



# Entry board

How confident are you in talking about carbon and climate change?

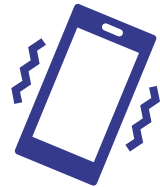
Pop your sticker on the chart

Why is it important for us to be able to talk about carbon?





# Housekeeping



**Any concerns?**





# Intros

Name as you would like  
to be known...

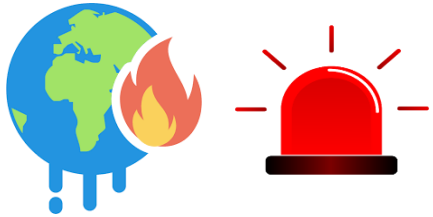
Business  
area...

**Entry board** - How confident are you in talking  
about carbon and climate change?  
Why is it important?

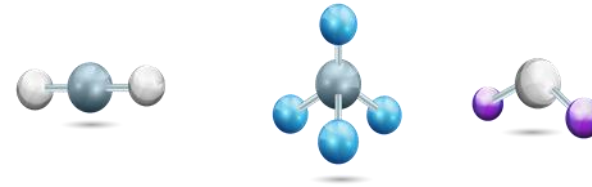




# Objectives



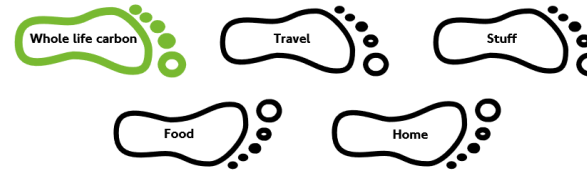
Impacts of climate change



Climate science



Targets and policies



Your personal carbon footprint



TfL's influence on carbon



Actions for you to reduce carbon at TfL



# Agenda

Carbon Literacy  
Project



## Morning

## Afternoon



### Module 1 Climate Change

- What has caused the climate to change
- How is the climate changing
- The impacts of climate change
- Equity & Vulnerability

Hard facts



### Module 2 Policy & footprint

- The Policy Position
- What is a carbon footprint



Progress



### Module 3 TfL

- Breakdown of TfL's carbon impact
- Strategies and tools to tackle carbon
- What can your business area do?

Inspiration



### Module 4 Taking action

- Action planning – make your carbon pledge
- Talking about climate change

Solutions



# What is Carbon Literacy?

**“An awareness of the carbon costs and impacts of everyday activities and the ability and motivation to reduce emissions, on an individual, community and organisational basis.”**

**Carbon Literacy Project**




30,080  
citizens  
certified



60,160  
actions  
pledged



108,082<sup>CO<sub>2</sub>e</sup>  
carbon  
saved



69 certified  
training  
professionals



322  
courses  
designed



11 Sectors



9 Toolkits



2,535  
organisations  
engaged



90  
Carbon  
Literate  
Organisations



15  
nations  
delivering



5-15% carbon  
savings  
per-person





# Carbon Literacy Project



This is to certify that via

Sample Organisation

Sample Name

has met all the requirements of the Carbon Literacy Standard and thus for the purposes of workplace, education and community should be regarded as Carbon Literate.

signed

Ali Abbas, Chair, on behalf of The Carbon Literacy Trust.  
Registered Charity Number 1156722

date

certificate no.

30<sup>th</sup> March 2014

00000000 / v1.05



certificate







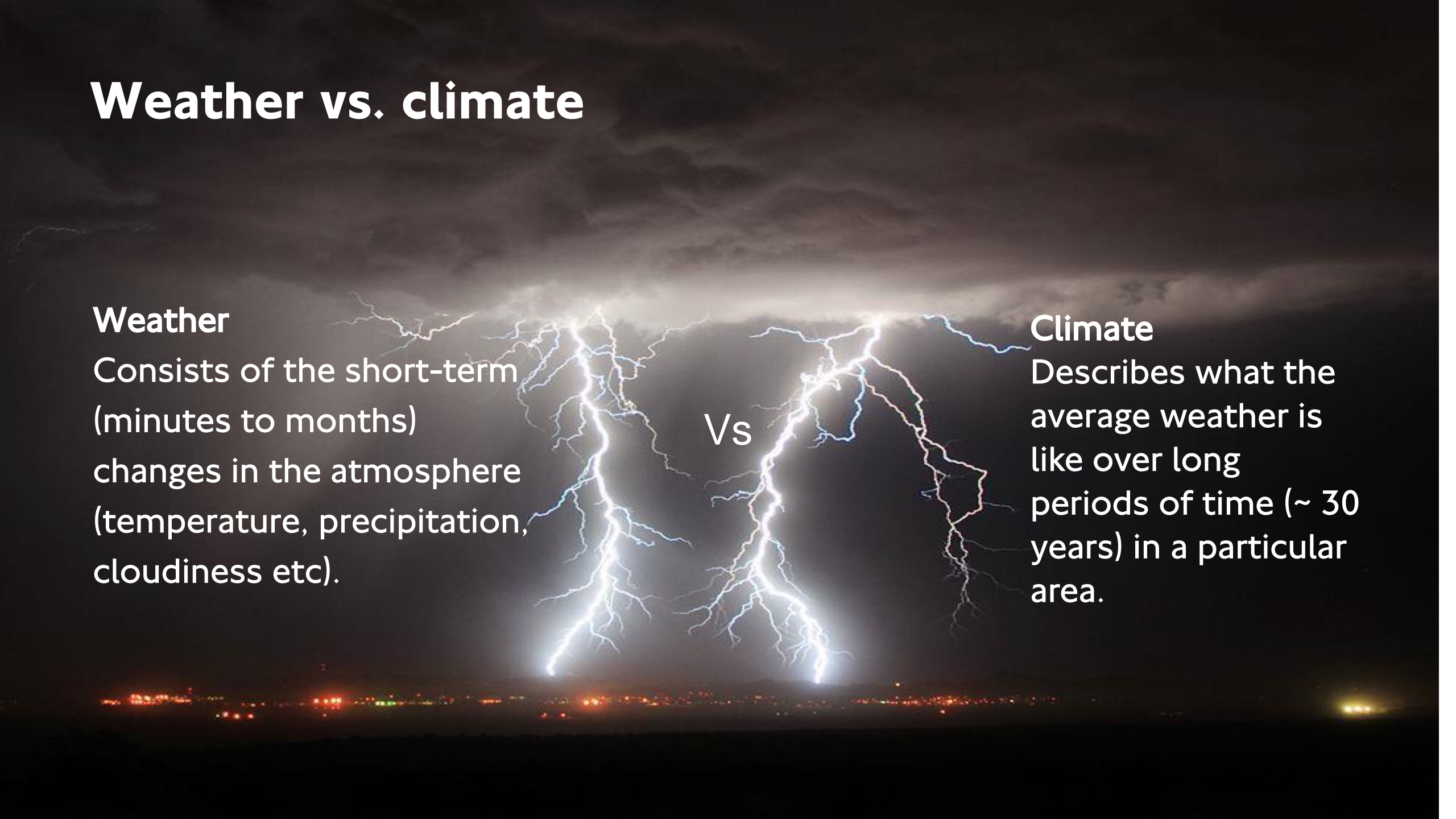
# Module 1

## Climate Change



- What has caused the climate to change
- How is the climate changing
- The impacts of climate change
- Equity & Vulnerability

# Weather vs. climate



## Weather

Consists of the short-term (minutes to months) changes in the atmosphere (temperature, precipitation, cloudiness etc).

Vs

## Climate

Describes what the average weather is like over long periods of time (~ 30 years) in a particular area.



# The Carbon Cycle



# The Greenhouse Effect

Some solar radiation is reflected by the Earth and the atmosphere.

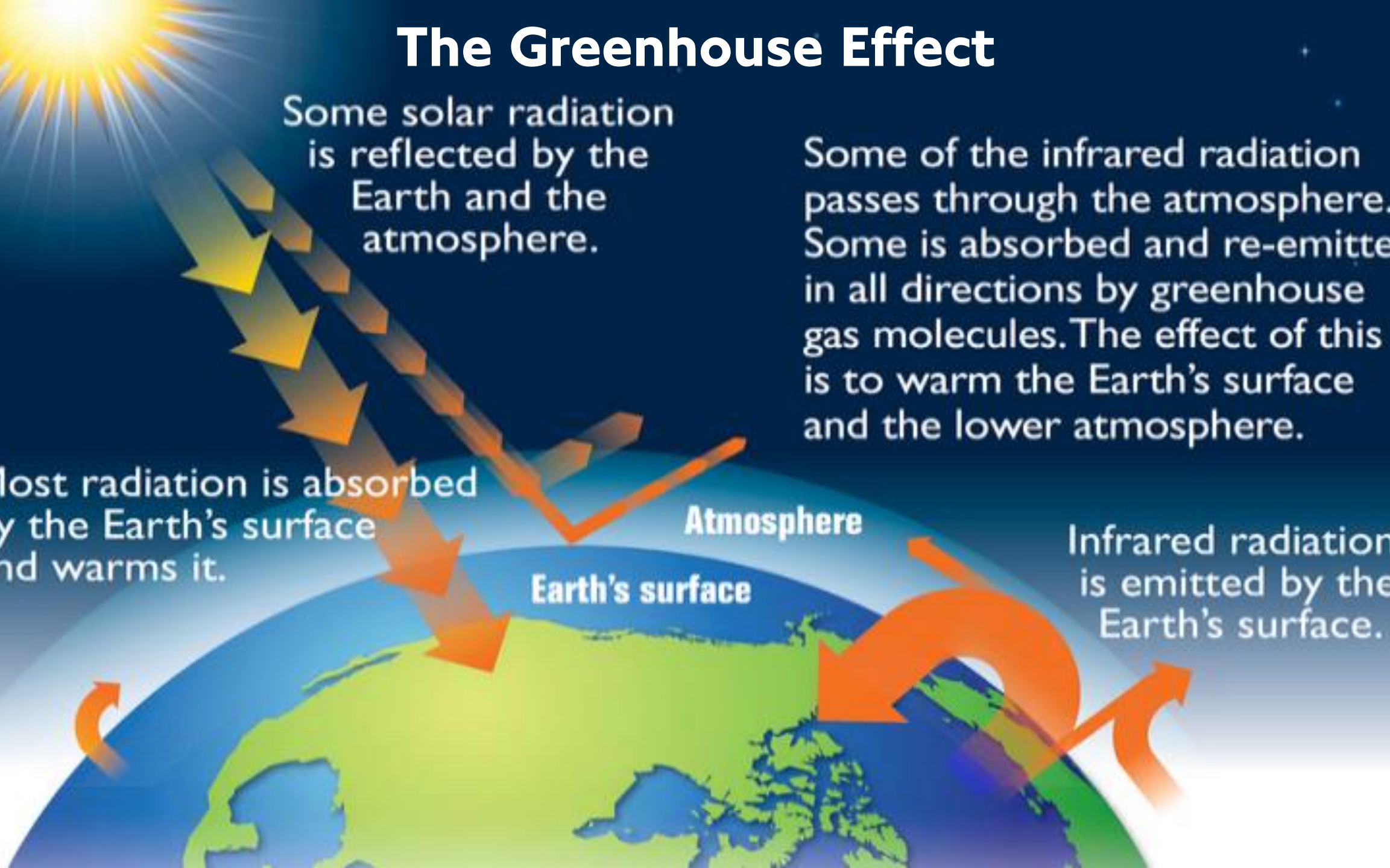
Some of the infrared radiation passes through the atmosphere. Some is absorbed and re-emitted in all directions by greenhouse gas molecules. The effect of this is to warm the Earth's surface and the lower atmosphere.

Most radiation is absorbed by the Earth's surface and warms it.

Infrared radiation is emitted by the Earth's surface.

Atmosphere

Earth's surface





# The Greenhouse Gases

Greenhouse gas

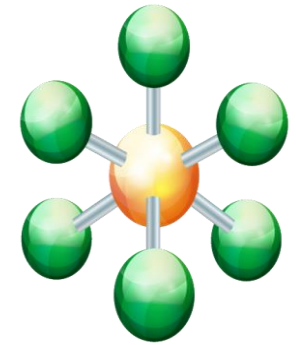
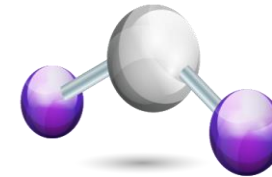
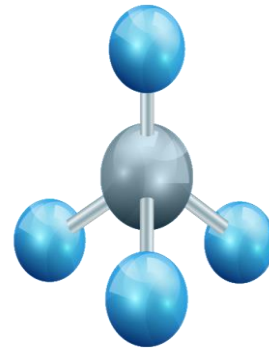
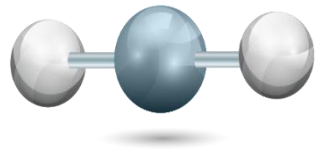
Carbon Dioxide  
(CO<sub>2</sub>)

Methane (CH<sub>4</sub>)

Nitrous Oxide (N<sub>2</sub>O)

F Gases (various)

Structure



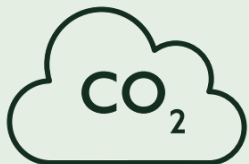
Global warming  
potential

1

28

265

10s-10,000s

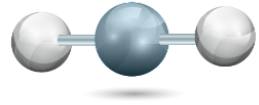


'Carbon' is often used as shorthand for the impact of all greenhouse gases. It is quantified as tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e)

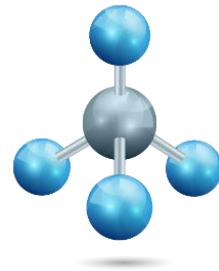


# Activity: Which activity releases which greenhouse gas?

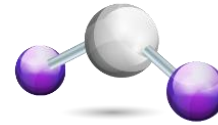
Match the greenhouse gases with their sources



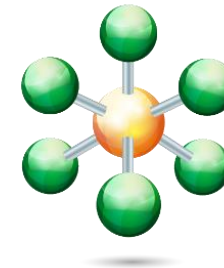
Carbon Dioxide



Methane



Nitrous Oxide



F Gases





# Module 1

## Climate Change



- What has caused the climate to change

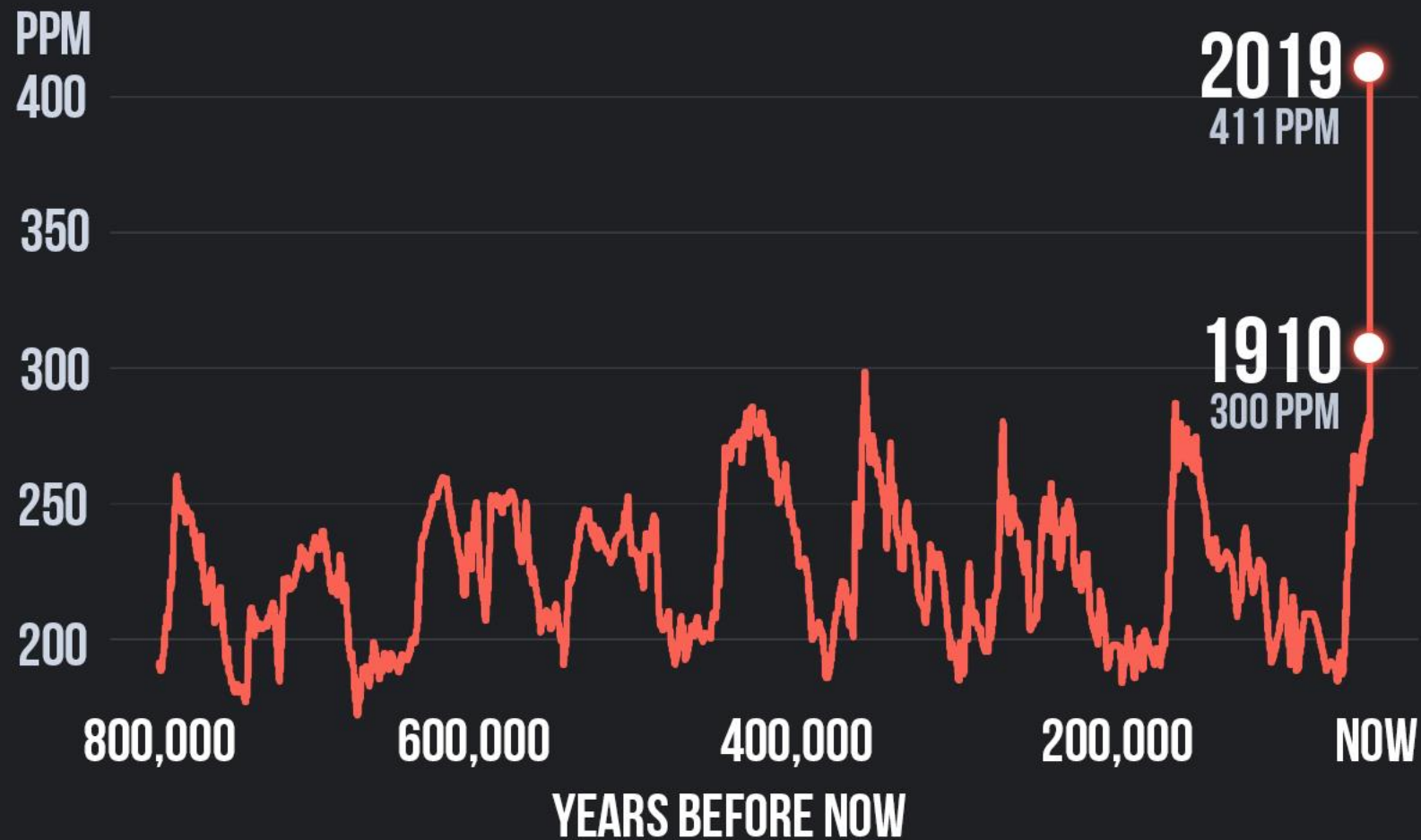
- How is the climate changing

**"let's follow the science & look at the data"**

- The impacts of climate change
- Equity & Vulnerability

# CHANGING OUR ATMOSPHERE

## 800,000 Years of Carbon Dioxide

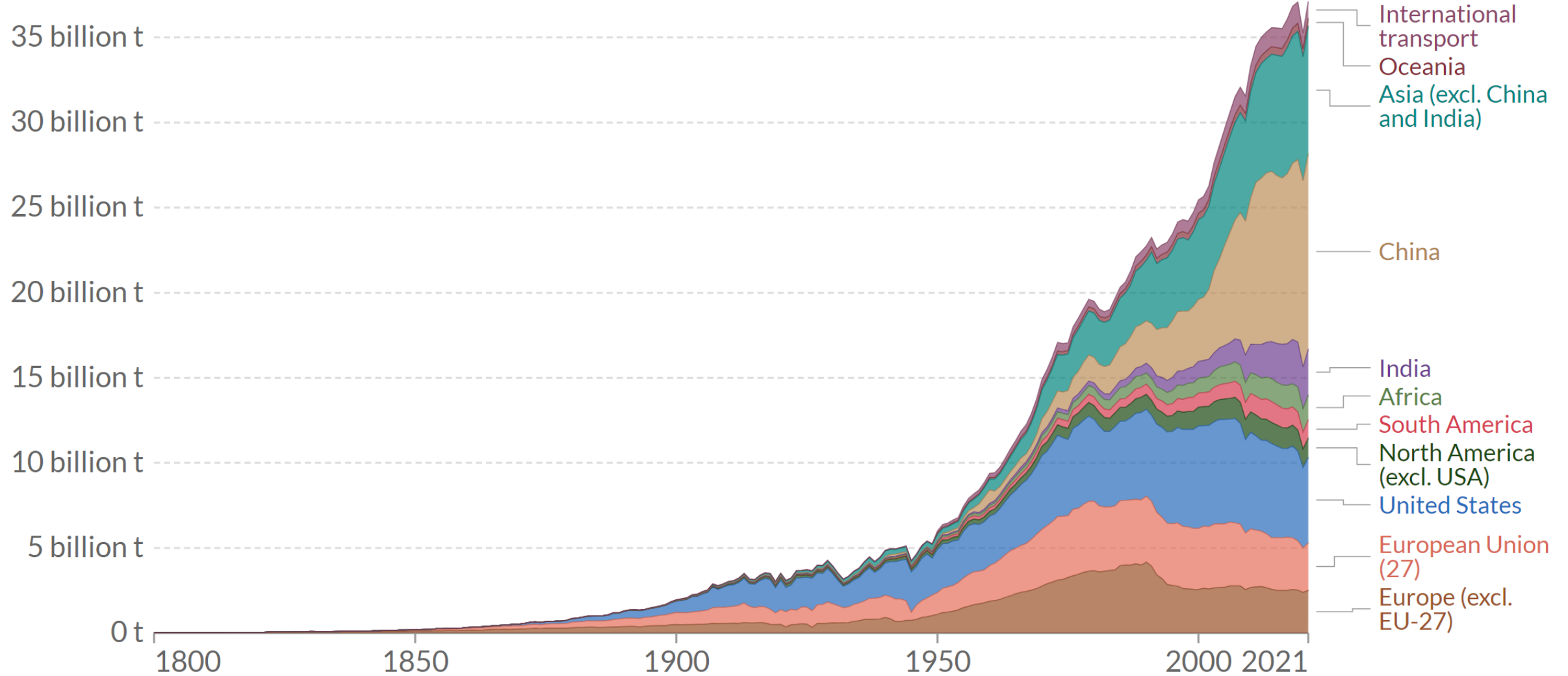


Source: Luthi et al (2008) ([cdiac.ornl.gov](http://cdiac.ornl.gov)) & NOAA ESRL ([esrl.noaa.gov](http://esrl.noaa.gov))

CLIMATE  CENTRAL

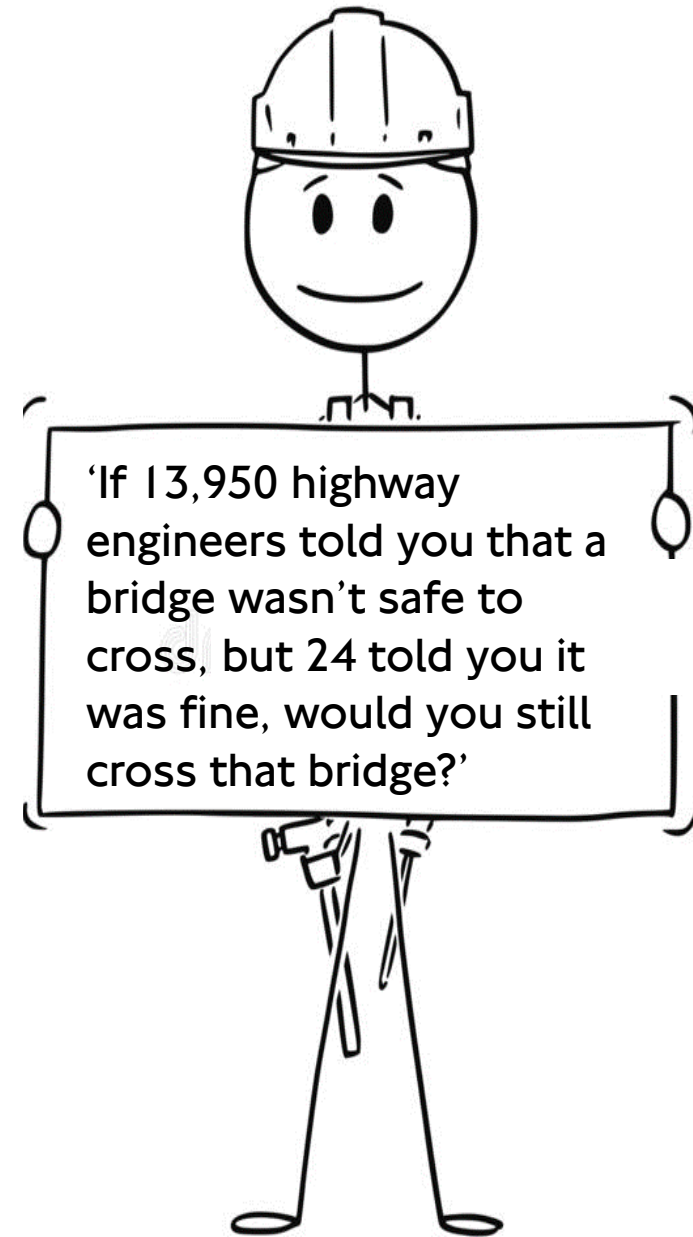
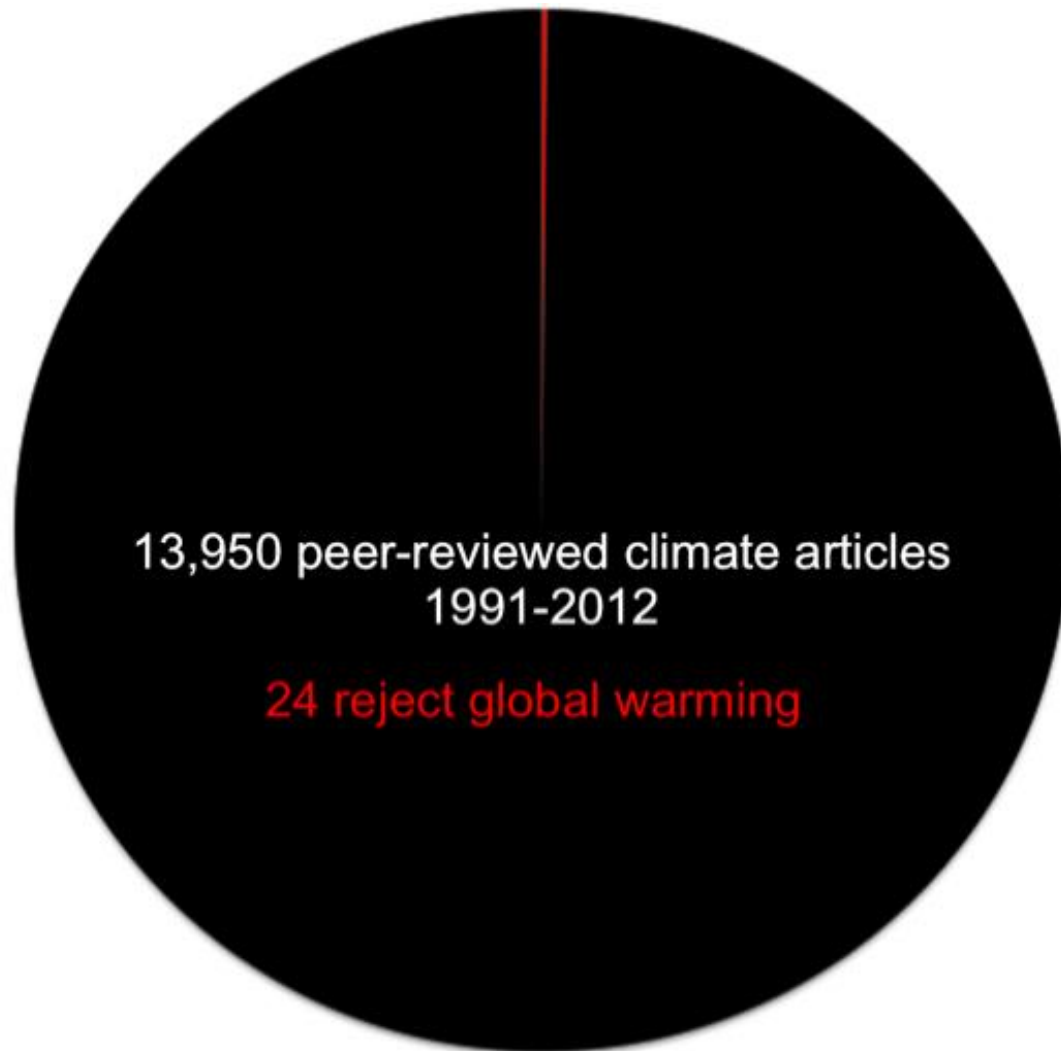


# Annual emissions by world region





## The scientific consensus on climate change...



# Temperature Anomalies by Country Years 1880 - 2017

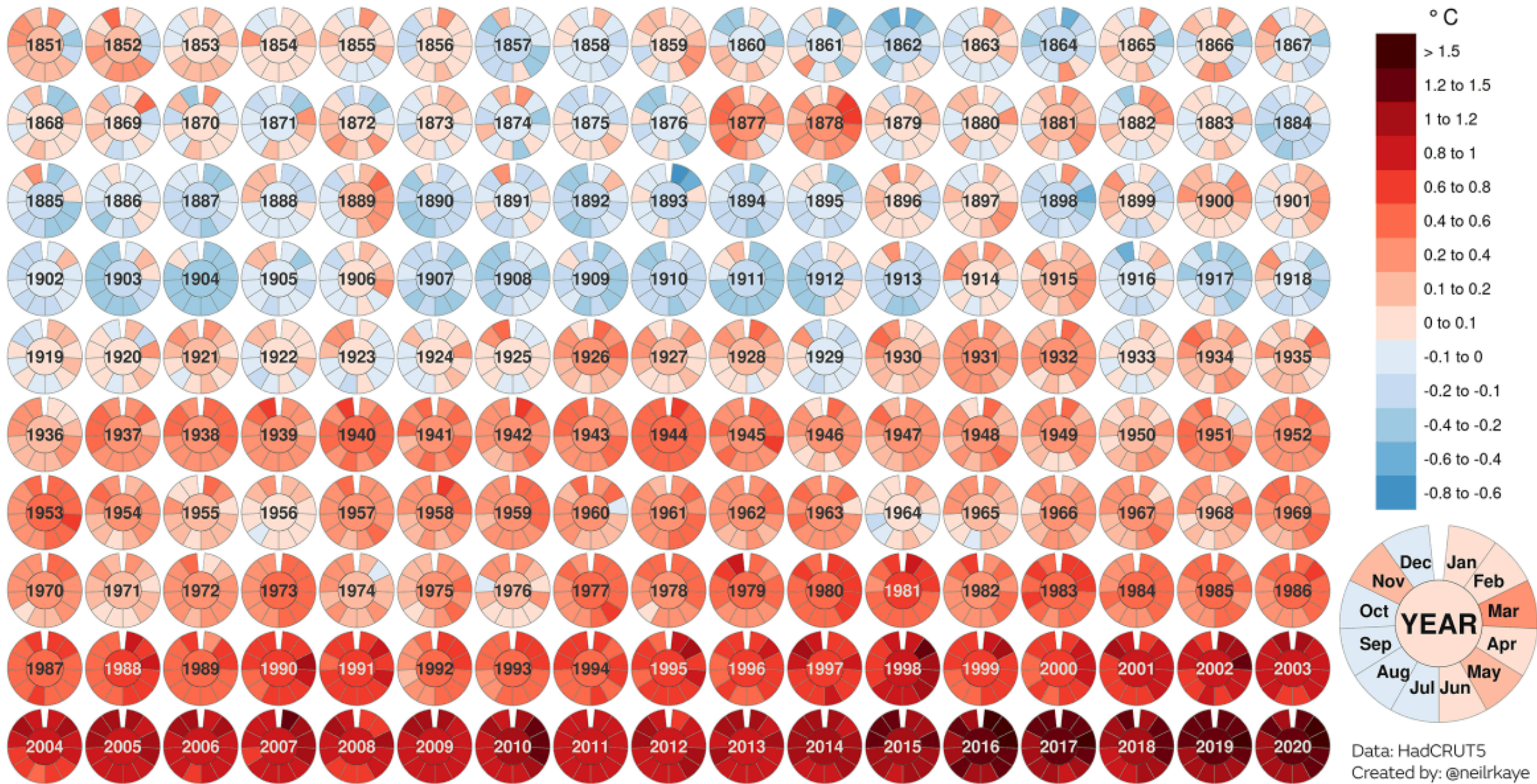
# 1880



Data Source:  
 NASA GISS, GISTEMP Land-Ocean Temperature Index (LOTI), ERSSTv5, 1200km smoothing  
<https://data.giss.nasa.gov/gistemp/>  
 Average of monthly temperature anomalies. GISTEMP base period 1951-1980.

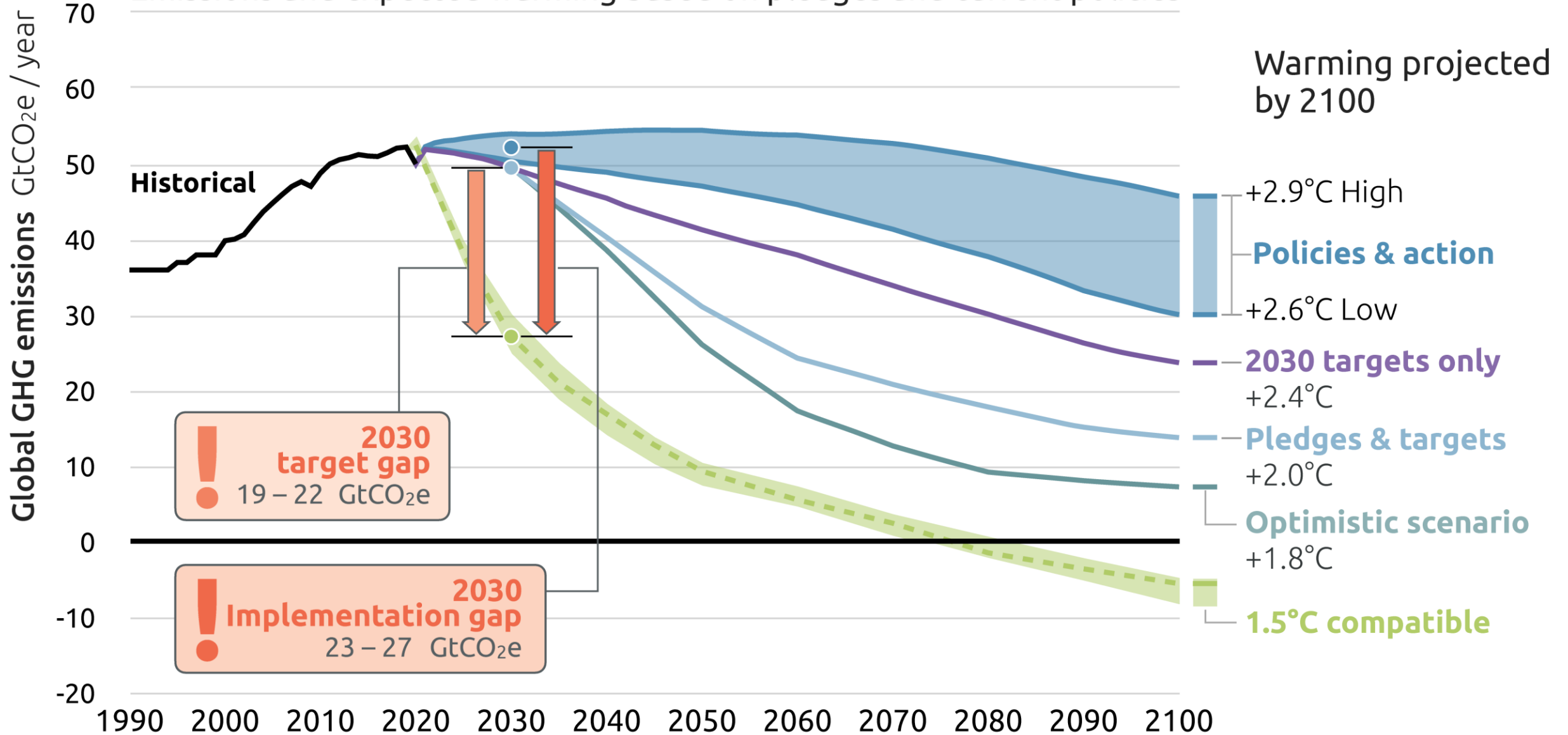
Video license: CC-BY-4.0  
 Antti Lipponen (@anttilip)

**Met Office** Monthly global mean temperature 1851 to 2020 (compared to 1850-1900 averages)



# 2100 WARMING PROJECTIONS

Emissions and expected warming based on pledges and current policies



THERE IS NO SINGLE '1.5°C WARMER WORLD', BUT SOME PATHS DIVERGE MORE FROM THE WORLD AS WE KNOW IT TODAY



**LATE, UNCOORDINATED ACTION**

One possible  
storyline from among  
worst case scenarios



**DELAYED, DECISIVE ACTION**

One possible  
storyline from among  
mid-case scenarios



**EARLY, EFFECTIVE ACTION**

One possible  
storyline from among  
best case scenarios

# Late, uncoordinated action



**Inflation, food security**



**Mass migration**



**Public unrest**



**Multiple major conflicts**



# Delayed, decisive action



**Inflation, food security**

**UK food inflation hits 13.3%  
in December**

**British Retail Consortium**



**Migration,  
forced displacement**



**Ecosystems devastated**



**Catastrophic  
storm damage**





# Early, effective action



**Crop yields stabilise**



**Continued  
sea level rise**



**Some ecosystems  
begin recovery**

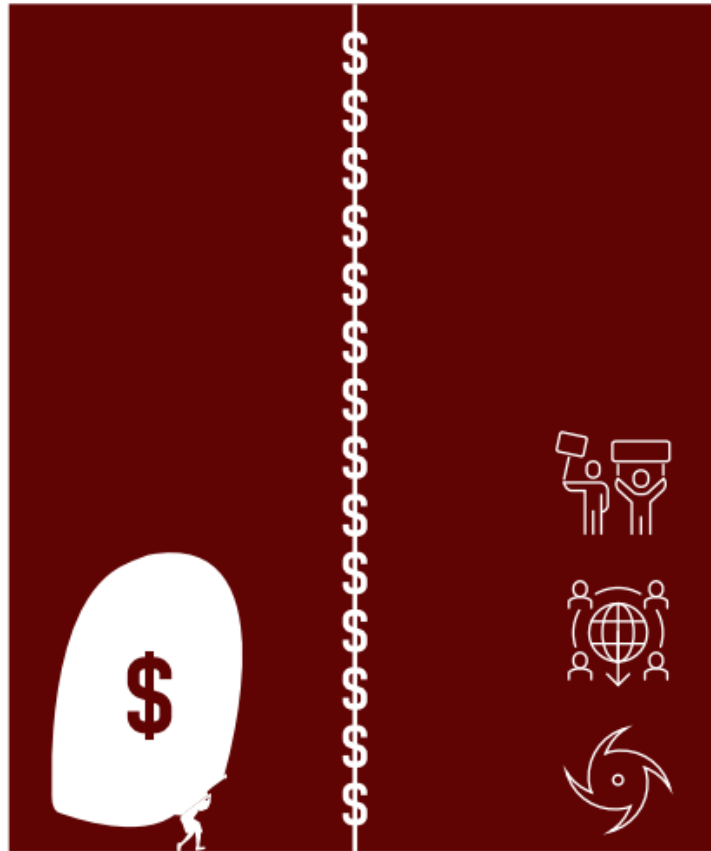


**Extreme weather  
commonplace**



# AGGREGATE ECONOMIC DAMAGES BY 2100

Substantial, owing to the combined effects of **political instability**, **losses of ecosystem services** and **climate change**



Small, but the loss in **ecosystem services** due to **climate change** creates large economic losses



Relatively small, but some local losses associated with **extreme weather events**





# Break





# Break video





# Module 1

## Climate Change



- What has caused the climate to change
- How is the climate changing
- **The impacts of climate change**
- Equity & Vulnerability



# Global impacts



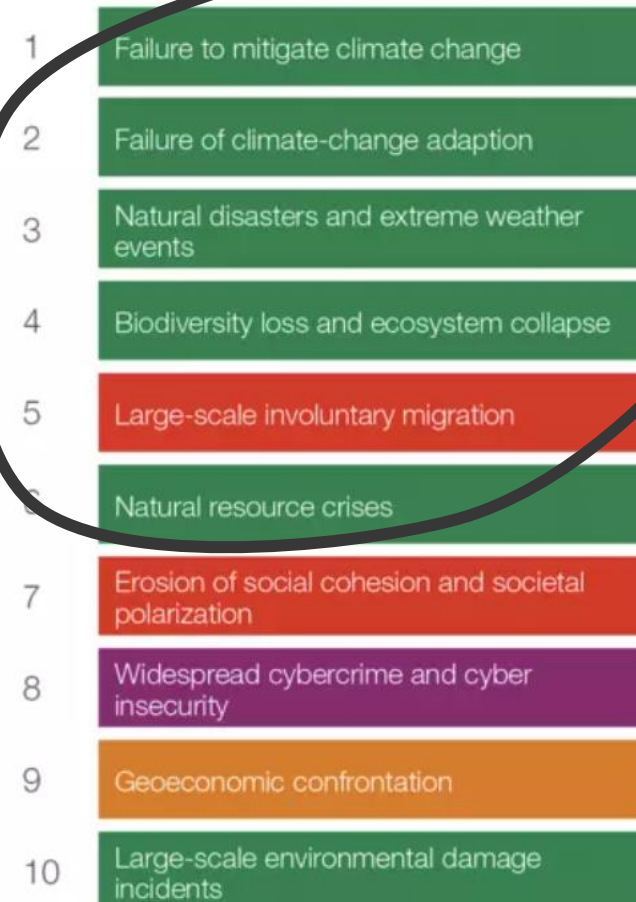
# Top 10 Risks

“Please estimate the likely impact (severity) of the following risks over a 2-year and 10-year period”

## 2 years



## 10 years





Hotter hots



Drier dries

## Climate change impacts in the UK



Wetter wets



Colder colds





## Activity: Local climate change impacts

In groups discuss...

How climate change has impacted, or is likely to impact:

- TfL
- The work of your department





# Module 1

## Climate Change

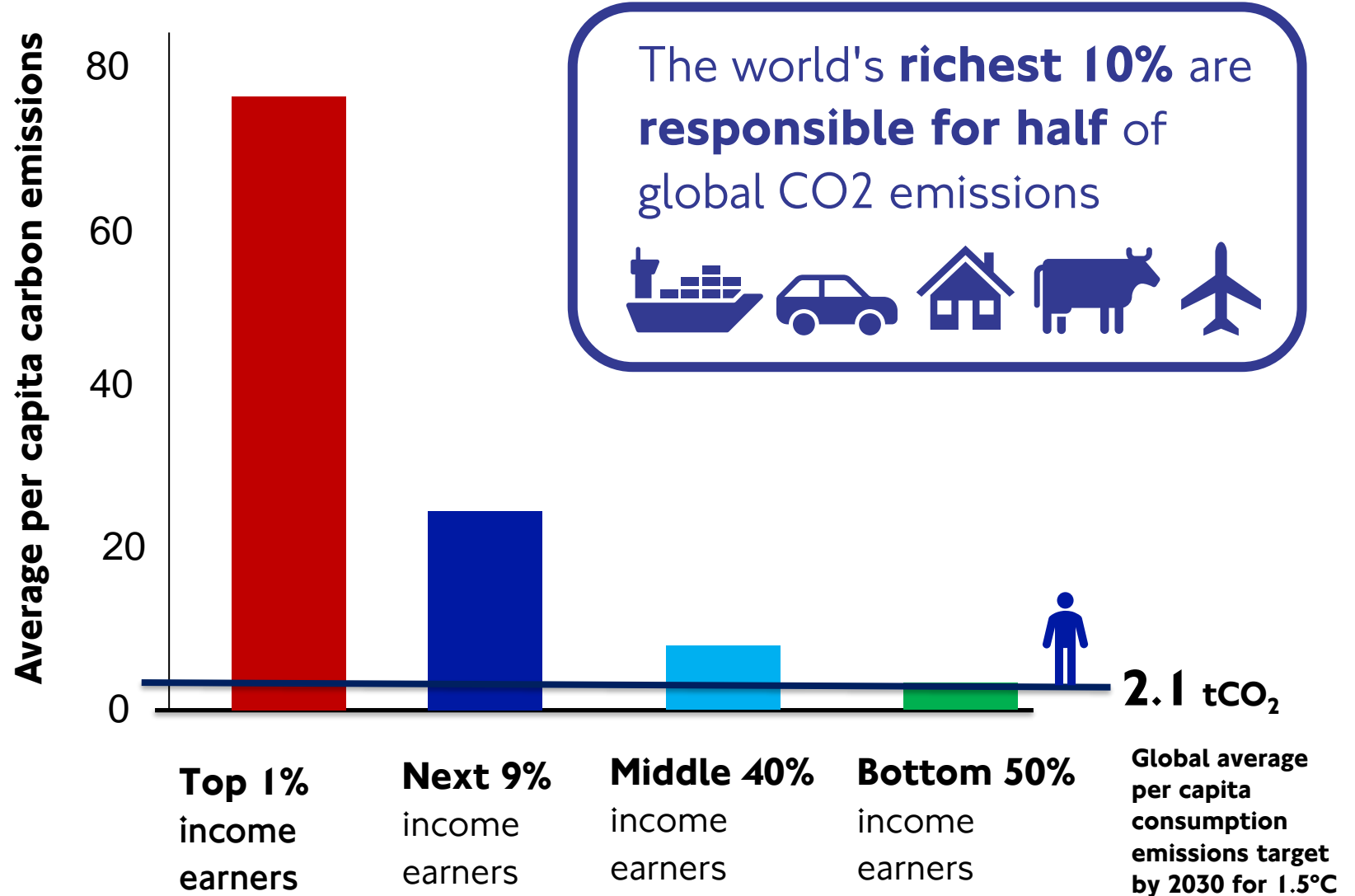


- What has caused the climate to change
- How is the climate changing
- The impacts of climate change
- **Equity & Vulnerability**



# Equity and vulnerability

Where do you sit in the worldwide income / carbon emissions scale?





# Equity and vulnerability in the UK: July 2022, 40°C

**i** News



## UK heatwave: Health alert issued for England as 'extreme' temperatures pose risk to vulnerable

Look out for others, especially older people, young children and babies and those with underlying health conditions, people are urged

**The Guardian**

## UK people of colour four times more likely to live in areas 'at higher risk from heatwaves'



**BIG ISSUE**

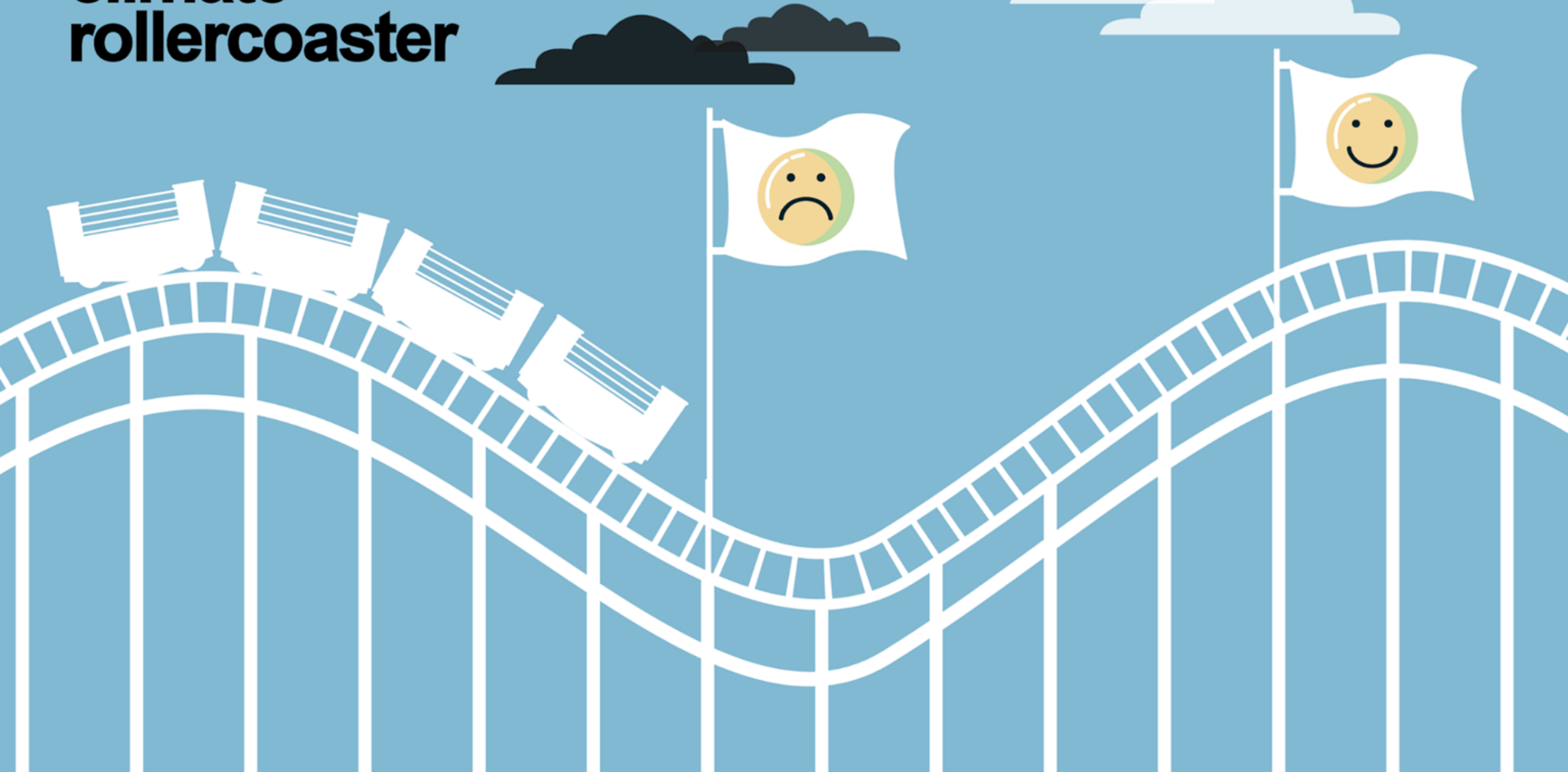


## Government urged to bring in new laws to protect homeless people in heatwaves

Climate change means heatwaves are going to become more frequent and intense but there is no law requiring authorities to protect people on the streets.

# climate rollercoaster

Check in (board)





# Break





# Break video

