# **Climate Challenge**

UK Domestic Green House Gas Emissions (GHG) by Sector 2021 Source: BEIS, HMG



Others include Public, Industrial Processes and the Land Use, Land Use Change and Forestry (LULUCF) sectors. The percentages may not sum to 100% due to rounding.

 $\underline{https://assets.publishing.service.gov.uk/media/63e131afe90e07626c86856c/emissions-statistics-summary-2021.pdf$ 

We are legally required to achieve net zero green house gas emissions by 2050.

# Government has agreed milestone of 78% reduction by 2035.

Transport is the largest contributor of green house gases in the UK, and has reduced slowly since 1990 (15%) compared to energy (69%) or waste (74%). Only residential (14%) and agriculture (12%) are slower.

Transport emissions were the main factor in the overall trend in the last two years, falling 19% in 2020 as people travelled less during the pandemic before rising 10% in 2021

Most transport emissions in the UK come from road vehicles so these drive the overall trend

Essex Climate Action Commission
Powering positive change



### **Coastal Flooding & Erosion**



Climate Central forecast LAND PROJECTED TO BE BELOW ANNUAL FLOOD LEVEL IN 2050

#### Committee on Climate Change

- Coastal communities, infrastructure and landscapes already face threats from flooding and coastal erosion. These threats will increase in the future.
- In the future, some coastal communities and infrastructure are likely to be unviable in their current form. This problem is not being confronted with the required urgency or openness.
- Sustainable coastal adaptation is possible and could deliver multiple benefits. However, it requires a long term commitment and proactive steps to inform and facilitate change in social attitudes.

Managing the coast in a changing climate - Climate Change Committee (theccc.org.uk)



Cliffs at Cudmore Grove on Mersea Island are slowly being worn away.

### Local impacts: Increased flooding



#### Homes at Risk

Fluvial Flooding
 Coastal Flooding
 Surface Water flooding

#### The number of homes at risk of surface flooding is expected to double between now and 2050.

Environment Agency's <u>long-term investment scenarios 2019</u> ... with the University of Oxford...show that for every person affected during a large flood about 16 more suffer knock-on effects from losses of utility services

UK CLIMATE

The <u>Flood and coastal erosion risk management (FCERM) risk management</u> <u>report</u> estimates that the economic losses from flooding between November 2019 and March 2020 were about £333 million. However, it would have cost an extra £2.1 billion without flood defences.

https://www.gov.uk/government/publications/flood-and-coastal-risk-management-national-report/flood-and-coastal-erosion-risk-management-report-1-april-2019-to-31march-2020#flood-risk

Sayers et al. 2017 (CCRA2)

## Local impacts: Water – Not Enough & Poor Quality



The whole of eastern England is now classified as seriously water stressed – there is a water crisis

(Water Resources East, Jan 2022)



6 out of 91 water bodies in Essex (7%) achieve 'GOOD' status (England 16% overall)
33 out of 91 water bodies in Essex (32%) are POOR status (England 17% overall)

### FUTURE IMPACTS – AGRICULTURE, SOILS AND SUBSIDENCE

# 207 2030 Highly unlikely Likely Highly likely

British Geological Survey 2030 & 2070 projections showing potential change in shrink swell subsidence susceptibility due to climate change

It is estimated that subsidence has cost the economy c£3bn over the past decade.

#### Agriculture

Climate change will cause soil erosion – soil washed away in heavy rainfall in winter and blown away in drier summers - leading to degradation of our agricultural land and impacting our farming economy. *This is a key factor in blocked drains*.

### Subsidence Risk for Buildings & Roads

Climate change leading to hotter, drier summers, shrinks and cracks ground under houses. British Geological Survey reports *risks of clay related subsidence increases by a third by 2030 and triples by 2050.* 

This means the 1m homes at risk in the UK in 1990 is set to rise to 2.4m by 2030.

## How climate change affects the strategic road network

This diagram illustrates some of the impacts of climate change and measures we are taking to address these



formation can hel

form road users o

severe weather

Bridge expansion joints

and bearings may be

damaged by extreme

Cycles of wetting & drying, plus ground water changes de-stablise slopes, damage undergound pipes & undermines foundations. Extreme weather - high winds, storm surges & wildfires are all increasing



DfT is developing a transport adaptation strategy

Extend the scope of the next round of the Adaptation Reporting Power (ARP4) to cover local authority functions related to road infrastructure, ports, airports, and key supply chain organisations: *reports due by the end of* 2024.

<u>Government response to the Climate Change Committee 2023 report to Parliament –</u> progress in adapting to climate change - GOV.UK (www.gov.uk)

## **Nature Based Solutions**

The Climate Change Committee identifies eight risk areas that require the most urgent attention in the next two

Vears. https://www.theccc.org.uk/publication/independent-assessment-of-uk-climate-risk/

### Trees and woodlands provide over £400m each year in fight

#### against flooding, new study finds

Trees and woodlands provide over £400m each year in fight against flooding, new study finds - GOV.UK (www.gov.uk)

- Forests help to reduce flooding in numerous ways, in what is referred to as a 'sponge effect'. Firstly, evaporation from leaves and branches helps to reduce the amount of rainfall reaching the ground. This process, known as interception, is significantly greater for woodland compared to other land use types. Secondly, the soils within forests receive, store and delay water, helping to reduce rapid run-off and peak flows. Finally, the presence of trees, shrubs and large woody dams along rivers and on the floodplain creates a barrier effect that slows the passage of flood waters downstream, in addition to delivering biodiversity benefits.
- Natural Capital Value of the flood regulation service provided by Great Britain's trees in flood risk catchment areas to be up to £25.1 billion. This represents their value over the course of a century and provides a useful means of comparison to other natural assets.
- Today's announcement follows another recent Forest Research report which calculated the economic value of individual trees planted outside of forests and woodlands to be up to £3.8 billion. Announced as part of National Tree Week, the valuation is based on the important role that these trees play in sequestering and storing carbon, regulating temperatures, strengthening flood resilience and reducing noise and air pollution.

#### **Urban Trees**

- reduce the impact of heavy rain and floods, making Sustainable Urban Drainage Systems more effective. In Milwaukee, the urban forest reduced run off flow by 22% and provided more than \$15 million in benefits. - cool the air naturally Trees in cities can cool the air by 2°C to 8°C,

reducing heat-related illness.

FC URBAN FOREST A4 4PP V9.indd (publishing.service.gov.uk)

#### Figure 1 Highest priorities for further adaptation in the next two years

	Time period 2020	2050	2100	Key policy areas
Risks to the viability and diversity of terrestrial and freshwater habitats and species from multiple hazards				Biodiversity, soil and water protection and restoration, environmental land management, sustainable farming and forestry, Net Zero, green finance
Risks to soil health from increased flooding and drought				
Risks to natural carbon stores and sequestration from multiple hazards leading to increased emissions				
Risks to crops, livestock and commercial trees from multiple hazards				
Risks to supply of food, goods and vital services due to climate-related collapse of supply chains and distribution networks				Public procurement, business resilience
Risks to people and the economy from climate-related failure of the power system				Infrastructure, energy, Net Zero
Risks to human health, wellbeing and productivity from increased exposure to heat in homes and other buildings				Building regulations and strategies, planning reform
Multiple risks to the UK from climate change impacts overseas				National resilience, overseas aid, research and capacity building
Magnitude of risk 🖊 High	/ Medium	n		
Sources CCC				

#### Source: CCC

Notes: Figure shows the changing magnitude over time of the risk areas that require the most urgent action in the next two years. Change in magnitude is shown up to 2100 for the highest scenario assessed in the Technical Report for the relevant risks for that theme. Details are set out in an accompanying Annex to this report.