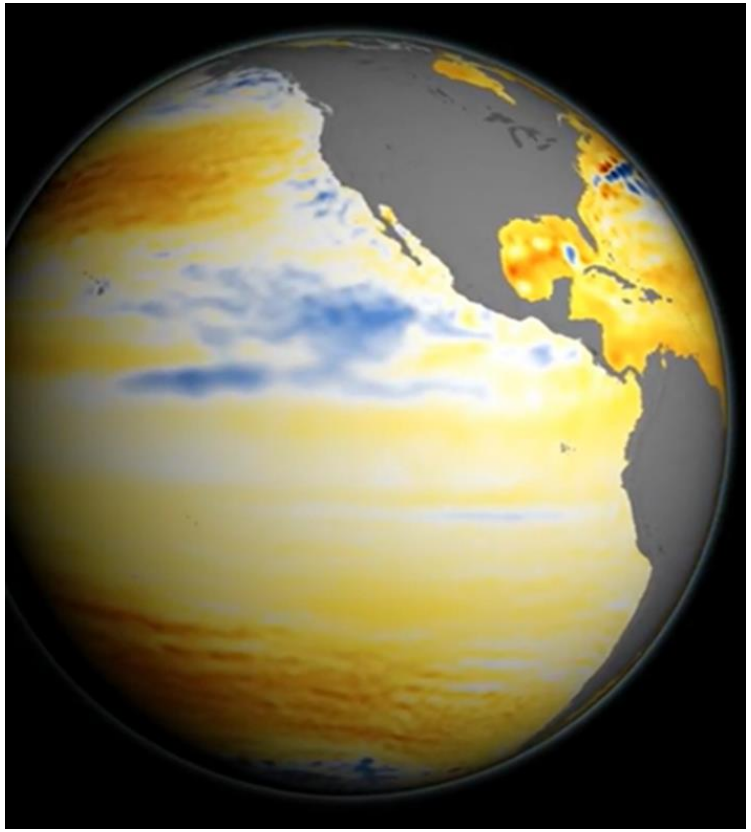
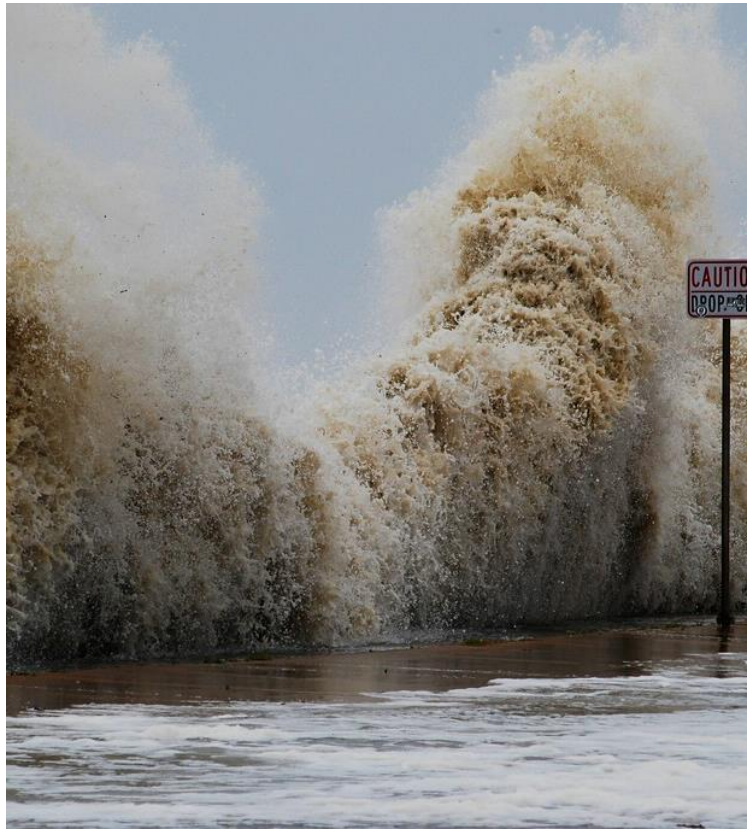
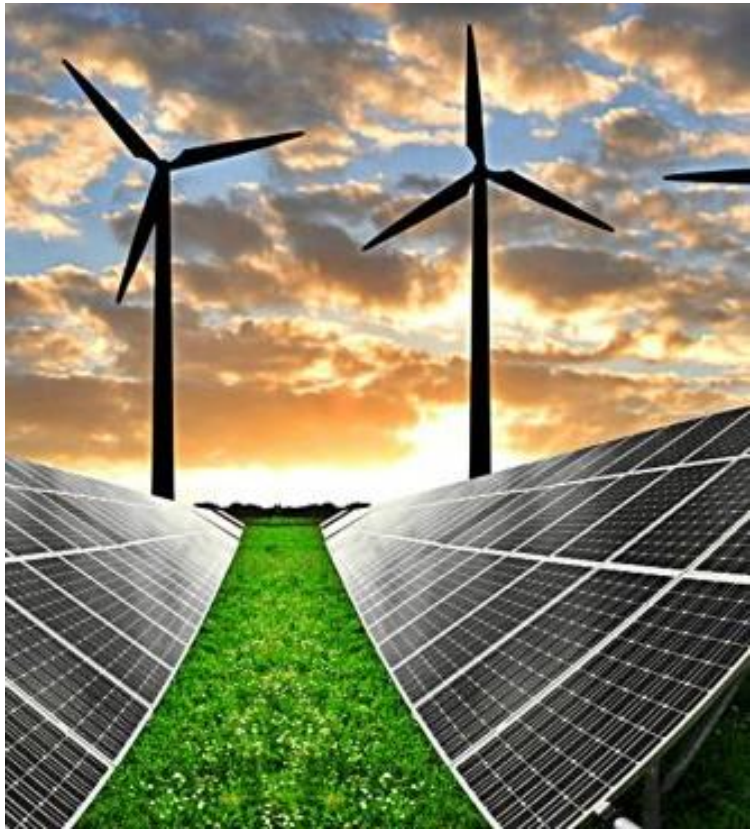






Transformation, Adaptation and Mitigation for a 1.5 degree Global Warming:

Current challenges in climate science and policy

bc3 BASQUE CENTRE FOR CLIMATE CHANGE
Klima Aldaketa Ikergai
Sustainability, that's it!

ELISA SAINZ DE MURIETA · BC3-UPV/EHU SUMMER SCHOOL · BILBAO, 8TH OF JULY, 2019

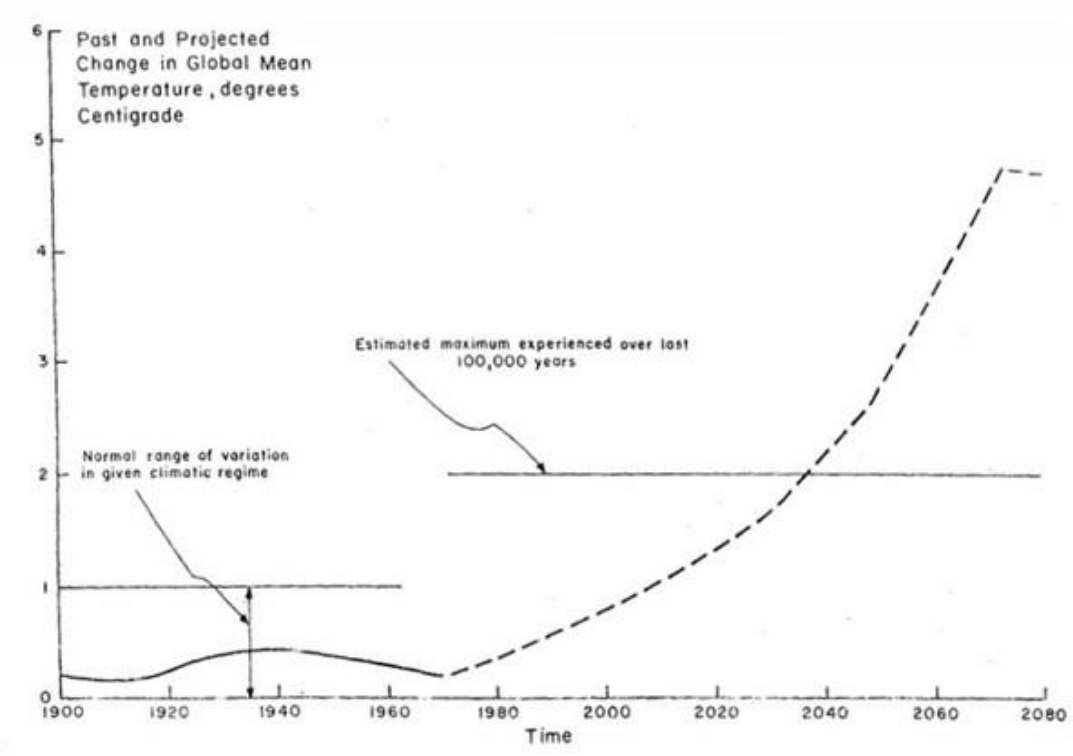
10TH EDITION OF THE BC3-UPV/EHU SUMMER SCHOOL!

10TH EDITION OF THE BC3-UPV/EHU SUMMER SCHOOL!

1. IPCC 1.5 Report: background and process
2. SR1.5: Where are we now?
3. What does 1.5C mean compared to 2C?
4. The magnitude of the challenge

1. IPCC 1.5 REPORT: BACKGROUND AND PROCESS

- 2C Climate target



- 1988: the IPCC is created
- 1990: SEI suggests a 2C limit
- 1992: UNFCCC is adopted
- 1996: EU Council of Environmental Ministers declared the 2C as the limit
- 1997: Kyoto Protocol is adopted
- 2010: Cancun Agreements: countries commit to limit temperatures to 2C

Source: Nordhaus (1977)

1. IPCC 1.5 REPORT: BACKGROUND AND PROCESS

- What about the 1.5C target?
  - First mentioned in the COP16 Cancun Agreements (2010)

Established a process to review "the adequacy of the long-term global goal (…)."

- Review of the long-term global goal (LTGG)
  - From 2013 to 2015
  - Process: Structured expert dialogue
  - Report presented in Bonn in May 2015

1. "In some regions and vulnerable ecosystems, high risks are projected even for warming above 1.5°C"
2. "Buffer zone" instead of "guardrail".
3. "'While science on the 1.5°C warming limit is less robust, efforts should be made to push the defence line as low as possible'

1. IPCC 1.5C REPORT: BACKGROUND AND PROCESS

COP21 · CMP11
PARIS 2015
UN CLIMATE CHANGE CONFERENCE

1. IPCC 1.5C REPORT: BACKGROUND AND PROCESS

Article 2

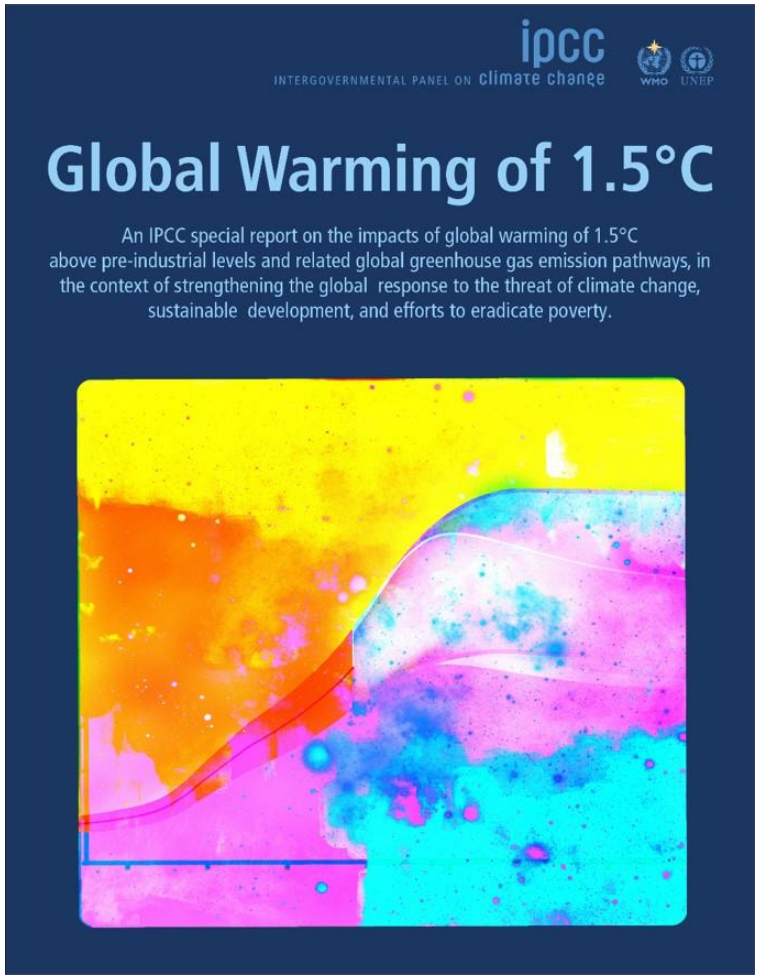
1. This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by:

(a) Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;

…But what does a 1.5C scenario mean?

1. IPCC 1.5C REPORT: BACKGROUND AND PROCESS

- Paris Agreement: UNFCCC invites the IPCC to prepare a Special Report on 1.5C (known as SR1.5):
  - Impacts of climate change above 1.5C compared to pre-industrial levels
  - Related emission pathways to limit global temperatures to 1.5C
  - IPCC outline (2016) includes links to sustainable development and poverty eradication.
- IPCC team: 91 authors from 44 countries
- IPCC SR1.5 published in October 2018



2. SR15: WHERE ARE WE NOW?

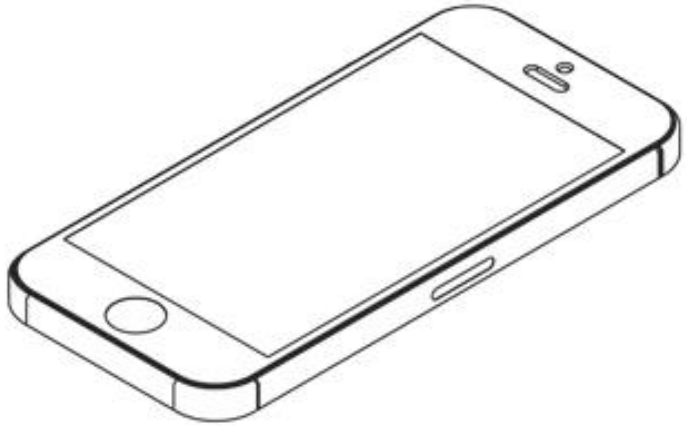
Before going ahead…

1. How much has the temperature increased since the pre-industrial era?

2. What is the current concentration of CO2 in the atmosphere?

3. At current warming rates, temperatures are expected to reach 1.5C by… ?

Go to **www.menti.com** and use the code **33 90 96**



1

Grab your phone

www.menti.com

2

Go to www.menti.com

3

Enter the code 33 90 96 and vote!

2. SR15: WHERE ARE WE NOW?

≡ EL PAÍS Materia

CLIMA ›

2014 ha sido el año más caluroso desde que empezaron los reg

La temper

CALENTAMIENTO GLOBAL ›

2015 fue el año más cálido desde que arrancaron los regis

El pasad

≡ EL PAÍS Materia

2016 fue el año más caluroso del que se tiene constancia

La Tierra

2017 ha sido el segundo año más caluroso desde

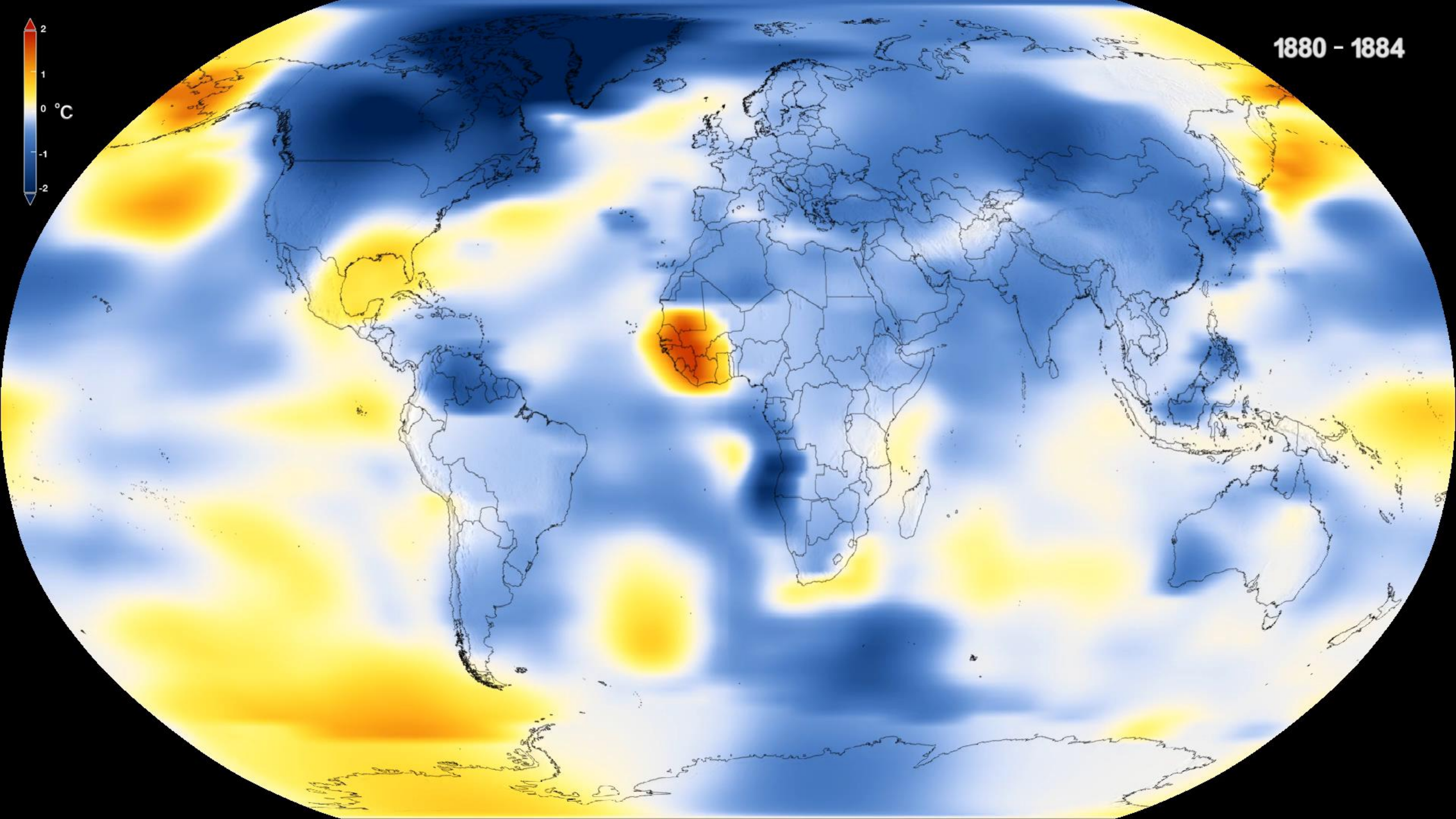
• La Organ consecuen

• Según in calentami

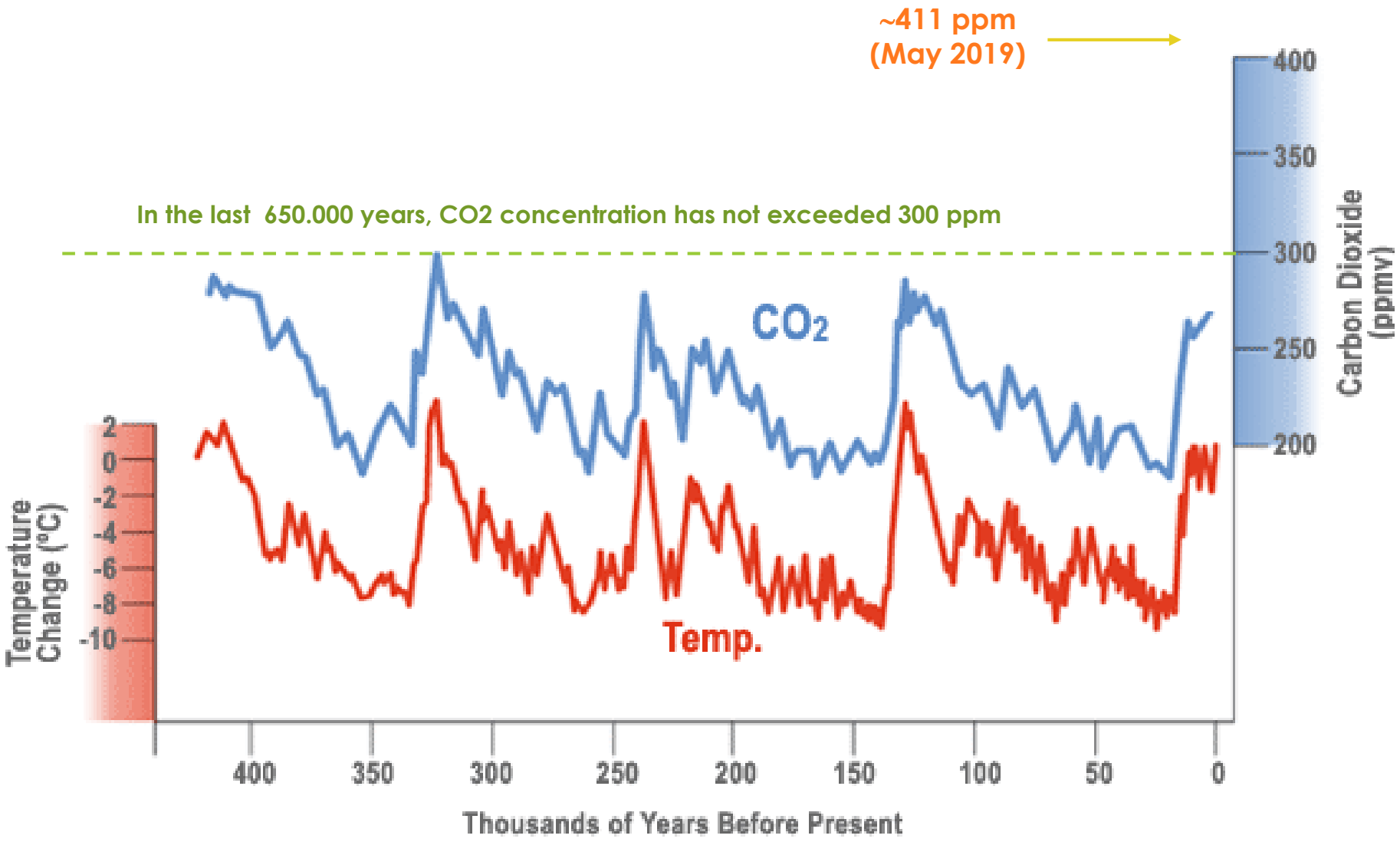
2018 es el cuarto año más cálido en la historia moderna de la Tierra

• El balance de la Organización Meteorológica Mundial destaca que en los últimos 22 años se han batido 20 récords de temperaturas elevadas

Source: El País, La Vanguardia

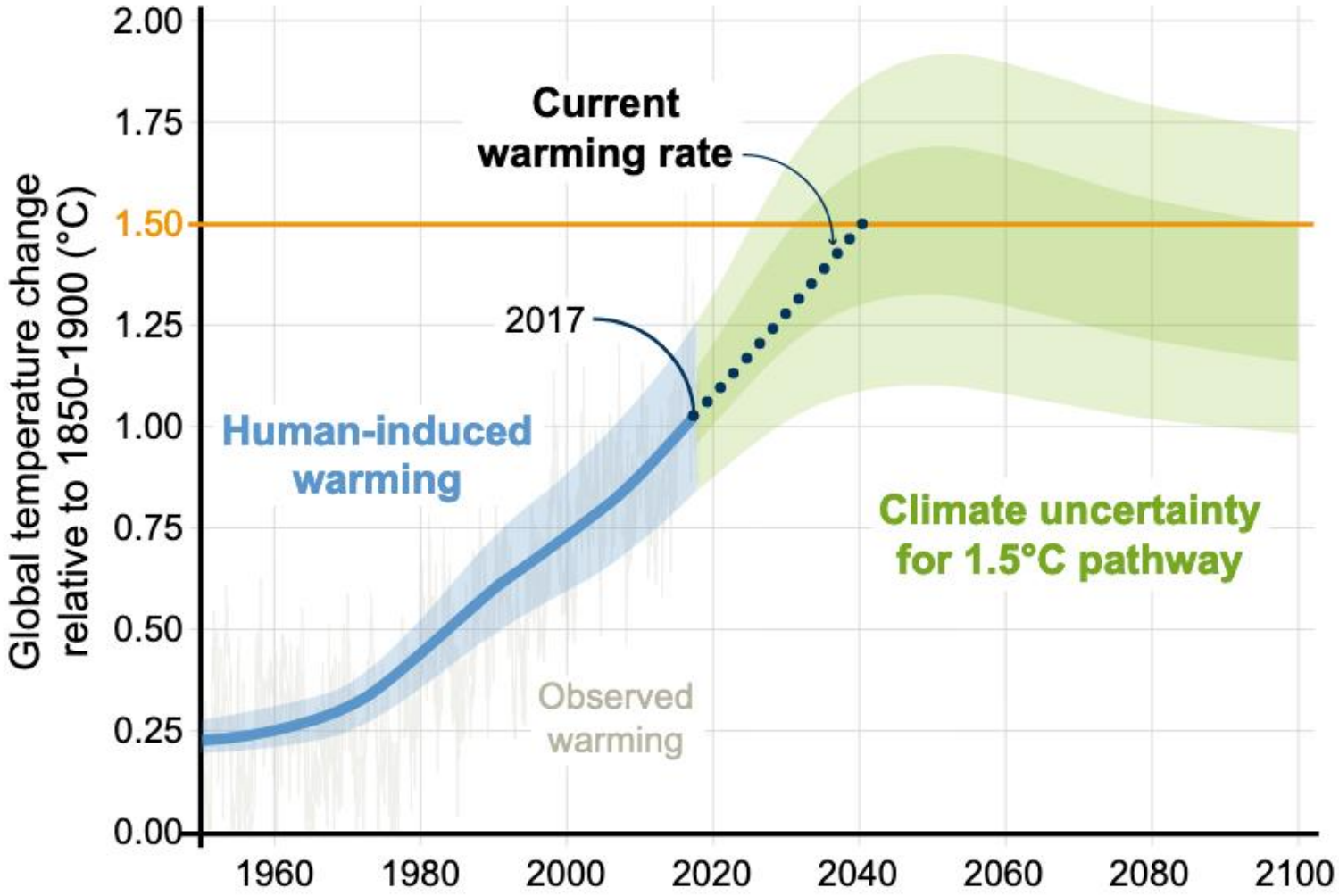

1880 – 1884
2
1
0
-1
-2
°C

2. SR15: WHERE ARE WE NOW?



http://www.johnenglander.net/chart-of-temperature-and-co2-400000-years/

2. SR15: WHERE ARE WE NOW?



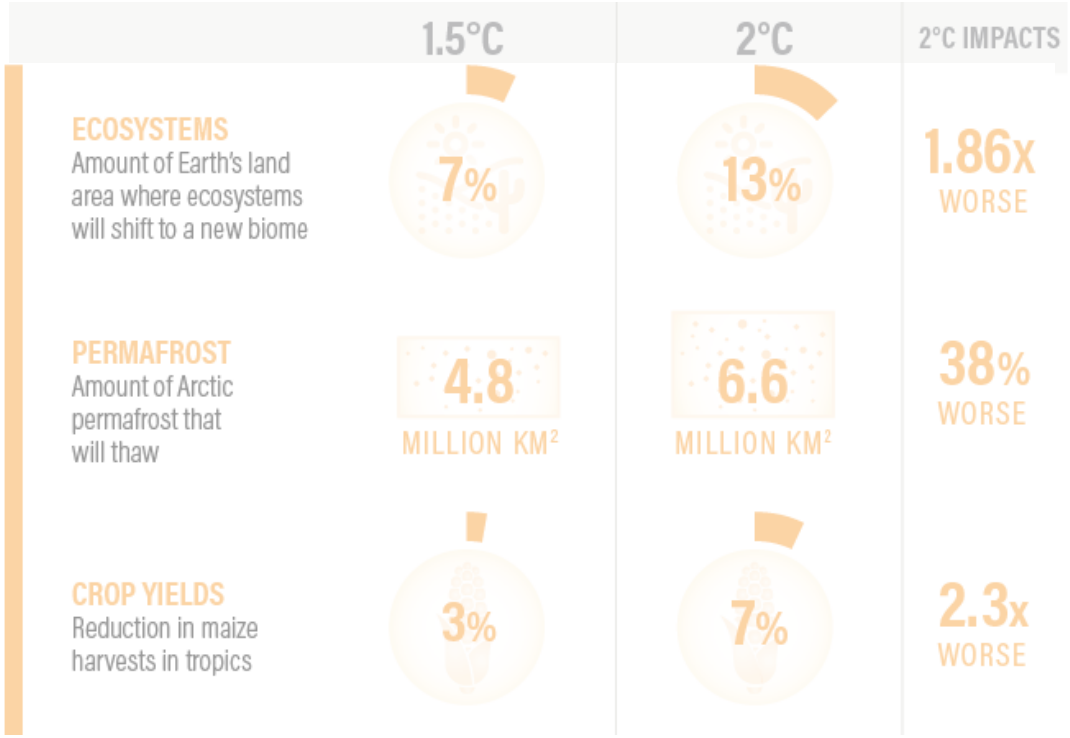
Source: FAQ 1.2, Figure 1. Chapter 1, IPCC SR15 (2018)

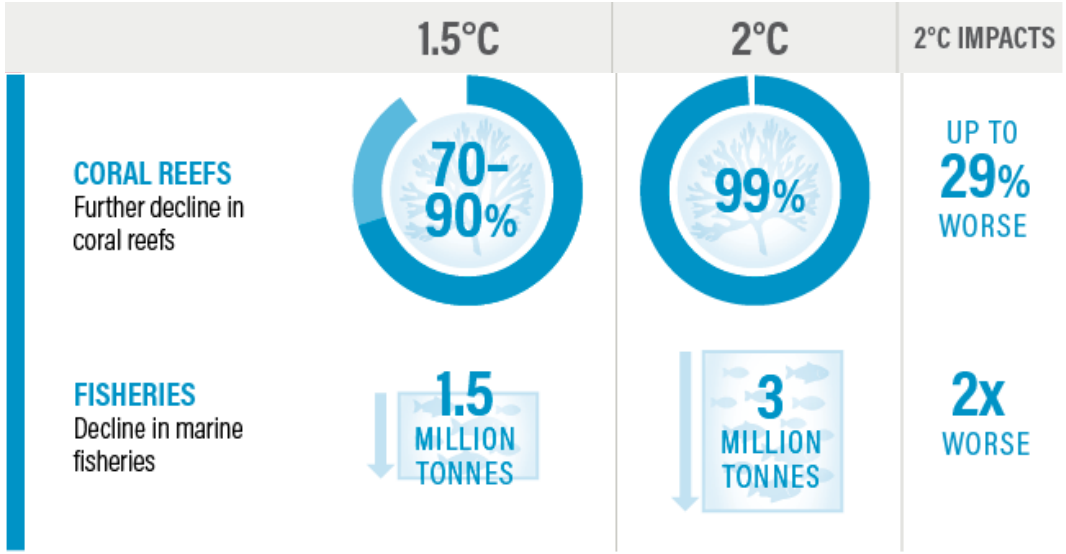
3. WHAT DOES 1.5C MEAN COMPARED TO 2C?

"Climate models project **robust differences** in regional climate **between present-day and global warming up to 1.5°C, and between 1.5°C and 2°C** (*high confidence*)." (Ch. 3, pp. 177).

Source: World Resources Institute

3. WHAT DOES 1.5C MEAN COMPARED TO 2C?





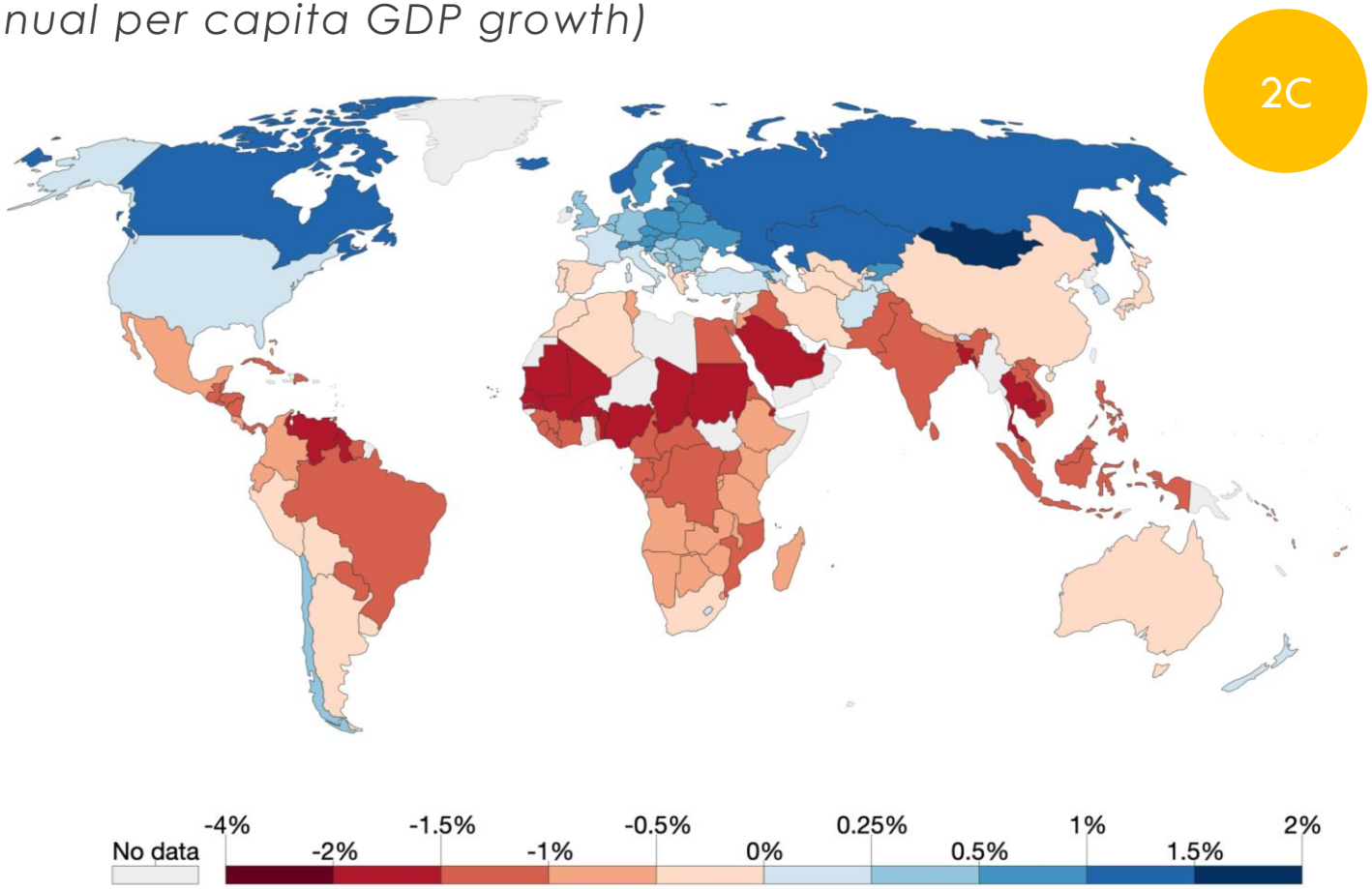
WORLD RESOURCES INSTITUTE

Source: World Resources Institute

3. WHAT DOES 1.5C MEAN COMPARED TO 2C?

Economic impacts of 1.5C and 2C

(Change in annual per capita GDP growth)

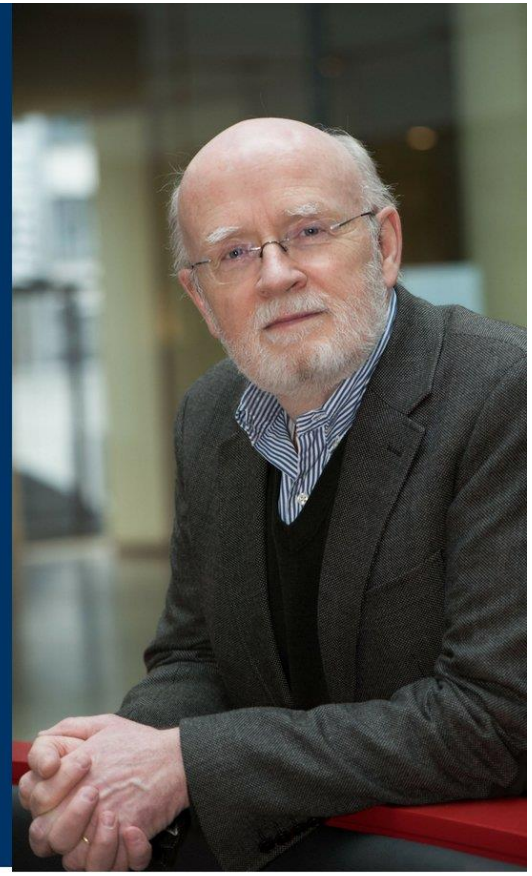


Source: Pretis et al., 2018. Uncertain impacts on economic growth when stabilizing global temperatures at 1.5°C or 2°C warming. Philosophical Transactions of the Royal Society A 376, 20160460; Infographic from Carbon Brief.

3. WHAT DOES 1.5C MEAN COMPARED TO 2C?

In other words…

Every extra bit of warming matters, especially since warming of 1.5 °C or higher increases the risk associated with long-lasting or irreversible changes, such as the loss of the Greenland ice sheet or warm water coral reefs.



Hans-Otto Pörtner

Co-Chair, WG II

Incheon, 8 October 2018

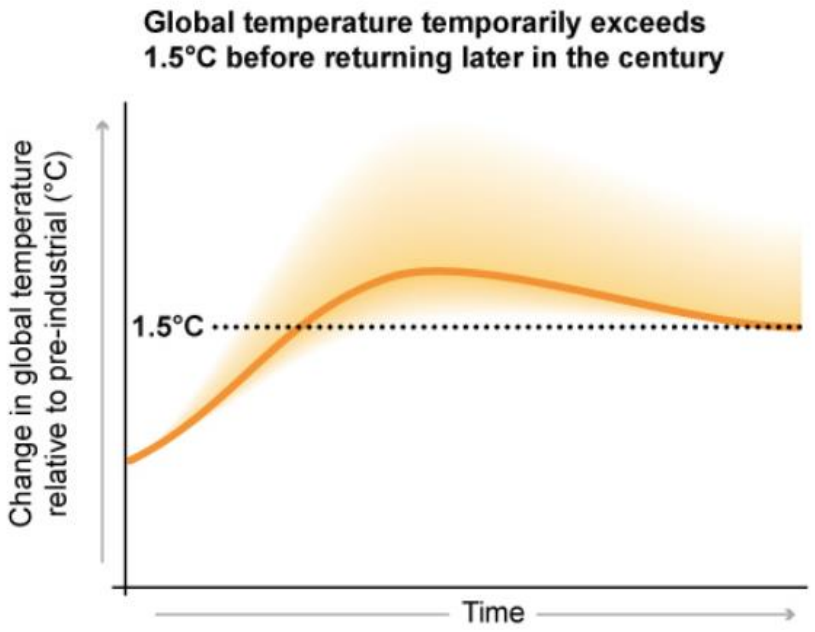
ipcc INTERGOVERNMENTAL PANEL ON climate change

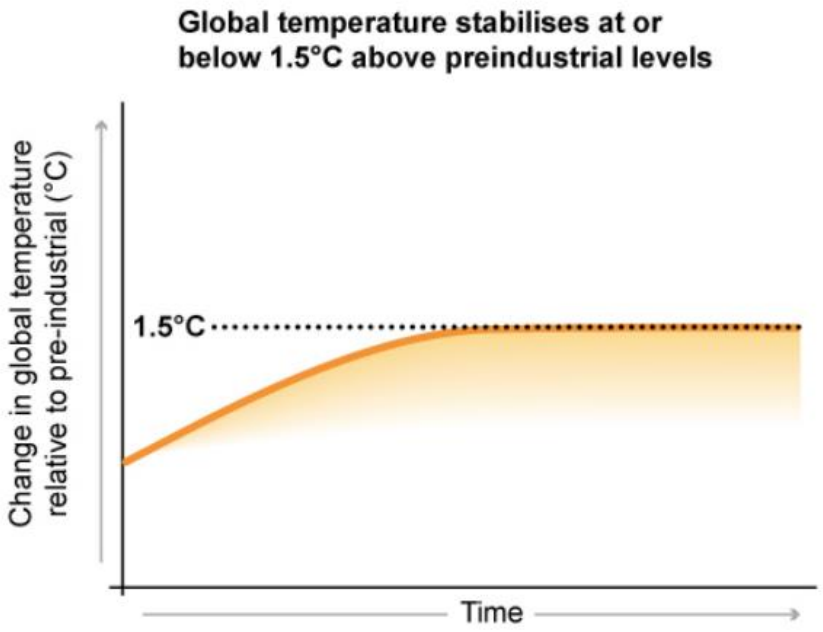
WMO UNEP

4. THE MAGNITUDE OF THE CHALLENGE

"Limiting warming to 1.5°C is possibly within the laws of chemistry and physics but doing so would require unprecedented changes."

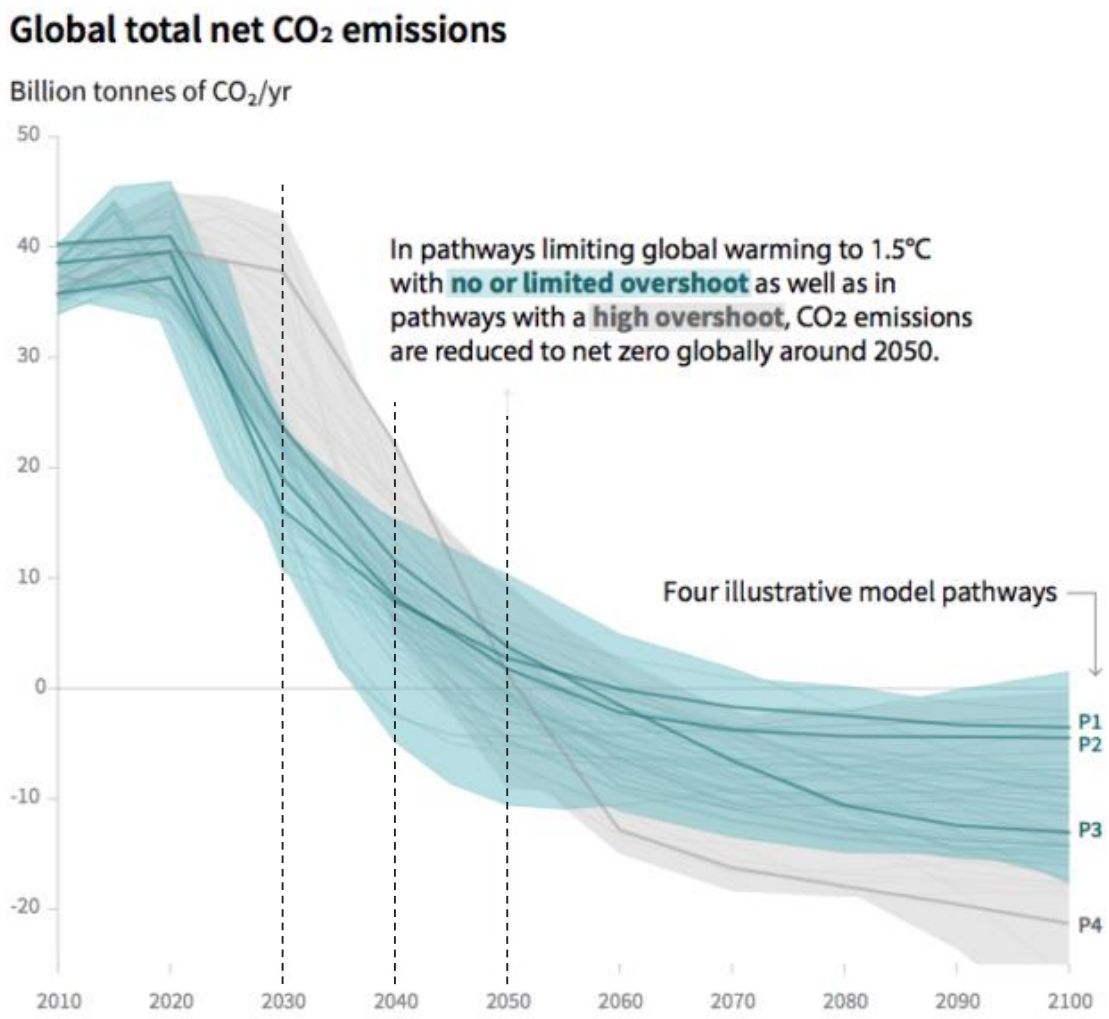
Jim Skea, Co-Chair of IPCC Working Group III

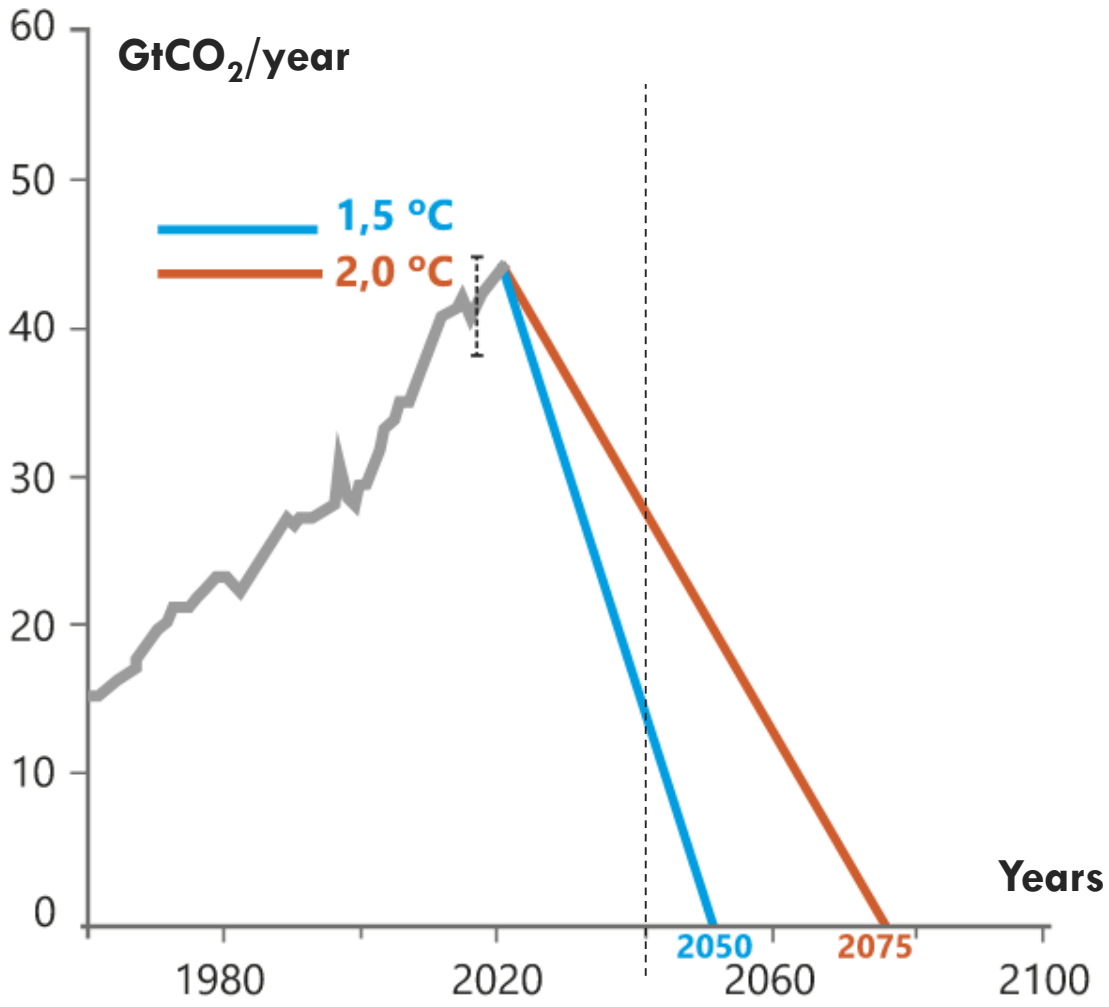




Source: FAQ 2.1, Figure 1. Chapter 2, IPCC SR15 (2018)

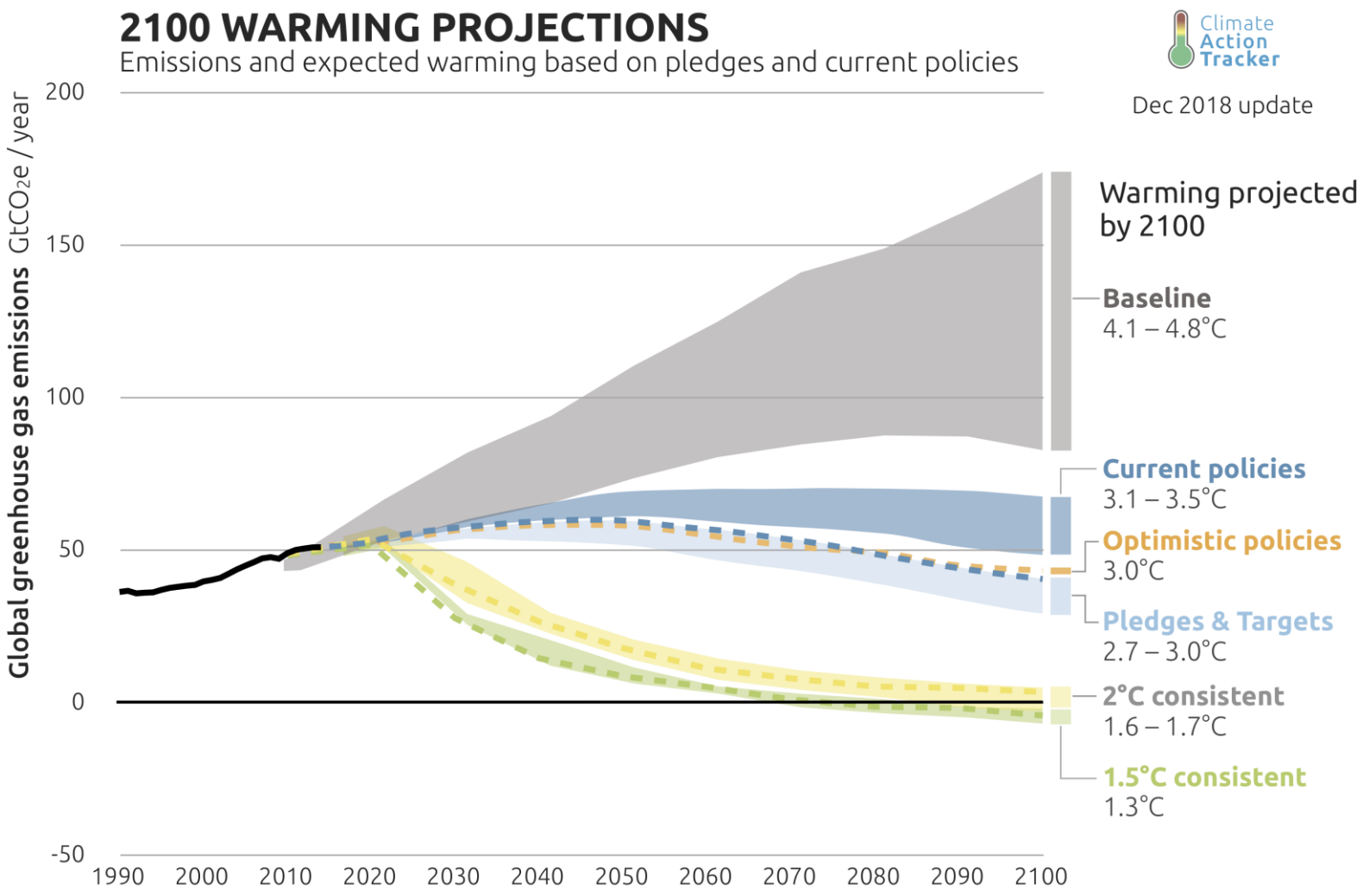
4. THE MAGNITUDE OF THE CHALLENGE





Source: IPCC SR15 (left) and Cambio climático: Calentamiento global de 1,5°C, MTE (2019)(right).

4. THE MAGNITUDE OF THE CHALLENGE



4. THE MAGNITUDE OF THE CHALLENGE

In summary, if we want to avoid higher risks…

”Urgent and far-reaching” action is needed:

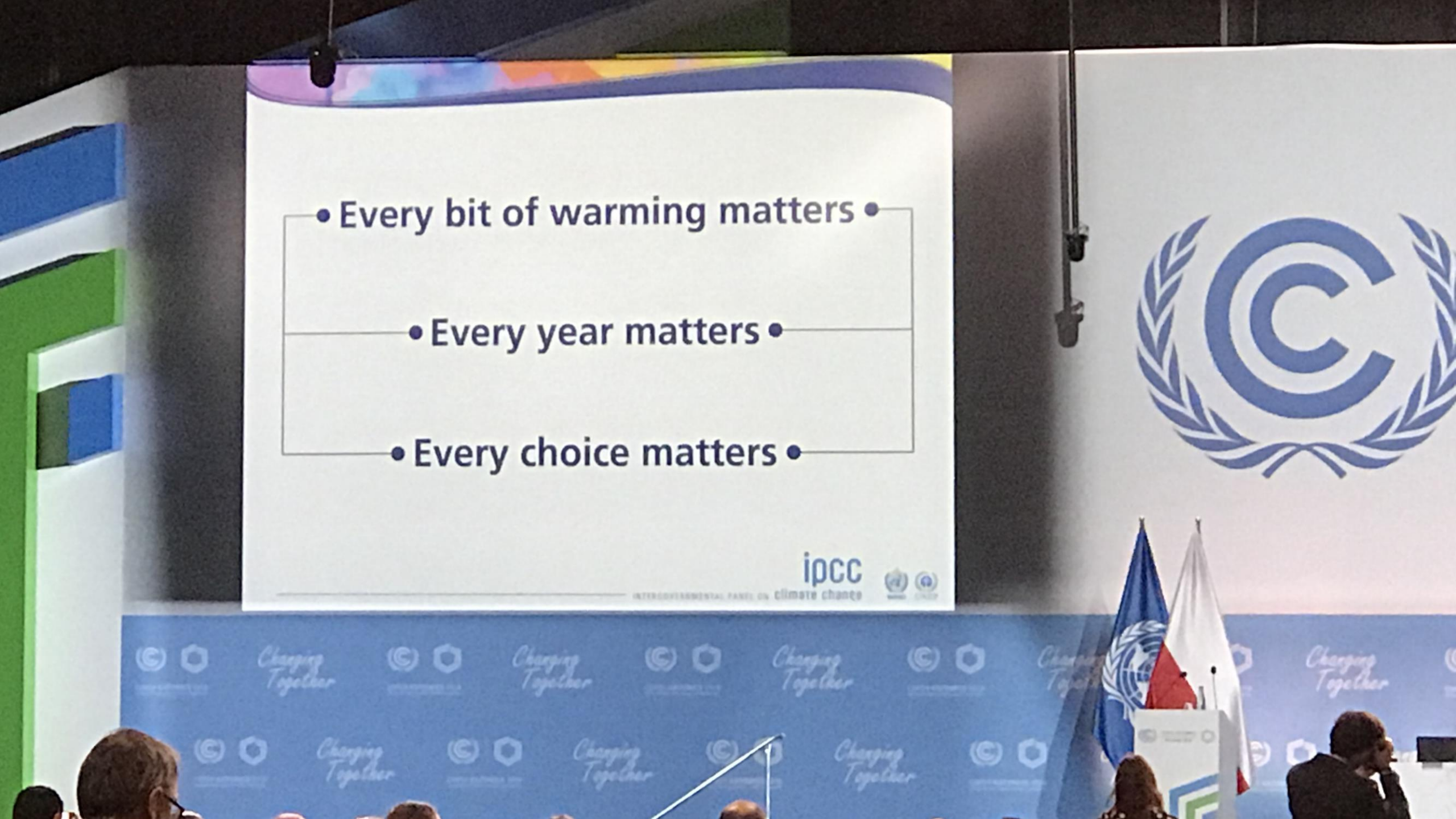
- Global **carbon emissions need to decrease** by 45% by 2030; in 2050 emissions need to be net zero.
- We need transitions that are ethical and just, that align with the SDGs and poverty eradications policies.
- Achieving a 1.5C scenario is not impossible, but it “would require **transformative systemic change**, integrated with sustainable development” (IPCC SR1.5, p. 315).
- The required systemic change needs to go hand by hand with **adaptation**, including transformational adaptation (especially with overshooting).

Mitigation

Transformation

Adaptation

Source: Transformation icon from Climate Change by Made x Made from the Noun Project


Every bit of warming matters
Every year matters
Every choice matters
ipcc
INTERGOVERNMENTAL PANEL ON climate change
Changing Together

bc3
BASQUE CENTRE
FOR CLIMATE CHANGE
Klima Aldaketa Ikergai

LSE THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

Grantham Research Institute on Climate Change and the Environment


Climate
is changing