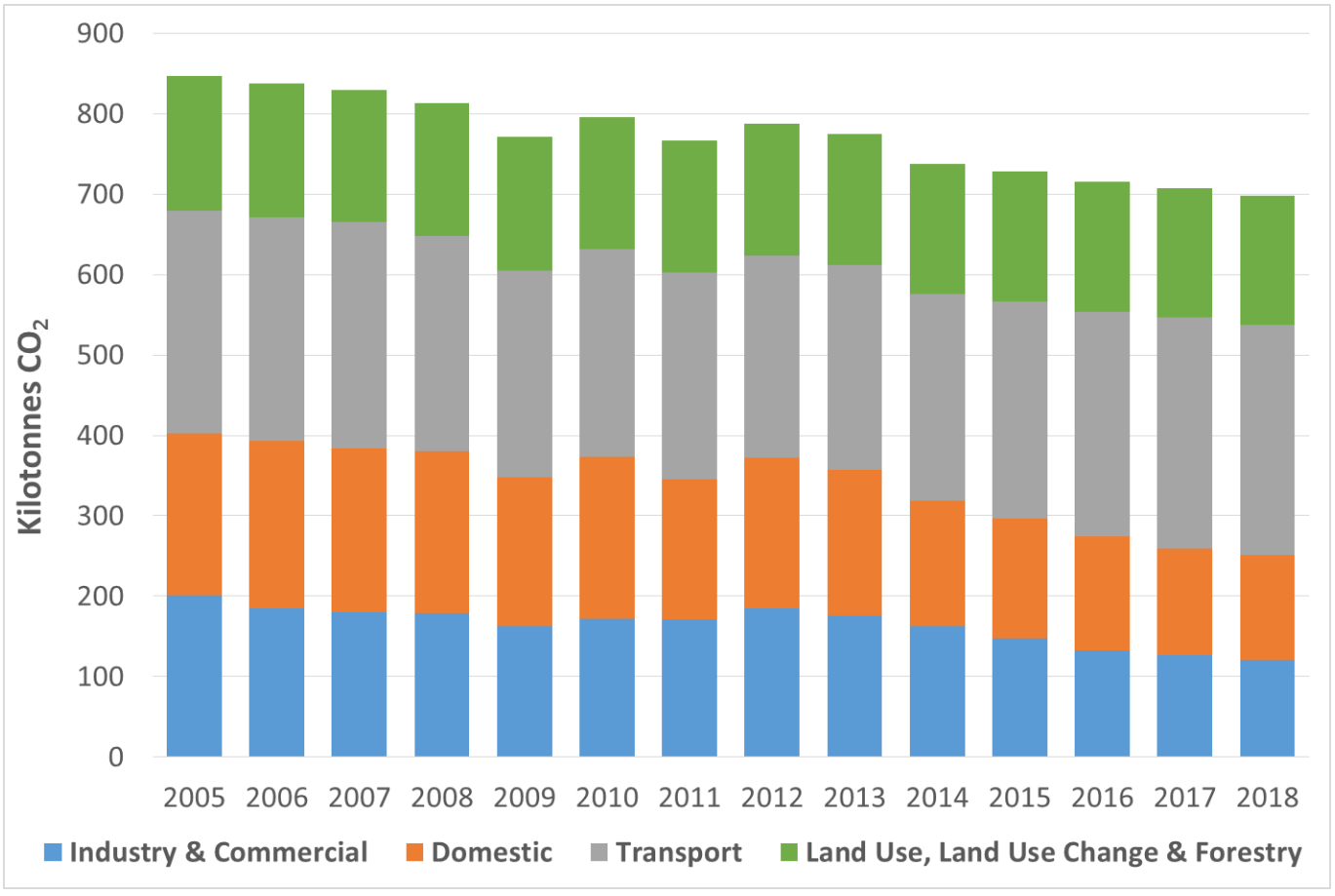


Figure: East Cambridgeshire's CO_2 emissions by end-user sector, 2005 – 2018 (BEIS, 2020)

[5] Decarbonisation means reducing the carbon intensity of energy in the national grid, this is achieved by reducing the proportion of fossil fuels and increasing the proportion of renewable energy sources such as solar and wind.

It is also useful to look at this data on a per capita basis. This shows that each resident in East Cambridgeshire is currently responsible for emissions amounting to 7.81 tCO_2 annually, illustrated in the figure below, significantly higher than the national average at 5.19 tCO_2. We are uncertain at this stage precisely why this is the case, though most of Cambridgeshire has a similar higher than national average.

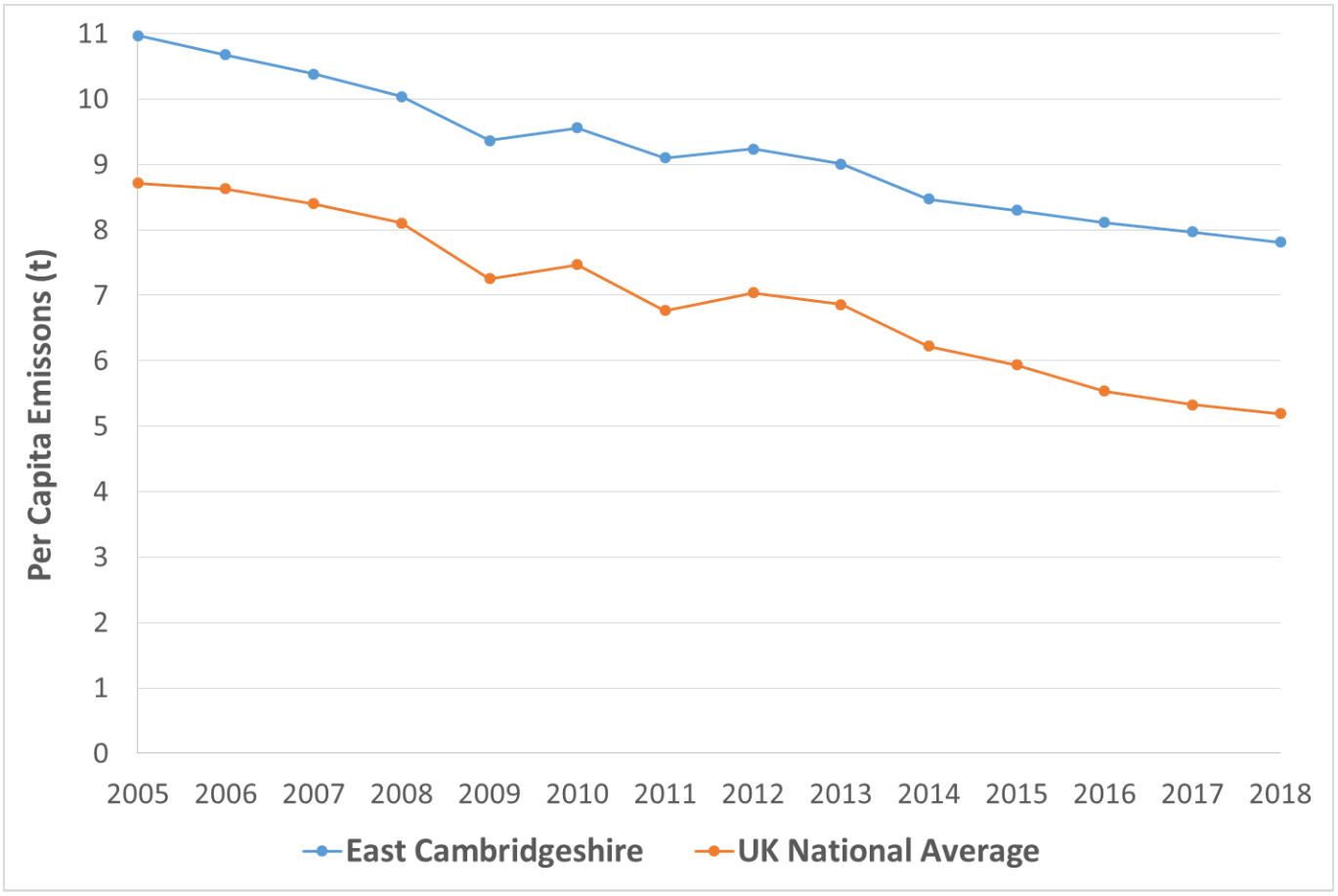


Figure: Per capita emissions for East Cambridgeshire and UK National Average, 2005 – 2018 (BEIS 2020)

East Cambridgeshire District Council's Carbon Footprint

Defining the Scope

The previous section, looking at Cambridgeshire-Peterborough as a whole, and East Cambridgeshire as a whole, used data collected and published by other parties. However, to work out the carbon footprint of an individual company or organisation, like East Cambridgeshire District Council, then a lot more data collection and analysis is required to determine a robust carbon footprint.

The starting point for carbon management is to accurately establish the emissions baseline. The scope of the baseline includes the required types and sources of emissions over a defined timescale. The baseline is a fixed point against which a reduction target can be set and future performance monitored. Our baseline was set as emissions arising in 2018/19 (details below).

Emissions-releasing activities are classified into three groups known as scopes. Scope 1 and 2 are generally considered to be areas that an organisation has a high degree of control over and can therefore reduce the resultant emissions significantly, if not completely. Scope 3 are considered to be indirect emissions that an organisation cannot directly control and therefore the ability to reduce emissions to net-zero is less realistic.

These scopes, and their relevant associated activities, are defined in the GHG Protocol Corporate Standard as follows:

Scope	**Definition / Activity**
1 (Direct)	***Emissions from sources that are owned or controlled by the organisation***
Fuels	Fuel sources combusted at a site or in an asset owned or controlled by the organisation.
Refrigerants	Refrigerants that leak from air-conditioning equipment.
Passenger vehicles	Travel in cars and on motorcycles owned or controlled by the organisation.
Delivery vehicles	Travel in vans and heavy goods vehicles that are owned or controlled by the organisation.
2 (Indirect)	***Emissions that are a consequence of the organisation's operations, but occur from sources owned or controlled by another company***
Electricity (grid)	Electricity used by an organisation at sites owned or controlled by them.
3 (Other Indirect)	***Emissions that are a consequence of the organisation's operations, which occur at sources which they do not own or control***
Business travel	Travel for business purposes in assets not owned or directly operated by the organisation.
Hotel stays	Overnight hotel stays for work purposes.
Material use	Process emissions from purchased materials.
Waste disposal	Emissions from end-of-life disposal of different materials using a variety of different disposal methods.
Water supply	Emissions from water delivered through the mains supply network.

Water treatment	Emissions from water returned to the sewage system through mains drains.
Transmission & Distribution	Emissions associated with grid losses (the energy loss that occurs in getting the electricity from the power plant to the organisations that purchase it).
Well-to-Tank (WTT)	Upstream emissions of extraction, refining and transportation of a primary fuel source prior to its point of combustion.

Table: GHG Emission scopes and associated emission releasing activities (BEIS,2020)

In order to then produce our organisational carbon footprint it is essential to accurately establish the scope of the operations on which our organisation will report. This process is known as defining the 'organisational boundary'.

The organisational boundary means establishing what activities and functions are counted (or 'in scope') for the purpose of determining the Council's overall emissions, and by default what activities and functions are not counted ('out of scope'). This stage of the process involves reviewing the Council's operations to determine activities that give rise to carbon emissions.

We have determined that it is appropriate to include the following sources:

Scope	Activities typical to an office based organisation		Identified Council emission sources
1	**Stationary**	Production of electricity, heat or steam	• Gas used in Council Offices e.g. The Grange • Gas used in buildings operated by the Council e.g. E-Space North
	Mobile	Transportation of raw materials/waste	• Travel in cars, vans and heavy goods vehicles operated by the Council
	Fugitive	Hydrofluorocarbons (HFC) emissions during use of refrigeration and air-conditioning equipment	• Air conditioning used in Council Offices e.g. The Grange
2	**Stationary**	Consumption of purchased electricity, heat or steam	• Electricity used in Council Offices e.g. The Grange, Portley Hill Depot • Electricity used in street and car park lighting which also includes road signs and illuminated bollards • Electricity used in business facilities operated by the Council e.g. E-space North, E-space South • Electricity used in public facilities operated by the Council e.g. Ely Market Square, Jubilee Gardens
3	**Stationary & Process**	Production emissions from purchased materials	***Excluded (see below)***
	Mobile	Transportation of raw materials/ products/ waste, employee business travel, employee commuting	• Staff business travel and accommodation • Employee commuting ***– Excluded (see below)*** • Supply and treatment of water used in Council Offices e.g. The Grange • Supply and treatment of water used in public facilities e.g. Public toilets

Table: Identified Council related emissions in relation to typical GHG emissions for service sector / office based organisations (WRI/WBCSD, 2004)

Excluded Emissions

In addition to those sources detailed above there are other areas which give rise to emissions that the Council feels should be included but for which, at this time, insufficient detail is held to enable them to be included. These all fall within the category of 'scope 3':

Scope 3

- Waste production
- Purchased materials
- Employee commuting
- Third parties

It is not unusual for such matters to be categorised as 'out of scope'. However, over time, we intend to make as many of these areas as possible 'in scope', therefore taking even greater responsibility for emissions arising, even where we don't have direct control over those emissions.

Data Collection

The energy data used to calculate the baseline was gathered from different sources, for example invoices received by the Council, annual energy statements from utility providers and property services. Work continues to ensure that this data is robust and systems are in place to ensure ongoing timely and accurate collection of such data.

Energy Type	Source	Data Quality/Estimation techniques
Gas	Energy invoices from different suppliers, meter readings.	Where estimations have been used records are held with source data. Methods include: Annualising consumption or average data calculated using bookended data.
Passenger vehicles	Staff mileage claims, fuel purchased and vehicle log books.	Annualising consumption where required
Delivery vehicles	Fuel purchased and vehicle log books.	Annualising consumption where required
Electricity	Energy invoices from different suppliers, meter readings.	Where estimations have been used records are held with source data. Methods include: Annualising consumption or average data calculated using bookended periods.
Business travel	Staff mileage claims	N/A
Hotel Stays	Staff claim forms	N/A
Refrigerants	Energy invoices	N/A
Water supply	Energy invoices from different suppliers.	Annualising consumption where required

Table: Source of data by energy type

Calculating the Baseline

To calculate CO_2e emissions arising, it is necessary to convert the 'raw' data (such as KWh of electricity used) into CO_2e emissions. This process is relatively straight forward, using what are known as 'conversion factors'. The carbon conversion factors used for this Plan are the 2018 UK Government published carbon conversion factors (BEIS, 2020c).

The Council will use the most up to date conversion factors each time it updates this Plan or reports on its carbon footprint. The key conversion factors used (for this second Plan, June 2021) are as follows:

Energy Type	Conversion factor
Fuels	
Natural Gas	0.18385 kg CO_2e / kWh (Gross CV)
Diesel (average biofuel blend)	2.59411 kg CO_2e / litre
Petrol (average biofuel blend)	2.20904 kg CO_2e / litre
Electricity	
UK electricity	0.2556 kg CO_2e / kWh (Gross CV)
Vehicles (passenger, delivery and business travel)	
Small diesel car	0.22868 kg CO_2e / mile
Medium diesel car	0.27459 kg CO_2e / mile
Large diesel car	0.33713 kg CO_2e / mile
Small petrol car	0.24736 kg CO_2e / mile
Medium petrol car	0.30945 kg CO_2e / mile
Large petrol car	0.45536 kg CO_2e / mile
Small car (unknown fuel type)	0.24072 kg CO_2e / mile
Large car (unknown fuel type)	0.36785 kg CO_2e / mile
Average car (unknown fuel type)	0.28502 kg CO_2e / mile
Water	
Water supply	0.344 kg CO_2e / cubic metres
Water treatment	0.708 kg CO_2e / cubic metres
Transmission & Distribution	
UK electricity	0.02413 kg CO_2e / kWh
Well-To-Tank	
Various	Various (dependant on fuel type)

Table: Key GHG conversion factors (BEIS 2020)

Overall Summary

The carbon footprint of East Cambridgeshire District Council (as an organisation) comprises emissions that occur as a result of the Council's own operations. We have calculated the carbon footprint of the Council's own operations in line with the UK Government's Environmental Reporting Guidelines for Voluntary Greenhouse Gas Reporting[6].

[6] These reporting guidelines are based on internationally-recognised standards from the World Resources Institute and World Business Council for Sustainable Development: the GHG Protocol Corporate Accounting and Reporting Standard, and the GHG Protocol Scope 3 standard. (BEIS, 2019a)

The first Plan, of June 2020, reported the baseline upon which future years progress will be monitored. That baseline carbon footprint (using data for the financial year 1 April 2018 to 31 March 2019) resulted in a **baseline carbon footprint for the Council**, as an organisation, **for 2018/19 of 1,317 tonnes of CO_2e** (full breakdown in the June 2020 Plan).

This second Plan, of June 2021, reports the carbon footprint for the Council for 2019/20 (i.e. to April 2020). It therefore accounts for emissions which occurred prior to the first Plan being produced in June 2020. As such, actions taken since the first Plan was agreed in 2020 are not reflected in the calculations for the carbon footprint reported below, but should start to be reflected in the June 2022 Plan onwards.

The resultant carbon footprint is calculated as being (**for 2019-20) 1,315 tonnes of CO_2e**. This is summarised in the table below:

Total Gross Emissions 2019-20	**Tonnes of CO_2e**	**% contribution**
for Scope 1 (Direct)	871	66%
for Scope 2 (Indirect)	120	9%
for Scope 3 (Other indirect)	325	25%
Grand Total	**1,315**	**100%**

Table: Emissions by scope, 2019-20

Scope 1 (direct) and scope 2 (purchased electricity) emissions amounted to 991 tonnes CO_2e. Scope 1 and 2 includes emissions from gas and oil for heating our buildings, electricity for our buildings and street lighting etc. and emissions from fleet vehicles.

Thus overall, in headline terms, the Council's carbon footprint for 2019/20 (1,315 CO_2e) showed little change from the baseline year of 2018/19 (1,317 CO_2e) being only slightly down by 0.15%, but as the figures on the next two pages demonstrate, there was a fairly significant drop in emissions from its buildings but an opposite increase in its vehicle's emissions, increasing the share of emissions via vehicles to over four-fifths of all the Council's emissions.

Further details on the 2019/20 carbon footprint are provided on the following two pages, starting with a breakdown in more detail of where the Council's emissions arise.

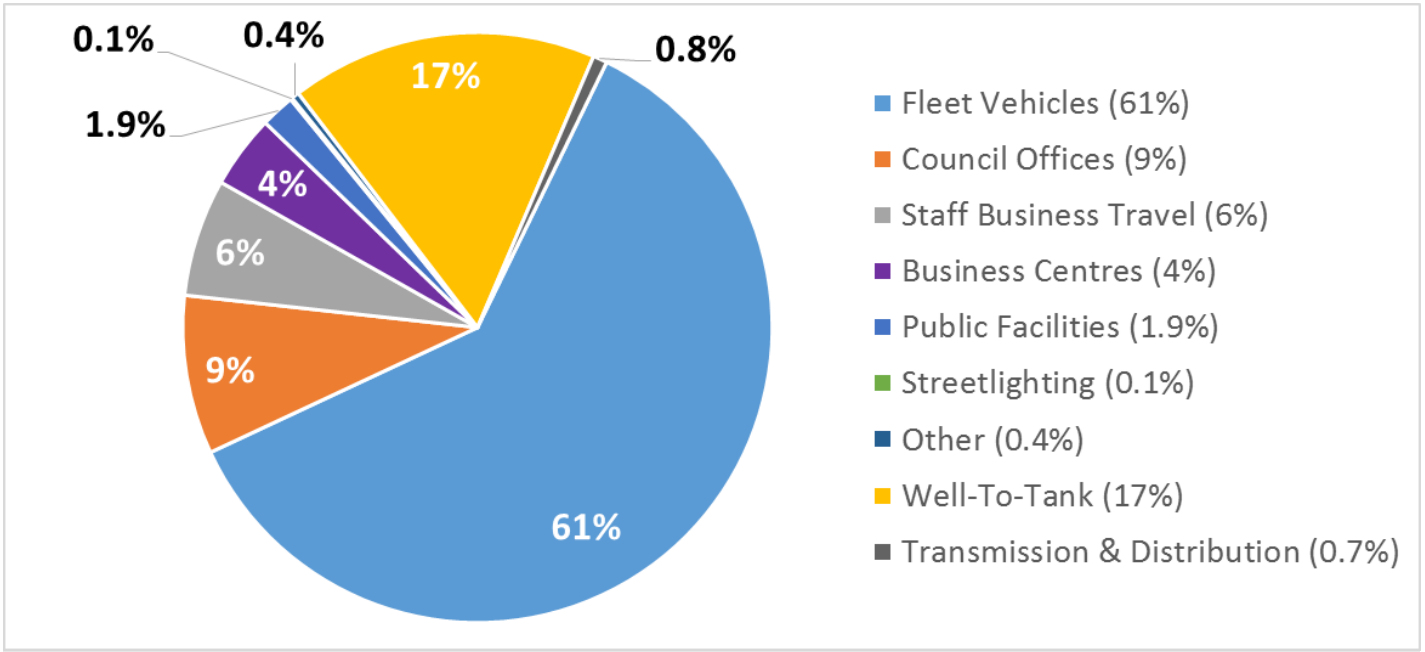


Figure: Emissions by business area, 2019-20

Understanding the Council's biggest emitters helps focus identification of projects, as set out in Section 6 of this Plan. The largest single contributing area is a consequence of the Council's 'fleet vehicles' (i.e. the vehicles it uses for waste collection, maintaining our parks and open spaces, general maintenance of our properties and land, and any lease vehicles; it also includes what is known as 'well to tank', that being the emissions arising from the production and distribution of fuel before it enters the vehicles). When the Council's fleet vehicles are combined with the relatively small (but still significant) staff business travel, the Council's 'transport' activities consequently result in 1,097 tonnes of CO_2e in 2019/20 (baseline = 1,049tCO_2e), which is 83.4% of the Council's entire volume of emissions. In comparison, the Council's buildings (such as The Grange and E-Space North) emitted 216 tonnes of CO_2e (baseline = 268tCO_2e), or 16.6% of the Council's emissions.

Of the Council's 'fleet vehicles', the following table breaks the figures down further, and also factors in the 'well to tank' element for each row. As can be seen below, the Council's waste collection vehicles are responsible for two-thirds of the Council's entire emissions:

Fleet Vehicle Activity	Fleet Vehicle Activity Distance or fuel consumed	Tonnes CO_2e (including well to tank element)	% of Council's entire emissions of 1,315 tonnes
Waste Collection (ECSS)	265,169 litres diesel	851	64.7%
General Maintenance	15,803 litres diesel & 4,276 litres petrol	62	4.7%
Parks and Open Spaces	22,257 litres diesel	71	5.4%
Lease Vehicles	15,907 miles	5	0.4%
Total (fleet vehicles as a % of Council's total GHG emissions)			75.2%

Table: Fleet vehicle emissions by activity

More detailed figures on all the Council's emissions are set out below (with 'well-to-tank' listed separately, rather than merged into the individual applicable rows):

GHG Emissions (Tonnes CO_2e)	Scope 1	Scope 2	Scope 3	Grand Total
Buildings & utilities	**71**	**119**	**26**	**216**
Electricity for Council Buildings	-	118	-	118
Electricity for Street Lighting	-	1	-	1
Gas Consumption	71	-	-	71
Water and sewerage	-	-	7	7
Transmission & Distribution	-	-	10	10
Well-to-tank emissions for fuels used	-	-	9	9
Transport	**800**	**-**	**297**	**1,097**
Staff Business travel	-	-	85	85
Fleet Vehicles	800	-	-	800
Well-to-tank emissions for fuels used	-	-	212	212

Waste	**-**	**-**	**1**	**1**
Council Building Waste Disposal	-	-	1	1
Grand Total				**1,315**

Table: Breakdown of emissions, tonnes of CO_2e

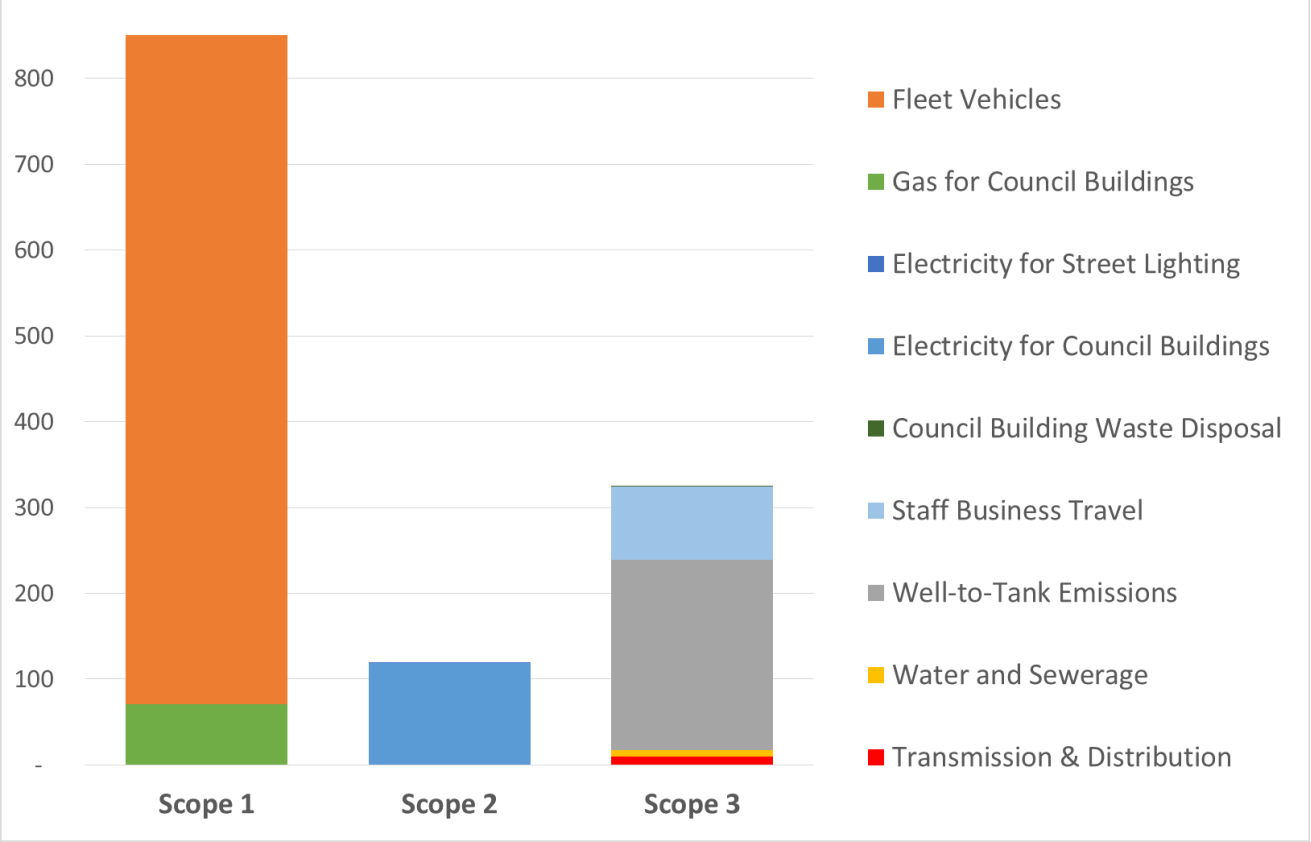


Figure: Breakdown of emissions by scope and type, tonnes of CO_2e

Intensity Ratios

Intensity ratios express the GHG impact per unit of physical activity or unit of economic value. It is common for organisations to report their intensity ratio, though this is only really of value when comparing one organisation with a very similar organisation, to see how a 'peer' organisation compares. The intensity ratio that is most relevant to the Council's emissions is tonnes of CO_2e per full time equivalents. The Council employed 183 FTE in 2019-20 which equates to an intensity measure of 5.41 tCO_2e/FTE (scope 1 and 2 only).

3. Carbon Emission Overall Target and Interim Targets

Introduction

When declaring a climate emergency in October 2019, the Council agreed that it "*will explore and consider…measures required and feasibility of reaching net zero carbon emissions by the Council by 2050".* The relevance of 2050 is important: it is the same year legally committed to by UK government, whereby UK greenhouse gas emissions by 2050 should be net zero emissions[7].

However, even since October 2019, the urgency to reach net zero as soon as possible is ever increasing, and the importance of deep, early cuts to emissions is increasingly needed. For example, national Government itself has recently (April 2021) committed to a 78% cut by 2035, as a step towards net zero by 2050. And new analysis shows that, across Cambridgeshire, we are starting at a higher baseline than most other area - our emissions are approximately 25% higher per person than the UK average[8]. Put another way, we have only about 6 years remaining under 'business as usual' before Cambridgeshire, as a collective, will have exhausted all of our 'allowed' share of emissions to 2050[9]. We can't, therefore, wait until 2050 to act. We have to act now.

As such, over the past 12 months, the Council has explored two matters: first, whether the 2050 date should be brought forward for the Council's operations to become net zero; second, establishing a set of interim targets to monitor progress towards net zero.

As set out in the previous section, the Council's 'carbon footprint' is 1,315 tonnes CO_2e in the financial year 2019/20. That is the figure we need to drive down as quickly as possible.

Determining interim targets requires an analysis of what is causing our emissions. The previous section highlighted the following:

- The Council's Fleet Vehicles (of which, waste collection vehicles are the primary source) are far and away the leading cause of the Council's emissions: around 75%.
- Our two main buildings also cause a significant contribution, with The Grange (predominantly heating, electric use): 10%; and E Space North: 5%.
- Vehicle business mileage, from staff and Members undertaking site visits or meetings etc (but does not include staff commuting; but such mileage would form part of an individual's carbon footprint) also makes a significant contribution: 7%.

To get to net zero emissions, then obviously each of the above contributors needs to reduce their fossil fuel consumption to zero (or close to zero) and do so by relying more on renewable sources of energy.

One option, especially in the interim stages towards net zero, is to produce more renewable energy than it consumes, to offset any remaining fossil fuel or other combustion fuel usage. However, this is not technically allowable under the true definition of 'net zero carbon' because it still involves the use of fossil fuels which are not offset by carbon capture. But, an argument can be made to use this as a basis for interim targets during the period when the national grid is still reliant on fossil fuels, because the renewable energy generated and exported to the grid should result in an equivalent reduction in

[7] - see The Climate Change Act 2008 (2050 Target Amendment) Order 2019

[8] - see Cambridgeshire & Peterborough Independent Commission on Climate, Interim Report, March 2021

[9] - see Cambridgeshire & Peterborough Independent Commission on Climate, Interim Report, March 2021

fossil fuels needed to be consumed by the grid (though this assumption will gradually become less reliable, as the grid on some days of the year (sunny and windy days) could be entirely renewable energy fed in any event, meaning any additional renewable energy fed into it by the Council's infrastructure would not be offsetting any fossil fuel use, unless such energy is stored in some way).

Overall, to get to net zero will require national measures (primarily, the 100% decarbonisation of the electricity grid, and the likely outlawing of fossil fuel direct combustion in vehicles). Ultimately, it will require society to be almost entirely run on electricity (rather than direct combustion of fossil fuels, such as gas, petrol and diesel), and that electricity created through renewable energy sources.

But, this Council does not want to simply 'wait for change to happen' and wait for measures to be mandated on organisations such as this Council. Indeed, many would argue we have a moral duty to make change happen, and quickly, in order for this Council to do its bit to help avert the worst of the emerging environmental crisis. As such, setting challenging organisational-targets towards net zero is a sensible and appropriate measure for all organisations, including this Council.

Establishing a set of Targets

So, what could those interim targets be for the Council? The Council has considered a wide range of evidence to inform its position, including:

- Research emerging from the Tyndall Centre, a partnership of universities bringing together researchers from the social and natural sciences and engineering to develop sustainable responses to climate change, which often broadly recommends that CO_2e emissions for an organisation should be reduced by an average of **13.5% per year, or 50% every 5 years**.
- The need for deep cuts in emissions to be made early, and the more difficult (smaller) cuts to be made later. One of the principles behind their approach is the idea that to meet Paris Agreement (2015) commitments and IPCC recommendations (2018) (i.e. limit global temperature to 1.5C increase), we have around 7 years of Business as Usual (BAU) carbon left to emit i.e. if we carry on as normal, within about 6-7 years from now, we would have used up our entire 'budget' of carbon that can be emitted if we are to stay within 1.5-2% rise in global temperatures. To stretch out those years beyond 7 years requires cuts to be made now, and the deeper the earlier cuts are, the longer you can stretch it out before you need to eliminate carbon emissions entirely (on a net basis).
- In December 2020, the UK Climate Change Committee published a 'world first' detailed route map for a fully decarbonised UK, and set a target of 78% cuts in emissions by 2035 (from a 1990 base – by 2019, UK emissions are already down 41% from 1990 base). Interestingly, such cuts by 2035 are not recommended to be evenly spread across all industries and uses, with some operations targeted as 100% net zero before 2035, and others (such as "trucks") being low carbon "by 2040". Turning the CCC 78% target by 2035 into an ECDC target is difficult, because of the 1990 baseline adopted by CCC, rather than our 2018/19 baseline. But, roughly speaking, and reflecting the 41% reduction already made nationally, it equates to a **65% emissions cut by 2035** as an ECDC organisational target.
- In April 2021, UK government backed the above target of a 78% cut in emissions by 2035, and committed to putting that target into law.
- Reviewing the targets being set by other Councils across the country, and their proposals to meet any such targets (though many Councils have set no target at all).
- Cambridgeshire-Peterborough Climate Commission work, as commissioned by the Combined Authority, which has published a set of interim recommendations including a recommendation

that “All…Council operations should be **net zero by 2030**, underpinned by a regional Science Based Targets (SBTi)-type action plan.”

- Consideration of targets and recommendations from a wide range of other organisations and lobby groups, such as, for example, that of Extinction Rebellion UK, which seeks the UK to become **net-zero by 2025**.

In determining an interim target, it has to be ambitious yet realistic. And, on that basis, it is a statement of fact that the biggest source of emissions by the Council is from its vehicle fleet, and of that (and by far), from its waste collection vehicles.

And therein lies a fundamental problem: reducing the emissions from our vehicle fleet is extremely challenging and not a straight forward problem to solve or plan for. First, it would require low carbon/electric waste collection vehicles to be available on the market, that can successfully undertake waste collection in a rural district such as East Cambridgeshire. Put simply, such vehicles are not presently available. Even if they were, or soon became available, they would require considerable capital cost to purchase (running into £m’s). And, to complicate things further, Government has delayed consulting and finalising its waste strategy, with such a strategy presently expected to dictate significant changes to the way waste is collected and managed, which means any early purchase of new vehicles now could be incompatible with that new national strategy and requirements.

Even if these hurdles can be overcome in the next few years, it also has to be factored in that getting rid of perfectly useable vehicles ‘early’ (i.e. before end of life), in order to switch to a low carbon vehicle, could arguably be a counter-productive measure from an emissions point of view due to the huge embodied carbon[10] in a new vehicle. This is because the embodied carbon in a vehicle is often greater than the carbon emissions emitted in the entire operating life of a fossil fuel consuming vehicle (it is, for example, accepted internationally that most petrol or diesel cars produced in the world consume more energy (and hence emissions of CO_2e) during the manufacturing of that car, than the car will ever emit through its entire life of petrol/diesel consuming use).

Thus, buying an electric waste collection vehicle or other low carbon vehicle may appear a good measure, and will actually reduce a council’s headline annual carbon footprint (especially if the vehicle is charged via renewable energy), but the net consequence on the environment may be worse due to the hidden carbon footprint of embodied carbon – put more simply, you could be doing wrong, when you think you are doing right. Taking the right decision, therefore, is not always a simple calculation, irrespective of the amount of money involved.

On the basis of the evidence available, therefore, it is not feasible to set a significant reduction in carbon emission from our (waste collection dominated) fleet vehicles until probably around 2030, when it is hoped such low carbon / electric vehicles will be available on the market. In the meantime, as an alternative, we should focus on making the delivery rounds of such vehicles as efficient as possible (and hence reduce the miles travelled), investigate whether any lower emission fuels are available to service the existing fleet (such as biofuels) and put in place a target date of securing low carbon / electric fleet vehicles starting from around 2030, and ending by 2035. Any new purchase in the meantime (to replace any vehicles which reach end of life prior to 2030), should focus on aligning to a new end of life of around 2030 to 2035.

[10] Embodied carbon includes any CO_2e created during the manufacturing of a product (eg building materials require material extraction, transport to manufacturer, manufacturing etc) and the transport of those products to the final destination (eg building materials to the building site). Put simply, embodied carbon is the carbon footprint of a product or project before it becomes operational or is used.

Turning to our office and other buildings, there is greater scope to reduce their carbon footprint in the shorter term, through a combination of energy efficiency measures, behaviour change (of staff occupying and using such buildings) and through renewable energy generation. As part of that process, we should make the transition away from gas heating to electric based heating, but only when such gas heating systems reach, or are close to reaching, 'end of life', again for embodied carbon reasons. Again, we could target a 2030 date for such a transition to take place.

However, even if we implemented all of the above by, say, 2030 or 2035, for vehicles and for buildings, the Council would not be 'net zero' because of the carbon element of electricity. For example, an electric vehicle in use today is not 'carbon neutral' if it is charged up via the grid (the grid still being powered by gas and coal to a significant degree).

Thus, to align to the 'net zero' aspirations, the Council itself would need to generate the same amount of electricity from renewable sources as it consumed, at least until the national grid was truly decarbonised. To do this, the Council would need to explore direct investment in renewable energy generation, on its own land, on a commercial scale. For example, rather than the Council focussing only on reducing its energy use, it also focusses attention on generating renewable energy in the first place. And, in doing so, determines how, for each £1 spent, the greatest net CO_2e savings can be achieved.

For example, once the easier and relatively inexpensive energy efficiency saving measures have been taken (on our buildings or vehicle routes), chasing further savings may cost a lot of money for very little CO_2e saving. A more effective measure could be to generate renewable electricity ourselves, so that overall our emissions are reducing towards net zero on an interim basis. Of course, land will be needed to make this happen (and may have to be bought if not available). There will also be planning issue to consider, as well as local community views on installing renewable energy infrastructure. But, very approximately, and subject to those issues and constraints, an investment of around £2m in renewable infrastructure (e.g. for a relatively small solar PV farm (5-8ha), or 1-2 wind turbines) would likely generate enough electricity and CO_2e savings equivalent of the entire CO_2e that ECDC presently emits, per year. That investment would, of course, also deliver an annual financial return from the selling of such generated electricity.

This Council has agreed to investigate the potential of this option, and is presently securing preliminary advice on what its options are. The most promising appears to be PV solar panels on its own land, potentially acting as a 'roof' over one or more of its car parks.

If the investigations prove that a deliverable and viable option exists, then it is feasible for such measures to be in place by 2025, and the scale of which could steadily grow up to 2030 and beyond.

Bringing all of the above together, the evidence is pointing to the following **ambitious interim targets** as being realistically possible (though note the definition of what is a 'net reduction' in the third bullet, and also note the risks on the following page):

- **A 20-33% reduction in our net CO_2e emissions by year 2025/26.** That will be achieved via: reduced energy use in our buildings; a lower carbon conversion factor for the energy we do use, due to the broader national decarbonisation of the electricity grid; maximising the efficiency and performance of our existing fleet vehicles; investment in our own renewable energy infrastructure; and minimising the use of business miles of our staff.
- **A 66-80% reduction in our net CO_2e emissions by year 2030/31.** That will be achieved via further investment in our own renewable energy infrastructure; some investment in electric based fleet vehicles; and (potentially) moving off the gas grid to heat our buildings.

- **A 100% net reduction (i.e. near or at net zero position) in our CO_2e emissions by year 2034/35**. That will be achieved by moving to a vast majority, if not entirely, electric based vehicle fleet; zero gas use in our buildings; and further investment in renewable energy infrastructure.

  (*Note: This '100% net reduction' target will not mean a truly 'net zero carbon' organisation at this stage, because greenhouse gas reporting accounting rules dictate that if an organisation sources any electricity from the national grid, and the national grid is not yet fully decarbonised, then that organisation still causes emissions. Put another way, an organisation cannot 'net off' any renewable energy it generates, unless such energy is directly consumed by the organisation (i.e. it would have to have no grid consumption to be truly net zero carbon). However, from a headline perspective, we believe it is reasonable to claim a '100% net reduction in our emissions' if, on a net basis, we use no fossil fuels directly (petrol, gas, diesel) and produce at least as much renewable electricity as electricity we consume; or, if we still have some limited direct fossil fuel use at this stage, we produce more renewable electricity than (a) the electricity we consume and (b) enough renewable energy to offset the remaining fossil fuel use.*)

- **A truly 'net zero carbon' organisation (and potentially negative carbon emission organisation) by 2040.** To achieve this will almost certainly require the national grid to be 100% decarbonised, and the organisation will use no fossil fuels for any of its operations. To be a negative carbon emission organisation, the organisation will generate more electricity than it consumes and, if technology exists, the excess electricity generated would be used to extract CO_2e from the atmosphere ('carbon capture'), making the organisation a negative contributor to CO_2e levels in the atmosphere.

There are, of course, a number of challenges and risks in reaching such targets. These include:

- The rate of decarbonisation of the national grid fails to materialise as expected.
- Electric HGV-style vehicles do not get developed in the market place, or are prohibitively expensive, in the next 5-10 years.
- No feasible (practical, deliverable, affordable) means of establishing our own renewable energy infrastructure arises in the next 3-10 years.
- Energy use in our buildings (and/or the carbon intensity of such energy) does not reduce as hoped for, despite investment and staff training.
- National policy or legislation changes results in a greater level of service requirements being deployed (such as increased waste collection and waste separation) which results in increased emissions.
- Growing populations and households, meaning the Council is serving more people over time and consequently (all things being equal) would result in a rise in Council emissions (for example, the housing stock of the district is rising by 1-2%pa, which means 1-2% more homes every year requiring their waste to be collected, which will cause an increase in emissions arising to collect such waste).
- Unforeseen events / emergencies (such as the covid pandemic), which disrupts efficiency savings and requires increased energy use.
- The interim targets of 2025/26, 2030/31 and 2034/35 are all on the basis that we calculate our net emissions by offsetting our fossil fuel use with renewable energy generated (accepting that this method is not truly in line with the definition of how 'net zero carbon' should be calculated). The 2040 target is, however, in line with the true definition of net zero, because it involves no fossil fuel use.

The targets set out, therefore, should be regarded as ambitious, working towards targets, rather than fixed guarantees. Indeed, the Council would like to exceed them, if at all possible, but is equally mindful that many events are beyond its control which could impair its ability to achieve them.

4. Biodiversity and the Natural Environment

Introduction

Our environment provides numerous benefits to people and communities' humanity, many of which are fundamental to our lives. It enables the food we eat to grow, clean air to breathe and water to drink. This is referred to as the 'regulating' services or benefits we get from nature. We also, of course, derive huge cultural, mental health and wellbeing benefits from the natural environment all around us.

Put another way, damaging our natural environment, especially if beyond recovery and repair, will mean a diminished quality of life for us all and for future generations.

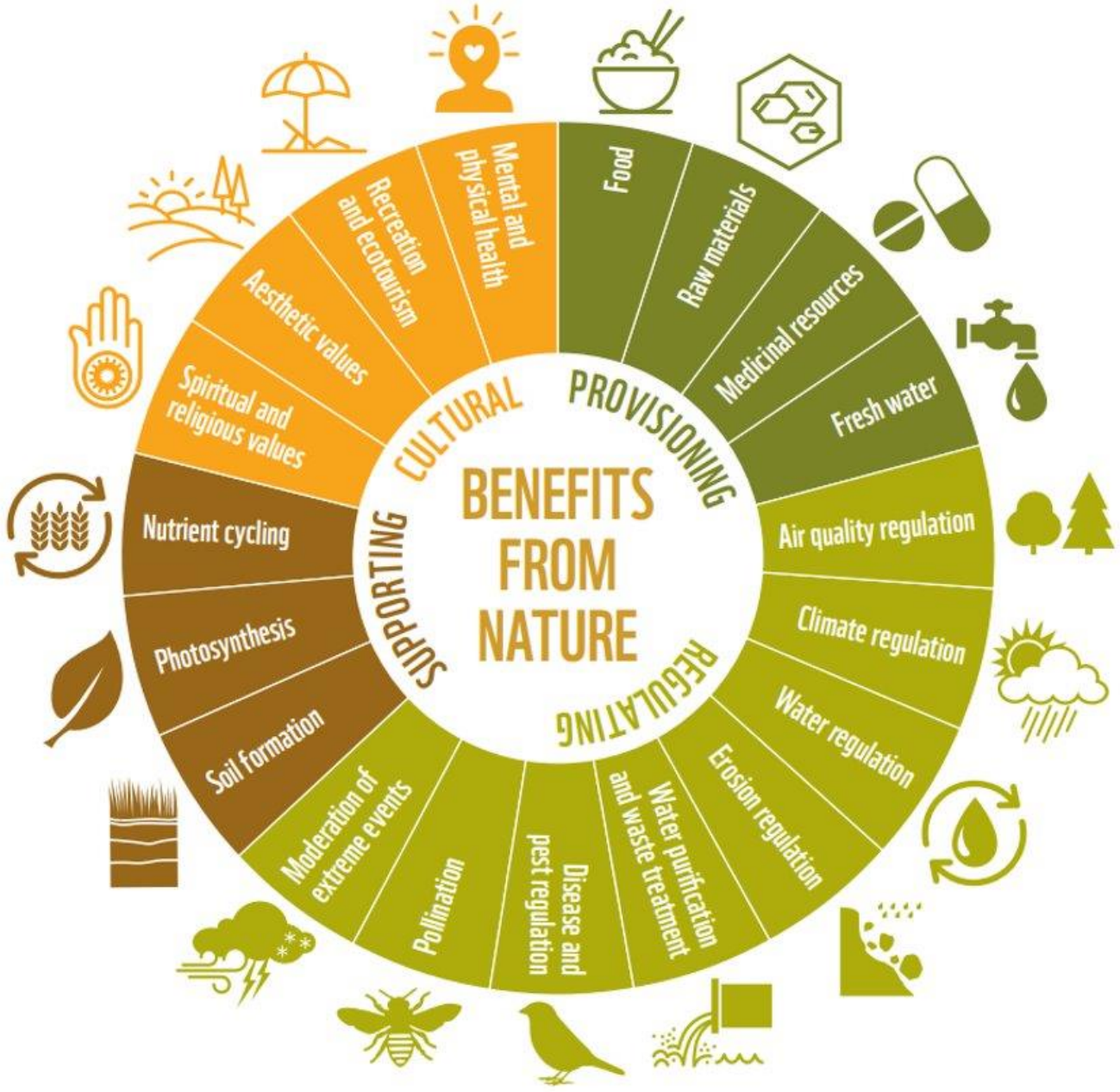


Figure: Benefits from nature, adapted from Millennium Ecosystem Assessment, 2005

(Source: Cambridgeshire County Council Climate Change and Environment Strategy)

How can we ‘measure’ the benefits of (or harm to) our natural environment?

It isn’t easy, but there are ways to identify what benefits our natural environment provides, and consequently what harm arises if we neglect it. Scientists usually break down the natural environment into two main types to do this. First, the all-encompassing ‘natural capital’ and second, forming part of the first and the one we perhaps most think of, ‘biodiversity’. These are explained a little more below.

Natural Capital

Natural capital is our ‘stock’ of water, land, air, species, minerals and oceans. From this stock goods and services are produced, including clean air and water, food and pollination, energy, wildlife, recreation and protection from hazards. These services provide economic, social, environmental, cultural, and well-being benefits.

Biodiversity

Biodiversity, our flora and fauna, is an essential component of natural capital stocks and an indicator of the stocks’ condition and resilience. It provides benefits directly to people, for example, the pollination of plants to produce seeds. This benefits society primarily through food provision, and has a global economic value of approximately £120 billion and within the UK alone in the region of £690 million each year.

Methods to measure the benefits

There are a range of established methodologies now available to value these benefits and quantify these financially to allow for easy incorporation into decision making. Such methods are not commonly used yet, but are highly likely to become more and more common, in the same way that it is becoming more common to measure the ‘carbon footprint’ of actions we take.

By providing a financial value to our natural environment, it can demonstrate to decision makers the full cost of exploiting our environment for short term gain, compared with the gains achievable through enhancing or protecting it. This is known as the ‘natural capital approach’.

As an example, currently, the UK consumes resources equivalent to three planet earths. This means that if every human on the planet consumed the same amount of resource as someone in the UK, there simply would not be enough resource to share around – we'd need three planets to do so, not just the one we have. The UK is not alone in consuming more than its fair share of what the earth can provide. Most ‘western’ developed countries are similarly around ‘three planets worth’.

This is not sustainable.

We must therefore become far more resource efficient, reduce consumption and reduce waste, especially as our environment takes time to replenish itself. The UK Government also recognises the need for change in its recent ‘A Green Future: Our 25 Year Plan to Improve the Environment”.

Threats to our natural environment

Climate Change:

Climate change impacts species and ecosystems, and therefore the services they provide, in many ways. Changes in prevailing weather conditions (temperature, precipitation, seasonality) directly affects ecosystem processes as well as species survival, encourages the spread of pathogens, and disrupts the timing of life cycle events. It decouples evolutionary relationships and undermines complex processes that underpin ecosystem function.

There are many lines of evidence that show that species are already being affected by climate change. With the damage to this natural capital comes impacts on the services they provide us, and the development of feedback loops which exacerbates both the cause and effects of this damage.

Risks include:

- Damage to crops from severe weather/lack of water;
- Loss of top soils due to floods;
- Changing temperatures impacting wildlife through changes to habitat and food chains;
- Damage to historic buildings from air pollution.

Pollution

Clean air is one of our natural capital 'stocks' but air pollutants generated by a mixture of natural and human-made processes are creating health and environmental damage. The main challenge is the production of particulates and nitrogen dioxide (NO2) resulting from the combustion of fossil fuels, causing unacceptable impacts on health. Particulates, when inhaled can lodge in the lungs and exacerbate existing respiratory problems whilst NO2 can increase asthma impacts in children. Our wildlife is also impacted by poor air quality reducing new growth and vulnerable species not thriving.

The Cambridgeshire Transport and Health Joint Needs Assessment identified the following:

- Levels of air pollution in Cambridgeshire impact health, as evidenced by respiratory and cardiovascular admissions to hospital;
- 257 deaths in 2010 were attributable to air pollution in Cambridgeshire;
- Over 5% of Cambridgeshire's population mortality is attributed to air pollution;
- Hot spots of pollution include urban areas and arterial and trunk roads such as the A14;
- New developments in Cambridgeshire are often sited near poor air quality areas;
- Small particulates from traffic also contribute to indoor air pollution, where people spend most of their time and receive most of their exposure to air pollutants.

Managing the impacts of air pollution from cars and power stations is possible and there are many synergies between approaches to manage air pollution and reduce carbon emissions.

Polluting our rivers and oceans from single-use plastics and agricultural run-off poses a significant threat to marine-life and reduces the ability of our oceans to nurture and restock itself. The Council is committed to making a difference on this issue.

- An estimated 79% of all plastic waste ever created is still in our environment and needing to be cleaned up;
- Waterways become clogged with plastic pollution, preventing natural functioning of the systems and harming wildlife when consumed;
- Agricultural run-off, for example use of fertilisers, cause oxygen levels in waterways to diminish such that flora and fauna cannot survive.

Population Growth and Development

Cambridgeshire is one of the fastest growing counties in the UK. Growth necessitates the provision of more housing, food and water, which must be managed sustainably to minimise the environmental impact of our county's success. There are numerous examples globally of economic development taking place to the detriment of nature. Examples have included:

- Damage to landscape from minerals extraction for building materials;
- Loss of natural habitat to make way for new homes or road building programmes;

- Increasing air pollution from burning fossil fuels for travel;
- The impact of agricultural pesticides on water quality and biodiversity.

To achieve sustainable growth, it is important that everyone acts to conserve and enhance our natural capital. Using Cambridgeshire's growth as an opportunity, natural capital can be developed and enhanced through:

- Provision of increased green spaces for people and nature;
- Increasing tree planting to assist with shade/urban cooling, air quality and biodiversity;
- Switching from cars to more active travel choices such as walking, cycling and mass transport solutions.

What can East Cambridgeshire District Council do to help conserve and enhance the natural environment?

The Council is not a major landowner (unlike, for example, the County Council which has a large farm estate portfolio), so is limited by what it can do directly. However, it has significant policy responsibilities, such as planning policy, which means it can require or influence others to act.

East Cambridgeshire is home to a number of nationally and internationally important wildlife and historic sites. It has a number of Sites of Scientific Interest (SSSI) including Devil's Dyke. It also hosts three internationally important Ramsar sites (the Nene Washes, Great Ouse Washes and Chippenham Fen), as well as a number of internationally important Special Areas of Conservation (SACs) including part of Fenland SAC. Through our partnerships we can help to maintain these valuable sites in positive conservation status.

We can also encourage and help facilitate new biodiverse rich sites within the district.

Planning Policy and Planning Decision Maker

As a District Council, we are responsible for preparing planning policies for the district, as well as determining the vast majority of planning applications for development in the district (a limited number are determined by other bodies, such as minerals and waste development whereby both policy and decisions on applications are taken by Cambridgeshire County Council).

Our 2015 Local Plan contains many policies to help protect and enhance the natural environment, but over 2020 we recognised we could go further. Following public consultation, we therefore adopted a new Natural Environment Supplementary Planning Document (SPD), which sets out much more detailed requirements for development proposals to follow. Examples of the sorts of things we can achieve through making decisions on planning applications are:

- Preventing harm to any designated nature site;
- Requiring a 'net gain' in biodiversity via development i.e. the quantity and/or quality of biodiversity must be better for a particular site after development has happened, than it was before; and
- Helping improve water quality.

Parish Councils can also set their own natural environment planning policies for their local parish, via a 'Neighbourhood Plan', and we encourage them to do so and offer support throughout the process.

Reducing plastic pollution

The Council buys services and goods to deliver its statutory responsibilities. It will look to improve its procurements and work with its supply chain to find better, more sustainable options to replace single use plastics.

Priority areas for natural capital through collaboration with partners and our communities

Peatland: In its natural (damp) state, peatland acts as a 'carbon sink', sucking carbon dioxide out of the atmosphere and 'locking' it in the ground. Wicken Fen is a good example of such wet peatland. However, the vast majority of our peatland is not in its natural state. The CUSPE carbon footprint work of 2019 highlighted that Cambridgeshire's peatland is probably producing 5.5 million tonnes of CO_2e per annum, due to the intensive farming (and consequent drying of the peat, which releases carbon dioxide into the atmosphere). This is almost the equivalent of all other emissions from all sectors (i.e. from homes, cars, businesses, manufacturing, waste etc combined) across Cambridgeshire. Thus, if we reduce all our emissions from all these others sources to zero, we would still only have cut our emissions by half because of the vast quantity of emissions arising from our drying peatlands.

Large parts of East Cambridgeshire are, of course, peat-based fenland, especially the northern half of the district.

To exacerbate matters, fen peatlands are among the UK's most diverse habitats for wildlife, but the vast majority have been lost to drainage and agricultural practices, with just small pockets like Wicken Fen remaining. These habitats rely on a delicate balance of water volume and quality to maintain their diverse range for flora and fauna, and what remains of them are often internationally recognised for their importance.

But there is some good news emerging on peatland. Already there are projects such as Wicken Fen Vision (the National Trust) and, in Huntingdonshire, the Greater Fen Project (Wildlife Trust) working to conserve and re-wet small additional areas of our peatlands.

And research is underway on how farmers and others in the agritech industry can work peatlands in a different way, preserving the peat, enhancing its biodiversity value and, at the same time, still deliver a viable return for the land and producing the crops that the country relies on. The NFU, for example, are fully behind such initiatives, not only for the sake of the natural environment, but to protect the assets the farmers own: if we continue to dry out our peatland, the rich peat soil literally disappears into the atmosphere (we lose 1-2cms of peat per year), to the point that in 50-100 years it is predicted that most of the fenland peat soil will have gone, leaving poorer quality soils (eg clay) behind.

East Cambridgeshire District Council fully supports the County Council bringing this issue to greater prominence, and welcomes its proposals to manage its own land in a different way. Whilst our ability to influence how peatlands are managed is limited, we will support all efforts to raise awareness and change land management practices, where we can, for the benefit of wildlife and for the benefit of our climate.

Green Spaces and 'Doubling Land for Nature': Cambridgeshire has one of the smallest percentages of land managed for nature in the country. Currently only 8.5% of the county is covered by natural or green spaces. Natural Cambridgeshire, the Cambridgeshire and Peterborough Local Nature Partnership (LNP), is a partnership bringing together district councils (including East Cambridgeshire District Council), the County Council, Natural England, the Environment Agency, the National Farmers Union and more. Recently, it adopted its long term target of 'Doubling Land for Nature' across Cambridgeshire. This year, the LNP is working on proposals to commence delivery of that ambition, including funding to make it happen. East Cambridgeshire District Council fully supports this initiative.

5. Ideas Forum

On 16th December 2019 we launched the Climate Change Ideas Forum, where members of the public were encouraged to submit their ideas for our consideration.

Residents can submit their ideas on-line, by email, telephoning the Council or speaking to an advisor at the Council Offices during office hours. All ideas will be acknowledged, then recorded and shared with senior officers of the Council to be considered. Where we can, those ideas are translated into 'actions' within the next available Environment Plan.

Separate to this June 2021 Environment Plan, we have, like last year, published a report summarising all of the views we received, up to the second cut off point of end of February 2021. That report demonstrates both the huge interest the public has in environmental matters, and the wide and diverse ideas and suggestions people have.

These include:

- Lots of suggestions around improving cycling and walking facilities;
- Ideas of how to improve communication and education;
- Ideas around funding to help people and businesses cut their emissions;
- Suggestions regarding green spaces and creating land for nature;
- A desire for new development to be environmentally friendly and energy efficient;
- Suggestions relating to renewable energy, including what we should encourage (and some we should not) and what incentives we should offer;
- A large volume of suggestions relating to transport, including parking, buses and electric vehicles;
- A strong desire to plant more trees (and protect those we have);
- Ideas relating to recycling.

The above is just a flavour – there were lots of other great ideas.

The Council cannot thank you enough for the time and effort that you take in sending us your ideas. The Ideas Forum remains open for any new suggestions you may have. All those received by end of February 2022 will be considered for the next iteration of this Environment Plan, due by June 2022. For further details, please visit www.eastcambs.gov.uk/climatechange .

Over the next 12 months, we will be looking at additional ways to communicate with everyone, both to offer advice and the ability to share ideas.

6. Actions and Projects

To boost our natural environment and to achieve our carbon emission targets as set out in section 3 will be a momentous task. There is an indefinite list of changes required, many of which are only realistically feasible on a regional or national scale.

However, there are realistic and practical actions that can be taken at a local level, and now.

The following section of this report provides a breakdown of actions that the Council will seek to take forward over June 2021 to June 2022, as well as a review of the actions we committed to in June 2020.

In order to make decisions on what projects to take forward, the Council has adopted the following key principles:

- Cost of the action proposed in relation to the CO_2e saved (i.e. high CO_2e saving per £ spent) or the degree of likely benefit to the natural environment;
- Ease of implementing (for example, easy / quick actions will make carbon savings sooner);
- Public demonstration (whilst of less importance than other principles, by undertaking highly visual or engaging actions we could stimulate others to also act themselves).

Review of our Top 20 Actions for 2020/21

In June 2020, the Council set a long-term vision to deliver net zero carbon emissions for the Council's operations and, in partnership with all stakeholders, for East Cambridgeshire as a whole. At the same time, it committed to supporting its communities and East Cambridgeshire's biodiversity and environmental assets to adapt and flourish as our climate changes.

To help move one step towards that vision, the Council committed to a set of 'top 20 actions' over the period June 2020 to June 2021. Those actions are set out below (first column), and commentary on the degree of meeting those actions is also set out (second column).

Our Target (set in June 2020)	***Our Progress (by June 2021)***
1. Review its entire electricity and gas contracts, and, where practical to do so, will seek to amend to 100% renewable electricity tariffs and 100% carbon off-set gas tariffs as soon as possible.	*Electricity contract moved to 100% renewable energy from October 2020.* *No carbon off-set gas tariff practicably available. Continue to consider alternative off-set mechanisms, as well as future aim of moving off gas altogether.*
2. Appraise the impact of its streetlights and consider the options to move to LED lighting, if feasible, taking account of the carbon savings, financial savings and public opinion of doing so, including consideration as whether dimming of lights is practicable and safe during certain low-use hours (note: most street lights are not under the	*Moved entire ECDC responsible street and car parking lights to LED by end of 2020.* *Dimming of such lights to further reduce energy use not deemed practical at this stage.*

control of East Cambridgeshire District Council).	
3. Embed a greater culture of home working (to reduce commuting) and less business travel (eg for site visits), taking advantage of lessons learnt during the Covid-19 lockdown, with the aim of encouraging staff to undertake less, and more coordinated, site visits and meeting attendance.	*Staff and Councillor business miles have dropped by over half over the year (which should show up in the carbon footprint accounts we report for 2020/21).* *Whilst we have no mechanism to record staff commuting miles, these are likely to have been significantly reduced over 2020/21, as most staff, most of the time, have worked from home.* *Moving forward, the Council's significant investment in IT facilities for staff and Councillors over 2020/21 means that we expect considerably lower business and commuting miles to be undertaken than was the case pre-pandemic, as working from home and remote meetings become, in part, the 'new norm'. The Council will continue to embed this 'new norm', subject to the maintenance of high-quality services to our residents and other customers.*
4. Undertake a thorough appraisal of the potential to expand electric car charge points.	*The Council has engaged with two national electric vehicle (EV) charging infrastructure companies, looking to determine potential for additional EV charge points on our own land (eg car parks). Barton Rd and Newham Street car parks appear most viable, and investigations continue.* *The Council adopted a new Supplementary Planning Document in Feb 2021, relating to climate change, which expressly encourages developers to install new EV charging points as part of new development.* *The Council is fully committed to working with the Combined Authority (CA) on a more wide-ranging county strategy for boosting EV infrastructure. This was anticipated over 2020/21, but was delayed by the CA into 2021/22. A joint (rather than ECDC alone) strategy will give greater confidence to residents and businesses across Cambridgeshire to invest in EV, and will give the greatest scope for public bodies to fund such infrastructure.*
5. Roll out further guidance and training for staff in relation to the recently introduced 'Carbon Impact Assessment' (CIA) procedure – a new assessment which requires all Council decisions to be assessed	*CIAs have been duly completed for all relevant decisions taken by the Council, and recorded as part of the officer reports to Council meetings.* *Guidance and training have been given to those staff that have responsibility for preparing such reports.* *As an interim measure, the ECDC CIA process was further improved, with new guidance for staff, has just been launched. However, moving forward, the Council*

for the carbon implications of the decision being made.	*welcomes the recommendation of the CA Climate Commission (see Action 17) to establish a comprehensive, consistent approach to carbon assessment in decision making, and we will work proactively with other districts to establish such a framework.*
6. Work with ECTC and ECSS, the Council's wholly owned companies responsible for matters such as waste collection, street cleansing and maintaining public open spaces, conclude a review into alternative options for its vehicle fleet, and set out a programme of how its vehicle fleet will become less carbon intensive, plus review our waste collection methods to determine whether more efficient route collections can be secured, thereby reducing vehicle fuel consumption (and consequently reduced CO2 emissions).	*Based on the evidence, ECTC and ECSS acknowledge that the biggest contributor to the Council's overall emissions are due to its fleet vehicles, with that proportion increasing over the past 1-2 years.* *ECSS continues to be committed to review options, as and when fleet needs replacing. Currently there are no suitable low carbon vehicles on the market that can effectively deliver the standards required for the collection of waste across our rural district, though there is evidence that the industry is moving in the right direction and showing willingness to develop vehicles that meet all geographical requirements in the future (rather than just urban geographies).* *Where fleet needs replacing (and for some vehicles this is due soon), we are delaying such purchases as we continue to await the Government's Waste and Resource Strategy now set to be released later in 2021 (delayed from Autumn / Winter 2020; a further consultation was launched in May 2021). This will ensure the correct specifications are procured. It is very likely, however, that the next vehicles procured will be powered by diesel engines as there are no suitable carbon neutral / low carbon viable or practical alternatives available at this time. To minimise embodied carbon, and to increase flexibility in terms of switching to low carbon vehicles as soon as practical, ECSS are considering leasing (rather than outright purchase) of vehicles.* *A significant part of the fleet is due for renewal in 2025 at which time further advances in carbon neutral / low carbon vehicles may have been completed and further specifications on offer that meet our district's requirements.* *Our smaller vehicles, which electric versions are more widely available, are not due for replacement until 2027/28. Full consideration will be given to carbon neutral / low carbon alternatives for these vehicles, during the procurement process.* *Separately, ECSS are currently working through a large scale round reconfiguration project for all of its waste collection vehicles and schedules. The plan is*

	scheduled for implementation in the second half of the financial year 2021/22. The main objective of this plan is to ensure that all vehicles are running as efficiently as possible, maximising their productivity across the working week and reducing any lost time. *This would likely see vehicles working collectively in combined areas, reducing any unnecessary travel time. Additionally, the aim is to maximise the collection areas in the district, creating a natural flow through the week, rather than zig zagging across the district each day. This will assist in reducing additional travel time and resource required for collecting missed collections the following day.* *Secondary outcomes of this plan include possible but not guaranteed round reductions. Any reduction in rounds would result in less vehicles required, reducing the daily carbon output (and reduce embodied carbon, if a net lower number of vehicles).* *Overall, therefore, some limited short term CO_2e savings may be possible, but bigger cuts on such emissions are not expected until at least 2025/26, and potentially not until the 2030s.*
7. Complete an energy opportunity assessment for The Grange to identify measures that can be taken to reduce consumption and/or generate renewable energy and deliver at least one of the measures identified within a year. 8. Complete an energy opportunity assessment for E-Space North to identify measures that can be taken to reduce consumption and/or generate renewable energy and deliver at least one of these.	*An energy audit of both The Grange and E-Space North was completed by end of Dec 2020. This identified some 'quick wins' in terms of energy efficiency improvements to The Grange. Fortunately, the timing of the audit's conclusions linked to a grant scheme run by Government. This meant a grant was able to be bid for, to undertake such quick win measures, which we were successful in receiving in Jan 2021. The works (insulation and double glazing) are due for completion by September 2021, with the hope that this should result in lower energy bills / lower CO_2e emissions for The Grange, for winter 2021/22.* *The audit found limited cost-effective scope for other measures at the two sites, due to the relatively efficient and modern heating systems in place and the limited ability to install renewables. However, these will continue to be explored.* *More generally, as staff return in greater numbers to the office from summer 2021, a programme of behavioural change activities is intended to be set up, encouraging staff to reduce energy.*
9. Develop a Customer Access Strategy, which at its heart will enable customers to undertake	*Pre-COVID, approx. 1,500 customers per week accessed The Grange reception, but reception has been largely closed since March 2020. We are now*

activities with the Council without the need for physical attendance at Council Offices.	*trying to understand in more detail how those customers are accessing the services they want (whilst reception was closed) and what could be improved (eg website) so customers don't have to come to reception in the long term. Whilst this is unlikely to reduce the Council's own carbon footprint, it should reduce the carbon footprint of the customer, if they no longer have to travel to The Grange to conduct their business. The final Access Strategy will be completed shortly.*
10. Finalise the Council's bus, cycling and walking review (which commenced over winter 2019/20), and work with a wide variety of partners to try to implement its findings, taking advantage of new Government funds, linked to Covid-19 recovery, to boost cycling and walking infrastructure.	*Comprehensive public consultation took place in Spring 2020. A Member Working Party was established, resulting in a New Bus Proposals for East Cambridgeshire prospectus. This was submitted to the Combined Authority (Dec 2020), and will provide useful evidence for bidding against any other funding streams.* *A walking and cycling strategy is also being developed for East Cambridgeshire.*
11. Undertake a thorough appraisal of the Council's land assets, and determine whether a programme of tree planting and/or meadow planting can take place on any of it. If so, commence that programme during the 2020/21 winter and spring planting season.	*Working with the local Wildlife Trust, ten candidate sites were reviewed for their potential, which was then whittled down to three of the most promising sites for early delivery and effectiveness are: Victoria Green, Witchford; Gateway Gardens, Ely; West of Ely, St Johns Road to Downham Road. Measures include a mix of better cutting regimes (to encourage wild flowers and great biodiversity) being implemented from summer 2021, to some tree planting opportunities for winter 2021.*
12. Prepare, consult and adopt two Supplementary Planning Documents (SPDs), one on the Natural Environment and the second on Climate Change.	*Both SPDs were successfully consulted upon, comments considered, and final documents adopted by Feb 2021. Both documents are now used in the determination of planning applications, helping the Council achieve a greater degree of biodiversity and/or climate change mitigation measures via new development in the district.*
13. Identify / develop a training course for all staff and Members on climate change issues, minimisation, mitigation, adaptive measures, and key environmental policies (possibly Open University's Environment: treading lightly on the Earth). Aim for all staff and Members to have completed training by 2021. All new starters from 2021 to	*Following the trial of a number of potential training courses, the Council formally launched in April 2021 a comprehensive 'pick and mix' style training course for all staff and Councillors, making it mandatory for all staff to complete at least one of the courses on offer before the end of 2021. The courses range from biodiversity issues to climate change. A review of the success of the courses, following staff feedback, is scheduled for Sept 2021.*

complete training within 2 months of start date.	
14. Put in place arrangements, by April 2021 (including a district wide partnership forum), to facilitate the preparation of a district wide Action Plan ('District-EnvPlan'). This Action Plan, which is prepared in partnership with a wide range of stakeholders, will set out how we can cut our carbon emissions and boost the natural environment collectively across the East Cambridgeshire area.	*In March 2021, the first Partnership Forum took place, with a wide range of local bodies and organisations taking part. Whilst the Forum is still in its formative stages, some of the ideas and thoughts from it have already influenced the proposed new 'top 20' targets for 2021 (such as the focus on engaging with children / schools / youth sector; and the potential for improved communications and coordination between action takers across the district). The purpose, actions and outcomes of the Forum are for the Forum (not ECDC) to decide, and therefore it may not proceed with the district wide action plan as previously envisaged, but more targeted single issue programmes of action.*
15. Work with a willing Parish Council (PC), to prepare a template parish-based Action Plan ('Parish-EnvPlan'), and subsequently encourage all Parish Councils to come up with their own targets and projects.	*Over the past year we have engaged with three PCs, one of which (Burwell) is a clear 'front runner' in terms of preparing an Action Plan, and published its first version in Feb 2021. ECDC welcomes, in principle, the production of the Action Plan, and considers that it acts as a simple, yet effective, base upon which meaningful actions can be taken, and further ideas and actions proposed. ECDC encourages other PCs to follow the lead taken by Burwell, with Burwell's Action Plan being a useful starting point as a potential template for other PCs. Available here:* *http://www.burwellparishcouncil.gov.uk/Policies_34601.aspx*
16. Prepare a second Council-EnvPlan by June 2021 (ie a review of this document), setting out progress over 2020/21, and proposals and targets for 2021/22.	*This has been achieved, and forms this document.*
17. Work proactively with the Combined Authority, as part of its recently launched Climate Change Independent Commission	*The Council continues to actively engage with the Climate Commission (which was slightly delayed due to the pandemic), submitting evidence at the relevant stages. The Council welcomes, in principle, the interim report and recommendations (Feb 2021) and looks forward to the final report due around Sept 2021. The Council, with other partners, has already started to look at the interim findings, and is committed wherever practical and viable to implement such recommendations. Implementing the full package will, however, require considerable funding and legislative changes from Government.*

18. Support Cambridgeshire County Council (CCC) in its delivery of its recently adopted Action Plan.	*We continue to engage with CCC, and wider districts and unitary councils, sharing best practices and ideas, and ECDC remains fully committed to supporting CCC with the implementation of its own Action Plan.*
19. The Council also acknowledges that in recognising there is a climate emergency, the actions needed to be taken are not all about mitigating the impacts, but also adapting to the inevitable changes of climate change. As such, the Council also commits to commence preparation of a Climate Adaptation Plan over the next 12 months.	*Preparation of a climate adaptation plan has, in accordance with the target, commenced. It is hoped to bring this to the appropriate Committee of the Council for approval in Autumn or Winter 2021.* *In addition, the Climate Change SPD (see Action 12) included policy measures relating to the adaptability of new buildings to meet the demands of a changing climate. This will help ensure that homes and other buildings built today, will be more resilient to extreme changes in the climate (such as increased heat or rain).*
20. Work with Palace Green Homes (PGH), the Council's commercial property and development company, to establish a new sustainability policy for the company; this will then inform how it can progress its development schemes in the most sustainable, yet viable, way.	*PGH adopted a new sustainability policy in Feb 2021, setting out its commitments in terms of its approach to building sustainably and respecting the local environment. It is published on its website at:* *https://www.palacegreenhomes.co.uk/palace-green-homes-sustainability*

Our 20 Commitments for 2021/22

Building on the commitments and achievements of last year, the Council commits to the following set of 'top 20 actions' for the period June 2021 to June 2022:

1. Develop (including in partnership with East Cambridgeshire Street Scene (ECSS)) **a programme of engagement activities with schools**, helping to educate young people of the importance of climate change and the natural environment, and what they can do to help.
2. Actively participate, and encourage others to participate, in the '**Queen's Green Canopy**' initiative, which is a programme of tree planting in winter 2021 and winter 2022.
3. Create a new **Queen Elizabeth Jubilee Tree Maze**, via: running a competition with children to design the maze; plant out in a suitable location the winning maze design, using a native tree/hedging species (eg hornbeam); educate the benefits of the maze (biodiversity / carbon locking / active lifestyles).
4. Establish an **East Cambridgeshire Create an Orchard Programme** and target the creation of at least **26 Orchards (East Cambs COP26)**, whereby ECDC encourages and helps the creation of new (or renewed) orchards by community groups, Parish Councils or schools. ECDC to provide free fruit trees, stakes and other essential equipment to establish the orchard (land, planting and maintenance provided by the group/council/school).
5. Implement new **grass cutting and wildflower management** arrangements in suitable locations, to help support greater biodiversity.
6. Develop a **preliminary 'nature recovery strategy' for East Cambridgeshire**, to feed into Cambridgeshire wide nature recovery actions and frameworks.
7. Undertake a series of **energy efficiency improvements on The Grange** (such as window replacement, loft insulation and LED lighting). In addition, commence a programme of 'behavioural change' activities for staff, so as to encourage efficient use of energy with The Grange. Combined, this action should reduce energy use within The Grange.
8. Before the end of 2021, report findings of a preliminary investigation into whether **ECDC could operate its own renewable energy infrastructure**, such as solar panels (PV) over one of its car parks. If feasible, progress implementation, with the target in future years of generating enough renewable energy to match the energy used by ECDC in its buildings, street lights and storage depots.
9. Help improve the **energy efficiency of existing housing stock** in the district, in particular through: (a) direct delivery of over £1m in home energy efficiency improvements to at least 100 homes in the district, comprising of Sanctuary Properties (40 properties), low income private homes (10 properties) and park homes (50 properties) (*Note: these improvements are a partnership between ECDC, Sanctuary Properties and the Cambridgeshire Action on Energy Partnership*; (b) the recruitment of a new ECDC part time Home Energy Advisor to offer advice and support to all residents on home energy and fuel poverty issues; and (c) undertaking further research, including with Sanctuary Properties, to gain a deeper understanding of the scale of need and opportunities available to make further future energy efficiency improvements to existing homes in the district.
10. In respect of our fleet vehicles (eg waste and recycling lorries; parks and open space maintenance vehicles), work with ECTC and ECSS to, as first priority**, reconfigure routes and collection rounds** with a view to minimising miles travelled. Separately, respond to the new national waste strategy and continue to monitor the emerging electric/low-carbon vehicle market. Ensure any purchase (or lease) of new fleet vehicles, during 2021/22, considers the potential for electric/low-carbon vehicles to become more widely available from 2025 onwards.

11. Adopt a new **Cycling and Walking Strategy for East Cambridgeshire**, and use that strategy as the basis for influencing change, bidding for funds and for negotiation with developers.
12. To progress the **delivery of Electric Vehicle Charging Points (EVCPs)** across the district, through the direct delivery of new EVCPs in at least one of our public car parks during 2021/22, and through working with the Combined Authority on a county-wide strategy to support the mainstream roll out of EVCPs.
13. Improve the **'Carbon Impact Assessment'** procedure, developed in coordination with partners and in line with Combined Authority Climate Commission recommendations. This will help demonstrate the carbon implications of the decision being made.
14. Encourage and monitor the take up of the newly launched **'mix and match' training courses for staff and councillors**. The OU recognised and developed courses accommodate a wide range of staff interests and skills, helping to build a base of environment knowledge across the council, no matter what the core duties of that person are. All staff and Members are targeted to have completed at least one such course by end 2021.
15. Continue to embed a greater culture of **home working (to reduce commuting) and less business travel (e.g. for site visits)**, taking advantage of lessons learnt during the Covid-19 lockdown, with the aim of encouraging staff to undertake less, and more coordinated, site visits and meeting attendance. Target 20% reduction in business miles from pre-pandemic levels.
16. Active role in **encouraging / lobbying for the highest energy efficiency standards in new development**, as part of:
    - the new 'spatial strategy' for the Oxford-Cambridge Arc;
    - the proposed new national Building Regulations and 'Future Homes Standard';
    - the new planning system being introduced via the Planning White Paper;
    - any emerging Neighbourhood Plan that Parish Councils produce; and
    - any future development schemes by Palace Green Homes / Community Land Trusts (CLTs) in the district.
17. Work proactively with the Combined Authority, seeking to implement as many as reasonably practical of the **Climate Change Independent Commission recommendations** (due Sept 2021).
18. Further develop the recently established **East Cambridgeshire Partnership Forum**, with the aim of the Forum to help devise actions and targets to reduce carbon emissions and boost the natural environment collectively across the East Cambridgeshire area. Potentially establish a non-ECDC website as a base for information and actions.
19. Continue to prepare **an annual ECDC Environment Plan**, setting out the latest 'carbon footprint' of the Council, a series of annual actions, and a longer-term target to reduce ECDC's net emissions by 20-33% (by 2025); 66-80% (by 2030); 100% (by 2035); and achieve a truly net zero carbon organisation by 2040.
20. Work with Palace Green Homes (PGH), the Council's commercial property and development company, assisting it to implement its recently adopted **Sustainability Policy**; and, for all its future major development proposals (i.e. developments of 10 homes or more, which don't already have planning consent as at 1 June 2021), achieve the **Local Nature Partnership's 'Working with Nature Charter Mark'**.

7 Financing the Strategy and Action Plan

Like all councils, we have challenging financial and resource pressures. We are also a small Council, operating with a relatively small budget (around £10m per annum total spend), compared with other councils. County Councils, for example, have operating budgets of hundreds of £millions. However, we cannot use any of these challenges as an excuse for not finding new ways of living, and doing 'our bit' with the budgets we operate under. We can find realistic and genuine ways to make positive changes that limit our impact on and improve our environment, and we can also regulate others to do their fair share, through the policies we set and licenses we operate.

All potential projects referred to in this Plan will, where necessary, go through the Council's approval process and receive expenditure approval in accordance with the budget setting process. It must be noted that these corporate controls are required regardless of eventual funding streams as the Council needs to ensure Value for Money is achieved.

The Council has access to several potential funding streams and the choice of most appropriate funding will depend upon achievement of Value for Money. This will be assessed following the completion of relevant business cases for individual projects. External funding will always be considered before the use of internal Council funds.

Some of the ways the Council may decide to fund the projects associated with the Plan are:

- **Invest to Save:** For example, capital expenditure ('investment') to improve the energy efficiency of the buildings or vehicles we own can save money every year thereafter through lower energy costs. The money to fund the original expenditure could be from a council's own reserves or from a loan.
- **Grants and Loans:** These can be from Government or private sources.
- **Match-Funding:** Some grants might require the Council to contribute some (often half) the funding for a project.

More specifically, at the time of writing, the following budgets are available, or potentially available:

- **Council direct 'revenue' funding:** £100,000 per annum funding was agreed by the Council in 2020 to help deliver on the actions within each annual Environment Plan. We therefore have £100,000 for the financial year 2021/22 to help deliver the top 20 actions identified.
- **Government Grants**: we have been awarded nearly £100,000 by Government to improve the energy efficiency of The Grange.
- **Government Grants:** in partnership with Cambridgeshire County Council, City and District councils, we have been collectively awarded a total grant of just over £2 Million to improve the energy efficiency of 286 properties. It is planned that 100 properties in East Cambridgeshire will benefit from this grant funding, at a cost of around £1m.
- **Council direct 'capital' funding:** whilst no money has been set aside for capital projects at this stage, the Council will consider making such investments if it proves value for money and helps generate an annual income (as well as a carbon saving) for the investment made.

8 Further Reading

There is a host of information available on the internet, and we set out some links in the Appendices.

We also intend to improve information we post on our own website, via this page: https://www.eastcambs.gov.uk/climatechange

If you are particularly interested in learning more about climate change and environmental matters, and would like to reward yourself with a certificate, we recommend you have a go at completing any of the Open University courses available on the web. Most are free, and can take as little as 1 hour to complete

https://www.open.edu/openlearn/nature-environment

9 Monitoring and Evaluation

Successful implementation and ongoing delivery require a robust, transparent governance procedure which will ensure strategic ownership of the Council's carbon reduction aims in line with the climate emergency declaration. This governance process will bring together the diverse range of projects undertaken throughout the Council which contribute to the organisation's overall environmental impact.

Identifying Projects

The Council is committed to identifying opportunities to reduce carbon emissions across all areas of its operations. In order to achieve this the Council has introduced the following:

- A core team of officers, representing key service areas, have been identified. These officers will meet informally on a regular basis in order to discuss ideas and forthcoming projects.
- Decisions taken by the Council are now be subject to a Carbon Impact Assessment (CIA). This involves lead officers undertaking a review of their project/decision and considering what impact it will have on the Council's aim to achieve net-zero carbon emissions. A summary of the CIA will be included in the governing report to enable the relevant decision maker to make an informed decision. The introduction of this process, which we periodically update and improve upon, also helps raise awareness of the challenge amongst officers and will lead to officers considering the potential environmental impacts earlier in the decision making process, for example, at the contract specification stage.
- Steps to ensure that officers throughout the organisation have the opportunity to make suggestions for projects that could help to reduce carbon emissions.

Initiating Projects

Before any project gets off the ground the relevant Council officer will ensure that all of the necessary procurement and governance steps are undertaken. Consideration will also be given, on a case by case basis, to any communication activity that may be required alongside any specific monitoring requirements.

Monitoring

The impact of individual projects will primarily be monitored by collating data for all emissions sources that are within the organisational scope. This will be undertaken in line with the process set out earlier in this document. Where it is possible and feasible to do so individual projects will be monitored more frequently to ensure any deviation from projections are identified and addressed as soon as possible.

Separately, the Council will continue to monitor the Government's approach to UK carbon pricing and the implications of that new scheme on the Council and wider stakeholders.

Reporting Progress

Each year the Council will produce an annual report no later than the 30th June each year.

Baseline Year Recalculation Policy

There may be circumstances under which it becomes necessary to recalculate our baseline year emissions. If significant changes were to occur - either within the Council's organisation or to recognised methodologies - it could challenge the validity of existing data. To mitigate this, we have developed the following baseline year recalculation policy which will ensure that any significant changes are identified, measured for a recalculation threshold and processed accordingly:

Change scenario	Baseline year recalculation?
Mergers, Acquisitions, Divestitures	
Acquisition of (or insourcing) a facility that did not exist in the baseline year.	Potentially recalculate baseline year emissions depending on likely impact to be consistent with new approach, or correct errors
Disposal of (or outsourcing) a facility to another company.	Potentially recalculate baseline year emissions depending on likely impact to be consistent with new approach, or correct errors
Transfer of ownership/ control of emissions sources. This includes changes in lease status.	No base year recalculation required
Organic Growth and Decline	
Organic growth	No base year recalculation required
Organic decline	No base year recalculation required
Changes in Quantification Methodologies / Errors	
Changes in emission factors or methodologies (e.g. change in activity data) that reflect real changes in emissions (i.e. changes in fuel type or technology)	No base year recalculation required
Changes in measurement methodologies, improvements in the accuracy of emission factors/ activity data, or discovery of previous errors/ number of cumulative errors	Potentially recalculate baseline year emissions depending on likely impact to be consistent with new approach, or correct errors

Table Baseline year recalculation policy

The Council will review the scope on an annual or biennial basis to ensure that data is collected from all relevant sources.

10 Stakeholder engagement

It is clear that the Council, working alone, cannot achieve the target of net-zero carbon emissions across both the geographical area of East Cambridgeshire and throughout the Council's own operations. Yet, the Council is committed to working in partnership in order to make this ambition a reality. As such, in addition to Council Members and Officers, the Council plans to work with the following stakeholders:

- **Youth Council**
- **Citizen Engagement**
- **Schools**
- **Natural Cambridgeshire Local Nature Partnership (LNP)***
- **Business Community**
- **Parish Councils**
- **Cambridgeshire County Council**
- **Cambridgeshire and Peterborough Combined Authority (and its associated Climate Commission)**
- **Other Local Authorities**
- **Government**

**The LNP comprises a wide range of organisations committed to improving the natural environment of Cambridgeshire, including: Natural England; Defra; Environment Agency; NFU; RSPB; Wildlife Trust; Anglian Water and Cambridge University*

Appendices

Appendix 1: Impacts of Climate Change

Climate change has many impacts. These will be realised by the Council in a variety of different ways. The table below summarises some of these.

Impact	Description	Possible Impacts for the Council
Flood Risk	Projected increases in extreme rainfall will bring increased risk of flooding. The nature of surface water rainfall means that many areas will be affected by increased flooding. Runoff from compacted or impermeable areas will increase and water will accumulate in low spots. As temperatures increase and sea levels rise areas like the Fens will become under greater threat.	**Infrastructure**: Disruption to transport links could affect staff travel to work and access to parts of the district and wider county for meetings. Disruption to travel could disrupt Council response processes by restricting access to some parts of the district. There may be increased risk of power outages associated with flooding and thunderstorms, which could cause disruptions to transport, logistics and processes.
		Finance: Increased costs of flood related damage and flood investigations. Increased costs for providing flood resilient infrastructure to existing buildings. Increased social costs associated with providing support for people suffering from emotional issues associated with flooding and uncertainty.
		People and health: Council employees may suffer from increased stress or mental health problems associated with flooding of their homes or the uncertainty associated with increased flood risk.
		Property: Council buildings and property may be damaged by flooding if located within flood risk areas.
Heat Waves	Climate change is projected to bring an increase in warm temperature extremes and it is very likely that heat waves will occur more frequently and last longer. Cambridgeshire is one of the warmer parts of the country, so could be significantly impacted by these changes. Cities will be impacted more than rural areas	**Infrastructure**: Disruption to transport links could affect staff travel to work and meetings. Disruption to travel could also disrupt Council response processes by restricting access to some parts of the district.
		Finance: Increased costs associated with summer cooling in Council buildings. Increased costs associated with installation of air conditioning and heat resilient infrastructure.
		People and health: Working conditions may become unsuitable for staff which could impact employee concentration and performance.
		Property: Office spaces may become unsuitable to work in during heat wave conditions. This will have implications on the design, construction and maintenance of existing and new office space.
Drought	With increased temperatures extremes and more frequent and longer lasting heat waves will mean increased water restrictions in Europe. Cambridgeshire is already one of the driest counties in	**Infrastructure:** Roads can be affected under drought conditions and subject to cracking (a matter of concern for Cambridgeshire County Council with knock effects for East Cambridgeshire District Council residents).
		Finance: Increased water costs for office buildings. Increased social costs as more people fall below the poverty line as a result of increased food and water costs.

Impact	Description	Possible Impacts for the Council
	England so could be significantly impacted by this. The frequency of drought is likely to increase in presently dry regions by the end of the 21st century	**People and health:** Employees may be emotionally or physically impacted by reduced food and water availability and increased costs associated with this.
Sea Level Rise (SLR)	Rising global temperatures are causing polar ice to melt and oceans to expand, resulting in global sea level rise. Global sea levels rose by circa 0.19 metres between 1901 and 2010. Cambridgeshire is one of the most low-lying counties in England so could be significantly impacted by sea level rise in tidal and fen areas. It is anticipated that the East of England could experience a dramatic sea level rise of up to 0.54 metres by 2100 under a high greenhouse gas emission scenario.	**Infrastructure:** Transport links may be impacted by SLR in low-lying parts of the district. SLR could restrict or prevent access to low-lying parts of the district, disrupting access for social needs, emergency planning and other service provision.
		Finance: Costs of re-locating Council buildings, infrastructure and Council operated housing away from high risk areas and provision of SLR resilient infrastructure.
		People and health: Council staff and communities in low- lying regions may be emotionally affected by the uncertainty surrounding sea level rise and re-location. Increased pressure on social needs to provide increased support.
Air pollution	Transport is a major source of short-lived greenhouse gas pollutants, which can result in direct damage to human health. Road transport (particularly diesel traffic) is a significant contributor to air pollution such as particulate matter (PM) and ground-level ozone (O_3). Rising temperatures are also projected to increase levels of ozone, as are other greenhouse gases such as carbon monoxide, methane and nitrogen oxides. Short-lived greenhouse pollution can also cause acid rain. Air pollutants have been linked to health conditions such as asthma and eczema.	**Infrastructure:** Ground level ozone could create a risk of damage to infrastructure, ecosystem services and functions. This could in turn influence agricultural productivity and water supply.
		Finance: Increased social costs associated with providing support to people impacted by pollution related health impacts. Increased costs associated with repair of Council buildings impacted by acid rain.
		People and health: Poor air quality can pose a risk to employee health which could lead to more sick days. Air pollution has been associated with the development and worsening of asthma and can also make people who already have asthma more sensitive to asthma triggers. Air pollutants have also been associated with health implications such as eczema. Urban air pollution can increase risk of cardiovascular, respiratory diseases and cancer. Council staff travelling for or to work may be particularly impacted by air pollution from vehicles.
		Property: Ozone pollution can cause acid rain which could cause damage to Council buildings. Indoor air pollution could increase mould and damp in office space.

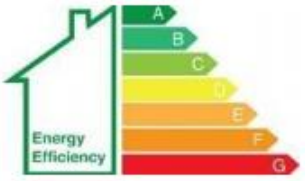
Appendix 2: Climate Change Mitigation Measures

Climate change mitigation measures can be incorporated into both existing and new infrastructure to reduce carbon emissions and improve energy efficiency. There are a number of ways to do this, and the following table describes some of these measures.

Table: Methods to mitigate carbon emissions

	Mitigation measure	How does this mitigate carbon emissions?	Description
Renewable Energy and Storage	Solar Panels  Photo	Reduces fossil fuel usage for electricity and heating (if electric).	Sunlight is absorbed by the photovoltaic panels and is used to generate electricity.
	Solar Thermal  Photo ©Greentech	Reduces fossil fuel usage for water heating.	Heat from the sun is used to warm water running in pipes through the panel. Depending on the temperature the water reaches, the temperature can be "topped up" using conventional methods.
	Battery Energy Storage  Photo ©Greentech Media	Enables intermittent renewable energy sources to become viable alternatives to fossil fuels.	Stores electricity for use at times when generation is low.
	Air Source Heat Pump  Photo ©burtonwright	Reduces or removes fossil fuel usage for heating.	Air is used to heat liquid refrigerant. The pump uses electricity to compress the refrigerant to increase its temperature then condenses it back to release stored heat. This heat is sent to radiators and stored as hot water.
	Ground Source Heat Pump  Photo ©Homebuilding & Renovation	Reduces or removes fossil fuel usage for heating.	Coils or pipes containing refrigerant are buried in the ground. Heat from the ground is used to warm the refrigerant and an electric heat pump is used to raise this temperature further. This heat is transferred from the refrigerant via a heat exchanger in the building to providing hot water and heating.

	Mitigation measure	How does this mitigate carbon emissions?	Description
	Hydrogen  Photo ©National	Reduces or removes fossil fuel usage for heating.	Hydrogen, produced through electrolysis of water using solar or renewable energy, or, produced using natural gas but using carbon capture and storage, is being considered heating homes.
	Planning  	Enables standard requirements for mitigation actions within developments.	The Planning System in England is 'plan-led.' The Local Plan contains policies that set out what development is needed where – either by identifying specific sites or general types of site. When a planning application is submitted, it is tested against those policies to see whether or not it should be approved.
	Building Regulations  	Can be set to reduce energy demand of homes (e.g. through energy efficiency measures).	These are statutory minimum standards for design, construction and alterations to virtually every building.
Energy Efficiency	Passive House  Photo ©Magnetitte	Little to no domestic heating requirements.	Homes designed to combine ultra-low energy consumption with consistently good air quality. They are built with superinsulation, low-volume heat recovery ventilation systems and tightly controlled rates of air infiltration, which combine to make sure the building's carbon footprint is as small as possible. These types of buildings do not require conventional heating systems.

	Mitigation measure	How does this mitigate carbon emissions?	Description
	Fabric First/Insulation  Photo ©MyBuilder.com	Reduces heat loss from buildings, reducing heating requirements.	Materials used to reduce heat loss from buildings – these can be built into new builds or retrofitted. It can come in many forms specific to the area being insulated including: Pipe insulation Roof insulation Wall insulation
	Other energy efficiency measures  Image ©Base Energy	Reduce energy consumption, thereby reducing emissions from generation.	Various methods to reduce energy consumption. e.g. LED Lighting and double glazing.
	District Heating/Heat Networks  Image ©Energy Saving Trust	Facilitates low carbon heating.	Groups of co-located (e.g. a village or town) buildings sharing the same heating source. They are directly connected via insulated pipes to a local renewable heating source, such as a ground source heat pump. This enables faster transition to renewables.
Transportation	Active transport eg. Cycling, walking  Photo ©The Independent	Zero carbon.	Avoids travel by vehicles.
	Car Sharing/Car Clubs  Photo ©Pacific Rent-A-Car	Reduces the number of vehicles on the road.	Car sharing is the sharing of car journeys so that more than one person travels in a car, and prevents the need for others to have to drive to a location themselves. Car clubs are a model of car rental where people rent cars for short periods of time, often by the hour.
	Public Transport  Photo ©intelligenttransport.com	Reduces the number of vehicles on the road.	Public Transport reduces the number of vehicles on the road, but provides far greater benefits than car sharing as more people can use the same vehicle.

	Mitigation measure	How does this mitigate carbon emissions?	Description
	Electric Vehicles (private and public) and charge points  Photo ©Rolec  Photo ©Electrek	Removes combustion of fossil fuels as the direct source of energy.	Electric vehicles (EVs) do not rely on the internal combustion engine (ICE) burning petrol or diesel to function. Instead they contain batteries which charge on electricity, removing their carbon emissions as well as reducing air quality impacts. If the electricity comes from renewable sources, use of these vehicles is carbon free.
	Hydrogen Vehicles  Photo ©intelligenttransport.com	Removes combustion of fossil fuels as the direct source of energy.	For larger vehicles, Hydrogen could be used as a fuel source. This is where Hydrogen is electrolysed to produce electricity. Water vapour is the only by-product emitted from the exhaust.

Appendix 3: Adaptation measures

Climate change adaptation measures can be incorporated into both existing and new infrastructure to reduce the effects of climate change. This is done by improving our resilience to the changes that are anticipated to come forward over the coming years. There are a number of ways to do this, and the following table describes some of these measures.

Table Methods to adapt to climate change impacts

Adaptive measure	What change does this adapt to?	Description
Rainwater harvesting/ water butts  ©SusDrain 2019	Flood and drought.	Rainwater is collected in water butts and used as a non-portable water resource such as toilet flushing. Harvested water can also be used for gardening and small-scale infrastructure.
Grey water harvesting  © The Green Age	Flood and drought.	Wastewater from baths, showers, washing machines, dishwashers and sinks can be re-used for portable water sources.
Sustainable Drainage Systems (SuDS)  ©SusDrain 2012	Flood, heat waves and drought.	SuDS mimic nature and manage rainfall at the source. They slow the flow of surface water and treat it before it enters watercourses. They provide areas to store water at the surface and allow green and blue infrastructure to be incorporated into urban spaces.
Property Level Resilience (PLR)  ©Flood Protection Solutions	Flood, SLR.	Protective measures installed in existing homes and buildings to offer protection from flooding. This is best suited for existing buildings located in high flood risk areas which are expected to be impacted most by high intensity flooding and sea level rise associated with climate change.

Adaptive measure	What change does this adapt to?	Description
Green space and low level vegetation  ©Cambridge Independent	Flood, drought, heat waves.	Can be incorporated into both new and existing developments. Areas of green space can be used as flood storage providing adaptation to flooding. They also allow water to be absorbed into the ground, recharging drinking water supplies to provide adaptation to drought.
Tree planting  ©Cambridge City Council	Air pollution, flood, heat waves and drought.	Trees provide shading and urban cooling to allow adaptation to increased temperatures and heat waves. They provide adaptation to increased rainfall and flooding by intercepting rainfall. The interception of rainfall allows more water to be absorbed into the ground providing groundwater recharge and thus adaptation to drought. Trees can improve air quality by removing particles and gases from the air (14).
Resilient building design  ©Building Green	Heat waves, flooding, sea level rise, air pollution, drought.	Buildings designed better to adapt to changing temperatures through installation of energy efficient air conditioning, window shading and tinting. Buildings can also be designed with air pollution filters, and ventilation to reduce indoor air pollution. Green walls can be a successful air pollution adaptation measure in city areas, as planting of large trees along narrow streets can obstruct wind flow, limiting their ability to absorb pollutants. Buildings can be designed with floor levels above the projected flood or sea level to adapt to flooding and sea level rise. Buildings can also be adapted to include water re-use/ recycle measures and water saving features such as automatic taps to adapt to drought.
Locating services  ©The Independent	Flooding, sea level rise.	Infrastructure services such as power supplies, property and transport links should be located in areas at less risk of flooding and sea level rise.