How the world agreed on Net Zero

by not agreeing on what it actually means

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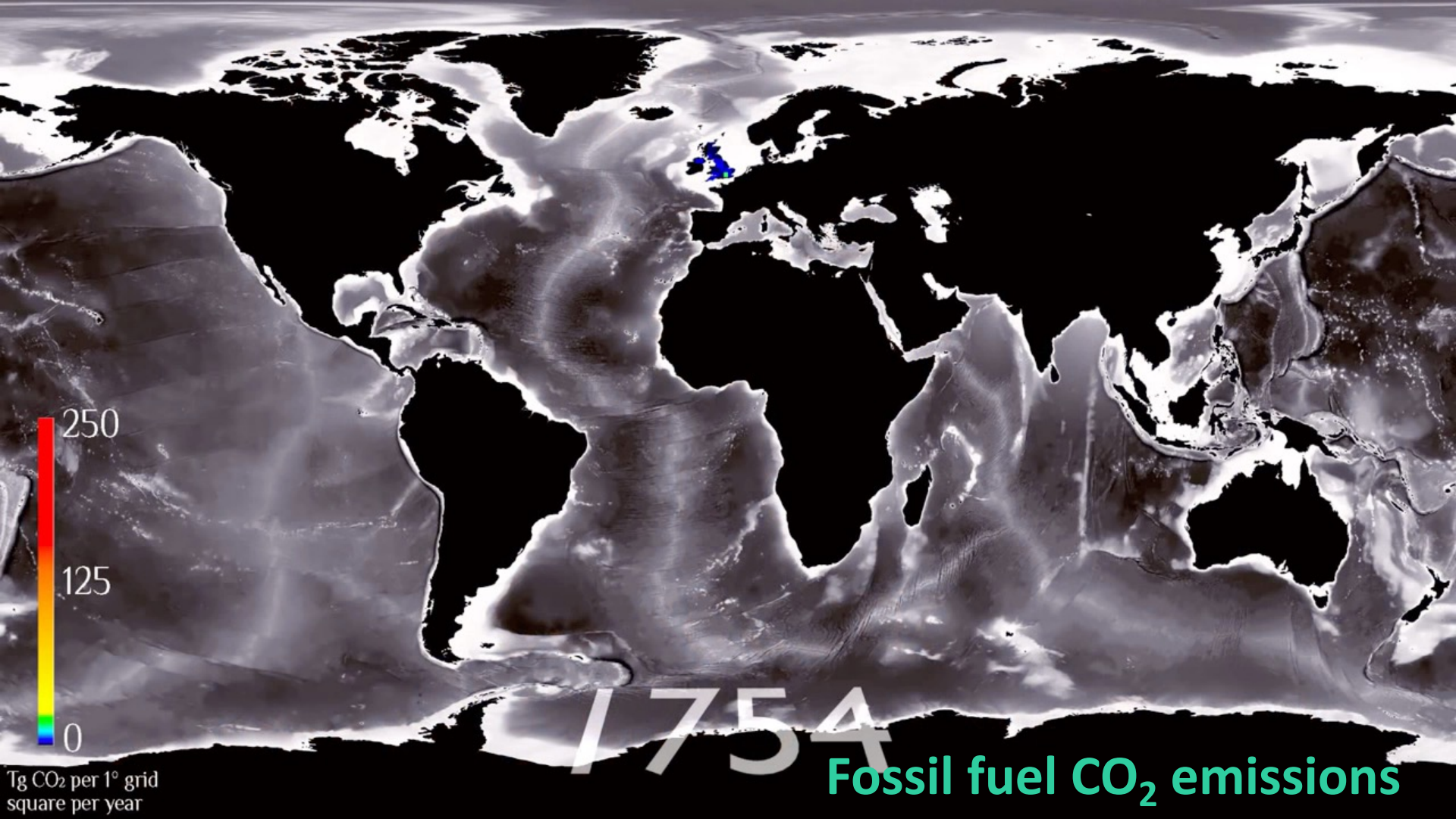
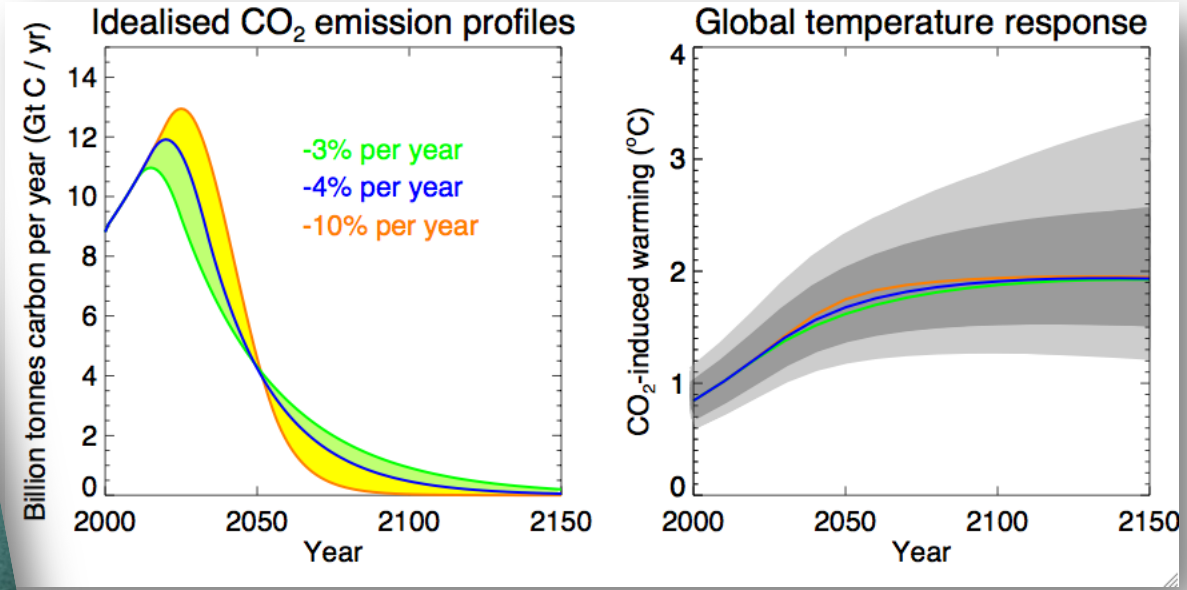
23rd May 2023

EST. 1597

GRESHAM COLLEGE


250
125
0
Tg CO_2 per 1° grid square per year
1754
Fossil fuel CO_2 emissions

2009: we worked out what needed to be done



2015: The Paris Agreement

United Nations

Framework Convention on Climate Change

FCCC/CP/2015/L.9/Rev.1

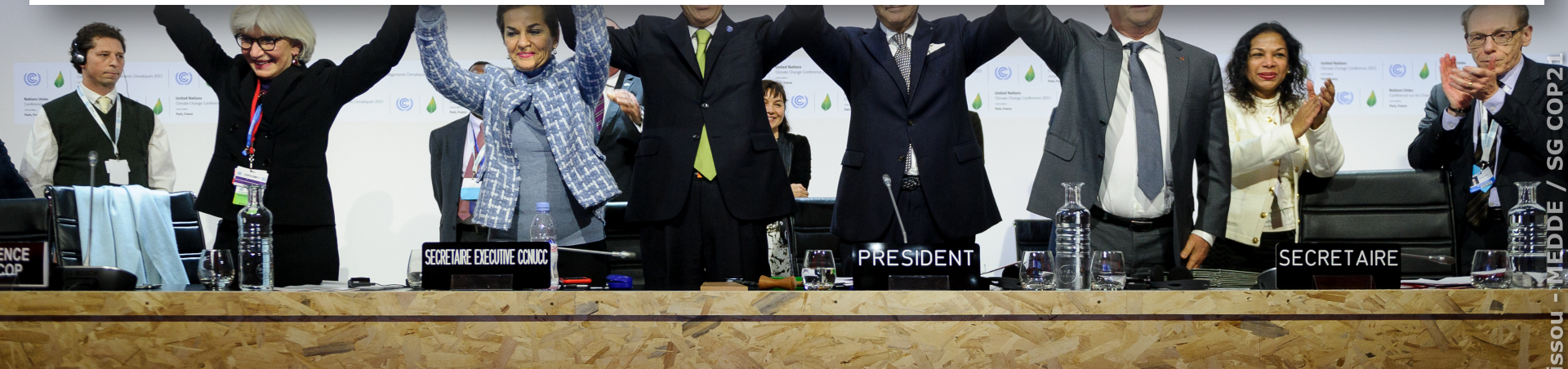
Distr.: Limited
12 December 2015

Original: English

Article 2

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 to pursue 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;

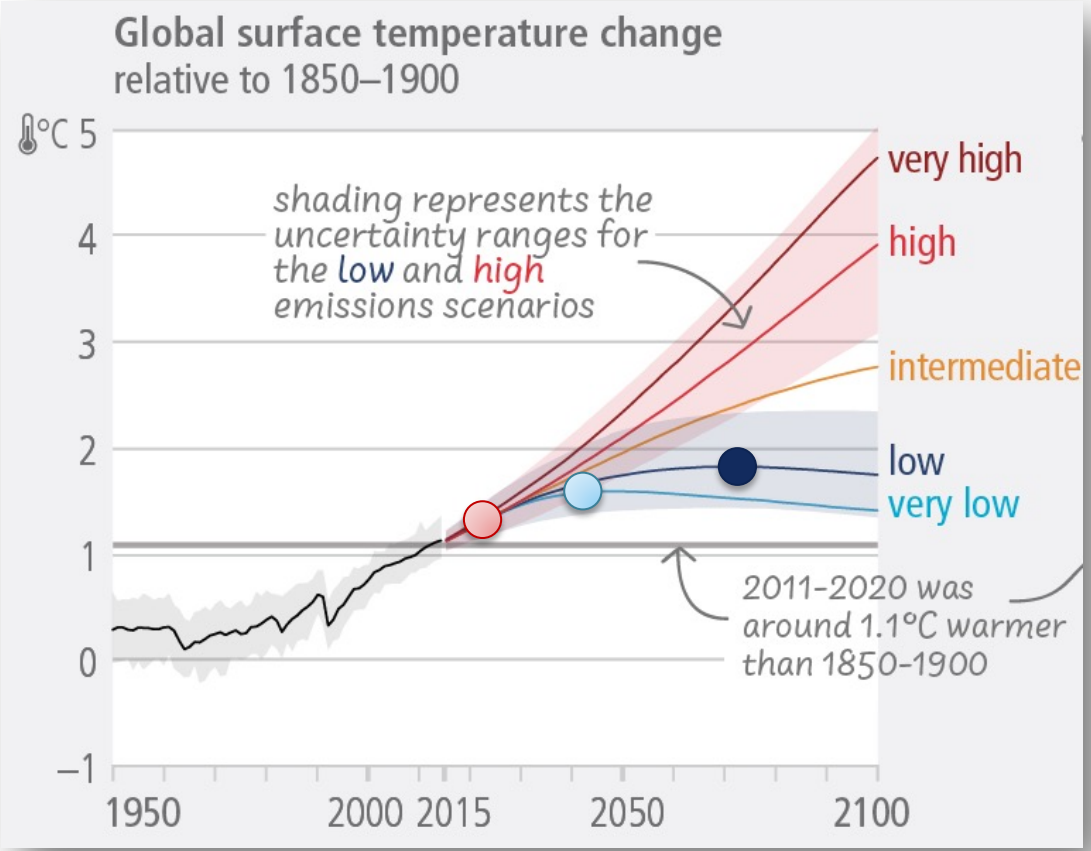


The Paris Agreement committed the world to halt global warming within a generation…

1¼°C now, warming at ¼°C per decade

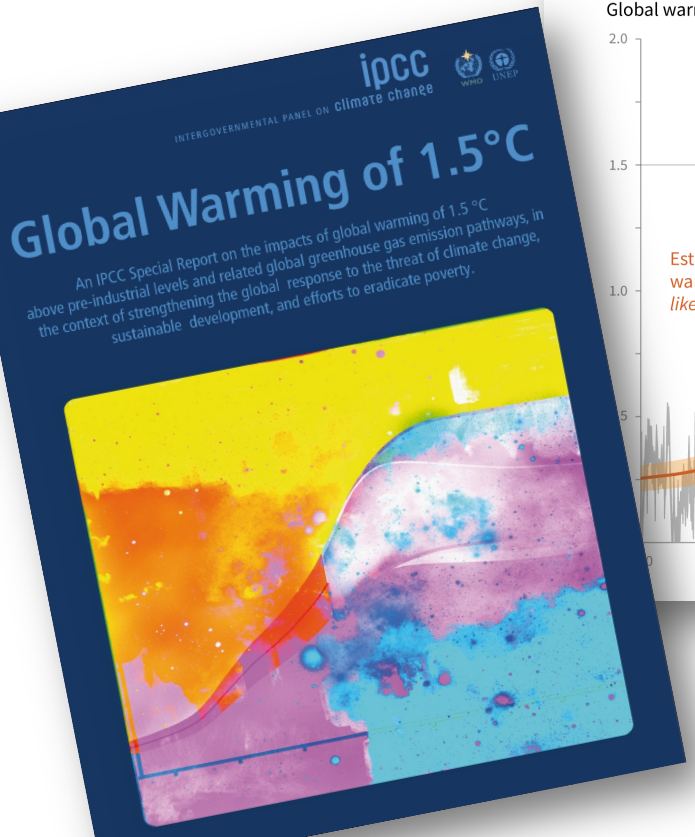
20 years to halt warming for 1.5°C

50 years to halt warming for <2°C

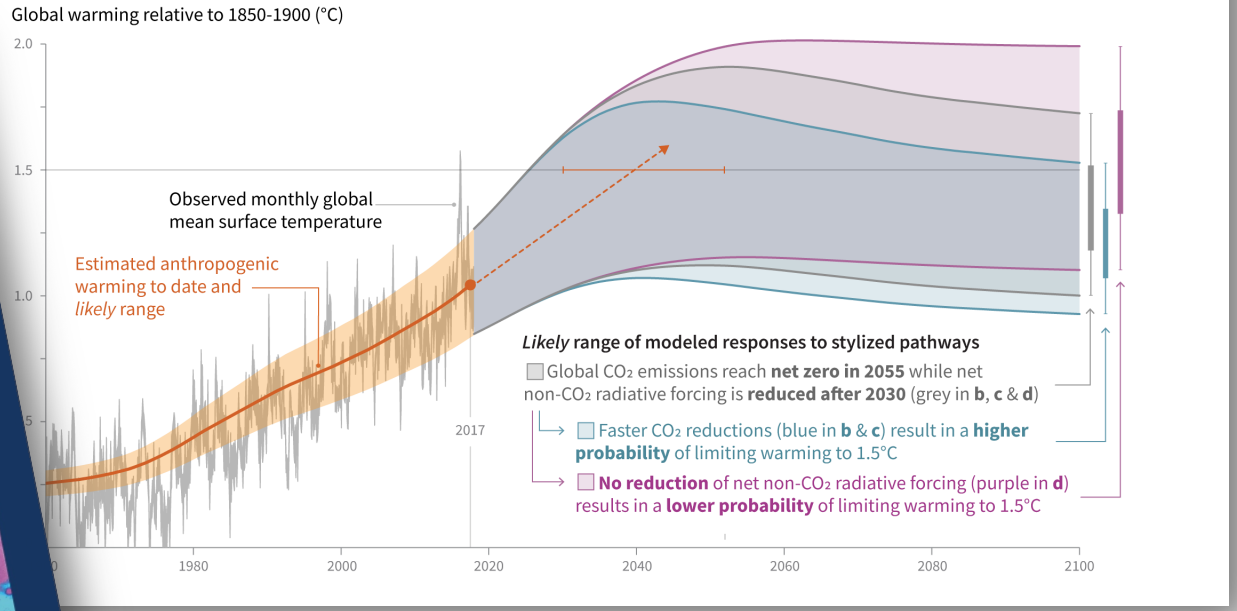


Source: IPCC

…and asked the IPCC to work out what it would take

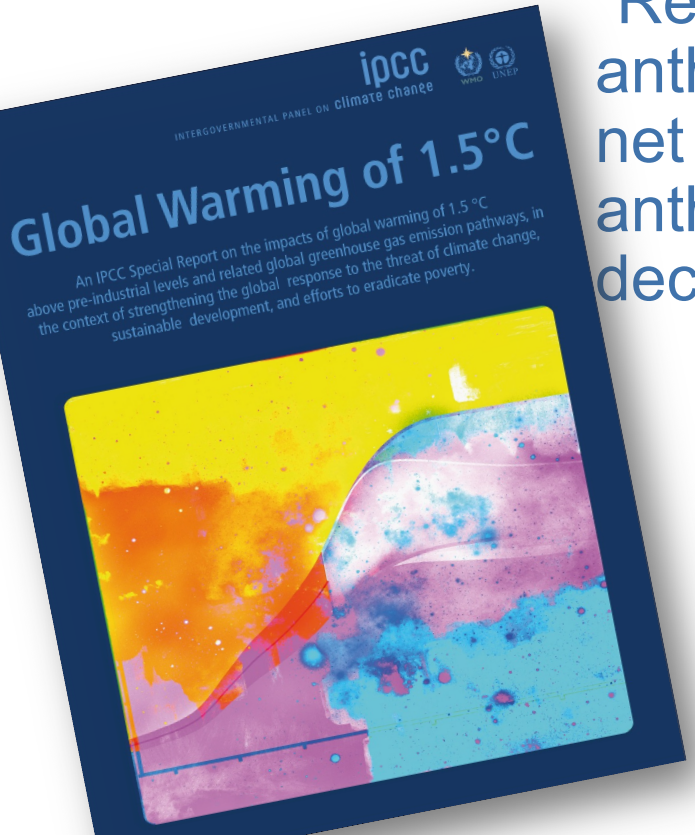


a) Observed global temperature change and modeled responses to stylized anthropogenic emission and forcing pathways



ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

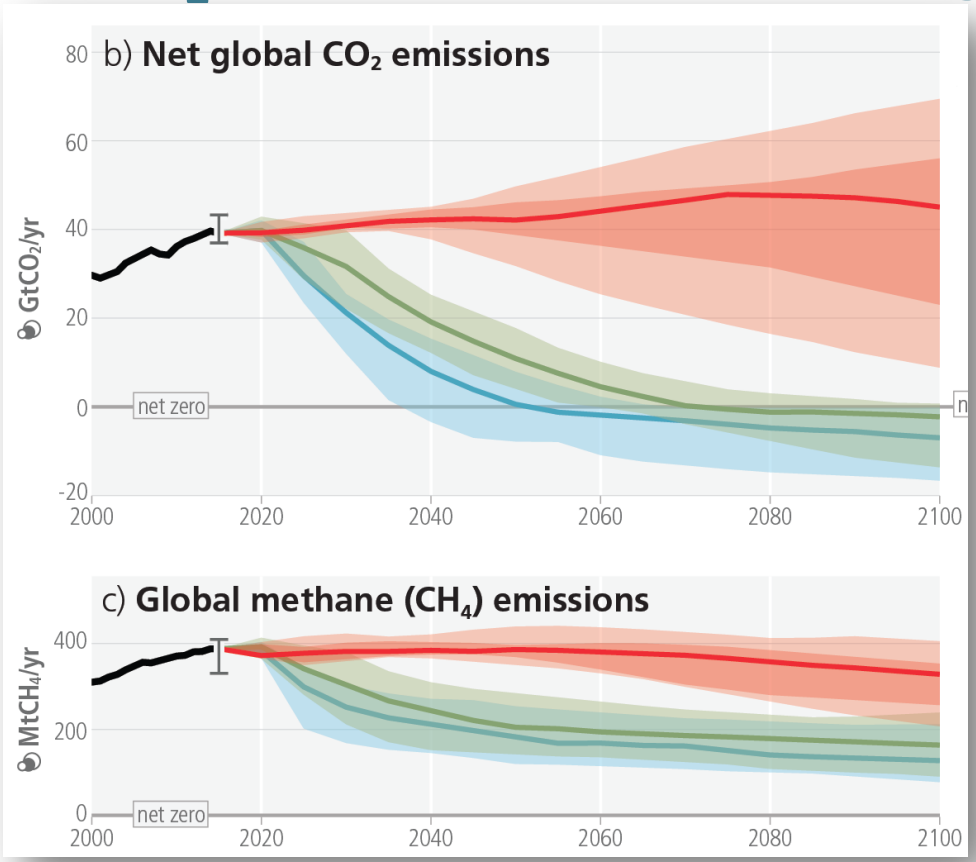
2018: The IPCC Special Report on 1.5ºC

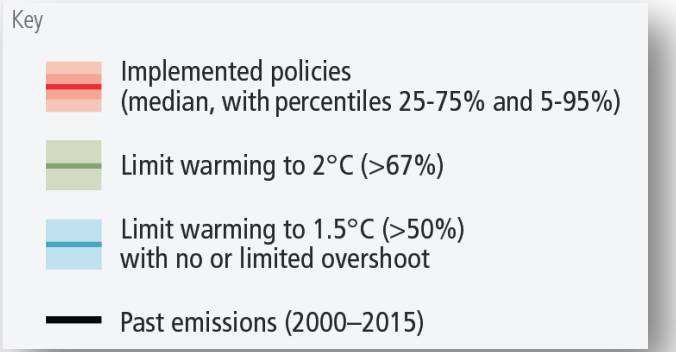


"Reaching and sustaining net-zero global anthropogenic CO_2 emissions and declining net non-CO_2 radiative forcing would halt anthropogenic global warming on multi-decadal timescales (*high confidence*)."

ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

Halting warming requires (approximately) net zero global CO_2 emissions AND declining methane emissions





Source: IPCC

So is it all sorted?

United Nations — FCCC/CP/2015/L.9/Rev.1

Framework Convention on Climate Change

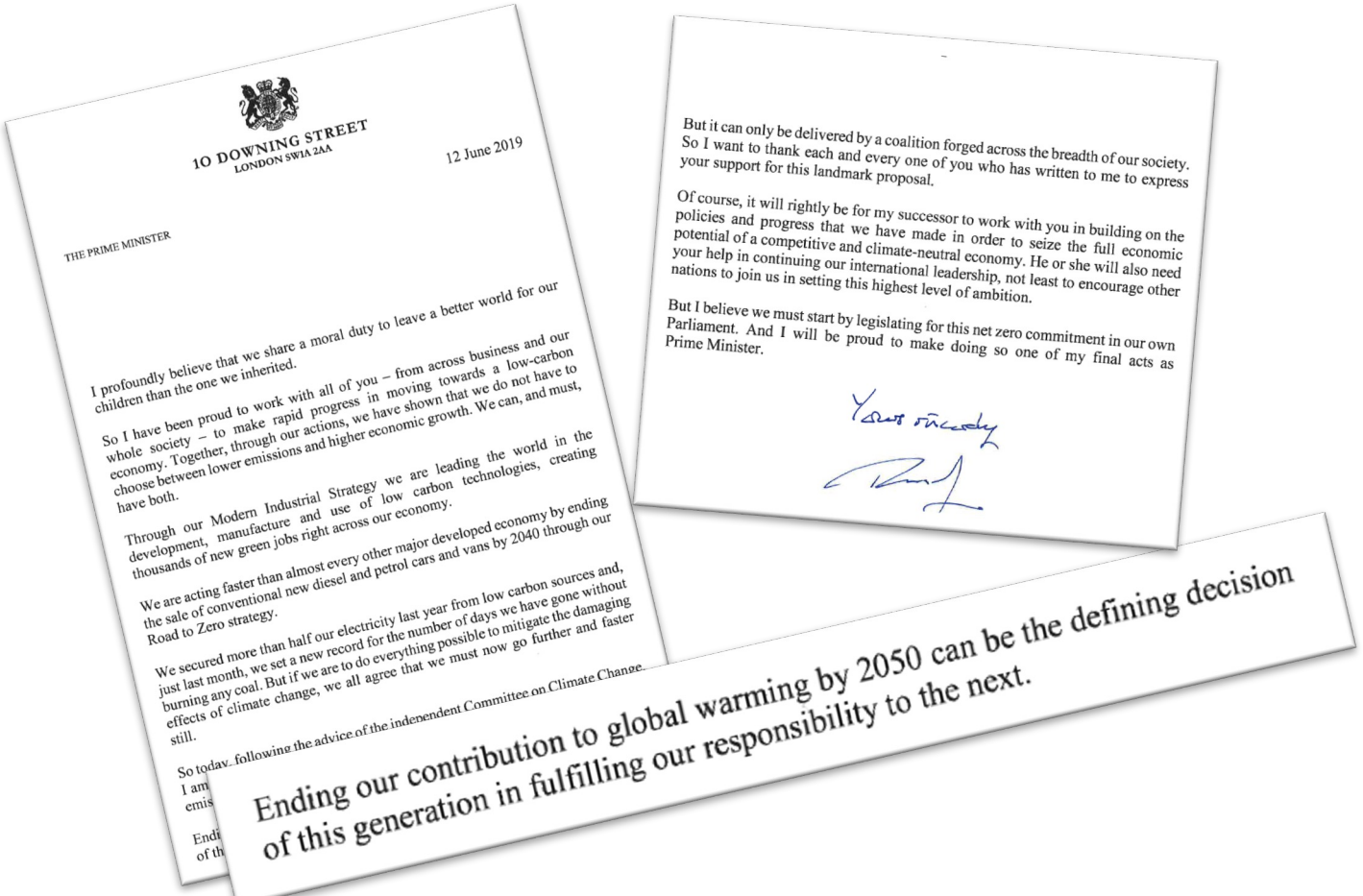
Distr.: Limited
12 December 2015

Original: English

Article 4

In order to achieve the long-term temperature goal set out in Article 2, Parties aim to reach global peaking of greenhouse gas emissions as soon as possible, recognizing that peaking will take longer for developing country Parties, and to undertake rapid reductions thereafter in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty.

You'd like to think so…



10 DOWNING STREET
LONDON SW1A 2AA

12 June 2019

THE PRIME MINISTER

I profoundly believe that we share a moral duty to leave a better world for our children than the one we inherited.

So I have been proud to work with all of you – from across business and our whole society – to make rapid progress in moving towards a low-carbon economy. Together, through our actions, we have shown that we do not have to choose between lower emissions and higher economic growth. We can, and must, have both.

Through our Modern Industrial Strategy we are leading the world in the development, manufacture and use of low carbon technologies, creating thousands of new green jobs right across our economy.

We are acting faster than almost every other major developed economy by ending the sale of conventional new diesel and petrol cars and vans by 2040 through our Road to Zero strategy.

We secured more than half our electricity last year from low carbon sources and, just last month, we set a new record for the number of days we have gone without burning any coal. But if we are to do everything possible to mitigate the damaging effects of climate change, we all agree that we must now go further and faster still.

So today, following the advice of the independent Committee on Climate Change, I am
emis

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But it can only be delivered by a coalition forged across the breadth of our society. So I want to thank each and every one of you who has written to me to express your support for this landmark proposal.

Of course, it will rightly be for my successor to work with you in building on the policies and progress that we have made in order to seize the full economic potential of a competitive and climate-neutral economy. He or she will also need your help in continuing our international leadership, not least to encourage other nations to join us in setting this highest level of ambition.

But I believe we must start by legislating for this net zero commitment in our own Parliament. And I will be proud to make doing so one of my final acts as Prime Minister.

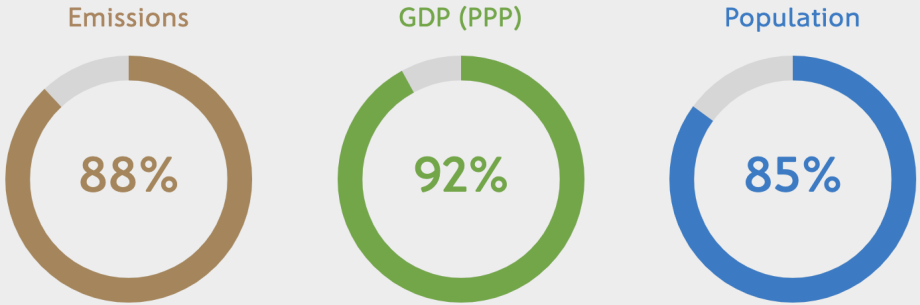
Yours sincerely

Ending our contribution to global warming by 2050 can be the defining decision of this generation in fulfilling our responsibility to the next.

You'd like to think so…

NET ZERO TRACKER

GLOBAL NET ZERO COVERAGE



Country-level coverage only. We do not include sub-national net zero targets in countries without a target.

NET ZERO NUMBERS

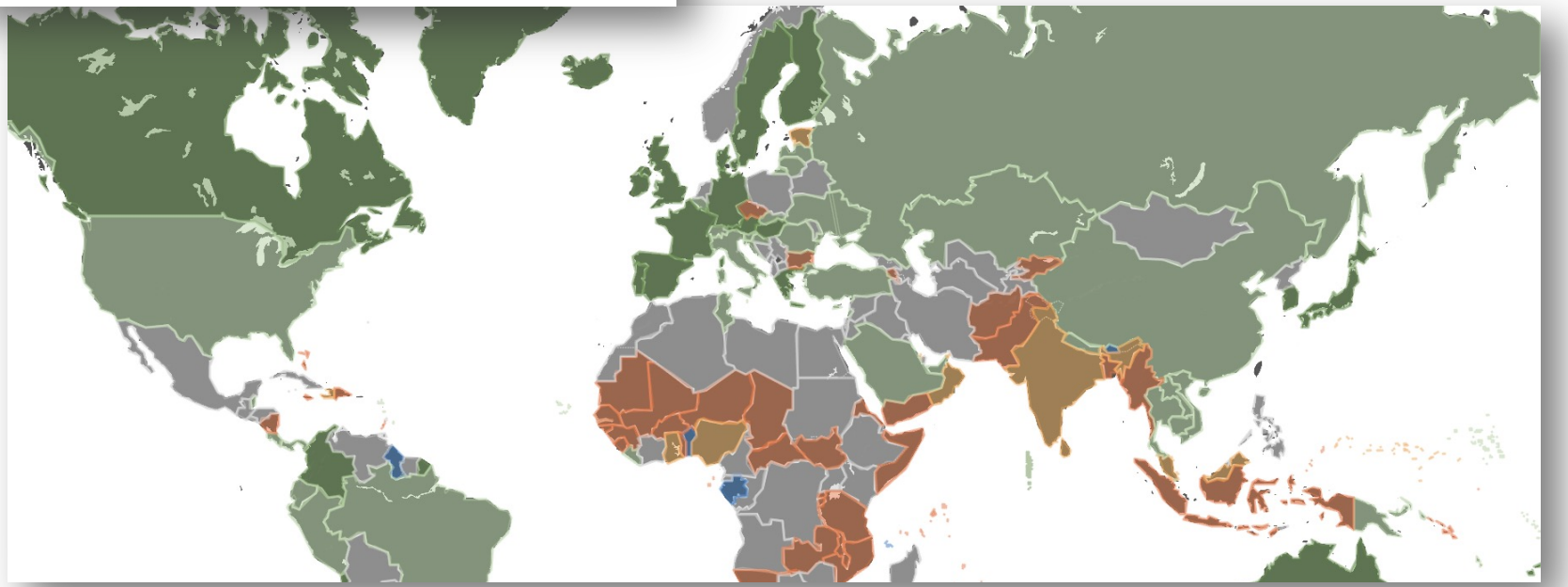
Countries	Regions
133	143
Cities	**Companies**
252	923

Out of 198 countries, 709 regions, 1,186 cities and 1,986 companies.

https://zerotracker.net

You'd like to think so…

NET ZERO TRACKER



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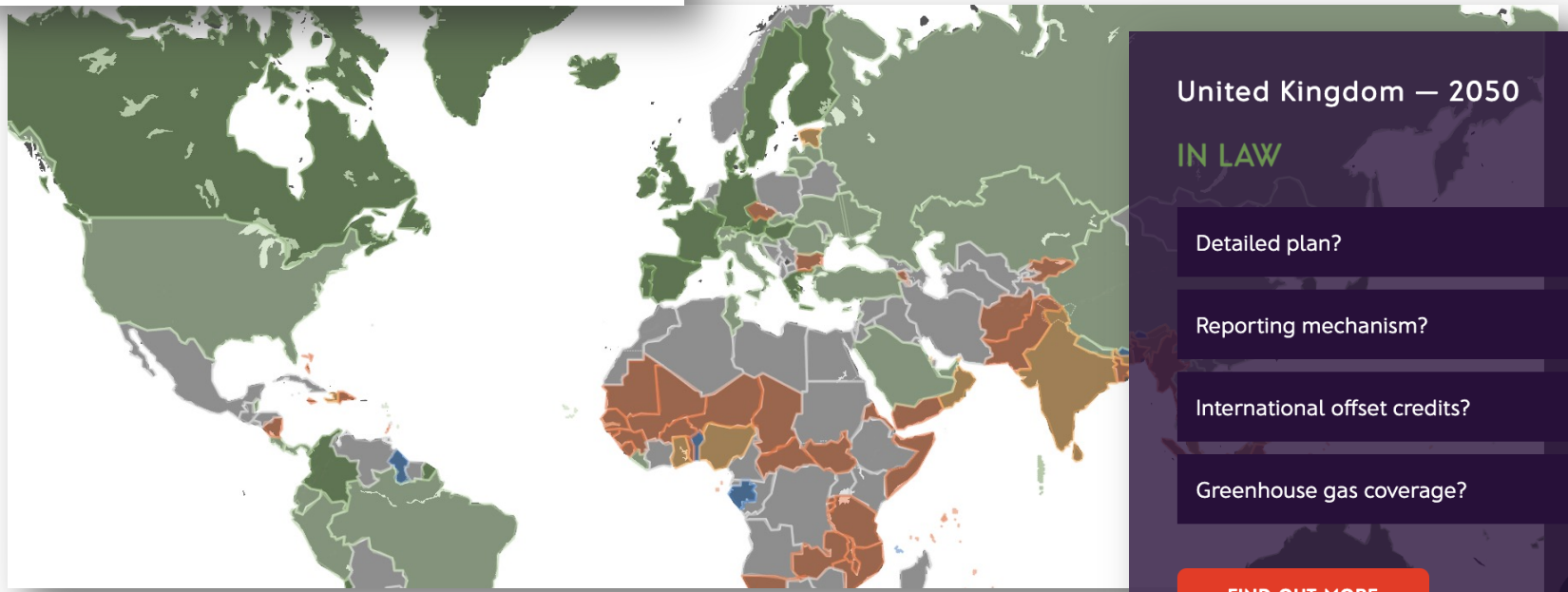
You'd like to think so…

NET ZERO TRACKER



https://zerotracker.net

You'd like to think so…

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Gabon is first African country paid to protect its rainforest

22 June 2021

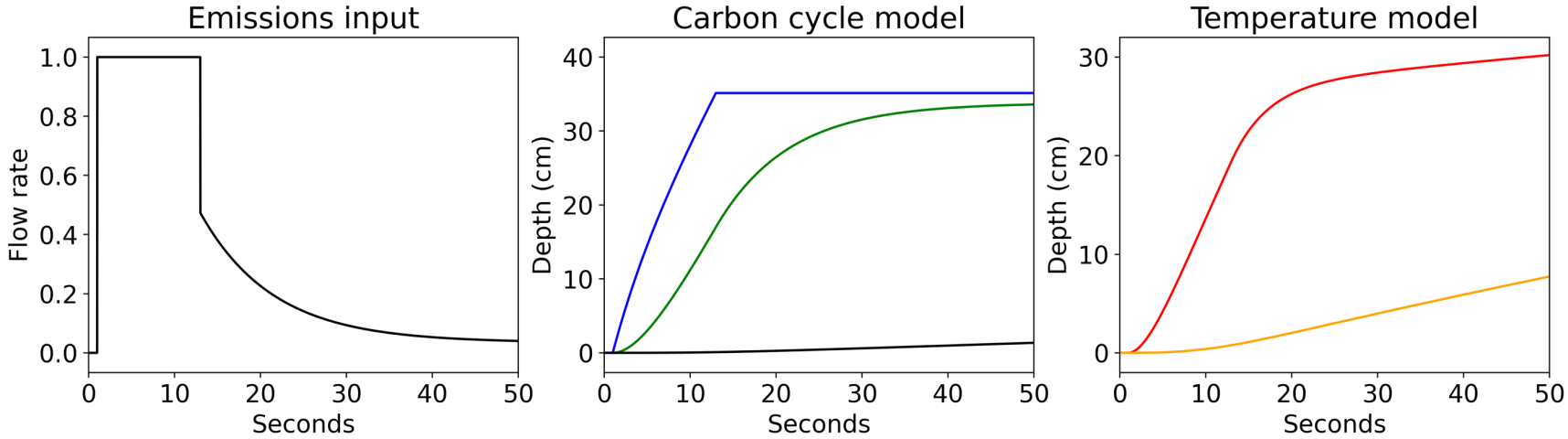
Climate change

https://zerotracker.net

Last updated: 21 Feb 2023

Quick recap on our coupled Gresham climate-carbon-cycle model

Stabilizing atmospheric CO_2 concentrations



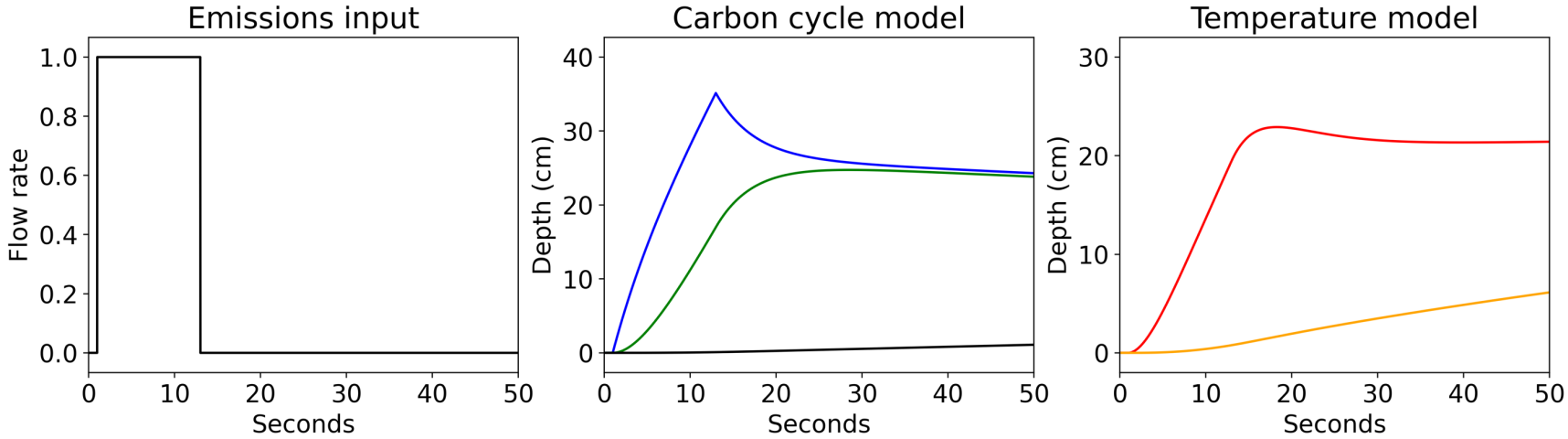
Allows emissions to continue

But temperatures keep rising

Quick recap on our coupled Gresham climate-carbon-cycle model

And net zero CO_2 emissions

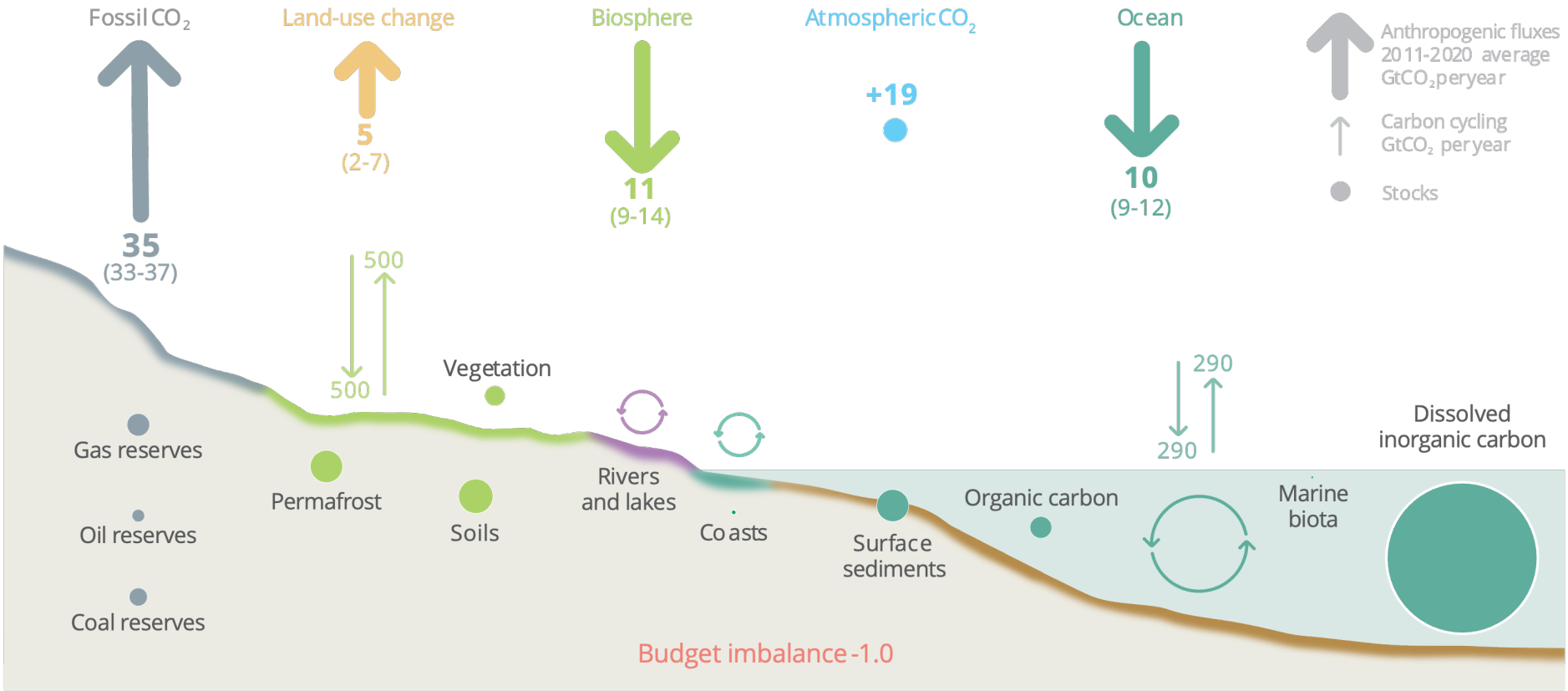
Stabilising temperatures



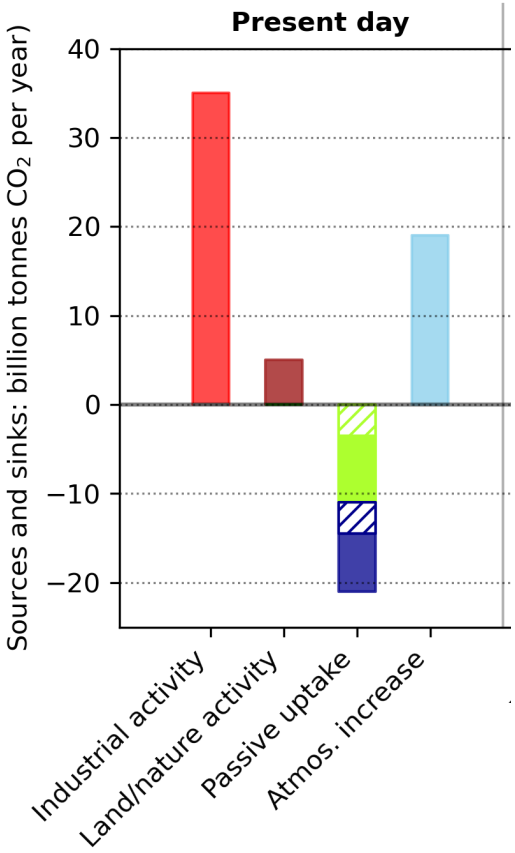
Requires declining atmospheric CO_2 concentrations

GLOBAL CARBON PROJECT

Human activity and the global carbon cycle



How the flows of carbon dioxide add up



Fossil fuels and industrial activity

Direct land-use & agriculture

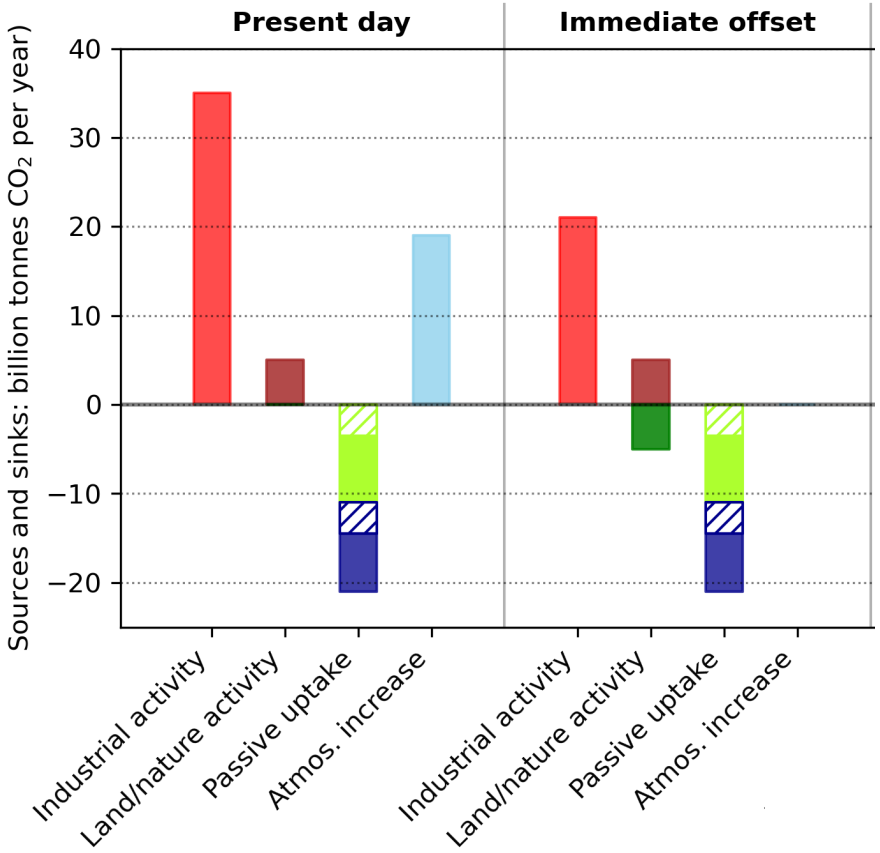
Atmospheric increase

Passive uptake by the biosphere

Passive uptake by the oceans

Hatching indicates uptake due to historical cumulative emissions

Immediate net zero using UNFCCC accounting rules



Fossil fuels and industrial activity

Direct land-use & agriculture

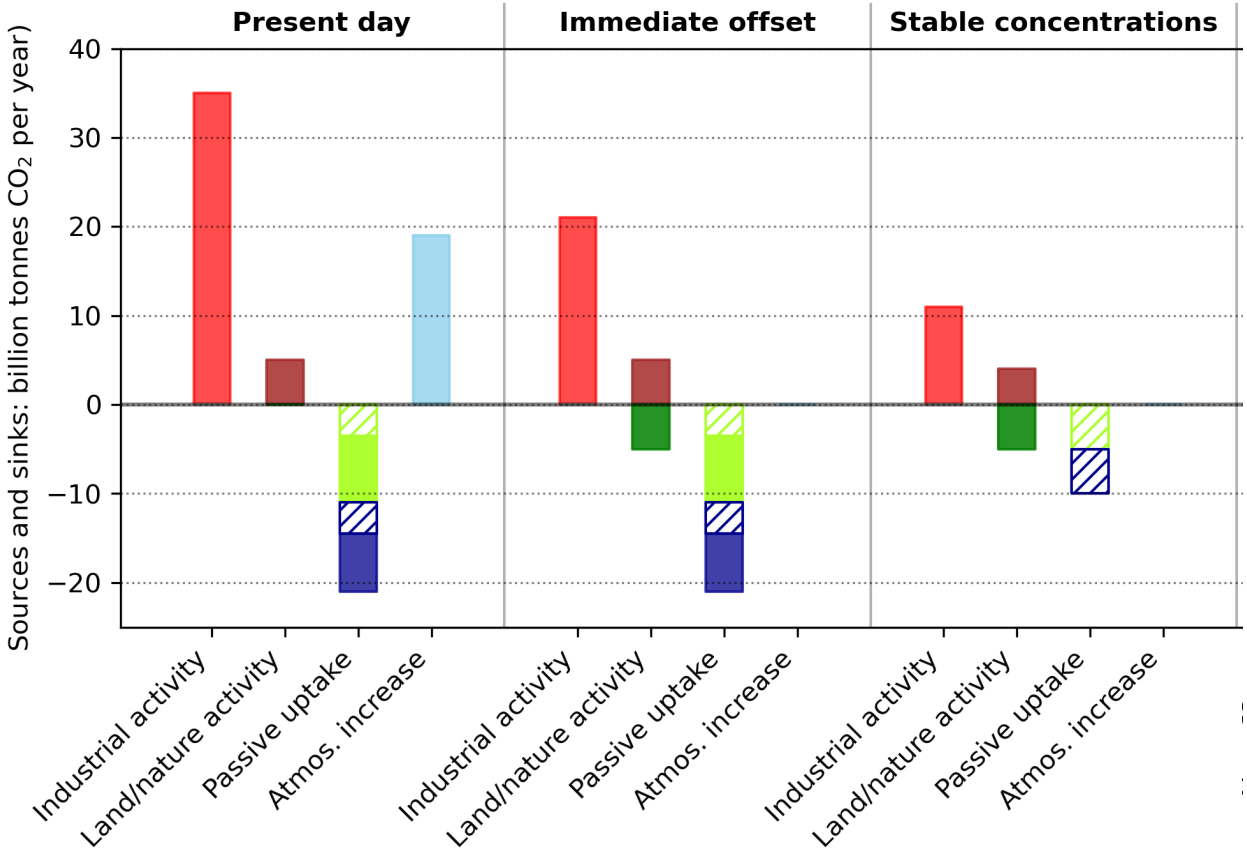
Nature-based solutions

Passive uptake by the biosphere

Passive uptake by the oceans

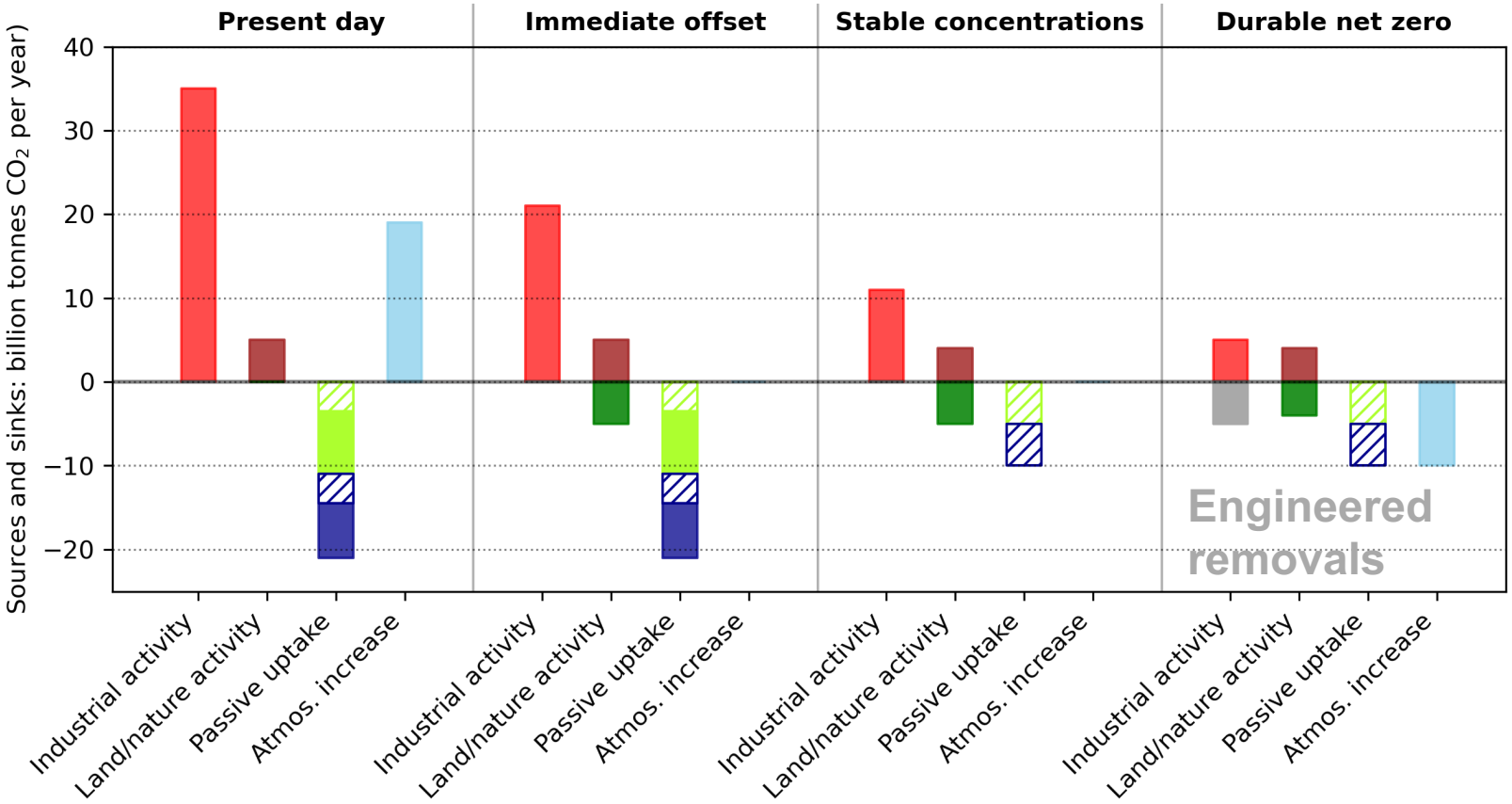
Hatching indicates uptake due to historical cumulative emissions

What it takes to stabilize atmospheric CO_2 concentrations



Food production and earth system feedbacks

What it takes to stop global warming



What happens when you forget to specify the question

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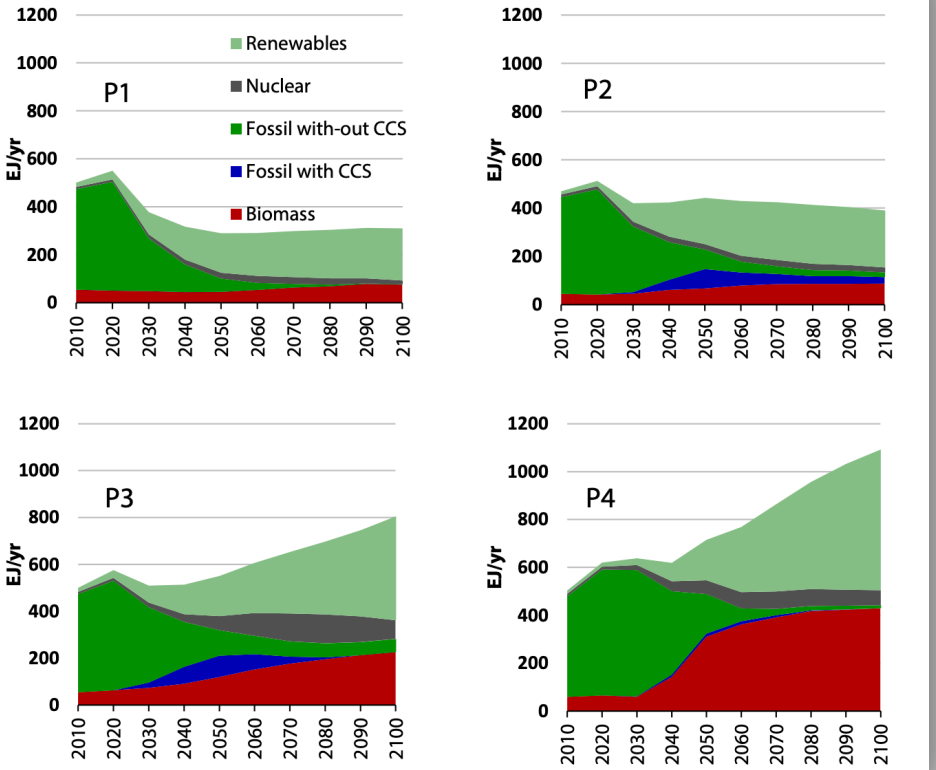
"The Answer to the Ultimate Question of Life, the Universe, and Everything"

We need to stop fossil fuels from causing global warming

Figure 3.3. Global primary energy in the four archetype 1.5°C scenarios set out by the IPCC



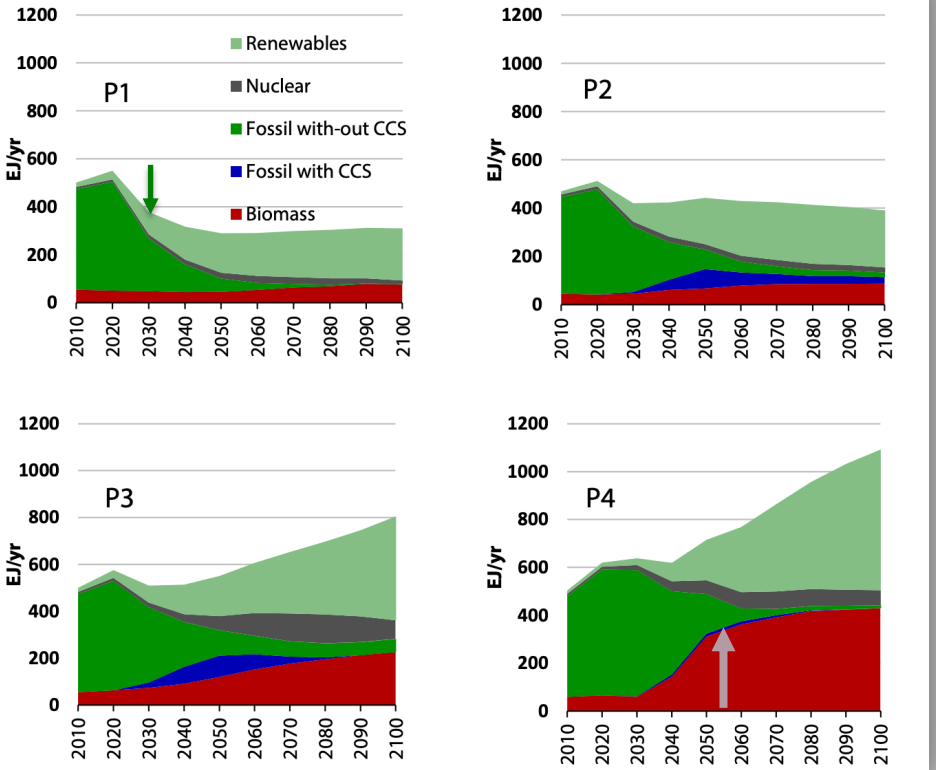
We need to stop fossil fuels from causing global warming – before the world stops using fossil fuels

"Fossil elimination" 1.5°C scenarios require either

P1: immediate ~30% reduction in primary **energy** demand or

P4: implausible levels of bioenergy production in future

Figure 3.3. Global primary energy in the four archetype 1.5°C scenarios set out by the IPCC



UK CCC 2019 from IPCC database

We need to stop fossil fuels from causing global warming – before the world stops using fossil fuels

- “In a pragmatic, just and well-managed energy transition, we must be laser focused on phasing out fossil fuel emissions, while phasing up viable, affordable zero-carbon alternatives.” COP28 President Sultan Al Jaber

We need to stop fossil fuels from causing global warming – before the world stops using fossil fuels

- The Stone Age didn’t end because we ran out of stones.
- The Oil Age won’t end because we run out of oil.
- Global Warming must end before we stop using fossil fuels.

How the world agreed on Net Zero

Largely by being vague on what it actually means: but this is dangerous.

Allowed current definitions won't stop global warming.

They must include Geological Net Zero

23rd May 2023

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