



# Cabot Institute

The Paris Agreement – where are  
we now?

*New evidence, a new call for action*

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#CabotLecture2018

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# What happened in Paris?

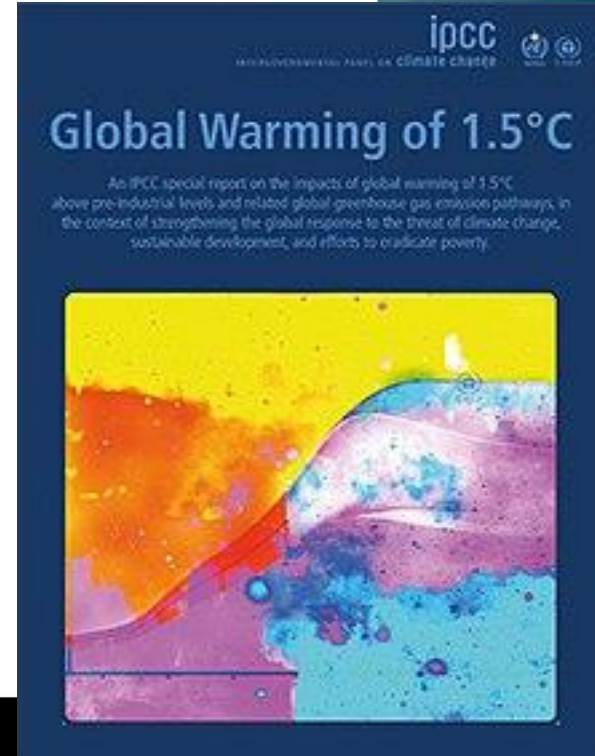
- December 2015 – world leaders met at the 21<sup>st</sup> United Nations Framework Convention on Climate Change
- Agreed to keep mean global temperature rise to below 2 °C, and pursue efforts to limit warming to < 1.5 °C



# 3 years on...

- Direct response to government request in Paris - Intergovernmental Panel on Climate Change Special Report on Global Warming of 1.5 °C
- What are the impacts of limiting warming to 1.5 °C (and compared to 2 °C)? What is required to achieve this?

*91 authors, 40 countries, 6000 references*



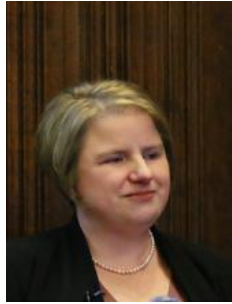
# Bristol researchers involved in IPCC



*Prof.  
Tony  
Payne*



*Dr Jo  
House*



*Prof.  
Dani  
Schmidt*



*Prof.  
Andy  
Ridgwell*



*Prof.  
Dan  
Lunt*



*Prof.  
Jon  
Bamber*



*Dr  
Dann  
Mitchell*



*Prof. Pierre  
Friedling-  
stein*

# Tonight

- The Paris Agreement: Where are we now?
- **Why** does limiting to 1.5C matter?
- **What** will the world look like?
- **How** do we achieve this?



*Prof. Tony  
Payne*



*Dr Jo  
House*



*Dr Dann  
Mitchell*



*Dr Alix  
Dietzel*





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Future climate change

Dr Dann Mitchell

 @ClimateDann

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# Why did we write this report?

Science

Environmental

Human



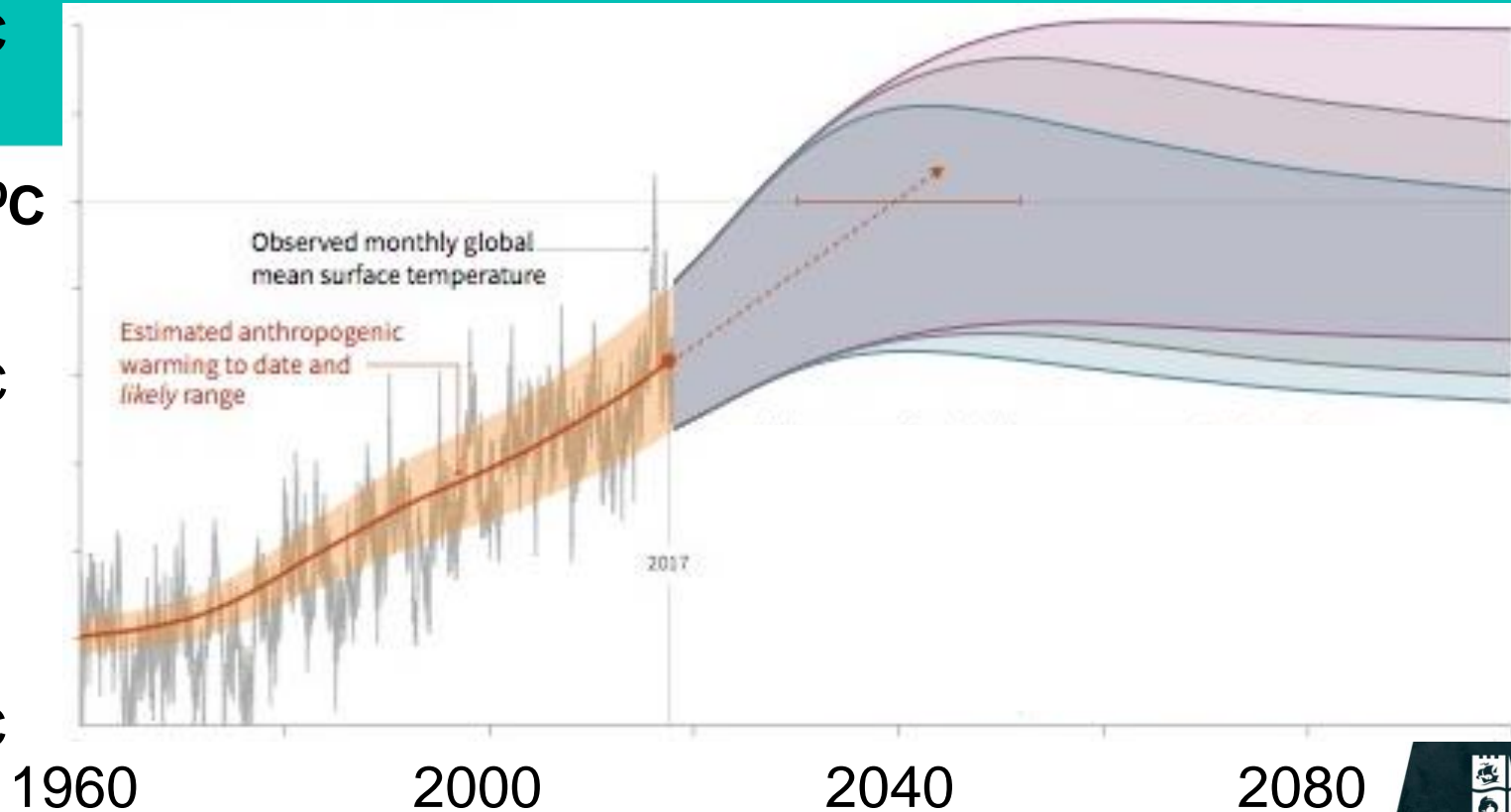
# Global Mean Temperature

2 °C

1.5 °C

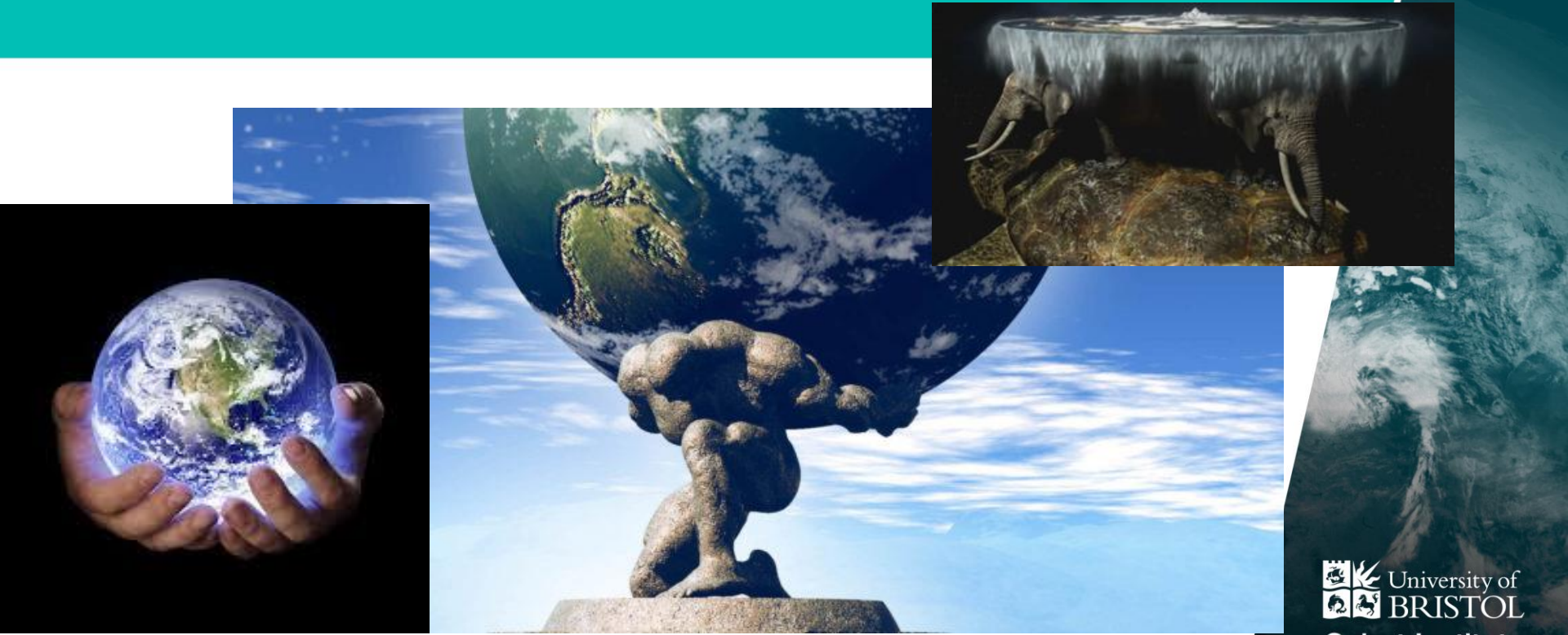
1 °C

0 °C

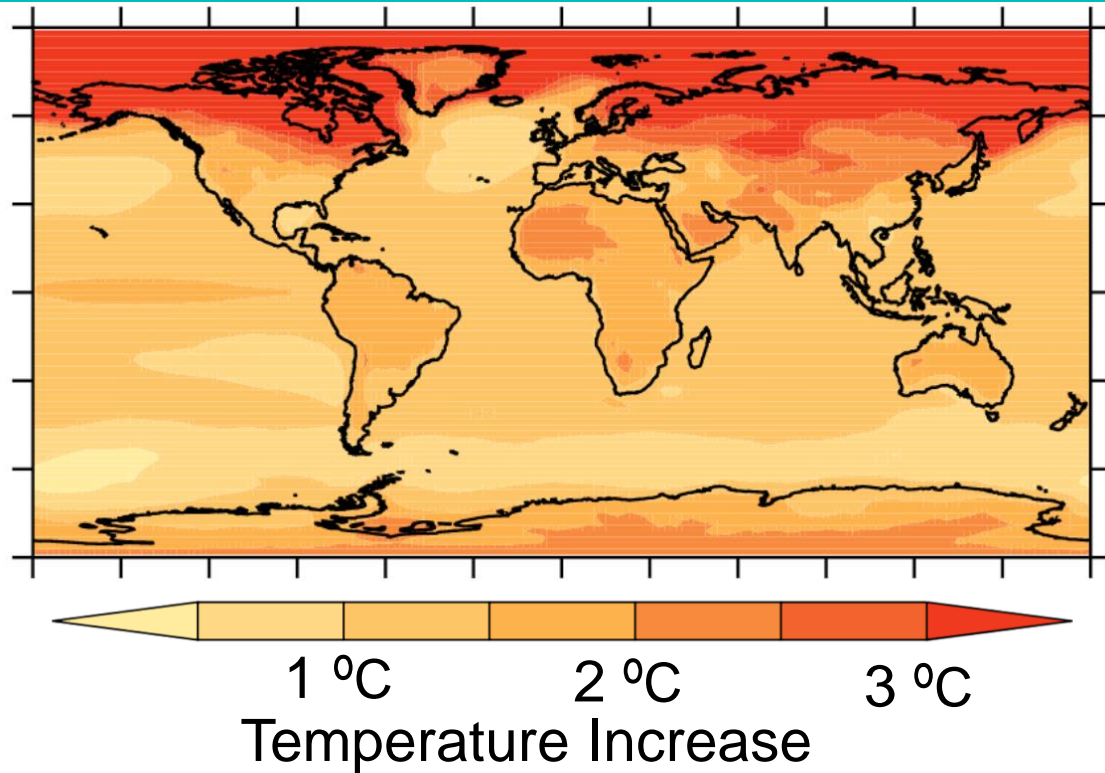




# Who cares about the global mean?



# Regional temperatures at 1.5C



2 °C

Almost every  
year

1.5 °C

Every 2 years

Current

Every 5 years

# How can the global temperature impact us locally?

## 1. Heating up the atmosphere

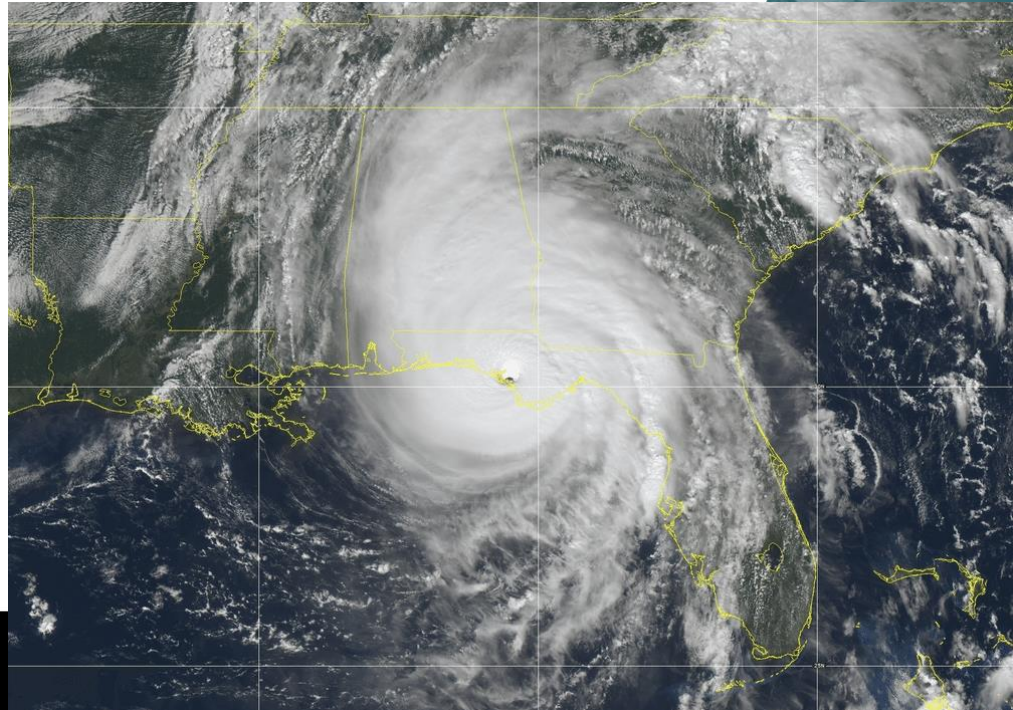
➤ **It expands**

## 2. Stretching storm systems

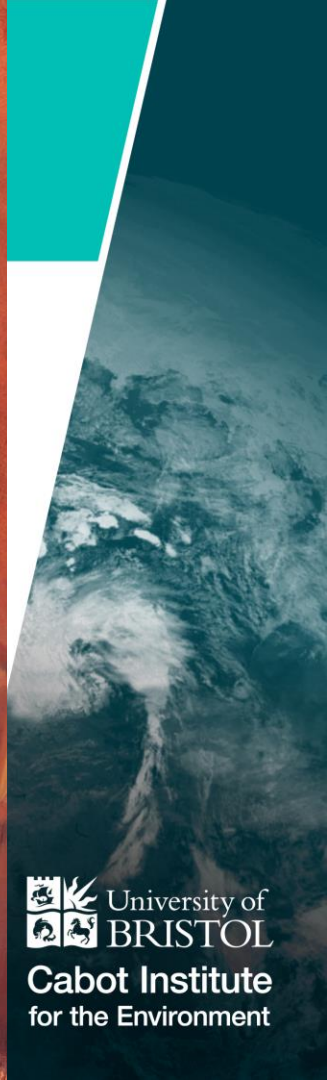
➤ **More intense**

## 3. More intense storms

➤ **Last longer**











# Thank You

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A satellite image of Earth from space, showing a large portion of the Western Hemisphere. The image is in shades of teal and blue, with white clouds and dark landmasses. The Earth's curvature is visible on the left side. A dark teal diagonal shape cuts across the right side of the image, serving as a background for the text.

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What might a 1.5C world be like?

Tony Payne  
School of Geographical Sciences

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# Who am I?

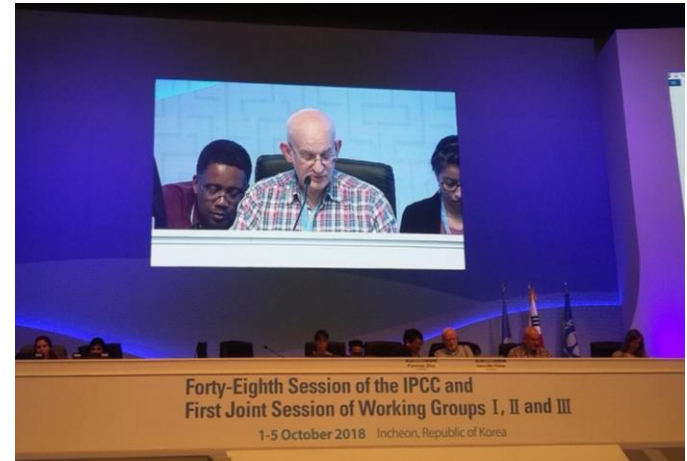
Main are of expertise in Greenland and Antarctic ice sheets, and future sea level rise

Lead Author on Sea level chapter 5<sup>th</sup> Assessment Report of the IPCC (2013)

Lead Author on Impacts chapter of 1.5C Special Report

Approval session of *Summary for Policy Makers*, Korea October 2018

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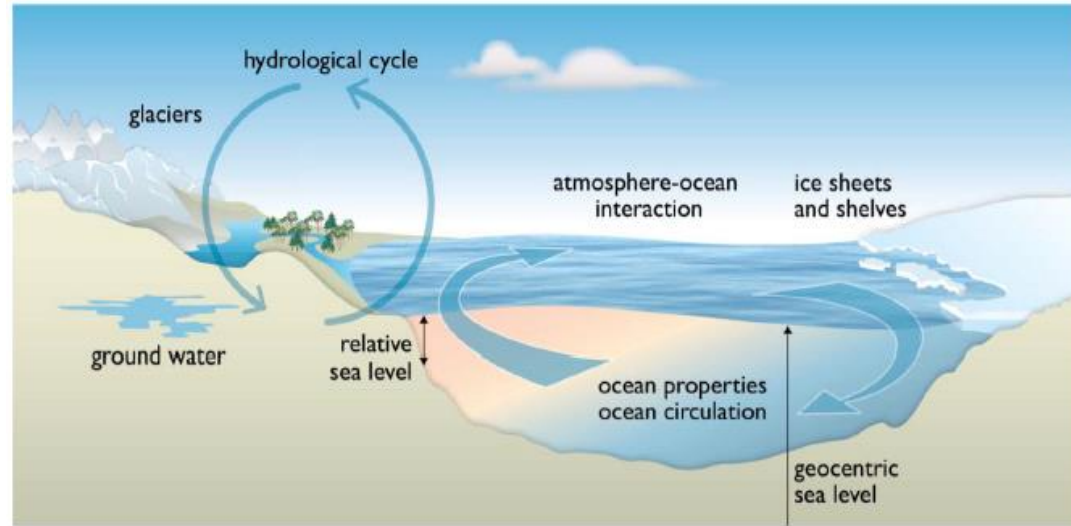


# How important is the extra 0.5 °C?

## Sea level

At 2100, around  
10cm less in a 1.5C  
world compared to  
2.0C (~20%)

Roughly 10 million  
fewer people exposed  
to risk



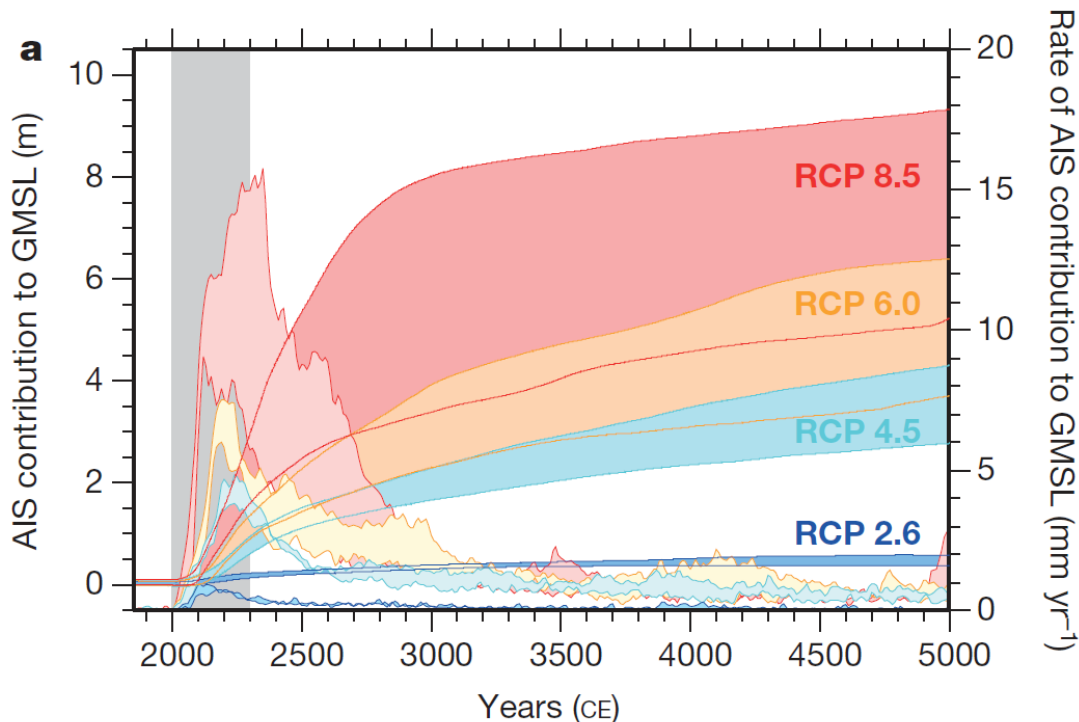


# How important is the extra 0.5 °C?

## Sea level

Melting Greenland and Antarctic ice sheets could raise by many meters over 100s-1000s years

Existential threat to many small island states and coastal cities

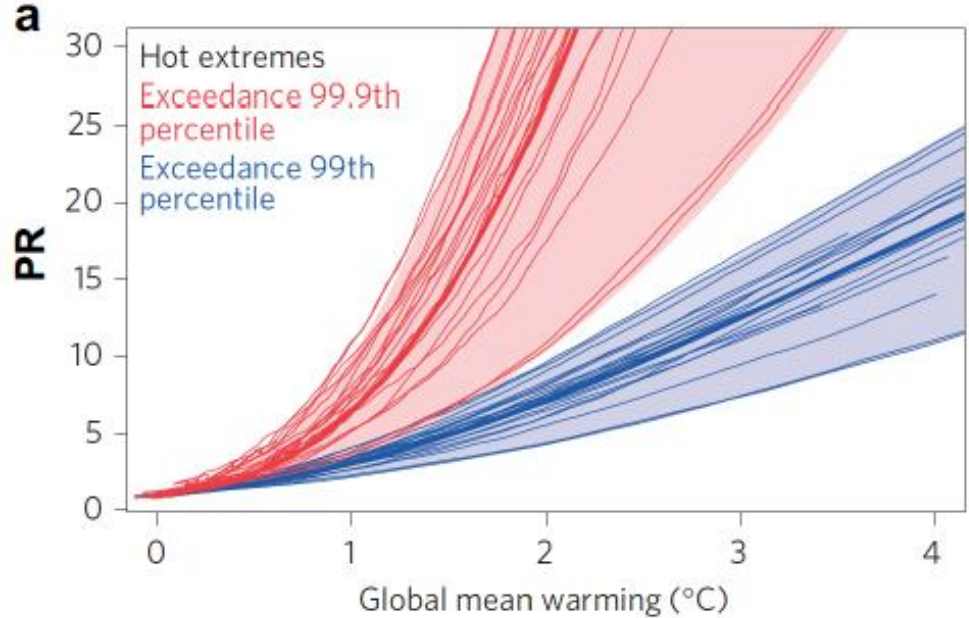


# How important is the extra 0.5 °C?

## Extremes of weather

Number and severity of days increase far more than mean

Reduced food availability in the Sahel, southern Africa and the Mediterranean

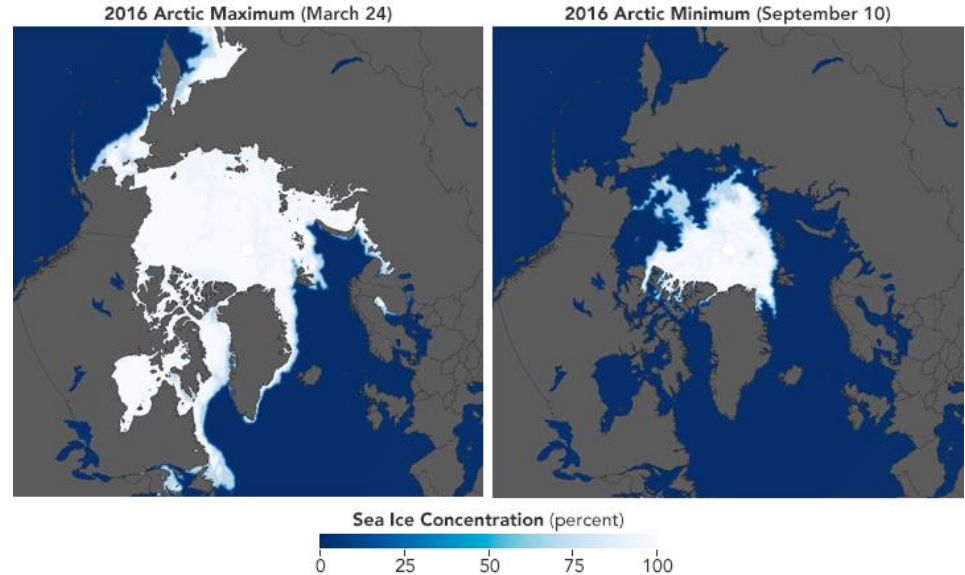


# How important is the extra 0.5 °C?

## Sea ice and the Arctic

Chance of a sea-ice free Summer increases from one per century (1.5C) to one per decade (2.0C)

Arctic ecosystems (tundra, permafrost) at particularly high risk of degradation



# How important is the extra 0.5 °C?

## Coral reefs and the oceans

Coral reefs all but disappear at 2.0C, 10-30% survive at 1.5C

Ocean warming, increased acidity and declining oxygen levels affect biodiversity and fisheries.





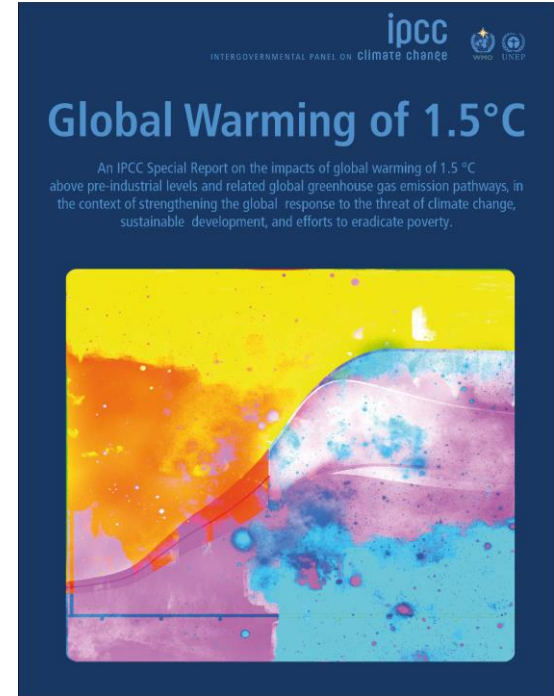
# How important is the extra 0.5 °C?

## Summary

Limiting warming to 1.5C substantially reduces ecosystem and biodiversity loss, as well as impacts on health, water and food security ...

how to achieve it?

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A satellite image of Earth from space, showing a curved horizon and swirling cloud patterns over a dark ocean. The image is partially obscured by a dark teal diagonal shape on the right side of the slide.

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How can we achieve a 1.5  
degree world?

Dr Jo House

Cabot Co-Chair: Environmental Change

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# The Solutions – key messages

- There is lots that can be done and is being done, **but we need to ramp it up**
- Some is already affordable and could save you money
- It has other co-benefits so we might want to do it anyway



# Nations Unies

## Conférence sur les Changements Climatiques 2015

COP21/CMP11

Paris, France



- 196 countries signed up to Paris Agreement
- Country pledges “Nationally Determined Contributions”

Well below  
2 °C

Pursue  
efforts  
1.5 °C

Balance of  
emissions  
& removals

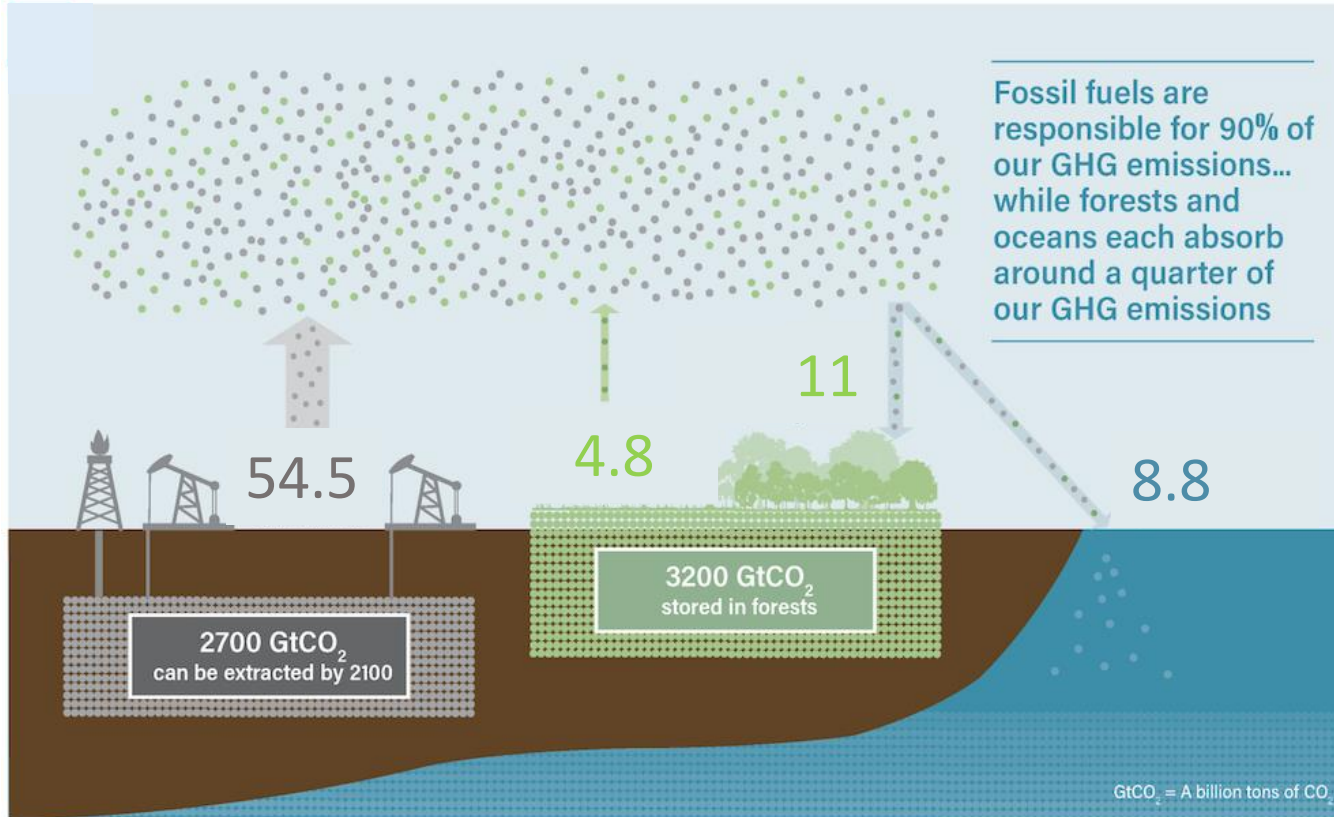


# What do we need to do?

## Main Greenhouse Gasses:

- Carbon dioxide
- Methane
- Nitrous oxide

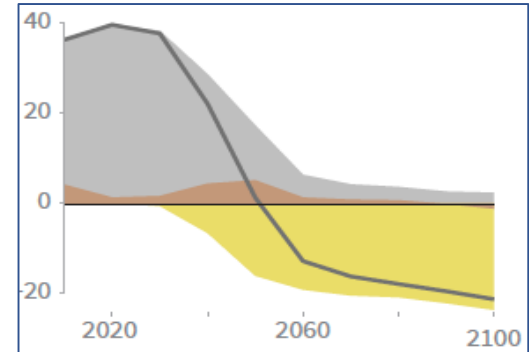
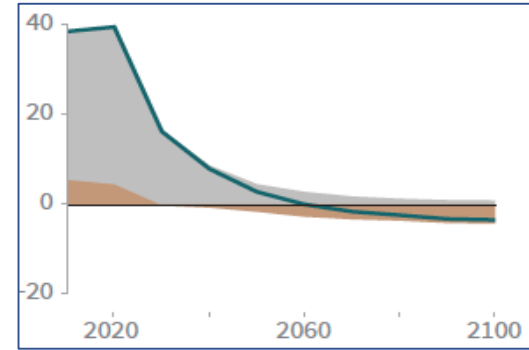
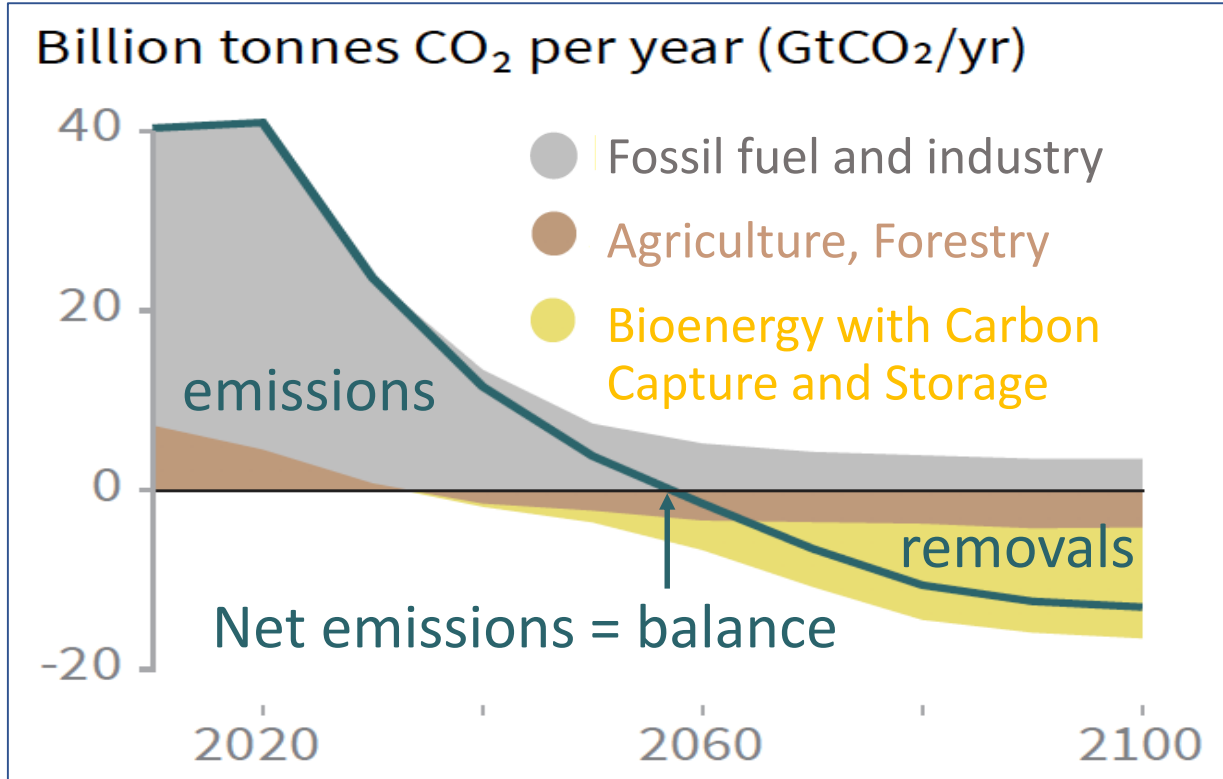
We can only put 750 GtCO<sub>2</sub> into the atmosphere to limit warming to 1.5 degrees – around 15 years or current emissions



Emissions GtCO<sub>2</sub> per year = a billion tonnes of carbon dioxide per year

# How do we get to 1.5 degrees?

There are multiple different pathways that can limit warming to 1.5 °C



# What can we do with energy and industrial emissions?

Reduce

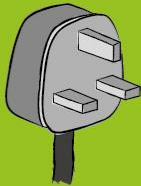
Replace

Remove

## ENERGY SAVING



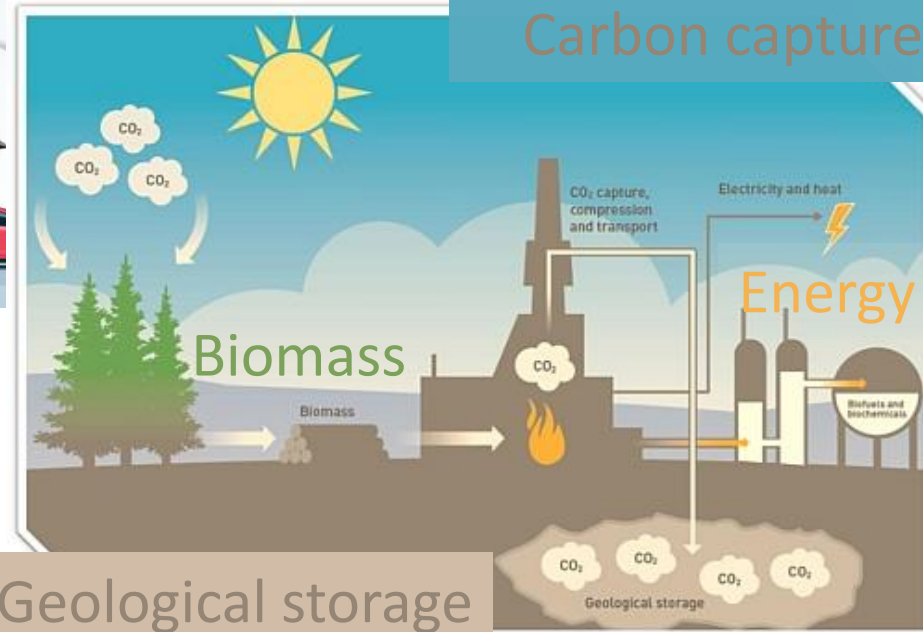
SWITCH IT  
OFF



UNPLUG IT



SAVE POWER



# What else can we do on the land?

Protect

Enhance

Reduce

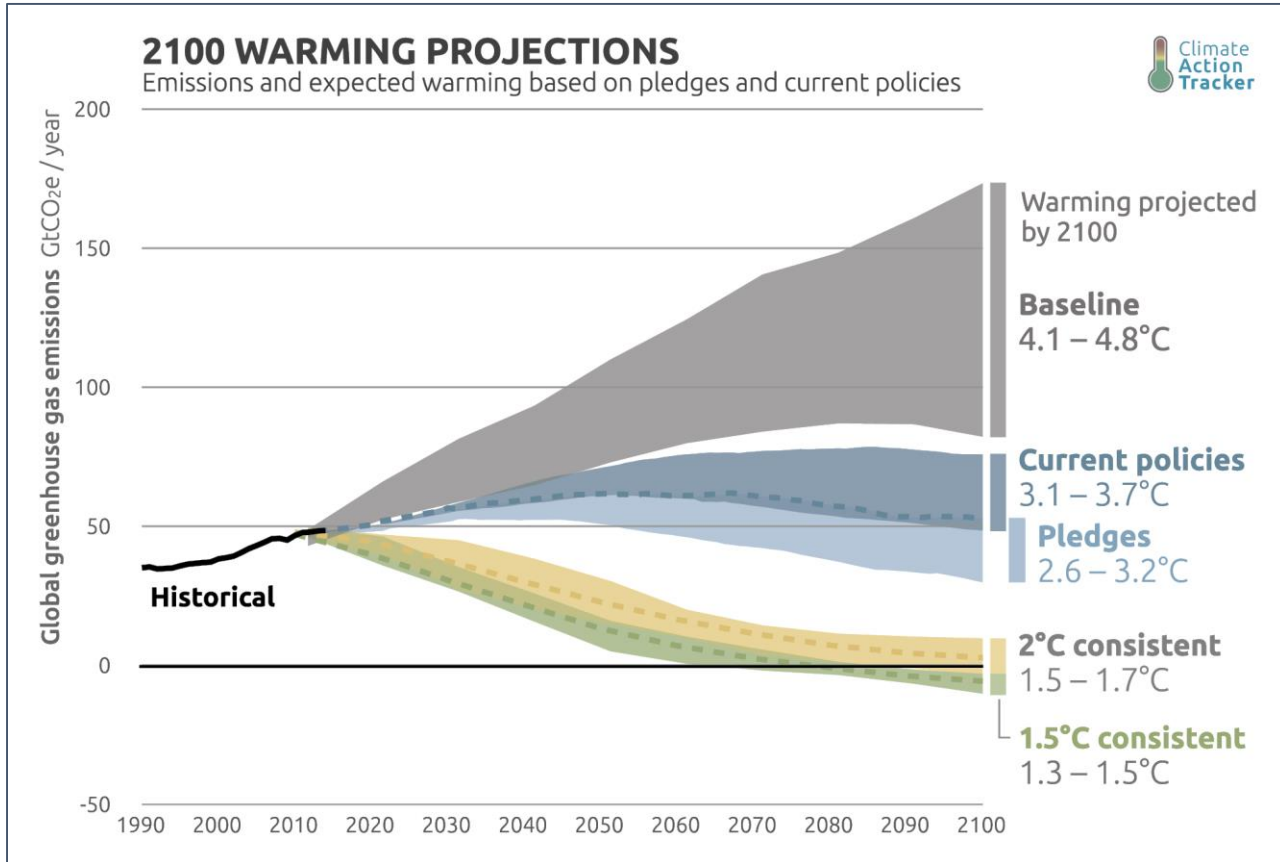


Tree planting 'can reduce flooding'





# Where have we got to so far?



Climate pledges so far will limit global warming .... but not enough.

(Climate Action Tracker)

Forests expected to provide a quarter of pledged mitigation by 2030.

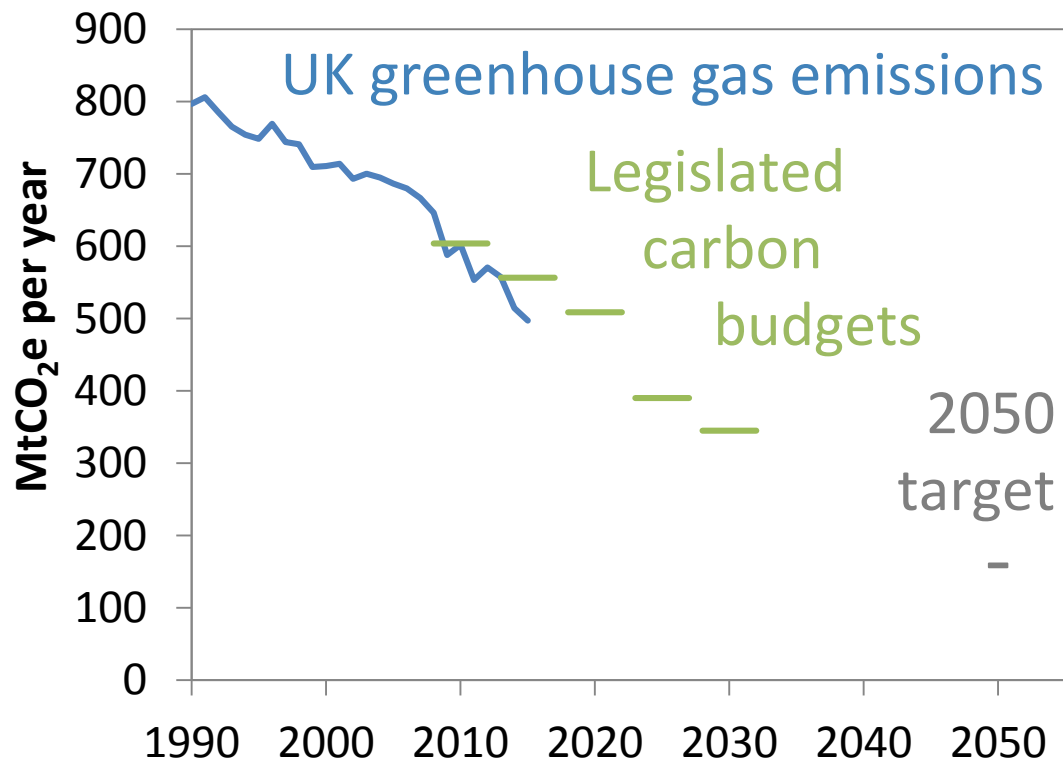
(Grassi, et.al. 2017)

# What is the UK government doing .... and not doing?



Climate Change Act 2008

80% reduction in UK greenhouse gas emissions for 2050 compared to levels in 1990



# What about Bristol?

**Target:** Reduce carbon dioxide emissions 80% by 2050 compared to 2005

**So Far:** reduced energy use by almost 20% and carbon dioxide emissions by almost 18% between 2005 and 2013



# The Solutions – key messages

- There is lots that can be done and is being done, **but we need to ramp it up**
- Some is already affordable and could save money
- It has other co-benefits so we might want to do it anyway

**How can we make it happen?**







# Thank You

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How Can We Achieve a 1.5  
Degree World?

Dr Alix Dietzel  
Lecturer in Global Ethics  
[@alixdietzel](#)

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# My Research

**Climate change justice** – ethics, fairness, responsibility, human rights.

**Climate change policy analysis** – states, sub-state actors, individuals.





# The Global Political Response: The UNFCCC (Kyoto Protocol, Paris Agreement)





# The Global Political Response: Sub-State Actors (Corporations, NGOs, Cities)



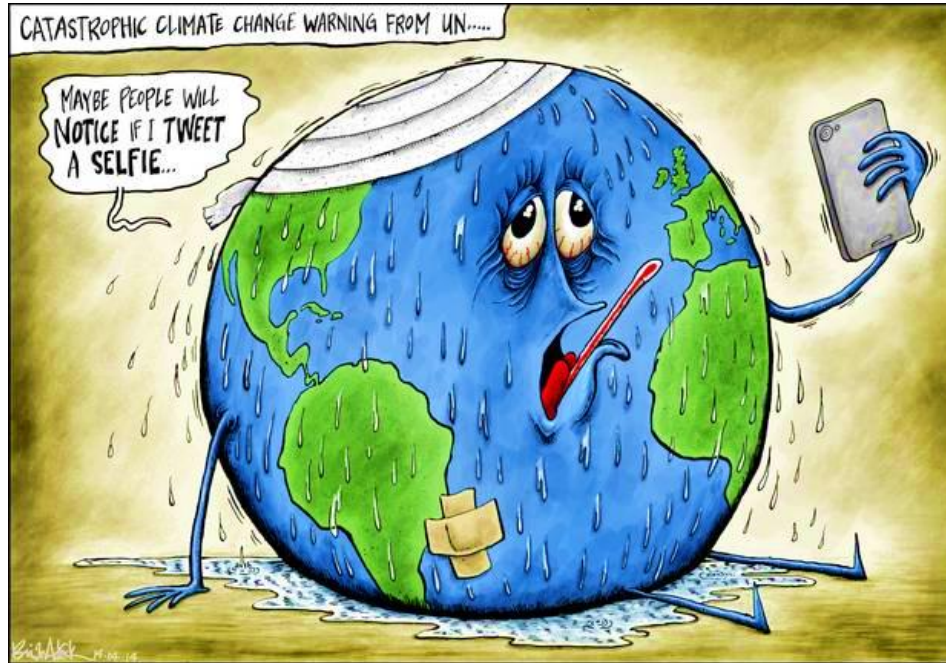
**C40CITIES**  
CLIMATE LEADERSHIP GROUP



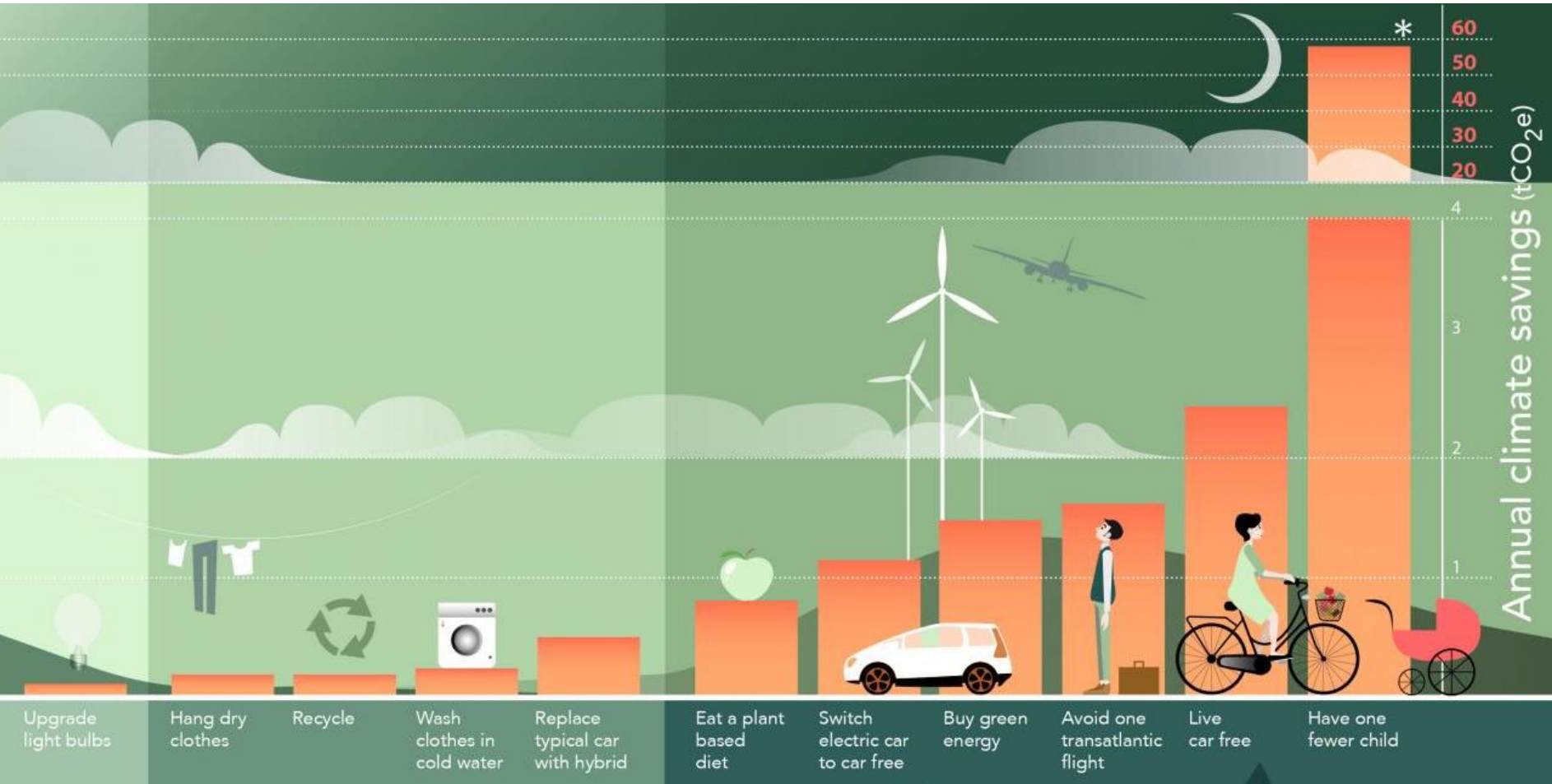
**THE CLIMATE GROUP**



# Who is Responsible for Acting on Climate Change?



# What Should Individuals Do?



# What Should Individuals Do?







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# Q&A

Prof Jemma Wadham - @jemmawadham

Dr Dann Mitchell - @ClimateDann

Prof Tony Payne - @BristolGlac

Dr Jo House - @drjohouse

Dr Alix Dietzel - @alixdietzel

@cabotinstitute @beisgovuk  
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