



# Climate Change: going beyond dangerous

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

**Kevin Anderson**

Tyndall Centre

Universities of Manchester & East Anglia

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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:

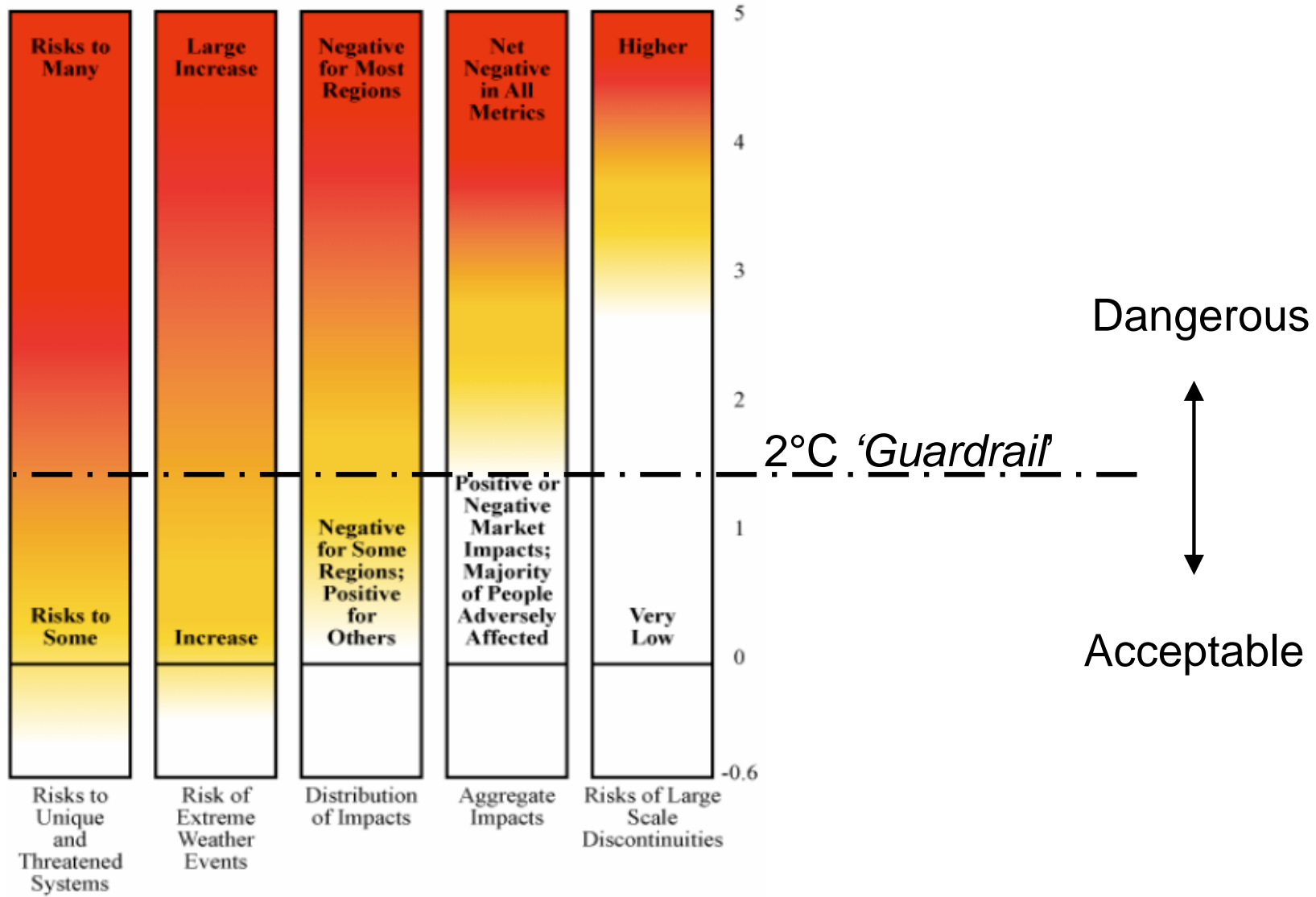
What do we need to do to provide  
a low probability of entering  
dangerous climate change

*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 ?

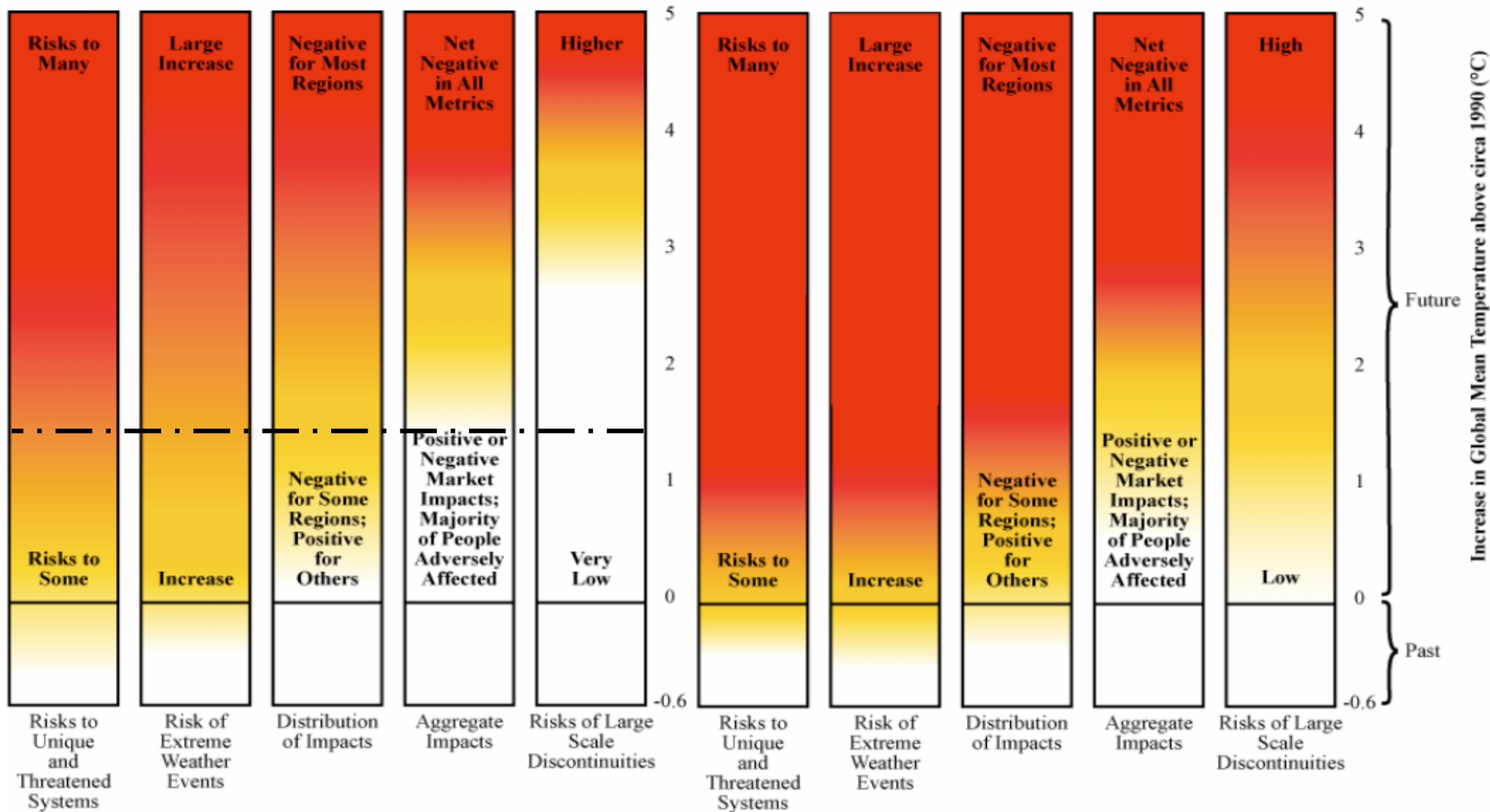
2001





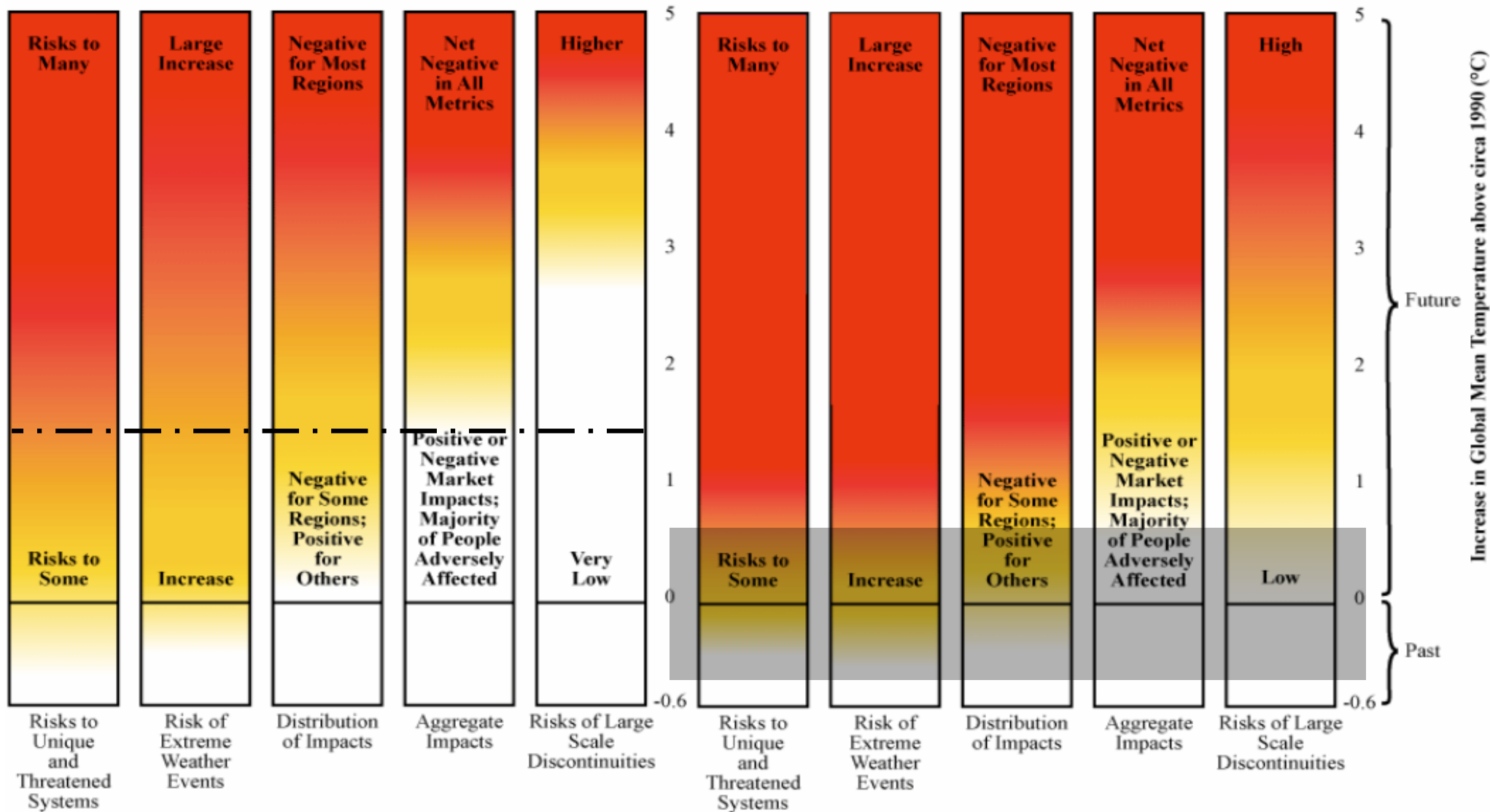
2001

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

<i>UK's 80%</i>	<i>reduction in CO<sub>2</sub>e by</i>	<i>2050</i>
<i>EU 60%-80%</i>	<i>"</i>	<i>2050</i>
<i>Bali 50%</i>	<i>"</i>	<i>2050</i>

- But, CO<sub>2</sub> 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...

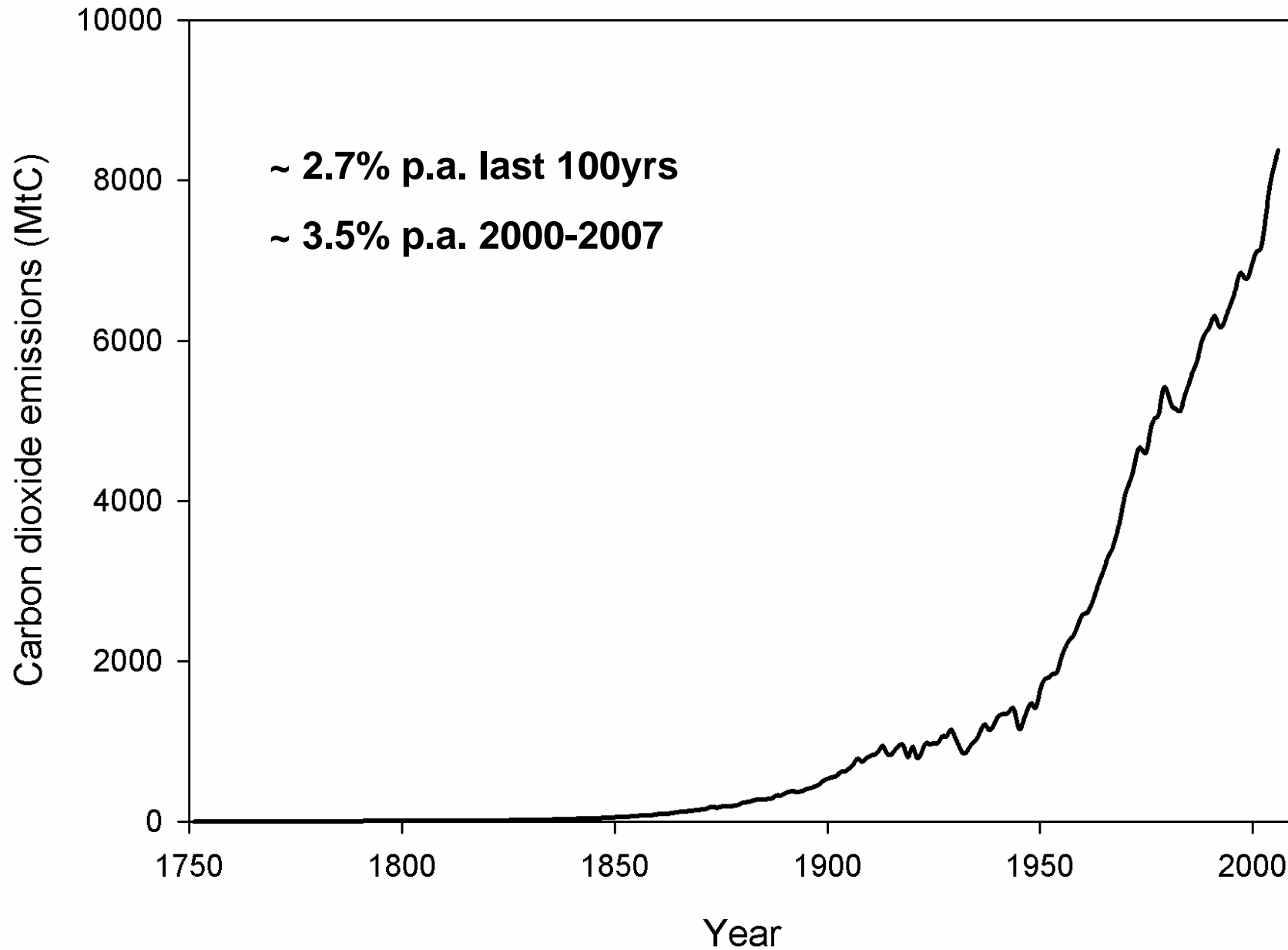
the latest emissions data

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



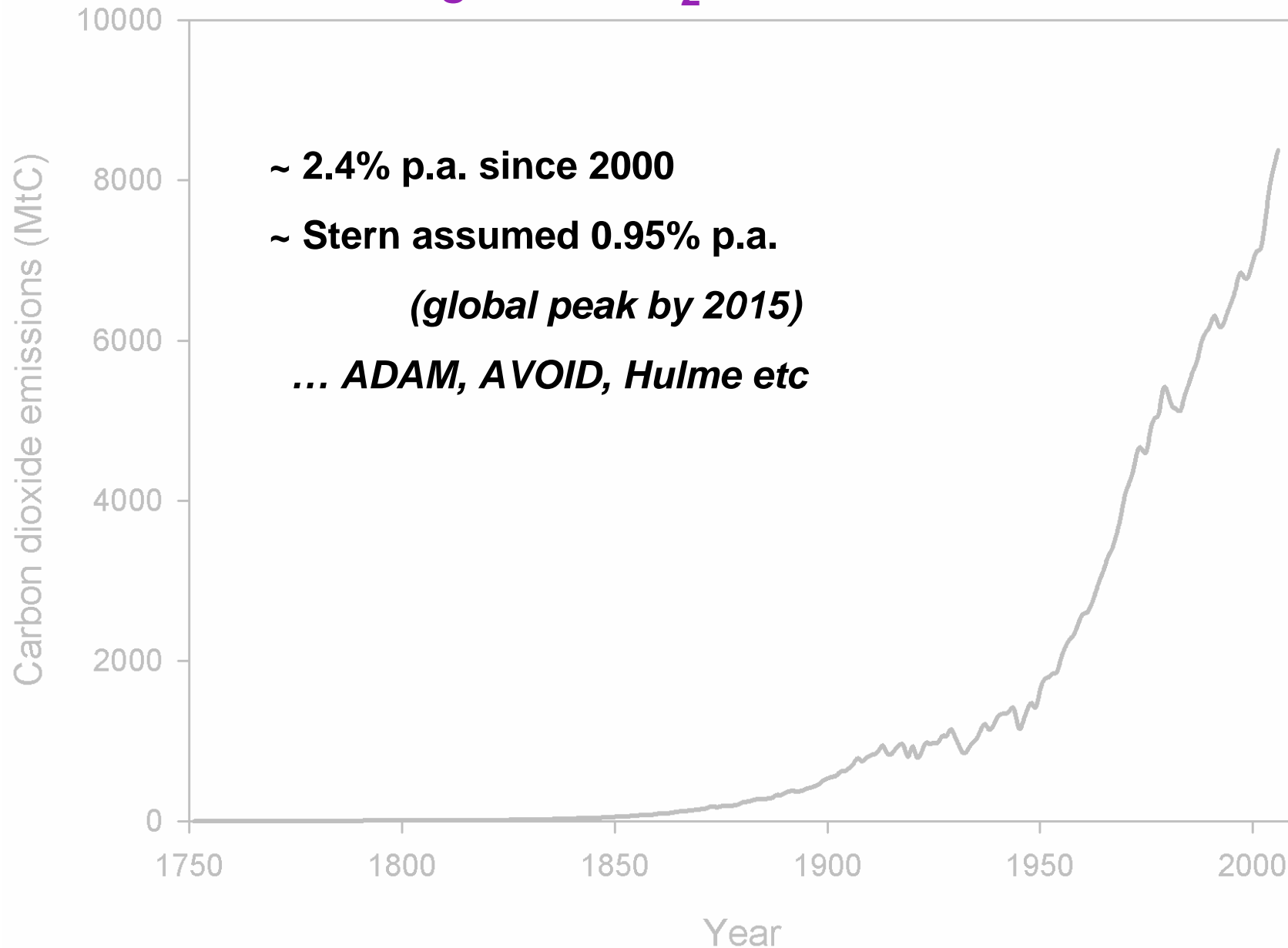
**It's getting worse!**

**Global CO<sub>2</sub> emission trends?**



... appears we're denying its happening

latest global CO<sub>2</sub>e emission trends?



What does:

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

Say about a 2°C future?

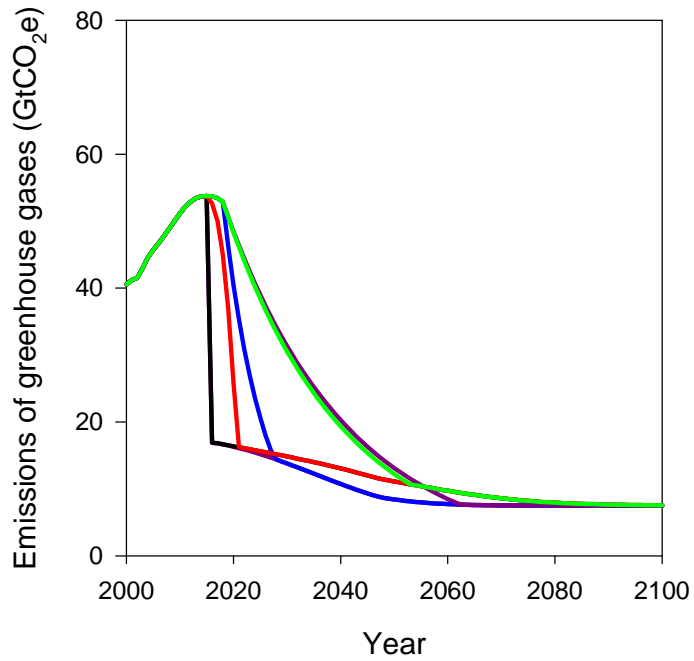
# What greenhouse gas emission pathways for 2°C

# Assumptions

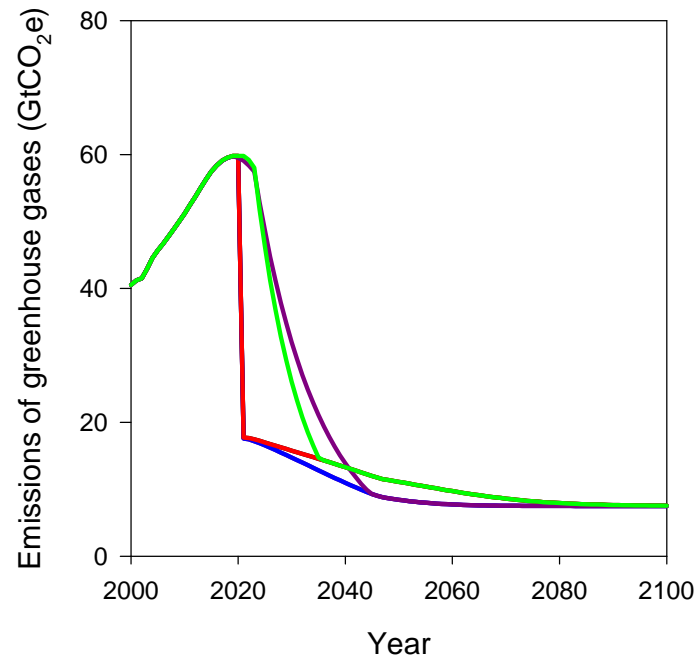
- 2015/20/25 global peak in emissions
- Highly optimistic deforestation & food emission reduction
- Full range of IPCC AR4 cumulative values for 450ppmv
- ~10% to 60% chance of exceeding 2°C

# Total greenhouse gas emission pathways

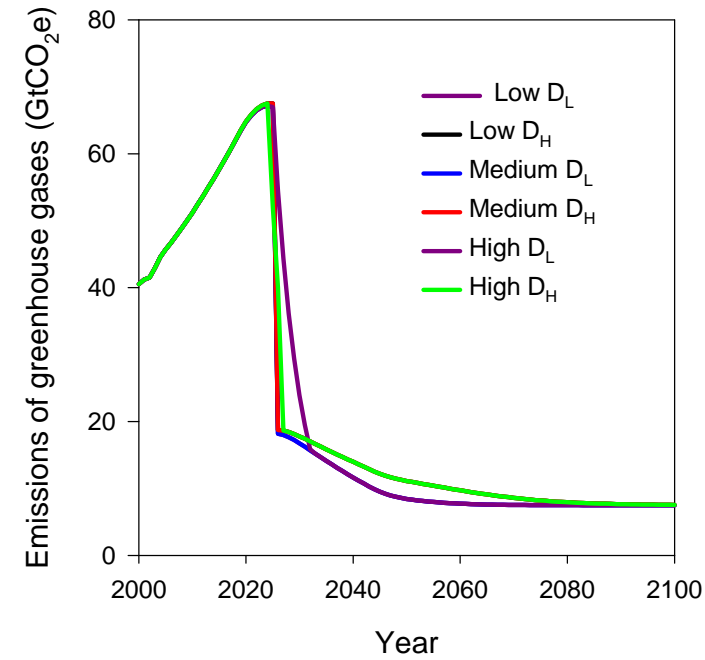
2015 peak



2020 peak

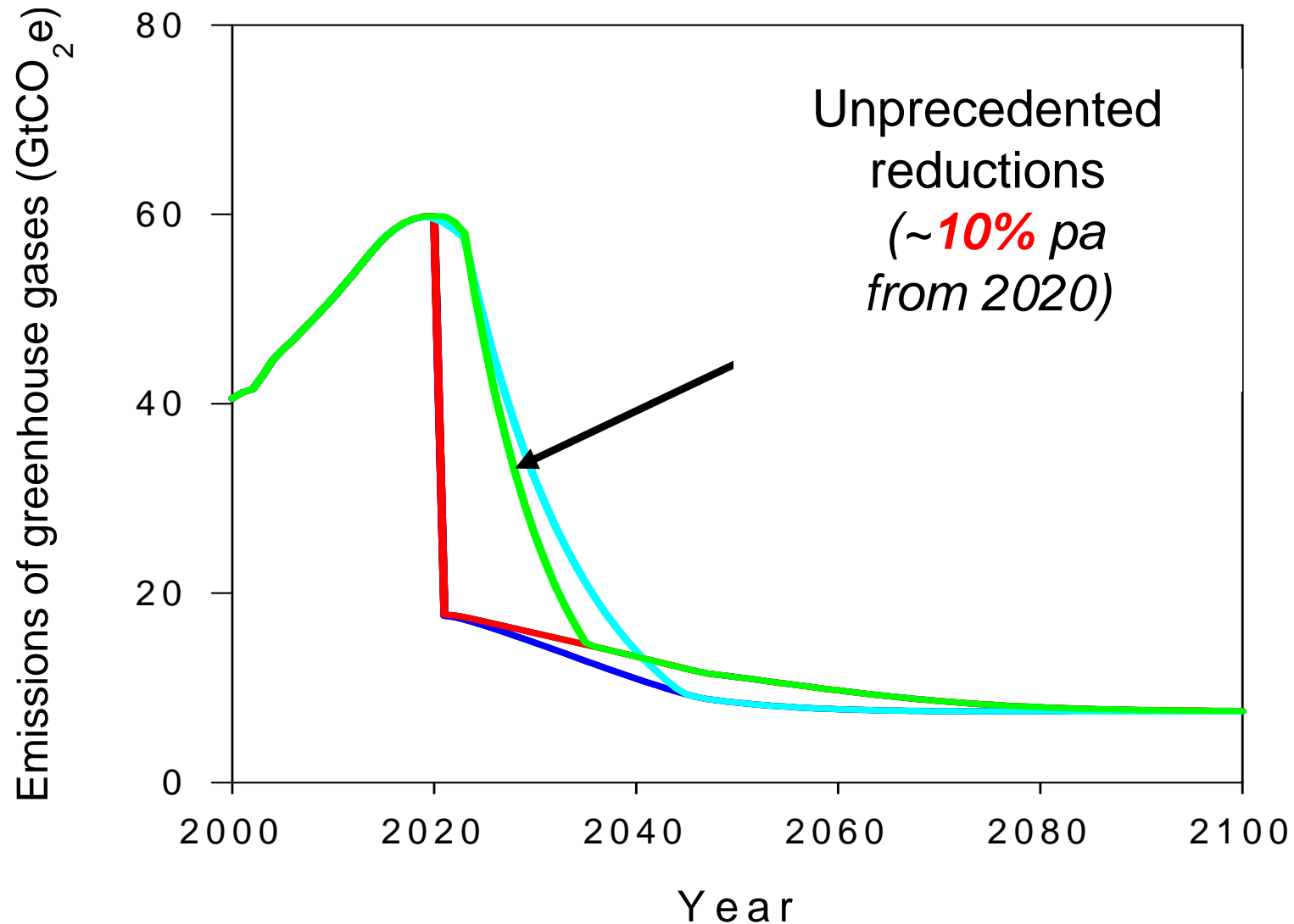


2025 peak



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

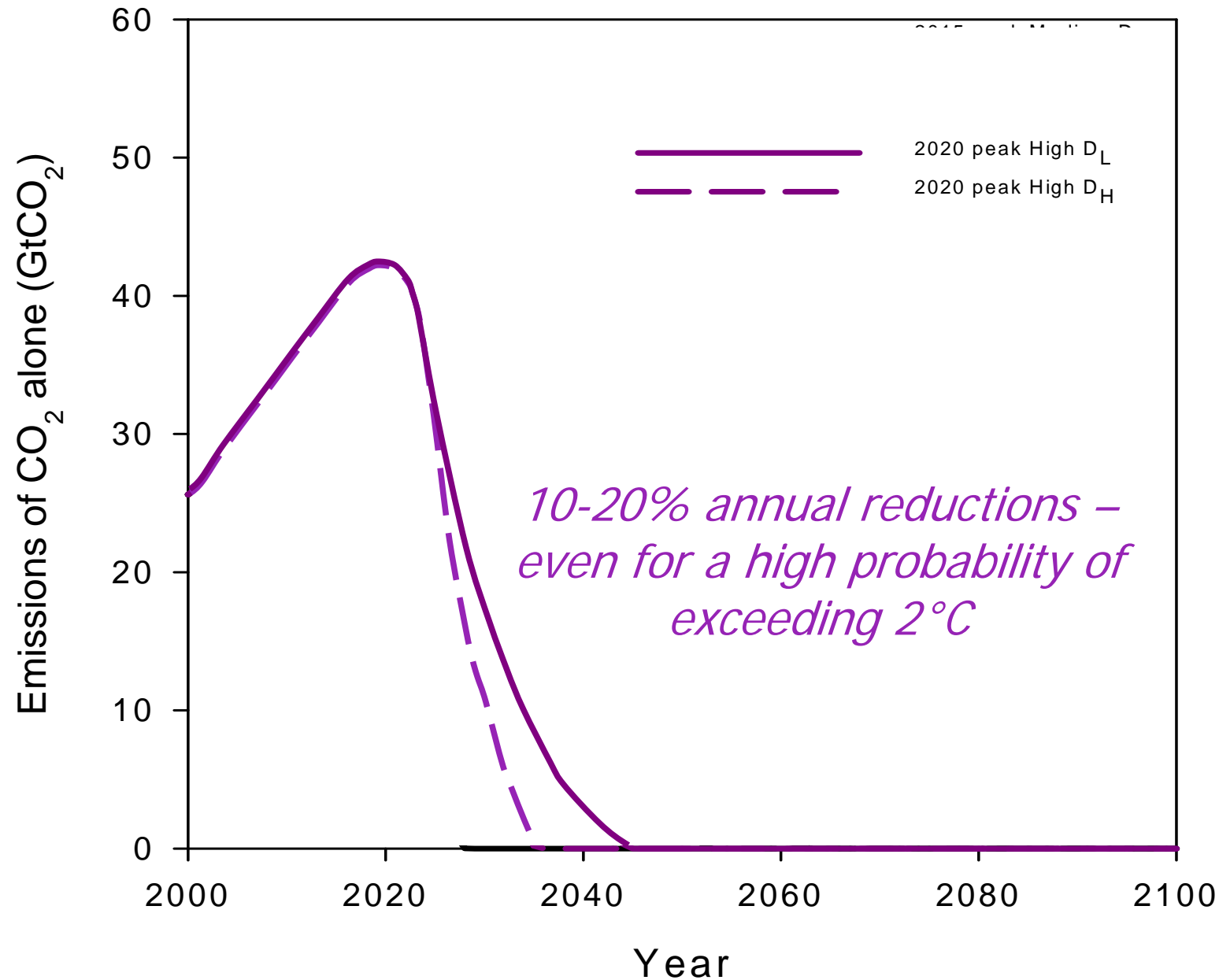
# ~50:50 chance of exceeding 2°C & with a 2020 peak



# ... 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 CO<sub>2</sub> 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

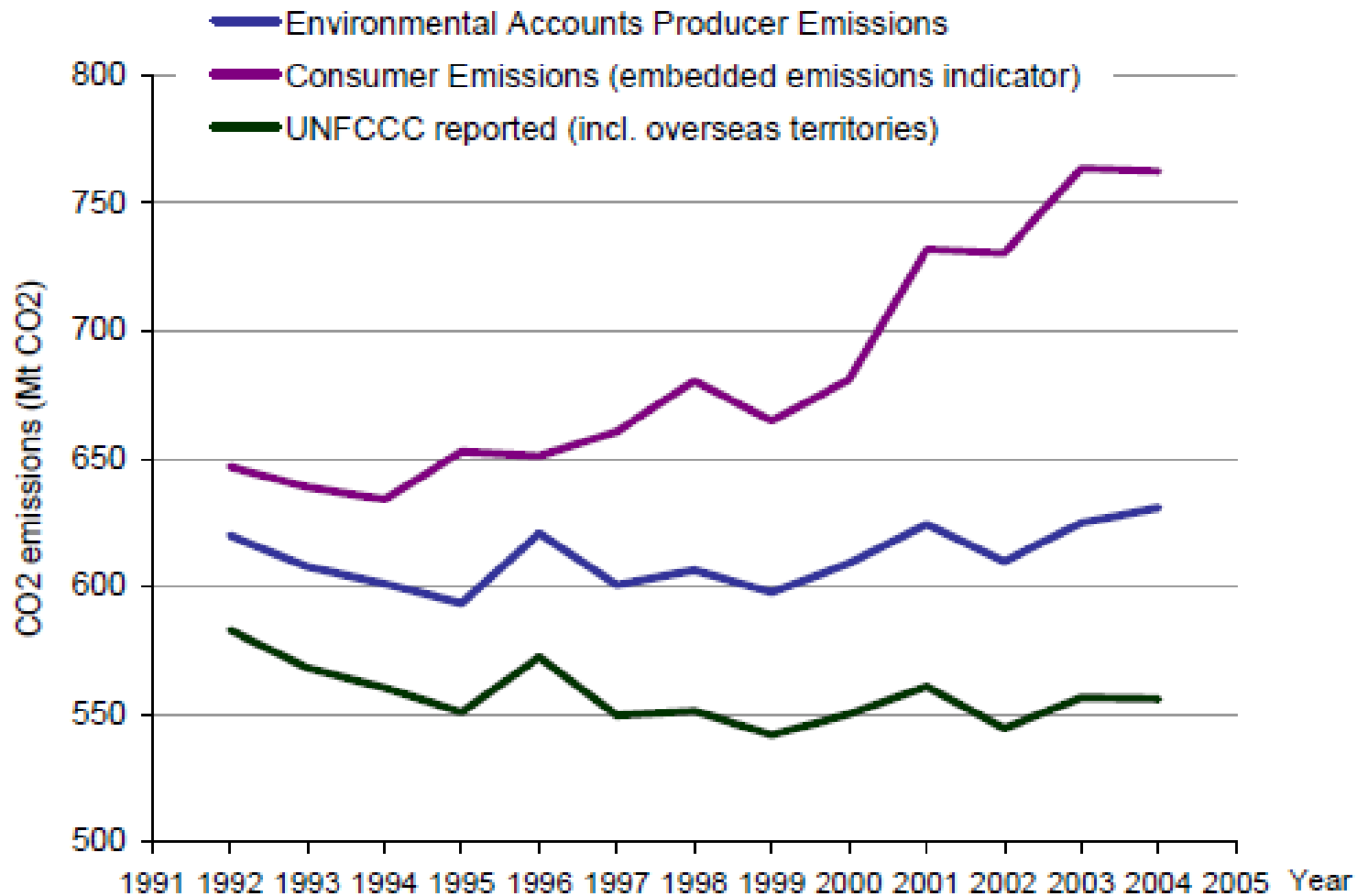
Can this be reconciled with *“must” rise no more than 2°C* ?

# Impact of probabilities on UK reduction rates

<u><i>Prob of Exceeding 2°C</i></u>	<u><i>UK Annual Reduction</i></u>
~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 polices 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*

2019  
& all with up to 9 billion people living on our planet!



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