



Discover our ideas & insights



Aviation & shipping



BECCS



Brexit



Carbon budgets



Future Scenarios



Perceptions of climate change



Urban resilience



Explore our research areas

Accelerating Social
Transitions

Overcoming Poverty with
Climate Actions

Building Up Resilience

Reaching Zero Emissions

Twitter

UK Government
commits to net zero
emissions. (And a little
bit about how we have
helped since 2000)...

<https://t.co/2Um4PZGTGJ>

1 month 1 day ago

Asher Minns
@ashermanns
@tyndallcentre
ashermanns.com





Joseph Fourier 1827 the atmosphere acts like the glass of a greenhouse (*Mem de l' Ac. R. de Sci de l'Inst de France Vol 7.*)



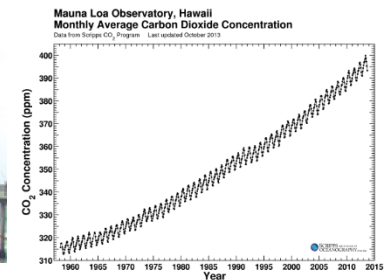
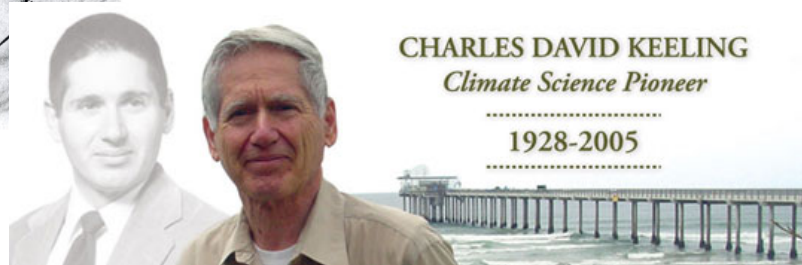
Eunice Foote 1856 affecting the heat of the sun's rays



Svante Arrhenius 1906 increasing carbonic acid in the atmosphere...for the benefit of rapidly propagating mankind

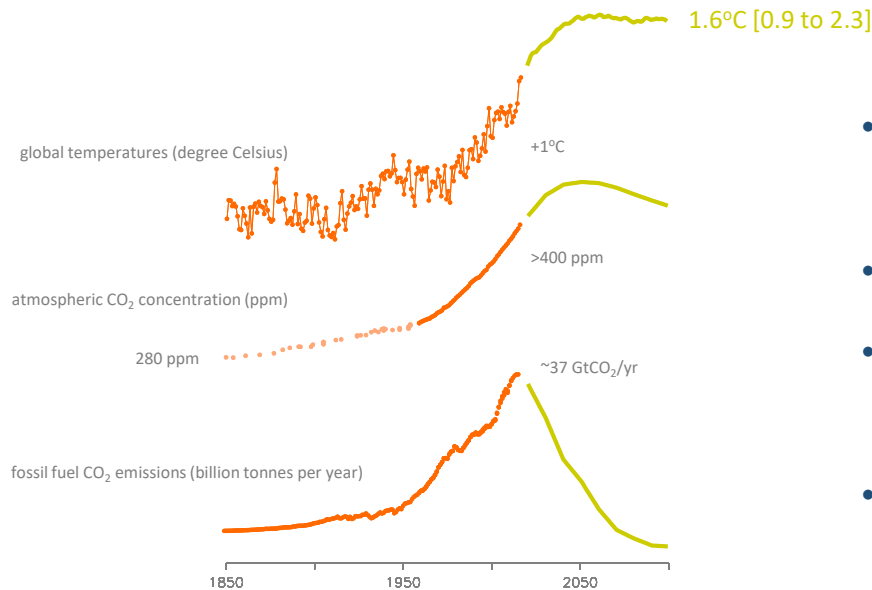


Guy Callendar 1939 changing the atmosphere at a rate exceptional on the geological time scale



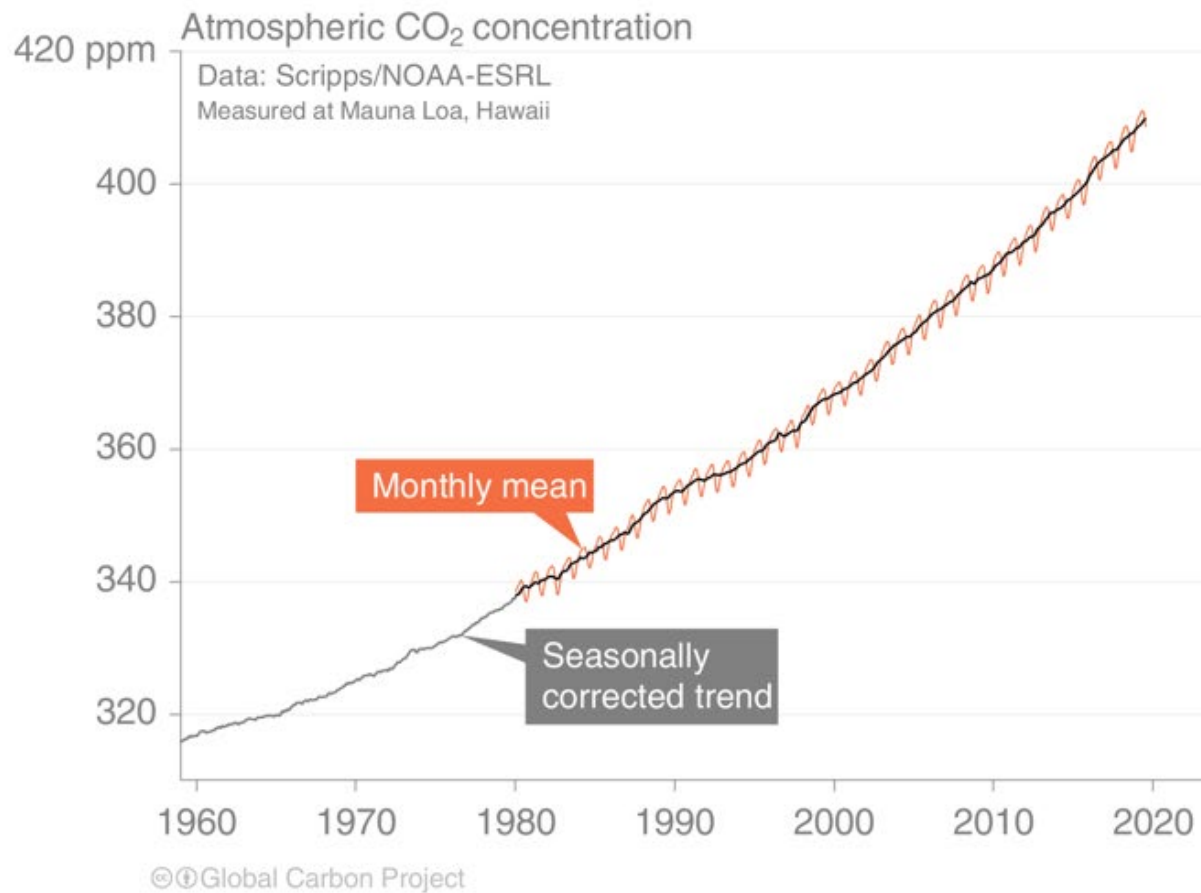
1958

Future warming depends on future emissions



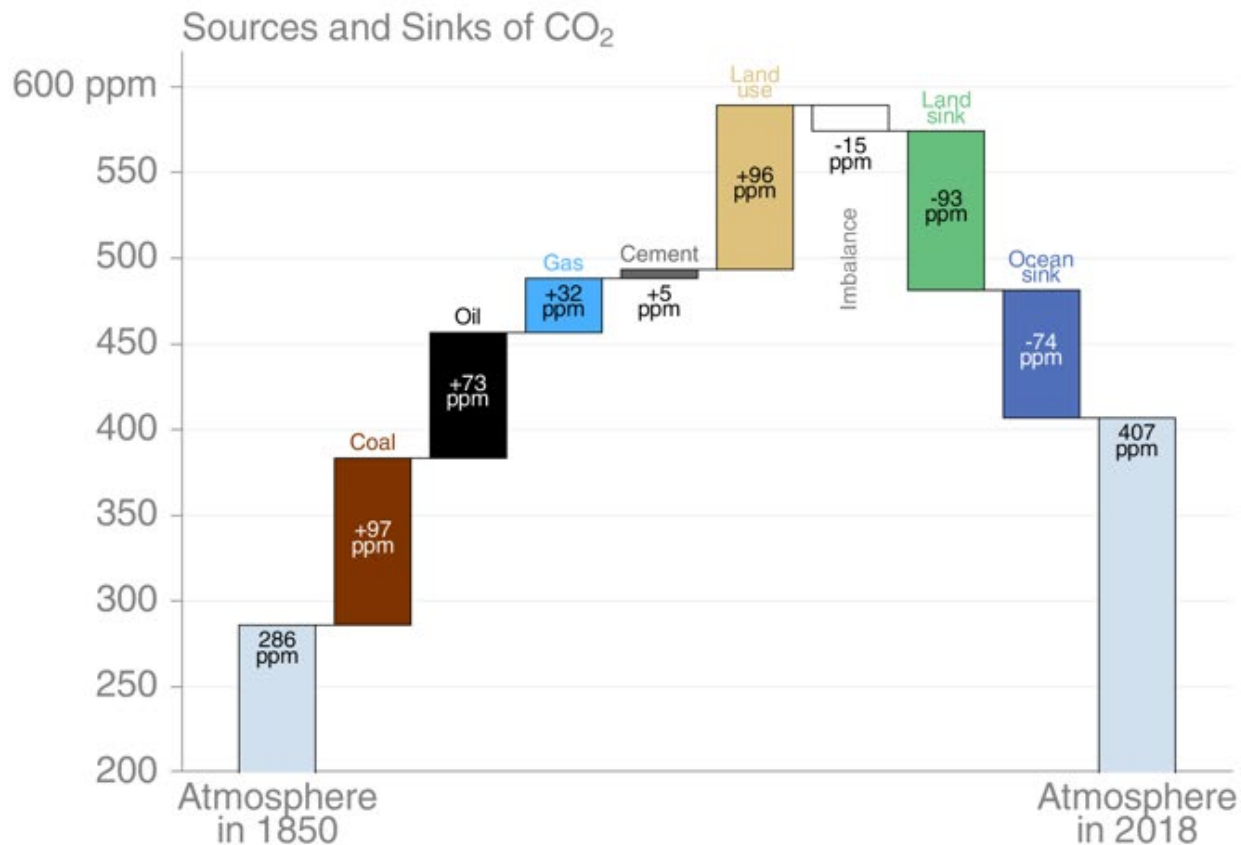
- the world has warmed on average about 1.1°C since pre-industrial times
- further warming & sea level rise is inevitable
- warming will cease only if emissions are decreased to around zero. Sea-level rise will continue.
- the lower the temperature goal, the lower the cumulative emissions budget

The global CO₂ concentration increased from ~277ppm in 1750 to 407ppm in 2018 (up 46%)
2016 was the first full year with concentration above 400ppm



The cumulative contributions to the global carbon budget from 1850

The carbon imbalance represents the gap in our current understanding of sources & sinks

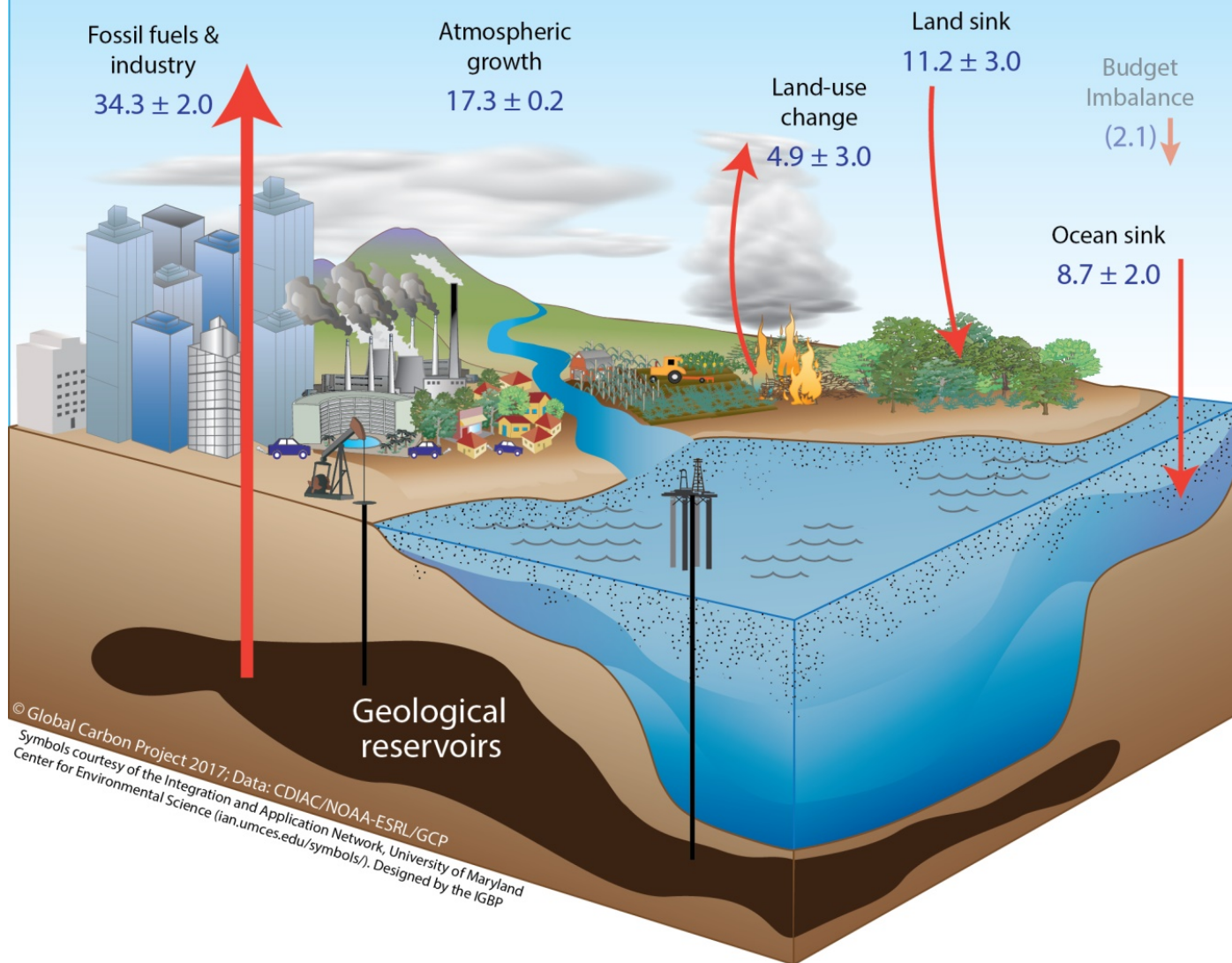




Global carbon dioxide budget (gigatonnes of carbon dioxide per year)

2007-2016

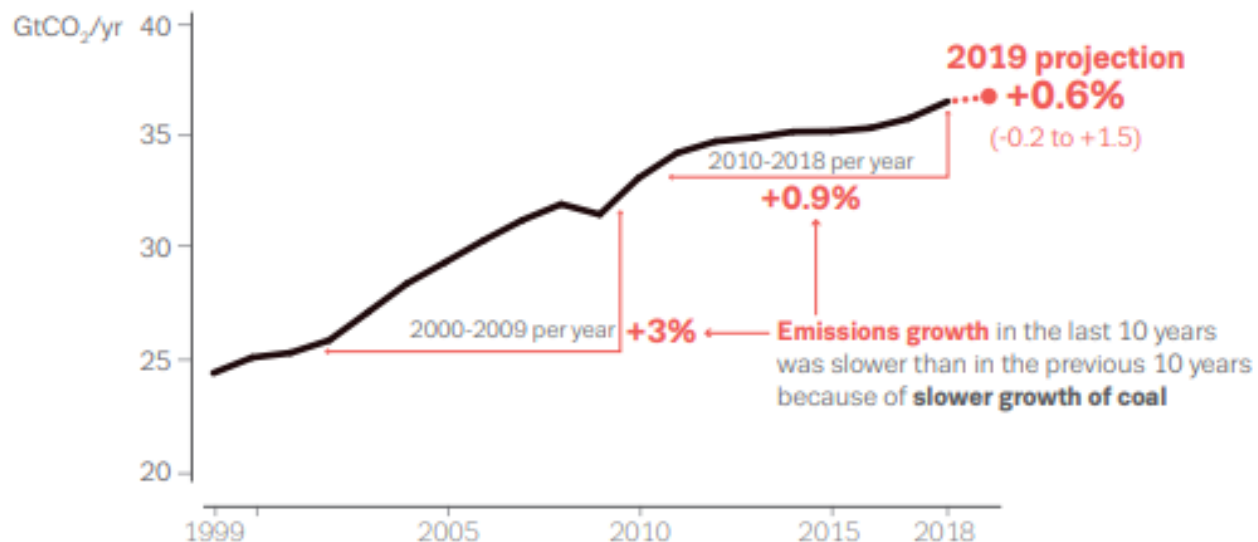
2007-2018



Global Carbon Budget 2019

CO₂ emissions grow amidst slowly emerging climate policies

Fossil CO₂ emissions grow more slowly... but do not yet decline

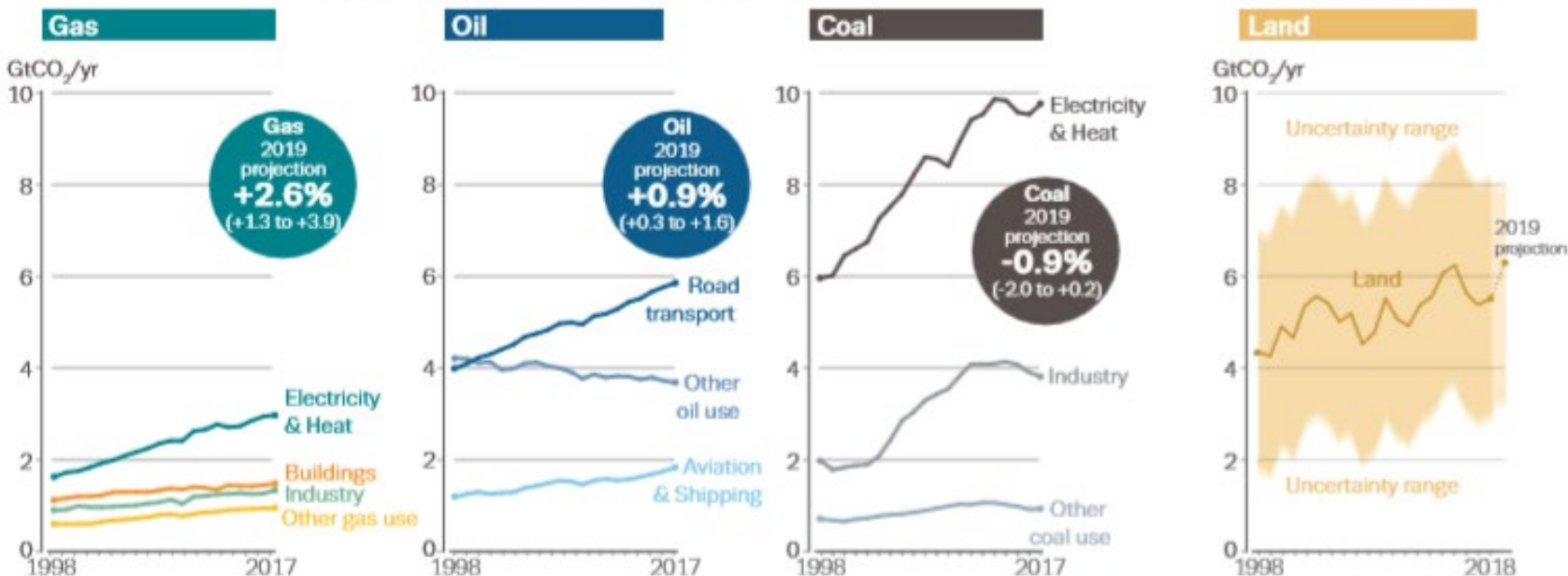


Source: Global Carbon Project based on UNFCCC/CDIAC/BP/USGS. Units: Billion tonnes of carbon dioxide per year (GtCO₂/yr)

CO₂ emissions need to decline rapidly to net-zero around mid-century to pursue the Paris Agreement 1.5°C goal

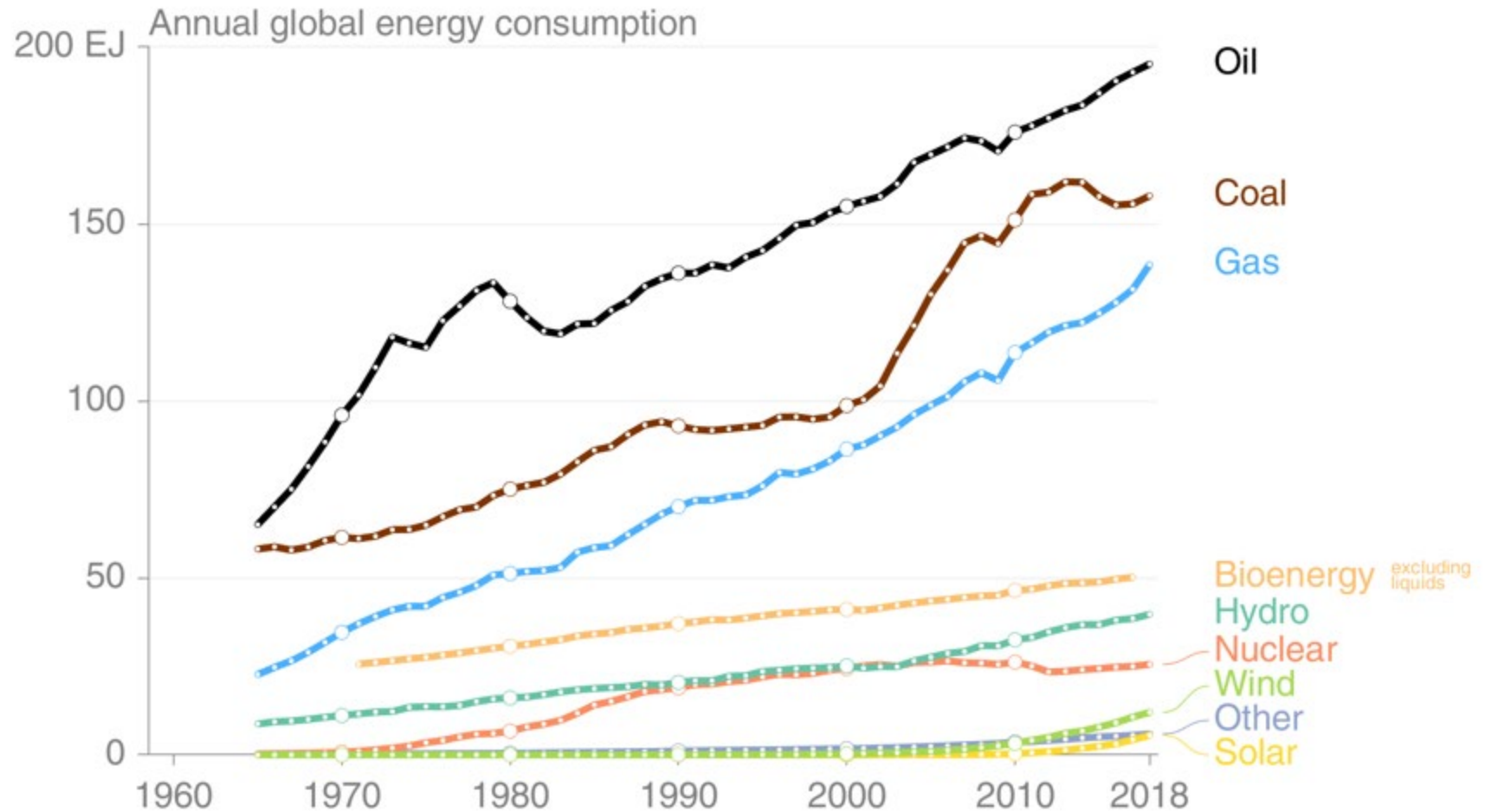
Natural gas and oil now drive global emissions growth

Continued support for low-carbon technologies needs to be combined with policies that phase out fossil fuels.

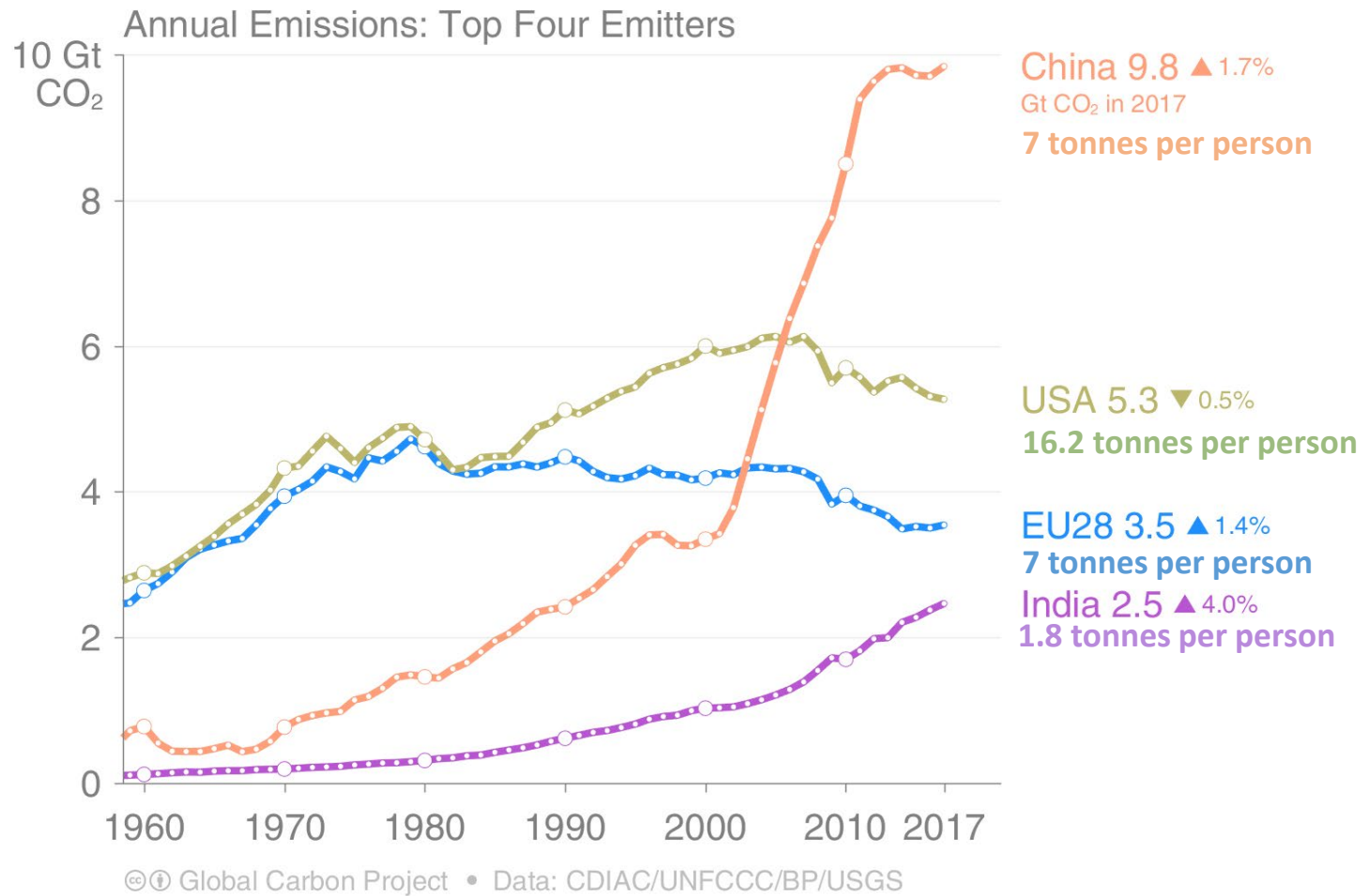


Source: 2019 projection by the Global Carbon Project. Trend to 2017 based on data from the IEA (2019) CO₂ Emissions from Fuel Combustion, www.iea.org/statistics. All rights reserved.

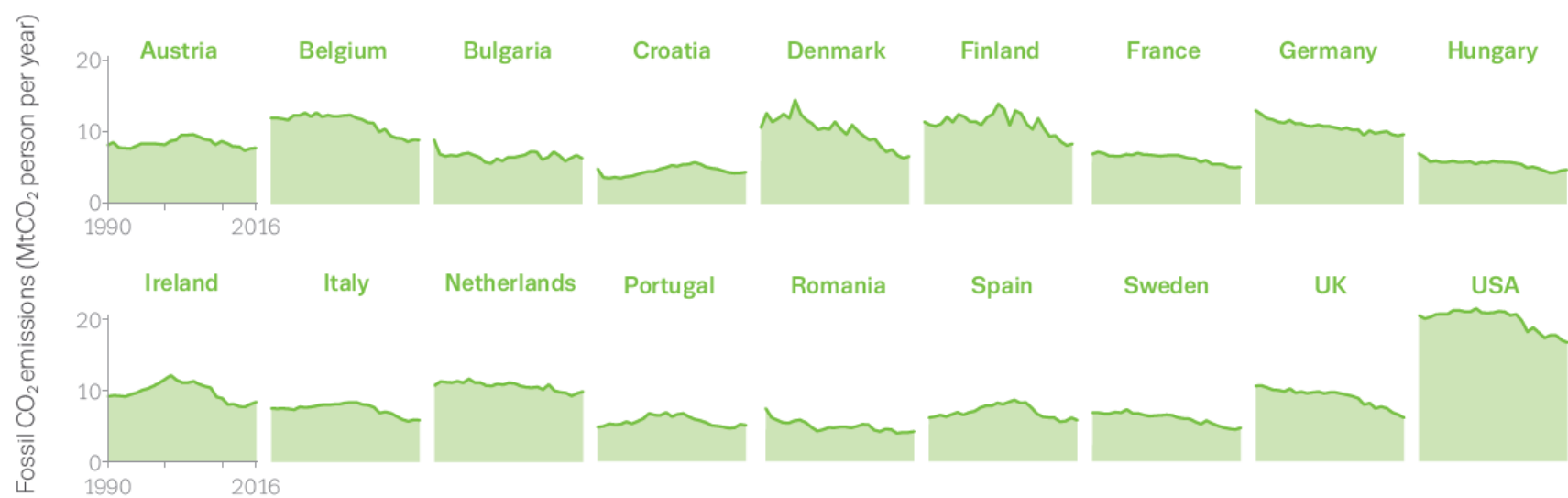
Renewable energy is growing exponentially, but this growth has so far been too low to offset the growth in fossil energy consumption.



© Global Carbon Project • Data: BP, IEA (bioenergy)



Many countries in Europe, and the US, have **decreased their CO₂ emissions from fossil fuels**, mostly with energy efficiency and demand reduction



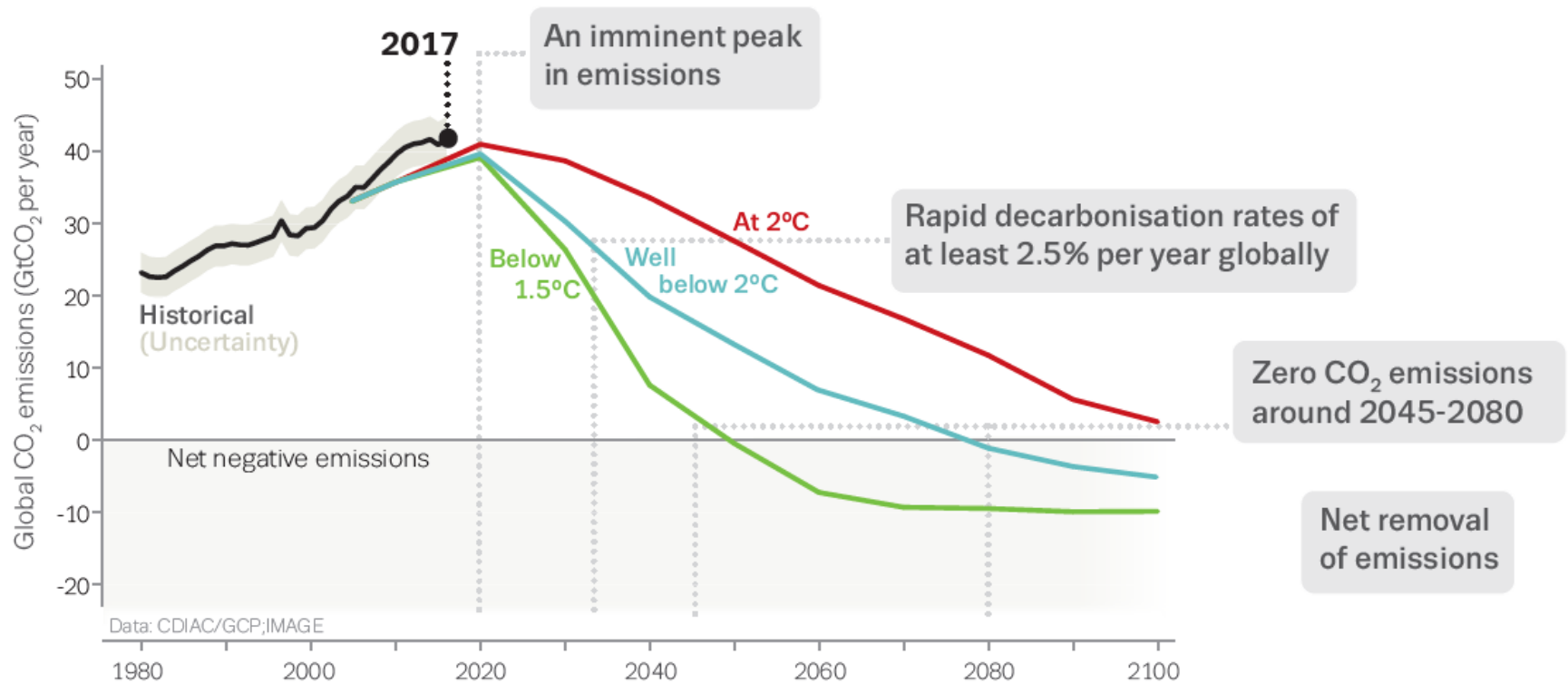
Meanwhile at the United Nations...

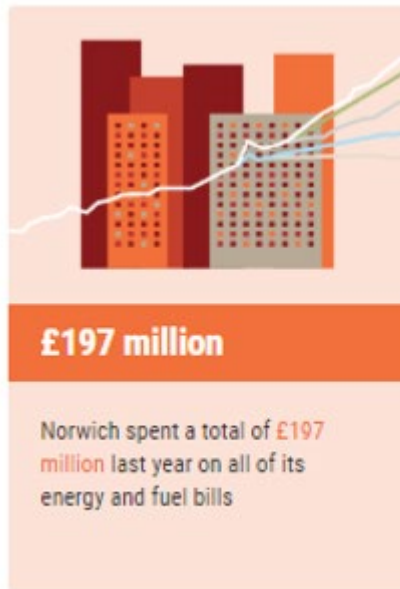


The UN Sustainable Development Goals



Pathways after Paris







£14 million

Households in the area would save **£14 million** a year from their energy bill.



£12 million

Schools, hospitals, offices, shops and restaurants in the area would save **£12 million** a year from their energy bill.



£3 million

The area's industry could cut its fuel costs by **£3 million** a year.



524 years

Doing this would lead to the creation of an extra 524 years of employment in the area.



26.0%

This would mean the area's carbon emissions would fall by 26.0% over and above what is already expected.



Priceless

And that would mean a happier, healthier, more prosperous and more resilient area for all!

The top 10% of emitters are responsible nearly half of all emissions and much of this difference is underpinned by household income





EDP



Do you think Norfolk County Council should have declared a 'climate emergency'?

Yes

42%

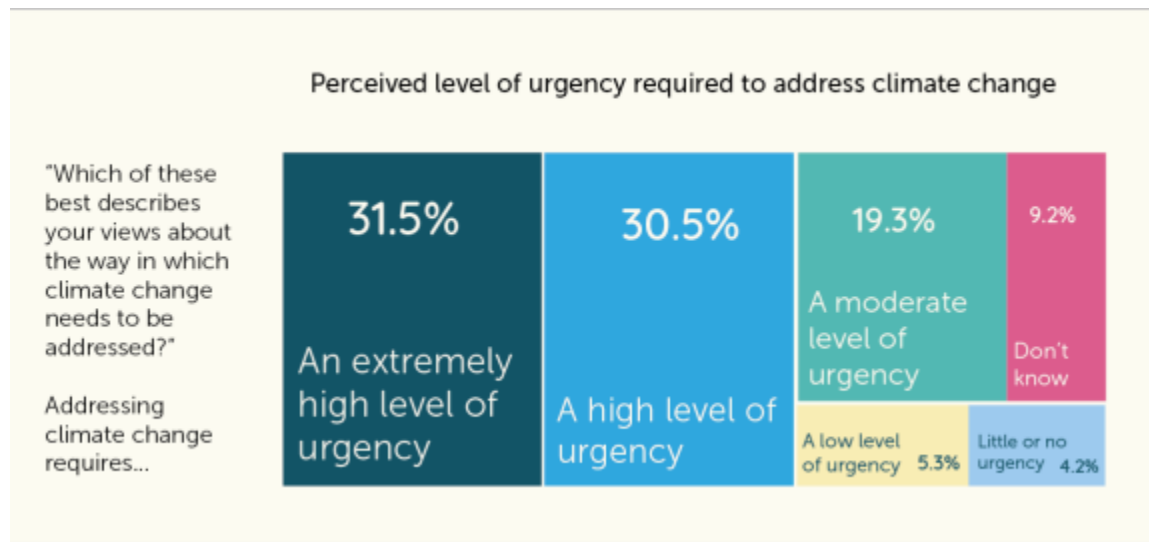
No

53%

Don't Know

5%



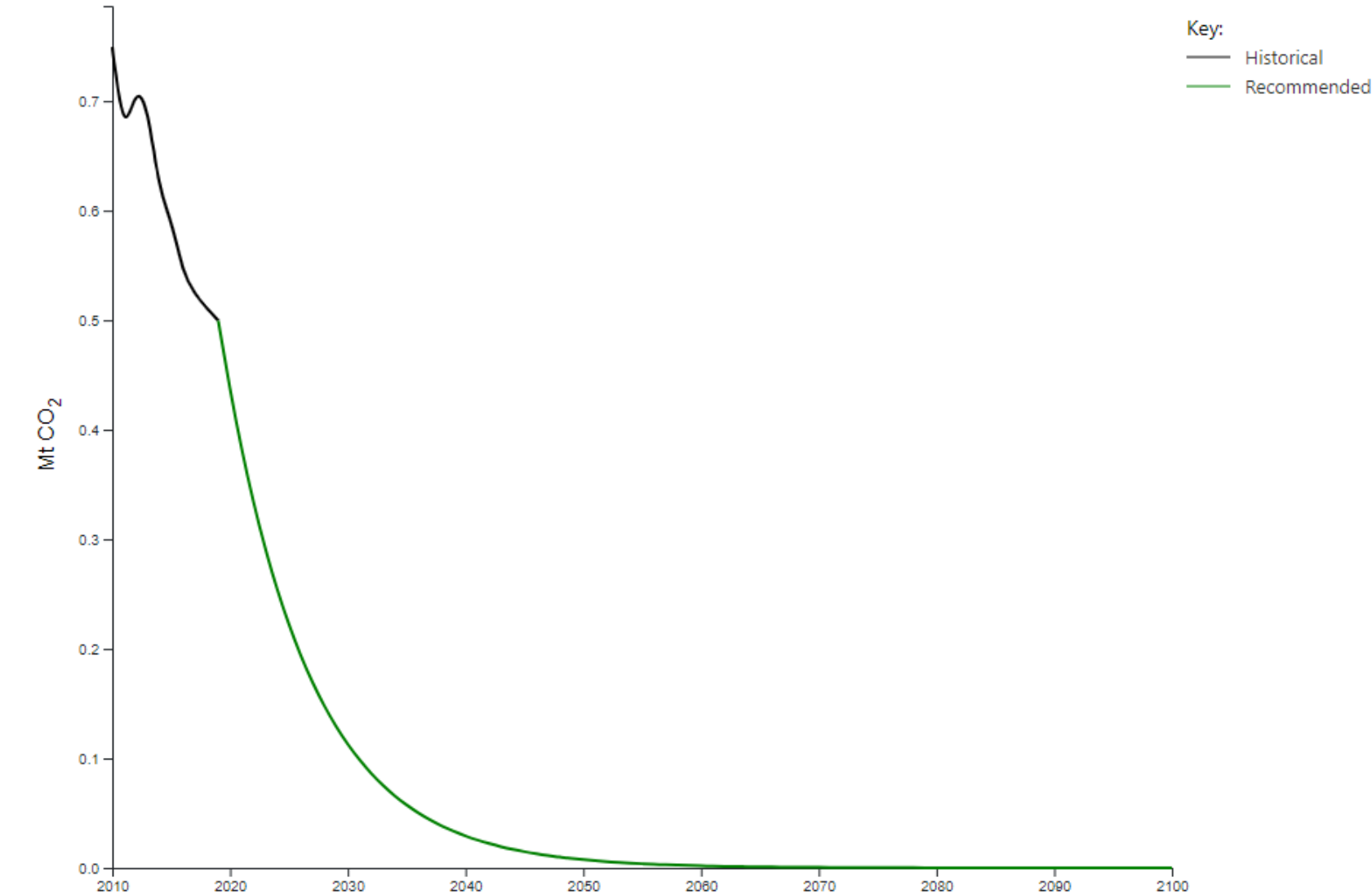


- More than three out of five people (62%) said that addressing climate change requires a 'high' or 'extremely high' level of urgency
- A majority (61%) supported the UK Parliament's declaration of a 'climate emergency', with only 11% opposing this
- Two-thirds of people (67%) felt that we should limit air travel in order to address climate change, whereas only 22% felt we do not need to do so
- Just over half of the respondents (53%) were of the view that we should reduce the amount of meat in our diets to address

The kinds of high impact changes that (most) people can make to their lives include:

- Switching to a plant-based diet
- Flying less and avoiding personal car use
- Campaigning and political engagement for decarbonisation
- Switching to renewable energy providers
- Reducing heating/cooling demands

Pathway projections for Norwich



☐ Show alternative pathway projections (see below)