NET ZERO NOW

Session 1: Climate Change and Carbon Reduction

Wednesday 9th June 2021, 19:00-21:00

Cambridge Carbon Footprint

South Cambridgeshire District Council

zero carbon communities

Welcome and Overview of the Course

19:00-19:10


To protect the things we love

About us

Cambridge Carbon Footprint

What you can expect from us:

- Provide useful resources
  - Interactive sessions
  - Resources
  - Take-home activities
  - Support
- Keep to time
- Session recordings: maintaining privacy of sessions
- Keep website and Slack up to date
- Help to foster a friendly and welcoming environment
- Listen and be open-minded in discussions

Agree expectations: What we can expect from you

- Attend the sessions
- Do the readings and take-home activities
- Help foster a friendly and welcoming environment
- Contribute to discussions
- Listen and be open-minded
- Tell us how things are going
- Zoom etiquette
- Use Slack to keep in touch

Timeline

Session	**Date**	**Time**	**Topic** (note that exact topics may change)
Session 1	Wednesday 9th June	19:00-21:00	Climate change and carbon reduction
Session 2	Wednesday 23rd June	19:00-21:00	Understanding solutions and the local context
Session 3	Wednesday 7th July	19:00-21:00	Changing behaviour effectively
Session 4	Wednesday 21st July	19:00-21:00	Communicating climate change
Summer break			
Session 5	Wednesday 8th September	19:00-21:00	Shaping ideas
Session 6	Wednesday 22nd September	19:00-21:00	Moving from idea to action
Session 7	Wednesday 6th October	19:00-21:00	Identifying and communicating with your audience
Session 8	Wednesday 20th October	19:00-21:00	What next? Ensuring longevity of actions

NET ZERO NOW

Session 1:
Climate Change and Carbon Reduction

Session 1

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Agenda

Agenda item	Time
Welcome and overview of the course	19:00-19:10
Introductions	19:10-19:20
Climate change quiz	19:20-19:35
Political and Cultural Landscape	19:35-19:55
Break	**19:55-20:05**
Introduction to carbon footprints	20:05-20:30
Carbon footprint discussion	20:30-20:50
Wrap up and next steps	20:50-21:00

Introductions

19:10-19:20

NET ZERO NOW

Climate Change Quiz

19:20-19:35

1. How does today's climate change (i.e. since the Industrial Revolution) compare to previous changes in climate?

a. Climate change has always happened and this time is exactly the same as the others
b. The levels of greenhouse gases currently in the atmosphere have not been seen for millennia
c. The increased levels of greenhouse gases in the atmosphere have increased much faster
d. Both b and c

2. Methane and Carbon Dioxide are both two key greenhouse gases. How do they differ?

a. Methane is more potent (stronger) than carbon dioxide but stays in the atmosphere for less time
b. Carbon dioxide is more potent than methane but stays in the atmosphere for less time
c. Methane is more potent than carbon dioxide and stays in the atmosphere longer
d. Carbon dioxide is more potent than methane and stays in the atmosphere longer

3. What does net zero mean?

a. When no greenhouse gases are being emitted into the atmosphere
b. When trees are planted to absorb greenhouse gases
c. When the greenhouse gases emitted into the atmosphere are balanced with the greenhouse gases being removed from the atmosphere
d. When the transport sector is completely electrified

4. What is embodied carbon?

a. The carbon emissions that you as an individual produce
b. The carbon emitted from a product when you use it
c. The carbon emitted when sourcing materials, manufacturing and distributing a product
d. The carbon emissions associated with animals (for example, emitting methane)

5. Is reforestation (planting more trees) useful for absorbing carbon dioxide from the atmosphere?

a. Yes, but only when it's done to support the biodiversity of the local environment
b. Yes, but it's essential to protect rainforests from deforestation alongside reforestation projects.
c. No, we must protect trees from deforestation instead of reforestation projects
d. No, trees do not absorb enough carbon dioxide to be significant

6. In 2019, which sector produced the highest emissions in the UK?

a. Transport
b. Business
c. Residential
d. Energy
e. Agriculture
f. Waste management

7. Which sector has seen the largest proportional decrease in emissions in the UK between 1990 and 2019?

a. Transport
b. Business
c. Residential
d. Energy
e. Agriculture
f. Waste management

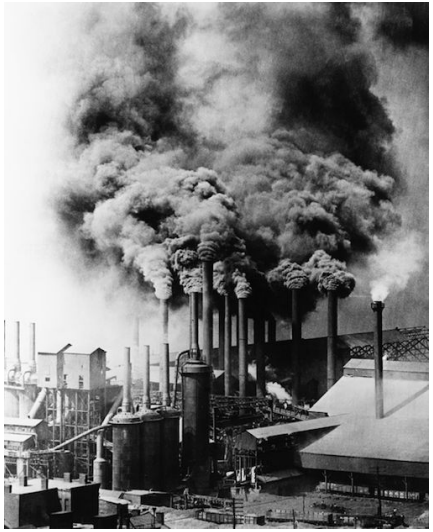
Quiz Answers

19:20-19:35

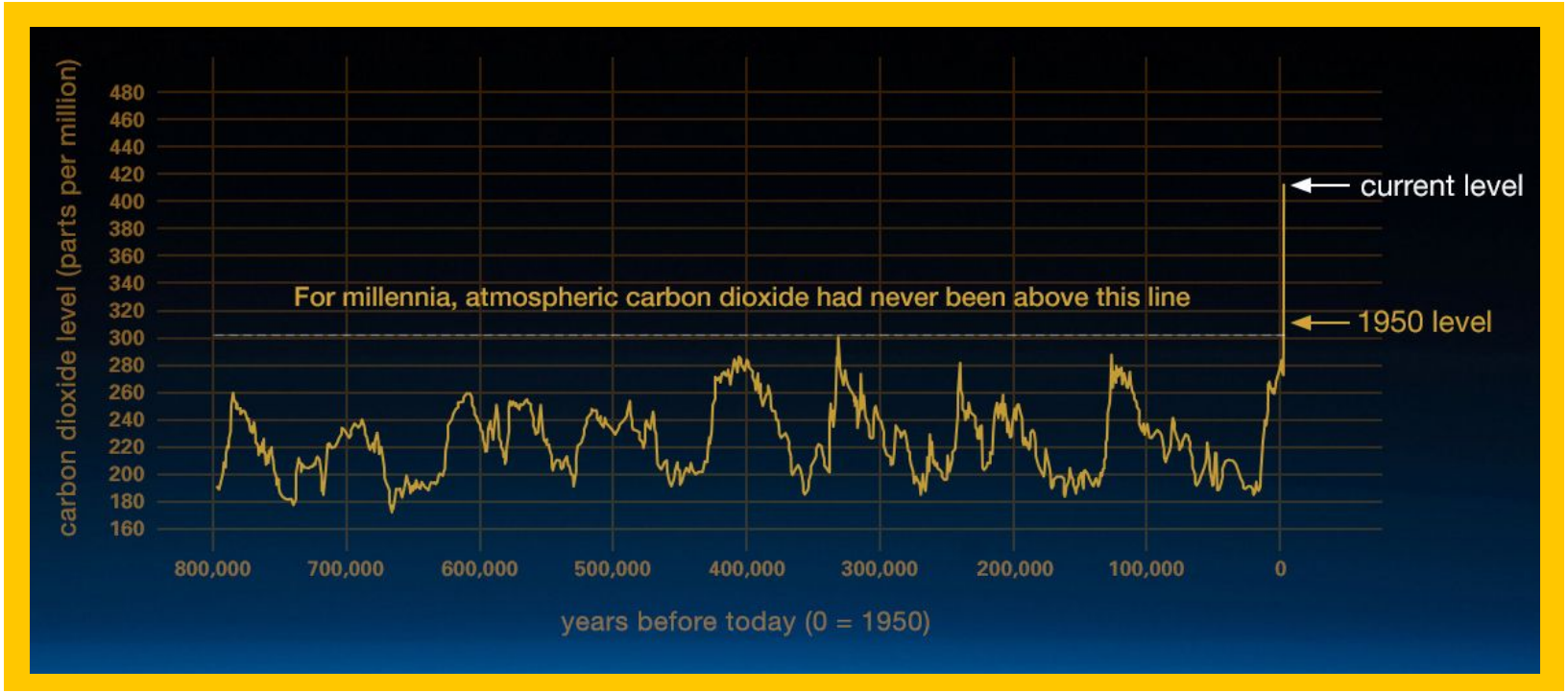
1. How do today's changes in climate (i.e. since the Industrial Revolution) compare to previous changes in climate?

d. Both b and c

- **The levels of greenhouse gases currently in the atmosphere have not been seen for millennia.**
- **The increased levels of greenhouse gases in the atmosphere have increased much faster.**



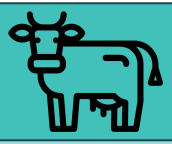
https://climate.nasa.gov/evidence/
https://skepticalscience.com/climate-change-little-ice-age-medieval-warm-period.htm



https://climate.nasa.gov/evidence/
https://skepticalscience.com/climate-change-little-ice-age-medieval-warm-period.htm

2. Methane and Carbon Dioxide are both two key greenhouse gases. How do they differ?

a. **Methane is more potent (stronger) than carbon dioxide but stays in the atmosphere for less time.**

	Methane 	Carbon Dioxide 
Definition	Methane is a major greenhouse gas with the chemical formula CH_4	Carbon dioxide is a major greenhouse gas that has the chemical formula CO_2
Human Sources	Enters the atmosphere mainly through burning fossil fuels and animal agriculture	Enters the atmosphere mainly through burning fossil fuels
Lifespan in atmosphere	About a decade	65-80%: 20-200 years The rest: much much longer
20 yr GWP*	84-87	1
100 yr GWP*	28-36	1
Proportion of global GHG emissions	17.3%	74.4%

*Global Warming Potential

Adapted from: https://www.differencebetween.com/difference-between-methane-and-carbon-dioxide/

3. What does net zero mean?

c. When the greenhouse gases emitted into the atmosphere are balanced with the greenhouse gases being removed from the atmosphere.

- **'Net':** enables us to balance emissions.
- **Absolute Zero**: when no greenhouse gases are being emitted. (a)
- **Planting trees** and **electrifying transport networks** are important elements of achieving net zero (b and d)

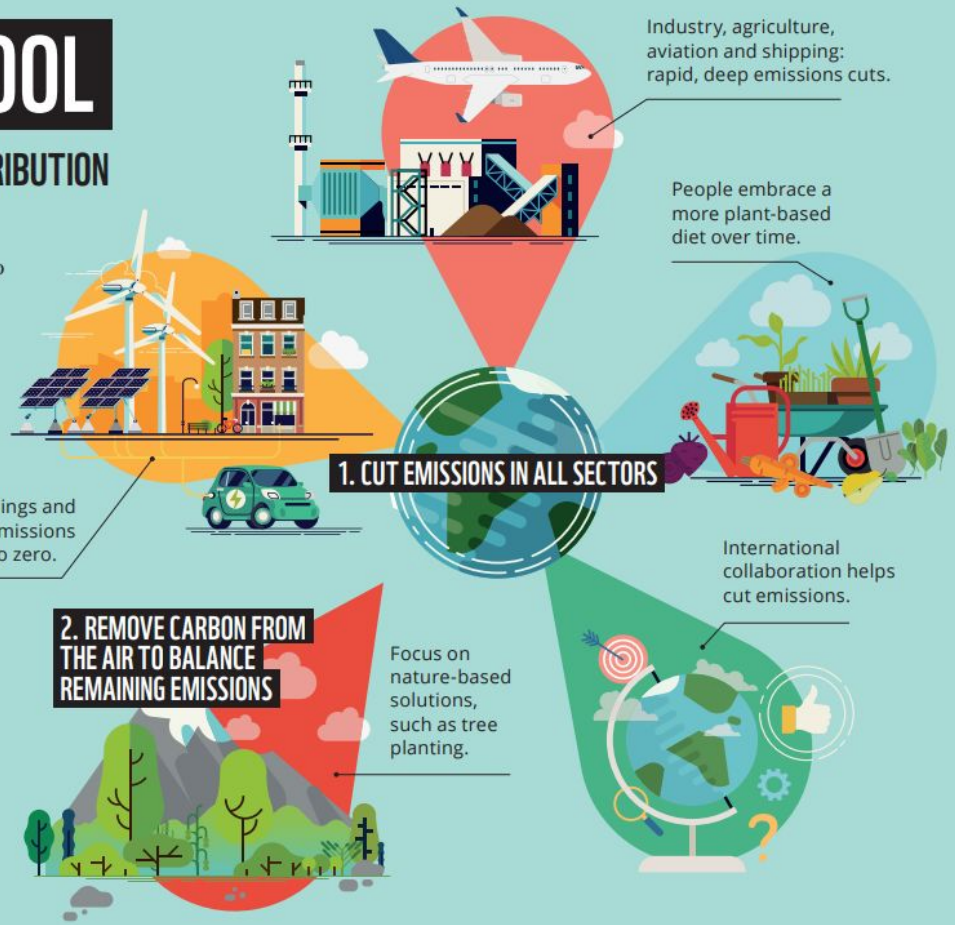
https://netzeroclimate.org/what-is-net-zero/

KEEPING IT COOL

HOW THE UK CAN END ITS CONTRIBUTION TO CLIMATE CHANGE BY 2045

To help limit global temperature increases to 1.5°C, the UK must reduce greenhouse gas emissions to net zero. WWF's report, *Keeping it Cool*, provides a pathway to achieve that by 2045.

wwf.org.uk/keepingcool

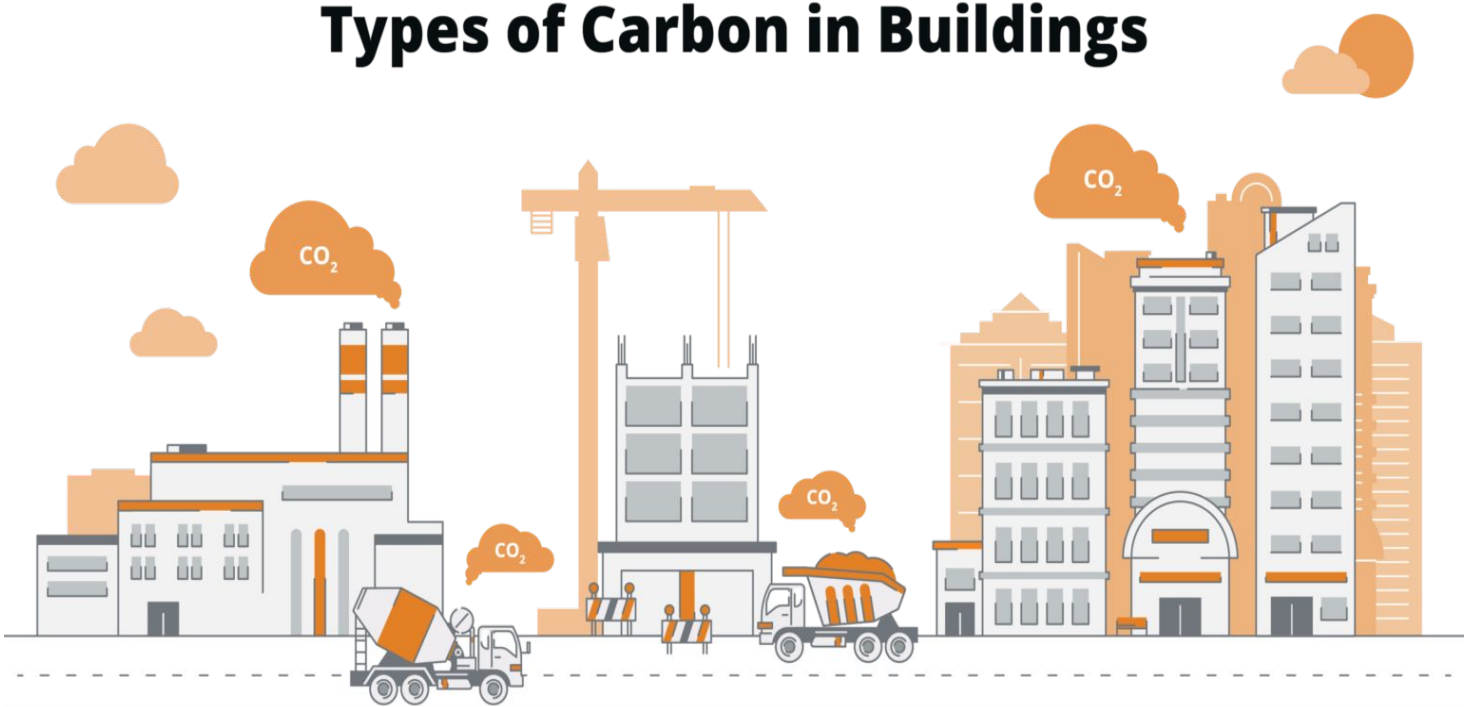


WWF | FOR YOUR WORLD

4. What is embodied carbon?

c. The carbon emitted when sourcing materials, manufacturing and distributing a product.

Types of Carbon in Buildings



Embodied Carbon
The emissions from manufacturing, transportation, and installation of building materials.

Operational Carbon
The emissions from a building's energy consumption.

https://www.carboncure.com/concrete-corner/what-is-embodied-carbon/

5. Is reforestation (planting more trees) useful for absorbing carbon dioxide from the atmosphere?

b. Yes, but it's essential to protect rainforests from deforestation alongside reforestation projects.

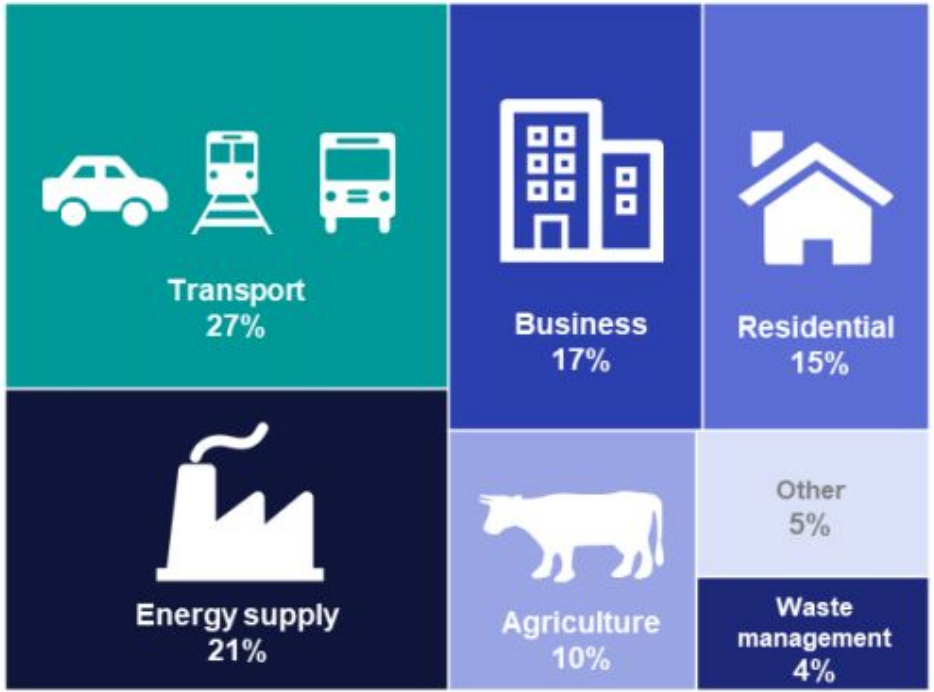
- Rainforests slow to develop, absorb more CO_2
- Larger, older trees absorb more CO_2
- Supporting biodiversity is vital to support the local ecosystem

https://www.youtube.com/watch?v=4jvI4o9-op8

6. In 2019, which sector produced the highest emissions in the UK?

a. **Transport**

Transport was the largest emitting sector in the UK in 2019, responsible for over a quarter of emissions



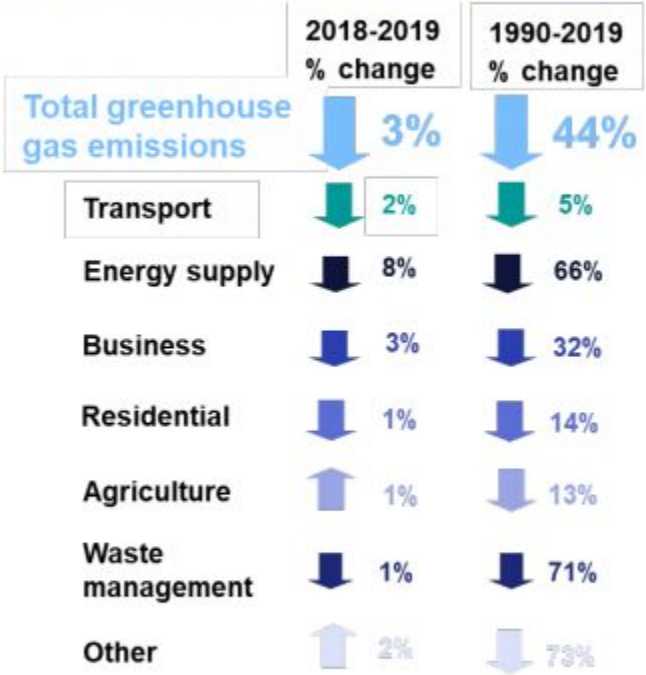
Others include Public, Industrial Processes and the Land Use, Land Use Change and Forestry (LULUCF) sectors. The percentages may not sum to 100% due to rounding.

https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2019

7. Which sector has seen the largest proportional decrease in emissions in the UK between 1990 and 2019?

f. Waste management

Energy supply delivered the largest reduction in emissions in the UK from 2018 to 2019, as power stations continued to reduce coal use



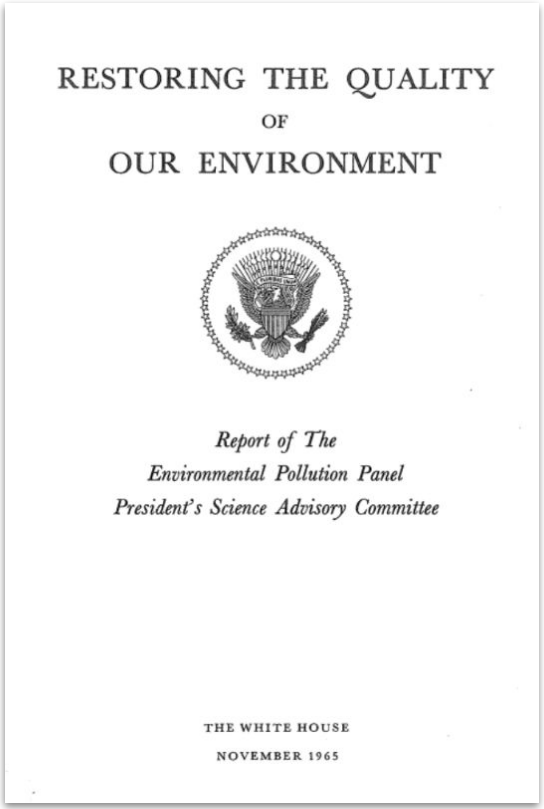
The energy supply sector has accounted for around half of the overall reduction in UK emissions since 1990, at which point it accounted for 34% of all emissions in the UK. It was the largest emitting sector until its emissions fell below transport in 2016.

https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2019

Political and Cultural Landscape

19:35-19:55

1965



Concerns about the ‘greenhouse effect’ and the resulting ‘climatic changes’ were first raised by scientists to a major political stakeholder - the US presidents Johnson.

“Climatic changes that may be produced by the increased CO2 content could be deleterious from the point of view of human beings.”

1965

http://www.climatefiles.com/climate-change-evidence/presidents-report-atmospher-carbon-dioxide/

1970/71

1965

[Earth Day]

[Greenpeace]

[Friends of the Earth]

1965 | 1970

1988


First session of the IPCC in 1988. Photo: IPCC

Intergovernmental Panel on Climate Change (IPCC) is founded.

"The objective is to provide governments at all levels with scientific information that they can use to develop climate policies."

1965 | 1970 | 1988

1992

United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro

"The Commission on Sustainable Development (CSD) was created in December 1992 to ensure effective follow-up of UNCED, to monitor and report on implementation of the agreements at the local, national, regional and international levels."

1965	1970	1988	1992

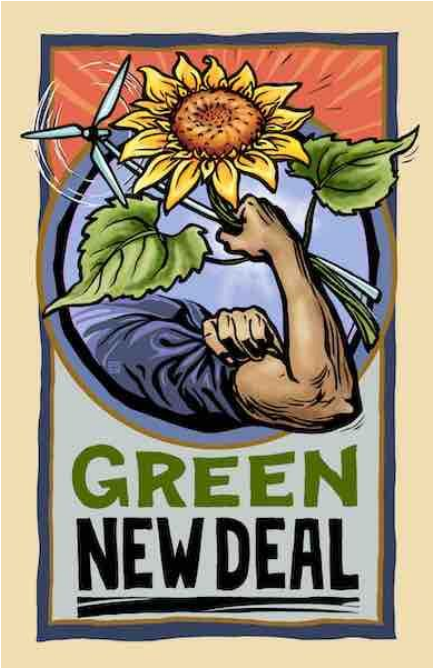
1997

First ever international agreement to mandate the reduction of greenhouse gases

“The targets for the first commitment period of the Kyoto Protocol cover emissions of the six main greenhouse gases.”

1965	1970	1988	1992	1997

2007



The concept of a Green New Deal is created by journalist Thomas Friedman and quickly adopted by political stakeholders.

“Like the New Deal, if we undertake the green version, it has the potential to create a whole new clean power industry to spur our economy into the 21st century.”

Image by Mona Caron via art.350.org

1965	1970	1988	1992	1997	2007

2008

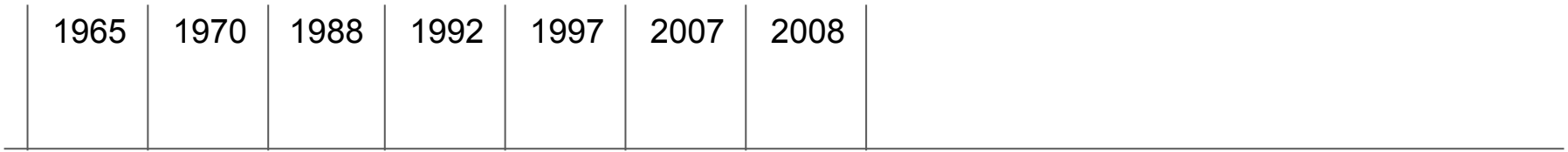
Climate Change Act 2008

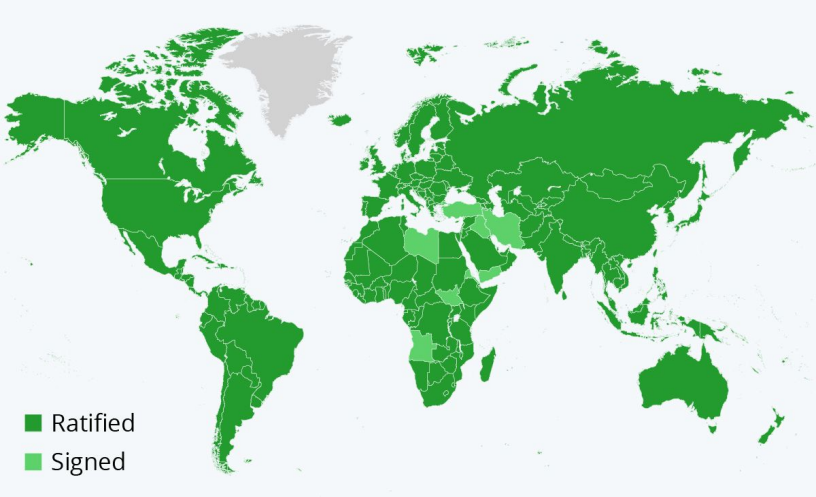
UK’s first Climate Change Act was passed

“Through the Climate Change Act, the UK government has set a target to significantly reduce UK greenhouse gas emissions by 2050 and a path to get there.”

1965	1970	1988	1992	1997	2007	2008

2016



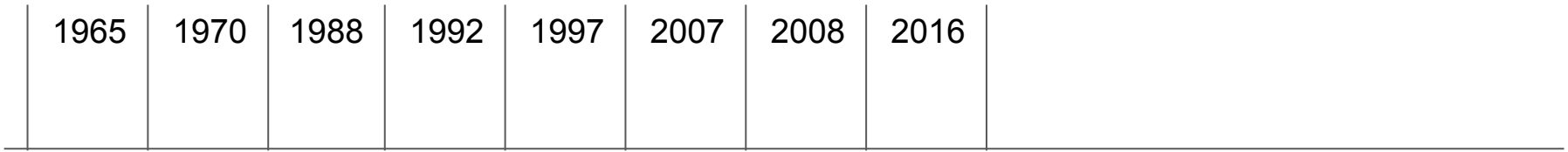


196 countries adopted the Paris Agreement at the COP21

"The deal aims to substantially reduce global greenhouse gas emissions and to limit the global temperature increase in this century to 2 degrees Celsius while pursuing means to limit the increase even further to 1.5 degrees."

1965	1970	1988	1992	1997	2007	2008	2016

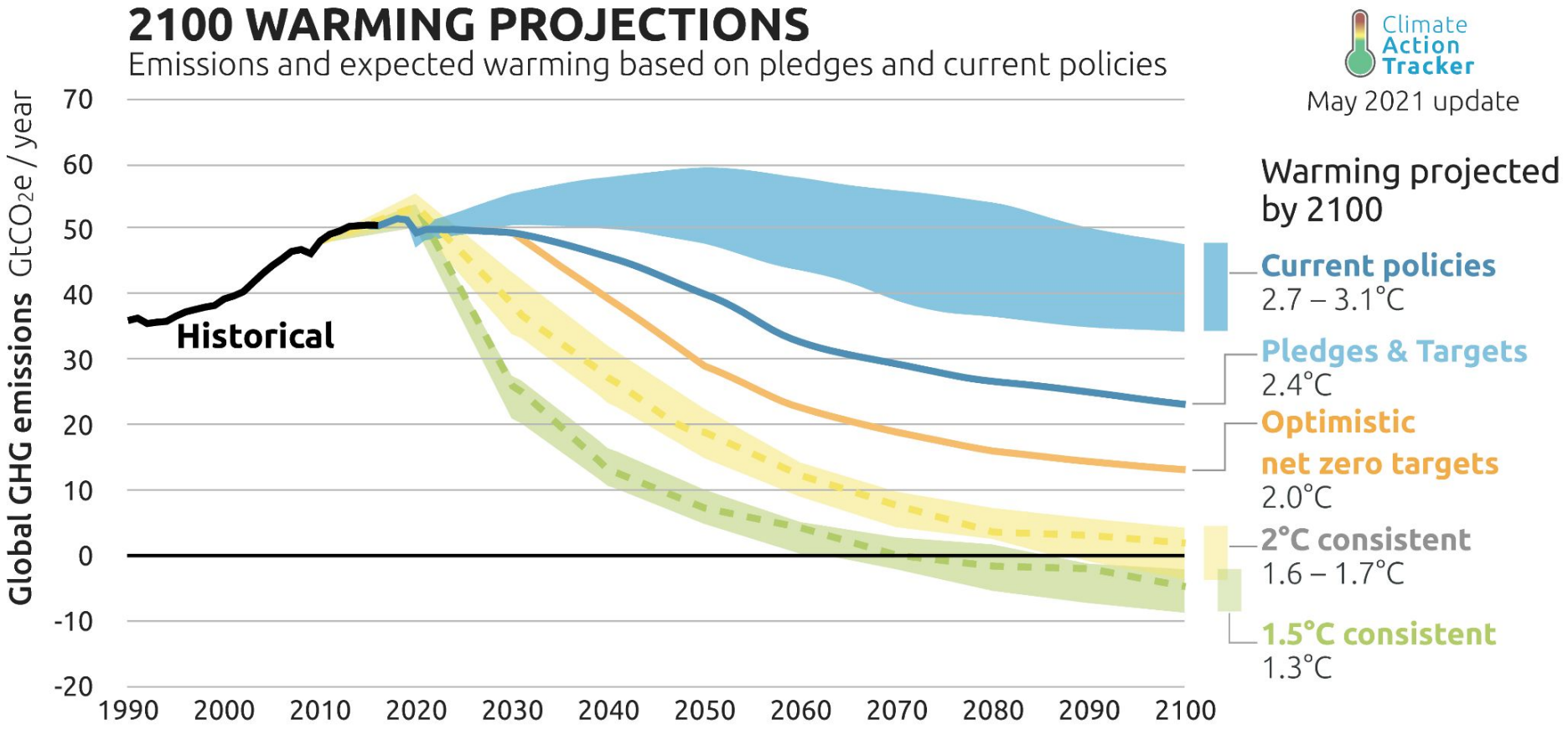
2018



[Extinction Rebellion]

[Fridays for Future]

1965	1970	1988	1992	1997	2007	2008	2016	2018



https://climateactiontracker.org/global/temperatures/

South Cambridgeshire and others declare climate emergencies

"We have adopted a Zero Carbon Strategy to bring down our own emissions and support businesses and communities (with the help of Net Zero Now) to do the same."

1965	1970	1988	1992	1997	2007	2008	2016	2018	2019

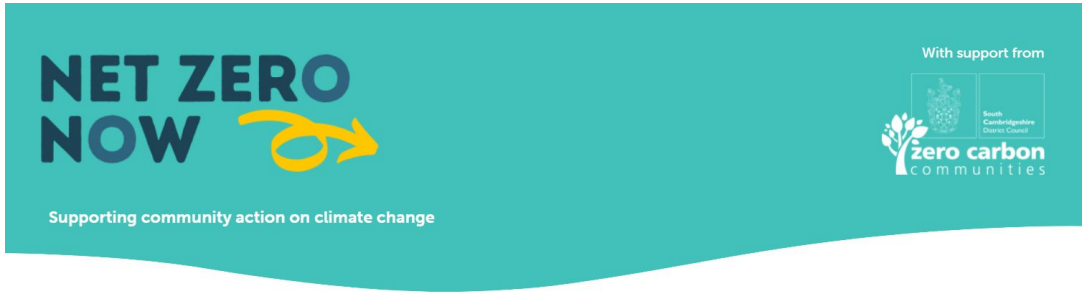
1965	1970	1988	1992	1997	2007	2008	2016	2018	2019	2021

Break

19:55-20:05

Tools

- Accessing core readings and resources
- Slack

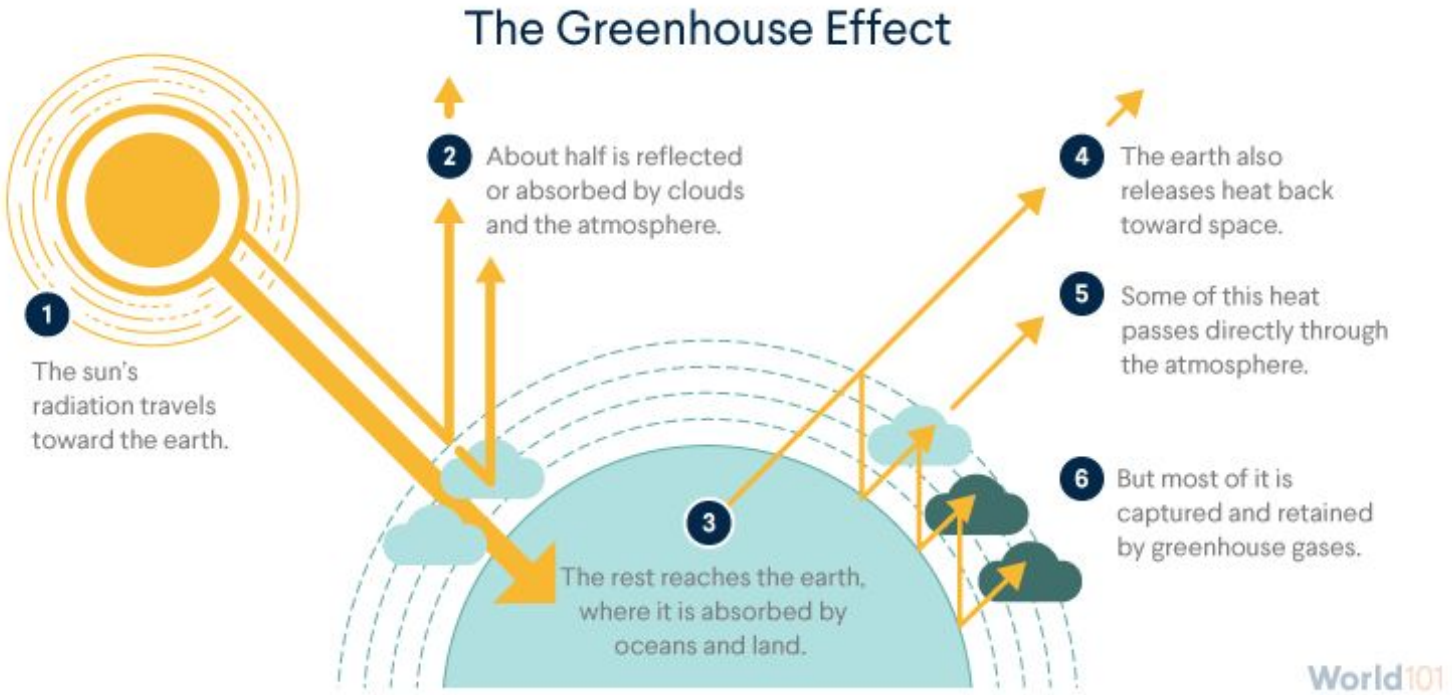


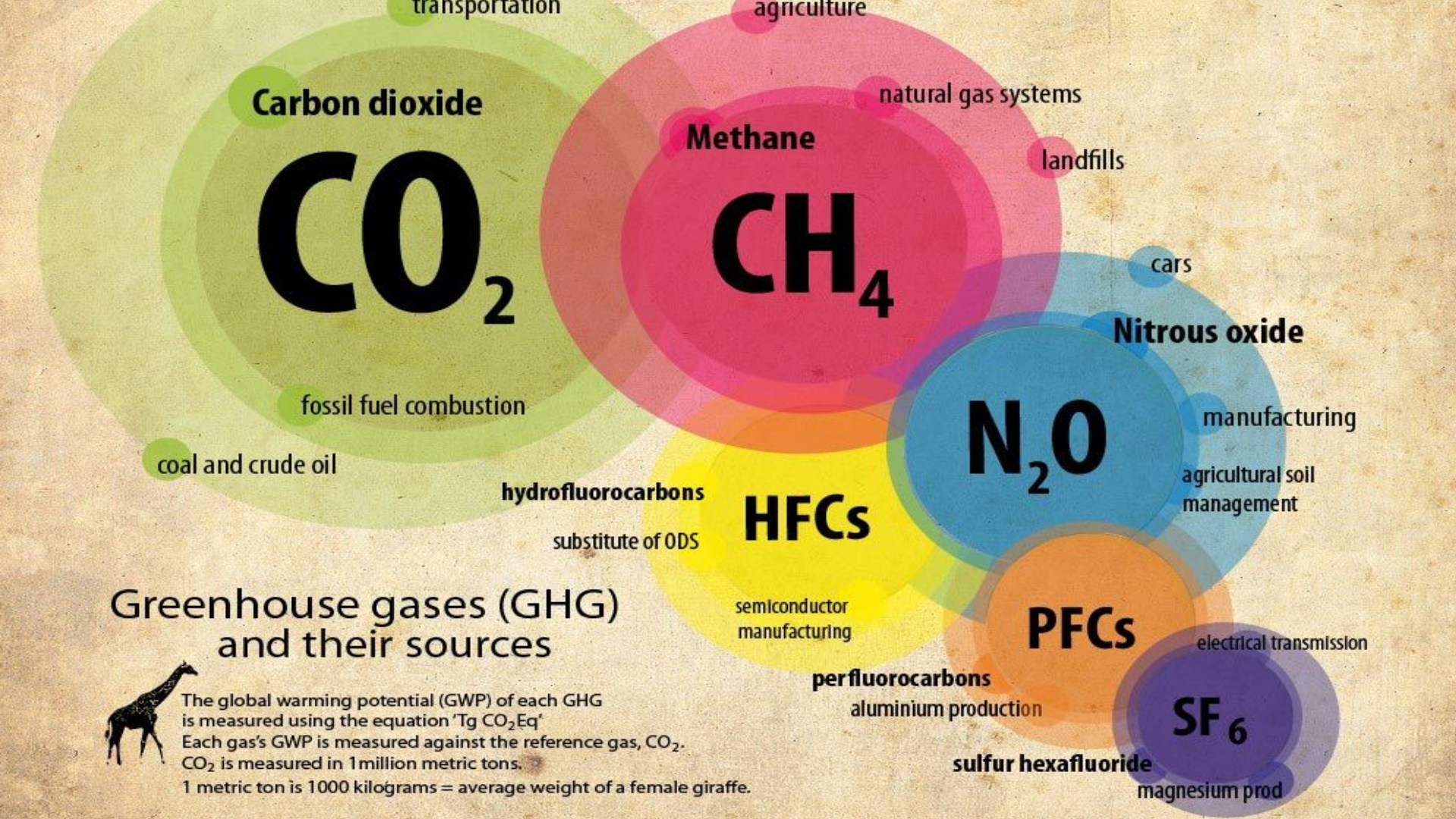
Course readings & resources

NET ZERO NOW

Carbon footprints

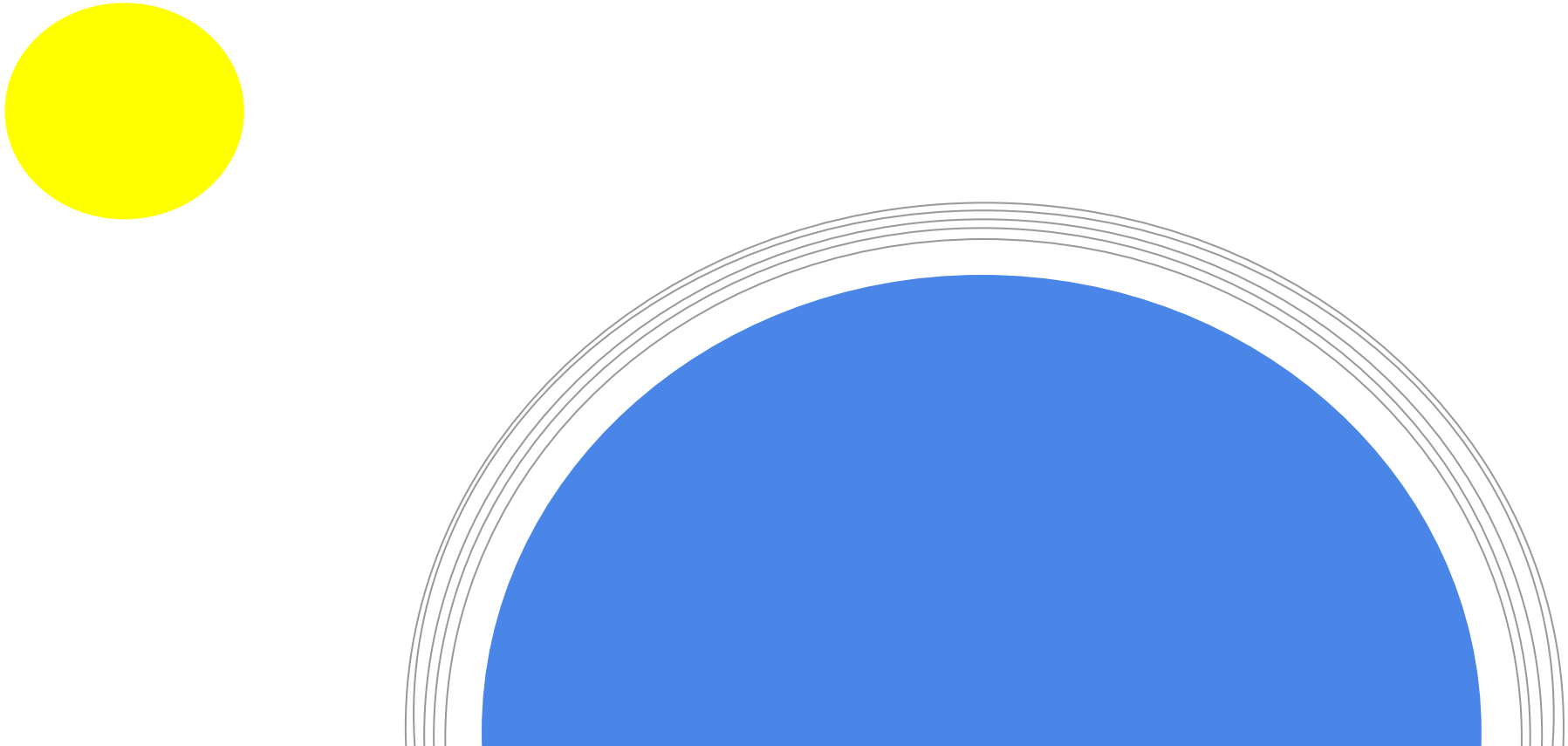
20:05-20:30

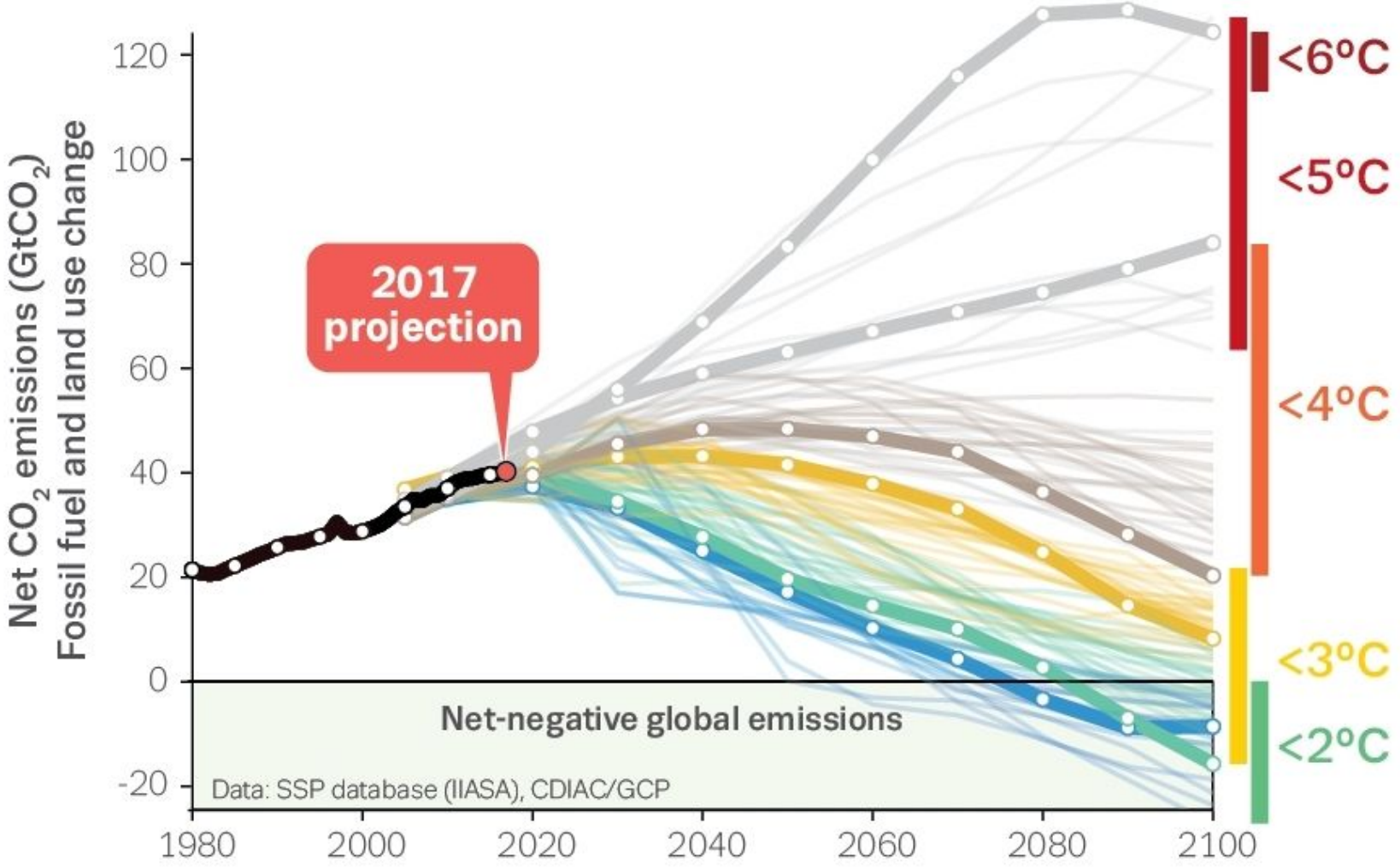

The Greenhouse Effect
1
The sun's radiation travels toward the earth.
2
About half is reflected or absorbed by clouds and the atmosphere.
3
The rest reaches the earth, where it is absorbed by oceans and land.
4
The earth also releases heat back toward space.
5
Some of this heat passes directly through the atmosphere.
6
But most of it is captured and retained by greenhouse gases.
World101



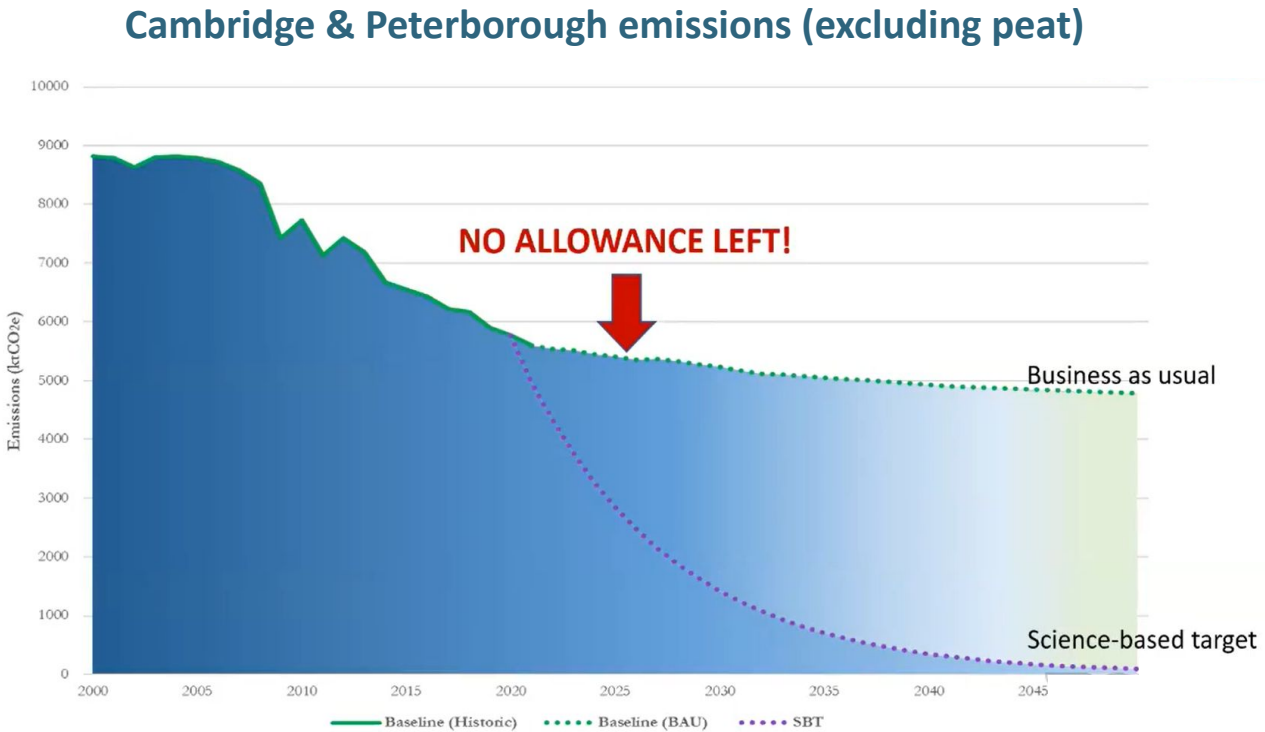
Greenhouse gases (GHG) and their sources

The global warming potential (GWP) of each GHG is measured using the equation 'Tg CO_2Eq'
Each gas's GWP is measured against the reference gas, CO_2.
CO_2 is measured in 1million metric tons.
1 metric ton is 1000 kilograms = average weight of a female giraffe.

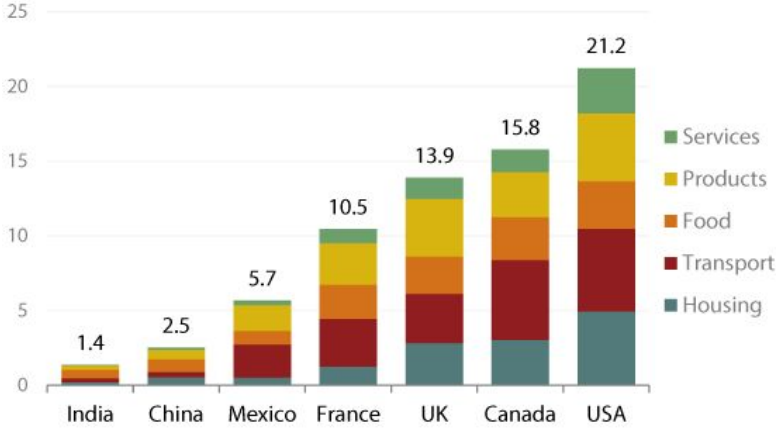



Net CO_2 emissions ($GtCO_2$)
Fossil fuel and land use change
120
100
80
60
40
20
0
-20
2017 projection
Net-negative global emissions
Data: SSP database (IIASA), CDIAC/GCP
1980
2000
2020
2040
2060
2080
2100
<6°C
<5°C
<4°C
<3°C
<2°C

We only have 6 years left before we exhaust our share of emissions to 2050



SOURCE: PCAN (University of Leeds) for the Cambridge & Peterborough Independent Commission on Climate

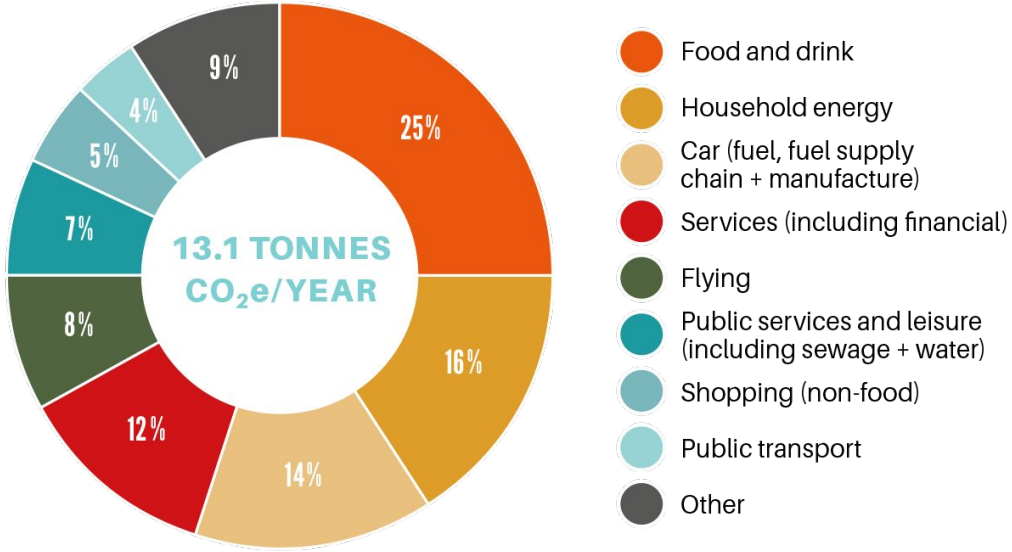


Personal Carbon Footprints: t CO2e/capita (2004)

Source: EUREAPA, excludes government and construction

shrinkthatfootprint.com

AVERAGE CARBON FOOTPRINT IN THE UK*



*A **carbon footprint** measures the total greenhouse gas (GHG) emissions caused directly and indirectly by a person. It's **measured** in tonnes of **carbon** dioxide equivalent (tCO_2e), a standard unit which expresses the impact of different GHGs.

Source: Small World Consulting

FOOD

ENERGY

TRANSPORT

SHOPPING

cambridgecarbonfootprint.org/calculator

Carbon Footprint Calculator

Almost everything we do creates carbon* which, in excess, can damage our climate and environment. The following calculator helps you to find out how much carbon your habits produce.

Calculate your footprint

*More on why and how we calculate carbon emissions can be found here.

Your Carbon Footprint

Go Back

Your footprint is

3.45

tonnes CO2e
per year!

That's about the weight of
1 Rhino!

Your breakdown

Home energy

0.97

tonnes CO2e

The weight of a **dolphin**!

Food

1.05

tonnes CO2e

The weight of a **dolphin**!

Travel

1.16

tonnes CO2e

The weight of a **giraffe**!

Shopping

0.26

tonnes CO2e

The weight of a **dolphin**!

Your personal goals

In order to fight the climate crisis we need to significantly reduce our carbon emissions - starting now!
Sign the Cambridge Climate Change Charter:

Share | View your personal goals | Download

Your Carbon Footprint

Go Back

Your footprint is

3.19

tonnes CO2e per year!

That's about the weight of **1 Rhino**!

Your breakdown

Your personal goals

Your personal goals show your pathway to a carbon neutral future

These goals are based on the Committee for Climate Change recommendations.. You can find more information here

In order to fight the climate crisis we need to significantly reduce our carbon emissions - starting now!
Sign the Cambridge Climate Change Charter:

Share | **Join others in taking action!** | Download

Select at least one action to reduce your emissions and at least one to demonstrate climate leadership:

Measure and reduce my emissions: | Demonstrate climate leadership:

Home Energy

(2) selected

- [ ] Switch to a 100% renewable electricity tariff ★★★
- [ ] Install solar panels ★★
- [ ] Upgrade my windows to improve insulation ★★
- [ ] Install wall insulation ★★
- [x] Insulate my loft ★★
- [x] Eliminate draughts ★
- [ ] Review my household energy use regularly
- [ ] Heat my house to a lower temperature and only when I need it ★★
- [ ] Take fewer baths and shorter showers ★
- [ ] Replace unrepairable white goods with extra efficient models ★★

Transport

(2) selected

- [ ] Walk or cycle instead of taking the car for one journey a week ★
- [ ] Switch as many car journeys as possible to walking, cycling or public transport ★
- [ ] Join or start a car pool for regular journeys like commutes ★
- [ ] Make my next car an electric or hybrid ★★★
- [ ] Join an electric car club ★
- [ ] Sell my car(s) ★★★
- [x] Work from home more often or at a local co-working space ★
- [ ] Don't fly for leisure in the next 12 months ★★★
- [x] Replace one holiday abroad with a UK destination ★★
- [ ] Replace a long-distance flight with a shorter one ★★★

Food

(1) selected

Shopping

(0) selected

NET ZERO NOW

Breakout room discussion




20:30-20:50

Breakout room discussion

1. Were there any questions in the calculator that surprised you?
2. What did you find most surprising in your results?
3. Did you find any useful tips in the charter? If yes, which?
4. Do you feel calculators are a useful tool to start talking about climate change and carbon reduction?




20:30-20:50

Wrap up and next steps

20:50-21:00

Take away activities

- Complete our pre-course survey!
- Help someone calculate their carbon footprint
- Complete ‘Action at all levels’ activity
- Look at ‘Essential reading’
- Try out Slack