

**Fair Low/Zero Carbon & 100% RE Strategies,
South & North Countries, Villages,
including Women Initiatives**

**UNFCCC COP21 Side Event, Paris, France
December 3, 2015**



Setting the Scene of Zero Carbon Transitions in North and South

by prof. Kevin Anderson

Presentations are available at the UNFCCC web site and at INFORSE:
www.inforse.org/europe/conf15_COP21.htm

The Ostrich or the Phoenix?

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Dec. 2015

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Duality in climate science

Kevin Anderson

Delivery of palatable 2 °C mitigation scenarios depends on speculative negative emissions or changing the past. Scientists must make their assumptions transparent and defensible, however politically uncomfortable the conclusions.

In July, Paris hosted 'Our Common Future Under Climate Change', a key conference organized as a prelude to the political negotiations scheduled for December 2015, also in Paris. In the conference summary that immediately followed, the scientific committee noted that limiting "warming to less than 2 °C" is "economically feasible" and "cost effective"¹. The statement chimed with the press release that accompanied the Synthesis Report published by the Intergovernmental Panel on Climate Change (IPCC) last November, in which IPCC representatives suggested that "to keep a good chance of staying below 2 °C, and at manageable costs, our emissions should drop by 40–70 per cent globally between 2010 and 2050, falling to zero or below by 2100"², and that mitigation costs would be so low that "global economic growth would not be strongly affected"³.

If these up-beat — and largely uncontested — headlines are to be believed, reducing emissions in line with a reasonable-to-good chance of meeting the 2 °C target requires an accelerated evolution away from fossil fuels; it does not, however, necessitate a revolutionary transition in how we use and produce energy. Such conclusions are forthcoming from many Integrated



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Report, no more than 1,000 billion tonnes (1,000 Gt) of CO₂ can be emitted between 2011 and 2100 for a 66% chance (or better) of remaining below 2 °C of warming (over preindustrial times)⁵. Without resorting to 'changing the past', or making the leap of faith that substantial amounts of CO₂ can be

negative-emission technologies. Even more worryingly, in all 56 scenarios without negative emissions, global emissions peak around 2010, which is contrary to available emissions data⁷.

In plain language, the complete set of 400 IPCC scenarios for a 50% or better

Our collective commitment on climate change

“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”

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IPCC latest report (AR5)

Crucially noted...

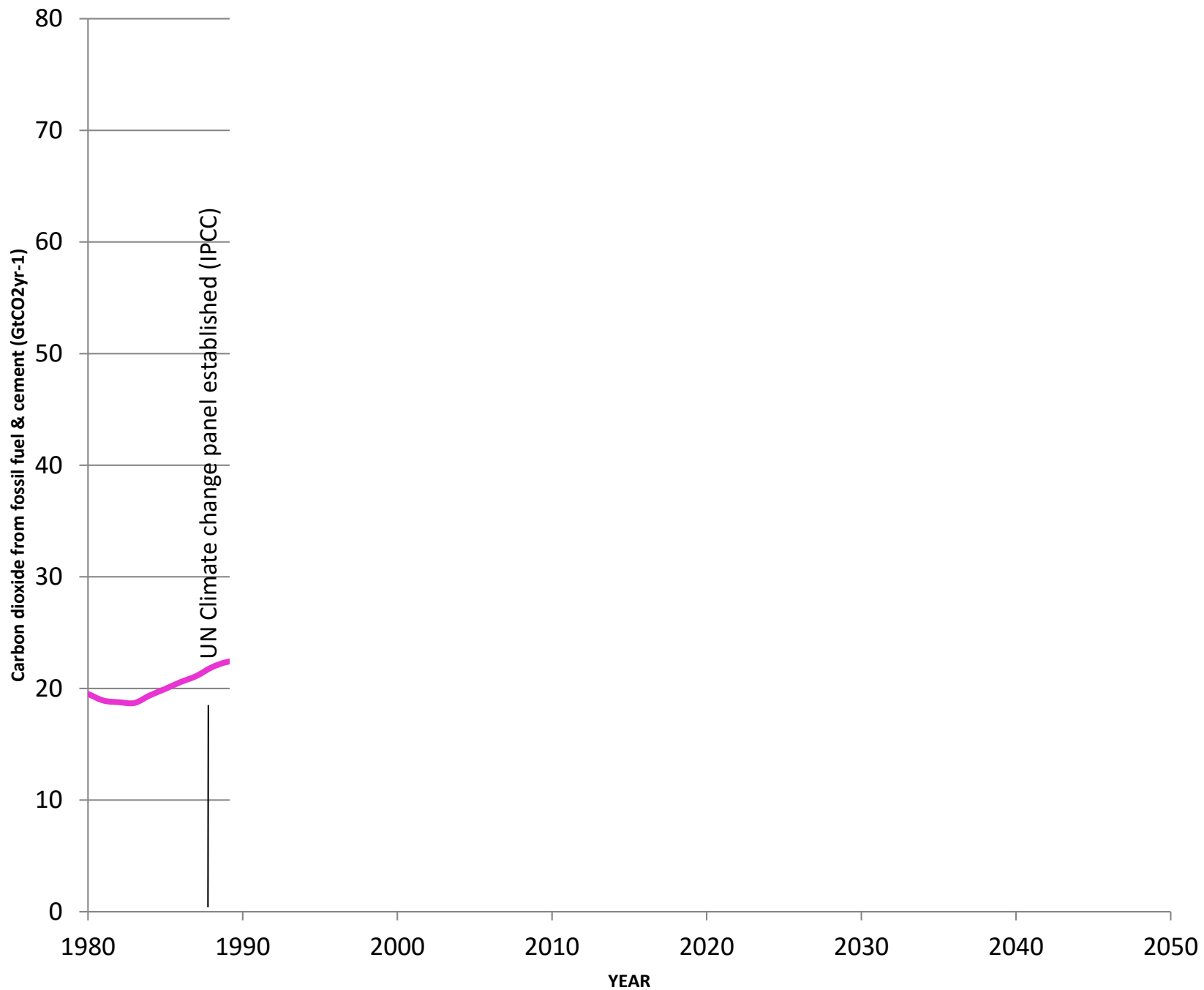
in terms of temperature (**2°C**) rise,

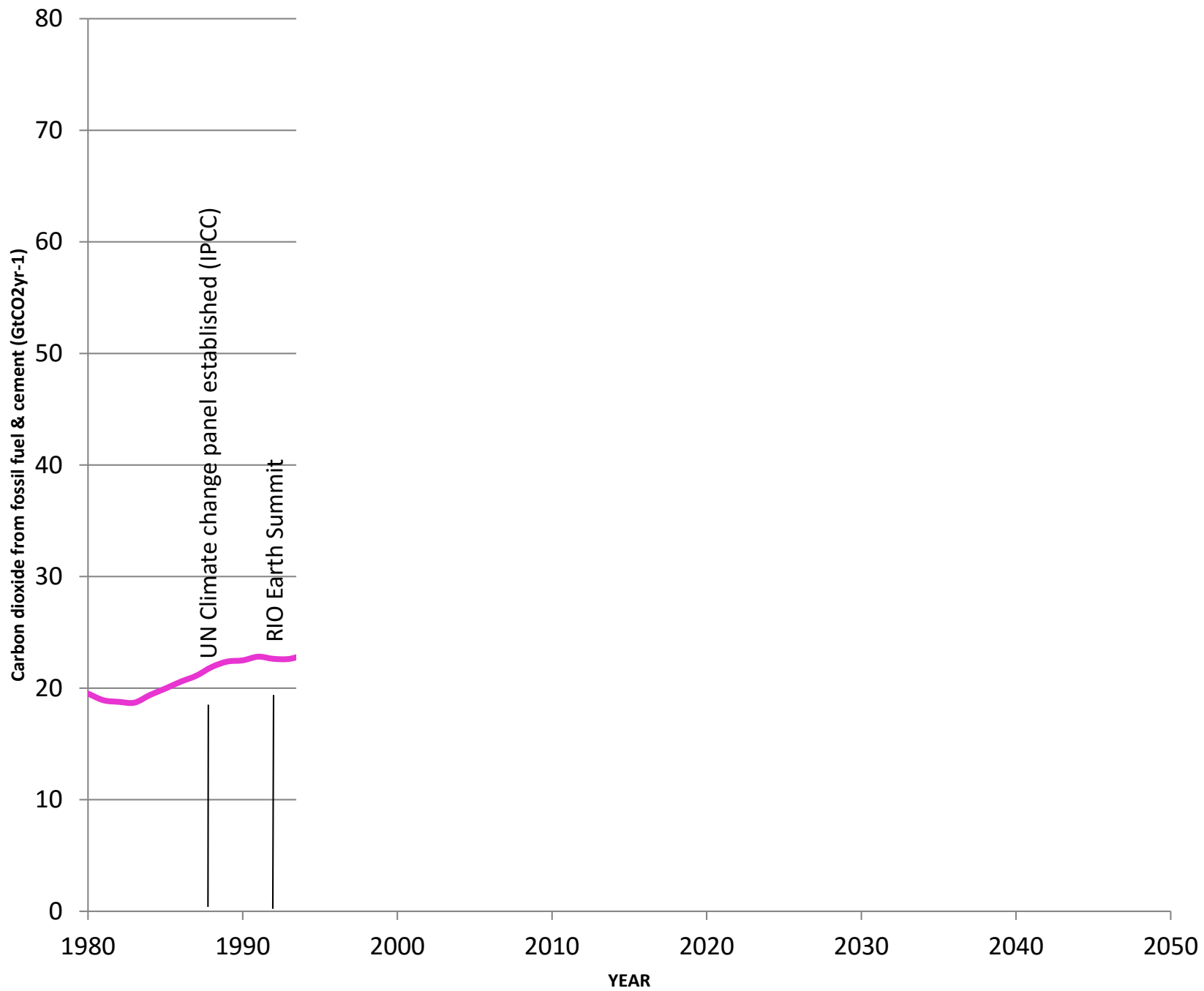
explicit recognition it's **carbon budgets** that matter,

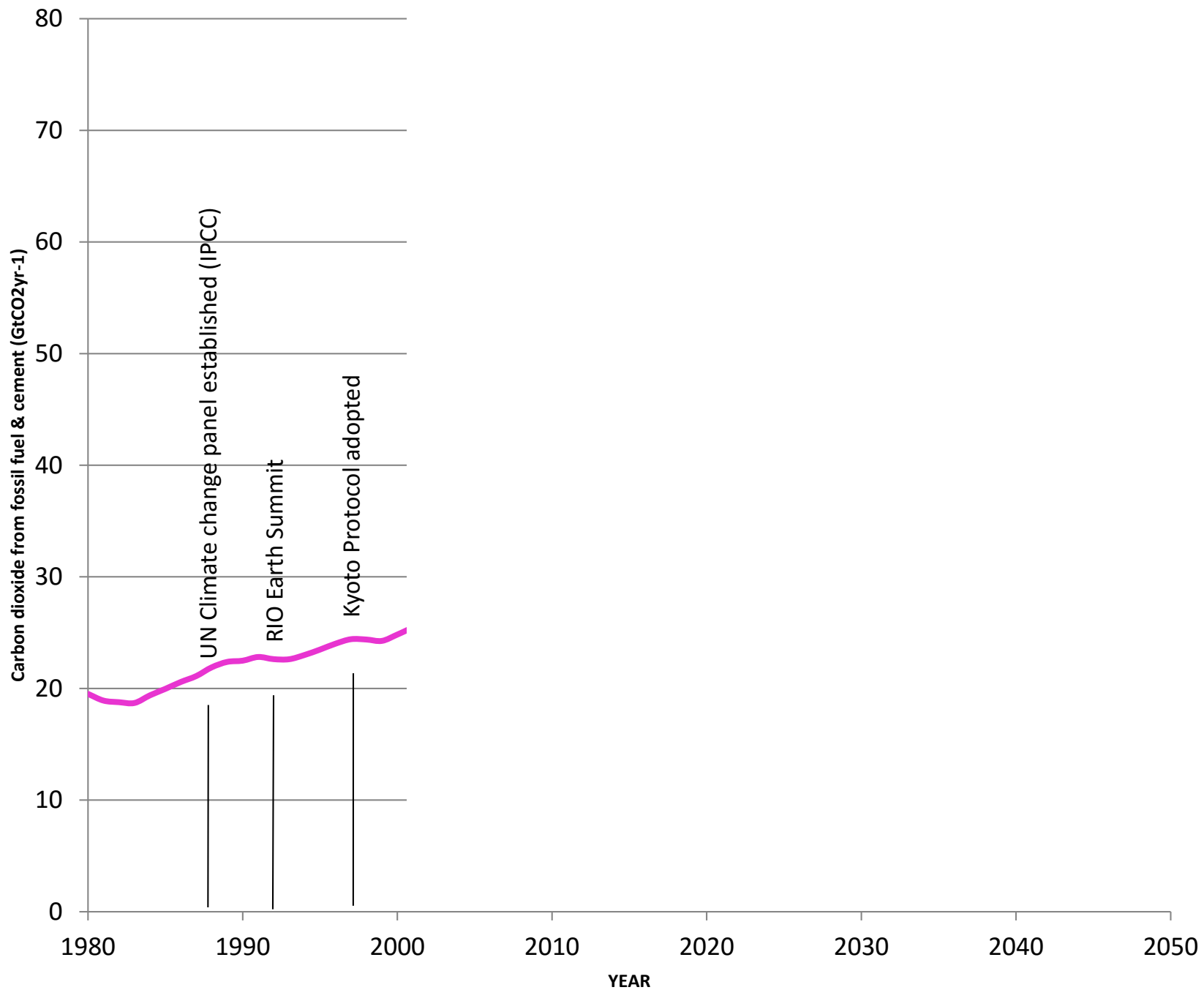
not long-term (**2050**) targets

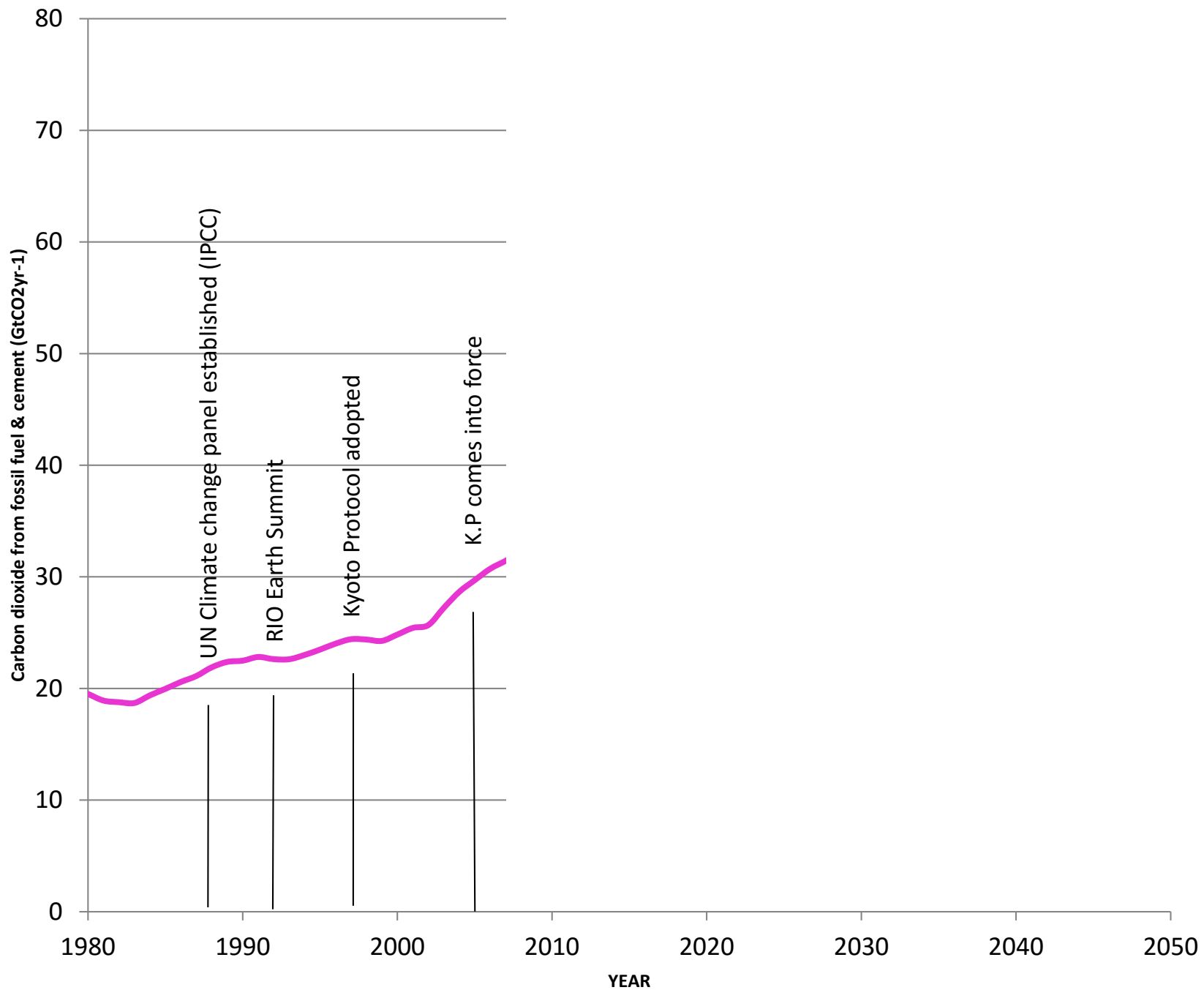
Thinking about this
'graphically'

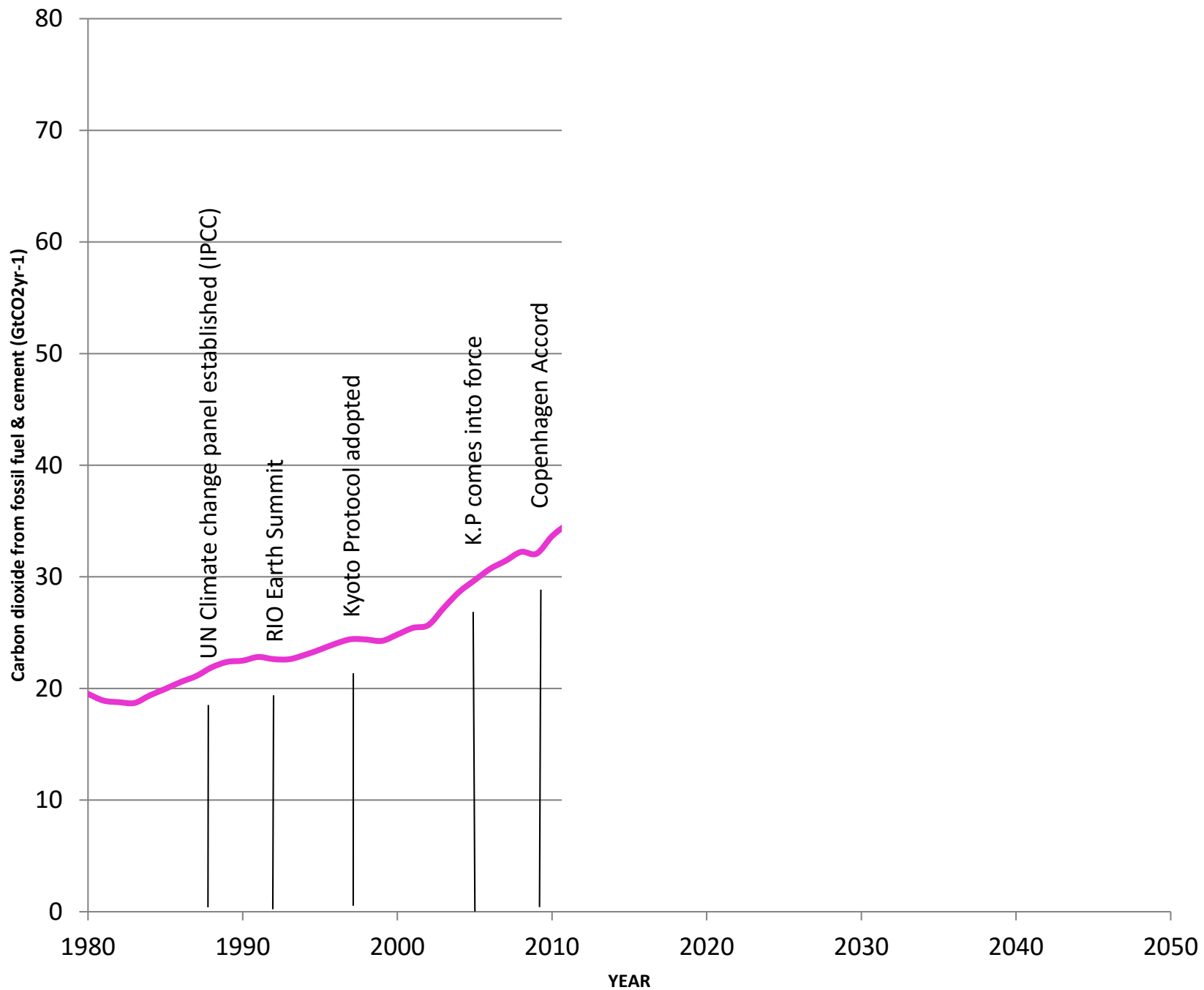


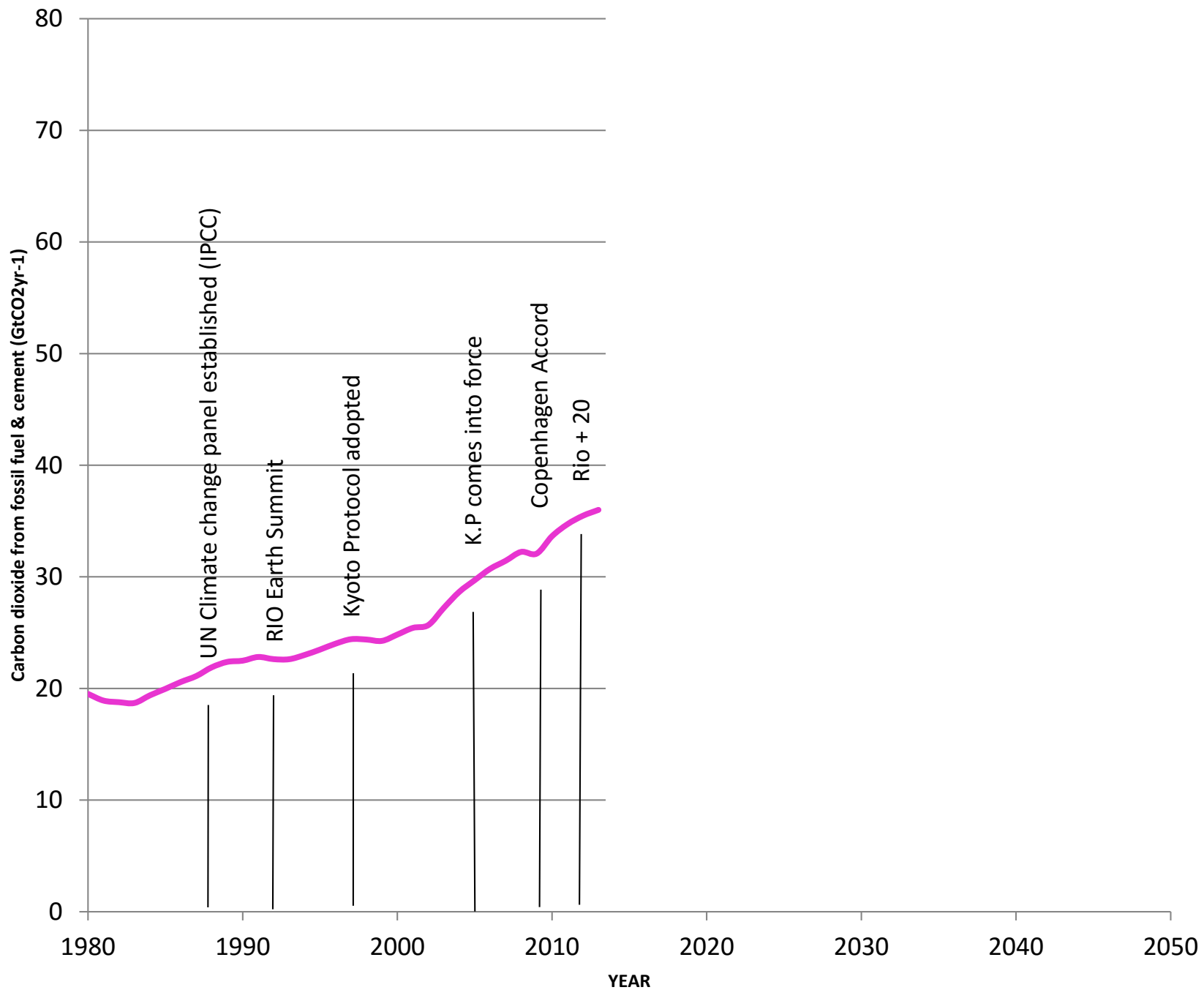


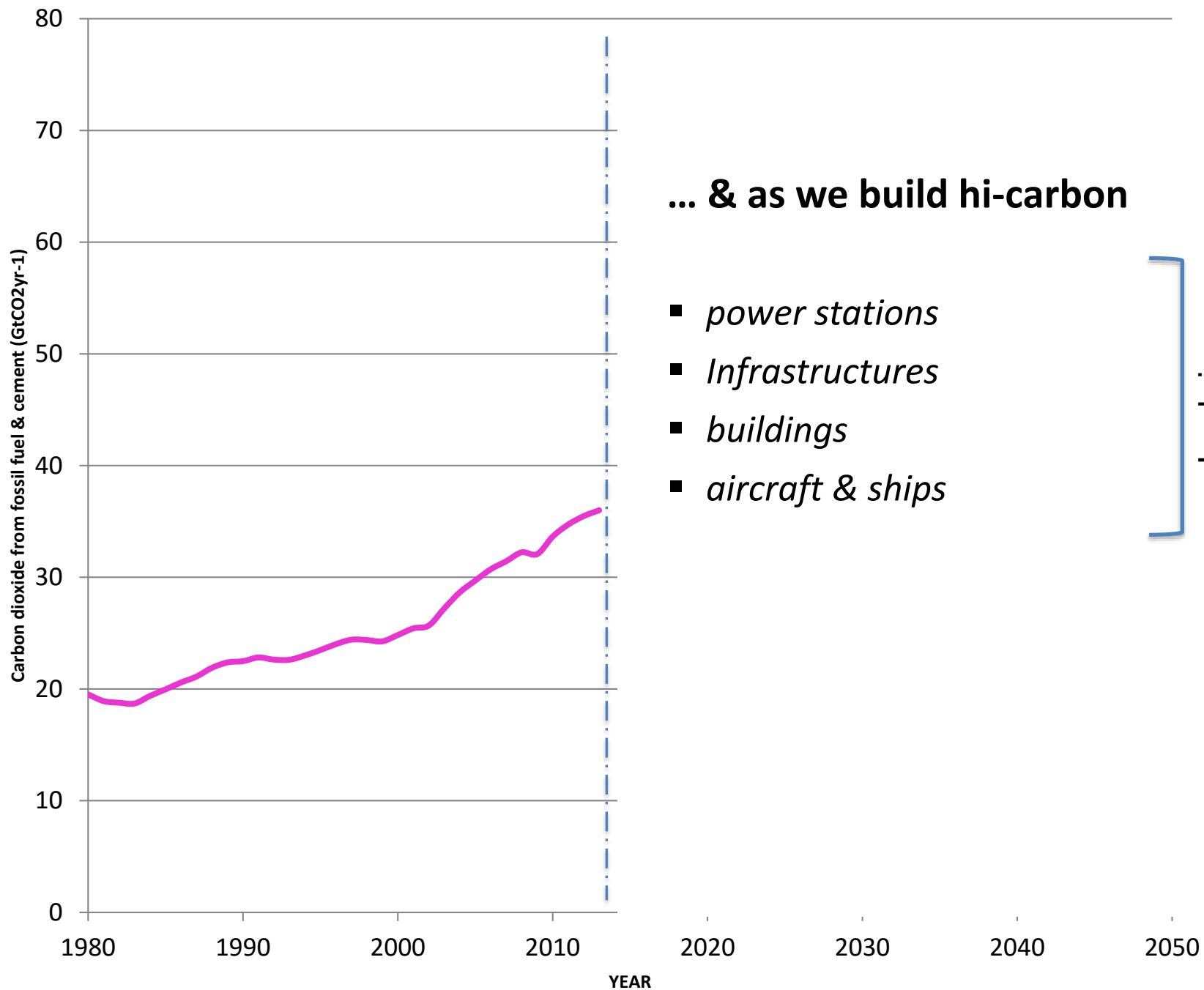


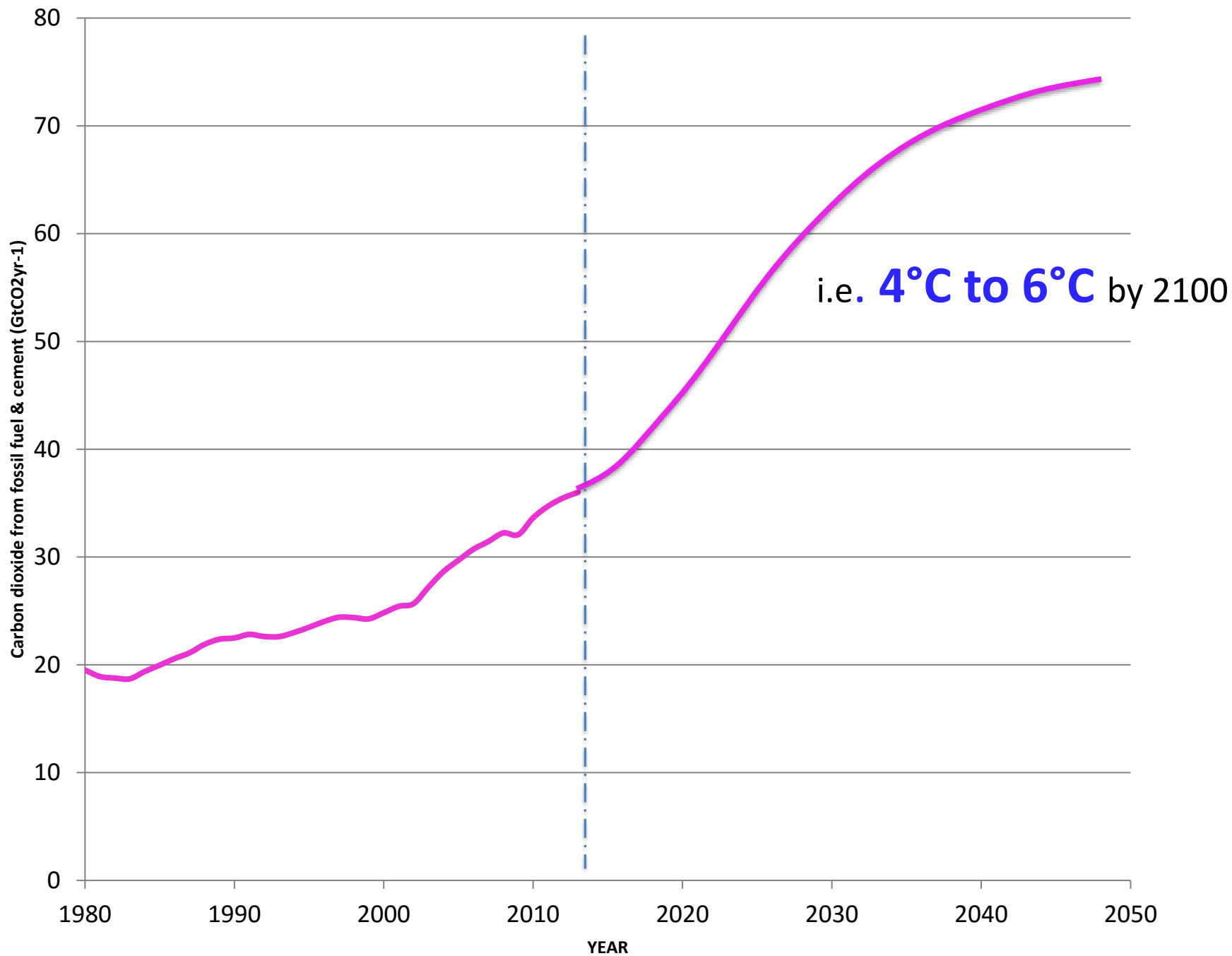












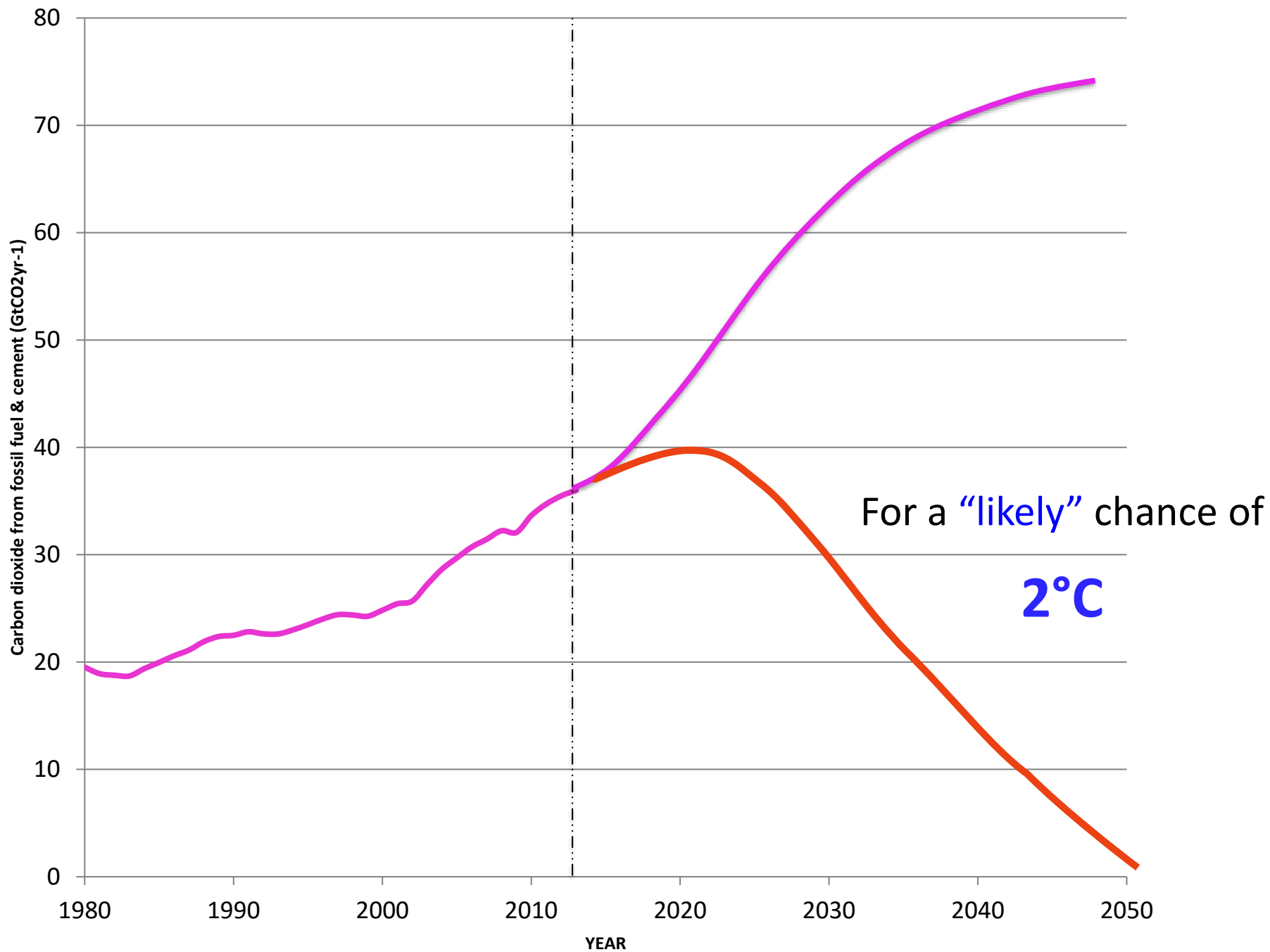
So recent history supports the IEA view

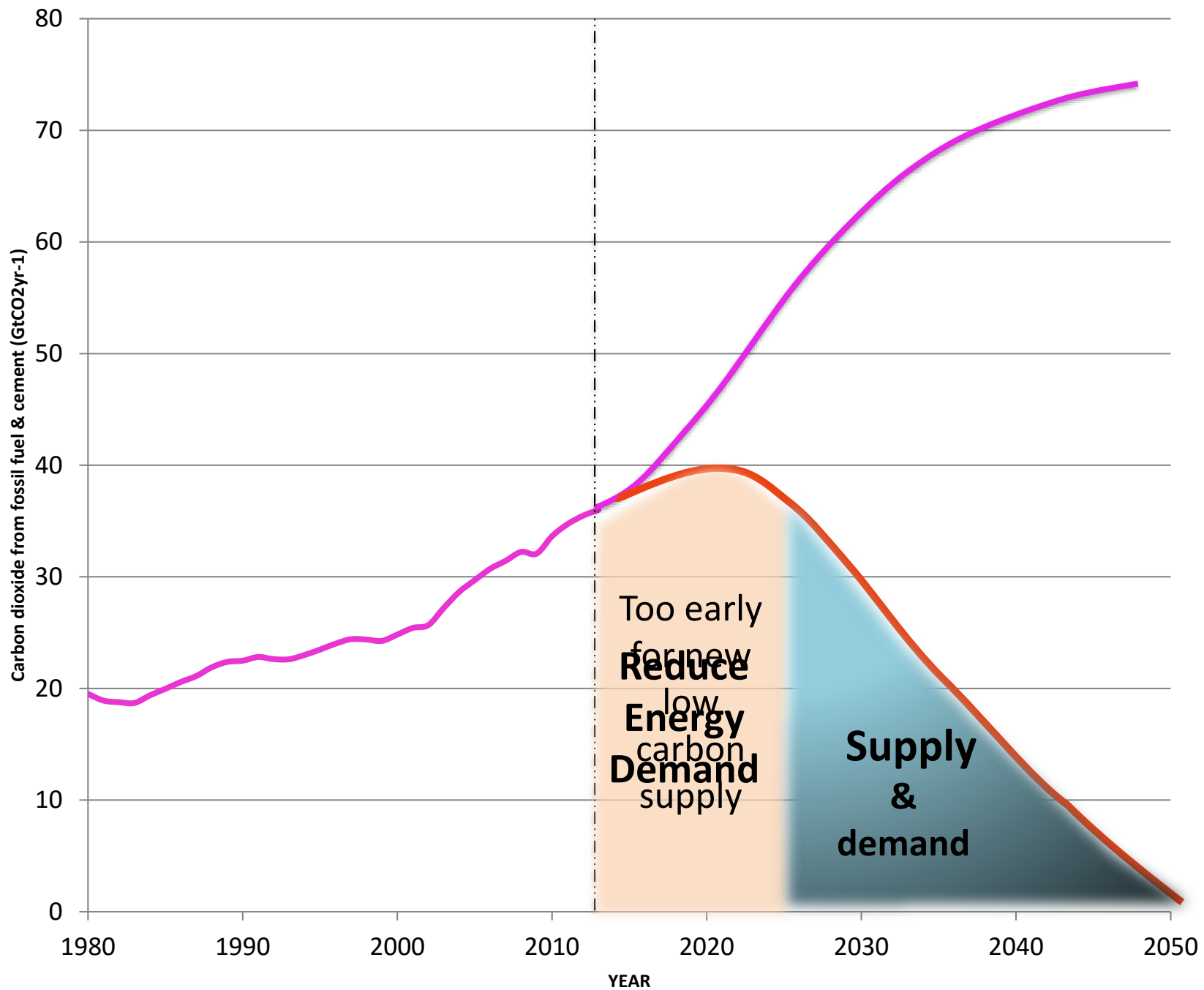
... that the CO₂ trend *“is perfectly in line with a temperature increase of **6 degrees Celsius**, which would have devastating consequences for the planet.”*

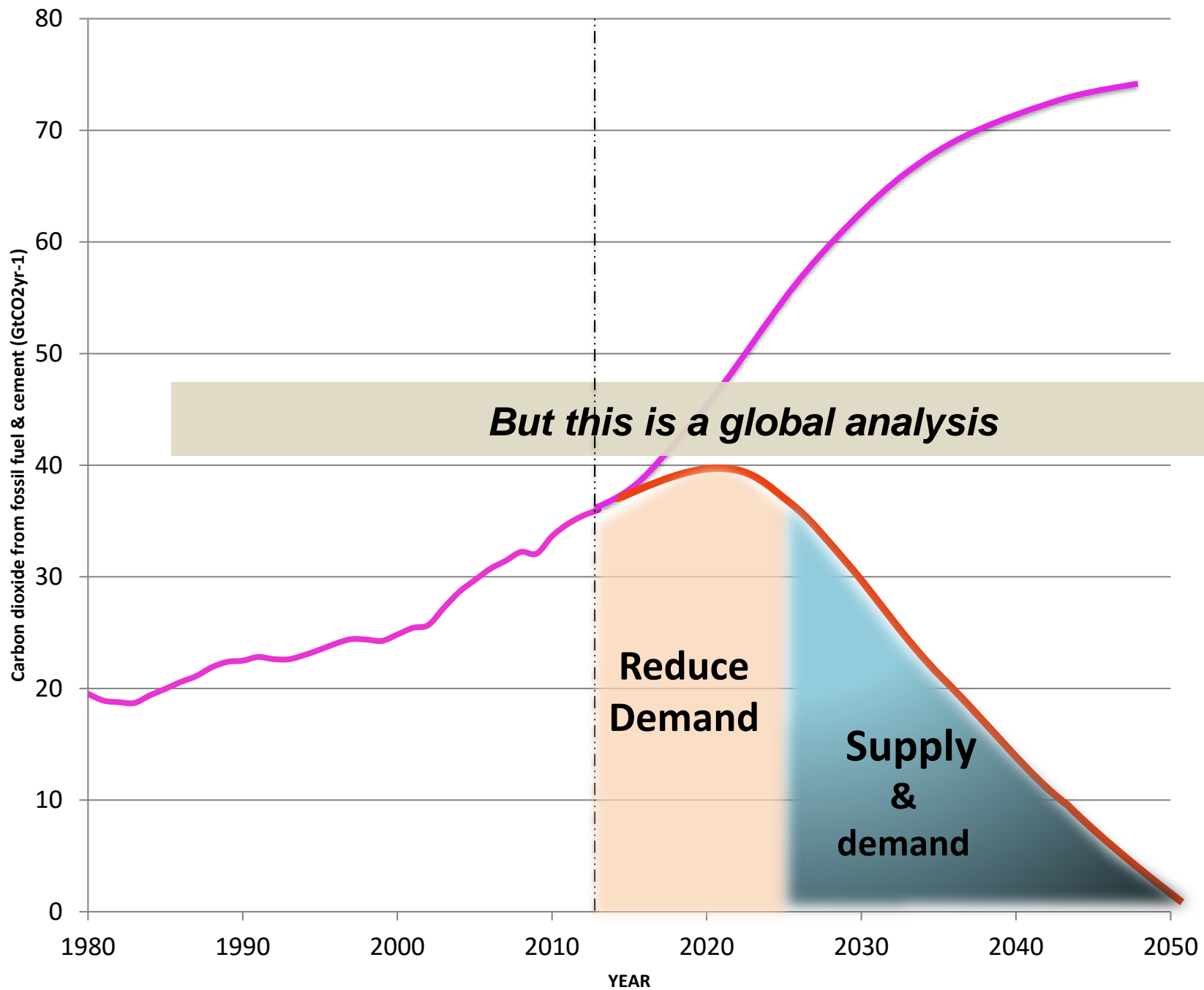
Fatih Birol - IEA chief economist

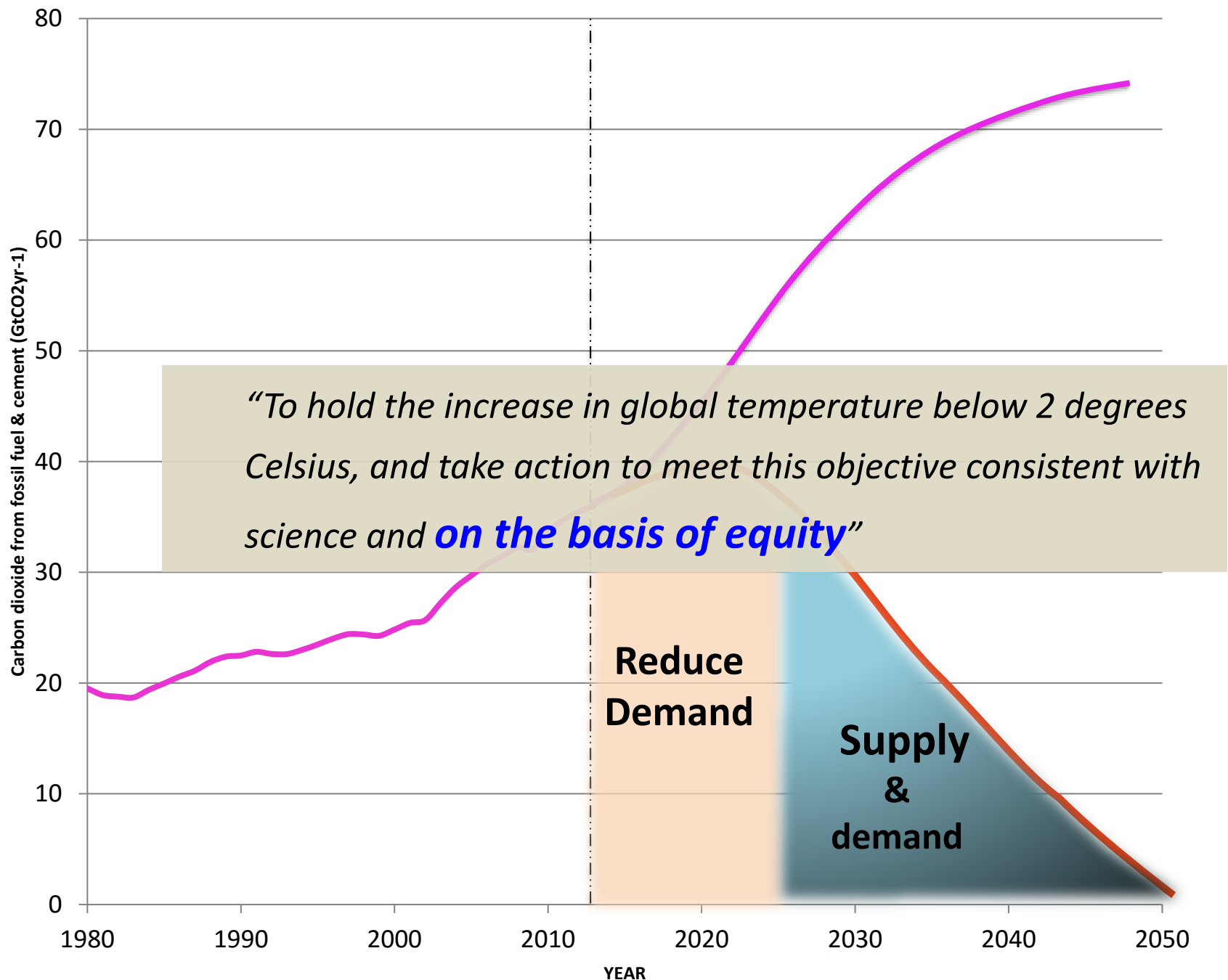
... but what about 2°C?











Returning to Carbon budgets

Numerically: based on IPCC Synthesis Report

Cumulative CO ₂ emissions from 1870 in GtCO ₂									
Net anthropogenic warming ^a	<1.5 °C			<2 °C			<3 °C		
Fraction of simulations meeting goal ^b	66%	50%	33%	66%	50%	33%	66%	50%	33%
Complex models, RCP scenarios only ^c	2250	2250	2550	2900	3000	3300	4200	4500	4850
Simple model, WGIII scenarios ^d	No data	2300–2350	2400–2950	2550–3150	2900–3200	2950–3800	n.a. ^e	4150–5750	5250–6000
Cumulative CO ₂ emissions from 2011 in GtCO ₂									
Complex models, RCP scenarios only ^c	400	550	850	1000	1300	1500	2400	2800	3250
Simple model, WGIII scenarios ^d	No data	550–600	600–1150	750–1400	1150–1400	1150–2050	n.a. ^e	2350–4000	3500–4250
Total fossil carbon available in 2011 ^f : 3670–7100 GtCO ₂ (reserves) & 31300–50050 GtCO ₂ (resources)									

$<2^{\circ}\text{C}$		
66%	50%	33%

... to stay below 2°C

... range of probabilities

emissions from 2011 in GtCO_2		
1000	1300	1500

... range of carbon budgets
for 2011-2100

... defined as a *“likely”* chance of *“staying below 2°C ”*

Estimating **energy-only** CO₂ budgets from **2015** to 2100



We need to note that:

- **Since 2011**, we've emitted about ~**150GtCO₂** (~15% of “likely” 2°C budget)
- **Deforestation** & land-use change from 2015-2100 ~**100GtCO₂**
- **Cement** process emissions from 2015-2100 ~**150GtCO₂**

*i.e.: ... to **subtract**, at least **400GtCO₂** from the energy budget from 2015*

... to stay below 2°C

emissions from 2015 GtCO ₂		
600 (66%)	900 (50%)	1100 (33%)

i.e.: the budgets from **2015 -2100** for **CO₂** from **energy** only

Considering **poorer** (non-Annex 1) nations:

GtCO₂
(2015-2100)

1. Peak CO₂ **2025**; mitigate **10%** p.a. from **2035**

2. Peak **2025**; mitigate **5%** from **2035**

3. Peak **2030**; mitigate **5%** from **2035**

Consider these in relation to 2°C budgets ...

1.	66% (600GtCO ₂)	50% (900GtCO ₂)	33% (1100GtCO ₂)
2.	66%	50%	33%
3.	66%	50%	33%

Considering **wealthier** (Annex 1) nations:

GtCO₂
(2015-2100)

1. Peak **now**; mitigate **5%** p.a. from **2025**
2. Peak **now**; mitigate **10%** from **2025**
3. Mitigate **10%** p.a. from now

Put bluntly

- 66% chance of 2°C is lost
- 50% chance demands a *war-like* footing on mitigation
 - Wealthier nations 10% p.a. within a few years
 - Poorer nations 10% p.a. by 2035
- 33% chance still demands mitigation rates far beyond anything that will be discussed in the Paris COP21 negotiations
- We have 25 years of explicitly choosing to fail on 2°C

But it is a choice!

How can this be reconciled with ‘official’ accounts?

... mitigation costs would be so low that *“global economic growth would not be strongly affected”*

WGIII Co Chair Nov. 2014

“To keep ... to 2°C ... the UK [must] cut emissions by at least 80% ... the good news is that reductions of that size are possible without sacrificing the benefits of economic growth and rising prosperity.”

UK Committee on Climate Change

... two rabbits from the hat:

1. Negative emissions technologies (BECCS):

Never worked at scale

huge technical & economic unknowns

major efficiency penalty

limited biomass availability (fuel or food?)

and fingers crossed on feedbacks

2. Peak global emissions in the past

Systemic bias: time travel & -ve CO₂ technologies

IPCC Scenario database:

- 400 scenarios for 50% or better chance of 2°C, of these:
 - **344** include large scale **negative emissions**
 - all **56** without negative emissions **peak in ~2010**
 - *many use negative emissions & adopt a ~2010 peak*

Returning to 2°C ... is it still a viable goal?



Hypothesis: yes

... but the probabilities are now very slim

(i.e. IPCC budget for only a 33% chance of staying below 2°C)

A Radical Plan for 2°C – two phases

1. Deep **reductions in energy** demand from now to ~2030

... by the wealthy high emitters

2. **Marshall-style plan** build programme of **very low-CO2 energy** supply

... with 100% penetration by 2050

and a message of hope to finish ...

*“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.”*

Robert Unger

Thank you

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