Twitter: @KevinClimate

Climate's holy trinity

… could cogency, tenacity & courage yet deliver on our 2°C commitment?

MANCHESTER 1824
The University of Manchester

UPPSALA UNIVERSITET

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Tyndall Centre for Climate Change Research

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Imagine …

1) Climate change was considered a serious (existential?) threat

2) Regulations force top 10% to cut their CO_2 footprint to the EU mean

3) The other 90% make no reductions

= 1/3 cut in global CO_2

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My provocation:

*Shrinking 2°C **carbon budgets,** together with highly **unequal responsibility for CO_2** embed **equity** at the heart of real mitigation.*

*The taboo issue of the huge **asymmetric distribution of wealth** underpins the international community's **failure** to seriously tackle climate change.*

*Only when we acknowledge this can we move from **incrementalism** to **system-change***

The **Davos** fraternity drive the global agenda

we're doing just fine

& mustn't disturb the dominant socio-economic paradigm

… of ongoing growth, with resources, power & CO_2 skewed to a privileged few

Record private jet flights into Davos as leaders arrive for climate talk

On climate, the Davos paradigm is legitimised by …

the Climate glitterati

M.Bloomberg, L. DiCaprio; N. Stern; C.Figueres; A.Gore; M.Carney

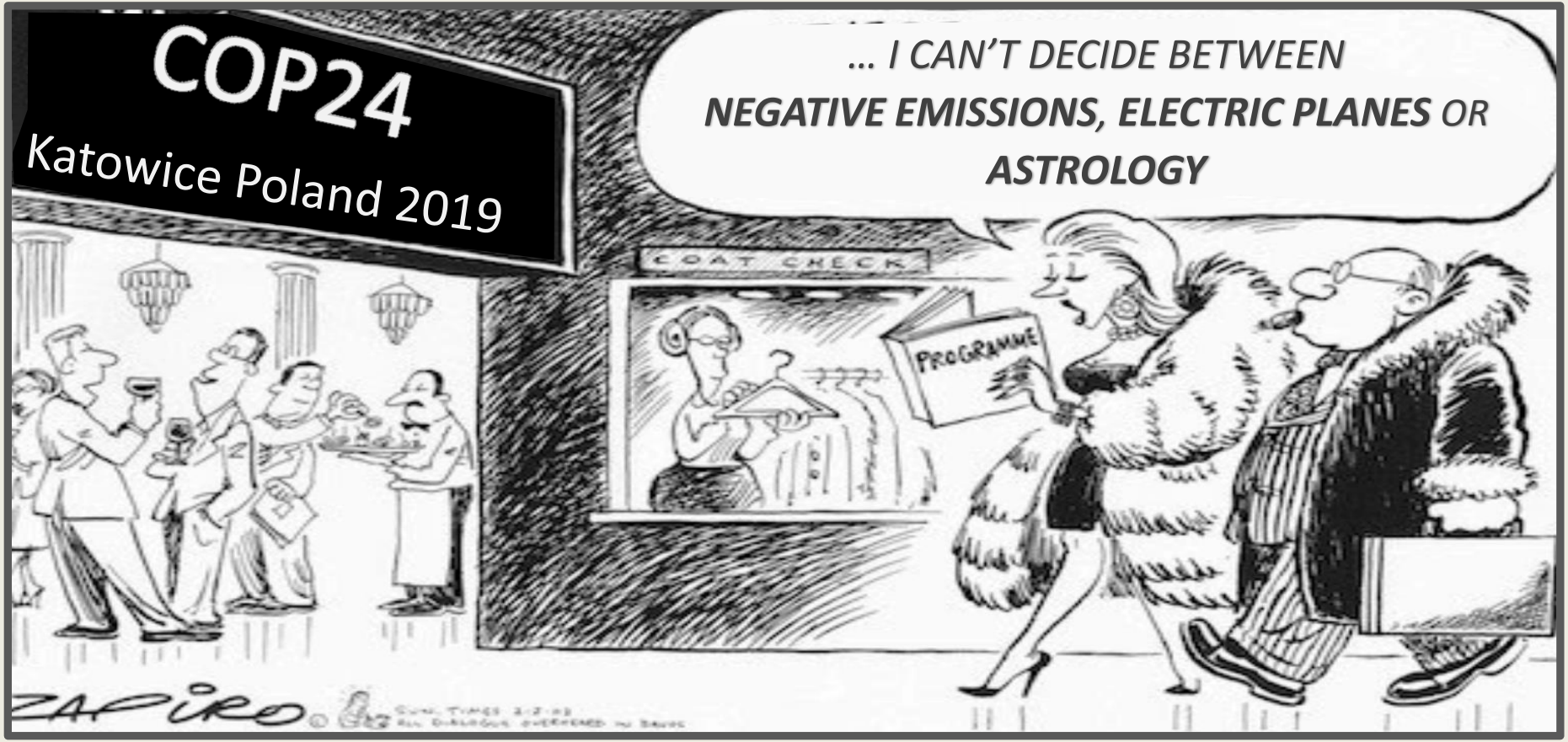
*Very wealthy **hi-emitting** individuals making the climate headlines*

supported by a cadre of senior climate academics promoting

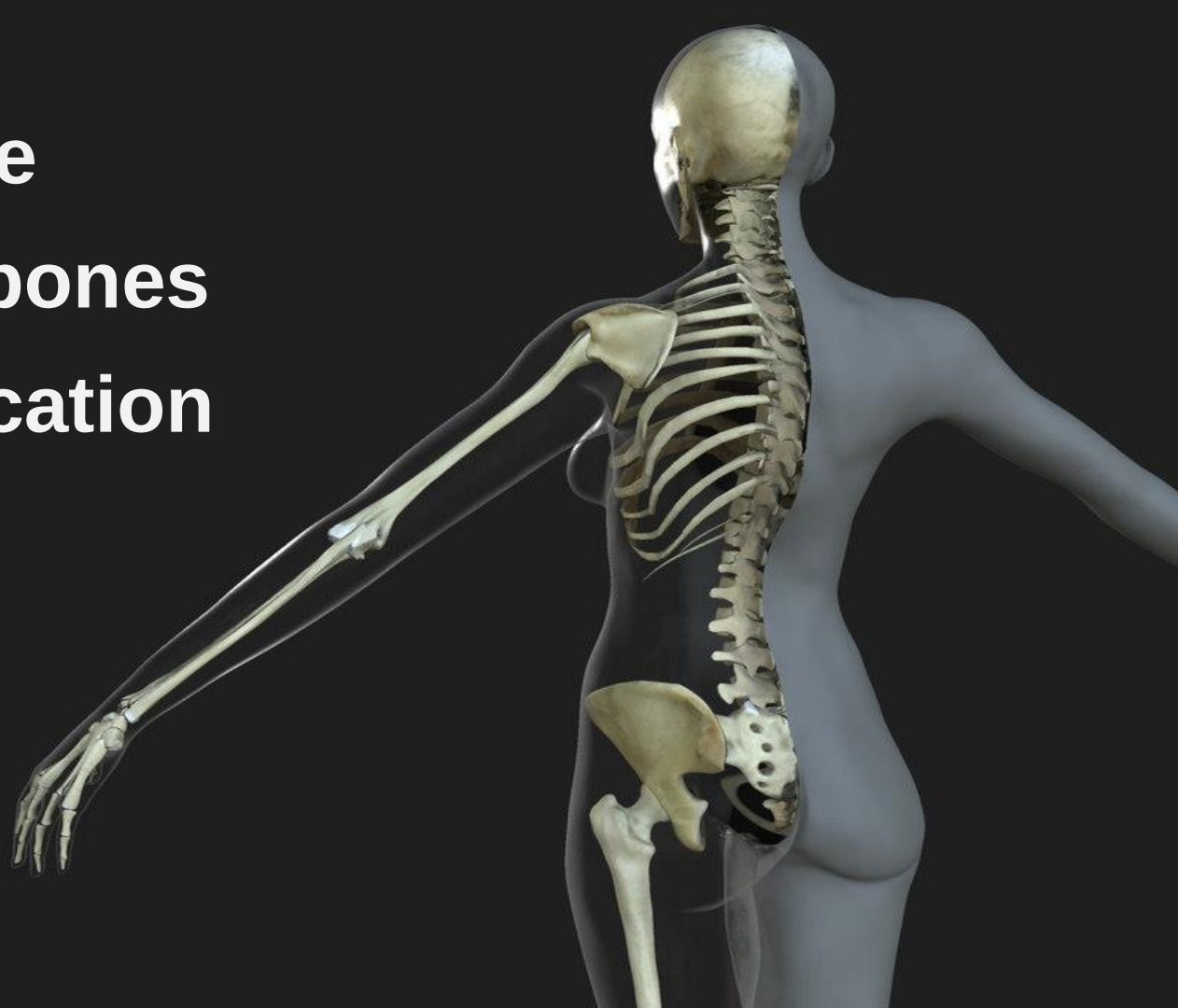
offsetting; negative emissions; geo-engineering; CCS; green growth; etc.

*incremental evolution **within** the system*

The **climate glitterati** drive the COP agenda



Put some
flesh on the bones
of my provocation



What is the International (& UK's) mitigation agenda

… commits us …

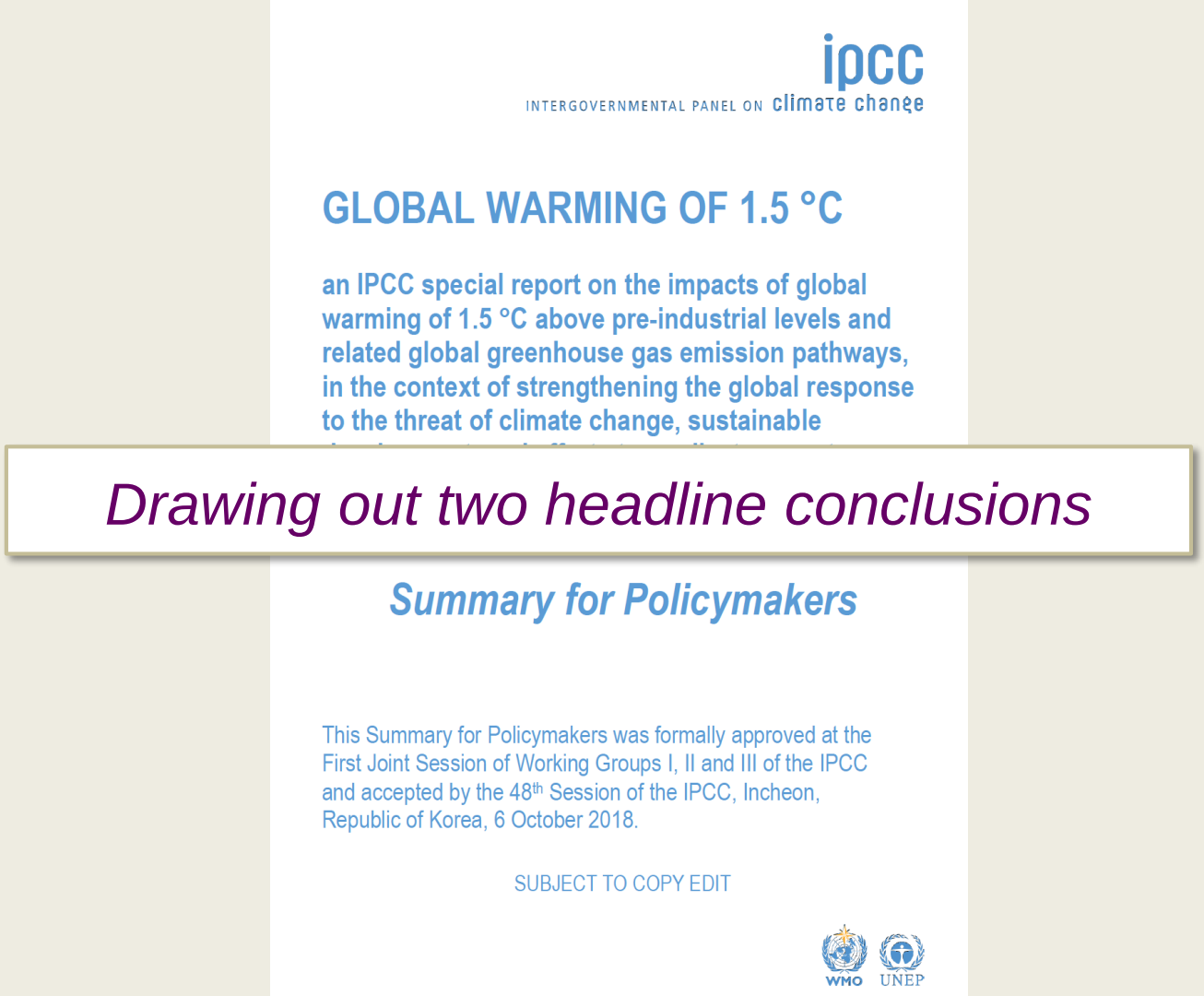
i.e. … to take action to:

… hold the increase in global average temperature to ***well below 2°C*** *above pre-industrial levels and pursue* ***efforts*** *to limit the temperature increase to* ***1.5°C***

… to undertake rapid reductions in accordance with ***best science***

… on the ***basis of equity****,*

Quick reflection on the IPCC 1.5°C report



Drawing out two headline conclusions

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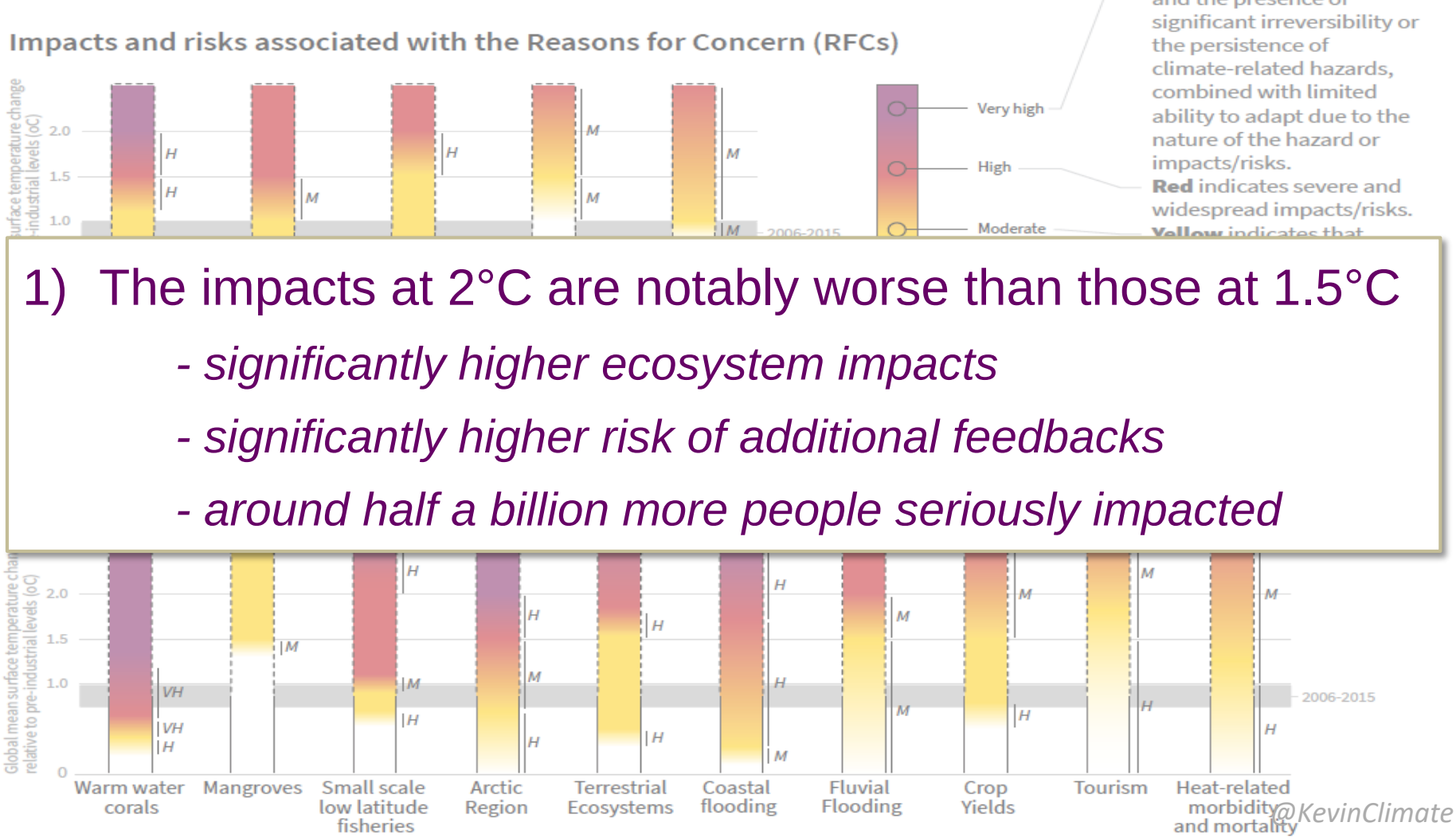
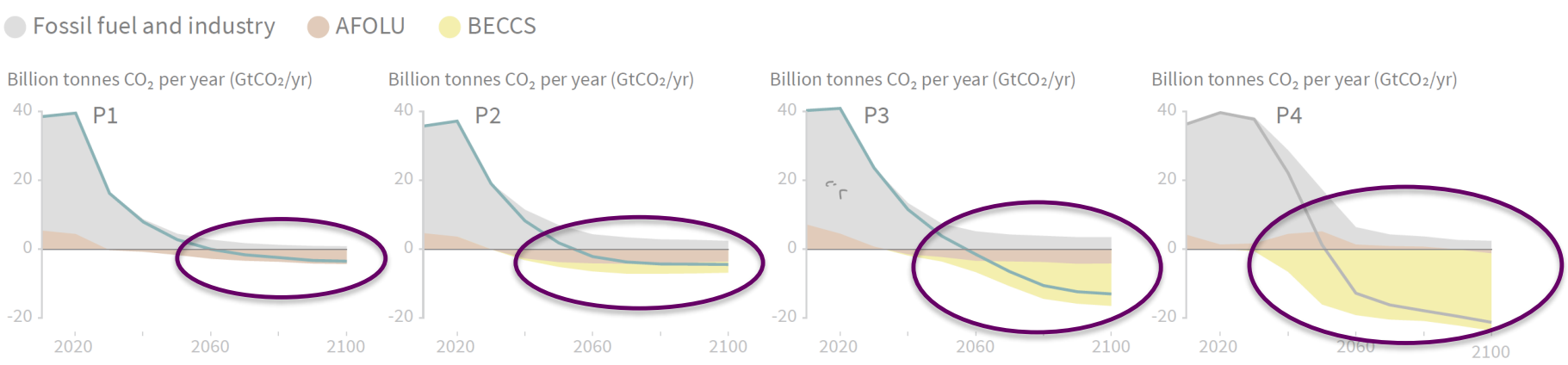


1) The impacts at 2°C are notably worse than those at 1.5°C

- *significantly higher ecosystem impacts*
- *significantly higher risk of additional feedbacks*
- *around half a billion more people seriously impacted*

Breakdown of contributions to global net CO_2 emissions in four illustrative model pathways



P1: A scenario in which social

P2: A scenario with a broad focus on

P3: A middle-of-the-road scenario in

P4: A resource and energy-intensive

2) 'Real' mitigation for 2°C needs to be complemented with planetary scale negative emissions

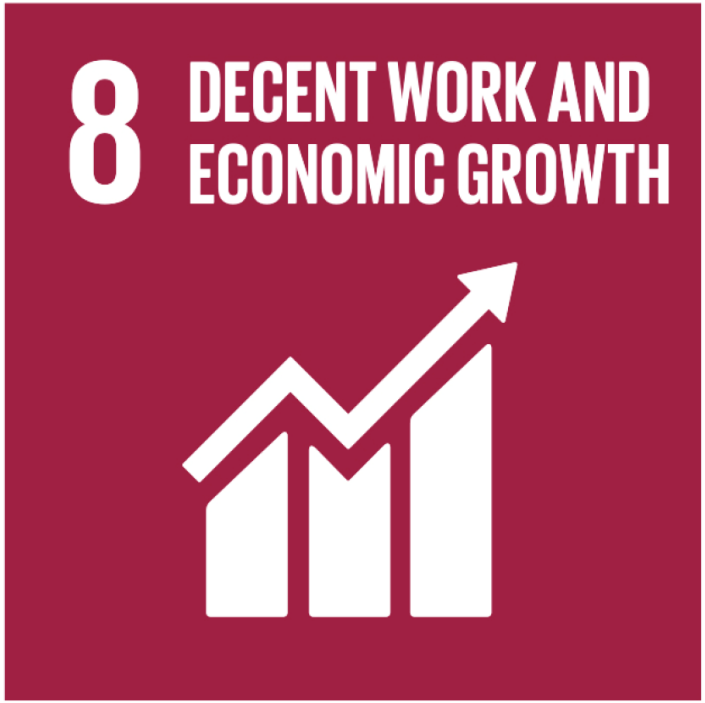
CDR option considered; neither fossil fuels with CCS nor BECCS are used.

well-managed land systems with limited societal acceptability for BECCS.

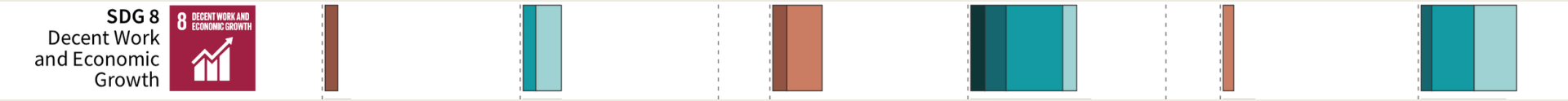
means, making strong use of CDR through the deployment of BECCS.

Global indicators	P1	P2	P3	P4	**Interquartile range**
Pathway classification	No or low overshoot	No or low overshoot	No or low overshoot	High overshoot	No or low overshoot
CO_2 emission change in 2030 (% rel to 2010)	-58	-47	-41	4	(-59,-40)
↳ in 2050 (% rel to 2010)	-93	-95	-91	-97	(-104,-91)
Kyoto-GHG emissions in 2030 (% rel to 2010)*	-50	-49	-35	-2	(-55,-38)
↳ in 2050 (% rel to 2010)	-82	-89	-78	-80	(-93,-81)

SDG 8
Decent Work and Economic Growth



IPCC claim few trade-offs and strong synergies between 1.5°C mitigation and economic growth



Response to the IPCC 1.5°C Special Report

By Kevin Anderson

Filed Under: All posts, Energy and Environment, Science and Engineering

Posted: October 8, 2018

The IPCC report meticulously lays out how the serious climate impacts of 1.5°C of warming are still far less destructive than those for 2°C. Sadly, the IPCC then fails, again, to address the profound implications of reducing emissions in line with both 1.5 and 2°C. Dress it up however we may wish, climate change is ultimately a rationing issue.

The responsibility for global emissions is heavily skewed towards the lifestyles of a relatively few high emitters – professors and climate academics amongst them. Almost 50% of global carbon emissions arise from the activities of around 10% of the

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The University of Manchester's Professor Kevin Anderson responds to today's report from the Inter-Governmental Panel on Climate Change.

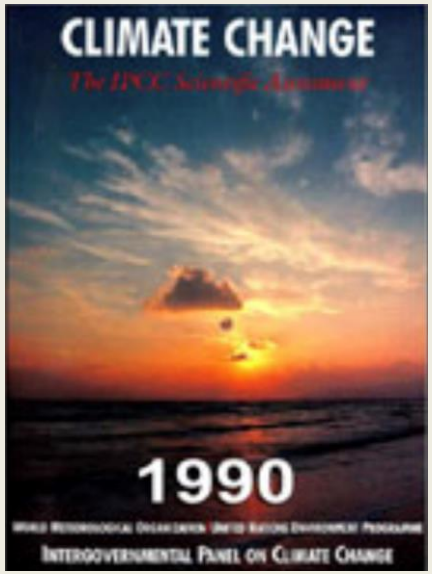
Ignoring the huge inequality in emissions, the IPCC chooses to constrain its policy advice to fit neatly within the current economic model.

again, to address the profound implications of reducing emissions in line with both 1.5 and 2°C. Dress it up however we may wish, climate change is ultimately a rationing issue.

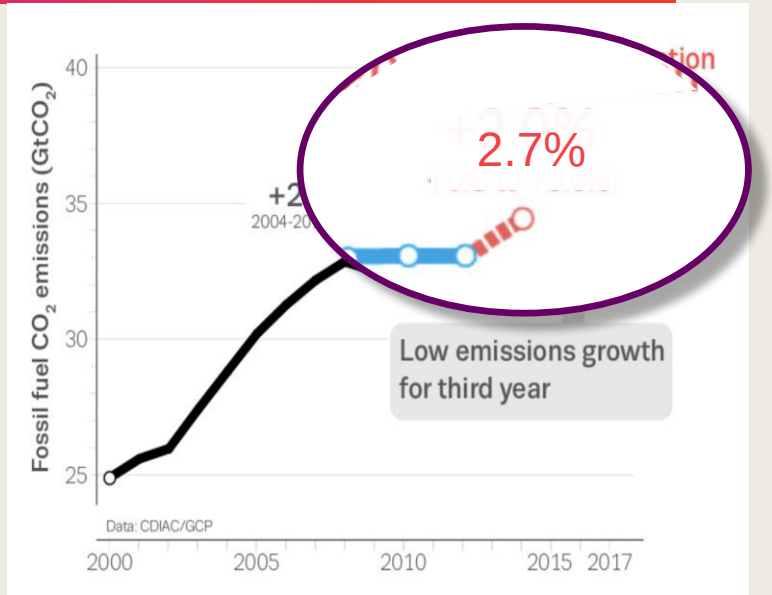
The responsibility for global emissions is heavily skewed towards the lifestyles of a relatively few high emitters – professors and climate academics amongst them. Almost 50% of global carbon emissions arise from the activities of around 10% of the

Returning to 2°C …
what is our response to this challenge?

Humility as a starting point for hope & action



- 1990: first IPCC report
- 2018: CO_2 65% >1990
- …still rising in 2018
- …up by around 2.7%



Despite optimistic rhetoric, we've delivered
28 years of abject failure in terms of reducing total emissions

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Thus far … *litany of **technocratic** fraud*

- Offsetting … paying a poor person to diet for us
- Clean development mechanism (CDM) … state sanctioned offsetting
- Emissions trading (EUETS) … so many permits the €tCO2 stays low
- Afforestation … plant a tree, expand an airport
- Speculative ‘negative emission technoligies’ (NETs) … at huge planetary scale
- Geo-engineering … a sticking plaster on gangrene

… we have not seriously tried to cut our CO_2!

Just look at the UK *(or Sweden, Denmark, France …)*

an international reputation as leading on climate change action

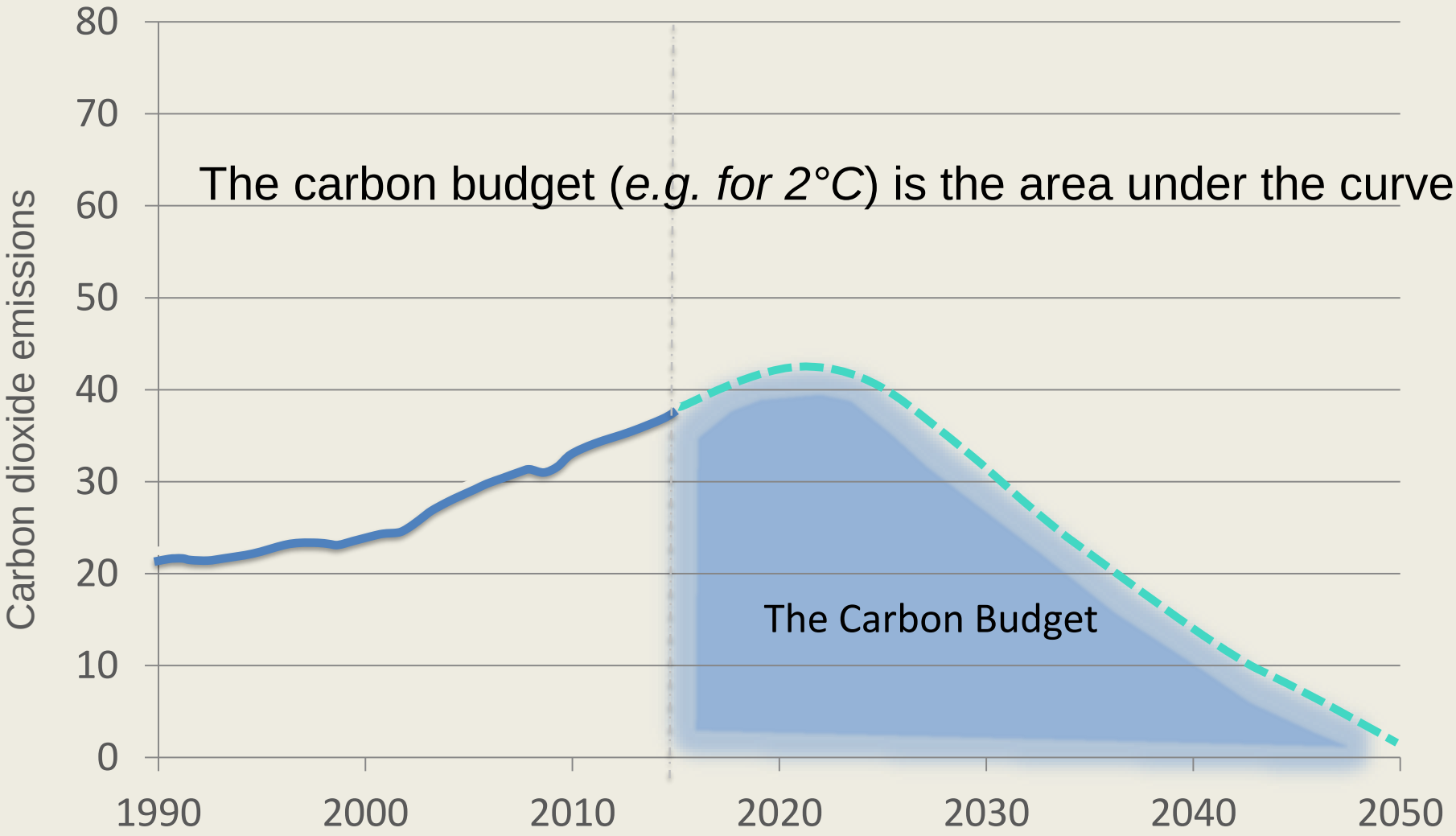
yet …

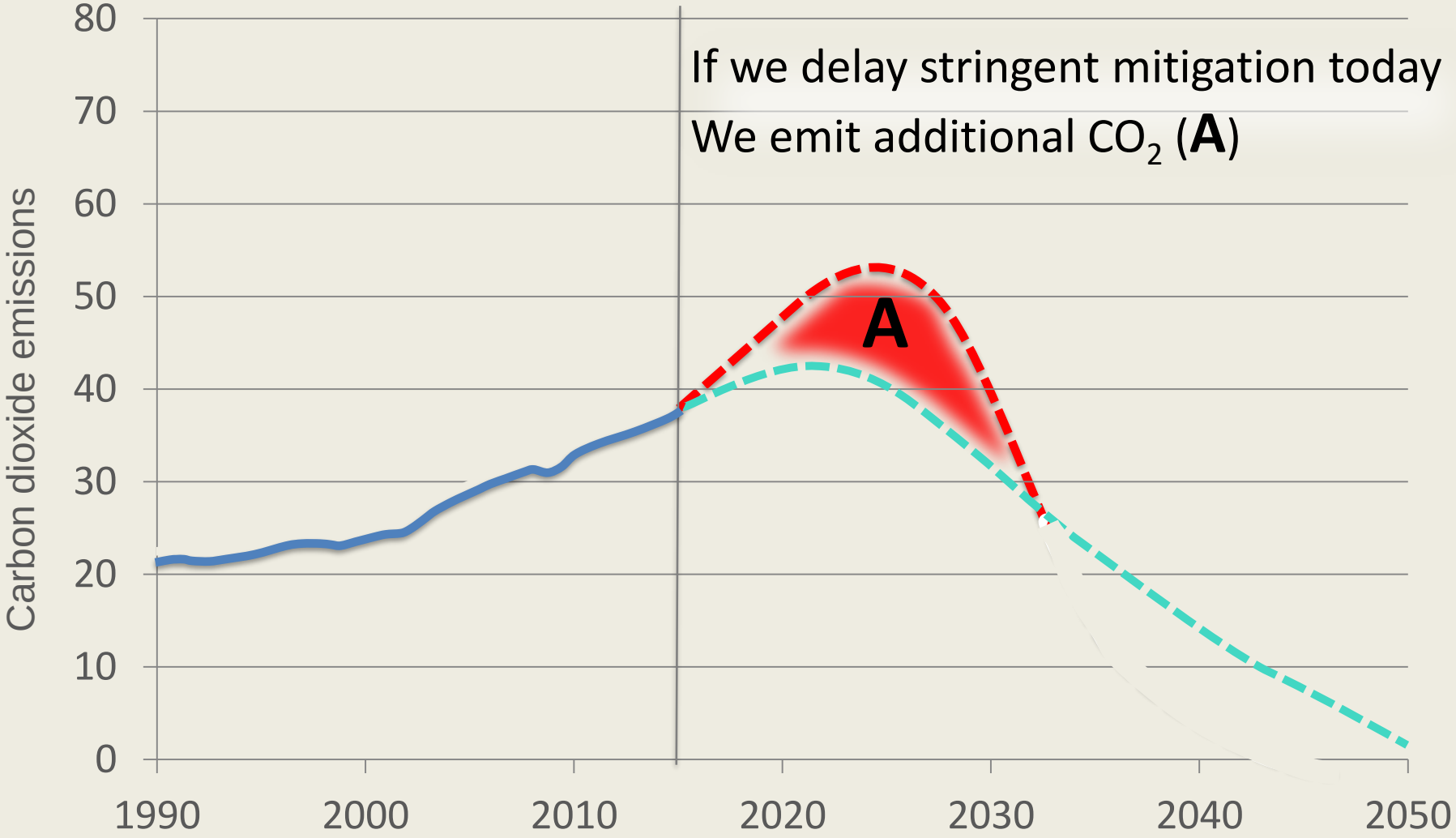
almost no change in CO_2 emissions since 1990*

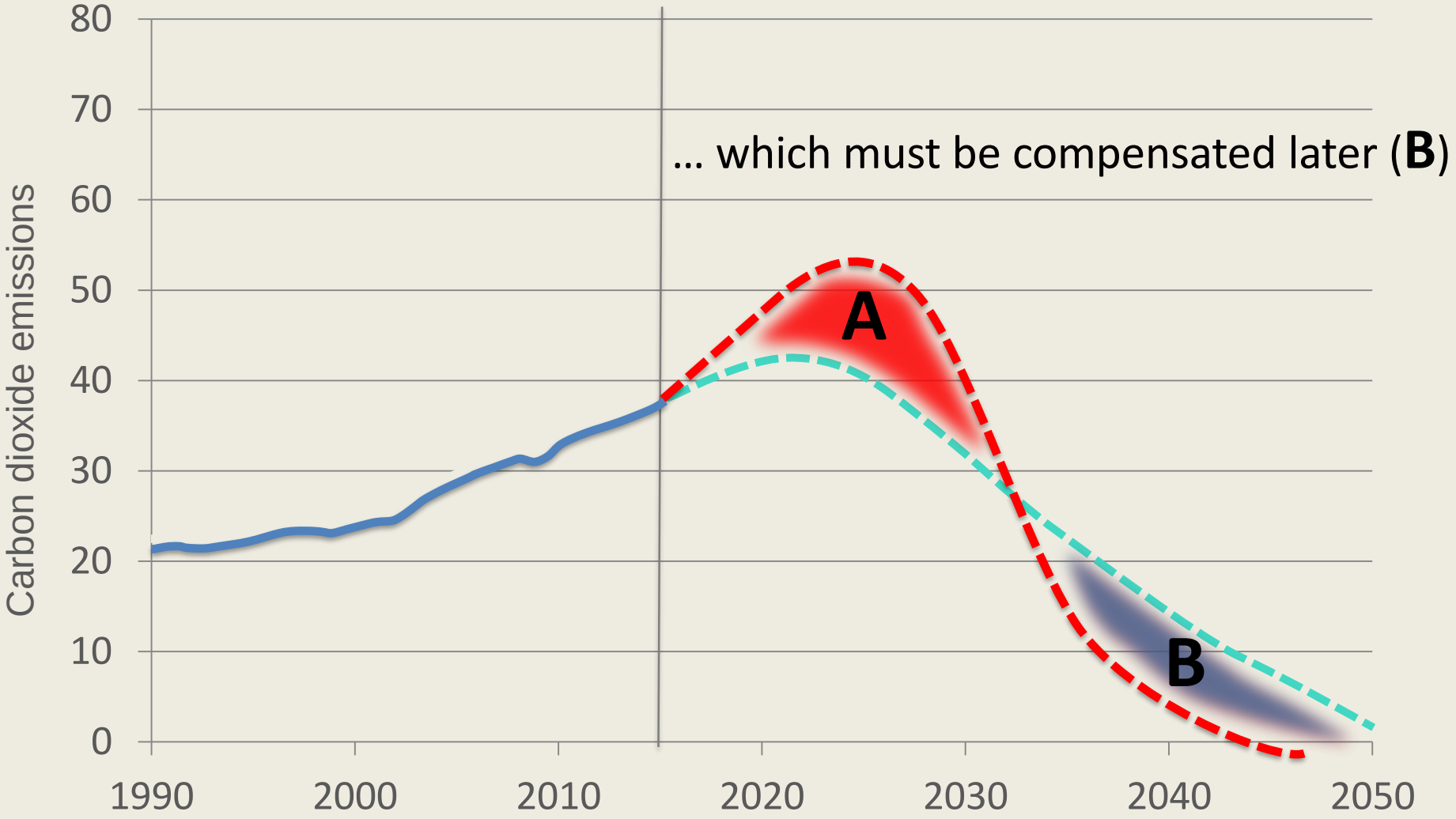
**once aviation, shipping, imports & exports are taken into account*

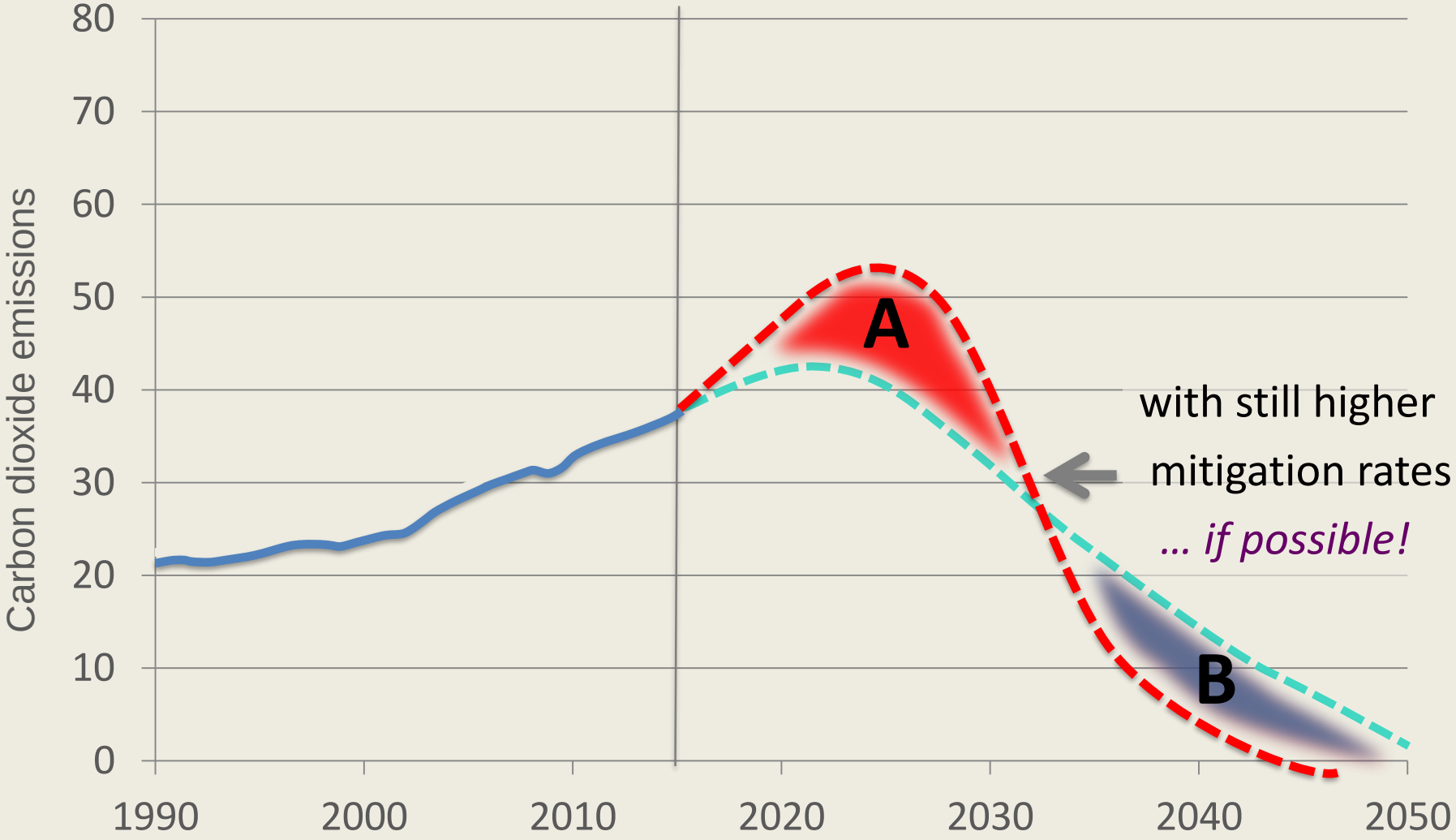
So where to from here?

*… it is **carbon budgets**, not long-term targets, that link with **temperature rise***


The carbon budget (*e.g. for 2°C*) is the area under the curve
Carbon dioxide emissions
80
70
60
50
40
30
20
10
0
1990
2000
2010
2020
2030
2040
2050
The Carbon Budget


If we delay stringent mitigation today
We emit additional CO_2 (**A**)
A
Carbon dioxide emissions
80
70
60
50
40
30
20
10
0
1990
2000
2010
2020
2030
2040
2050


80
70
60
50
40
30
20
10
0
Carbon dioxide emissions
1990
2000
2010
2020
2030
2040
2050
… which must be compensated later (B)
A
B


Carbon dioxide emissions
80
70
60
50
40
30
20
10
0
1990
2000
2010
2020
2030
2040
2050
A
B
with still higher
mitigation rates
… if possible!

So how big is the “well below 2°C” budget?

According to the IPCC …

- To meet the Paris ***"well below 2 ℃"*** commitment
- From **2019** the global carbon budget is **~700GtCO$_2$** *(to 2100 & beyond)*
- In 2018 global CO$_2$ emissions were **~43GtCO$_2$**
- i.e. under **16 years** of current emissions

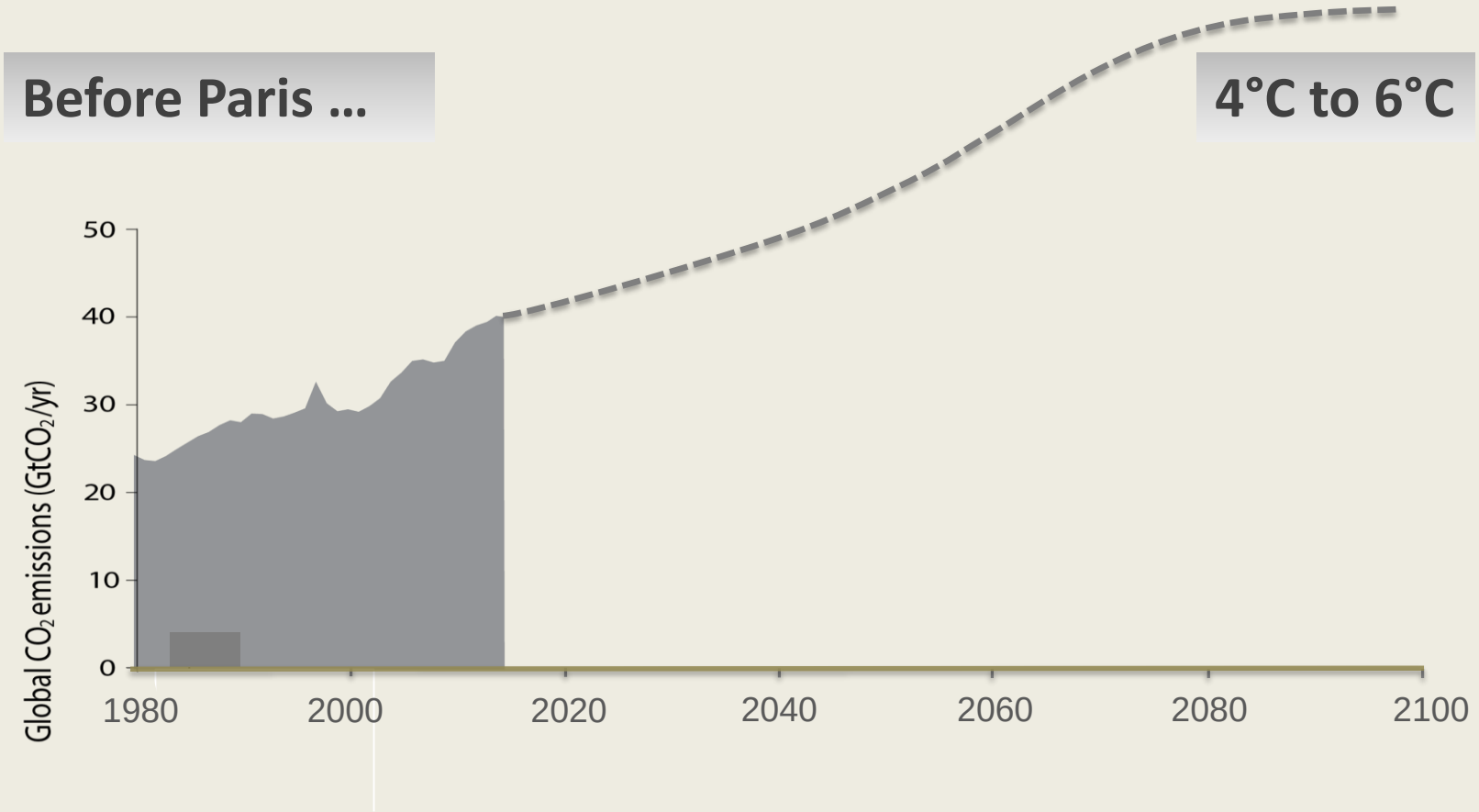
Table 2.2 | Cumulative carbon dioxide (CO_2) emission consistent with limiting warming to less than stated temperature limits at different levels of probability, based on different lines of evidence. *{WGI 12.5.4, WGIII 6}*

	Cumulative CO_2 emissions from 1870 in $GtCO_2$								
							<3°C		
Fraction of simulations meeting goal [b]	66%	50%	33%	66%	50%	33%	66%	50%	33%
[illegible] scenarios only [c]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Simple model, WGIII scenarios [d]	No data	2300 to 2350	2400 to 2950	2550 to 3150	2900 to 3200	2950 to 3800	n.a. [e]	4150 to 5750	5250 to 6000
	Cumulative CO_2 emissions from 2011 in $GtCO_2$								
[illegible] scenarios only [c]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1500	2400	2800	3250
Simple model, WGIII scenarios [d]	No data	550 to 600	600 to 1150	750 to 1400	1150 to 1400	1150 to 2050	n.a. [e]	2350 to 4000	3500 to 4250
Total fossil carbon available in 2011 [f]: 3670 to 7100 $GtCO_2$ (reserves) and 31300 to 50050 $GtCO_2$ (resources)									

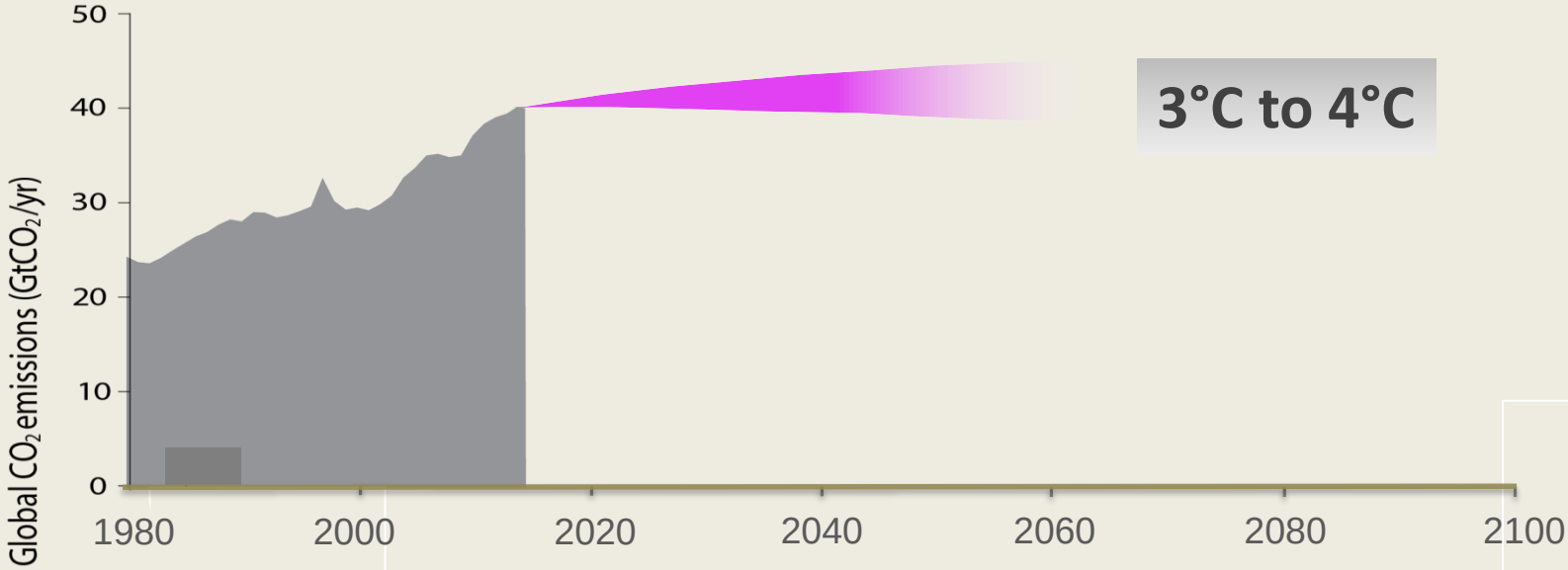
Quantifying the Paris Agreement

Before Paris …

4°C to 6°C

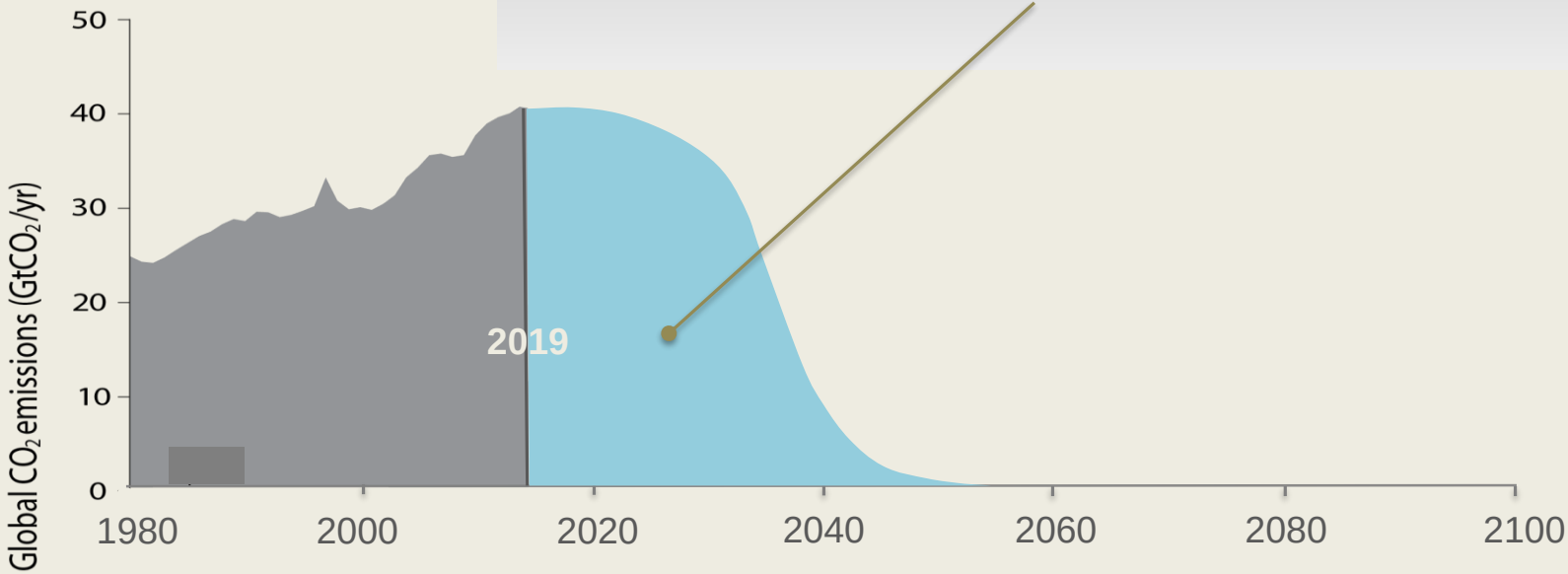


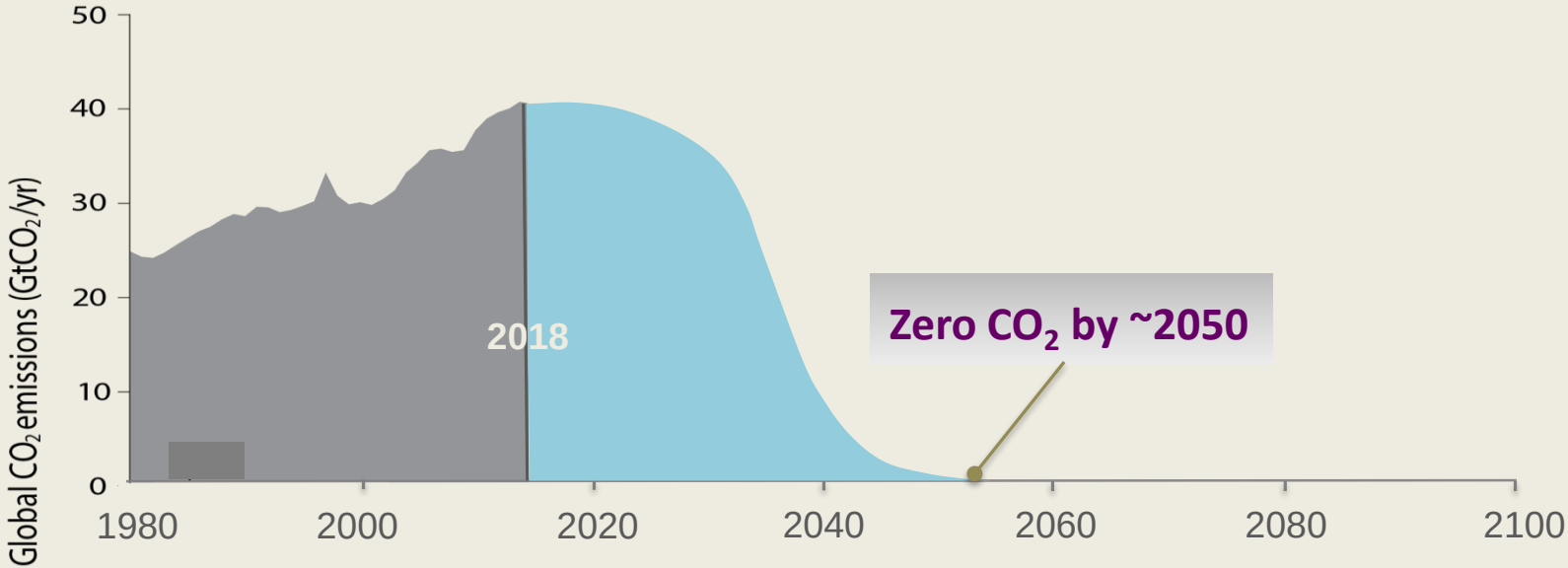
With Paris
… national pledges add up to...



And to stay ***"well below 2°C"***

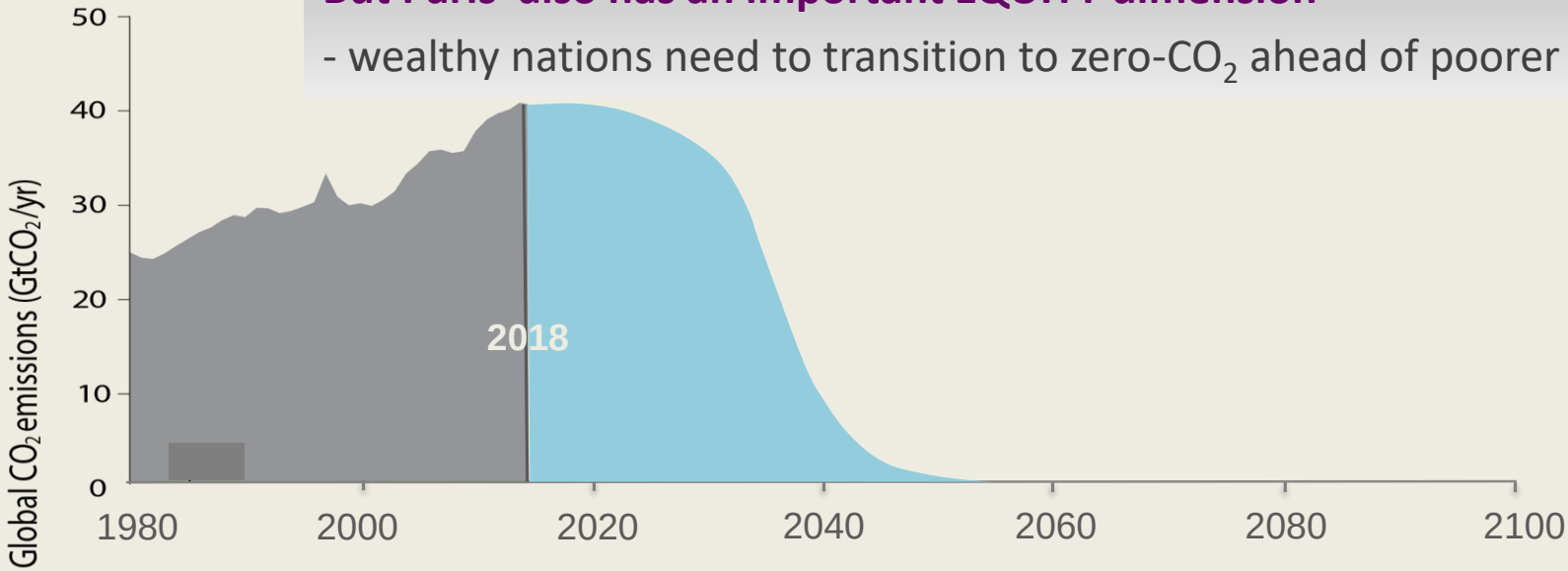
- the carbon budget remaining from 2019 is:
- approx. **700 billion tonnes CO_2** (i.e. 700GtCO_2)




Global CO_2 emissions ($GtCO_2$/yr)
50
40
30
20
10
0
1980
2000
2020
2040
2060
2080
2100
2018
Zero CO_2 by ~2050

But Paris also has an important EQUITY dimension

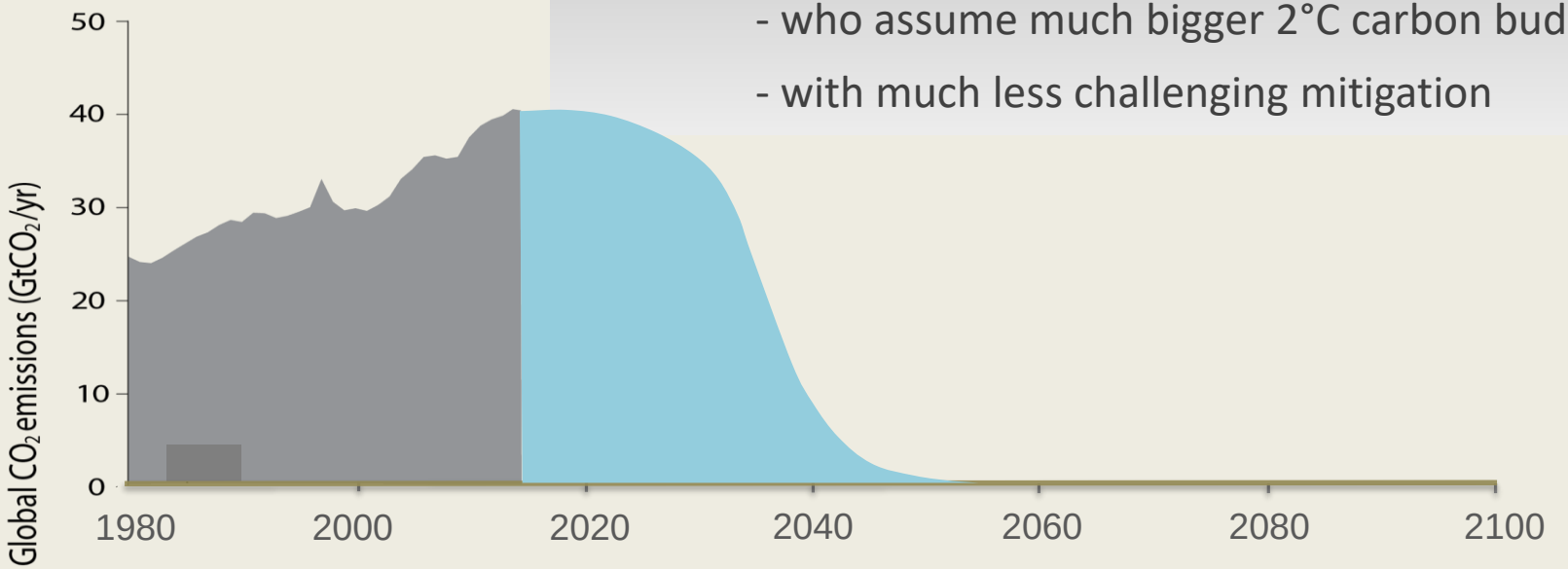
- wealthy nations need to transition to zero-CO_2 ahead of poorer nations



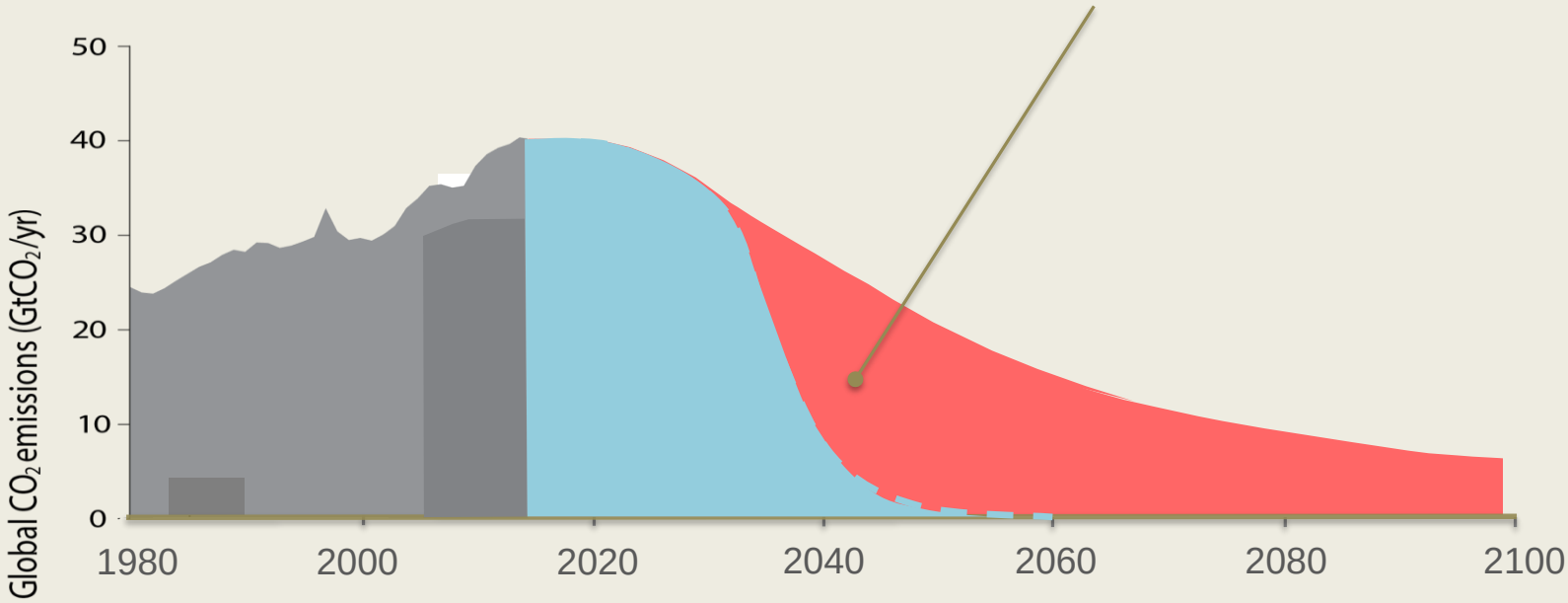
How can this fit with the Paris euphoria?

… because policymakers have received a different story

- their advice is dominated by modellers (IAM)
- who assume much bigger 2°C carbon budgets
- with much less challenging mitigation



Modelled emissions are nearer **1600 $GtCO_2$**



So for a “likely” chance of 2°C

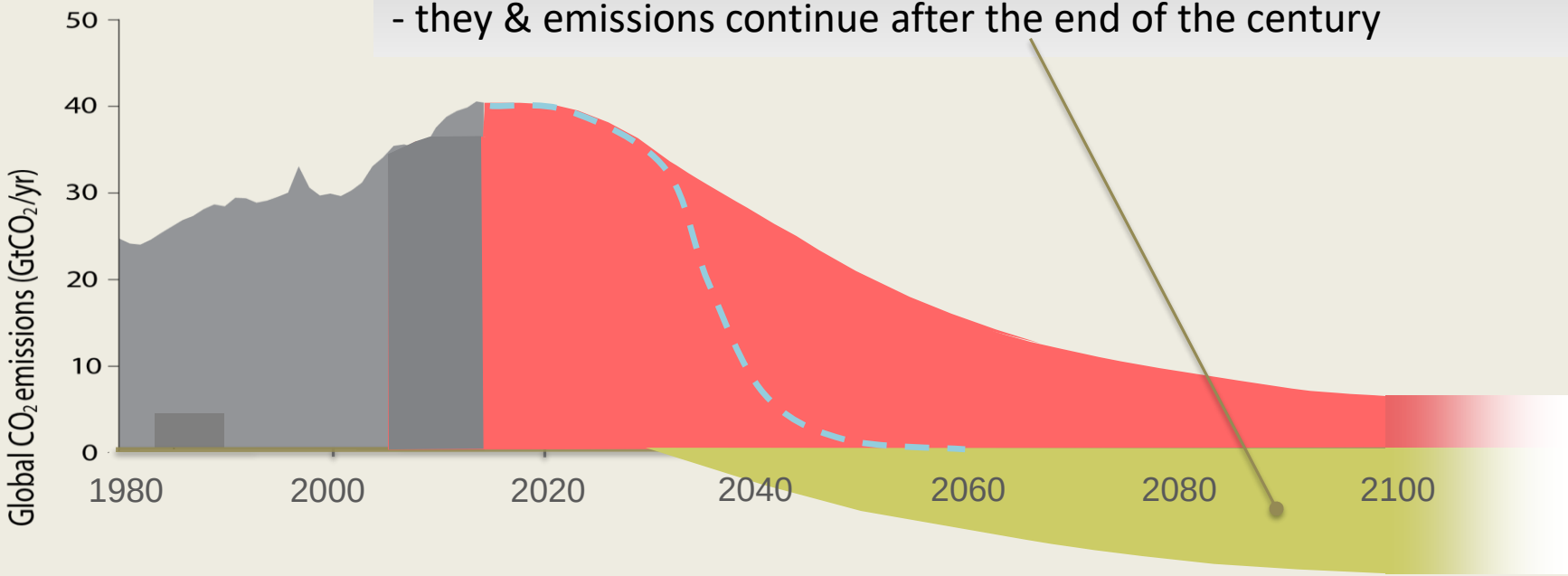
- IPCC **science** suggests around **800GtCO$_2$** from 2017
- IPCC economic **modellers** typically use **~1600GtCO$_2$** from 2017


... how
can this
make
sense?

… by pulling a rabbit from the magician’s hat

models conjour up **“Negative Emission Technolgies” (NETs)**

- to suck **100s billions tonnes of CO_2** directly from the atmosphere
- they & emissions continue after the end of the century



So Paris, some Academics & Politicians …

- **rather than focus on urgent & deep mitigation now**

  … *with challenging political & economic repercussions*

- **prefer to rely on non-existent negative emission technologies**

  … *to suck huge quantities of CO_2 from the air in the future*

  … *supporting ongoing fossil-fuel use to 2100 & beyond*

  … & masking how 2℃ demands major social change

What is the UK's fair contribution to 2°C?

To limit warming to a 2°C rise …

we have a set global carbon pie

i.e. total CO_2 that can be emitted from now to forever …

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To limit warming to a 2°C rise …

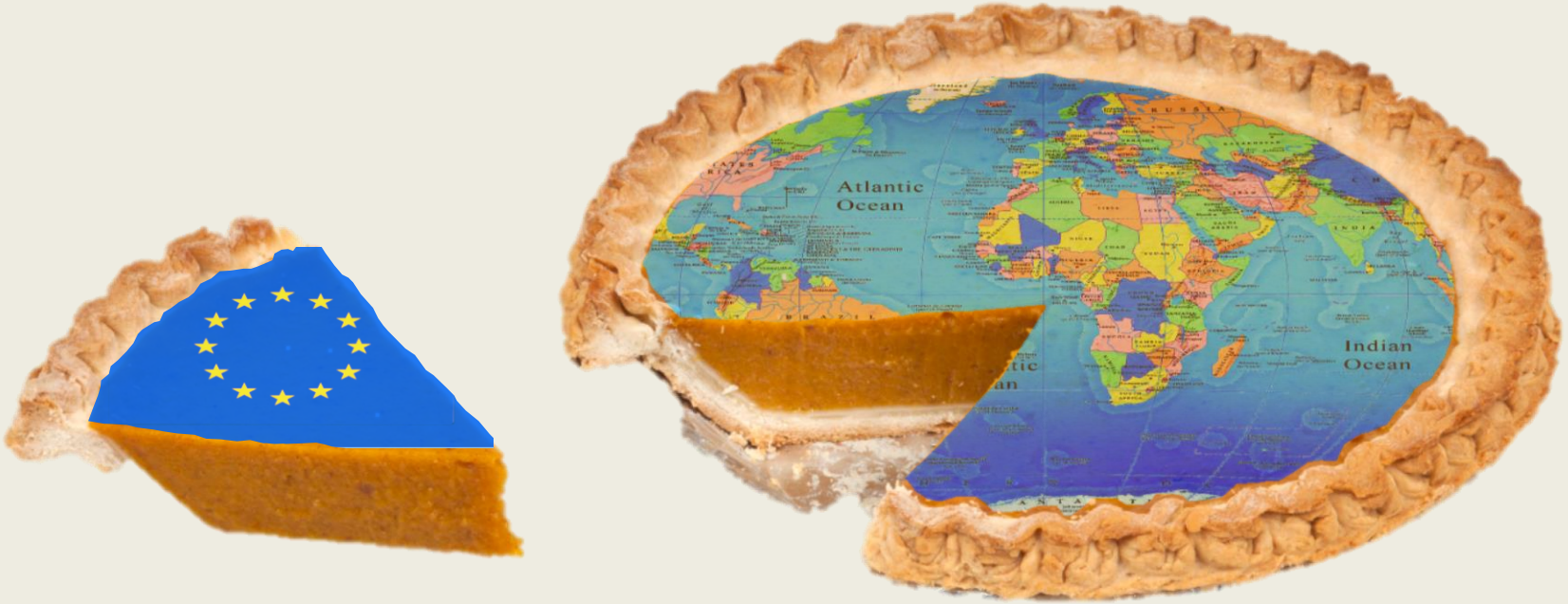
we have a set global carbon pie

i.e. total CO_2 that can be emitted from now to forever …

So to limit warming to a 2°C rise …

… this needs to be split **equitably** amongst all of the world's nations

What is a fair slice *(carbon budget)* for the **EU**?



Of the EU carbon budget …

… how much should the UK get?

… in terms of numbers

The UK's fair Paris 2°C carbon budget for energy is

~2.9 to 4 $GtCO_2$

… for 2018 to 2100 & beyond [1,2]

i.e. **7 to 9 years** of current emissions*

[1]*includes aviation & shipping;* [2]*excludes imports & exports*

Headline 2°C mitigation for the **UK**

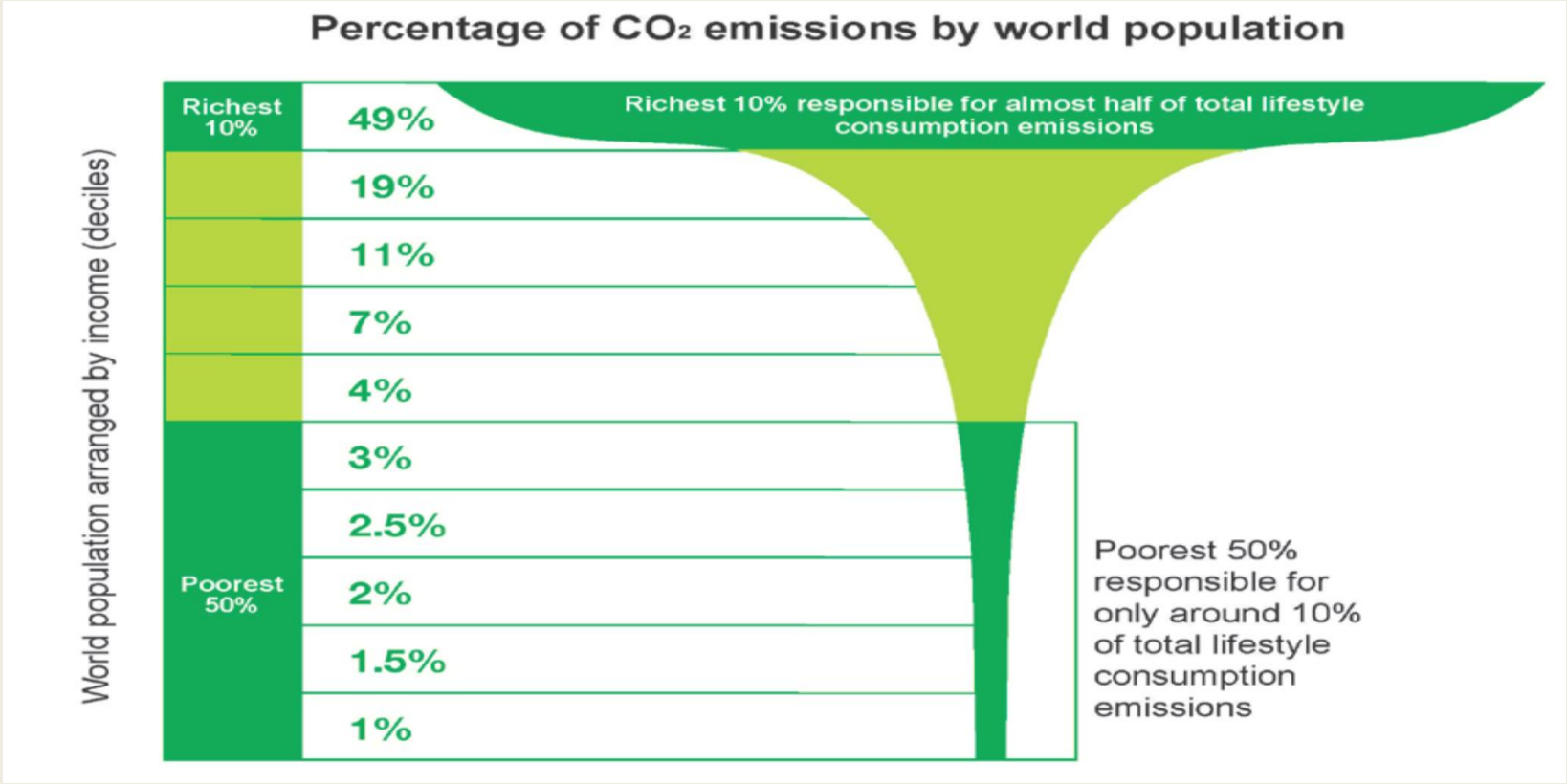
- Need to reduce CO_2 at **10-13% p.a.** starting now
- A total reduction of around 75% by **2025**
- **~fully** decarbonised **energy** by around **2035-40**
- *(non-OECD, around 15 years later)*

[1]includes aviation & shipping; [2]excludes imports & exports


So, are such mitigation rates viable

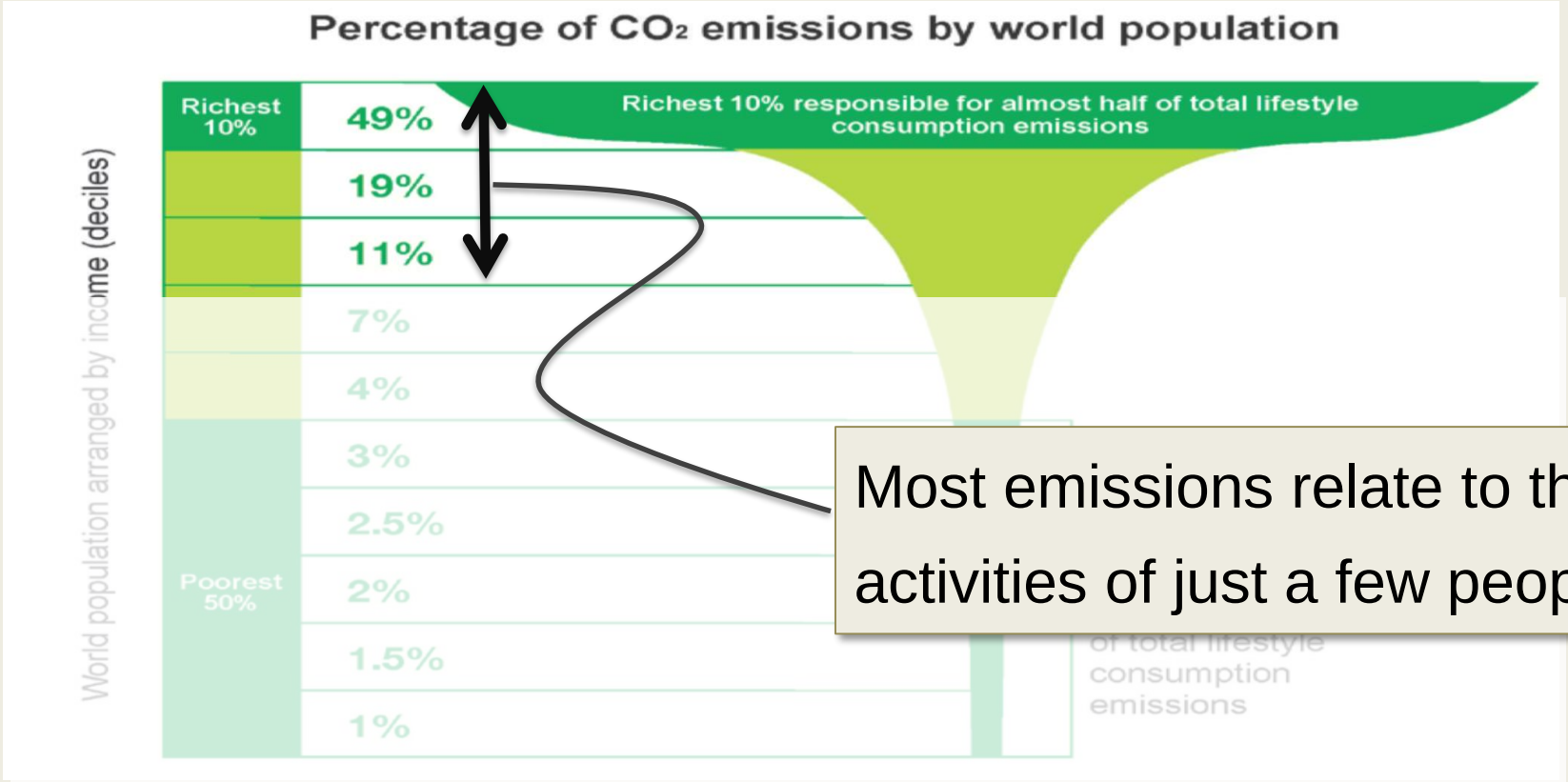
IPCC + Paris = Equity?

CO_2 is highly skewed towards the 'few'?



Global income deciles & associated lifecycle consumption emissions

CO_2 is highly skewed towards the 'few'?



Global income deciles & associated lifecycle consumption emissions

CO_2 is highly skewed towards the 'few'?

50% of CO_2 from 10% of the population

70% ..... from 20%

3 phase strategy: *to address CO_2 budgets & inequality*

1) Immediate & near term:

Profound changes in the energy **behaviors & practices** of high-energy users.

2) Near to medium term:

Very stringent **energy efficiency** standards on all major end-use equipment

3) Medium to longer term:

Marshall-style construction of ~zero-CO_2 energy **supply** & major electrification

3 phase strategy: *to address CO_2 budgets & inequality*

1) Immediate & near term:

Profound changes in the energy **behaviors & practices** of high-energy users.

2) Near to medium term:

Very stringent **energy efficiency** standard… ment

labour & resources

3) Medium to longer term:

Marshall-style construction of ~zero-CO_2 energy **supply** & major electrification

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3 phase strategy: *to address CO_2 budgets & inequality*

1) Immediate & near term:

Profound changes in the energy **behaviors & practices** of high-energy users.

i.e. a shift in the productive capacity of society

akin to that in WW2

2) N

Very stringent **energy efficiency** standards on all major end-use equipment

3) Medium to longer term:

Marshall-style construction of ~zero-CO_2 energy **supply** & major electrification

A flavour of this shift in labour/resource allocation

From:

- Large houses, holiday homes, second homes
- Prestige cars; SUVs; Multiple car ownership
- Highly mobile lives; Frequent fliers; Business/First class travel
- High levels of consumer goods

To:

Rapid transformation from 81% fossil fuel to zero-CO_2 infrastructure

A flavour of this shift in labour/resource allocation

From:

- Large houses, holiday homes, second homes
- Prestige cars; SUVs; Multiple car ownership
- Highly mobile lives; Frequent fliers; Business/First class travel
-

*i.e. A zero-carbon **industrial strategy***

To:

Rapid transformation from 81% fossil fuel to zero-CO_2 infrastructure

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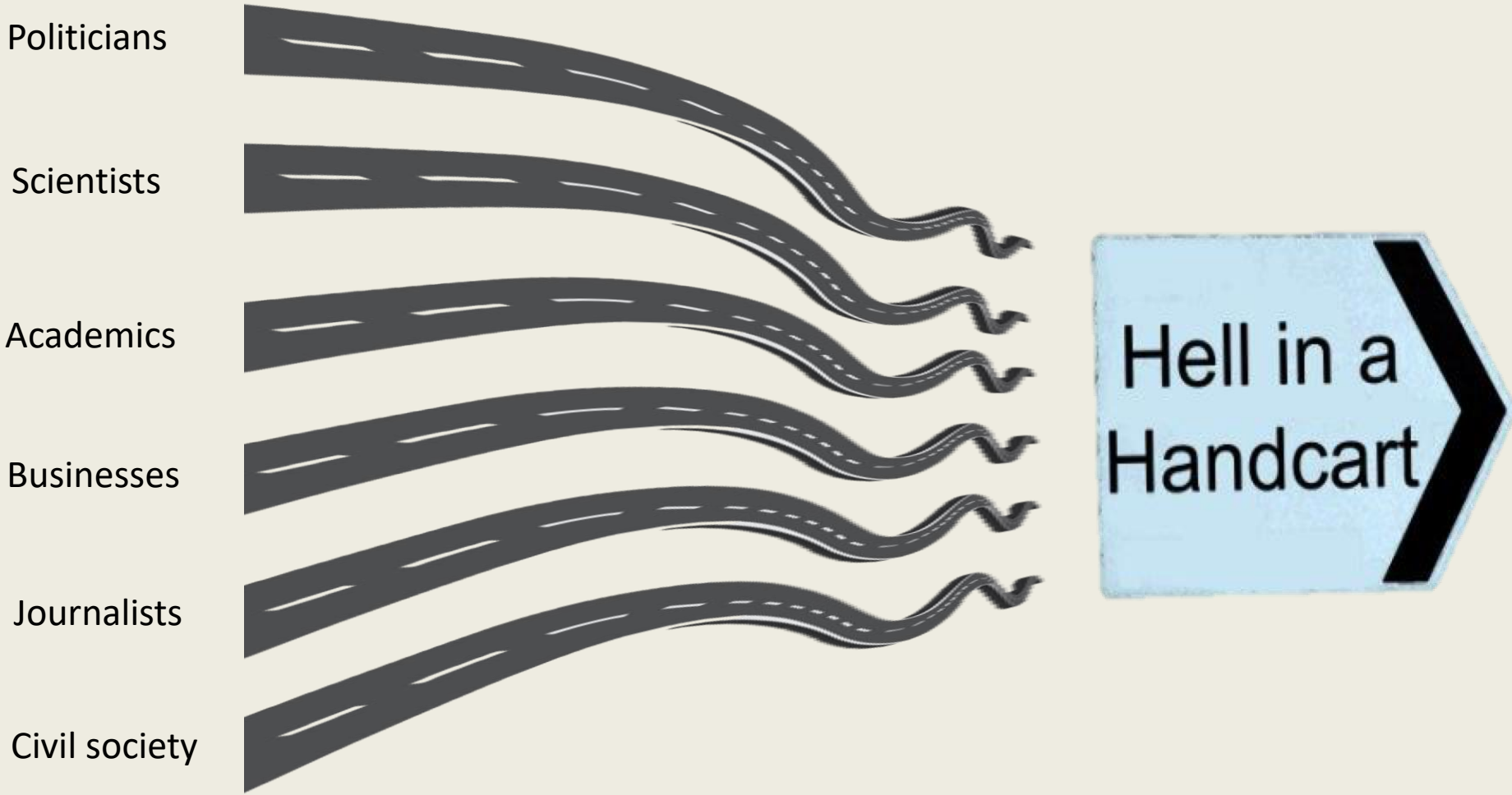
So, are there any signs of **deep system change**?



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Is there Light
in Despair?

kevinanderson.info

Comment on climate

Personal reflections on the 23rd COP in Bonn-Fiji – Nov. 2017

Kevin Anderson (@KevinClimate)
CEMUS. Uppsala University
Tyndall Centre, MACE. University of Manchester

Settling wearily into my Deutsche Bahn seat at the start of a two-day journey back to Uppsala, Sweden, I've endeavoured below to capture my early thoughts on the latest attempt to forestall our headlong rush towards oblivion.

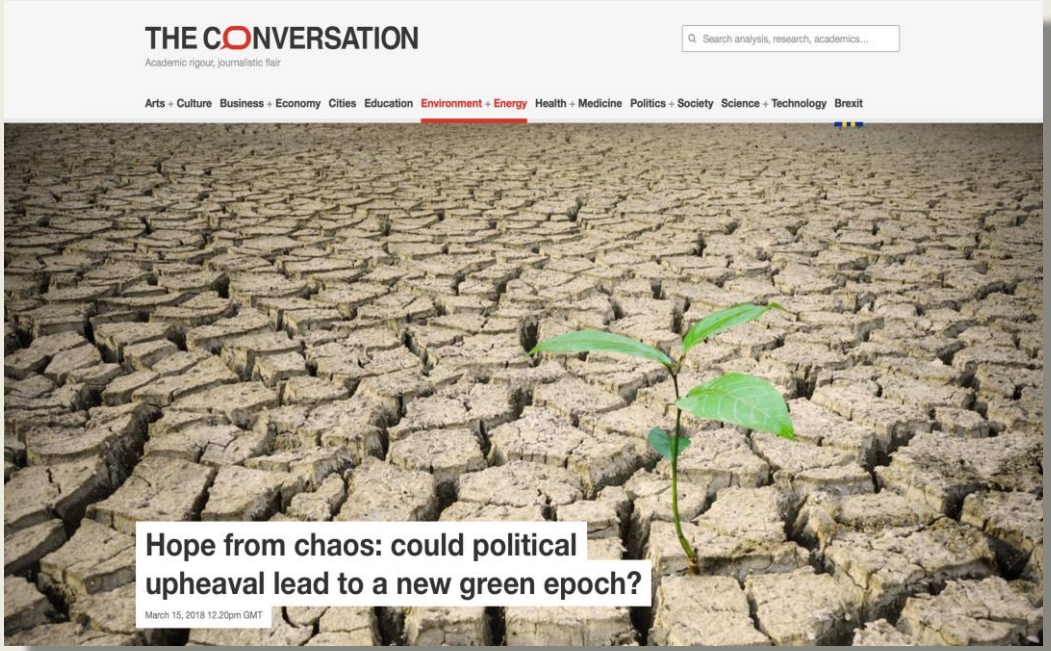
I said my goodbyes to the geographically divisive COP[1] venue yesterday afternoon. The roadies were already dismantling the paraphernalia that accompanies such events and heavily laden trucks had begun trundling towards the next jamboree. This was my third COP, and despite a challenging schedule of events, I leave Bonn-Fiji[2] more jaded than when I returned from its Parisian predecessor. I was certainly uneasy with the euphoria surrounding the Paris Agreement[3], but I could also see its potential for catalysing a transformation in global responses to climate change. Two years on and Bonn-Fiji signals just how entrenched, powerful and resilient our status quo is and how compliant the 'established' climate change community has become.

I've divided my thoughts into three short sections. First, a response to the depressing 2017 emissions data released during the COP. Second, a reflection on the *"them and us"* segregation structurally embedded in the COP venue. Finally, a tentative interpretation of how hope may yet reside in the emergent dynamics of contemporary societies.

Rising emissions and pitiful excuses

Last Monday (November 13th) the Global Carbon Project announced the results of its annual assessment of emissions data. In 2017 carbon dioxide from fossil fuels and cement is anticipated to be 2% higher than in 2016. Is this really such a surprise?

Witness the US and the EU's fervour for locking-in high-carbon gas[4] behind a veil of closing down old coal. Academic enthusiasm for evermore quixotic 'negative emission technologies'(NETs)[5] and geo-engineering to support 'big oil' and infinite growth. A growing cadre of climate glitterati ratcheting up its rhetoric to align with its rocketing emissions. The UNFCCC's promotion of expedient offsetting to 'neutralise' emissions from air-travel to Bonn and its other global meetings. Meanwhile journalists remain unwilling or ill equipped to call time on this catalogue of subterfuge. It's twenty-seven years since the IPCC's first report and a quarter of a century since the Rio Earth Summit, but still our carbon emissions are rising.



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Post-2008 – an assemblage of upheavals

Banking crisis – *QE resources quickly mobilised as markets fail to self regulate*

Social Media – *usurping the media barons' stranglehold*

Sanders & Corbyn – *radical positions breakthrough despite having no establishment support*

Brexit, Trump (Swedish Democrats?) – *a 'new' anti-establishment constituency?*

Arab Spring – *emergent people power*

Plummeting price of renewables – *& they continue to fall*

Raising concern of health impacts of fossil fuels – *even IMF engaged in fossil-fuel bashing*

Hope from chaos?

In themselves, each of the above disruptions has important implications for the evolution of contemporary society.

Most political and economic pontificators, buttressed by naysayers and established elites, remain incapable of seeing beyond their familiar 20th-century horizon.

Do **we** have something to offer this new agenda?

Are we prepared to:

- *think post-growth*
- *be open-minded to technical opportunities & limitations*
- *consider short-term rationing of energy*
- *stand up to the bullying of the City & the Davos set ...?*
- *reject hierarchy & the tyranny of grey-haired elites **...**?*

... do we (you) have the:

cogency, tenacity & courage to escape our neo-liberal black hole?

To conclude

In 2019 Climate Change is System Change

Interpreting Paris through the **logic of carbon budgets** begs fundamental questions of our **norms & paradigms**

- *transformation to decarbonised energy supply technologies*
- *rapid penetration of most efficient end-use technologies*
- *profound shift in behaviour & practices*
- *a reframing of values, success & progress*
- *development of economic models fit for purpose*

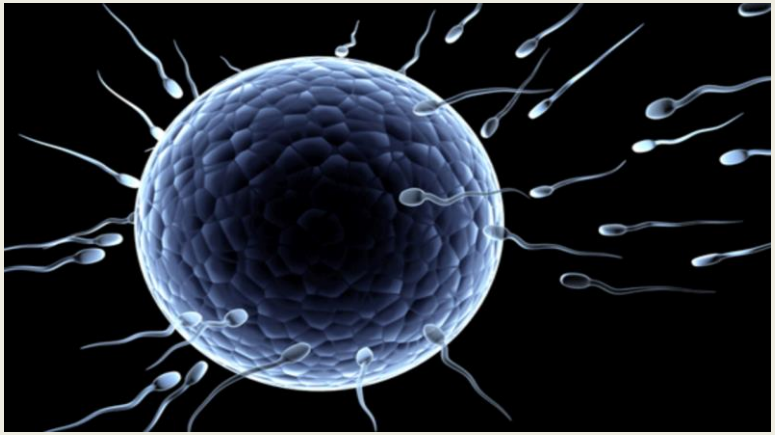
In 2019 Climate Change is System Change

Interpreting Paris through the **logic of carbon budgets** begs fundamental questions of our **norms & paradigms**

… starting now …

… we've a long way to go

… we've a long way to go



… we've a long way to go

Ultimately …

Winning slowly is basically the same thing as losing outright. In the face of both triumphant denialism and predatory delay, trying to achieve climate action by doing the same things, the same old ways means defeat. It guarantees defeat.

Alex Steffen 2017

Kevin Anderson
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