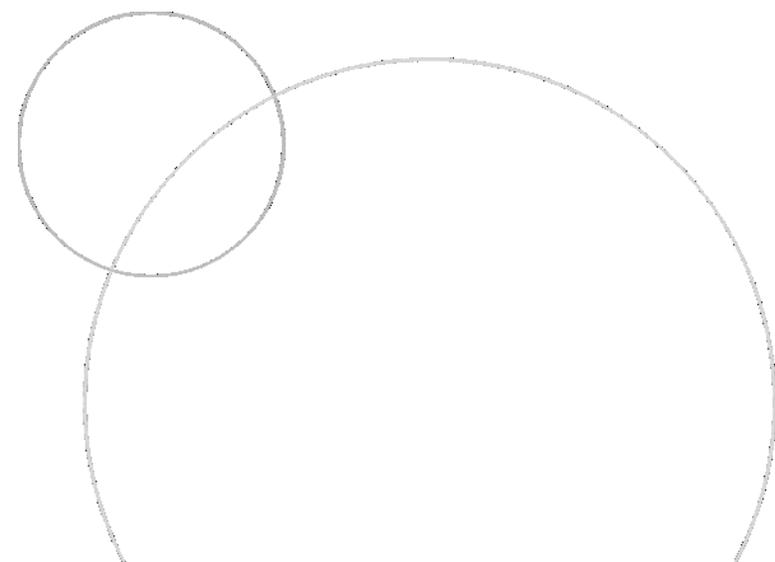


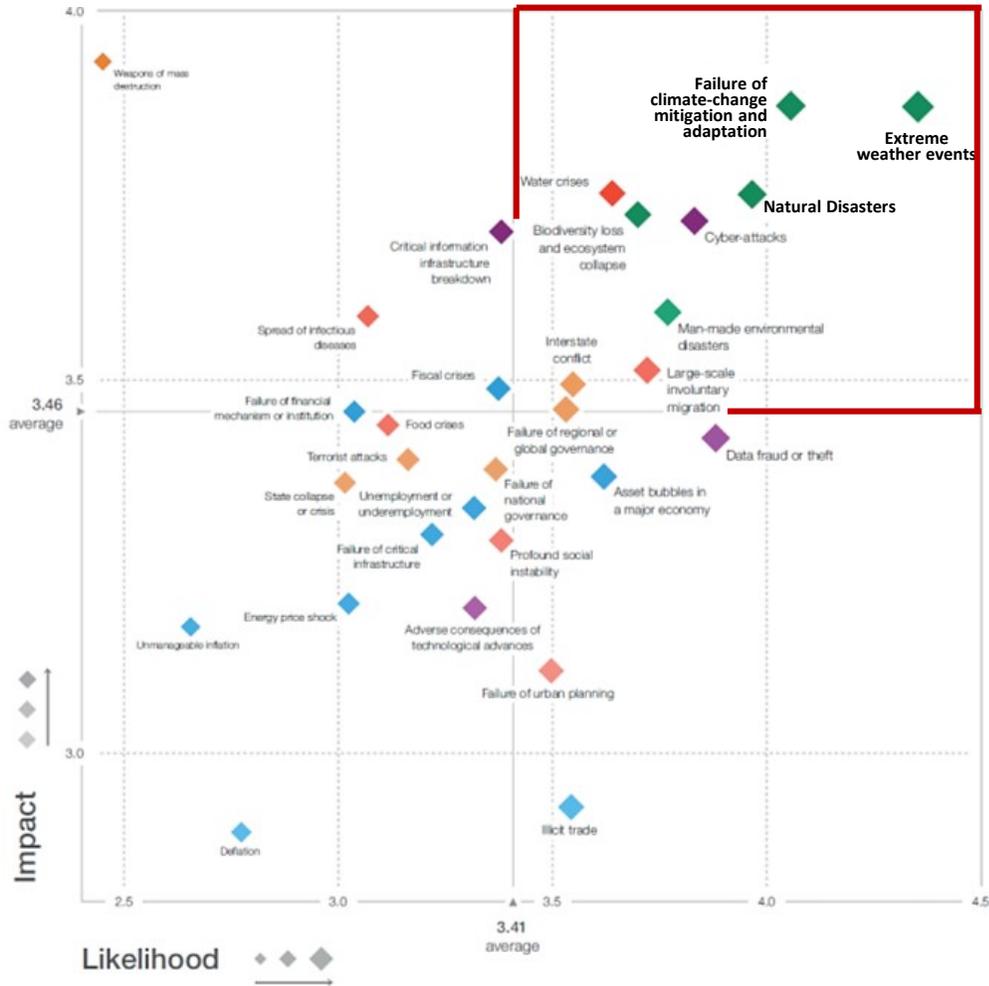


The Climate Challenge: ANALYSIS OF THE ISSUE





GLOBAL RISK FROM CLIMATE CHANGE IS HIGHER THAN INFECTIOUS DISEASES OR FISCAL CRISES





WORLD ECONOMIC FORUM – GLOBAL RISK REPORT 2020 “A PLANETARY EMERGENCY”

- Failure to act on Climate Change and associated impacts are the single biggest risk facing the World.
- Progress Report to Parliament, Committee on Climate Change, June 2020
- “We are not making adequate progress in preparing for climate change”
- The fundamental requirements to achieve Net Zero are largely unchanged by COVID-19: infrastructure investments and reskilling of workers – both of which can help the UK to recover from the COVID-19 crisis



THE CLIMATE HAS ALREADY CHANGED – TEMPERATURE AND SEA LEVEL ARE ALREADY RISING

What has happened so far?



Global average surface temperature is more than 1°C above pre-industrial levels.



UK annual average temperature is about 1.2°C above pre-industrial levels. We have experienced a 0.8°C increase since 1961-1990.



Global mean sea level has risen ~21cm from 1900.



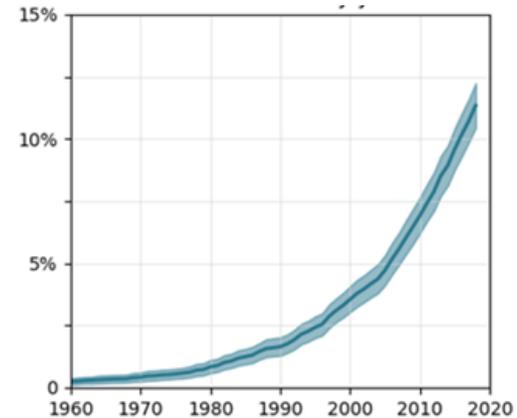
UK mean sea level has risen ~16cm from 1900.



There are some indications of **increasing heavy rainfall** in the UK, though difficult to quantify.

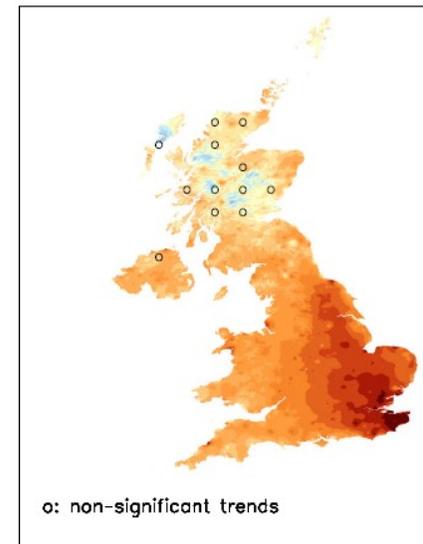


Increasing chance of UK heatwaves “like 2018 summer”. Now 10-25% chance each year, compared to <10% chance a few decades ago.



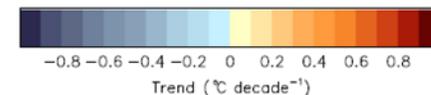
Chance of a UK “2018 Summer” increasing annually since 1960.

Chance >2018 by year
From the Met Office ‘UNSEEN’ project



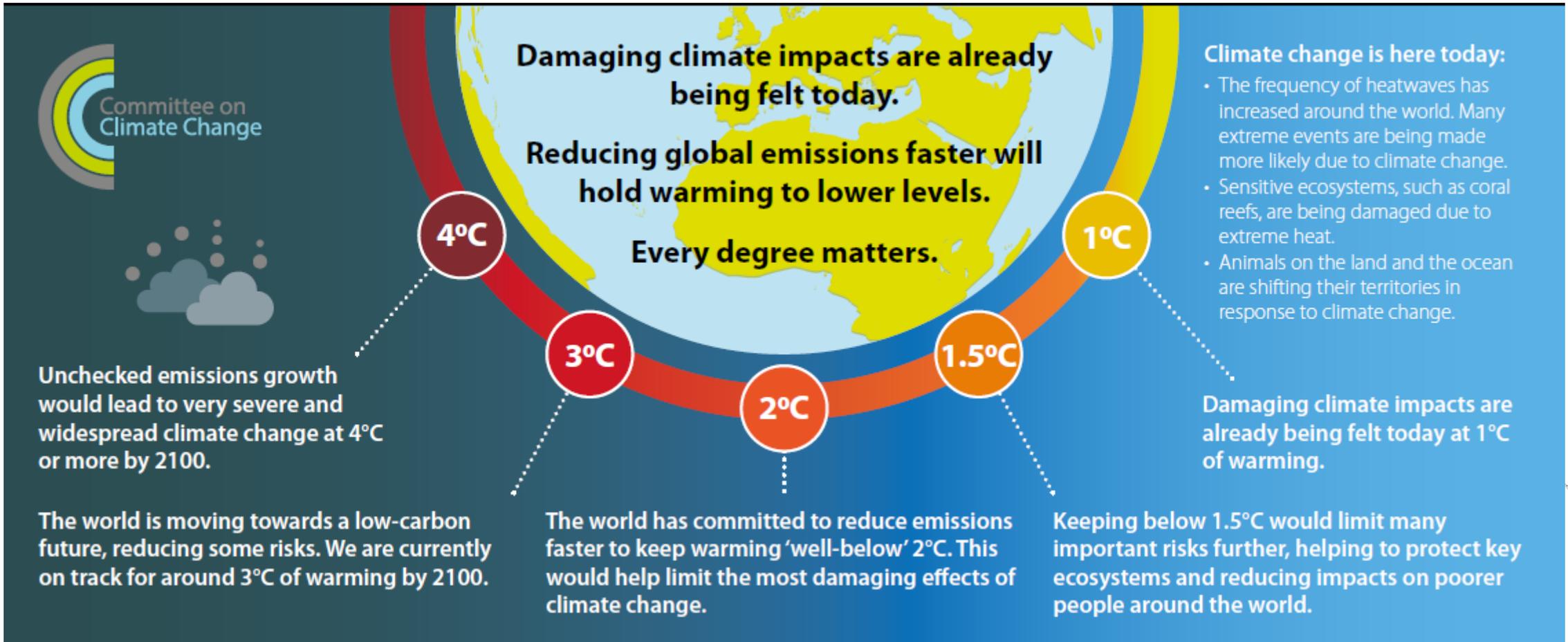
Trend in the warmest day since 1960.

1960-2019 observed trends
Christidis et al. (2020)





THIS MEANS WE NEED TO ACT NOW TO MITIGATE (REDUCE EMISSIONS) AND ADAPT (BUILD RESILIENCE TO CLIMATE CHANGE IMPACTS)



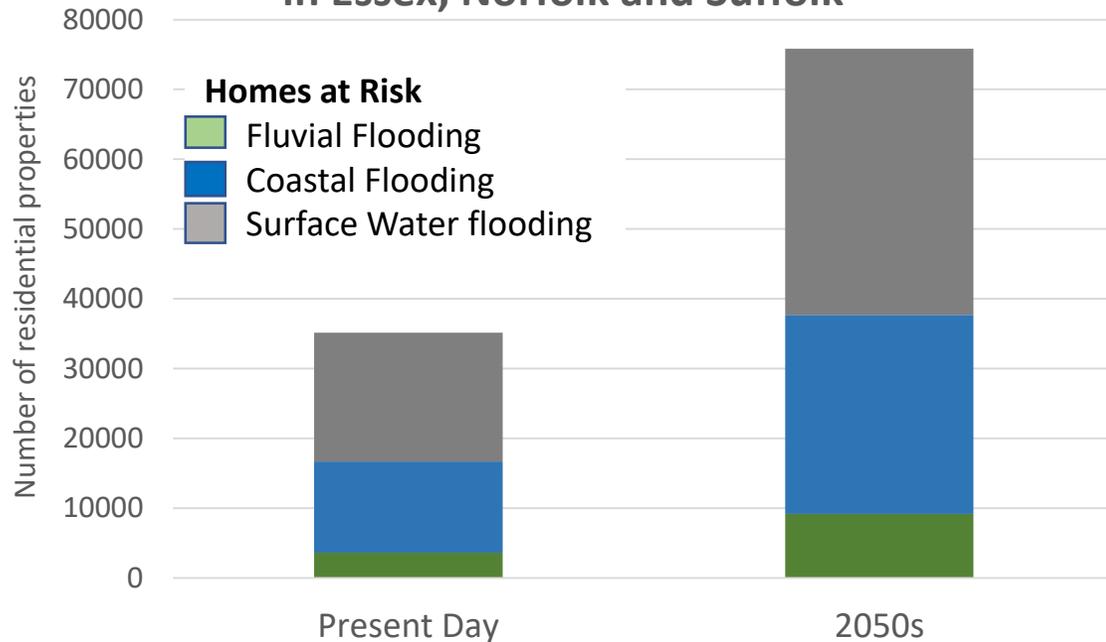


FUTURE IMPACTS: WATER - INCREASED FLOOD RISK

Essex has substantial issues with coastal and surface water flooding: even over the next 30 years, the number of homes at risk is projected to double without additional adaptation action.

ECC is lead flood authority and has an incentive to invest in flood mitigation to protect property and livelihoods.

Residential properties at significant flood risk
in Essex, Norfolk and Suffolk



The Environment Agency estimate that for every £1 spent improving protection from flooding and coastal erosion, we avoid around £5 of property damages

Flooding, and managing it, cost the UK around £2.2 billion each year: Nationally we currently spend around £800 million per annum on flood and coastal defences; and, even with the present flood defences, we experience an average of £1,400 million of damage. While the level of spending is fairly steady, damage due to flooding is intermittent and can be huge when a major flood occurs.

Flood defences protect not only people and private properties, but also **vital amenities** and public assets, including hospitals, the emergency services, schools, municipal buildings and the transport infrastructure. Disruption of these by flooding can have **major knock-on effects for business and society**



FUTURE IMPACTS: WATER - INCREASED WATER SCARCITY

Essex also has substantial issues with water scarcity and is one of the areas of the country with the highest levels of negative available water resource as a % of water available for abstraction in the country.

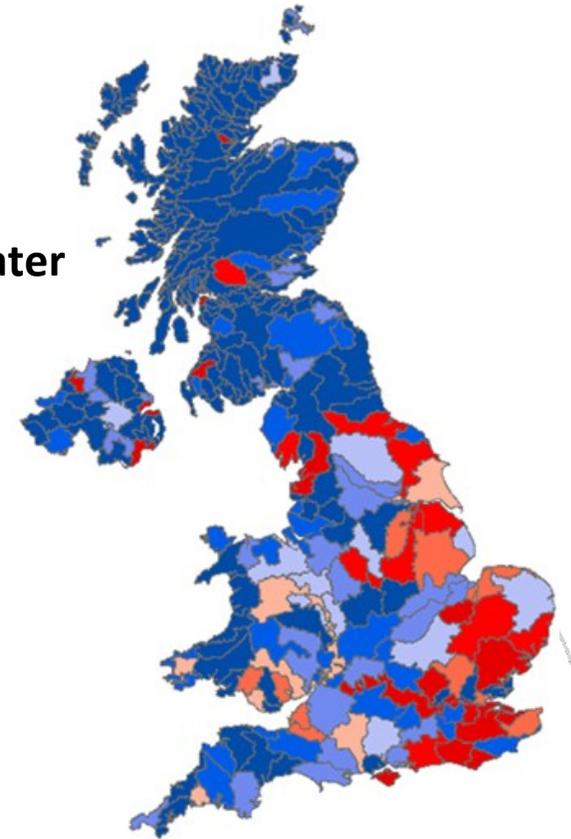
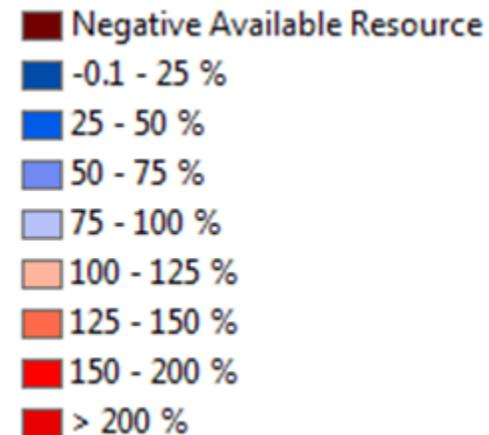
A recent study of Water scarcity in the Anglian River Basin catchment identified very high pressure areas in North Essex where we are consistently consuming more water than is available on an annual basis

Climate change risks are being recognised by the water companies in and their customers:

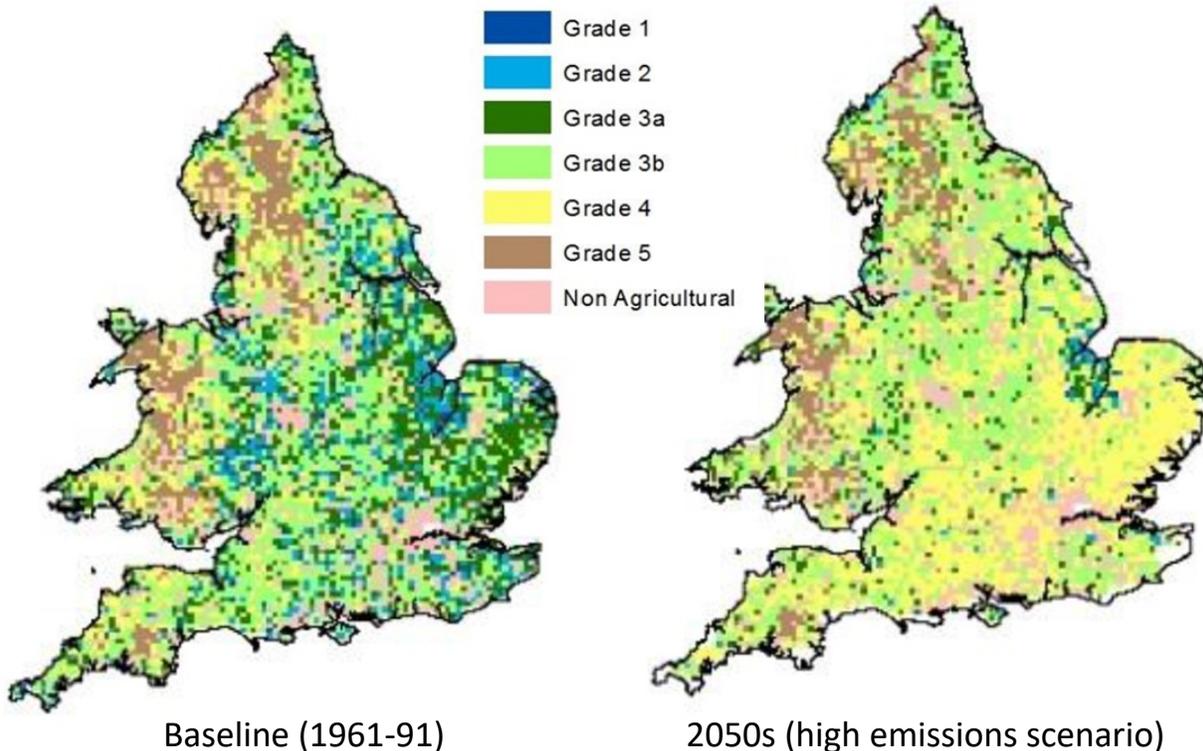
“**Customers want us to invest now to address climate change risks** and improve resilience rather than defer and are **prepared to see bills increase by up to 5%** in return for investment to address these risks.

...we will face ever growing pressures from climate change and population growth, areas where we are more exposed than other companies given our region is already water-scarce. To ensure we remain resilient to these pressures, we will need to **deliver significant increases in investment in new infrastructure**, deploy sufficient capital maintenance expenditure to safeguard existing assets, and deliver ongoing investment in our people.”
(Anglian Water, 2019)

Water demand as a % of water available for abstraction



AGRICULTURAL LAND CLASSIFICATION IN ENGLAND AND WALES



FUTURE IMPACTS – AGRICULTURE

Climate change will cause soil erosion and degradation of our agricultural land, threatening our farming economy.

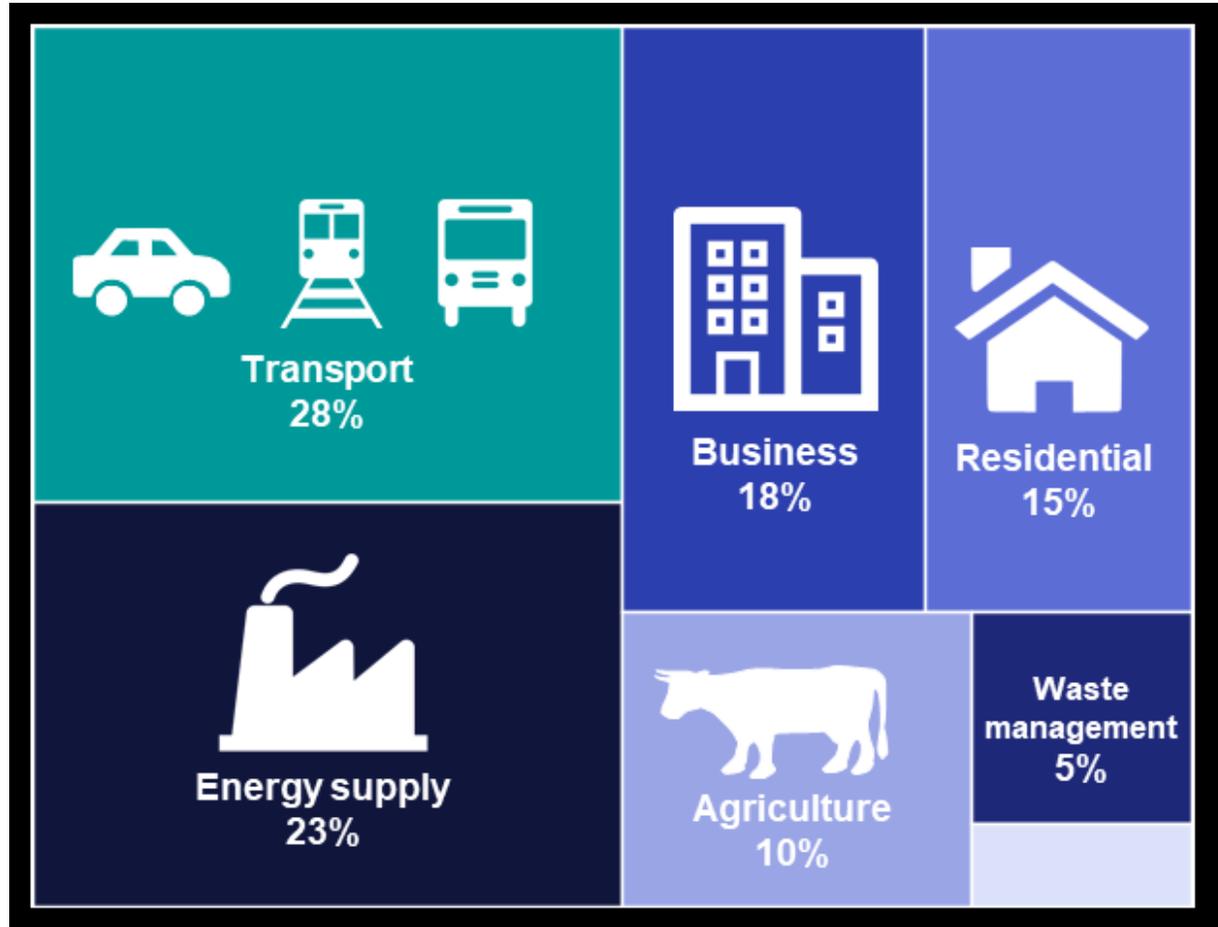
	Km ²	%
Total Area of Productive Spaces (e.g. Agricultural land)	2,240	61%
Total Area of all other Green Infrastructure	782	21%
Remaining land (e.g. Built up areas)	655	18%
Total Land area in Greater Essex	3,677	100%

In Essex Agriculture, Forestry & Fishing employs c5,000 people in 2,270 enterprises (2018)

Green House Gas Emissions UK

UK Domestic Green House Gas Emissions (GHG) by Sector 2018

Source: BEIS, HMG



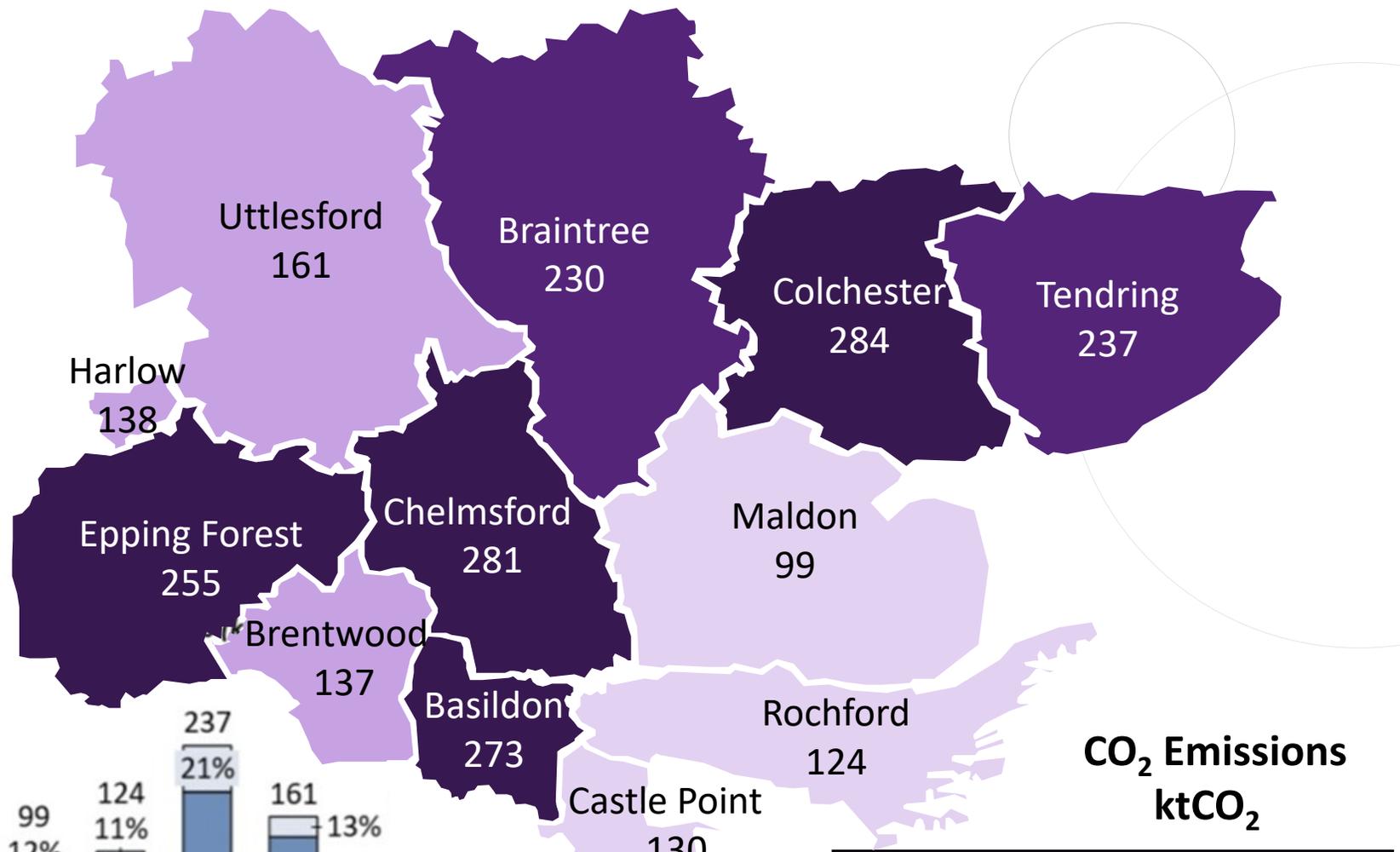
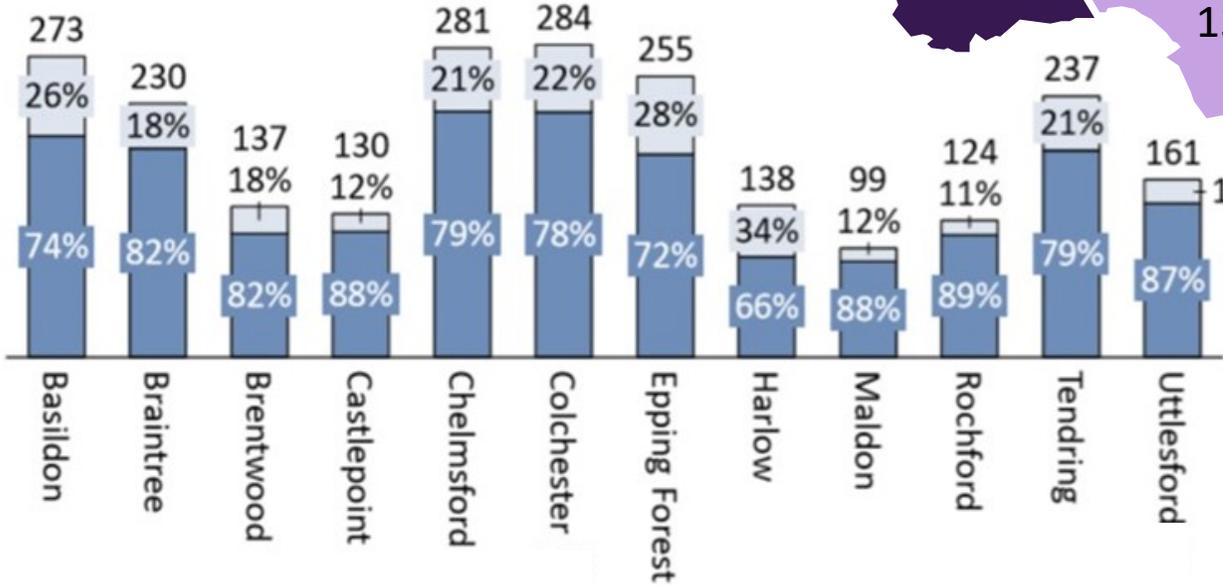
The UK has made significant progress, reducing GHG emissions by 43% from 1990, with the energy supply sector accounting for around half of this overall reduction.

We are committed to achieve net zero emissions by 2050 (Climate Change Act 2008).



CO2 EMISSIONS ACROSS ESSEX LOCAL AUTHORITIES

Non-domestic Domestic



CO₂ Emissions
ktCO₂





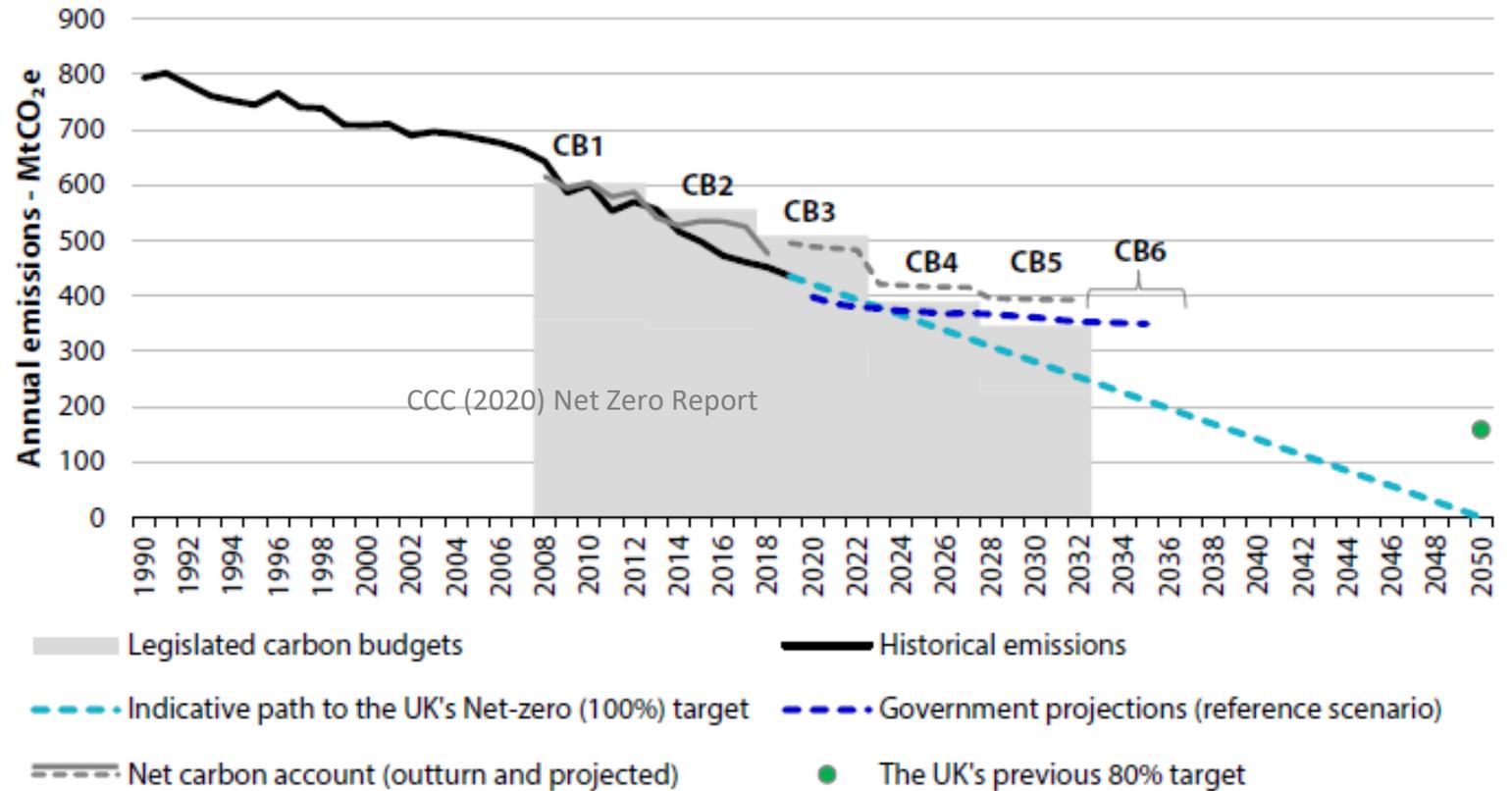
MEASURING PROGRESS - NET ZERO 2050

In 2019 the UK Government legislated for a target to reduce emissions to 'Net Zero' by 2050

Net Zero means **the majority of activities** - driving, manufacturing, heating, electricity generation - **emitting as close to zero emissions as possible by 2050** -

and the equivalent amount of any remaining emissions must be removed from the atmosphere

The UK is not on track to meet its Net Zero target:

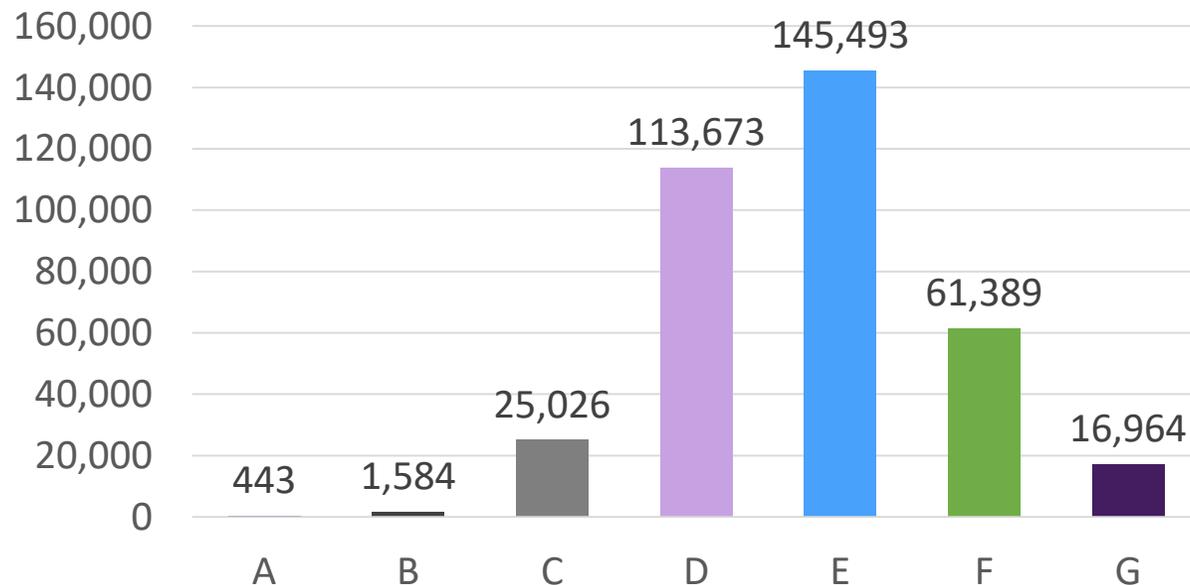




Domestic housing retrofit

Our homes consume about 30% of the UK's energy and produce about 20% of greenhouse gas emissions. 80% of that energy is for space and hot water heating, mostly from gas. The UK housing stock is old and inefficient, and the replacement rate is low. 80% of the homes we will use in 2050 already exist. We must upgrade our existing housing stock to be much more energy-efficient. This means improving the fabric of the buildings, to transform the existing housing stock into homes fit for the future

Number domestic households in Essex per energy performance certificate (on register)



Extrapolating data for properties with an EPC rating, it is estimated Essex has c.540,400 dwellings with an EPC report of C or lower.

To improve these household's energy efficiency is estimated to cost £3,615¹ per household

To complete this retrofit for households in Essex would cost an estimated **£1.95 billion**.

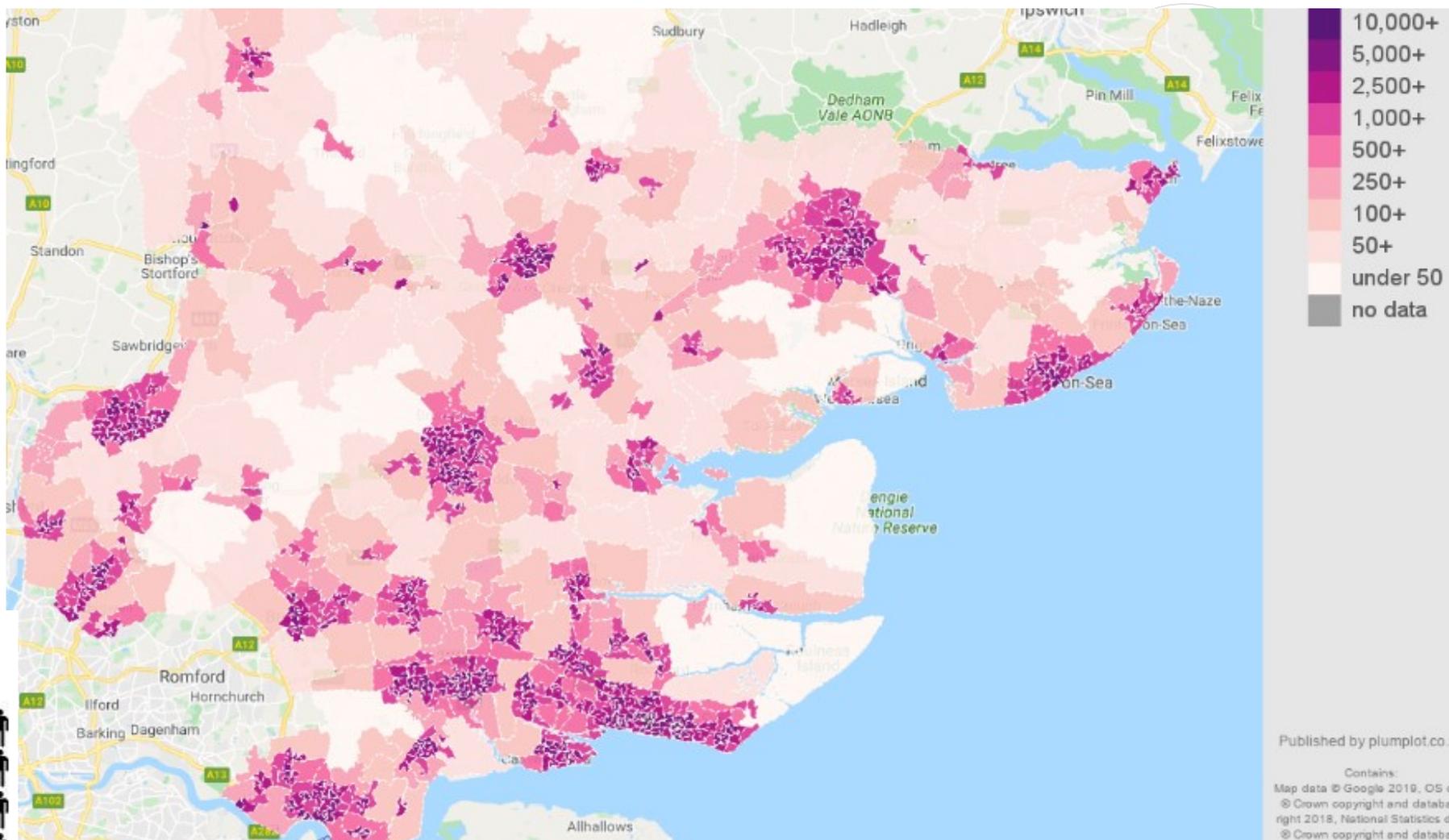
¹ This allows for the minimum cost of typical measures such as cavity wall insulation, suspended floor insulation, low energy lighting, and loft insulation



Essex in Numbers

From 2016-2036
17% POPULATION INCREASE

2001: Population of 1.3m
 2018: Population of 1.8m
 2036: Population of 2.1m



Greater Essex could grow by 298,700 people between 2016 and 2036, per ONS projections

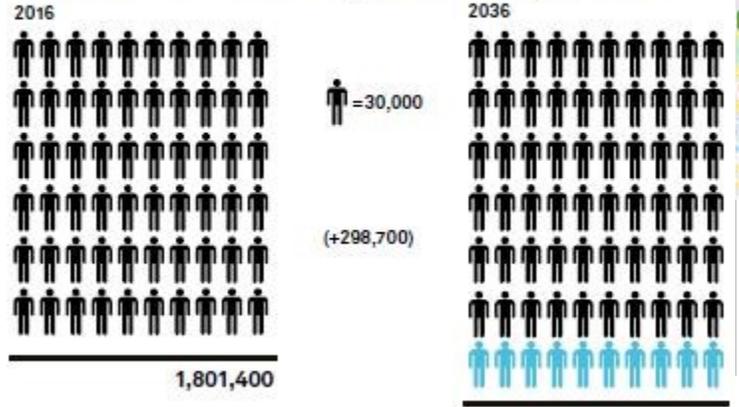


FIGURE 3.1 PROJECTED POPULATION CHANGE 2016-2036



Each new home 'costs' more than 50 tonnes of carbon to build.

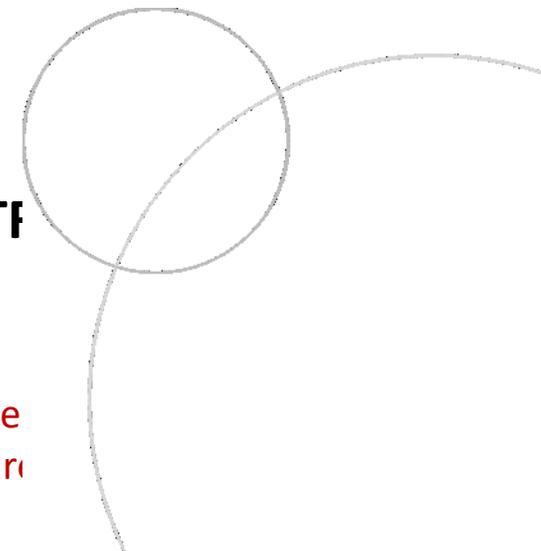
200,000 HOMES = 10,000,000 TONNES OF CARBON TO BUILD



THE GREEN ECONOMY – CHALLENGE & OPPORTUNITY

- 25m homes in UK need to decarbonize, 833,000 pa to meet the net zero challenge by 2050.
- 12.4m homes in Wider South East are connected to the Gas Grid, though 1.9m not.
- **BUT**
 - Sustainable construction sector is estimated to be worth £400bn rising to £1000bn
 - Will create 1.8m new jobs. 0.5m in Wider South East.





Government spending on renewable energy and energy efficiency has been shown to create more jobs than spending on fossil fuels.

Jobs created, directly and indirectly,¹ per \$10 million in spending

Fossil fuel
(oil and gas, coal)



¹Excludes induced jobs.
Source: Heidi Garrett-Peltier, "Green versus brown: Comparing the employment impacts of energy efficiency, renewable energy, and fossil fuels using an input-output model," *Economic Modelling*, pp. 439–47, 2017

INVESTMENT TO DELIVER A STRONG AND RESILIENT RECOVERY

There is strong evidence to support a range of climate adaptation 'green stimulus' measures.

Many can be delivered quickly and have high multipliers, high numbers of jobs created, and boost spending in the UK.

"The one crisis that affects all of us right now is the COVID-19 pandemic. Policymakers across the globe are rightly focused on protecting public health, stabilizing economies, and helping those whose livelihoods are at stake. But if recovery from the crisis is to be sustainable—if our world is to become more resilient—we must do everything in our power to promote a "green recovery.""

Tao Zhang, IMF Deputy Managing Director, May 2020

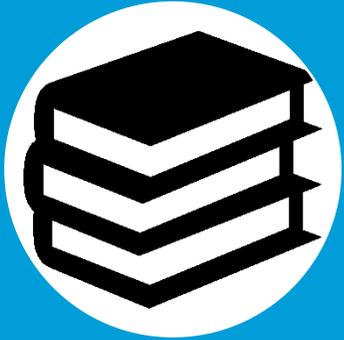
Essex Climate Action Commission - Climate Strategy for Essex

<p>Adapting to A Changing Climate</p> <ul style="list-style-type: none"> - flood - drought - overheating - pests - disease - supply chains 	<p>Transport</p> <ul style="list-style-type: none"> - public transport - modal shift - walking - cycling - EVs - charging infrastructure - sustainable freight 	<p>Built Environment</p> <ul style="list-style-type: none"> - Building standards - ECC estate - Residential - Industrial - Commercial - Planning - Garden Communities - Urban landscape - New Technologies 	<p>Energy & Waste</p> <ul style="list-style-type: none"> - Waste Reduction - Circular economy - Local energy & heat - Wind - Solar - Biomass 	<p>Land Use & Green Infrastructure</p> <ul style="list-style-type: none"> - Nature Based Solutions - Forestry - Nature Corridors - Land Use Change 	<p>Community Engagement</p> <ul style="list-style-type: none"> - Community energy - Behaviour Change - Businesses - Education - Skills - Health
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Long Term Objective
 Interim Milestones
 5 year policy and delivery plan framework



NEW BUILD COMMISSIONER HEADLINE RECOMMENDATIONS



**All New Schools
commissioned to
be Carbon Zero by
2022**



**All New Homes
Consented to be
Carbon Zero by
2025**



**All New
Commercial
Buildings to be
Carbon Zero by
2025**



**All New Schools
Commissioned to
be Carbon
Positive by 2030**



**All New Homes
and non-
domestics
buildings
Consented to be
Carbon Positive
by 2030**



RETROFIT COMMISSIONER HEADLINE RECOMMENDATIONS



Coastal flood resilience schemes in critical areas to be implemented by 2023



50% of Essex schools to be retrofitted to net zero standards by 2025. 100% by 2030.



All Anchor Institutions and ECC estate assets to be retrofitted to net zero carbon standards by 2030



One Third of commercial buildings to be retrofitted as far as possible with renewable energy systems by 2030



Two thirds all dwellings to be retrofitted as far as possible to net zero carbon standards by 2030.



Existing residential buildings- carbon emissions reduction of 50% by 2030. Carbon Zero by 2040.

Housing and Urban Areas

- Set goals for reversing the national decline in urban greenspace
 - Greenspace 'retrofit' programmes should be included in **local plans**
 - Incorporate national green infrastructure from the 25 Year Environment Plan into **local planning**
- Include water efficiency measures in energy efficiency retrofit programmes
- Overheating risk needs integrating into **local plans** (we have already made extensive recommendations to MHCLG on the need to amend building regulations). Plans are also needed for care homes, hospitals, schools, prisons. [To note there are options to make these adaptation nature based: with trees for shading, green walls and roofs]
- Stronger policy on sustainable urban drainage to ensure it is included as the default for **new developments** (To note this again is nature based with planting, ponds and ditches)
 - Make green SuDS the default in all new developments (buildings and infrastructure) – this is set out in the NPPF but needs implementation
 - Automatic right to connect new developments to the sewer system should be made conditional on national SuDS standard being met
 - Clarify arrangements for who is adopting and maintaining SuDS

Transport

Key Recommendations

Increase Active
Travel

Rebuild Public
Transport

Trial e-scooters /
e-bikes

Discourage
unnecessary car
use

Increase Low
Traffic
Neighbourhoods

Expand EV
charging network

First / last mile
delivery

Expand Park &
Choose

Introduce
'School Streets'

Pilot local
delivery hubs

Behaviour
Change



Climate Change

Energy consumption in new buildings



Challenging developers to employ technologies to reduce energy consumption for new buildings will help tackle climate change and support the market for technologies to retro-fit existing buildings .
Would you support a policy to uplift energy efficiency standards for new homes, even where it may impact on other issues like affordability ?

CO² produced by the construction of new buildings



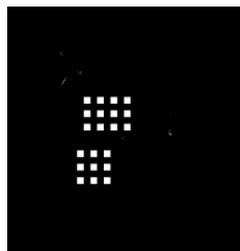
In addition to energy efficiency, it is important to ensure development uses water, minerals, materials and other natural resources efficiently.

How should developers be required to meet high standards that demonstrate sustainable design and construction in the buildings ?

Will the action we take today be enough to forestall the impacts of climate change ?

Understanding your priorities will help us plan for growth and change.

Mitigating and adapting to climate change through design



The next generation of buildings need to be designed to be resilient to climate change. Flooding, managing overheating and working with nature to manage the impacts of climate change, whilst supporting zero carbon lifestyles. **What do you think are the most important changes we need to make to how and where we build ?**

Transport & movement



In Essex nearly 50% of CO₂ emissions are generated by transport. De-carbonising transport is critical to tackling climate change. **What barriers are there to sustainable transport – train, bus, cycling, walking and electric vehicles ?**

Renewable and low carbon energy



Renewable energy sources such as wind, solar and hydro along with other technologies such as green gas and district heating can contribute to decarbonising our energy needs. **Would you support community led energy schemes, even where they may impact on the landscape ?**