

Environmental Emergency Response Programme

Climate Change and Biodiversity Briefing - Summary of Global and Local Impacts and Responses

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Impacts - the greenhouse effect

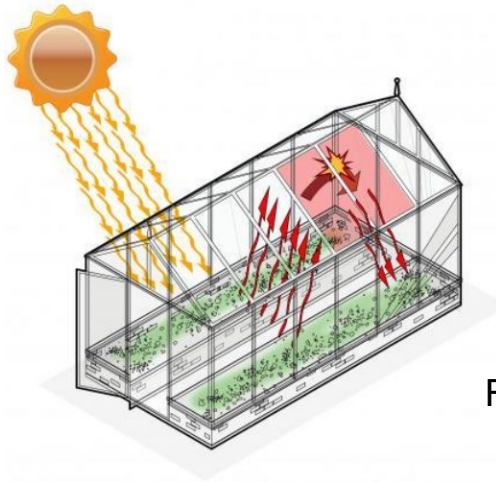


Fig 1



Fig 2

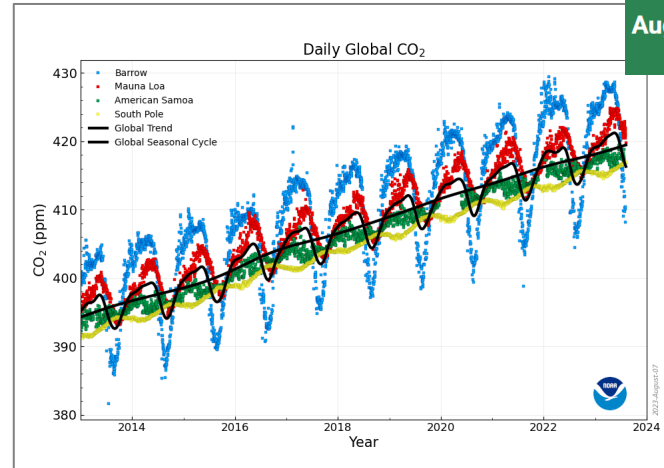


Fig 3

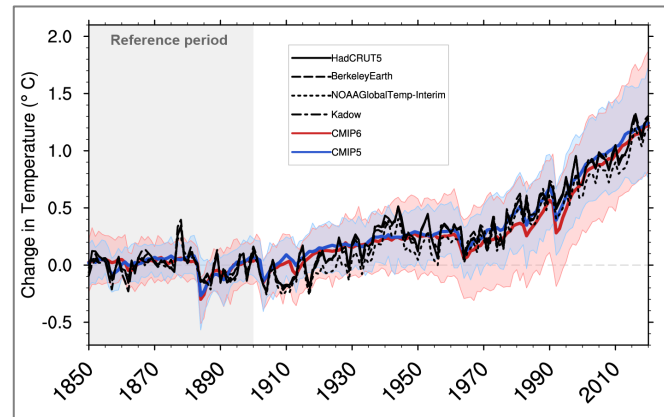


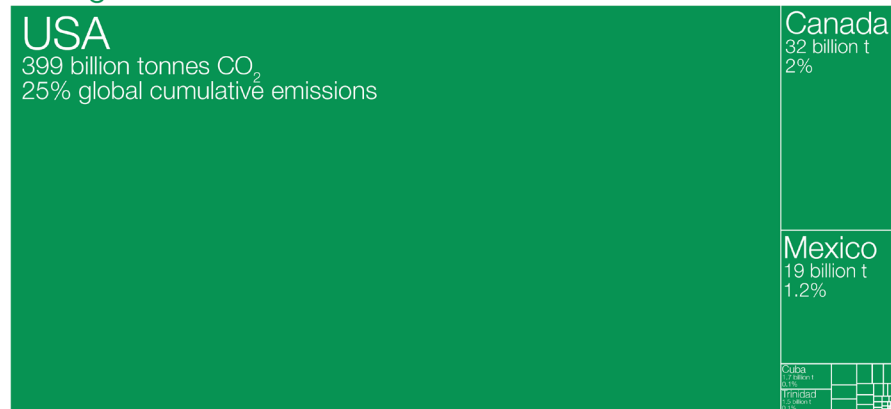
Fig 4

Who has contributed most to global CO₂ emissions?

Cumulative carbon dioxide (CO₂) emissions over the period from 1751 to 2017. Figures are based on production-based emissions which measure CO₂ produced domestically from fossil fuel combustion and cement, and do not correct for emissions embedded in trade (i.e. consumption-based). Emissions from international travel are not included.

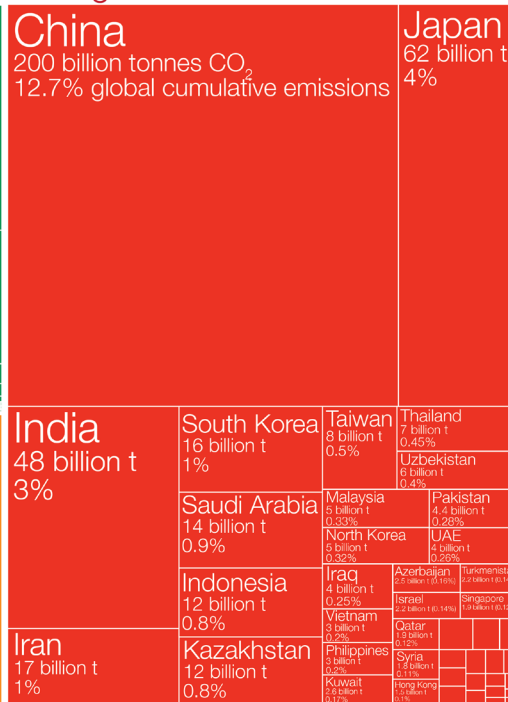
North America

457 billion tonnes CO₂
29% global cumulative emissions

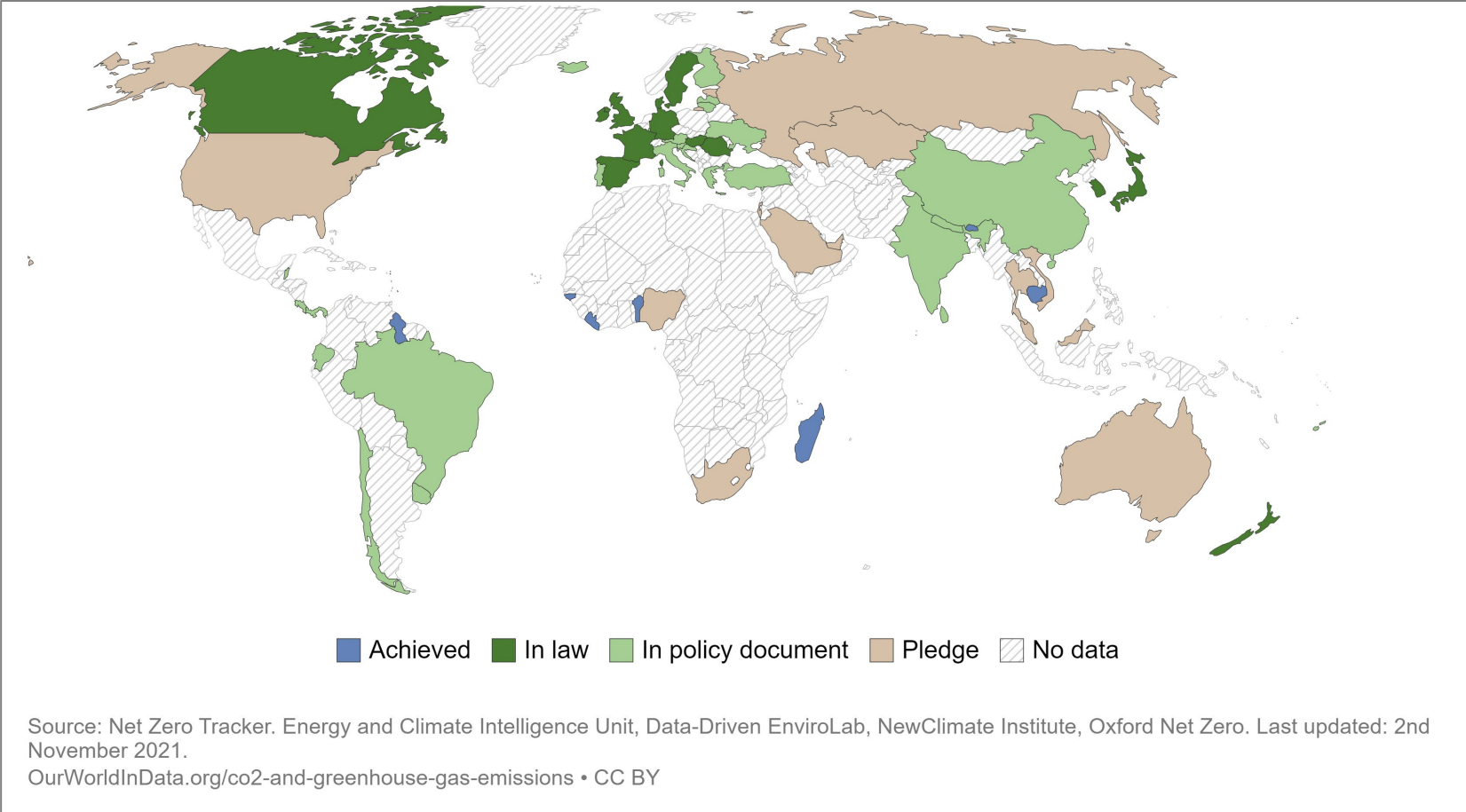


Asia

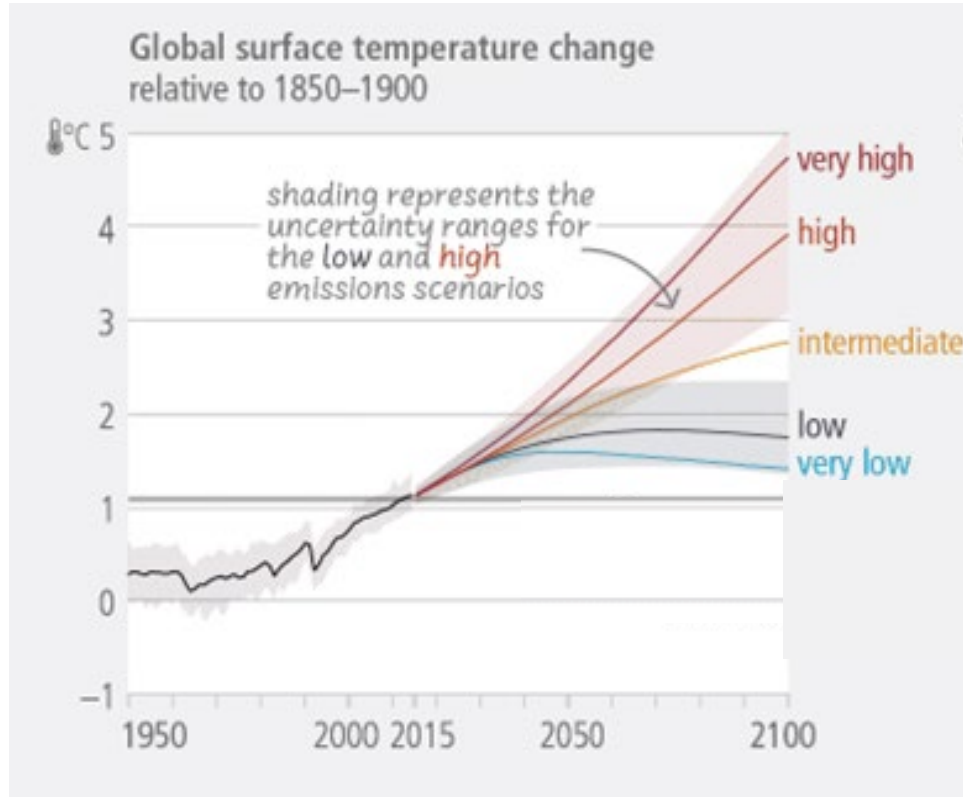
457 billion tonnes CO₂
29% global cumulative emissions



The international global political response so far



How much warming ?



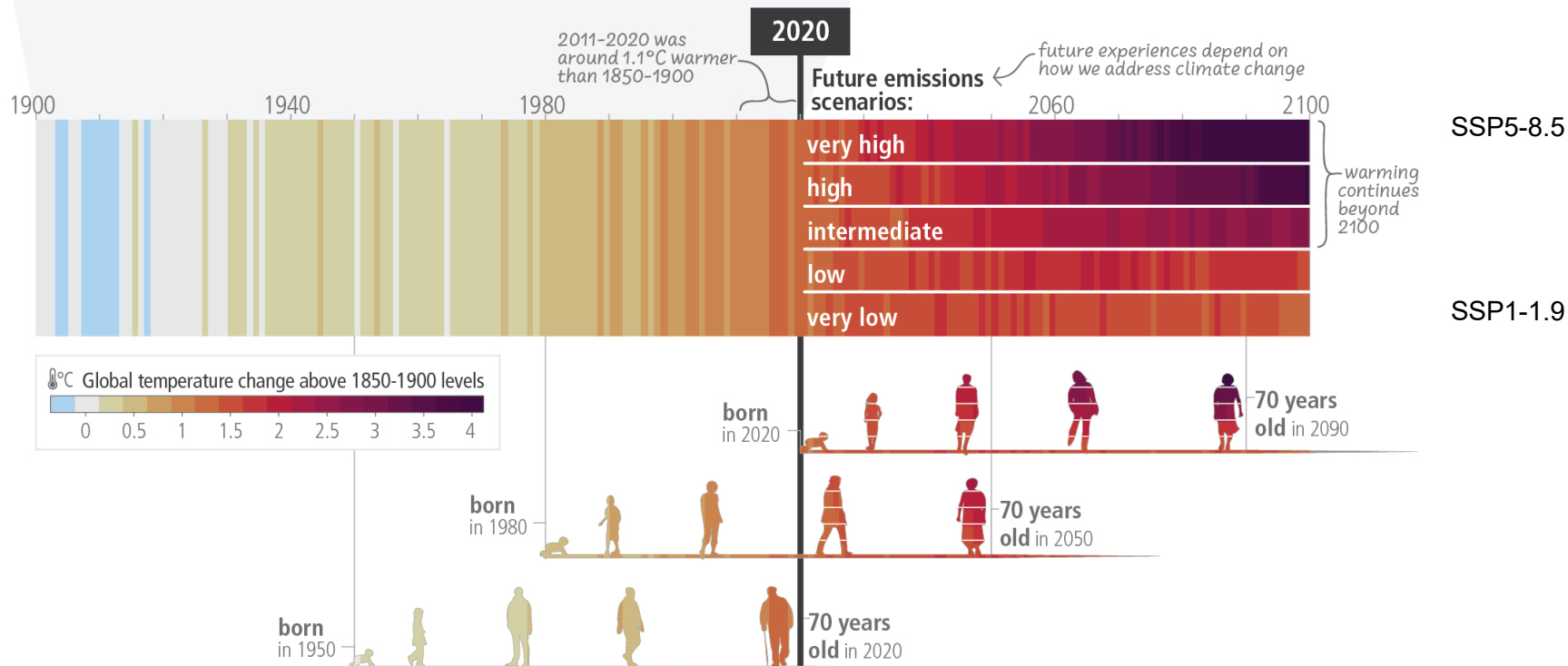
SSP 5 – 8.5 °C

2.8 to 3.1
Current commitments

SSP 1 – 1.9 °C

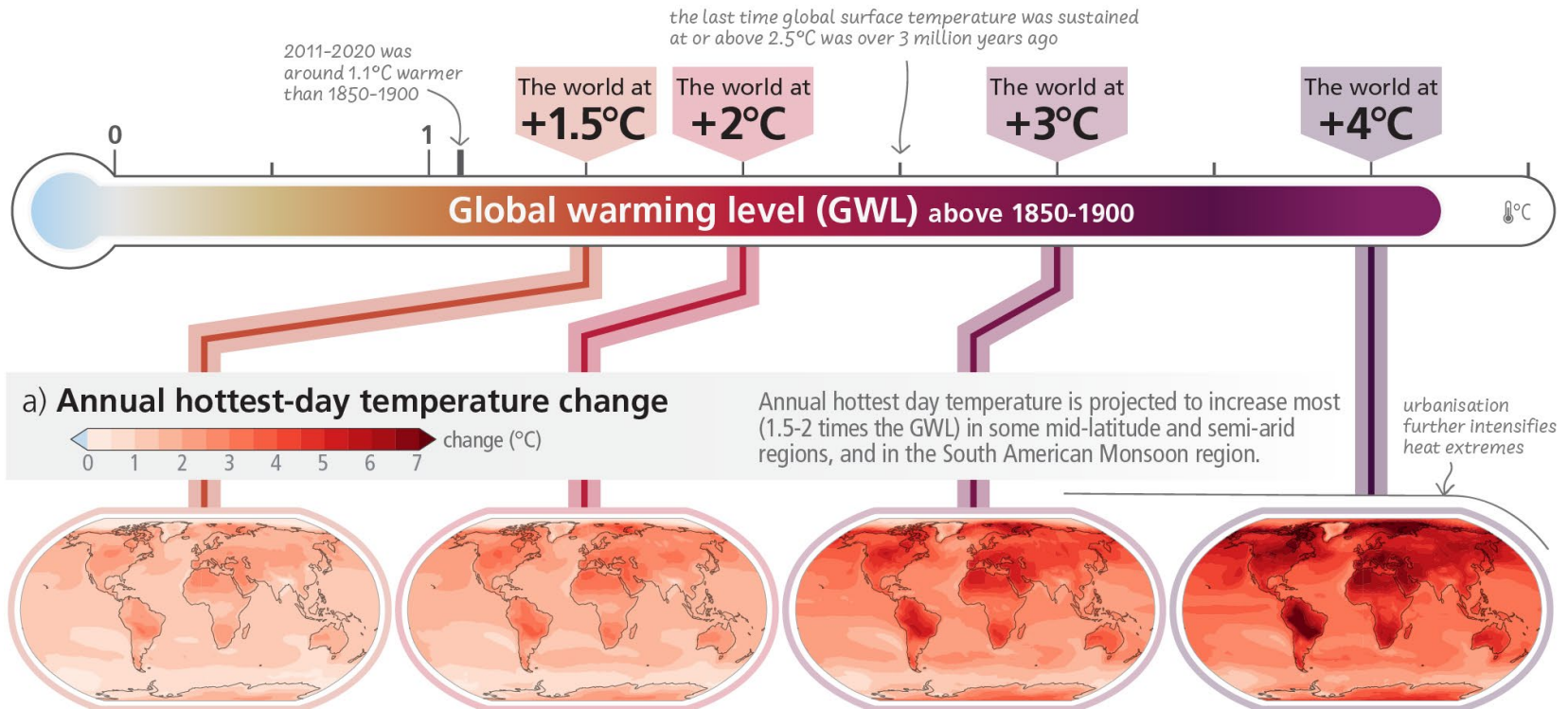
Global warming scenarios

c) The extent to which current and future generations will experience a hotter and different world depends on choices now and in the near-term



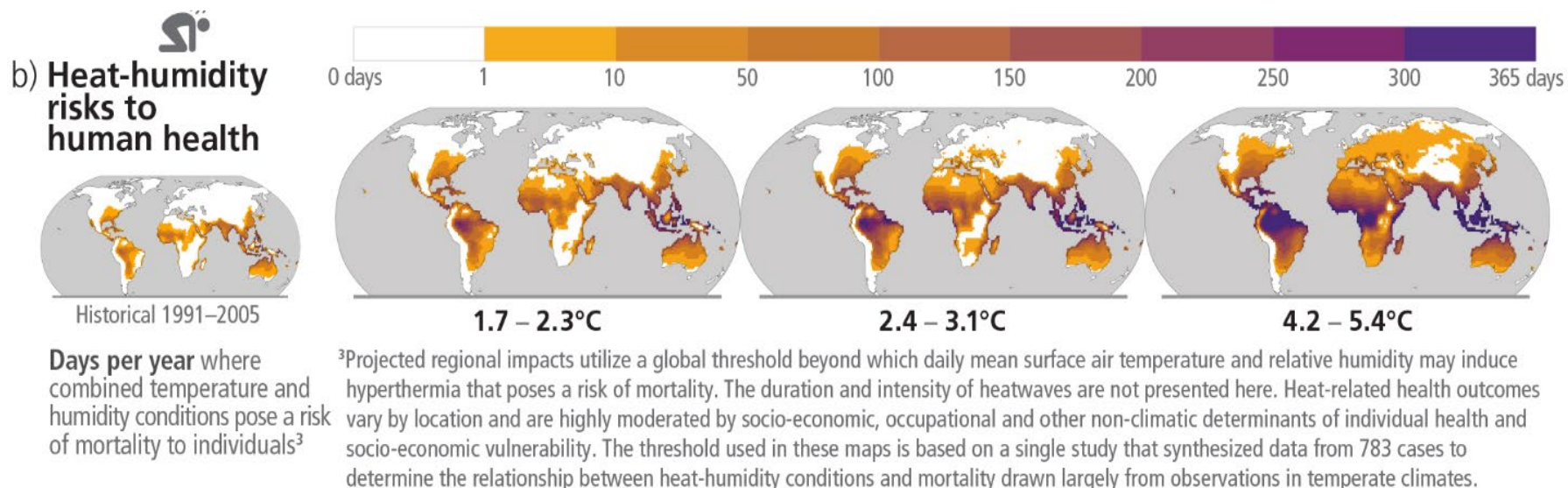
IPCC 2023 AR6

Global impacts - heat stress



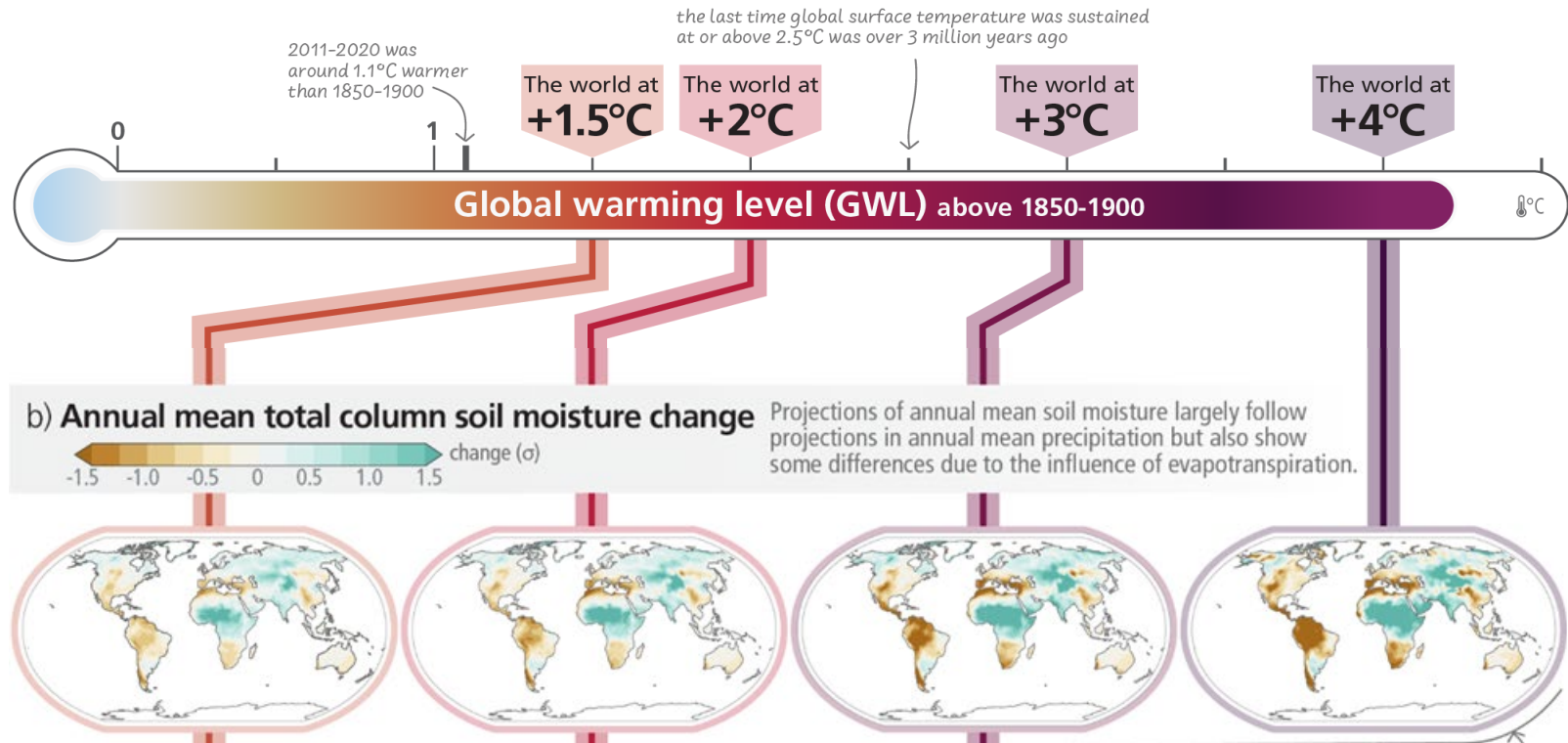
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Global impacts – heat stress human health (migration proxy)



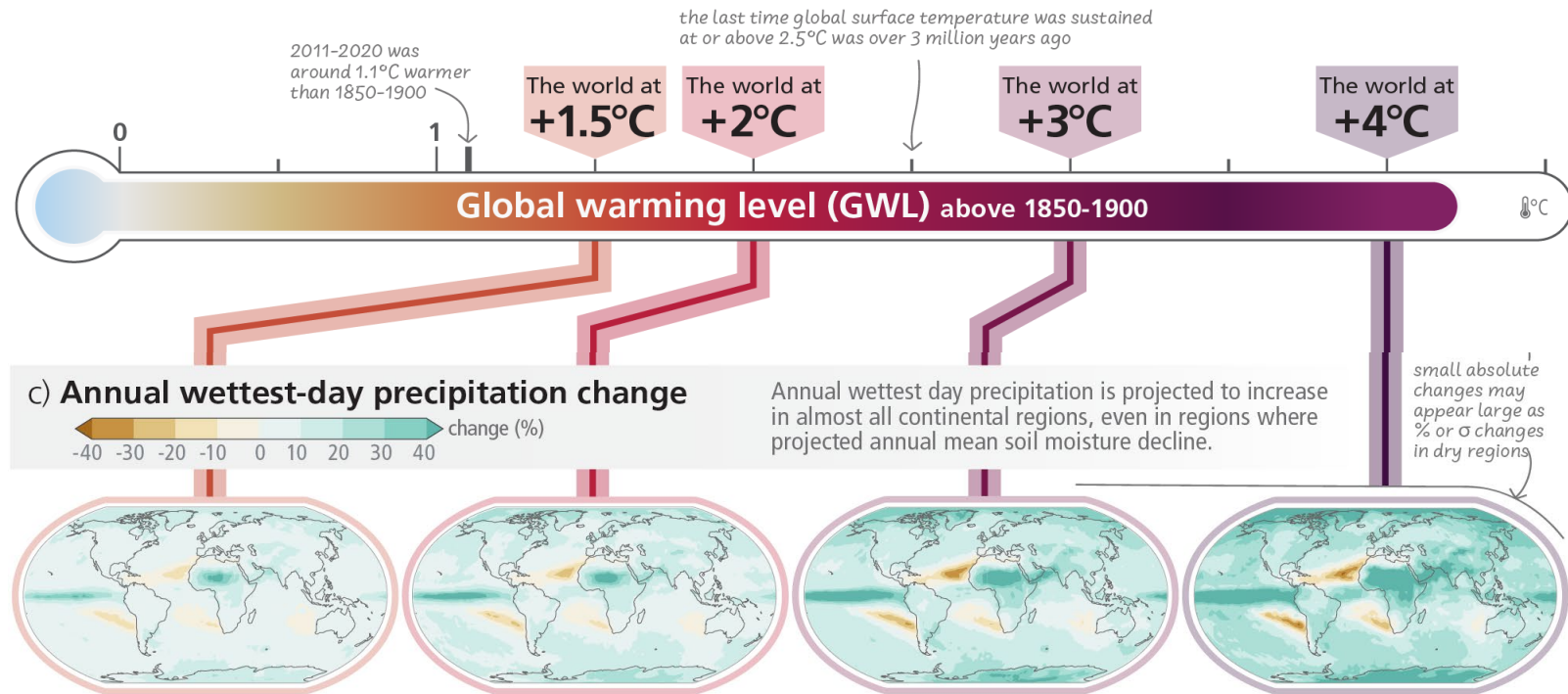
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Global impacts – soil moisture



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Global impacts - wettest day precipitation

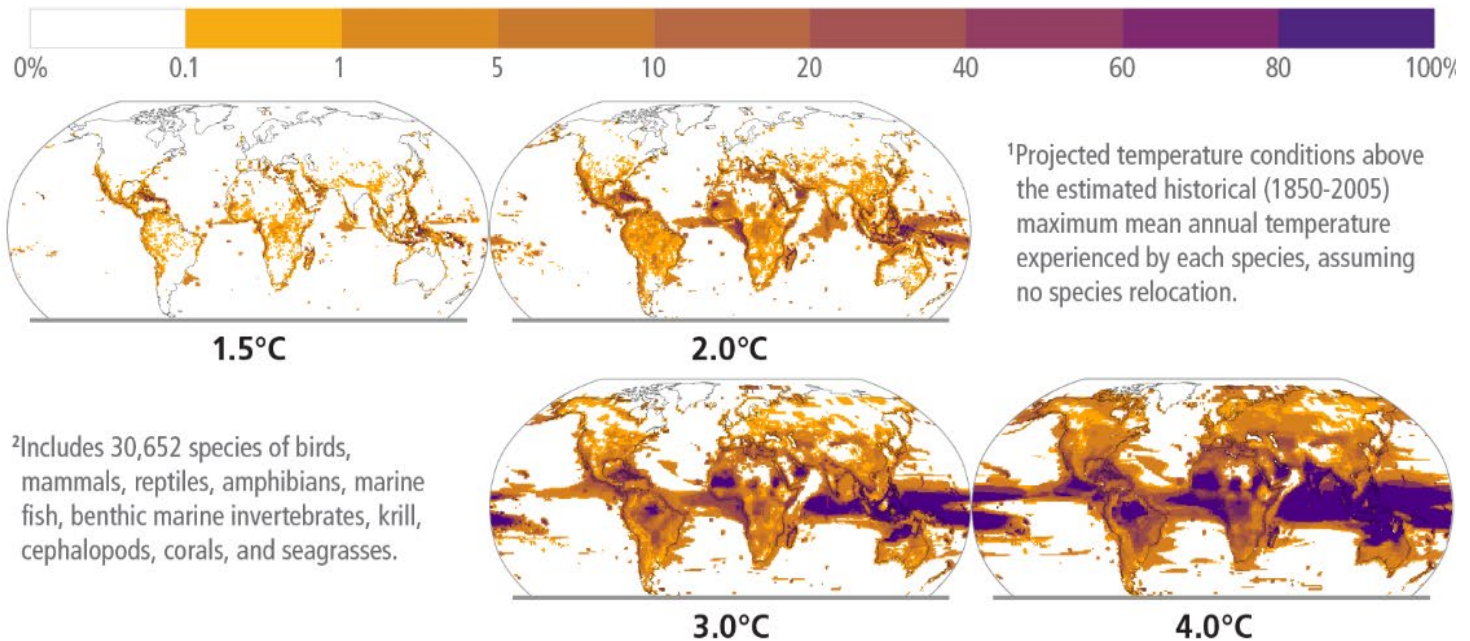


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Global impacts - biodiversity loss (migration proxy)

a) Risk of species losses

Percentage of animal species and seagrasses exposed to potentially dangerous temperature conditions^{1, 2}



IPCC 2023 AR6

Global impacts – sea level rise

Sea level rise is unavoidable for centuries to millennia due to continuing deep ocean warming and ice sheet melt, and sea levels will remain elevated for thousands of years (high confidence).

Relative to 1995–2014, the likely global mean sea level rise under the SSP1-1.9 GHG emissions scenario is 0.15–0.23 m by 2050 and 0.28–0.55 m by 2100; while for the SSP5-8.5 GHG emissions scenario it is 0.20–0.29 m by 2050 and 0.63–1.01 m by 2100 (medium confidence).

Over the next 2000 years, global mean sea level will rise by about 2–3 m if warming is limited to 1.5 ° C and 2–6 m if limited to 2 ° C (low confidence).

IPCC 2023 AR6

IPPC AR6 Report (March 2023) key statements

The choices and actions implemented in this decade will have impacts now and for thousands of years

Approximately 3.3–3.6 billion people live in contexts that are highly vulnerable to climate change.

All global modelled pathways that limit warming to 1.5°C ...to.... 2°C, involve rapid and deep and, in most cases, immediate greenhouse gas emissions reductions in all sectors this decade.

Biodiversity loss

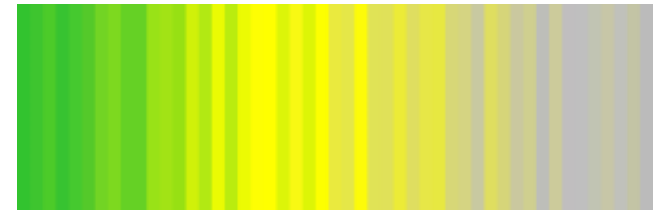
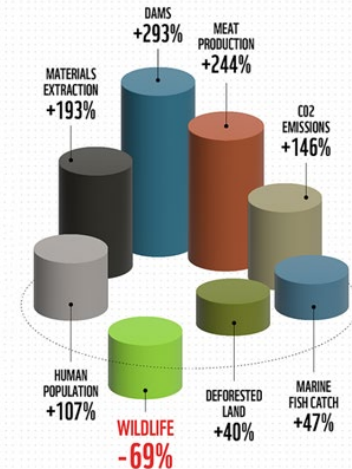
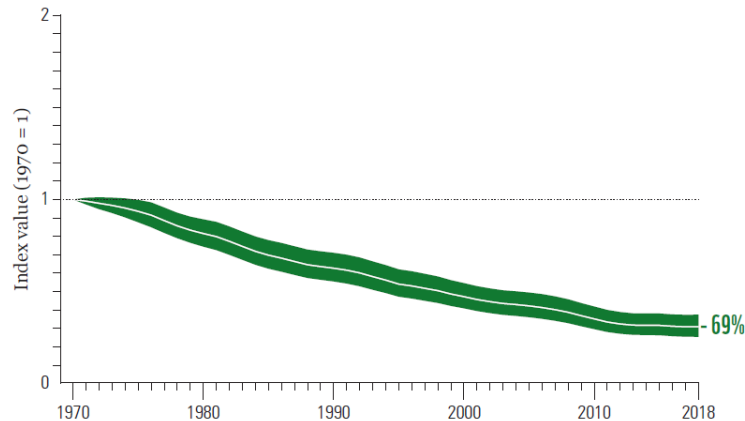


Figure 3: The global Living Planet Index (1970 to 2018)

The average change in relative abundance of 31,821 populations, representing 5,230 species monitored across the globe, was a decline of 69%. The white line shows the index values and the shaded areas represent the statistical certainty surrounding the trend (95% statistical certainty, range 63% to 75%). Source: WWF/ZSL (2022)¹⁸⁴.

Key

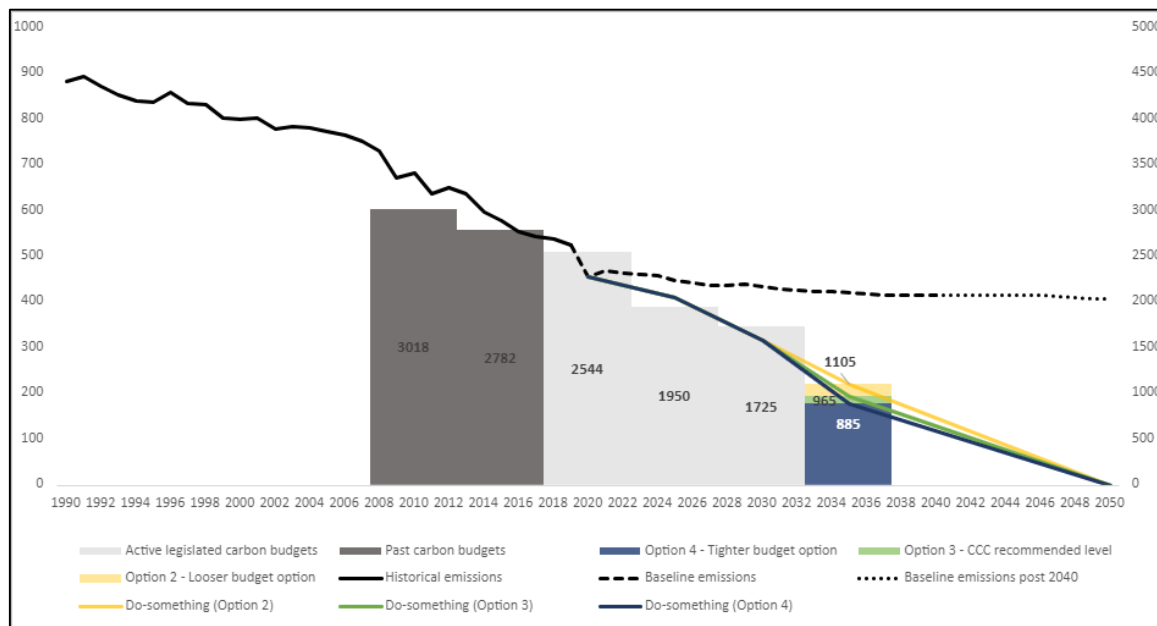
- Global Living Planet Index
- Confidence limits



WWF Living Planet Report 2022 Building a Nature-Positive Society

UK government response

- *Climate Change Act 2008* set a target of 80% CO₂e reduction by 2050, compared to 1990 levels
- *Climate Change Act 2008 (2050 target amendment) Order 2019*, increased the target to 100% by 2050
- *6th Carbon Budget Order 2021* sets the 2033-2037 budgetary period at 965 million tonnes of CO₂e. This requires a 78% reduction by 2035, averaged across sectors.



Norwich emissions 2005 to 2020 per sector and type

Fig 1

Norwich City Territorial GHG Emissions - BEIS

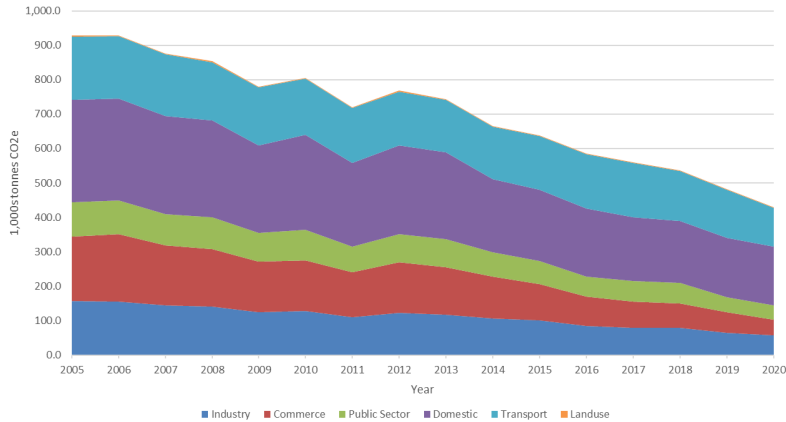


Fig 2

Norwich Accumulative CO2e Emissions 2005 - 2020

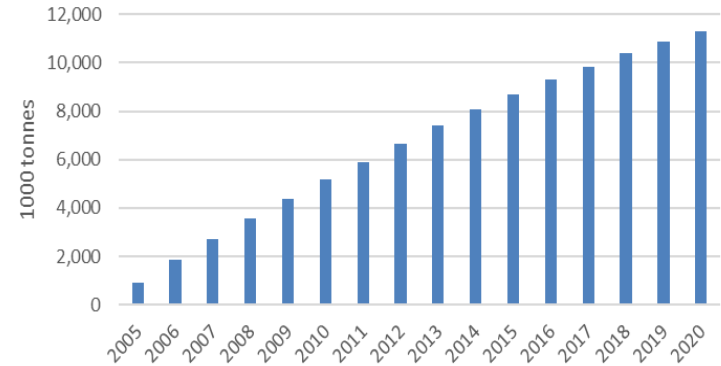
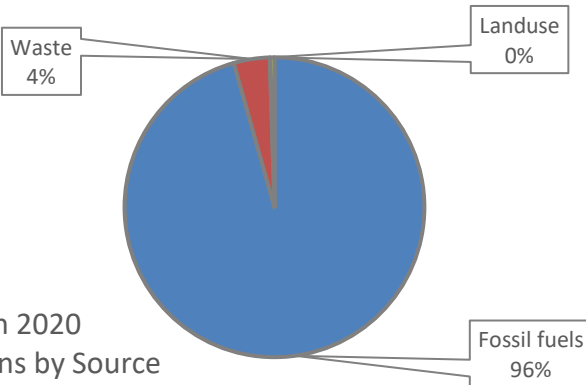
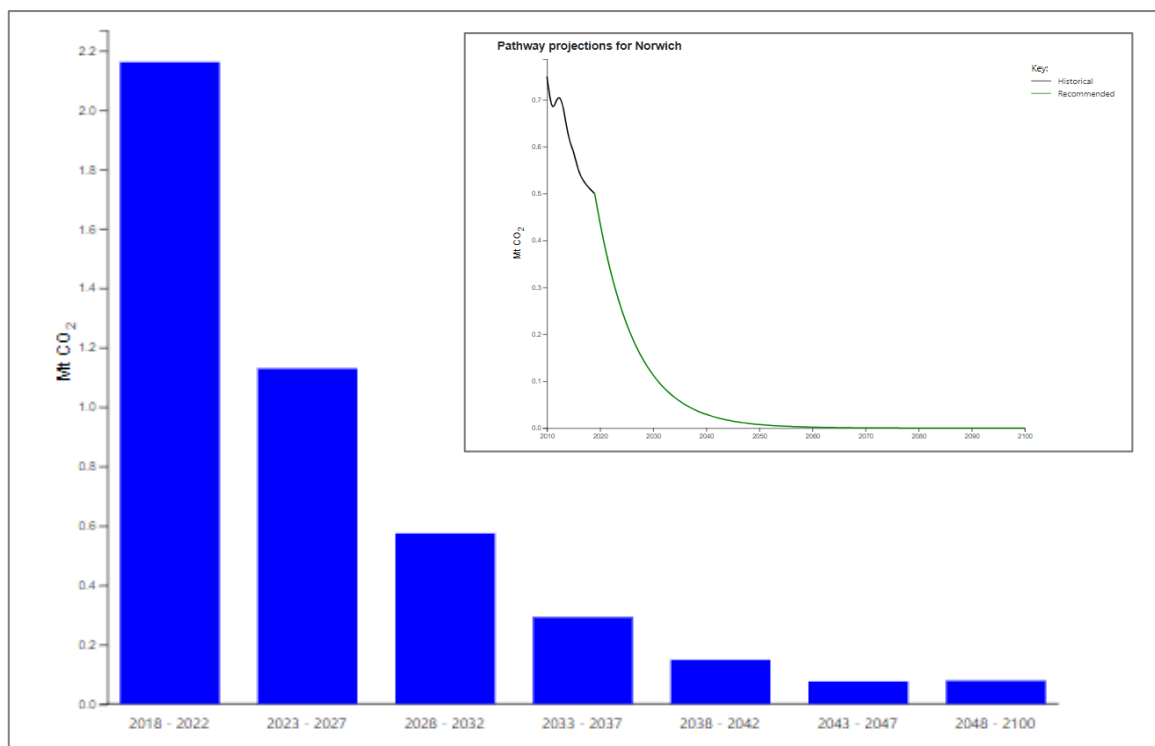


Fig 3



Sub national allocation - 1.5°C degree pathway for Norwich



CO2e reduction targets

2020	26.3%
2025	62.6%
2030	81.0%
2035	90.3%
2040	95.1%
2045	97.5%
2050	98.7%

2015 baseline

Aligned to 2015 Paris Agreement to limit warming to *well below 2°C and pursuing 1.5°C*
Manchester University Tyndall Centre 'Scatter' fair methodology for Norwich to meet its contributions under the Paris Agreement of 2015.

Norwich per capita emissions and deprivation

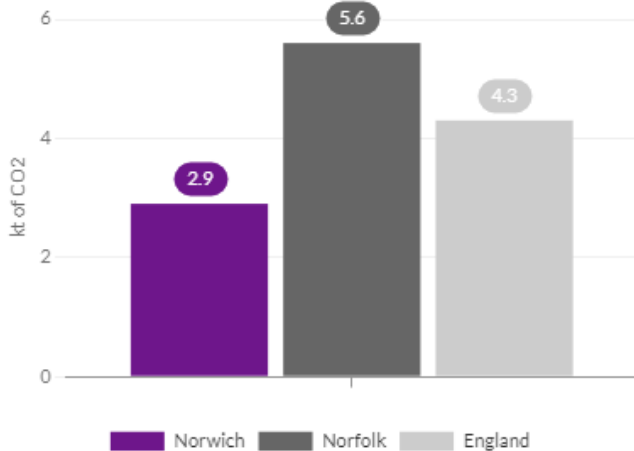
Total carbon emissions
CO₂ per capita (2020)

2.9 tonnes

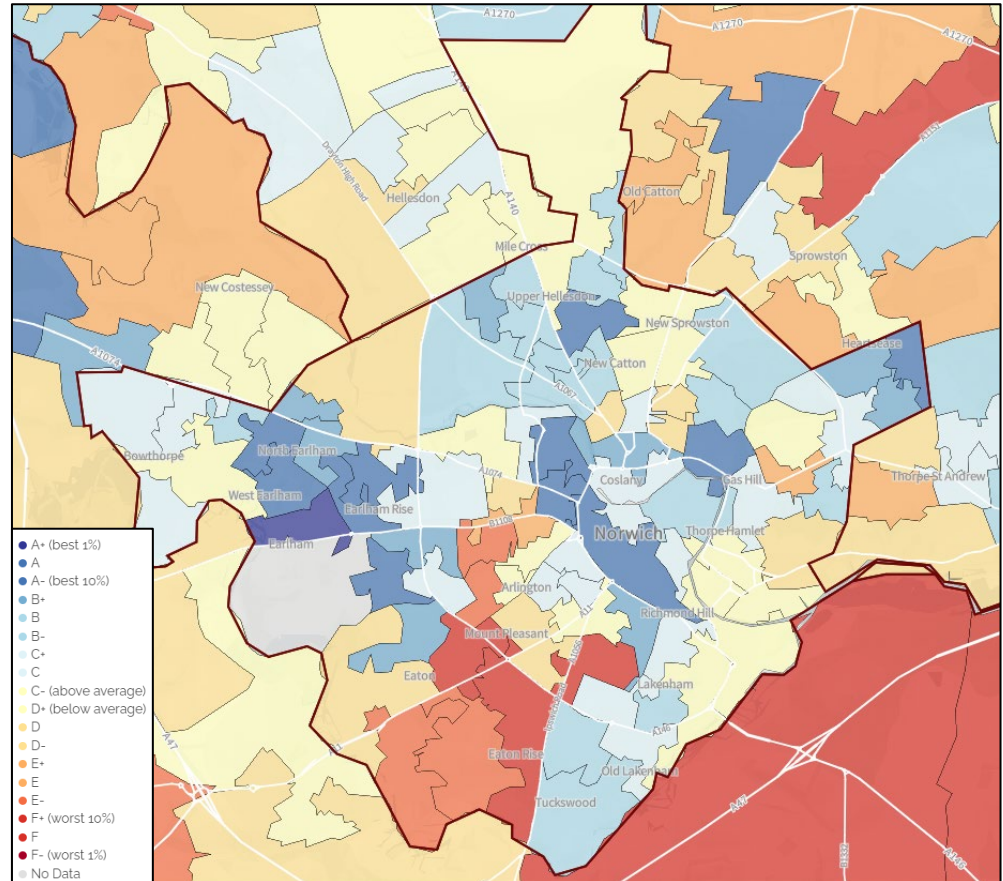
Source: BEIS



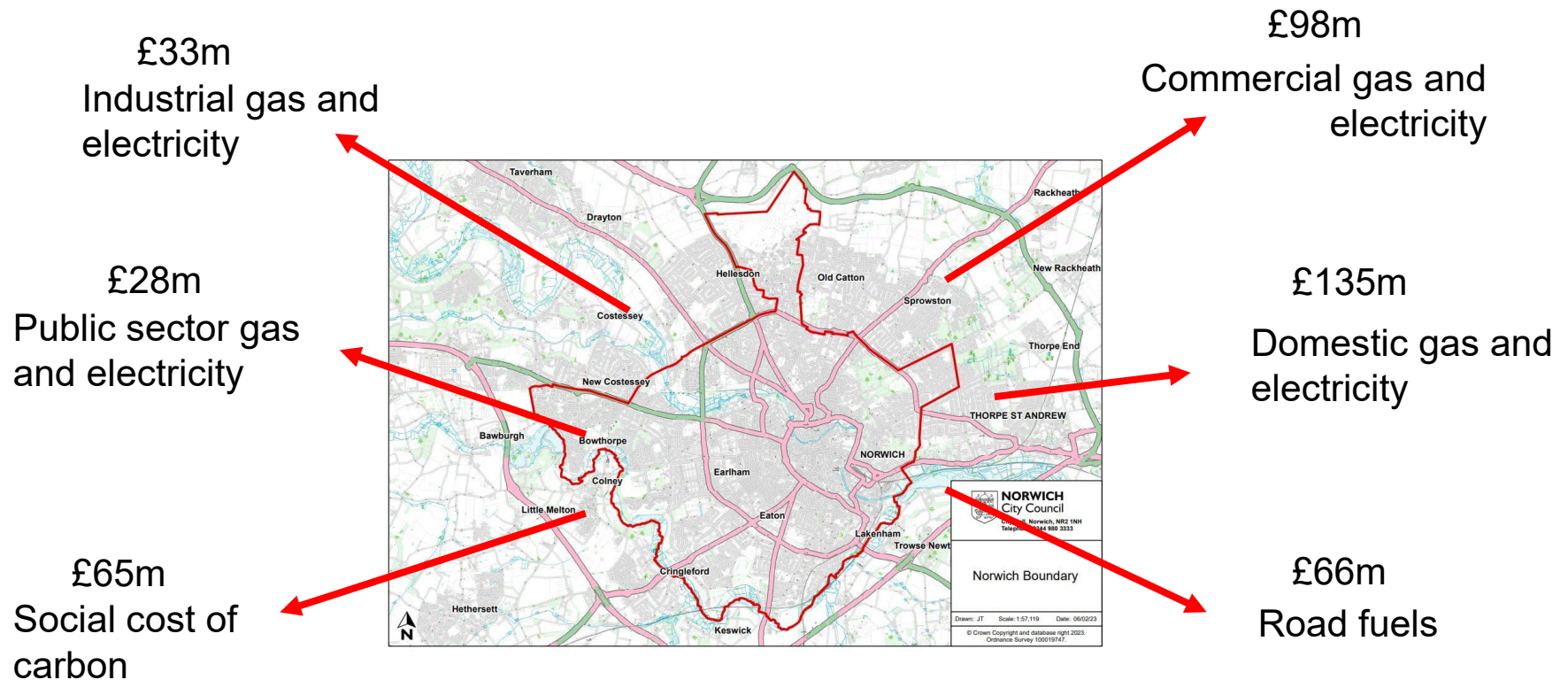
Total CO₂ emissions per person (2020)



Source: BEIS

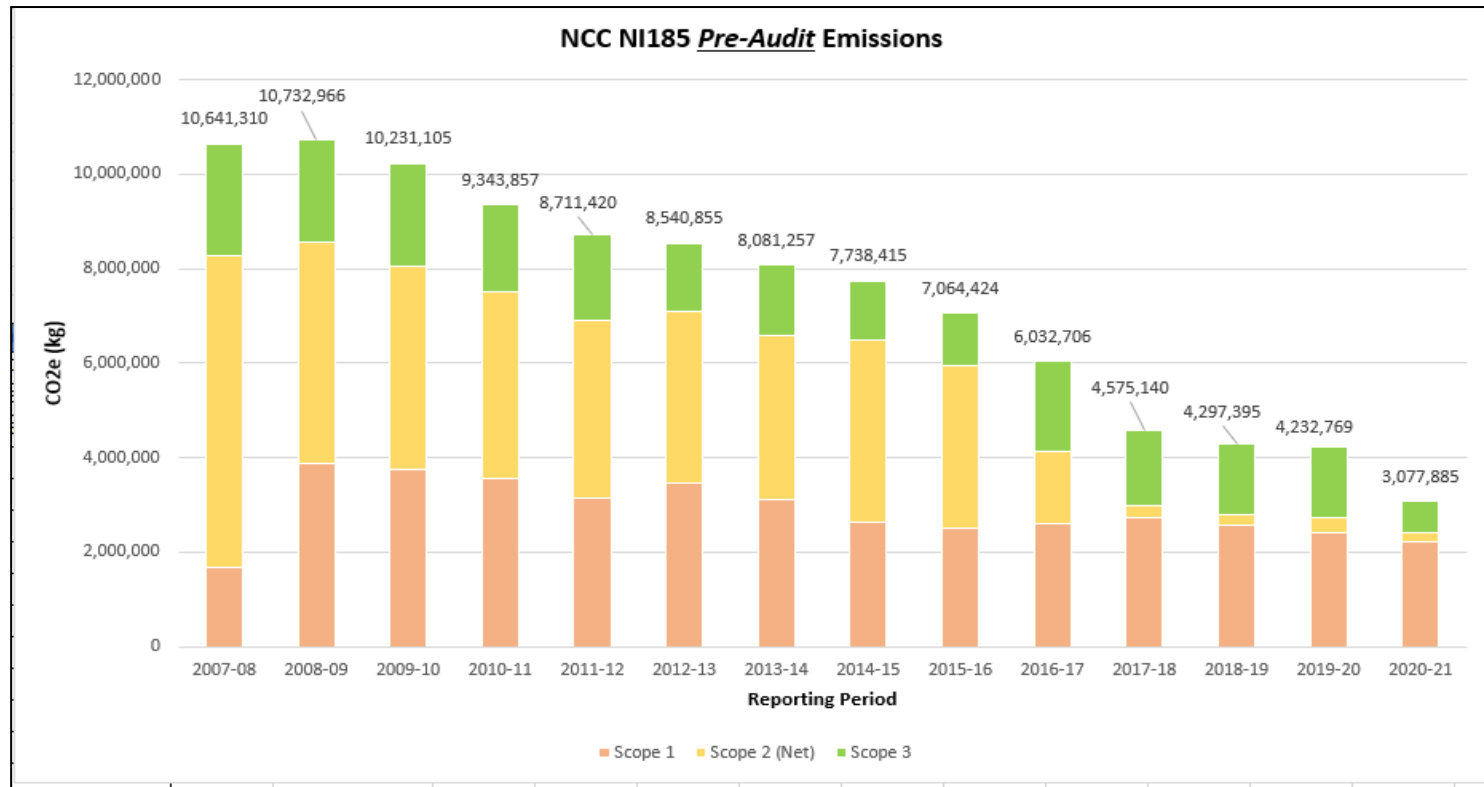


Norwich socioeconomic impact of fossil energy consumption

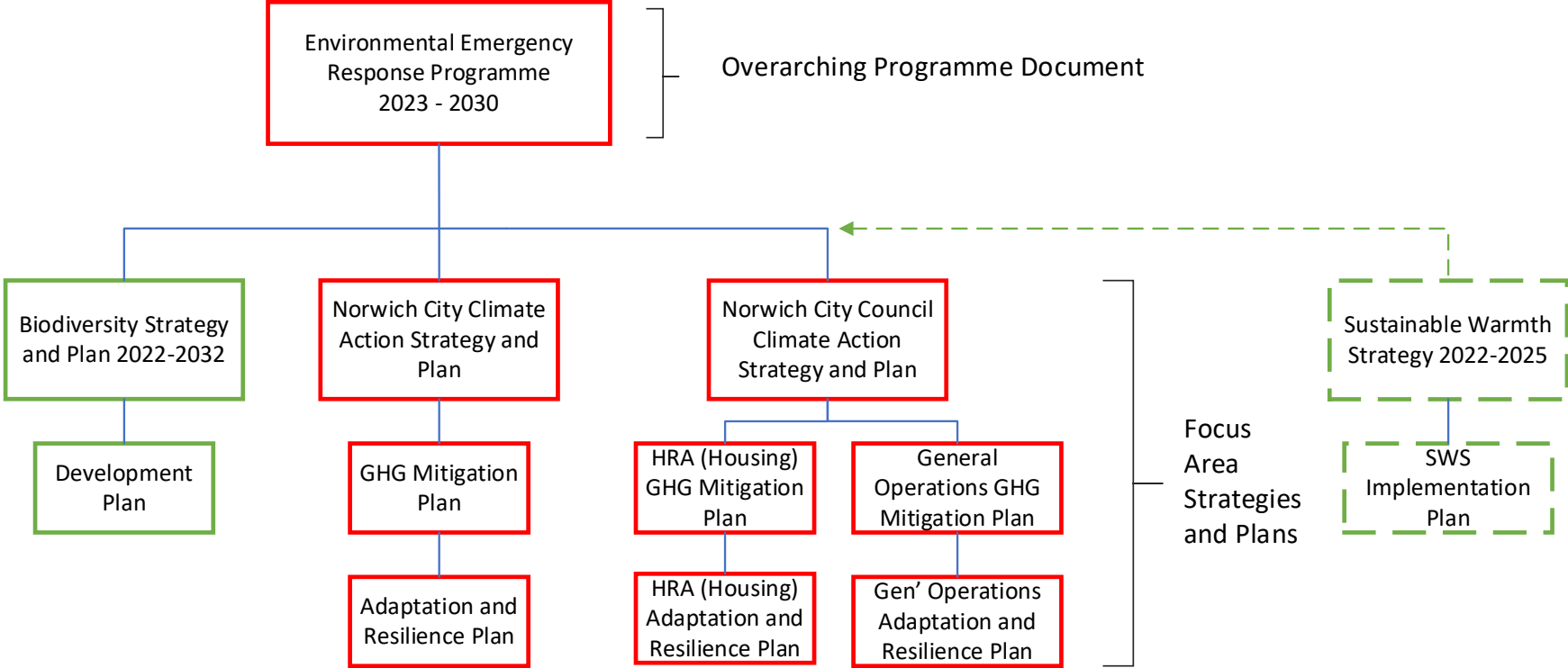


Total net extraction of wealth from Norwich = £361m pa
Total cost of energy consumption in Norwich = £426m pa

Council emissions since 2007/8 (NI 185) – 2020/21



Structure of Environmental Emergency Response Programme



Phraseology

- Climate action – implies all activity required to manage climate impacts, including mitigation and adaptation
- Carbon dioxide – is the main driver of climate change but it's not the only one i.e. 'carbon management plan' is becoming a little outmoded
- Greenhouse Gases (GHG) – includes all 11 gases which have climate impact e.g. carbon, nitrous oxide, methane, refrigerant gases (originally set out in the Kyoto Protocol)
- Net zero – when GHG emissions have no net impact on the climate, by means of reduction and removal; the use of removal/offsetting is implied by NZ
- Carbon neutral – when GHG emissions are reduced to no net impact on the climate, by means of reduction only; possible only in the longer term.
- CO₂e – *carbon dioxide equivalent* is a way of reporting the impact of different GHG's (each GHG has a 'Global Warming Potential') as a single metric
- Mitigation – means reducing impact on the climate reduction and removal offsetting
- Adaptation – measures to ensure *resilience* in light of the changing climate
- Emitter – something that emits GHG such as a building, vehicle or business
- Pathway/abatement – routes to reducing emissions towards net zero and the specific actions taken