



Climate Change: going beyond dangerous

*... brutal numbers & tenuous hope
or
cognitive dissonance?*

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Before thinking of responses and ‘answers’
what’s the question?

Copenhagen Accord (2009)

*‘To hold the increase in global temperature
below 2 degrees Celsius, and take action to
meet this objective consistent with science and
on the basis of equity’*

European Commission's annual communication

*'The EU must ensure global average
temperature increases do not exceed
preindustrial levels by more than 2°C'*

UK Low Carbon Transition Plan (2009)

*“average global temperatures
must rise no more than 2°C,”*

DECC SoS – Ed Miliband (2009)

*“we should limit climate change
to a maximum of two degrees”*

So, for Climate Change -
the question is clear:

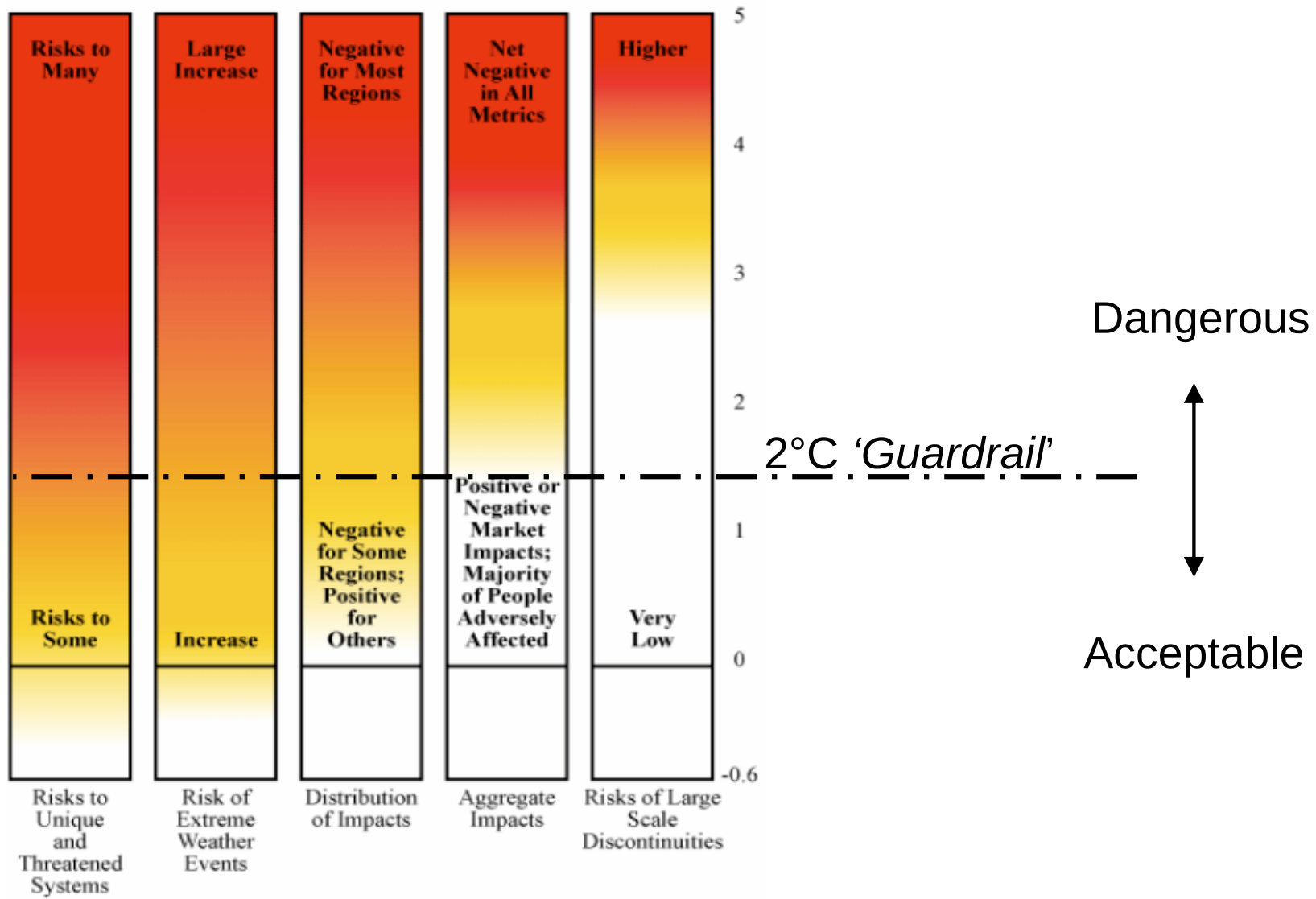
What do we need to do to provide
a low probability of entering
dangerous climate change

i.e. how do we stay below 2°C?

NB. 2°C is a 'wealthy western' view of the appropriate characterisation of dangerous, many poorer nations consider it too high

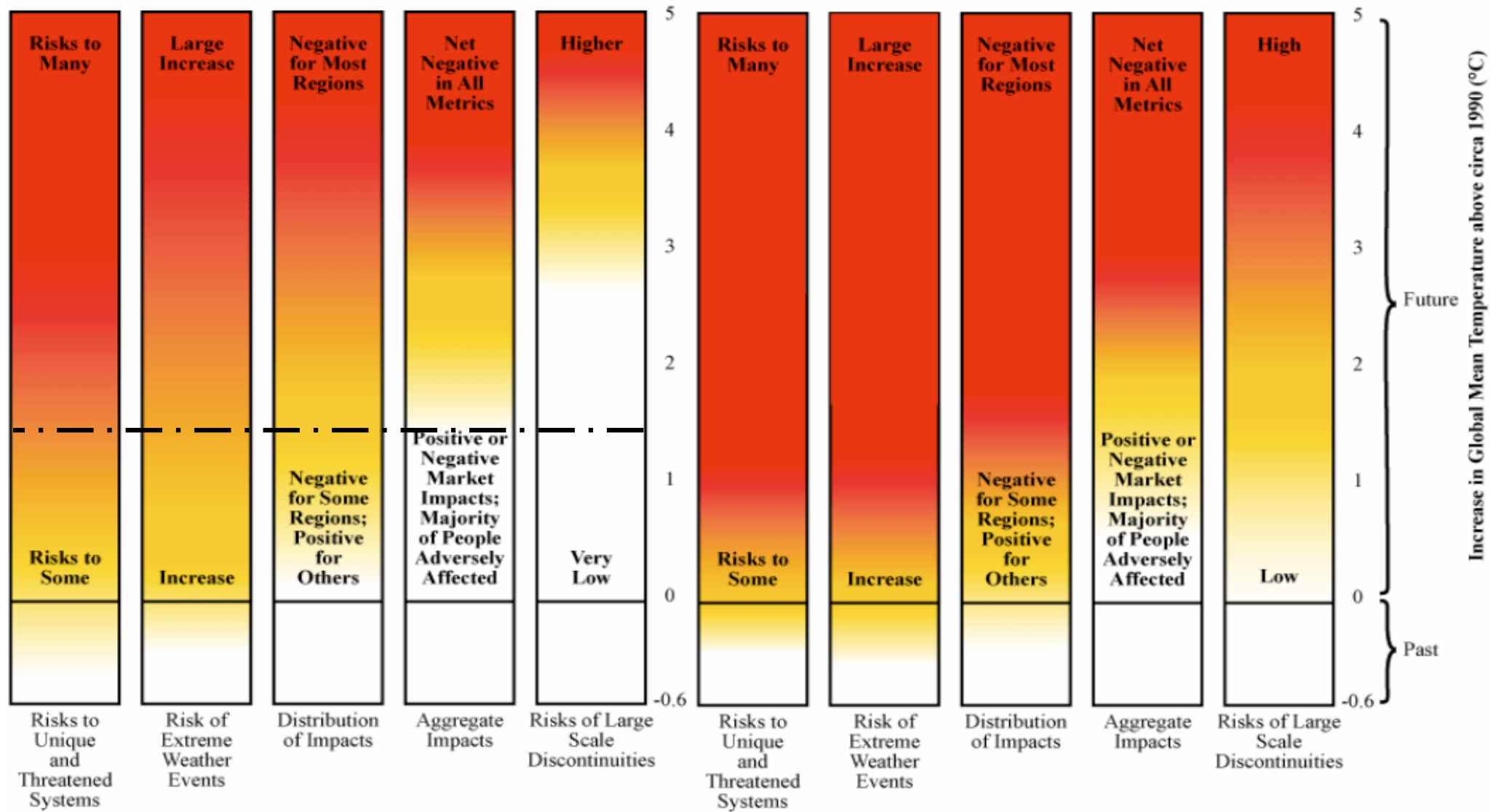
... but why 2°C ?

2001



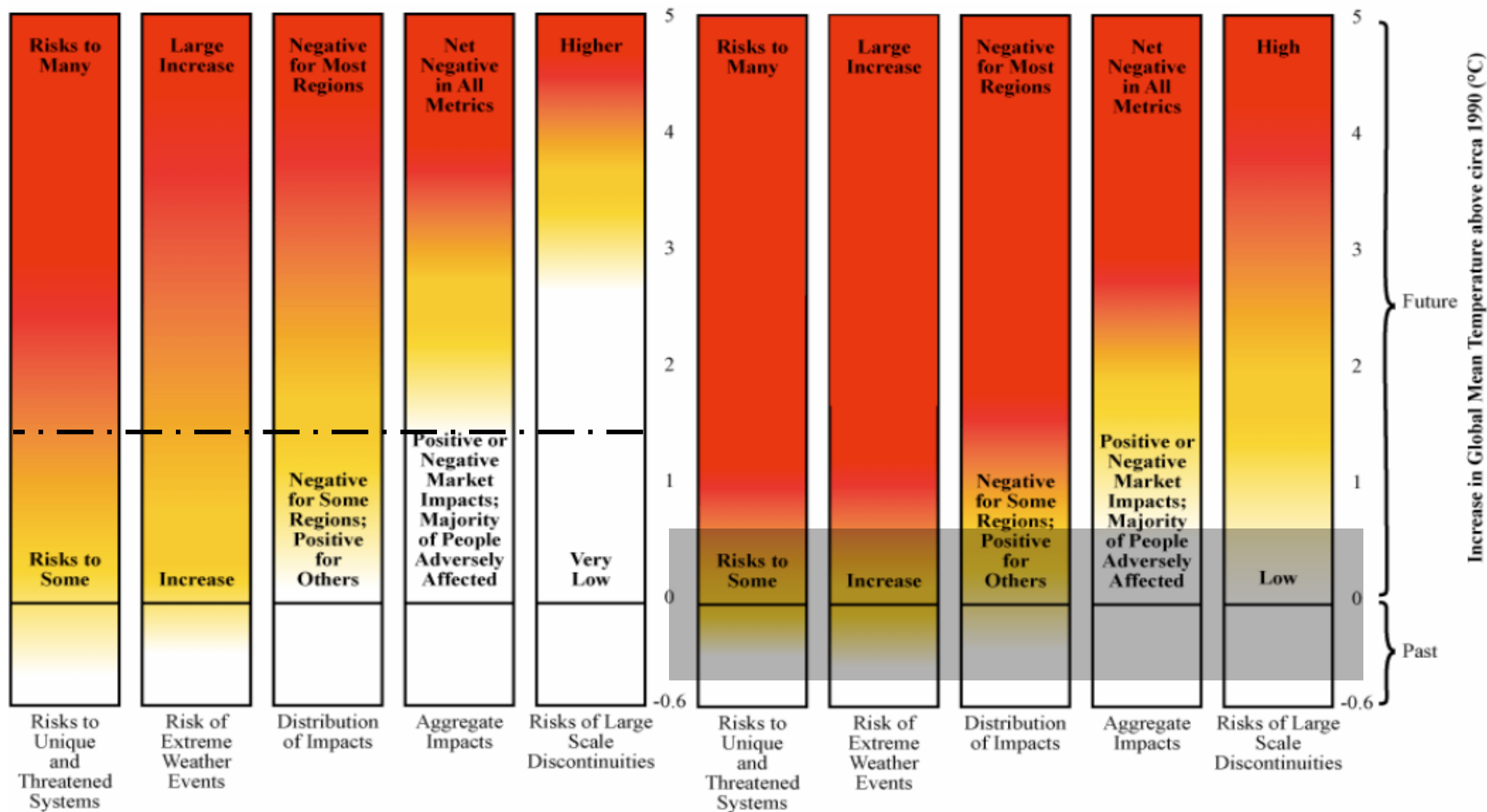
2001

2009



2001

2009



Is 2°C – dangerous or extremely dangerous?

Is 1°C the new 2?

sticking with 2°C

2°C

... how not to frame the problem

- UK, EU & Global - long term reduction targets

UK's 80%	reduction in CO ₂ e by	2050
EU 60%-80%	"	2050
Bali 50%	"	2050

- But, CO₂ stays in atmosphere for 100+ years,
- So long-term targets are dangerously misleading
- Put bluntly, 2050 targets are unrelated to Climate Change

2°C – the fundamental issue

- Its **cumulative** emissions that matter
(i.e. the carbon budget)
- This rewrites the chronology of climate change
 - *from long term gradual reductions*
 - *to urgent & radical reductions*

How does this scientifically-credible approach
change the challenge we face?

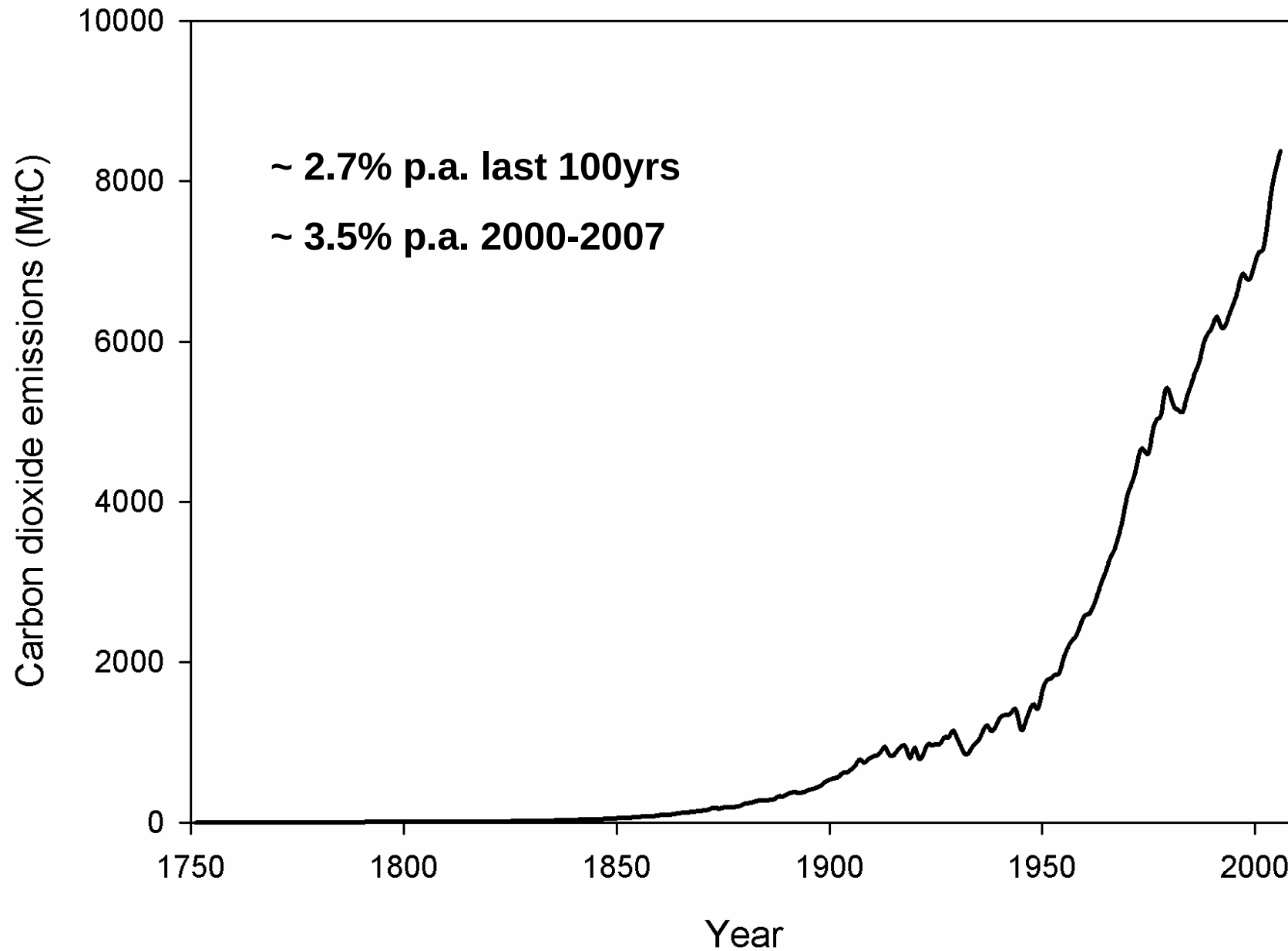
factoring in...

the latest emissions data

what is the scale of the global
'problem' we now face?

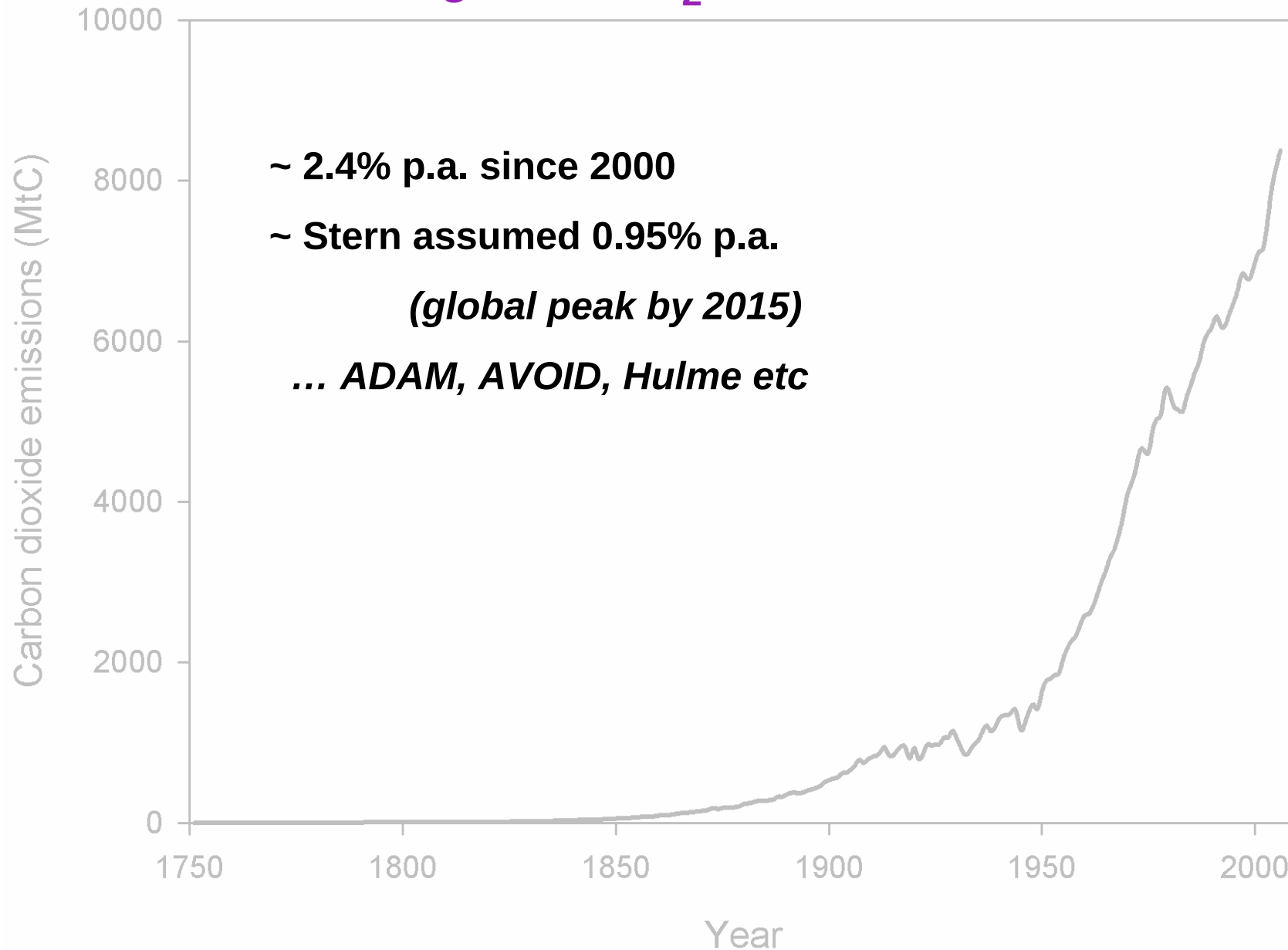
It's getting worse!

Global CO₂ emission trends?



... appears we're denying its happening

latest global CO_2e emission trends?



What does:

- this failure to reduce emissions
- &
- the latest science on cumulative emissions

Say about a 2°C future?

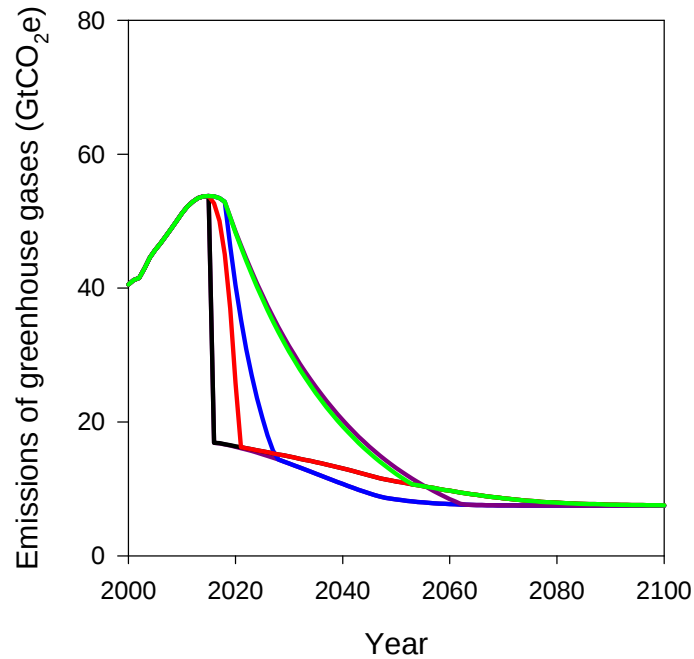
What greenhouse gas emission pathways for 2°C

Assumptions

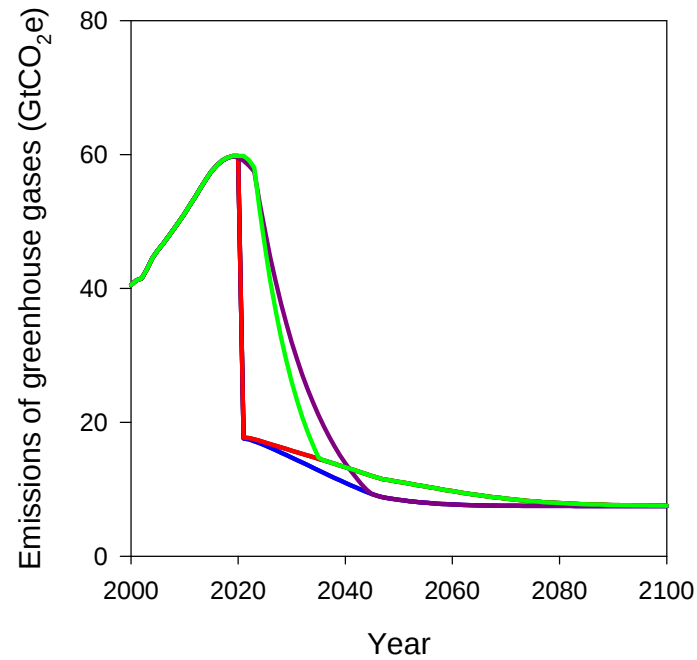
- 2015/20/25 global peak in emissions
- Highly optimistic deforestation & food emission reduction
- Full range of IPCC AR4 cumulative values for 450ppmv
- ~10% to 60% chance of exceeding 2°C

Total greenhouse gas emission pathways

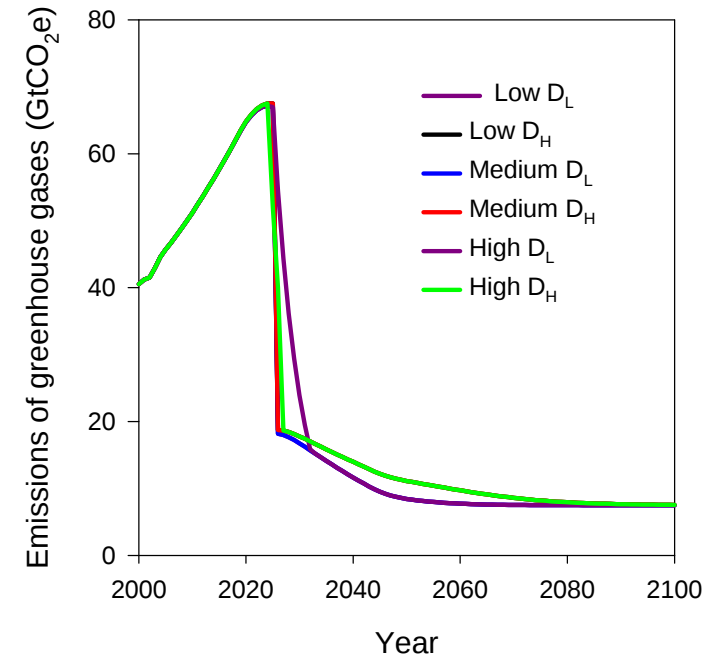
2015 peak



2020 peak

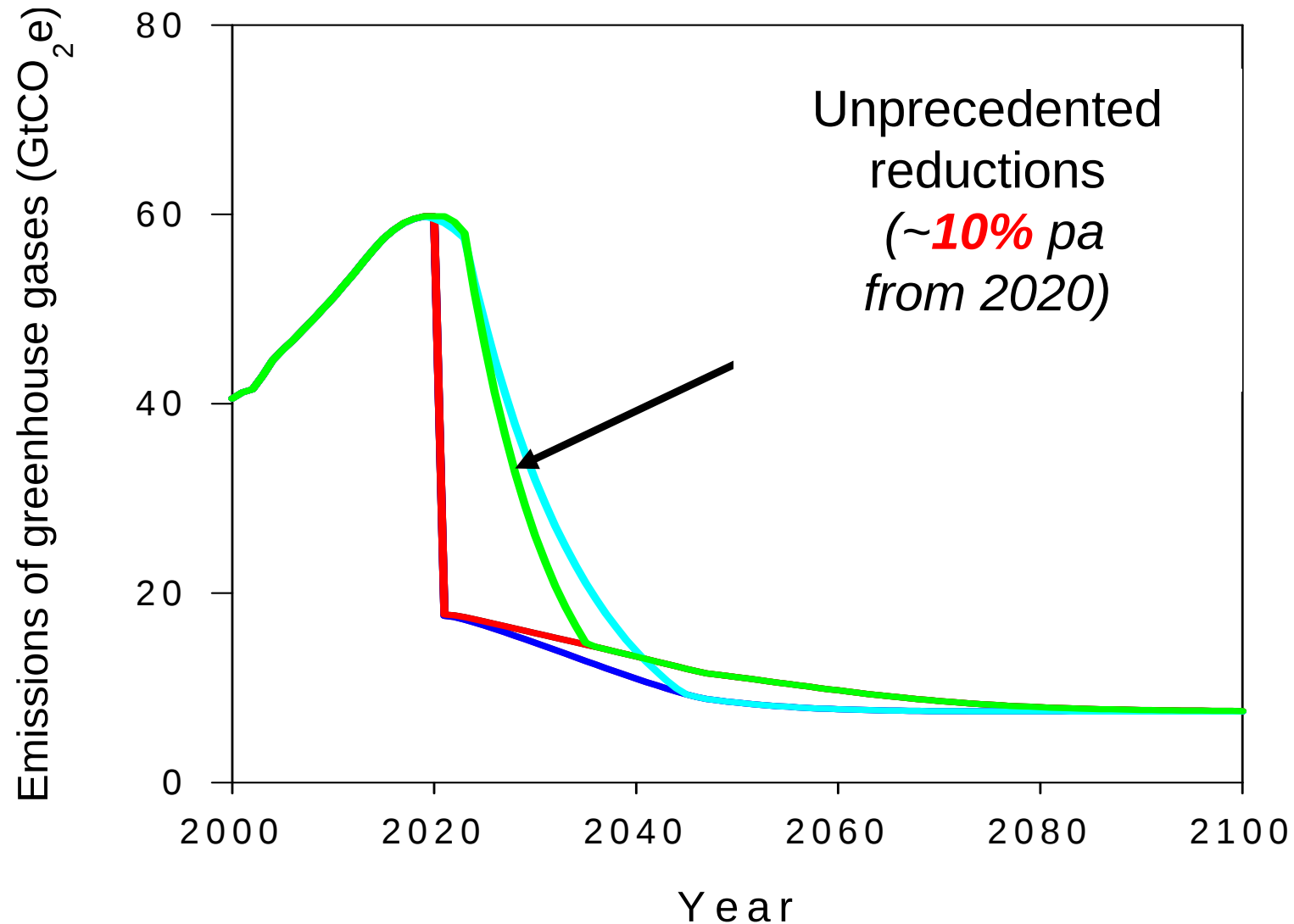


2025 peak



(Anderson & Bows. 2008 Philosophical Transactions A of the Royal Society. 366. pp.3863-3882)

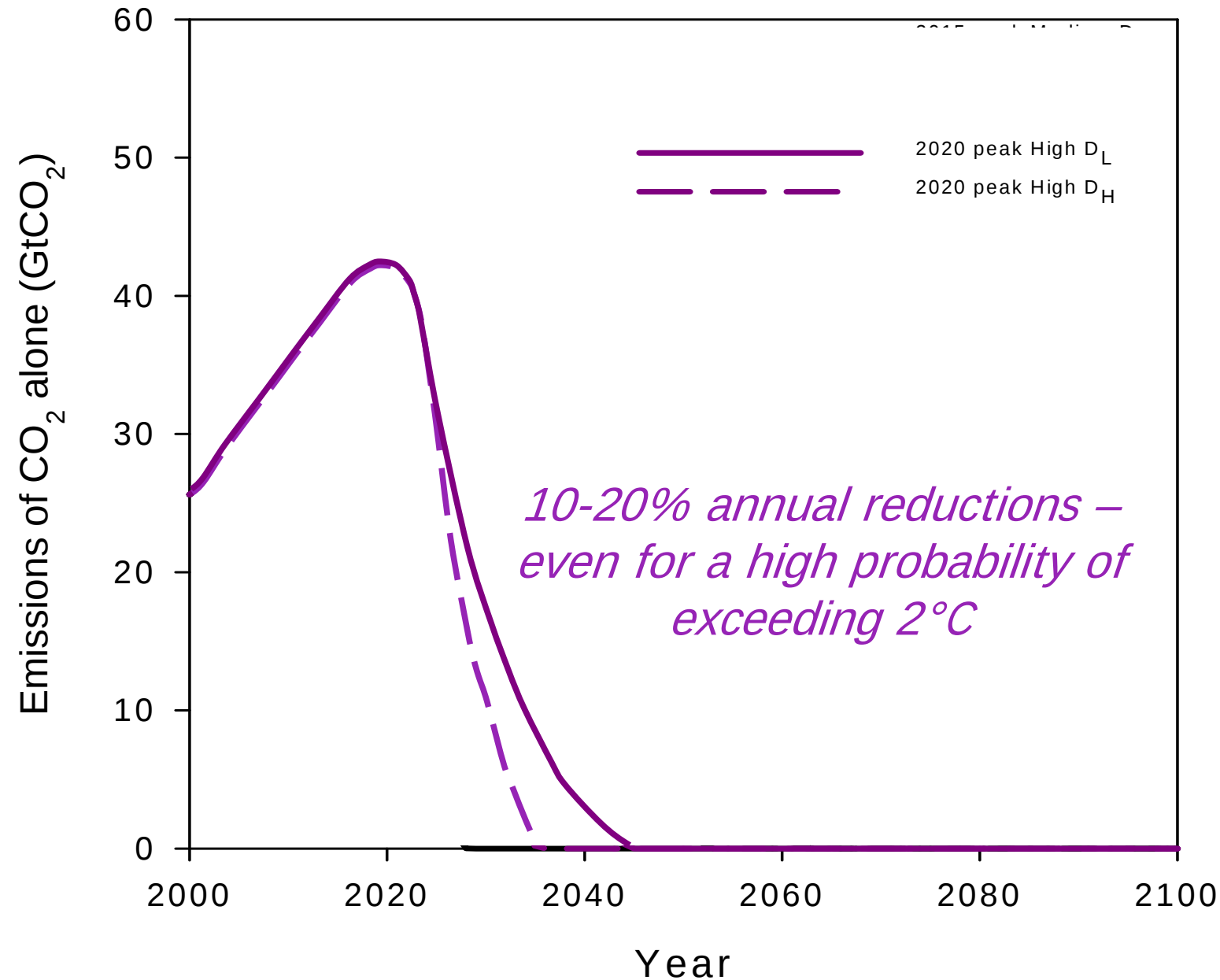
~50:50 chance of exceeding 2°C
& with a 2020 peak



... and for energy emissions?
(with 2020 peak)

13 of 18 scenarios
'impossible'

Even then total
decarbonisation by
~2035-45 necessary



What are the precedents for such reductions?

Annual reductions of greater than 1% p.a. have only

“been associated with economic recession or upheaval”

Stern 2006

- *UK gas & French 40x nuclear ~1% p.a. reductions*
(ex. aviation & shipping)
- *Collapse Soviet Union economy ~5% p.a. reductions*

What annual global emission reductions from energy for 4°C

For 4°C & emissions peaking by 2020:

... 3.5% annual reductions in CO₂ from energy

A fair deal for non-OECD (*non-Annex 1*)
... what's left for us (*OECD/Annex 1*) ?

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publication**

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publication**

How does this differ from 'standard' analyses?

- Peak year assumptions (& growth rate to peak)
- Rate of emission reduction order of magnitude more challenging
- Technology and innovation cannot deliver in time
- Socolow's Wedges are wrong way round (need early action)
- Costs are '*not*' meaningful (non-marginal mitigation & adaptation)

How are the UK and International Community fairing against this challenge?

UK position based on CCC report

CCC claim their 'cumulative' values have
~ 60% chance of exceeding 2°C

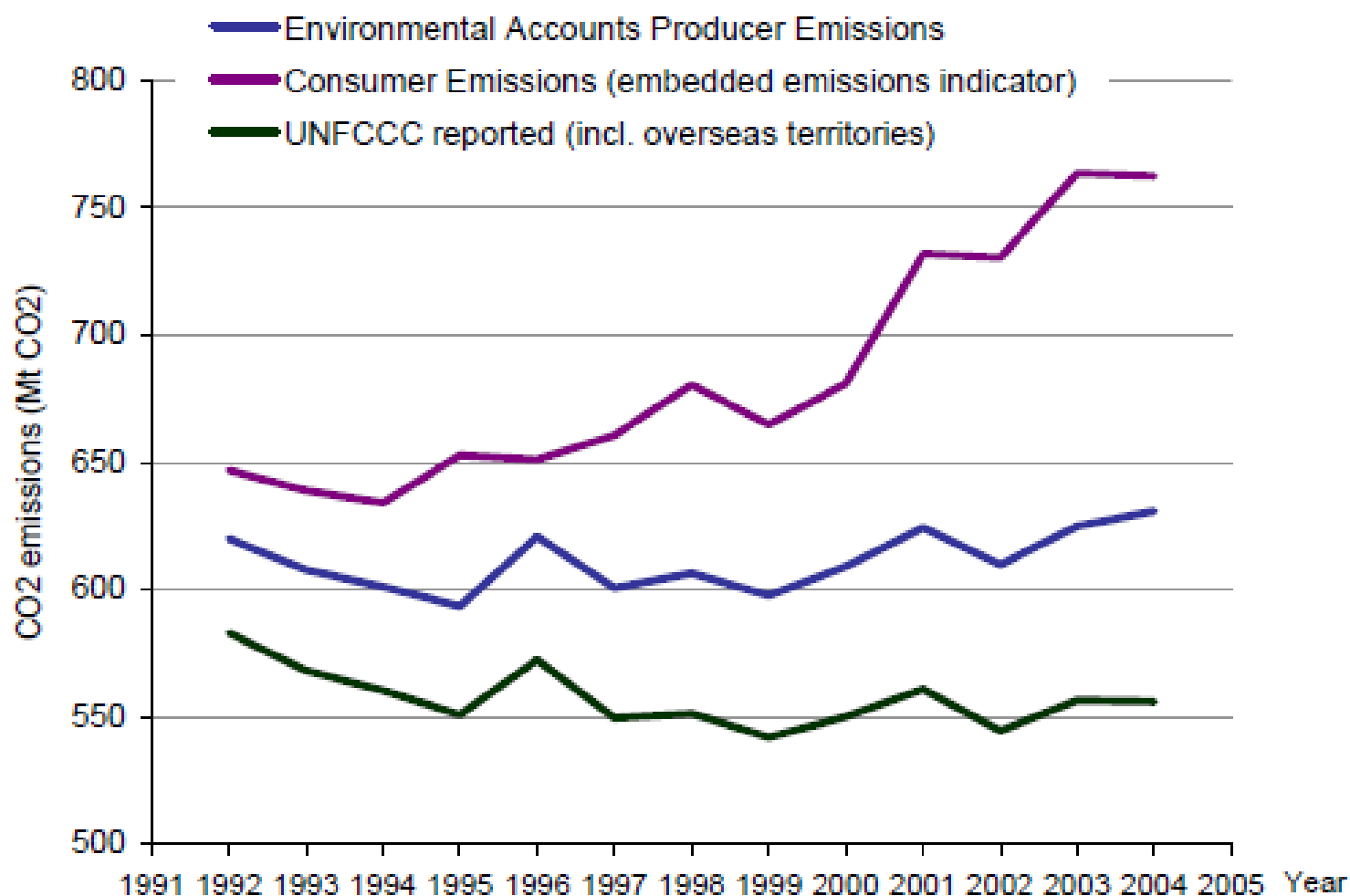
Can this be reconciled with *“must’ rise no more than 2°C”* ?

Impact of probabilities on UK reduction rates

<i><u>Prob of Exceeding 2°C</u></i>	<i><u>UK Annual Reduction</u></i>
~60%	3%
~30%	5%
~15%	9%

... and CCC's analysis premised on China
& India's emissions peaking by ~2018

What are current UK emission trends?



Summary of best example

- At best ~60% chance of exceeding 2°C
- Assumes very optimistic Global peak in 2016
- Large buyout from poor countries (CCC 17% & 27%)
- *Partial/incomplete inclusion of Shipping & Aviation*
- 'Real' emissions up ~18% since 1990

... and what of the rest?

- Waxman-Markey Bill
no US reductions necessary before 2017 & 4% by 2020
- Japan & Russia ~25% by 2020
- California 80% by 2050 (same as EU now!)
- China & India – demand ‘big’ reductions from Annex 1
- LDC’s – historical emissions should be included

Equity –a message of hope

... perhaps?

Little chance of changing policies aimed at 6.7 billion
... but how many people need to make the necessary changes?

... 80:20 rule

80% of something relates to...
20% of those involved

80% of emissions from 20% of population

run this 3 times

50% of emissions from 1% of population

- who's in the 1%?

- *Climate scientists*
- *Climate journalists & pontificators*
- *OECD (& other) academics*
- *Anyone who gets on a plane*
- *For the UK anyone earning over £30k*

*Are **we** sufficiently concerned to*

*... make or have enforced substantial personal
sacrifices/changes to our lifestyles*

NOW ?

... or/and would we rather plan for:

- 3°C to 4°C by 2060-70
- 4°C to 6°C by 2100-2150
- 1m to 1.5m sea level by 2100 (5m-7m by 2300-2500)
- Increased severity (*and frequency?*) of severe weather events
- Significant ocean acidification (impact on fisheries & protein)
- Fundamental changes in rainfall and access to water
- Inability to adapt to 4°C & accompanying regional variations(?)

... or embrace cognitive dissonance



... a final message of hope ..

“at every level the greatest obstacle to transforming the world is that we lack the clarity and imagination to conceive that it could be different.”

Roberto Unger

2014-2015 is the first time in human history that the projected number of people in the world will be more than 9 billion people living on our planet!



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