

# Mendip Climate Action

**Mendip District Council**

**District-wide Carbon  
Management Plan**

**2021-2023**

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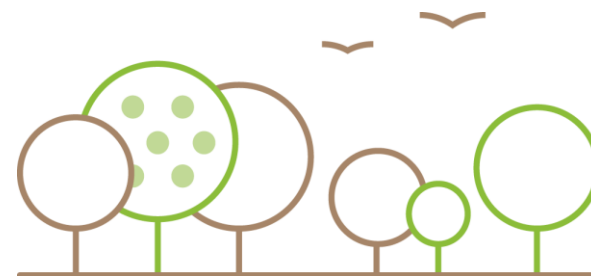
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# Overview and Summary

Climate change is currently the biggest threat to our civilisation and there is clear evidence to show that it is happening right now. The planet's average surface temperature has increased by 1°C since before the Industrial Revolution and seventeen of the eighteen warmest years on record have all happened this century. Greenhouse gases produced by human activities are said to have been the main contributor to this change, as before the Industrial Revolution, the average temperature was stable. In 2014, the Intergovernmental Panel on Climate Change (IPCC) stated that the human influence on the climate system is clear, with greenhouse gas emissions from human activities being the highest in history during recent times<sup>1</sup>. Since the Industrial Revolution – when humans began burning fossil fuels for energy – large quantities of greenhouse gases have built up in the atmosphere. Gases are released from the burning of fossil fuels and, as a result, the level of carbon dioxide (CO<sub>2</sub>) in the atmosphere has risen by 40% during the past 100 years. Climate change has already had widespread impacts on human and natural systems and, if greenhouse gases continue to rise, the impacts of climate change will be felt across the world<sup>1</sup>.

The IPCC's report detailed the impacts of an average temperature increase of 1.5°C above pre-industrial levels, with it being very likely that heat waves will occur more often, and these events will last longer. Extreme rainfall is likely to become more intense and frequent and sea levels will continue to rise, with oceans also becoming warmer and more acidic. Natural influences, such as volcanic eruptions, are considered within these projections and, therefore, these predicted changes are solely due to greenhouse gases from human activities. In response to this report, the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement was adopted, in an attempt to prevent global temperatures rising more than 2°C (with further ambition to limit the increase to 1.5°C) above levels recorded before the Industrial Revolution. The Climate Change Act was passed by the UK Central Government following



<sup>1</sup> IPCC (2014) AR5 Synthesis Report: Climate Change 2014 - *Summary for Policymakers* <https://www.ipcc.ch/report/ar5/syr/>

the adoption of the Paris Agreement, binding the country by law to bring all UK greenhouse gas emissions to net zero by 2050. Like many Local Authorities across the country, Mendip District Council did not feel the 2050 target was ambitious enough and, therefore, declared a climate emergency in February 2019 - pledging to make best endeavours to enable the District to be carbon neutral by 2030. The scale of the challenge to meet such an ambitious target should not be underestimated and it will require everyone within the Mendip community – from residents to businesses – to join forces to make it happen.

The average carbon footprint for all Mendip residents has been estimated at 8 tonnes of CO<sub>2</sub>e (carbon dioxide equivalent) per year and, if we are to become carbon neutral as a District, this needs to reduce rapidly. Making this change requires individual and collaborative action, for example thinking about how we heat our homes, how we travel and the goods we buy. These changes do not mean that we have to go without, it's just about being more conscious when making such choices. The benefits of these actions are not just environmental, as we have the potential to save money, for example on our energy bills, and become fitter and healthier by travelling actively.

The Council are committed to their key role in driving the action to fight climate change, but we recognise that delivering this agenda, requires us all to work together to make our beautiful district and the surrounding natural environment more vibrant and enhanced, in addition to becoming more resilient to the threat that climate change poses. The Mendip District Council District-wide Carbon Management Plan sets the scene of our collective journey to carbon neutrality and illustrates our adopted roadmap and series of measures to reduce emissions across key activities that occur within the district. Mendip is unique and, as such, the Plan details the actions that have been identified as key in making Mendip's distinctive towns and rural communities more sustainable and resilient to the future threats of climate change. Climate change-focussed research, technology and national policy is an evolving field and the roadmap within this Plan will, therefore, require regular review to ensure that we are on the right path to achieving our carbon neutral target.

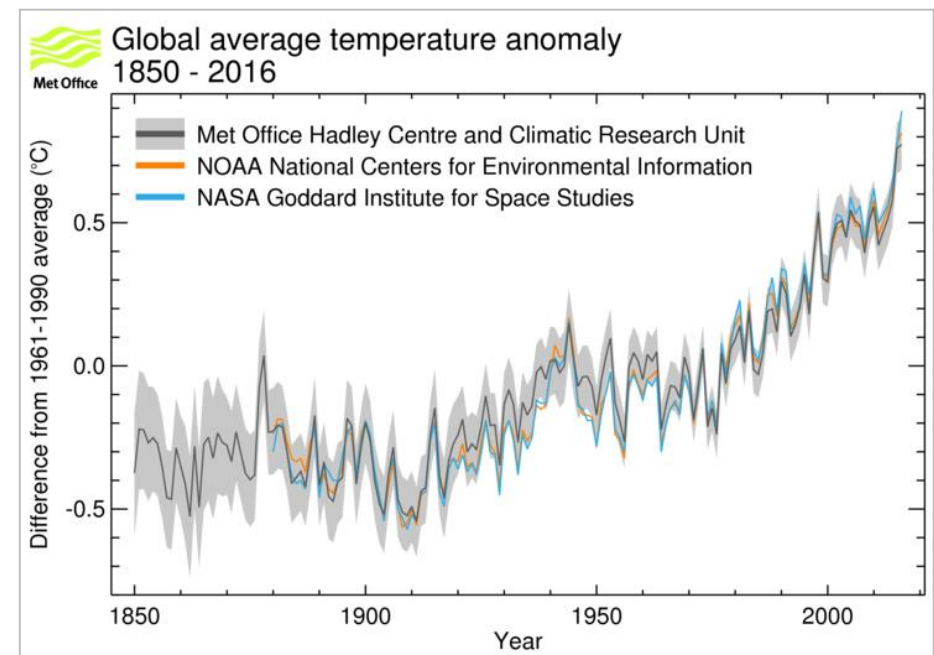
# Why are we concerned about Climate Change?

## What is Climate Change?

Climate change is a large-scale, long-term shift in the planet's weather patterns or average temperatures. Climate change has occurred naturally during the earth's history, resulting from events such as volcanic eruptions and variations in the earth's tilt towards the sun. However, since the start of the Industrial Revolution, global average temperatures have continued to rise, and scientists have found this to be a direct result of increasing levels of greenhouse gases (most pertinently carbon dioxide) in our atmosphere.

Greenhouse gases acquired their name because, like a garden greenhouse, they surround our earth and create a warm environment. The release of more greenhouse gases from burning fossil fuels enables the atmosphere to trap more heat from the sun, with the consequence that the planet warms up. Deforestation also increases the amount of carbon dioxide in the atmosphere. This is because trees sequester carbon through photosynthesis and store it in

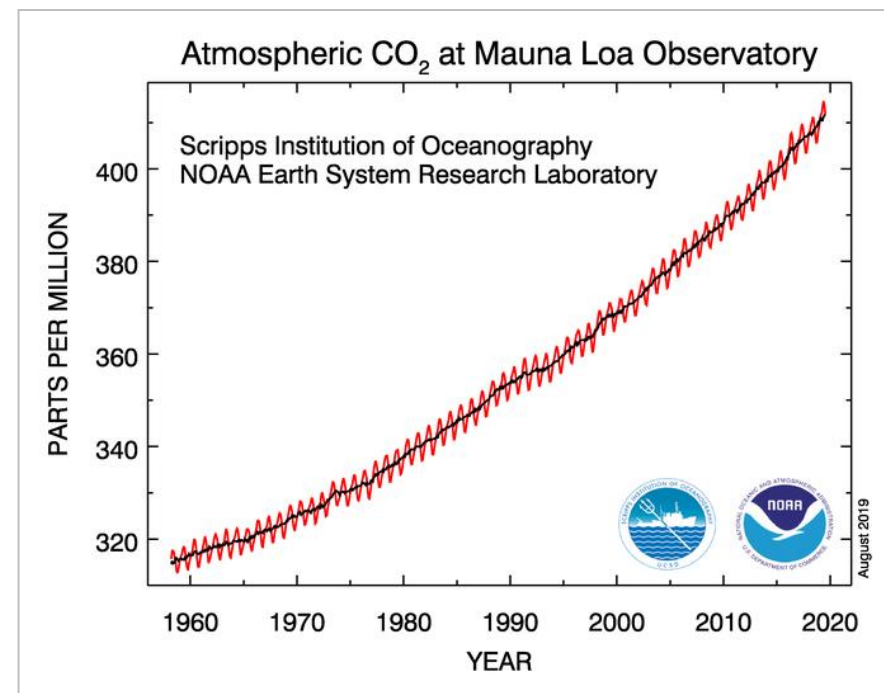
**Figure 1 - Increase in Average Global Temperatures Since 1850 (Source – *Met Office, UK*)**



their trunks and foliage, as part of the carbon cycle. This carbon is released and oxidised to form carbon dioxide if trees are chopped down or burned.

During the Holocene, average global temperatures were relatively stable (around 14°C)<sup>2</sup>. However, since 1850 the planet's average temperature has risen by around 1°C. Concentrations of carbon dioxide in our atmosphere have risen exponentially since 1960 (Figure 2) and scientists know with a high degree of confidence that climate change is happening today as a result of human activities (burning fossil fuels)<sup>3</sup>. This has led to scientists refer to time since 1850 as a geological epoch known as the Anthropocene, because humans have started to significantly impact the earth's atmosphere and ecosystems. Figure 1 shows that on average, global temperatures have risen by more than 1°C since the 1850s. Moreover, the Met Office claim that the years between 2015 – 2018 were the warmest on record, and heatwaves and extreme rainfall events have become more frequent and are likely to intensify as the climate continues to change<sup>4</sup>. Scientists are concerned that a tipping point could be reached if we do not do something soon to drastically reduce global emissions.

**Figure 2 - Global Carbon Dioxide Concentrations Since 1960 (Source – Met Office, UK)**



<sup>2</sup> What is climate change? Met Office (2021) - [www.metoffice.gov.uk/weather/climate-change/what-is-climate-change](https://www.metoffice.gov.uk/weather/climate-change/what-is-climate-change)

<sup>3</sup> The Sixth Carbon Budget: The UK's Path to Net Zero, Climate Change Committee (2020) - <https://www.theccc.org.uk/publication/sixth-carbon-budget/>

<sup>4</sup> Effects of Climate Change, Met Office (2021) - <https://www.metoffice.gov.uk/weather/climate-change/effects-of-climate-change>

## What are the Impacts of Climate Change?

The impacts of climate change, such as the recent extensive wildfires in the USA, Canada and Australia, are becoming increasingly apparent and concerning. The IPCC produced a Special Report in 2018 detailing the impacts of 1.5°C global warming, above pre-Industrial levels. The report stated that there is no clear threshold where climate change moves from safe to dangerous through the exceedance of a “tipping point”. Climate tipping points occur when global heating breaches a critical threshold, leading to abrupt and irreversible change. A loss of natural habitat and resources will be expected even with a 1.5°C temperature rise and the impacts of 2°C warming are likely to be more severe. The impacts of climate change that are felt globally will be entirely dependent on the scale of global efforts to reduce greenhouse gas emissions where, if we do nothing at all, global temperatures could increase by 4°C or more by the end of the century - presenting disastrous, tipping point consequences.

## Predicted Climate Change Impacts for Mendip and Somerset

The Met Office declared the UK summer of 2018 as the hottest year on record and suggested that such events will be 30 times more likely in the future; increasing in both intensity and duration. The 2003 European heat wave, for example, was responsible for 2,000 excess UK deaths and such incidents are now expected to happen twice a decade compared to twice a century. Heatwaves and droughts will likely affect the whole of the UK, but Somerset’s unique geography, with long stretches of low-lying coastline, means we are regarded as one of the most at-risk regions to threats of coastal flooding. Figure 3 illustrates the impacts that are likely to affect us in Somerset if global average temperatures exceed more than 1.5°C. More in depth analysis of the most pertinent climate change risks (particularly in greater warming scenarios) are discussed further in this section.



**Figure 3 - Likely Climate Change Risks for Mendip if Global Temperatures Exceed 1.5°C**  
*(Impacts have been synthesized from the IPCC special report of 1.5°C global warming and made relevant to our region)*

Extreme weather events	<ul style="list-style-type: none"> <li>• Increased occurrence of intense storms, particularly during the summer</li> <li>• Events like the 2014 floods on the Somerset levels become more frequent</li> <li>• Increased risk of flash flooding resulting from extreme weather events - areas like Wells and Shepton Mallet will be vulnerable</li> </ul>
Sea-level Rise	<ul style="list-style-type: none"> <li>• Sea-level of 0.27-1.13m predicted by 2100 along the Somerset coastline</li> <li>• Increased risk of storm surges and coastal flooding in our region - presenting disruption, for example to transport infrastructure</li> <li>• Increased migration of people inland, due to coastal flooding</li> </ul>
Higher average temperatures	<ul style="list-style-type: none"> <li>• Heatwaves and drought likely to become more common during the summer</li> <li>• Increase in heat-related illness and death, due to more extreme summer temperatures</li> <li>• Local livestock and arable farming at risk from heat stress</li> </ul>
Changing rainfall patterns	<ul style="list-style-type: none"> <li>• Summers are predicted to become hotter and drier</li> <li>• Winters projected to be warmer and wetter, especially in Southwest England</li> <li>• Stressed ecosystems due to variation of seasonal weather and increased stress</li> </ul>
Loss of natural habitat	<ul style="list-style-type: none"> <li>• Risk to vulnerable species due to drought, lack of food and habitat loss</li> <li>• Cold-loving wildlife pushed to higher elevations</li> <li>• Disruption to food chains, due to increased risk of species decline</li> </ul>
Risk to human health	<ul style="list-style-type: none"> <li>• Increased risk of vector-borne and waterborne diseases, as pests migrate to the UK due to warmer temperatures</li> <li>• Higher number of heat-related deaths amongst the elderly and vulnerable</li> <li>• Danger arising from extreme events, such as flooding</li> </ul>
Impacts on water quality and availability	<ul style="list-style-type: none"> <li>• Water shortages due to drought, changing rainfall patterns and pressure on river flows</li> <li>• Reduced recharge of groundwater flow leading to impacts on water quality</li> <li>• Increased water stress impacting upon human health, agriculture and industry</li> </ul>
Pressure on resources	<ul style="list-style-type: none"> <li>• Reduced crop production due to drought and intense rainfall leading to soil erosion, and flooding</li> <li>• Extreme events present risk of damage to buildings and transport networks, impacting on supply chains and distribution and, therefore, increasing prices</li> </ul>

## How Could Sea-Level Rise Affect Mendip?

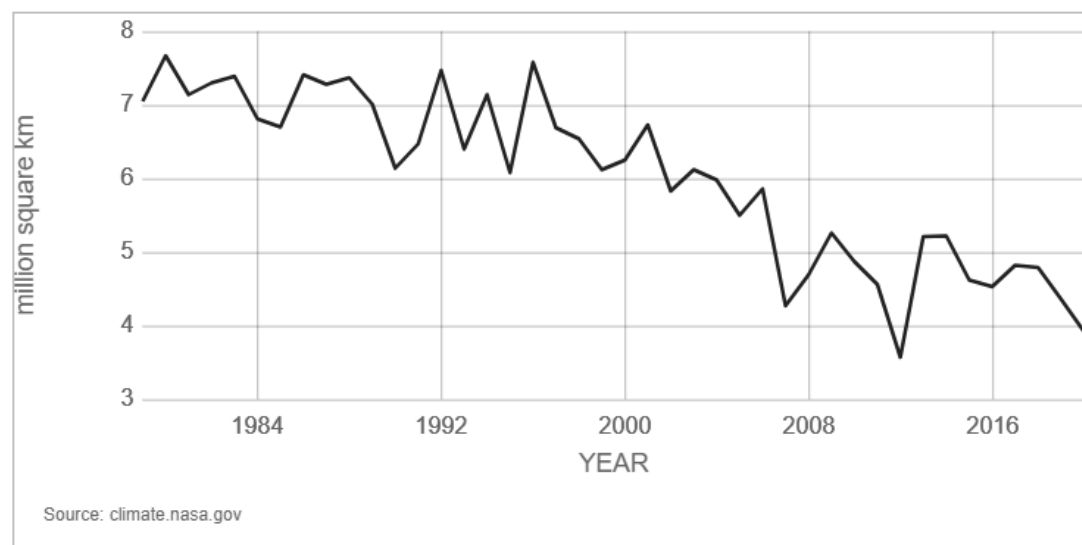
Global sea levels are predicted to increase by 2100, due to thermal expansion of oceans and melting sea ice in polar regions. NASA has stated that arctic sea ice is currently declining at a rate of 13.1% per decade (see Figure 4), with its smallest extent ever recorded in 2012<sup>5</sup>. Furthermore, the IPCC said in their 2014 report, that global sea levels have risen by 19 centimetres since the beginning of the 20th century<sup>1</sup>.

In all warming scenarios (1.5°C and more), sea-levels are projected to rise by 0.26 – 0.82m by the late 21<sup>st</sup> century, presenting potentially disastrous consequences for coastlines and coastal communities around the world. The South West of

England is predicted to be extremely vulnerable, as significant stretches of the region's coastline are at or below sea level. Met Office projections indicate that due to thawing Arctic sea ice and thermal expansion, a rise in sea-level of 0.27m - 1.13m is possible by 2100 in our region.

Sea-level rise and heavier rainfall in the South-west means that storm surge events are likely to become more intense and frequent. Scientists have stated that such events are likely to breach coastal defences, leading to flooding of low-lying areas, particularly the Somerset Levels. The geography of the levels is mainly flat, with much of the land at or a few metres above sea level and prone to seasonal flooding events. Following

**Figure 4 - Average minimum Arctic Sea Ice Extent**  
(Source – NASA)



<sup>5</sup> Arctic Sea Ice Minimum, NASA (2021) - <https://climate.nasa.gov/vital-signs/arctic-sea-ice/>

the end of the last ice age (approximately 10,000 years ago,) sea-levels rose following thawing of the ice sheets which covered most of the UK. The Somerset Levels area was an estuarine environment and places like Wedmore, Godney and Glastonbury were islands (see Figure 5). Around 6,500 years ago the rate of sea-level rise slowed down and reedbeds started to colonise the increasingly shallow water. As the plants died their remains fell into the water and, due to the absence of oxygen they did not decay, hence the considerable expanses of peat formation<sup>6</sup>. It wasn't until the late 1700s that the area was drained and reclaimed as agricultural land. As such, due to its low-lying topography and history of submergence, the area is at extreme risk of coastal inundation, if sea-level rise occurs in line with current projections.

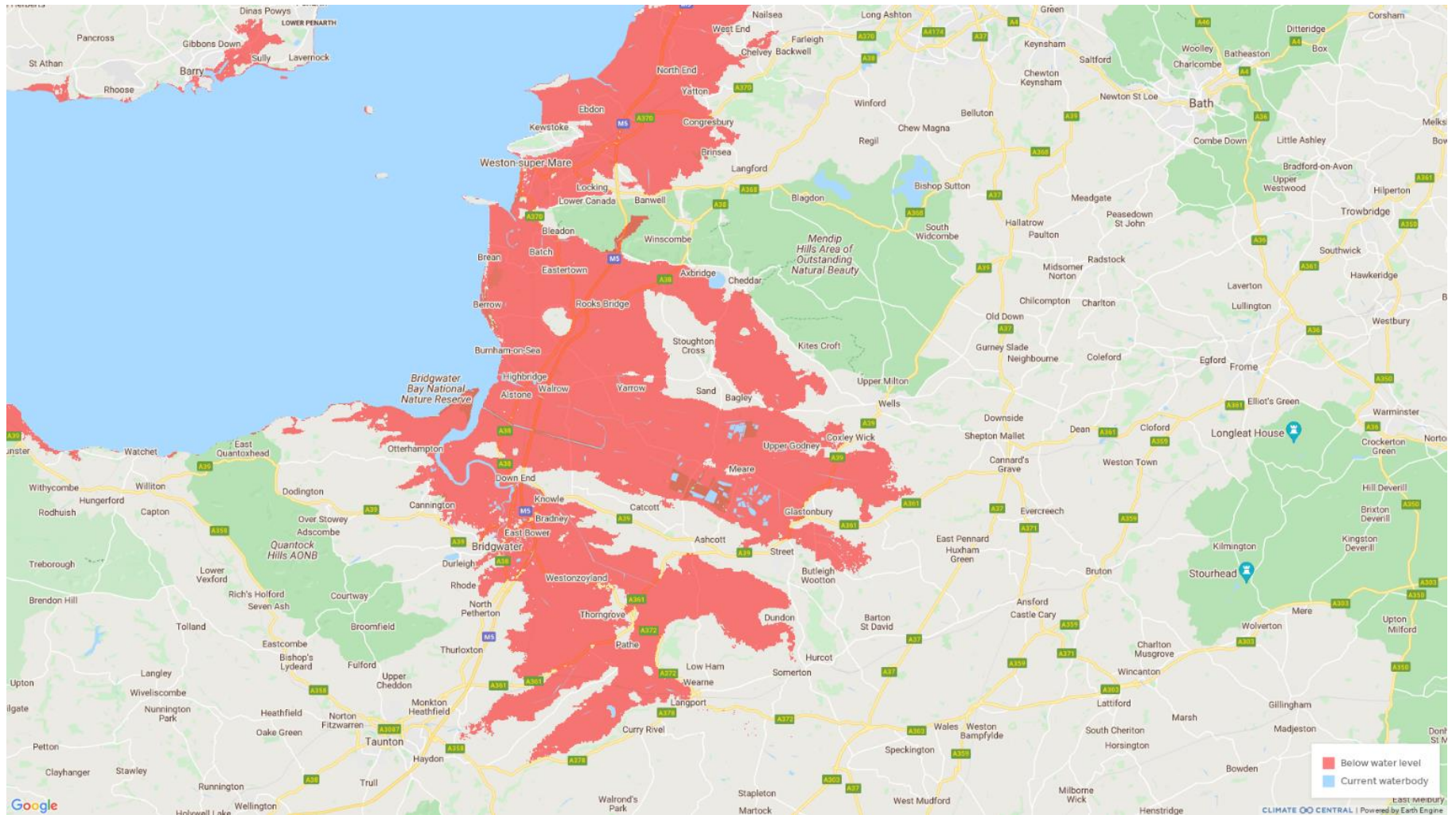
**Figure 5 - How the Somerset Levels Used to Look around 5000 BC**  
(Source – Avalon Marshes)



Figure 6 illustrates the projected extent of coastal flooding in Somerset by 2050. For Mendip in particular, areas between Wells and Glastonbury, and stretches from Meare as far out to Baltonsborough are predicted to be at risk of coastal inundation in 30 years' time. This scenario is extremely worrying and emphasises the need to not just drastically reduce emissions, but also ensure we are prepared and resilient as a district to the adverse impacts of climate change that are likely to occur in the future.

<sup>6</sup> Landscape History, *Avalon Marshes* (2020) - <http://avalonmarshes.org/the-avalon-marshes/landscape/landscape-history/>

Figure 6 - Projected areas in Somerset at Risk of Coastal Flooding in 2050 (Source – *Climate Central*)





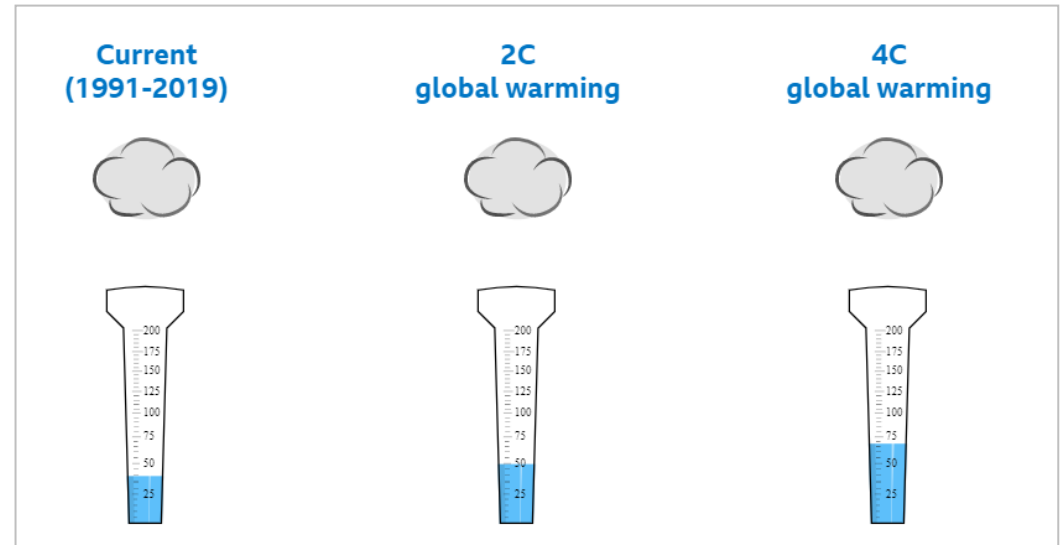
## What is the Risk of More Intense Rainfall in Mendip?

The South-west of England receives high amounts of rainfall all year round. Our climate is largely governed by prevailing south-westerly winds, which bring warm, moist air from the Tropics which creates relief rainfall, as clouds are forced up over high ground, like the Mendip Hills which have the highest rainfall of all the South-west regions (1100mm annual average). However, due to convection and Atlantic depressions, even low-lying areas like the Somerset Levels receive on average, 700mm of rainfall per year.

Climate change is likely to increase the amount of rainfall we receive in Mendip during the winter, as the season becomes warmer and wetter. If global average temperatures were to rise by 4°C, more than

half the country could see at least 10% more rain over the winter months<sup>7</sup>. The Climate Change Visualisation Tool was produced by the Met Office in conjunction with the BBC and enables people to observe how the area where they live may be affected by climate change. In Mendip, rainfall is projected to increase by 67% in a 4°C warming scenario (see Figure 7) and winters are likely to be warmer and wetter. These predictions are likely to increase the frequency and intensity of surface water run-off into river catchments and groundwater flow through porous areas like the Mendip Hills.

**Figure 7 - Projected Mendip Rainfall in 2°C and 4°C Warming Scenarios (Source – *The Met Office*)**



<sup>7</sup> What will climate change look like near me? *BBC and The Met Office* (2020) - [www.metoffice.gov.uk/research/climate/maps-and-data/regional-climate](https://www.metoffice.gov.uk/research/climate/maps-and-data/regional-climate)

According to the Environment Agency, peak river flows in the South-west are projected to increase by 85% from 2080 onwards in the most severe warming scenario, if we do nothing to curb emissions<sup>8</sup>. Events like the 2014 flooding of the Somerset Levels (see Figure 8) are, therefore, expected to increase in frequency and intensity. Worryingly, areas that are not currently flood prone are likely to be in the future, with towns like Shepton Mallet becoming vulnerable to increased flooding events from surface run-off. The impacts of increased flooding events in Mendip present concerns leading to serious consequences for our housing, rural transport networks and livelihoods.

## How Could Climate Change Affect our Health and Wellbeing?

According to the World Health Organisation (WHO), global warming may bring some localized benefits, such as fewer winter deaths in temperate climates and increased food production in certain areas, but the overall health effects of a changing climate are overwhelmingly negative<sup>9</sup>. Direct impacts on human health are created by changing exposure to heat and cold, increased exposure to UV radiation, air pollution, pollen, food safety risks, emerging infections, flooding and associated water-borne diseases<sup>3</sup>.

For people living in Mendip and Somerset, extreme heat is anticipated to adversely affect our most vulnerable residents, especially the elderly and those suffering from cardiovascular and/or respiratory health conditions. The Met Office UKCP19 projections estimate that average summer

**Figure 8 - Somerset Levels Floods, 2014 (Source – *The Independent*)**



<sup>8</sup> Flood risk assessments: Climate change allowances, *Environment Agency* (2020) - [www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances](https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances)

<sup>9</sup> *Climate Change and Health*, World Health Organisation (2018) - <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>

temperatures in the South-west could be 8°C hotter by 2080 in the highest warming scenario (Figure 9), which involves an average annual temperature increase of 3.7°C (by 2100)<sup>10</sup>. This scenario is regarded as the highest business-as-usual outcome if we do nothing to curb emissions.

The Committee on Climate Change's recent assessment of UK climate risk stated that there were 2,500 heat-related deaths in the summer of 2020, which is the highest number since 2003<sup>11</sup>. Severe heat stress is perhaps a less obvious health risk than flooding, however it is nevertheless a major concern and whilst to date, some flooding events have clearly devastated communities, by comparison, UK flooding in 2007 is reported to have been responsible for 10-15 deaths<sup>11</sup>. The UK Health Expert Advisory Group claims that UK heat-related deaths are projected to increase to an annual average of between 3,000 and 13,000 in the 2050s<sup>3</sup>. Pollen and allergen levels are also higher during extreme heat events, which can trigger asthma – currently affecting 300 million people worldwide.

**Figure 9 - Projections of Average Summer Temperatures in the Highest Warming Scenario by 2080, where the 10<sup>th</sup> Percentile is the Lowest Estimate and 90<sup>th</sup> is the Highest (Source – *Carbon Brief*)**

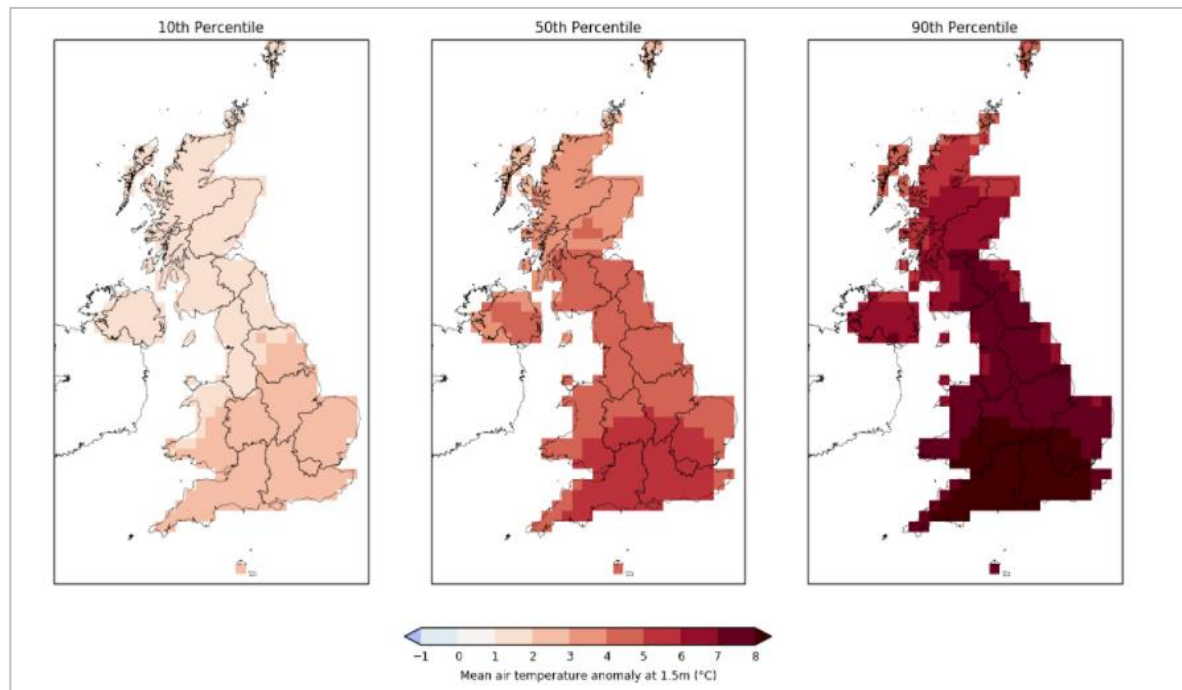


Figure 10 demonstrates the cause and effect of climate change impacts on human health, the majority of which are relevant to the UK and our region. A changing climate is likely to increase the prevalence of waterborne and vector-borne diseases, with the geographic range of diseases such as Malaria likely to broaden to temperate regions like Europe. The occurrence of extreme flooding events also present health risks to

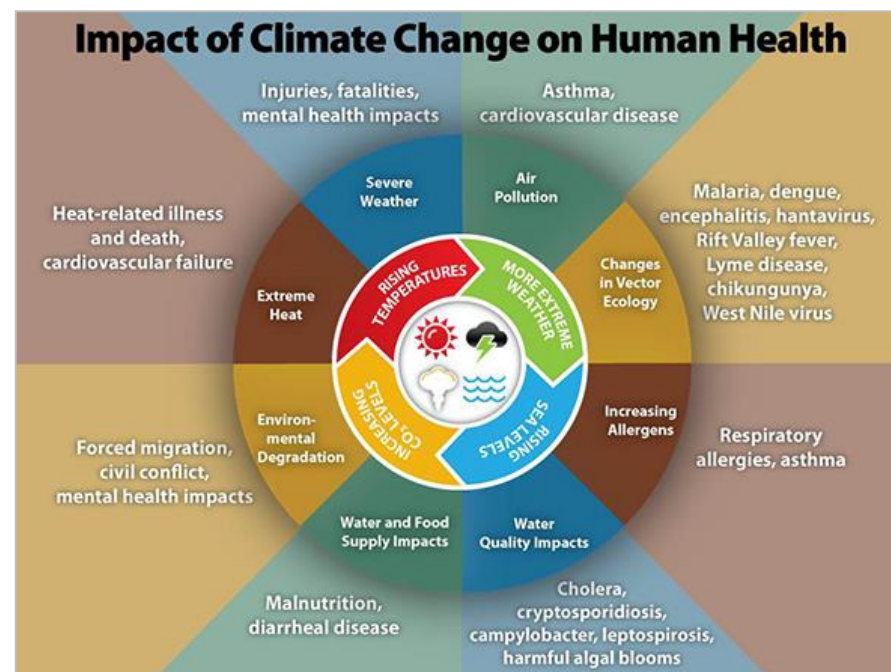
<sup>10</sup> In depth Q & Q: The UK Climate Projections, *Carbon Brief* (2018) - <https://www.carbonbrief.org/in-depth-qa-the-uk-climate-projections-2018>

<sup>11</sup> Independent Assessment of UK Climate Risk, *Committee on Climate Change* (2021) - <https://www.theccc.org.uk/publication/independent-assessment-of-uk-climate-risk/>

Mendip residents, in addition to socio-economic impacts, such as property loss. Low income groups are most at risk of the indirect impacts of climate change, which include higher prices for food and water, overheating in homes, reduced mobility, poverty and unemployment<sup>12</sup>.

Worryingly, experts have expressed concerns that all climate change risks are likely to be more sensitive in the highest warming scenario. The Climate Change Committee (CCC) also states that climate change is already happening due to past emissions of greenhouse gases, and even very ambitious global action to reduce emissions will take time to implement<sup>11</sup>. Therefore, there is a need to start adapting and prepare for the worst effects of climate change, as mitigation alone will not be enough.

**Figure 10 - How Climate Change is Likely to Impact on the Health of People Around the World (Source – *Center for Disease Control and Prevention*)**



<sup>12</sup> Advisory Group Report for the UK, *Committee on Climate Change* (2020) - <https://www.theccc.org.uk/publication/ucl-sustainable-health-equity-achieving-a-net-zero-uk>



# Why has Mendip District Council declared a Climate and Ecological Emergency?

## How has the World Responded to Concerns about Climate Change?

Due to concerns raised about climate change by scientists in the 1980s, the Intergovernmental Panel on Climate (IPCC) was set up as the world's leading body to investigate and report on scientific evidence on climate change, its impacts and risks and opportunities for mitigation and adaptation. The first IPCC report was published in 1990, which started to make the links between carbon dioxide and anthropogenic climate change. The report led to the formation of the United Nations Framework Convention on Climate Change (UNFCCC) in 1991, as an international environment treaty for addressing climate change. The UNFCCC's focus has been to prevent greenhouse gas concentrations from increasing in the atmosphere to a point that would lead to catastrophic disturbance of the climate system. The Kyoto Protocol came into force in 2005, seeking to extend the UNFCCC commitment to reduce greenhouse gas emissions through the acknowledgement by all 192 member states that climate change is happening, with human activities the most likely cause. The Treaty saw 36 countries committing to individual emissions targets between 2009 and 2012 but was considered a failure as global emissions increased by 32% in 1990-2010.

A further IPCC report in 2014 instigated increasing concerns about projected global warming and its impacts. As a result, the Paris Agreement was adopted in 2015 at the 21<sup>st</sup> Conference of the Parties (COP21), committing all 190 UNFCCC Member States to a global, legally binding, commitment to prevent global temperatures rise exceed 2°C above pre-Industrial levels, with further ambition to limit the increase to 1.5°C. A global annual carbon budget of 900 GtCO<sub>2e</sub> was also agreed and is shared between developing and developed countries around the world, with the former assisting the latter with their commitments. All participating countries must report on their progress to reduce emissions in pursuit of the 2°C goal.

Further commitment to address climate change is embedded in the 2030 Agenda for Sustainable Development. The Agenda was adopted by all UN Member States in 2015 and contains 17 Sustainable Development Goals (see Figure 11) which recognise that ending poverty must go hand-in-hand with strategies to improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests<sup>13</sup>.

**Figure 11 – The UN Sustainable Development Goals**  
(Source – *United Nations.org*)



<sup>13</sup> The 17 Goals, *United Nations Department of Economic and Social Affairs* (2020) - <https://sdgs.un.org/goals>

## What is the UK Government Doing to Address Climate Change?

The 2008 Climate Change Act (2050 Target Amendment) Order 2019 legislates the UK's commitment to net zero greenhouse gas emissions by 2050, through a series of five-yearly carbon budgets between 2008 – 2032. The Climate Change Committee (CCC) are the government's advisory panel who assess whether the UK is on track to meet the 2050 targets. A report by the CCC on the fifth carbon budget, advised the government to commit to reducing the UK's greenhouse gas emissions to 57% below 1990 levels by 2032. Many organisations and individuals, however, have felt that the UK government's 2050 net zero target is not ambitious enough if we are to limit temperature rise to well below 1.5°C. This has led to calls for more urgent action and many local authorities declaring climate emergencies and earlier carbon neutral (net zero) targets.

The CCC has recently published their report advising the government on how to attain the sixth carbon budget (2033-2037), by amending its target to reduce greenhouse gas emissions to 78% relative to 1990 levels, by 2035; taking the UK to three quarters of the way to net zero by 2050<sup>3</sup>. The CCC further stated that this target can only be achieved if central government, regional agencies and local authorities all work together. But, as more than half of the required emissions cuts are reliant on the adoption of low-carbon solutions by individuals and businesses, local government has a clear role to play as a facilitator for change, through the development of policies and strategies that support efforts to mitigate and adapt to climate change.

## Mendip District Council's Climate and Ecological Emergency Commitment

In February 2019, a motion was passed at Full Council, responding to the climate crisis and the need to be more ambitious than the UK's 2050 net zero target. The motion asked the Council to:

1. Declare a 'Climate Emergency';
2. Make best endeavours, using its powers and resources, including both financial and officer time, to enable the district of Mendip to become carbon neutral by 2030.
3. Call on Westminster to provide the powers and resources to make the 2030 target possible;
4. Work with other councils and governments to determine and implement best practice methods to limit Global Warming to less than 1.5°C;
5. Continue to work with partners across the district and region to deliver this new goal through all relevant strategies and plans;
6. Commit £100k to fund action in the scoping and delivery of the District Council's Climate Emergency 2030 commitment.
7. Report to Full Council every six months with the actions the Council will take to address this emergency.

Recognising how climate change and the loss of biodiversity across the UK are inextricably linked, the Council's declaration was amended to become a Climate & Ecological Commitment and forms one of the Council's three main priorities in the 2023 Corporate Plan.

## The Somerset-wide Climate Emergency Strategy

The Somerset-wide Climate Emergency Strategy was adopted by the five, Somerset councils in November 2020, in conjunction with external partners and experts, following public consultation earlier that year. The Strategy aims to reduce emissions across the County in pursuit of carbon neutrality by 2030 and enable Somerset to be resilient to the effects of climate change.

The strategy outlines targets across all sectors in Somerset to become carbon neutral by 2030, however the district councils – including Mendip – are to develop their own climate emergency plans, whilst aligning themselves to the county-wide strategic approach. Please click [here](#) to view the strategy documents outlining the joint climate emergency commitment of the five Somerset local authorities: Mendip District Council; Sedgemoor District Council; South Somerset District Council; South West Somerset and Taunton District Council, and Somerset County Council.

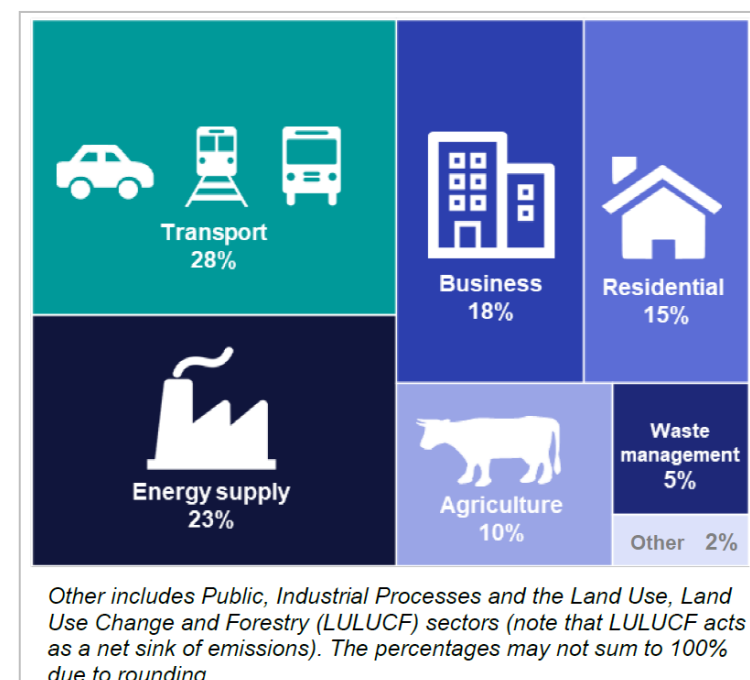
# Carbon Emission Profiles

## The UK's Carbon Emissions Profile

In 2018, the UK's total greenhouse emissions were **451.5 MtCO<sub>2</sub>e** – a reduction of 2.1% on the previous year. Of the greenhouse gases reported, carbon dioxide remains the most dominant greenhouse gas, accounting for 81% of the total. Overall, UK emissions were reported to be 43.1% lower than in 1990.

Figure 12 illustrates the breakdown of carbon emissions by sector, whereby transport was the main emitter, accounting for 28% of emissions. Energy supply was the second largest emitting sector (accounting for 23% of the total) but noted for a decrease in emissions by 62% on 1990-2018 levels. Agriculture was said to be the least emitting sector, accounting for 10% of total UK emissions.

**Figure 12 - 2018 Breakdown of UK Greenhouse Gas Emissions by Sector** (Source – *Department for Business, Energy and Industrial Strategy*)



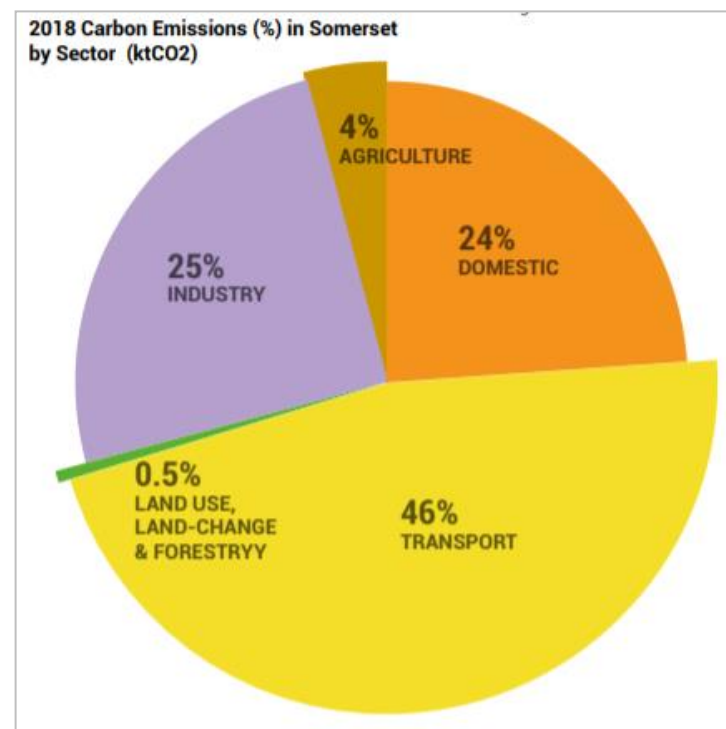
## Somerset's Carbon Emissions Profile

The Somerset-wide Climate Emergency Strategy presents an estimate for the county's total carbon emissions, based on data provided by the Department for Business, Energy and Industrial Strategy (BEIS). The Strategy reports that Somerset produced an estimated total of 3,269 thousand tonnes of carbon emissions in 2018.

The breakdown in Figure 13 highlights that transport was the primary emitting activity in Somerset, accounting for 46% of emissions. The county's industrial sector is the second largest emitter (producing a quarter of Somerset's emissions), whereas domestic energy, agriculture and LULUCF accounted for 24%, 4% and 0.5% of sectoral emissions respectively. For agriculture, it is important to note that only carbon dioxide from agricultural buildings and machinery is accounted for within the BEIS statistics. Of the greenhouse gases produced by the agricultural industry, carbon dioxide is the least in comparison to methane (the highest) and nitrous oxide.

Further information about the breakdown of Somerset's carbon emissions can be found in the [Somerset-wide Climate Emergency Strategy](#).

**Figure 13 - 2018 Carbon Emissions Profile (by Sector) for Somerset (Source – *Somerset-wide Climate Emergency Strategy*)**



## Mendip's Carbon Emissions Profile

An assessment of the District's baseline carbon emissions inventory was completed in February 2020. This work was the first of its kind to be completed in Mendip and stands as the starting point to monitor the District's progress to become carbon neutral by 2030. Demographically, approximately 133,500 live in the District's 62 Parishes. Mendip is largely rural, with 60% of land classified as agricultural, and there are five main settlements - Frome, Glastonbury, Shepton Mallet, Street and the City of Wells.

The District's baseline inventory report was developed in accordance with the Global Covenant of Mayors' Common Reporting Framework<sup>14</sup> and the Greenhouse Gas Protocol for Cities. Analysis of Mendip's carbon footprint has been conducted using the SCATTER Greenhouse Gas Inventory, which obtains local authority emissions data from BEIS, in addition to statistics from other publically accessible sources (as explained in the SCATTER [methodology](#)). This data is aggregated to present a more thorough assessment of carbon emissions (reported as carbon dioxide equivalent CO<sub>2</sub>e), rather than just relying on the BEIS data alone. Emissions are grouped according to where they occur (whether it is inside the Local authority/City boundary or outside) and are referred to as "Scopes" (see Appendix for further explanation). Scopes are referred to when analysing the emissions associated with the inventory boundary and provide useful context as to what is within the Local Authority's control.

A report was published by Mendip District Council in February 2020 which comprised of a comprehensive assessment of emissions from all three scopes, during 2017 (forming the base year for assessment). The total emissions during 2017 were estimated at **893,195 tCO<sub>2</sub>e**.

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<sup>14</sup> Global Covenant of Mayors Common Reporting Framework [www.globalcovenantofmayors.org](http://www.globalcovenantofmayors.org)



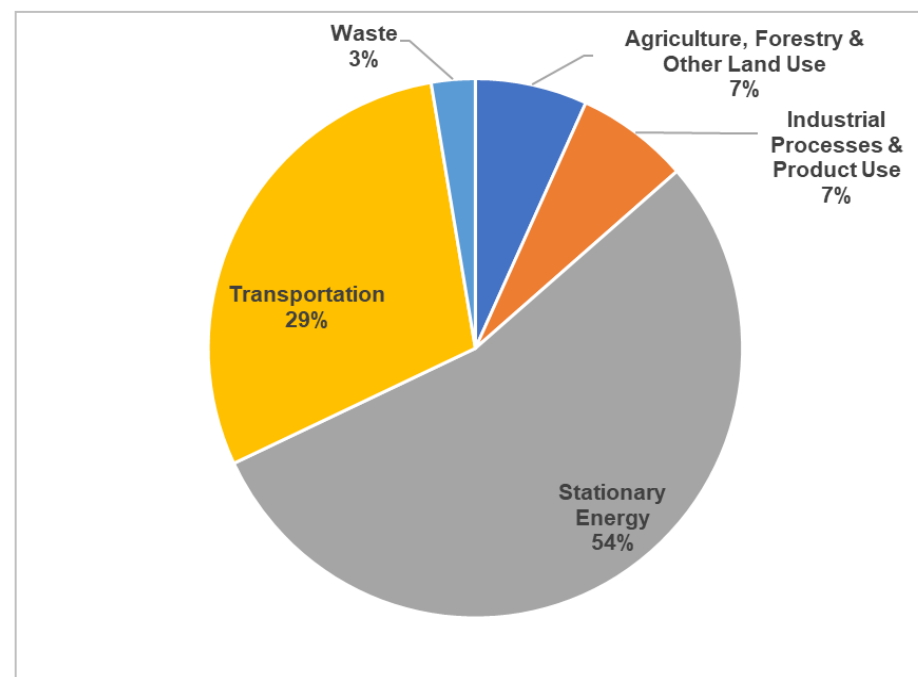
The District-wide Future Emissions Pathways Report was developed by specialist consultants and presented to Mendip District Council's Cabinet in February 2021. The report presents a revised assessment of Mendip's emissions, by looking at Scopes 1 and 2 only (in-boundary activities), as the consultants considered this enabled more accurate target setting and the identification of tangible decarbonisation measures. The revised inventory emissions for Mendip (during the base year of 2017) is, therefore, **818,996 ktCO<sub>2</sub>e**.

Figure 14 presents the assessment of scope 1 & 2 emissions (by sector) in Mendip. Stationary energy (used to heat and power the District's buildings) is estimated to be the primary emitter, comprising of 54% of emissions. Contrasting with UK and Somerset-wide figures, transport was found to be the second highest emitting sector in Mendip, accounting for 29% of total emissions. This contrast is likely due to the rurality of our District and lack of major road networks, such as the M5.

Further analysis of emissions (see Figure 15) illustrates that industrial and institutional buildings consume the largest proportion of energy emissions in Mendip (218,949 tCO<sub>2</sub>e) and is the primary emitting activity by sub-sector. On-road transport is the second highest emitting activity, accounting for 218,872 tCO<sub>2</sub>e. Energy used to heat and power residential properties in the District produced 186,971 tCO<sub>2</sub>e in 2017 and is the third largest emitter by sub-sector.

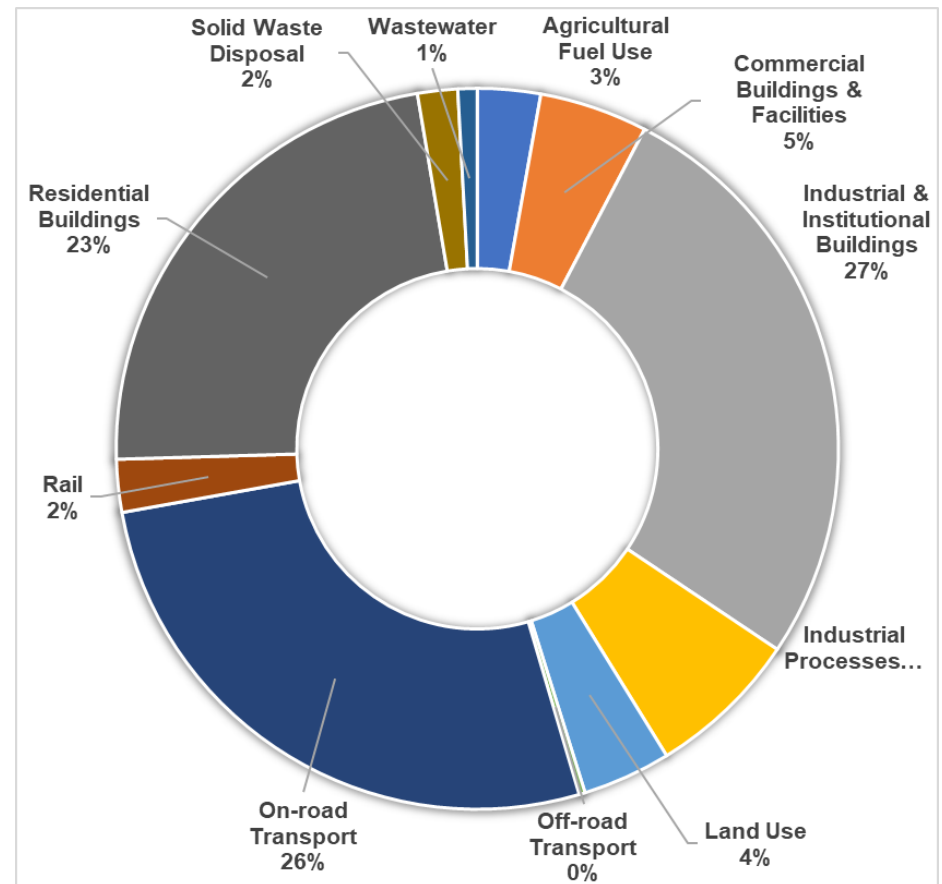
The analysis conducted by specialist consultants sought to try and quantify an estimate of emissions arising from Mendip's agricultural sector, aside from CO<sub>2</sub> produced by agricultural buildings and machinery. The methodology considers emissions from livestock (enteric fermentation)

**Figure 14 - Mendip's 2017 Carbon Emissions Profile**



only which, if accounted for in isolation, could potentially mis-represent the relationship between agriculture and climate change, by failing to take into consideration emissions resulting from other components (such as agricultural soils) and the carbon balance fostered through the sequestration potential of landholdings. The Council is exploring options to develop a bespoke mitigation strategy for agricultural emissions in Mendip, which includes a holistic assessment of farming-related greenhouse gases and potential methods for delivering tangible and pragmatic solutions.

**Figure 15 - Breakdown of Mendip's emissions by sub-sector in 2017**



# Mendip's Roadmap to Carbon Neutrality

## Mendip's 2030 Emissions Pathway

Establishing the baseline emissions inventory was the first step in planning how to deliver on the Council's target to enable the District to become carbon neutral by 2030. The next step involved the development of a 2030 Emissions Pathway to roadmap the journey to district-wide carbon neutrality by 2030. The Pathway illustrates what needs to be delivered to reduce emissions across the district and provides a series of annual emissions reduction targets to facilitate the measurement of progress towards carbon neutrality. This approach is in accordance with best practice, whereby local authorities (such as Bath and North East Somerset Council) have commissioned similar reports to provide an evidence base to inform planning in response to its climate emergency declaration. The Climate Change Committee's 2019 Net Zero Report provides a framework for local authorities who have set carbon neutral targets, by presenting a series of decarbonisation scenarios to demonstrate what needs to be delivered to achieve the target of net zero UK emissions by 2050.

Mendip's 2030 Emissions Pathway has been produced using the [SCATTER Pathway Modelling Tool](#), which manipulates a range of nationally available datasets in order to illustrate different emissions scenarios. The modelling tool has been developed to produce an emissions trajectory in parallel with the UK Government's 2050 net zero target, however, it does contain the flexibility to bring the target date forward; enabling a pathway to be produced which demonstrates the level of decarbonisation that is required across all sectors, in line with the Council's 2030 target. The Pathway was further manipulated to align with the 2017 emissions inventory data for the district, to enable a smooth, downward trajectory from the baseline year.

Mendip's 2030 Emissions Pathway is considered the most tangible option to enable District-wide decarbonisation (available within the Council's existing powers) and illustrates what needs to be delivered to enable this to happen. The Council acknowledges that the Pathway does not enable carbon neutrality to be achieved by 2030 and it should be considered as a "working document". As such, the Monitoring and Reporting section in this Plan outlines the programme for measuring progress to deliver on the district's annual emissions reduction targets, in addition to an annual review of the Pathway to ensure it is adjusted in accordance with opportunities that may arise from updated policy, funding frameworks, or other drivers and incentives.

As referenced above, Mendip's 2030 Emissions Pathway has been developed in accordance with the existing policy and funding levers (available to the Council) to deliver the actions needed to decarbonise activities across the District; reflecting the Climate Emergency Declaration. Where the Council's ambitions to enable the District to become carbon neutral by 2030 remain, the measures needed to facilitate rapid and intensive decarbonisation are largely dependent on existing policy and funding levers. For instance, although zero carbon homes are considered a key measure to reduce emissions from the domestic energy sector, there is currently no legislation within the National Planning Policy Framework to enable this to be delivered in Mendip at present.

**Figure 16 - Local Authority Sphere of Influence for Climate Change Mitigation (Source – LGA)**

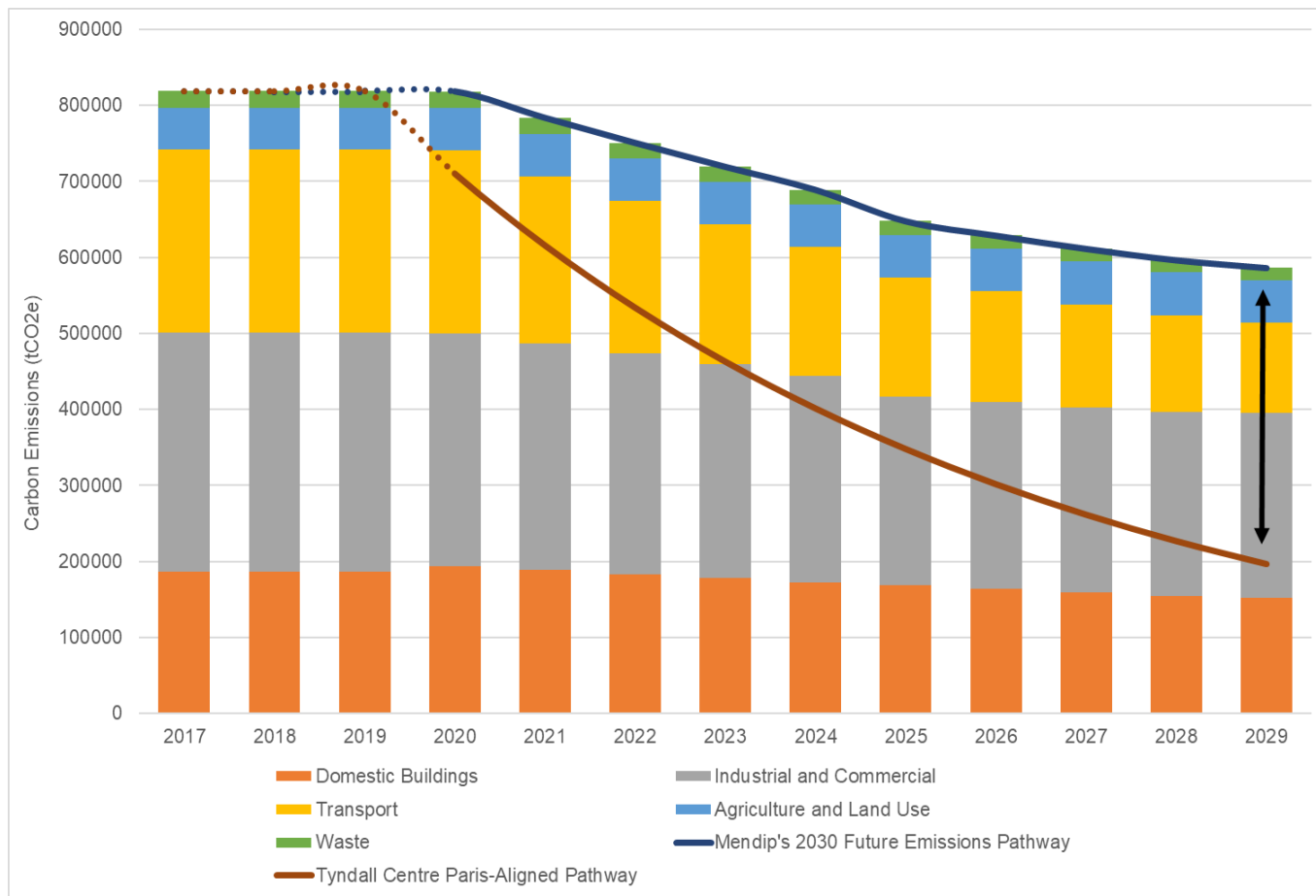


Figure 16 was developed by the Climate Change Committee to illustrate the Local Authority “Sphere of Influence” in terms of mitigating territorial carbon emissions. A large proportion of mitigation measures are dependent on behaviour change amongst local authority residents and businesses through the adoption of low-carbon solutions and are, therefore, not within the Council’s direct control. However, the Council does have the opportunity to influence behaviours by leading by example, bringing people and organisations together, and raising awareness about the solutions needed to reduce emissions in the District.

Mendip’s 2030 Emissions Pathway (Figure 17) was adopted by Cabinet in June 2021, following consideration that it currently offers the most achievable and practicable level of decarbonisation by 2030 (within the Council’s existing powers).

Mendip’s Emissions Pathway (Dark Blue Line) results in an overall 30.5% reduction in District-wide Scope 1 and 2 emissions by 2030. The Council recognises that the Pathway does not deliver the emissions cuts that are needed to achieve District-wide carbon neutrality by 2030, but the trajectory is considered to best reflect the current policy and funding levers that are available to facilitate decarbonisation of territorial activities.

**Figure 17 – Mendip’s 2030 Emissions Pathway**



Mendip's 2030 Emissions Pathway is compared with the Tyndall Centre Paris-aligned Pathway (Brown Line). The Tyndall Centre Pathway (based upon the report on climate change targets for Mendip, developed by the Tyndall Centre for Climate Change Research<sup>15</sup>) requires emissions across the District to be reduced by 13.3%, on an annual basis. The comparison illustrates the scale of challenge needed and the gap between what can be practicably delivered within existing powers and what needs to be actioned to achieve carbon neutrality by 2030. The Tyndall Centre targets for Mendip are derived from the commitments enshrined in the Paris Agreement; informed by the latest science on climate change and defined in terms of science based carbon setting<sup>15</sup>. The targets are focussed on reducing carbon dioxide from energy-derived emissions only (other greenhouse gases are not included) and are not based on tangible policy and implementation. Nevertheless, the comparison does provide an illustrative indication of the considerable gap in terms of what emissions reductions can be achieved within existing policy and funding levers.

**Figure 18 - Mendip's 2030 Annual Emissions Reduction Targets**

Year	Annual emissions reduction targets (%)
2017	0
2018	0
2019	0
2020	0.10
2021	4.24
2022	4.20
2023	4.19
2024	4.20
2025	5.98
2026	2.92
2027	2.76
2028	2.44
2029	1.71
2030	2.91

Attainment of Mendip's 2030 Emissions Pathway involves a year-on-year reduction in carbon emissions. Figure 18 presents a series of annual emissions reduction targets (aligned with Mendip's 2030 Emissions Pathway) to demonstrate the amount of decarbonisation that is required across the District, on an annual basis, to result in a 30% reduction on baseline emissions by 2030. These targets, therefore, form as the basis for monitoring progress to deliver on the agreed 2030 Emissions Pathway for Mendip and overarching Climate Emergency commitment.

<sup>15</sup> *Setting Climate Commitments for Mendip*, Tyndall Centre for Climate Change Research (2018) - <https://carbonbudget.manchester.ac.uk/reports/E07000187/>

## Mendip's 2030 Emissions Pathway – The Plan

The SCATTER Pathways Tool enables Local Authorities to calculate emissions trajectories based on factors for the change year-on-year, in terms of fuel consumption, numbers of trees, and waste generation within the local authority area<sup>22</sup>. Local Authorities can select the intensity level of a range of measures which are intended to reduce emissions within each sector. To support the decarbonisation of activities within Mendip, the Council has identified the suite of measures it feels are able to be delivered within existing policy and funding levers.

The following suite of measures and targets were approved by Cabinet in June 2021, to enable fulfilment of the Mendip's 2030 Emissions Pathway. The measures are directly linked with Mendip's 2017 Carbon Emissions Profile and can be broadly grouped into two categories; interventions focused on reducing energy demand and those seeking to decarbonise energy supply. Each measure demonstrates the indicative level of change that is needed by 2030 to reduce energy demand and also decarbonise and decentralise energy supply. The measures and targets will be presented sector-by-sector and altogether form the Action Plan to deliver a 30% reduction of District-wide emissions. As carbon neutrality requires offsetting of any residual emissions following the decarbonisation of in-boundary activities, the Plan also includes a series of measures that aim to enhance the carbon sequestration potential of natural capital in the District. The measures include a percentage increase of forest and standalone tree cover, in addition to recommended transitional targets for land management.

The Plan references the Council's 20-23 Climate and Ecological Emergency Corporate Priority Actions that are relevant to each sector, in addition to the applicable outcomes from the Somerset-wide Climate Emergency Strategy, as part of Mendip's contribution to enabling the whole county to become carbon neutral by 2030.

## Agriculture and Land Use

### Land Use, Land Use Change and Forestry

In pursuit of carbon neutrality, Mendip District Council are committed to **encouraging carbon absorption through tree-planting schemes**. Analysis presented in Figure 19 concludes that the District's Land Use, Land Use Change and Forestry (LULUCF) sector currently acts as a source of 32,435 tonnes of carbon dioxide (tCO<sub>2</sub>e), therefore a revision of the way in which land in Mendip is managed will also be crucial to increase the District's overall carbon sequestration potential.

The Climate Change Committee (CCC) has recommended that woodland cover across the UK increases from 13% to around 18% by 2050<sup>16</sup>. However, in Mendip, total tree cover is estimated to be around 12%, which is far short of this recommended national target.

Mendip's Baseline Emissions Inventory discovered that the District's wetlands emitted 33,836 tCO<sub>2</sub>e in 2017 and the National Atmospheric Emissions Inventory has placed Mendip's wetland emissions within the top 7 UK local authorities with peat extraction<sup>17</sup>. Due to land use change,

**Figure 19 - Breakdown of Land Use, Land Use Change and Forestry emissions (2017)**

Category	tCO <sub>2</sub>
Forestland	-39,485
Cropland	38,215
Grassland	-29,262
Wetlands	33,836
Settlements	29,132
<b>Total</b>	<b>32,436</b>

<sup>16</sup> Land Use: Policies for a Net Zero UK, Climate Change Committee (2020) - <https://www.theccc.org.uk/publication/land-use-policies-for-a-net-zero-uk/>

<sup>17</sup> Mapping Carbon Emissions and Removals for the Land Use, Land Use Change and Forestry Sector (1990-2017), National Atmospheric Emissions Inventory (2017) - [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/812153/LULUCF\\_Local\\_Authority\\_mapping\\_report\\_2017.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/812153/LULUCF_Local_Authority_mapping_report_2017.pdf)



68k tCO<sub>2</sub>e resulted from Mendip's croplands and settlements. These findings emphasise that urgent transformational change in terms of how land use is managed in Mendip is needed to enable the District's natural capital transition from a net source of emissions to a sink.

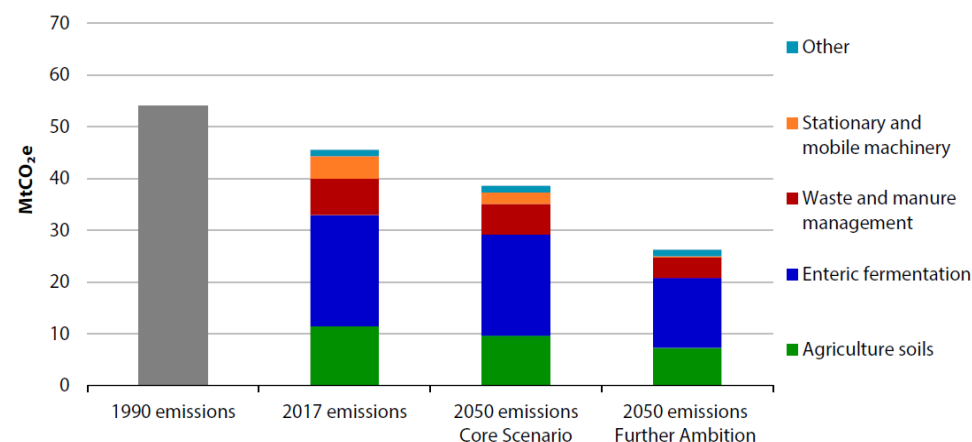
## Agriculture

Mendip has a prevalent farming community with the District ranking in the top 20 of all local authorities in England for cattle numbers. The SCATTER Pathways Tool was used to develop the Mendip's 2030 Emissions Pathway, however it contains limitations for the accounting of agricultural emissions at the local authority level.

The CCC has recognised that, due to the dominance of non-CO<sub>2</sub> emissions in agriculture, getting close to zero emissions will not be possible by 2050; largely due to the complex biological and chemical processes inherent within the industry<sup>24</sup>. There is also a distinct lack of low-carbon alternatives for powering stationary and mobile agricultural machinery, meaning fossil fuel dependence remains. In order to decarbonise energy use further, increased energy efficiency of agricultural buildings, to reduce demand, and adoption of low-carbon technologies for heating and power will be required.

**Figure 20 - 2050 Emissions Abatement Scenarios for the Agriculture Sector** (*Source – Committee on Climate Change*)

**Figure 7.3.** Scenarios for very deep emissions reductions from the agriculture sector



**Source:** BEIS (2019) *Final UK greenhouse gas emissions national statistics 1990-2017*; SRUC, ADAS and Edinburgh University (2019) *Non-CO<sub>2</sub> abatement in the UK agriculture sector by 2050*; and CCC calculations.

A wider uptake of low-carbon farming practices has been deemed by the CCC as essential to reduce non-CO<sub>2</sub> agricultural emissions. These measures include:

- **Improving the efficiency of nitrogen use** – precision farming, use of anaerobic digestates
- **Better livestock management** – improved health and feed digestibility of ruminants
- **More efficient manure management** – improvements to the application of manure to land and storage of animal waste

Further reduction of agricultural emissions is dependent on radical societal change to meat and dairy consumption, and food waste. In their 2019 Net Zero Technical Report, the CCC have modelled a series of 2050 emissions abatement scenarios (see Figure 20) for all sectors, whereby their core scenario is based on the low-cost/low-regret options and the Further Ambition scenario involves more challenging and/or more expensive action, but considered more likely to meet a net-zero target<sup>3</sup>. The scenario for the agriculture sector illustrates the challenges involved in enabling the industry to become net zero even by 2050. The Council recognises that Mendip's farming community can make significant improvements to current practices to reduce its environmental impact, but carbon neutrality by 2030 within the sector will be impossible. Nevertheless, agriculture does play an important role in the collective efforts to fight climate change through more efficient practices and enhancing the carbon sequestration potential of agricultural land holdings. As such, the Council intends to develop an approach that encourages Mendip farmers to be part of the solution in tackling climate change, by reducing emissions resulting from agricultural activities whilst also recognising that maintaining food security and economic viability of our farmers is paramount.

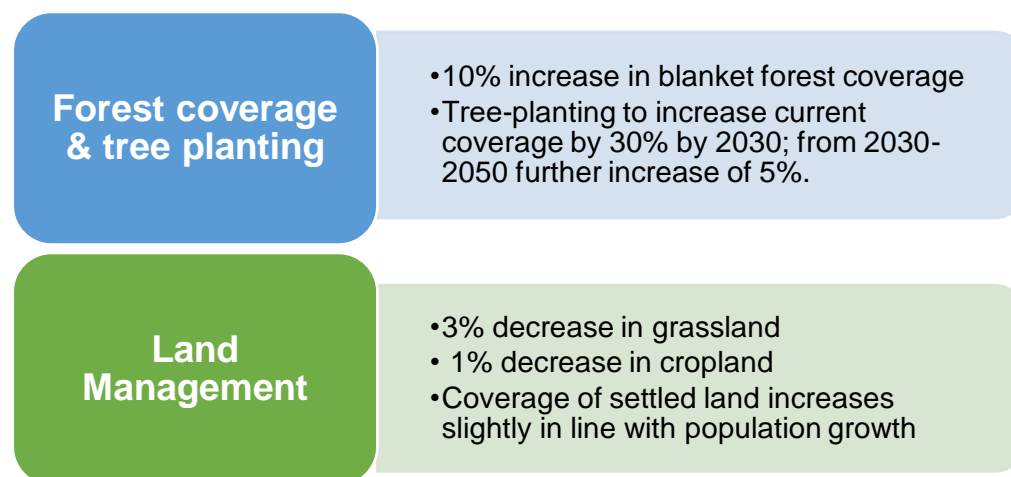
## The Plan

The adjacent targets and measures are specific to enhancing the carbon sequestration potential of Mendip's land use sector within Mendip's 2030 Emissions Pathway. Encouraging carbon absorption through tree-planting schemes form one of the Council's Corporate Priority Actions (see below), therefore the targets to increase current coverage by 30% provide a measurable reference point to support the strategy. Further work will be needed to ascertain the number of trees that need to be planted to meet this target. As the District's land use sector currently

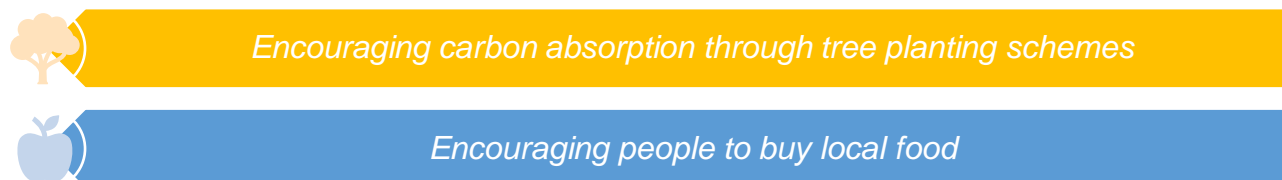
presents as a source of emissions, the Council will explore how various uses can be better managed. Where there are no targets for wetland usage, the Council will explore how these could be better managed to enhance their considerable carbon sink potential.

As previously mentioned, opportunities for tackling Mendip's agricultural emissions will be explored separately. However, as part of its Climate and Ecological Emergency Corporate Priority Actions, the Council does intend to engage with local residents and businesses to identify ways to reduce the emissions associated with the food we consume, for example by purchasing locally-sourced food. However, it should be noted that this action will reduce out-of-boundary emissions embodied in food imported into the District and, thus, may not have a positive impact on agricultural emissions produced within Mendip.

## Targets



## Corporate Priority Actions



## Relevant Somerset-Wide Climate Emergency Strategy Outcomes



## Domestic and Non-Domestic Buildings

### Domestic Buildings

Energy used to heat and power domestic properties in Mendip accounts for 23% of the District's emissions profile and 90% of homes in the UK currently use fossil fuels for heating. Analysis of the District's Domestic EPC register in 2019 discovered that 71% of houses use natural gas and 11% use oil to heat their homes. According to the Energy Saving Trust, the majority of household CO<sub>2</sub> emissions come from heating (including generating hot water), generating 2,745 kg of CO<sub>2</sub> for the average domestic property<sup>18</sup>. Furthermore, the Trust says that, to reach the UK's Net Zero 2050 target, we need to go even further and reduce heating emissions to 138 kg CO<sub>2</sub> per household. – a reduction of 95%. Where a drive towards renewable energy generation seeks to decarbonise power supplied to domestic buildings, there is a need to shift from the current, carbon-intensive way we heat our homes, if we are to achieve carbon neutrality as a District.

Mendip's 2030 Emissions Pathway has identified a target to move towards low carbon heating systems, such as community-scale networks and heat pumps. These measures still emit carbon emissions but are considerably lower than those resulting from mainstream methods, such as combustion of gas and oil. According to the Energy White Paper, the Government plans to grow the installation of electric heat pumps, from 30,000 per year to 600,000 per year by 2028<sup>19</sup>. However, in 2015 there were an estimated 47,900 houses in Mendip alone, therefore there is a need for central government to increase this target, in order to support the transition needed to deliver Mendip's 2030 Emissions Pathway<sup>20</sup>. The Government are committing £122 million of funding towards a new Heat Network Transformation Programme and will implement local authority zoning (district heating) by 2025, but rural districts like Mendip are considered to be outside the scope of these networks, as the paper references

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<sup>18</sup> Significant changes are coming to the UK heating market, *Energy Saving Trust* (2019) - <https://energysavingtrust.org.uk/significant-changes-are-coming-uk-heating-market/>

<sup>19</sup> Energy White Paper, *Department for Business, Energy and Industrial Strategy* (2020) - <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future>

<sup>20</sup> Household Estimates and Projections, *Somerset Intelligence* (2021) - [www.somersetintelligence.org.uk](http://www.somersetintelligence.org.uk)

that these systems lend themselves particularly well to densely populated towns and cities<sup>19</sup>. As such, the Council will work to identify suitability for these networks in Mendip and will lobby central government for additional support to deliver them.

Analysis of the District's EPC register in 2017 found that registered households emit approximately 159,715 tCO<sub>2</sub>. Analysis also demonstrates that the largest share of emissions (32%) result from properties in Band D and if all properties in the District were able to reach their potential EPC rating, it could result in a cumulative emission saving of 89,243 tCO<sub>2</sub> per year. Before pushing forward to install low-carbon heating alternatives, there is, therefore, an urgent need to firstly improve the energy efficiency of domestic dwellings in the District and Mendip's 2030 Emissions Pathway requires 15,400 retrofits to be completed by 2030. The Pathway also includes a target to ensure that all 2,240 homes built in Mendip (between now and 2030) are constructed to provide extremely high energy performance. The Government's target for all new homes to be zero carbon ready by 2025 will enable 1,680 new builds in Mendip to be built to this standard by 2030.

Mendip's 2030 Emissions Pathway requires a 26% reduction in the energy demand of domestic appliances. As part of its commitment to improve the energy efficiency of the country's homes, the Energy White Paper refers to the need to make energy-using products, such as household appliances, more efficient, helping to reduce bills and encourage innovation<sup>19</sup>. It is hoped that the government will provide support for Mendip's residents to facilitate the implementation of more efficient technologies in domestic properties.

## Non-Domestic Buildings

Industrial and Institutional Buildings account for 27% of Mendip's carbon footprint by sub-sector. Mendip's 2030 Emissions Pathway includes a target to reduce the hot water and heating demand of the District's commercial and industrial buildings by 13%, in addition to large-scale improvements in the efficiency of lighting, cooking and appliances. The Government has set a target for all rented non-domestic buildings to reach EPC Band B by 2030, where cost effective and will continue to explore how a thriving market for business energy efficiency can be stimulated through the proposed new energy efficiency scheme focused on small businesses.

## The Plan

The targets for reducing energy demand of the District's buildings are not hard-set and highlight the indicative level of change that is required to reduce energy demand and the carbon intensity of heating in residential dwellings and commercial/industrial units. The targets can be flexed, for example if a 50:50 split of community-scale combined heat and power (CHP) systems and electrified heating cannot be feasibly delivered, it could be amended to 75% heat pumps and 25% community-scale CHP systems, to achieve the same outcomes. These targets are aligned with the existing policy and funding levers available to the Council to facilitate the decarbonisation of the District's buildings. Retrofits and low-carbon heating systems are costly to implement and will be dependent upon supportive central government policy and funding levers. Schemes such as the Green Homes Grant provide financial assistance to homeowners and landlords to improve the energy efficiency and heating provision of domestic dwellings and such funding will need to continue if we are to retrofit 14,400 households in Mendip. The Council has a significant opportunity to increase the delivery of retrofits and more efficient appliances through awareness-raising and is

## Targets

More energy efficient homes & new builds	<ul style="list-style-type: none"><li>• 7,700 "medium" retrofit (deep inner wall insulation)</li><li>• 7,700 "deep" retrofit (deep external wall insulation)</li><li>• 2,240 new builds with extremely high energy performance</li><li>• 1,680 new builds to zero carbon standards</li></ul>
Domestic appliance, lighting and cooking efficiency	<ul style="list-style-type: none"><li>• 26% reduction (domestic) in demand for appliances &amp; lighting; share of cooking technology has grown by 30%</li></ul>
Switching to low carbon heating systems in domestic buildings	<ul style="list-style-type: none"><li>• 50:50 split between CHP systems and electrified heating such as heat pumps</li></ul>
Commercial/Industrial Heating and Cooling (Demand & Technology)	<ul style="list-style-type: none"><li>• By 2030, commercial and industrial heating, cooling and hot water demand has decreased by 13%</li><li>• Low levels of electrification, but significant levels (&gt;70% of heating) of community-scale CHP</li></ul>
Commercial/Industrial lighting, appliances and catering (demand & technology)	<ul style="list-style-type: none"><li>• 2% decrease in demand for appliances &amp; lighting</li><li>• Share of cooking technology has grown by 10%</li></ul>

committed to working with other local authorities to call for higher sustainability standards of new builds, in addition to exploring place-shaping opportunities within the Local Plan.

The Council's ability to influence these shifts is low, as energy efficiency improvements in non-domestic buildings will largely be driven by corporate strategies and national policy. The Council does have a significant opportunity to support Mendip businesses through awareness-raising and advice sessions about energy efficiency and emerging technologies, in addition to disseminating any policy and funding developments which are directed at supporting the delivery of fabric improvements. The Council is committed to improve the energy efficiency of its own estate and such measures are within its direct control.

## Corporate Priority Actions



*Encourage and support residents and landlords to make their homes more energy efficient*



*Refit the Council's buildings where possible to improve energy efficiency and lower carbon footprint*



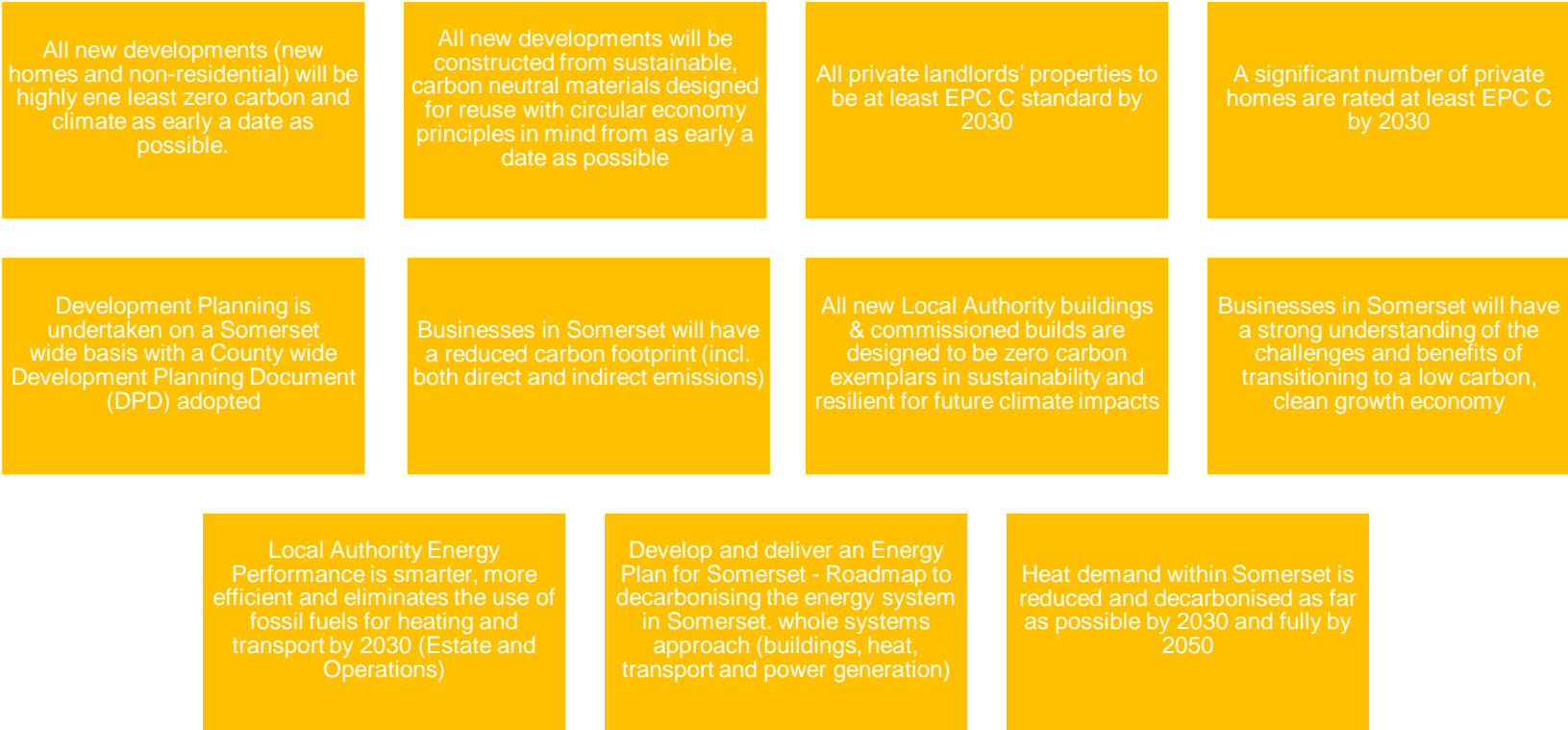
*Work with other local authorities to call for increased powers to set higher sustainability standards for all new housing*



*Identify and use the potential of the Local Plan to contribute to meeting our climate and ecological commitment, including requiring developers on large-scale projects to install carbon-neutral equipment (solar panels, car charging points, access to cycle routes etc)*



Relevant Somerset-wide Climate Emergency Strategy Outcomes

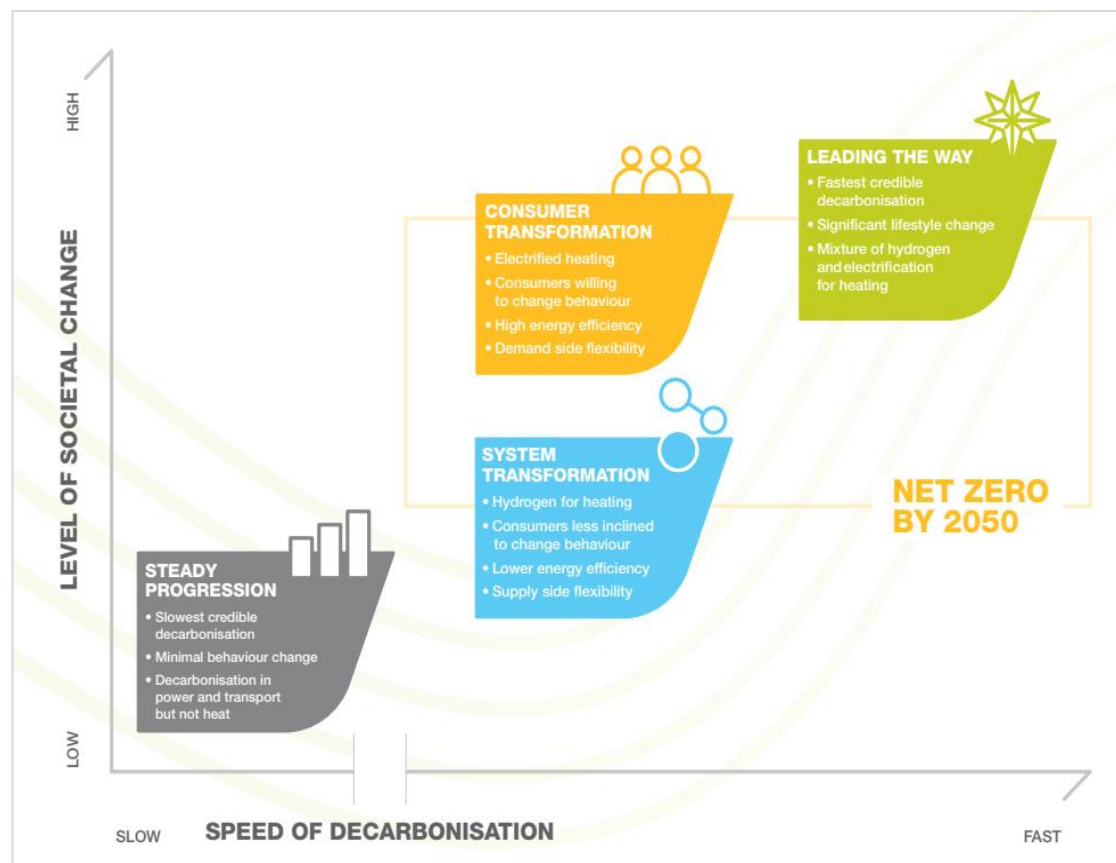


## Energy Supply

Driving down emissions in the quest for carbon neutrality is not just reliant on reduced energy demand; we also need to decarbonise its supply. With the push towards electrified heating and transportation, demand is anticipated to increase exponentially across the country. As such, there is a push to move towards a decentralised, renewable energy systems within each local authority to provide communities and businesses with the resilience to cope with the projected increase in demand. According to National Grid ESO, revised energy system models must evolve safely and reliably, to deliver low carbon energy when and where consumers need it, in order to meet our collective pursuits of net zero<sup>21</sup>.

To support local authorities with their carbon neutrality ambitions, the SCATTER Pathways Tool presents an emissions roadmap which includes a series of targets for decentralised energy supply. The Tool refers to “Local” capacity in its energy interventions, which means that energy

**Figure 21 - Future Energy Scenarios (2020) – Societal change vs Speed of Decarbonisation** (Source – National Grid ESO)



<sup>21</sup> Future Energy Scenarios, National Grid ESO (2020) - <https://www.nationalgrideso.com/future-energy/future-energy-scenarios>

installations are not owned or operated by Major Power Producers<sup>22</sup>. Examples of a local installation include solar photovoltaic (PV) on a domestic rooftop, or a community-led energy cooperative installation on the roof of a school or leisure centre. This methodology assumes targets for renewable generation that is produced locally and consumed within the Local Authority boundary first, before being topped-up by the grid, thus creating a decentralised model which is considered crucial in pursuit of intensive decarbonisation. Under the 2020 Future Energy Scenarios (FES), decarbonisation of electricity supply will be dependent on large generation connected to the transmission network that is increasingly complemented by small decentralised generation connected to distribution networks<sup>21</sup>. A headline message in the FES paper is that the energy system alone cannot deliver decarbonisation, even by 2050, and significant, transformative change needs to take place in residential homes, industry and transportation<sup>21</sup>. Figure 21 illustrates the level of societal change that needs to take place to increase the speed of decarbonisation. Whilst hydrogen fuel for heating (ie. hydrogen boilers) is not assumed within the targets for Mendip, Figure 21 highlights that system transformation (including smarter grid networks and demand-balancing technology) and significant lifestyle changes are vital in order to achieve rapid and intensive emissions reductions ahead of the UK's 2050 target.

The decentralised energy supply targets for Mendip could be perceived to result in a decrease in renewable generation at first glance, in some areas. For instance, Mendip's solar photovoltaic capacity in 2017 was 90.6MW, with a large proportion of this energy being distributed back to the grid. The Pathway's targets for a decentralised energy model assumes that the District will increase its solar photovoltaic capacity to use 80.8MW of locally-produced energy within the Local Authority boundary first, in preference to using the energy from the grid. This target breaks down to approximately 16.1kw of installed solar photovoltaic capacity for every 10 households (the capacity of panels installed on an average household is approximately 4kw).

Mendip's estimated capacity of energy generated by onshore wind was 3.7MW in 2017. The decentralised targets within Mendip's 2030 Emissions Pathway involve an increase in onshore wind capacity to 77.3MW by 2030, which is approximately 31 x 2.5MW wind turbines. This is

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<sup>22</sup> SCATTER Pathways Methodology, *SCATTER Cities* (2021) - <https://scattercities.com/pages/pathways-methodology/>

a significant increase on Mendip's current onshore wind capacity but is considered necessary to increase the District's energy resilience, as demand is set to accelerate. The Government's Energy White Paper includes a target to quadruple the UK's present offshore wind capacity by 2050, but the District will need to increase the amount of onshore wind power it uses first, above grid-supplied energy, in pursuit of a 30% reduction of Mendip's total carbon footprint by 2030. However, land sensitivity constraints (such as the Mendip Hills Area of Outstanding Natural Beauty) may impede the installation of the target requirement of wind turbines. As such, any developments will require in-depth consideration before installation and other renewable alternatives (such as increasing the target for solar) may be needed to compensate.

Under Mendip's 2030 Emissions Pathway, biomass generation is expected to increase by 50% by 2025 but then tails off after that. Mendip currently generates 28MW of biomass energy (the highest of any UK Local Authority) but models assume this will need to increase nationally. Biomass is a strong renewable asset for Mendip, however any increase in capacity should be enabled through "pure waste", to ensure that agricultural emissions do not increase to enable the production of materials (such as crops) for combustion. The targets for the District's Energy Supply sector also expect hydropower capacity to increase to 7.3MW of locally-produced and locally-consumed supply. In 2017, Mendip's overall hydropower capacity was estimated at 0.3MW, therefore a considerable increase in current installations is needed. Suitable sites for hydropower will require exploration, however the absence of major watercourses in the District may pose capacity constraints.

## The Plan

The targets for each renewable energy type are, therefore, to be considered with a degree of flexibility, whereby an increase in one type could allow for a decrease in another, if constraints persist. Nevertheless, it is clear that to support Mendip's carbon neutrality ambitions, and a 30% decrease in emissions by 2030 (under the current Pathway), accelerated development of in-boundary renewable generation will be needed to facilitate decarbonisation of the District's energy supply. The Council has committed (within its 20-23 Corporate Plan) to explore investments in renewable energy infrastructure, therefore there is the potential that growth of community-run schemes could be enabled through financial support. Increased provision of domestic renewables (eg. solar panels) could also be facilitated through the Council's place-shaping powers.

Furthermore, as part of its contribution to the Somerset-wide Climate Emergency Strategy, the Council will explore potential opportunities for using locally-generated renewable energy to meet the energy demand of its Civic Site and assets.

## Targets

<b>Biomass/Coal Power Stations</b>	<ul style="list-style-type: none"><li>• Solid biomass generation increases by 50% by 2025, dropping off after that.</li><li>• Coal phase-out follows National Grid 2 Degrees Scenario.</li></ul>
<b>Hydropower</b>	<ul style="list-style-type: none"><li>• Local hydro capacity grows to 7.3MW by 2030</li></ul>
<b>Solar Photovoltaic Panels</b>	<ul style="list-style-type: none"><li>• Local PV capacity grows to 80.8MW by 2030 (approximately 16.1kW for every 10 households)</li></ul>
<b>Wind Turbines</b>	<ul style="list-style-type: none"><li>• Local wind generation capacity grows to 77.3MW by 2030 (approximately 31 x 2.5MW turbines)</li></ul>

## Corporate Priority Actions



*Explore investments in renewable energy and infrastructure, including community run schemes*

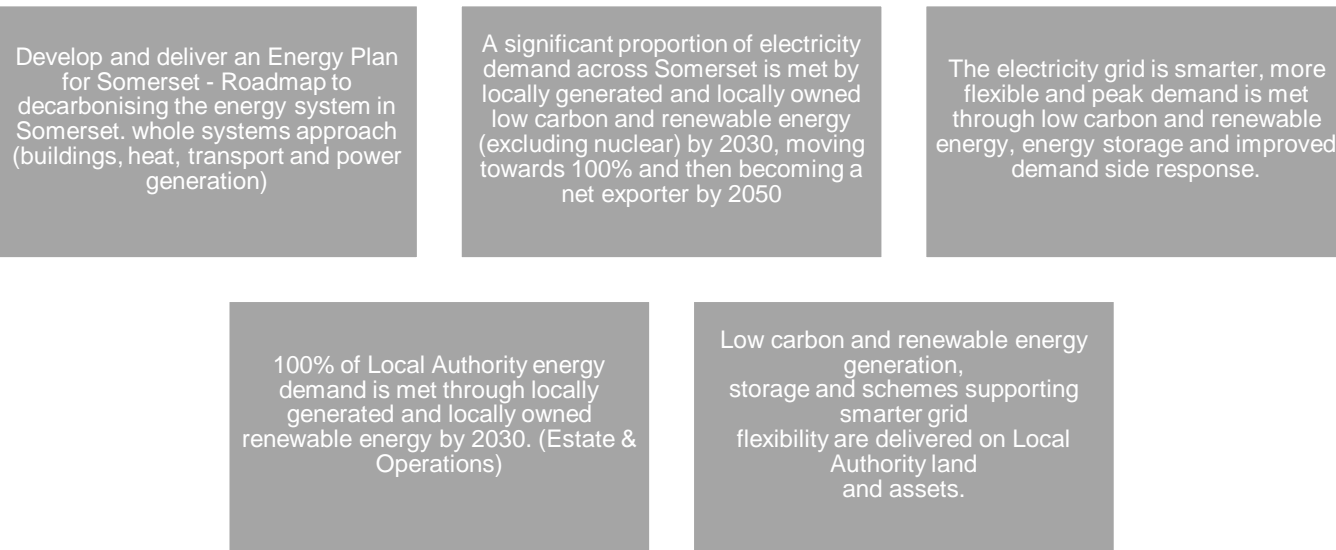


*Identify and use the potential of the Local Plan to contribute to meeting our climate and ecological commitment, including requiring developers on large-scale projects to install carbon-neutral equipment (solar panels, car charging points, access to cycle routes etc)*



*Develop and deliver a programme of communications and events to raise awareness, create links across communities and support and encourage local action to address Climate Change*

## Relevant Somerset-wide Climate Emergency Strategy Outcomes



## Industry

The targets and measures for the District's Industry sector are focussed on reducing emissions by moving away from fossil fuels for power and increased efficiency of industrial processes. Tackling industrial emissions can be extremely challenging, particularly decarbonising energy-intensive processes and reducing the emissions from the processes themselves. Nevertheless, industrial decarbonisation, is one element of the transition to a green economy which can be achieved through improvements such as energy and resource efficiency, and decarbonised fleet

transport. Furthermore, the adoption of Circular Economy principles by Mendip's industry sector has the potential to reduce emissions associated with resource use, generated waste and emissions embodied in supply chains.

National government policy and funding, combined with collaboration of key industry bodies, will be key to delivering emission reductions in the industrial sector. The Energy White Paper states that by 2050, emissions from industry will need to fall by around 90 per cent from today's levels<sup>19</sup>. The Government proposes several schemes to support businesses and industries reduce their carbon footprint, which include a performance-based rating scheme for large commercial and industrial buildings to provide businesses and their investors with more information on how to reduce energy consumption and lower both carbon emissions and energy bills and an Energy Savings Opportunity Scheme that aims to drive energy and carbon savings in businesses by improving the quality of the audits of the energy used by their buildings, industrial processes and transport.<sup>19</sup>. The Government aims to quadruple offshore wind generation by 2030 to provide more energy than homes use, but it is unclear how this will benefit the industrial sector, due to the reliance on hydrogen as an alternative. However, enhancements in digital connectivity does have the potential to reduce emissions from industrial energy demand, through the delivery of a smarter grid network and demand-balancing technologies, and this will be explored as part of the Somerset-wide Climate Emergency Strategy. Further plans to reduce industrial emissions involve decarbonised power through the implementation of Carbon Capture Utilisation and Storage (CCUS) and the distribution of low-carbon hydrogen as an alternative to current fossil fuels. However, it is unlikely that these technologies will be applicable to Mendip as they will be prioritised for development at industrial hubs, such as Humberside.

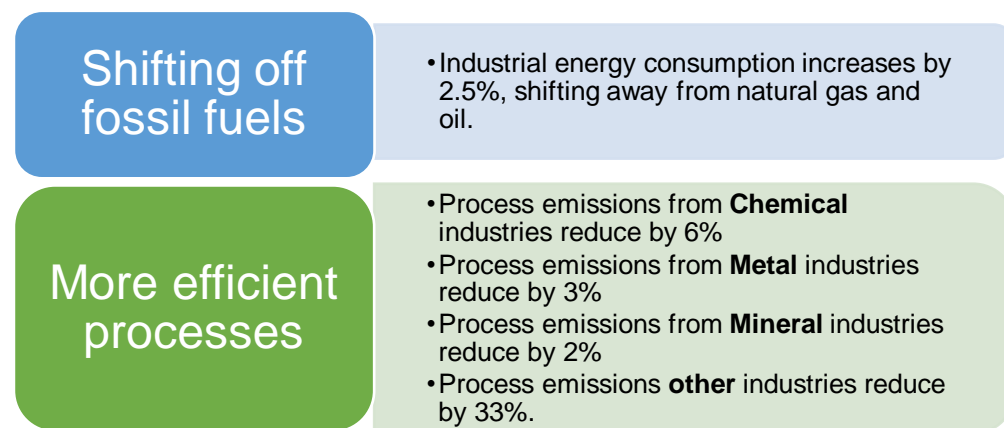
## The Plan

The headline targets for increasing efficiency of industrial processes are centred around the major emitting industries. The SCATTER Pathways Tool models the changing use of fuels for chemical, metal and mineral industries, where the most carbon-intensive fuels (i.e. fuel oil) are substituted in favour of transition fuels such as natural gas. As with freight emissions, alternatives for industrial fossil fuel dependency is reliant on national policy reform and support, therefore the targets for reduced consumption of natural gas and oil are currently low.



The Council does have the opportunity to invest in commercial renewable energy development, to encourage uptake, and can engage with local businesses to encourage them to procure energy produced locally. The Council's ability to influence industries to shift away from fossil fuels for heat and power is limited, as this is largely determined by national policy. However, the Council will explore options to raising awareness amongst local industries about sustainable ways of working, such as renewable energy and circular economy principles, in addition to promoting funding opportunities. Furthermore, the Somerset-wide Climate Emergency Strategy does plan to explore options to reduce emissions from the business and industry sector through clean growth and the transition to a green economy, further aided by technology improvements such as digital connectivity.

## Targets



## Corporate Priority Actions



*Explore investments in renewable energy and infrastructure, including community run schemes*



*Develop and deliver a programme of communications and events to raise awareness, create links across communities and support and encourage local action to address Climate Change*

## Relevant Somerset-wide Climate Emergency Strategy Outcomes

Businesses in Somerset will have a reduced carbon footprint (incl. both direct and indirect emissions)

Businesses in Somerset will have a strong understanding of the challenges and benefits of transitioning to a low carbon, clean growth economy

Somerset will have transitioned to a Clean Growth economy

The electricity grid is smarter, more flexible and peak demand is met through low carbon and renewable energy, energy storage and improved demand side response.

A significant proportion of electricity demand across Somerset is met by locally generated and locally owned low carbon and renewable energy (excluding nuclear) by 2030, moving towards 100% and then becoming a net exporter by 2050

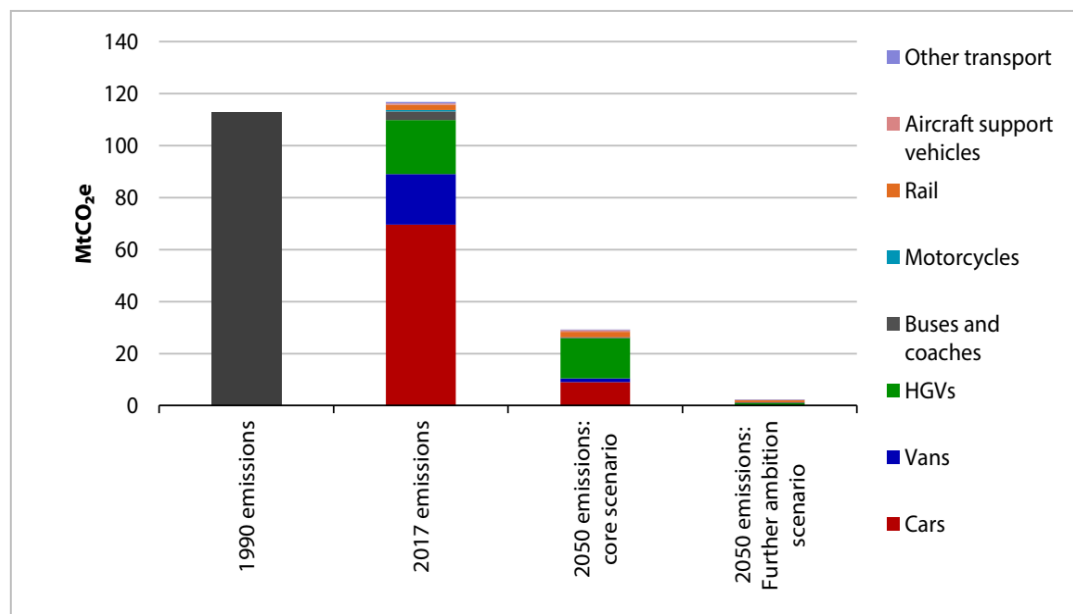
Develop and deliver an Energy Plan for Somerset - Roadmap to decarbonising the energy system in Somerset. whole systems approach (buildings, heat, transport and power generation)

## Transport

Analysis of the District's emissions profile has identified Transport as the second highest, emitting sector in 2017 – accounting for 240,416 tCO<sub>2</sub>e. Nationally, however, the Transport sector is regarded as the primary source of UK carbon emissions, totalling 119.6 Mt in 2019<sup>23</sup>.

The Climate Change Committee recommended in their recent Sixth Carbon Budget report that for the Government to deliver on its UK 2050 net zero target, emissions from surface transport must fall from 113 Mt to 32 Mt by 2035 and near zero (1 MtCO<sub>2</sub>e) by 2050, under their Balanced Net Zero Pathway<sup>3</sup>. This target would be achieved by a 9% reduction in car miles travelled, 17% switch to low carbon modes (such as active travel or public transport) and a high uptake of electric vehicles (cars and vans) by 2032 at the latest.

**Figure 22 – Scenarios for Very Deep Emissions Reductions from the Surface Transport Sector (Source – *Committee on Climate Change*)**



As part of their net zero advisory report to Government in 2019, the CCC presented a series of different scenarios for very deep emissions cuts within surface transport (see Figure 22). The core scenario is presented as what is needed to reduce emissions by 80% on 1990 levels by 2050.

<sup>23</sup> 2019 UK greenhouse gas emissions, provisional figures, *Department for Business, Energy and Industrial Strategy* (2020) - [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/875485/2019\\_UK\\_greenhouse\\_gas\\_emissions\\_provisional\\_figures\\_statistical\\_release.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/875485/2019_UK_greenhouse_gas_emissions_provisional_figures_statistical_release.pdf)

Where the further ambition scenario is likely to be more challenging and/or more expensive, the CCC considers that this is what is needed to deliver net zero<sup>24</sup>. In summary, these options include:

- ❖ *End of sales of conventional cars and vans brought forward to 2035 at the latest*
- ❖ *Roll-out of zero emission HGVs accelerated to reach nearly 100% of sales in 2040*
- ❖ *10% of car miles shifted to walking, cycling and public transport*
- ❖ *Further logistics improvements to reduce HGV km by approximately 10%*
- ❖ *At least 54% of rail track-km electrified by 2040 (hydrogen where possible)*
- ❖ *Aircraft support vehicles electrified by 2050.*

What is clear from these scenarios is that there will be a national requirement for significant societal and system transformation within the surface transport sector. For a local authority, sectoral emissions result from activity that occurs within its boundary, therefore the targets are contextualised and may not fully align with the CCC's recommendations for UK transport. However, the targets above exceed the Council's 2030 District-wide carbon neutrality target, meaning the rapid uptake of low-carbon transport alternatives may not be possible.

## The Plan

Mendip's 2030 Emissions Pathway includes a suite of targets to facilitate decarbonisation of the District's Transport sector by 2030, including 70% of cars changing to electric or hybrid. The Council is supporting the transition to electric vehicles through the roll-out of a network of charging points throughout its Council-owned car parks, but widespread uptake of zero emission vehicles will be dependent on rapid societal change;

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<sup>24</sup> Net Zero – The UK's contribution to stopping global warming, *Committee on Climate Change* (2019) - <https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/>

largely governed by affordability and accessibility. The Council has committed to investigating the potential of the Local Plan to require developers install provision for EV charging points, therefore it is hoped that accessibility issues will be improved in the future.





The Council is currently working on a project to develop a network of multi-user paths across the District to support the transition to active travel, through the creation of safe, well-connected infrastructure. However, reducing emissions from surface transport will also be dependent on a 15% reduction in distances travelled by cars within the District. It is anticipated that increased provision of options for multi-modal transport will reduce transport emissions, especially for those unable to access electric vehicles. It is also hoped that more residents will continue to work from home following the COVID-19 pandemic, further reducing the need to travel. The Council is also exploring the potential of the Local Plan to increase the provision of cycling routes across the District. However, major public transport network enhancements will be also needed for those unable to access electric vehicles or travel actively and the Somerset-wide Strategy aims to address transport inequality through spatial planning.

There are approximately 12,500 LGVs and HGVs registered in Mendip and these vehicles account for 20% of all vehicle mileage in Somerset. But, freight emissions are notoriously difficult to tackle at the local authority level, as low carbon shifts will largely be driven by national government policy. There is also current uncertainty about the most cost-effective and feasible way to decarbonise heavy goods vehicles (HGVs), and the CCC has suggested that central Government will need to fund large-scale trials of different technologies to gain a better understanding of options and for the market to develop<sup>3</sup>. But, due to the reliance of HGVs by Mendip's mineral industries, there is an opportunity for the Council to lobby central government for rapid research and development of more efficient freight vehicles and enhanced policy. The target for waterborne freight is not directly applicable for Mendip, however demand from within the District does shape the nature of out-of-boundary freight transport and associated emissions embodied in goods and services.

## Targets

Travelling shorter distances	<ul style="list-style-type: none"><li>• 15% reduction in total distance travelled per individual per year by 2030</li></ul>
Driving less	<ul style="list-style-type: none"><li>• Modal share at 2030: 82.4% road, 10.9% rail &amp; 6.6% active</li></ul>
Switching to electric	<ul style="list-style-type: none"><li>• 70% of cars in use change to electric or hybrid</li></ul>
Improving freight emissions	<ul style="list-style-type: none"><li>• 3% decrease in distance travelled by road freight</li><li>• 71% increase in road freight efficiency</li><li>• 10% increase in use of waterborne transport</li></ul>

## Corporate Priority Actions

	Create a network of local walking and cycling routes
	Identify and use the potential of the Local Plan to contribute to meeting our climate and ecological commitment, including requiring developers on large-scale projects to install carbon-neutral equipment (solar panels, car charging points, access to cycle routes etc)
	Increase the availability of electric car charging points across the district
	Work to identify ways to enhance the air quality status in the district

## Relevant Somerset-wide Climate Emergency Strategy Outcomes

By 2030, carbon emissions generated on Somerset's roads are reduced through the change to electric vehicles, ultra-low emission commercial vehicles and an overall reduction in road use (no. of miles travelled)

By 2030, carbon emissions from transport are reduced by encouraging and facilitating behaviour change including:

- reducing the number of single occupancy vehicle journeys undertaken by promotion of car sharing
- increased public transport use
- combining trips
- replacing vehicular journeys with active travel modes (walking and cycling)

Transport inequality has been addressed by reducing the need for car travel through improved spatial planning, public transport options/availability and public service delivery

All new developments will reduce the need to travel to access key services and employment opportunities and facilitate sustainable movement patterns in and around them by default.

Develop and deliver an Energy Plan for Somerset - Roadmap to decarbonising the energy system in Somerset. whole systems approach (buildings, heat, transport and power generation)



## Waste

In 2017, 21,777 tonnes of carbon emissions resulted from waste produced within the District. According to Somerset Waste Partnership (SWP), households in Mendip were estimated to recycle 43.6% of their waste in 2019/20, which is lower than the UK average of 45% in 2018<sup>25</sup>. SWP rolled out the “Recycle More” campaign in Mendip in October 2020, whereby a greater variety of items can now be recycled, including: *Plastic pots, tubs and trays, food and drink cartons and small electrical items*. Through the campaign and behaviour change, SWP aim to increase recycling rates in Mendip to 60% by 2023.

In 2019, Zero Waste Europe developed a “zero waste” hierarchy that looks to move away from the existing process to reduce emissions from waste through Circular Economy thinking. The 2008 Waste Framework Directive (Figure 23) was perceived by Zero Waste Europe to be limited, as its sole purpose is to minimise the environmental impact of generated waste, without considering the social, economic and logistic requirements of a transition to a Circular Economy<sup>26</sup>. The Zero Waste hierarchy (Figure 24) seeks to move away from waste management to resource management to ensure that resources are preserved sustainably within the economy for future generations. This is enabled by designing waste out of the system through influencing communities and businesses on consumption habits, and rethinking business models by making them waste-free by design.

Figure 23 - 2008 Waste Framework Directive (Source – Zero Waste Europe)



<sup>25</sup> UK Statistics on Waste, Department for Environment, Food & Rural Affairs (2020) - <https://www.gov.uk/government/statistics/uk-waste-data>

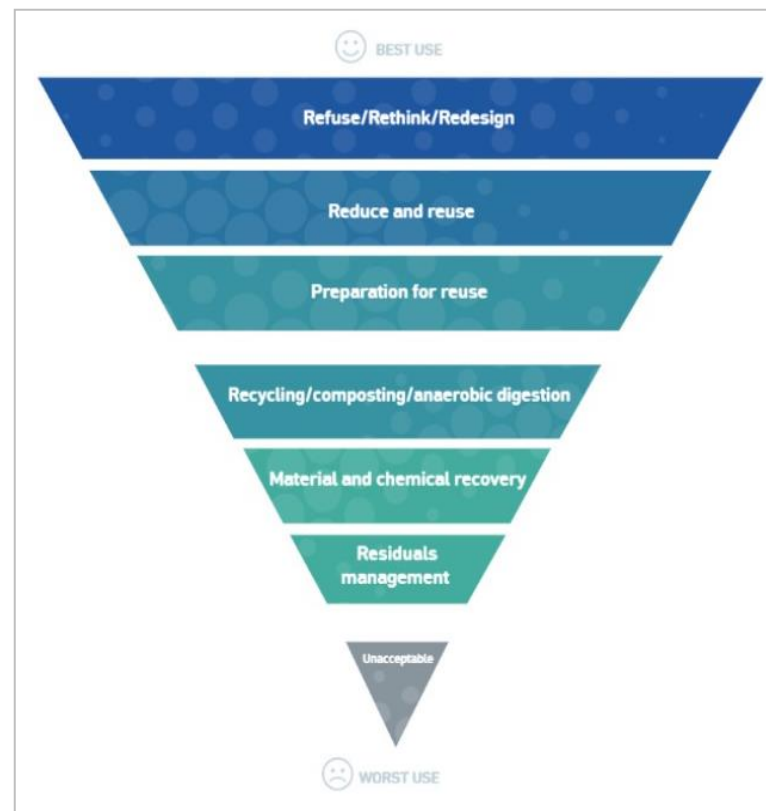
<sup>26</sup> A Zero Waste hierarchy for Europe, Zero Waste Europe (2019) - <https://zerowasteurope.eu/2019/05/a-zero-waste-hierarchy-for-europe/>

## The Plan

Mendip's 2030 Emissions Pathway includes a number of targets and measures aimed at reducing emissions from the District's Waste sector. The targets include both an increase in recycling rates (65% uplift) and reduction in waste volumes (decrease of 8% on 2017 levels). The roll-out of the "Recycle More" initiative across Mendip by Somerset Waste Partnership (SWP) will hopefully provide our residents with the incentive to further reduce the amount of waste they dispose of in domestic landfill collections, by increasing recycling provision for items such as plastic tubs, pots and trays. Through its relationship with SWP, the Council will look to promote Household Waste Recycling Centres in Mendip to increase recycling of materials such as garden waste and electricals. Furthermore, SWP recently introduced a new fleet of vehicles which will increase the capacity for recycled materials by 27,000 tonnes. But, in accordance with the Zero Waste Hierarchy, the Council will explore opportunities promote options to reduce and reuse resources before recycling or disposal, such as repair cafes and refill schemes.

Food waste is still finding its way into refuse collections and accounts for 15% by weight of all household waste. Furthermore, due to its carbon intensity, stopping food waste equates to removing 1 in 4 cars from the road<sup>27</sup>. Therefore, the Council will

**Figure 24 – New Zero Waste Hierarchy based on Circular Economy Principles (Source – Zero Waste Europe)**



<sup>27</sup> Tackling Food Waste, Somerset Waste Partnership (2021) - <https://www.somersetwaste.gov.uk/tackling-food-waste>

review opportunities to work with SWP to tackle food waste, through the promotion of solutions to reduce the amount of food that is wasted and encourage residents to utilise appropriate recycling receptacles.

Through the adoption of circular economy principles, it is hoped that businesses in Mendip will be able to reduce emissions from processes, through enhanced reuse of materials. For any materials that cannot be reused, options such as recycling, composting or anaerobic digestion (generating energy from waste) can reduce the amount of waste from entering landfill. Overall, the Council's influence over commercial and household waste is limited, but the Council will look at ways to embed zero waste principles, through the development of bespoke engagement programmes targeted at local businesses, such as the promotion of improved resource management and the elimination of single-use plastic. The Council is committed to reducing the carbon footprint of its own estate, by eliminating single-use plastic in its offices, meeting rooms and Council Chamber.

Targets

Producing less waste	•Total volume of waste produced decreases by 8% on 2017 levels by 2030
Increased recycling rates	•65% recycling, 10% landfill, 25% incineration by 2040, increasing to 75% by 2050

Corporate Priority Actions

-  *Work with Somerset Waste Partnership to continue to make recycling and waste management easier, taking action on plastics in particular*
-  *Refit the Council's buildings where possible to improve energy efficiency and lower carbon footprint and, wherever possible, eliminate single-use plastics in our offices, meeting rooms and Council Chamber*
-  *Develop and deliver a programme of communications and events to raise awareness, create links across communities and support and encourage local action to address Climate Change*

## Relevant Somerset-wide Climate Emergency Strategy Outcomes

By 2030, Somerset's Waste Carbon Footprint has reduced significantly from 2020

By 2030, (where possible) Somerset has a fully developed circular economy, managing our own waste and resources. The infrastructure is in place to achieve this and support local innovation. We gain value from items discarded by returning them back into the system

Domestic and non-domestic waste has reduced significantly following circular economy and waste hierarchy principles of refuse, reduce, reuse and recycle. This is enabled by the mechanisms and support to allow easier sorting and recovery of waste

Recycling of 'on the go' waste has increased from a (very) low base

By 2030, the waste vehicle fleet is made up of low carbon or electric vehicles

Businesses in Somerset will have a reduced carbon footprint (incl. both direct and indirect emissions)

# Responding to the Ecological Emergency

In February 2019, Mendip District Council declared a climate and ecological emergency; recognising the parallels between climate change and biodiversity decline in our District. Biodiversity has suffered severe losses in the UK and globally during the last century. Climate change, urbanisation and pesticide use have all been attributed as causes for the decline of a number of species, however intensive agriculture since the 1950s are regarded as the leading cause. Worryingly, 13% of England's bat species and 1 in 10 European wild bee species are threatened with extinction. In the UK, the 2019 State of Nature report states that out of 8431 species assessed, 15% are at risk of becoming extinct. Also, in terms of our landscapes, 97% of UK wildflower meadows were lost in the last century and 36 plant species in England have become extinct. Scientists are concerned that this is evidence that the world's sixth mass extinction event is already underway.

The intrinsic links between climate change and nature has been recognised in the State of Nature report. The report found that 70% of UK kittiwake species have declined as a result of climate change, which has reduced the availability of key food sources. The impact of climate change on nature has been acknowledged by central government, whereby their proposed Nature Recovery Networks (part of their 25 Year Environment Plan) seek to improve landscape resilience to climate change through the delivery of natural solutions. Nature Recovery Networks also aim to respond to the nationwide biodiversity crisis by enhancing sites designated for nature conservation and reinforce the natural and cultural diversity of our landscapes. All Local Authorities in the UK will be required to develop a Local Nature Recovery Strategy by identifying priorities and opportunities for conserving and enhancing nature. This work forms the Natural Environment workstream as part of the Somerset-wide Climate Emergency Strategy and the Somerset Local Nature Partnership will be leading on this work, and the Council's Cabinet agreed to contribute £10,000 (to the Partnership) to fund a post to coordinate nature recovery projects across the county.

The Council is also committed to responding to the Ecological Emergency through the delivery of its own strategic objectives, as illustrated below. Where there are synergies with the targets to mitigate emissions from Mendip's Agriculture and Land Use sector, for example through increased tree-planting, the actions specific to responding to the Ecological Emergency will be delivered through awareness-raising amongst communities and Parish Councils about topics such as habitat restoration and pollinators, place-shaping through local planning, and improving the biodiversity of Mendip-owned land.

## Corporate Priority Actions



*Protect our local ecology and find ways to enhance biodiversity*



*Identify and use the potential of the Local Plan to contribute to meeting our climate and ecological commitment*



*Develop and deliver a programme of communications and events to raise awareness, create links across communities and support and encourage local action to address Climate Change*

## Relevant Somerset-wide Climate Emergency Strategy Outcomes

Biodiversity and bio-abundance are increased and natural processes including carbon storage, water quality and natural flood management across Somerset's natural environment are restored through a clear shared vision and spatial plan embedded in decision-making processes

Healthy soils and watercourses underpin healthy ecosystems across Somerset which have increased biodiversity, locked-in carbon and support healthy productive farming and land management with reduced flood risk

A Nature Recovery Network and natural capital solutions are co-ordinated and delivered through community action

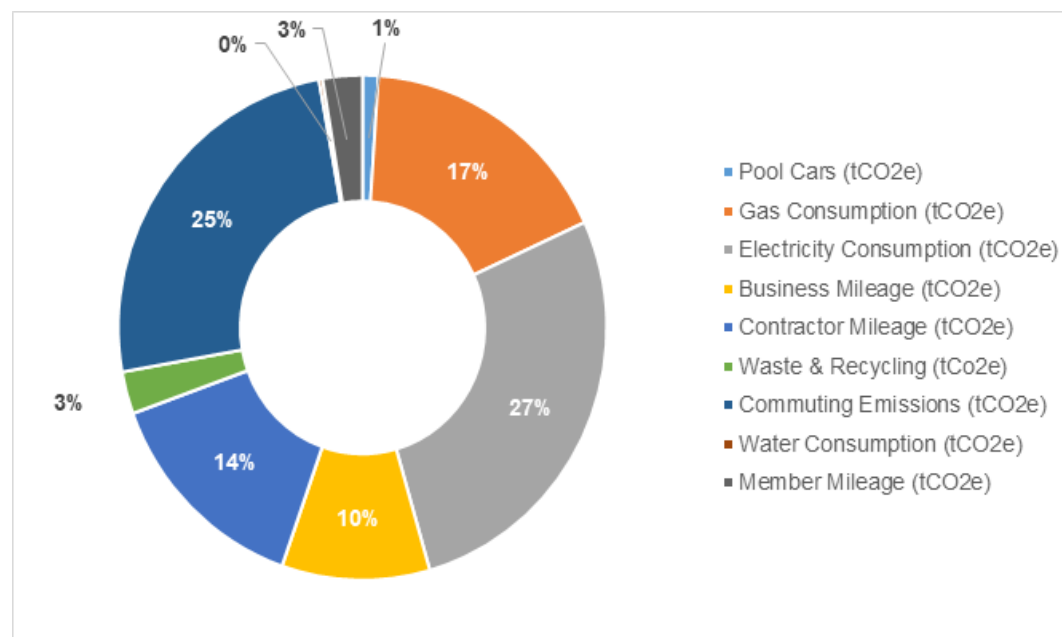
Soil health, carbon storage and biodiversity are improved through changes to land management practices by farmers and landowners

# Mendip District Council's Corporate Emissions

As part of the plans to deliver on the Climate and Ecological Emergency Commitment, Mendip District Council is committed to “getting its own house in order”. Analysis of the Council’s 2018-19 Corporate Emissions Profile was presented to Cabinet in February 2020. The analysis provided an estimate of emissions arising from Scope 1-3 activities (see Figure 25) across the Civic Site. Total emissions were estimated to be **381 tCO<sub>2</sub>e**, with the majority resulting from Scope 3 which are from sources the Council neither owns nor controls.

The Council contracts out its community maintenance operations, therefore emissions from these activities are difficult to measure. Procurement, street lighting and leased buildings were also excluded from the assessment (more detailed explanation can be found in the Civic Site Carbon Footprint Report).

Figure 25 - The Council's Corporate Emissions Profile (2018-19)



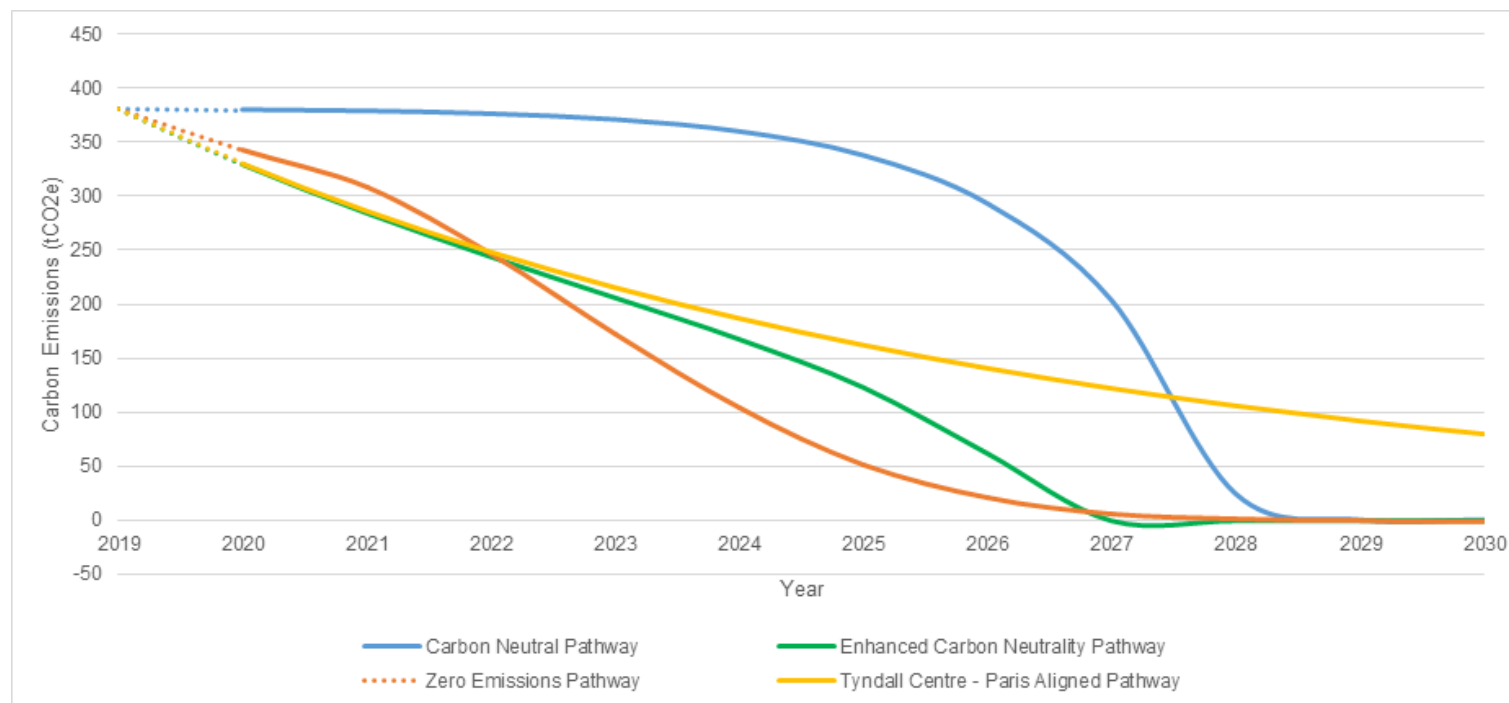


## The Plan

A Future Emissions Pathway (Figure 26) and series of annual reduction targets (Figure 27) were approved by Cabinet following presentation of the report in February 2020. The Cabinet opted for the Enhanced Carbon Neutrality Pathway (green line) which involves decarbonisation of Scope 1-3 activities first, before offsetting any residual through a programme of tree-planting.

The Council has committed to exploring opportunities to refit buildings on the Civic Site, where possible, to improve energy efficiency. Despite having installed solar photovoltaic panels on its estate, procured (Scope 2) electricity was noted as the main source of emissions for the Council in 2018-19. Therefore, a recommendation to switch to a zero-carbon electricity supply (with Renewable Electricity Guarantee of Origin Certification) was approved by Cabinet, which means that going forward, the Council will be able to report zero emissions for Scope 2 electricity (following annual re-baselining). A further recommendation was made to review the performance of the site's solar panels, to ensure they are working as efficiently as possible.

**Figure 26 – Recommended Future Emissions Pathways for Mendip District Council**



The Civic Site Carbon Footprint Report also presented further recommendations, such as zero emission pool cars, to assist the Council with its plans to mitigate emissions arising from its corporate activities. Implementing solutions to reduce emissions from Council activities will also need to be coupled with the planting of 570 trees annually, to deliver on its adopted pathway. The targets on this page are aligned with the adopted pathway and illustrate the level of decarbonisation that is needed, on an annual basis, for the Council to become carbon neutral (as an organisation) by 2030. Furthermore, the Council will work with the 4 other Somerset Councils to deliver on the Somerset-wide Climate Emergency Strategy outcomes that seek to reduce the carbon footprint of local authority estates in Somerset. This workstream presents collaborative working opportunities to deliver the low-carbon solutions that are needed to decarbonise the county's local authority buildings.

**Figure 27 - Approved Annual Emissions Reduction Targets for Mendip District Council**

Year	Carbon Emissions target (tCO2e)
<b>2020</b>	330
<b>2021</b>	285
<b>2022</b>	244
<b>2023</b>	206
<b>2024</b>	168
<b>2025</b>	123
<b>2026</b>	62
<b>2027</b>	0
<b>2028</b>	0
<b>2029</b>	0
<b>2030</b>	0

## Corporate Priority Actions



*Refit the Council's buildings where possible to improve energy efficiency and lower carbon footprint and, wherever possible, eliminate single-use plastics in our officers, meeting rooms and Council Chamber*



*Encourage carbon absorption through tree-planting schemes*



*Explore investments in renewable energy and infrastructure, including community run schemes*

## Relevant Somerset-wide Climate Emergency Strategy Outcomes

Local Authority Energy Performance is smarter, more efficient and eliminates the use of fossil fuels for heating and transport by 2030 (Estate and Operations)

100% of Local Authority energy demand is met through locally generated and locally owned renewable energy by 2030. (Estate & Operations)

All new Local Authority buildings & commissioned builds are designed to be zero carbon exemplars in sustainability and resilient for future climate impacts

# Monitoring and Reporting

The Council are committed to delivering on its Climate and Ecological Emergency pledge but recognises that its aspirations for District-wide carbon neutrality are currently impeded by Central Government. As such, a robust procedure for measuring progress will be conducted by the Council, to identify opportunities for prioritisation and strategic action, to close the gap towards carbon neutrality by 2030:

## District-wide Emissions

- Measure and report on annual basis
- Monitor progress in line with the adopted Future Emissions Pathway

## Council's Corporate Emissions

- Measure and report on annual basis
- Monitor progress in accordance with adopted reduction targets

## Climate Change Risks

- All Board reports to assess and identify potential climate change risks and opportunities, prior to decision-making stage
- Identified risks to be logged on the Council's risk register and monitored on annual basis

## Lobbying

- Develop bespoke lobbying programme to support the Council close the gap towards carbon neutrality
- Monitor progress to deliver the adopted Future Emissions Pathway and identify barriers to inform strategic lobbying

## Pathway Review

- Review the adopted Future Emissions Pathway on an annual basis and adjust in accordance with central government policy and funding reform and opportunities for closing the gap towards carbon neutrality

# Glossary

## **Anthropocene**

Periods of geological time are known as epochs. Scientists have unofficially labelled the period following the start of the Industrial Revolution as the Anthropocene, as human activity have started to significantly impact the earth's atmosphere and ecosystems.

## **Carbon Cycle**

The carbon cycle describes the transfer of carbon between living organisms and different reservoirs on the earth. The cycle is essential for maintaining life on earth. The biosphere (plants), hydrosphere (water systems) and geosphere (rocks, soils and fossil fuels) store carbon as an organic compound. Living organisms release carbon dioxide into the atmosphere through respiration, but plants remove it through photosynthesis – thus creating a dynamic equilibrium. When fossil fuels or trees are burned, the stored carbon is oxidised to form a gas (carbon dioxide) which enters the atmosphere. When more carbon dioxide is added to the atmosphere than is removed, it puts the balance out of kilter and traps more heat from the sun, causing the planet to warm.

## **Carbon Dioxide**

Carbon dioxide is a gas, consisting of two parts oxygen, one part carbon. It is naturally occurring within the atmosphere as a greenhouse gas and, with the other greenhouse gases, absorbs some of the sun's energy and prevents it returning to space. This keeps our planet warm and habitable. Carbon dioxide (otherwise known by its chemical shorthand CO<sub>2</sub>) is created by combusting certain materials and is naturally released

by animals during respiration, which is later absorbed by plants during photosynthesis. Concentrations have increased since the Industrial Revolution, as humans have combusted carbon intensive fuels in factories, to produce energy and power vehicles. Carbon dioxide accumulates in the atmosphere for 100+ years.

### **Carbon Dioxide Equivalent**

Carbon dioxide equivalent or CO<sub>2</sub>e is a universal unit of measurement used to compare the emissions from various greenhouse gases on the basis of their global-warming potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming. Emissions reported as CO<sub>2</sub> and not as an equivalent, refer to the gas carbon dioxide only.

### **Carbon Emission Profile**

An emissions profile presents detailed analysis of emissions resulting from a series of sources and activities, such as transport. The data is used to help organisations and political leaders decide on the priorities and solutions required to reduce emissions in the fight against climate change. A baseline emissions profile or inventory is the base year of analysis, carried out by an organisation or local authority, to assist in the measurement of progress towards an agreed target.

### **Carbon Sequestration**

Carbon sequestration refers to the transfer of carbon dioxide from the atmosphere to carbon sinks, through the carbon cycle, which results in the storage of carbon as an organic compound. Carbon is sequestered through biologic, chemical and physical processes (see examples below):

### Biologic sequestration

- *Carbon is absorbed and stored naturally by trees and grasslands by photosynthesis.*
- *Peatlands store carbon through the accumulation of partially decomposed organic matter that would otherwise breakdown completely.*

### Chemical sequestration

- *Man-made chemical processed reduces carbon dioxide to alternative forms.*

### Physical sequestration

- *Bioenergy with carbon capture storage (BECCS) uses biomass in power stations to capture and storage carbon dioxide which is produced as a by-product.*
- *Geological sequestration involves the pumping of carbon dioxide into depleted oil/gas reservoirs or underground rock formations.*

## Climate Change Adaptation

Climate change adaptation involves the delivery of measures and strategies to increase the preparedness of a business or community against the potential risks associated with climate change. Scientists and advisory bodies provide a series of projected impacts that may result from modelled warming scenarios to help leaders decide on solutions needed to increase resilience to climate risks.

## Climate Change Mitigation

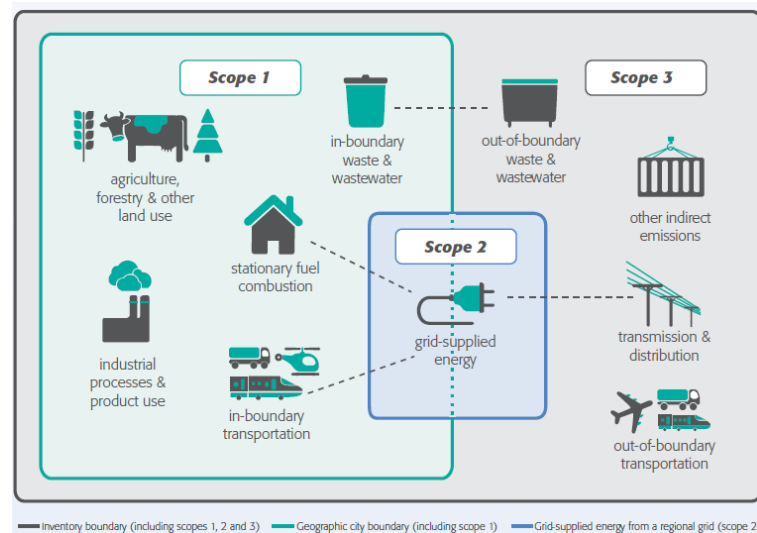
Climate change mitigation involves the delivery of certain actions and solutions to reduce the emissions that result from a human activity, such as cycling as an alternative to driving a car.



## Emissions Reporting Scopes

Emissions are grouped according to where they occur, whether it is inside the local authority/city boundary or outside and are referred to as “Scopes” (see the infographic below). Scopes are referred to when analysing the emissions associated with the inventory boundary and provide useful context as to what is within the city/local authority’s control:

- Scope 1 – *Emissions from sources located inside the boundary (otherwise known as territorial or direct emissions);*
- Scope 2 - *Emissions resulting from the use of grid-supplied electricity (power) and/or heat within the local authority boundary (grid-supplied energy, also known as indirect emissions);*
- Scope 3 - *All other emissions occurring outside the local authority boundary resulting from activities taking place within the boundary (out-of-boundary sources).*



Source - GPC Protocol

## **Global Warming Potential**

The Global Warming Potential (GWP) of each gas refers to its total warming impact relative to CO<sub>2</sub> over a set timeframe – usually a hundred years.

## **Greenhouse Gas**

Like a greenhouse, the earth's atmosphere consists of gases which trap radiation from the sun, maintaining our climate and life on earth. The primary greenhouse gases in the atmosphere are water vapour, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and ozone (O<sub>3</sub>). Without greenhouse gases, our planet would be as cold as Mars.

## **Greenhouse Effect**

The greenhouse effect is a naturally occurring process, whereby greenhouse gases absorb solar radiation (heat from the sun), creating a life-maintaining blanket. The human-induced greenhouse effect refers to the increased warming of our planet, from the addition of gases released by human activities (eg. carbon dioxide released from burning coal). The more greenhouse gases we add to the atmosphere, the more solar radiation gets trapped, causing our global temperatures to rise (global warming).

## **Holocene**

The geological epoch following the end of the last glacial (ice age) is known as the Holocene. The Holocene started around 11,650 years ago and continues into present time. However, scientists have unofficially classified the most recent time period as the Anthropocene (see above).

## **Intergovernmental Panel on Climate Change**

The IPCC was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) as the intergovernmental panel of the United Nations who provide the world with scientific reporting on the impacts of human-induced climate change and recommended response options.

## **Peak River Flow**

Peak river flow is the time when the river reaches its highest flow. There is a delay (lag time) for water to find its way to the river (as it runs off surfaces and infiltrates and finds its way through soil and underground rocks). The normal (base) flow of the river starts to rise when run-off, ground and soil water reaches the river following a period of rainfall.

## **Sea-level Rise**

Sea-level rise is an increase in the level of the world's oceans as a result of global warming. A rise in sea-level occurs through the melting of the world's glaciers (adding vast quantities of freshwater to oceans) and thermal expansion, whereby the volume of water increases and expands as oceans become warmer.

## **Photosynthesis**

Photosynthesis is a chemical process whereby plants, algae and certain bacteria harness energy from sunlight and turn it into chemical energy. Plants synthesis solar energy, water, and carbon dioxide to create oxygen and energy in the form of glucose (sugar). This process is vital for plants to survive and the energy is transferred to humans through the consumption of plants through the food chain.

## **Surface Run-Off**

Surface run-off is the flow of water over soil, vegetation or other ground cover instead of infiltrating to the underlying soil. Surface runoff usually occurs following a period of rainfall and can be increased due to the permeability of underlying material, or because the underlying material is already saturated.

## **Tipping Point**

Tipping points occur in the climate system when global heating pushes temperatures beyond a critical threshold, leading to accelerated and irreversible impacts. The exceedance of a tipping point is a “point of no return” in the climate system that cannot be reversed, once the threshold is passed, and presents drastic and far-reaching consequences for our planet.

## **Warming Scenario**

Global warming scenarios are modelling by scientists to illustrate the likely outcomes if global average temperatures increase by a certain amount. These scenarios are used by world leaders to implement the necessary mitigation and adaptation strategies that are needed to reduce the likelihood, but also increase preparedness, for certain temperature increases.