Delivering on the Paris 1.5℃ and 2℃ commitments

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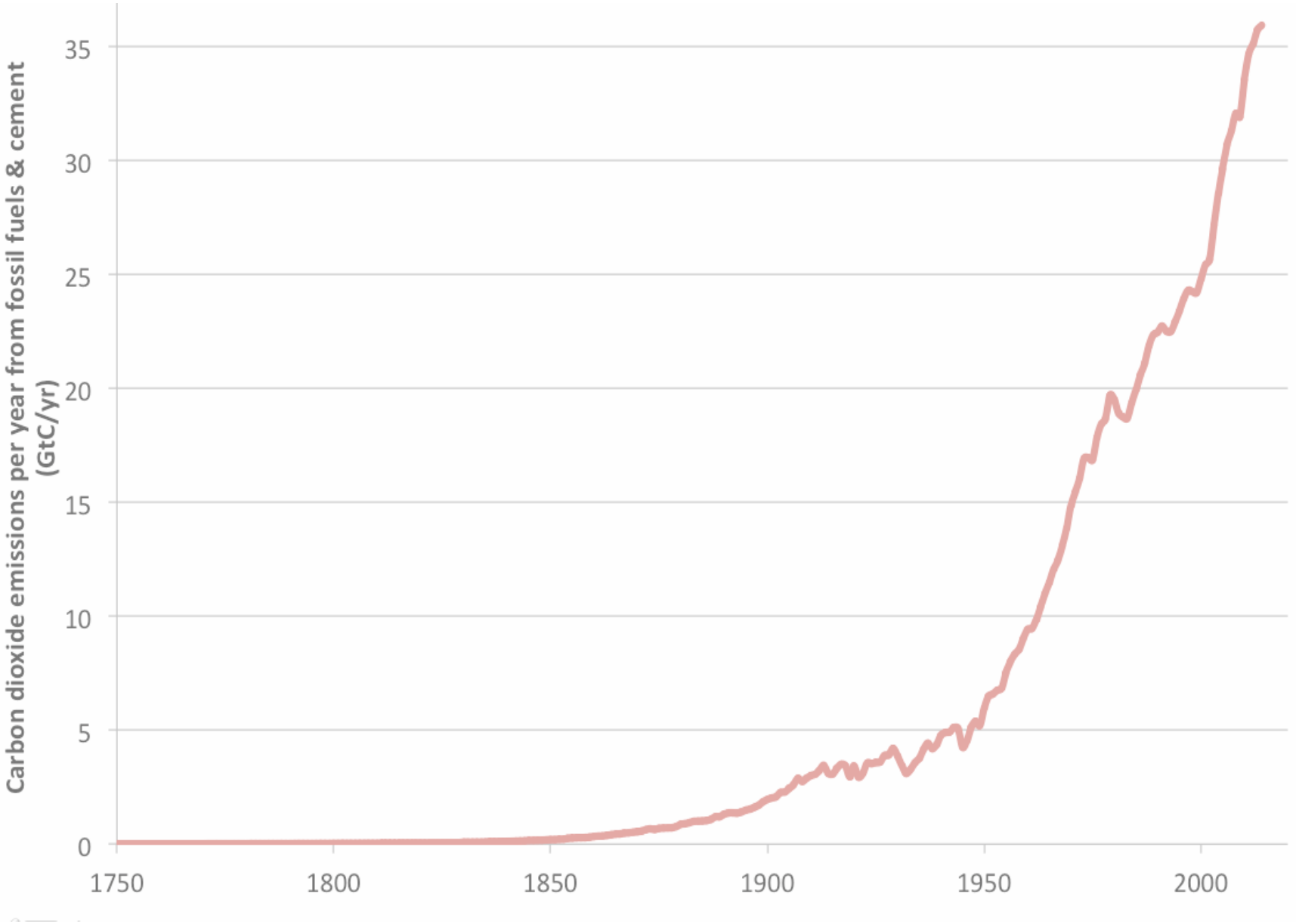
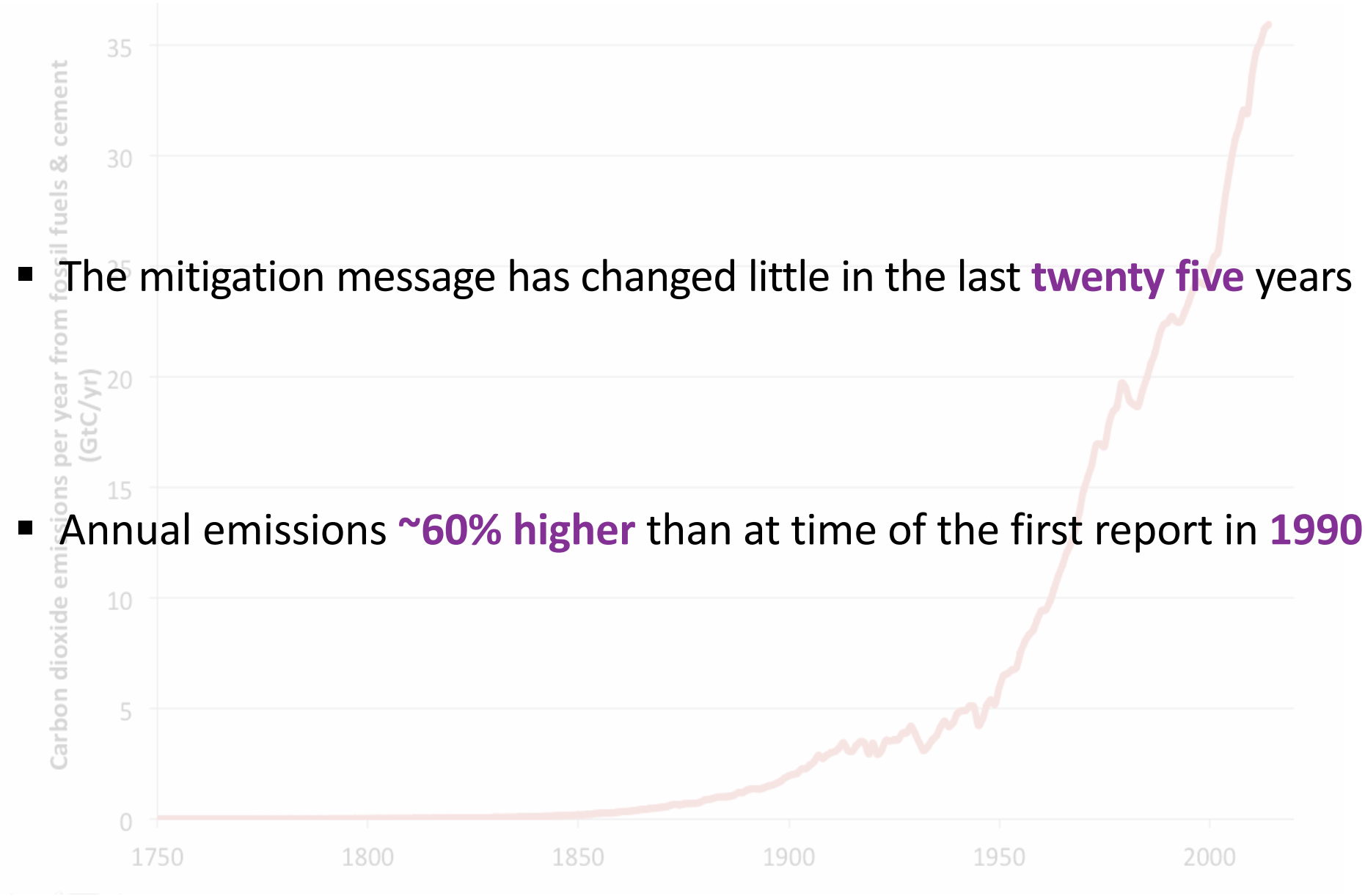
Backdrop to **Paris**

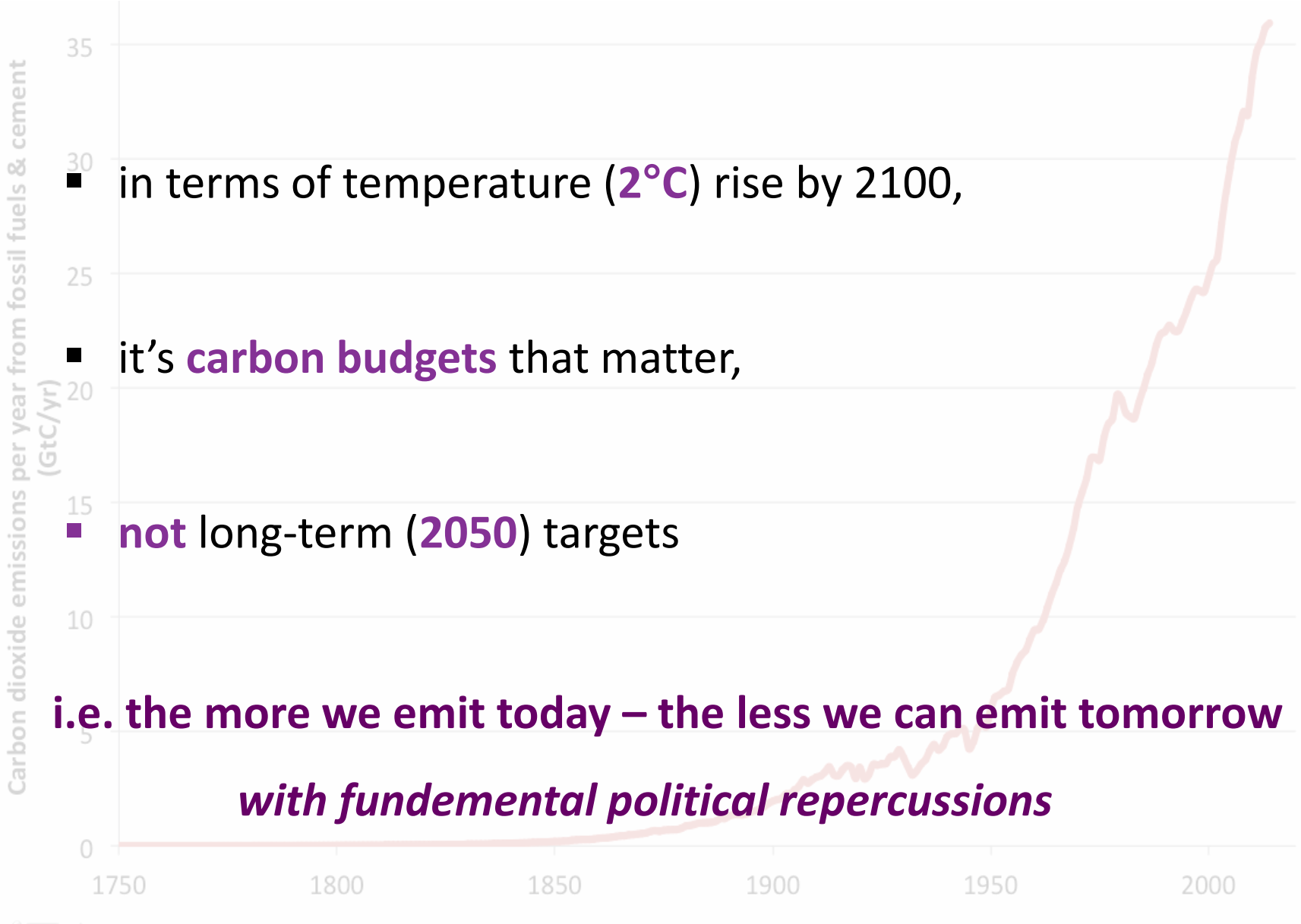


Backdrop to **Paris**



- The mitigation message has changed little in the last **twenty five** years
- Annual emissions **~60% higher** than at time of the first report in **1990**

Backdrop to **Paris:** *the latest **IPCC** reports*

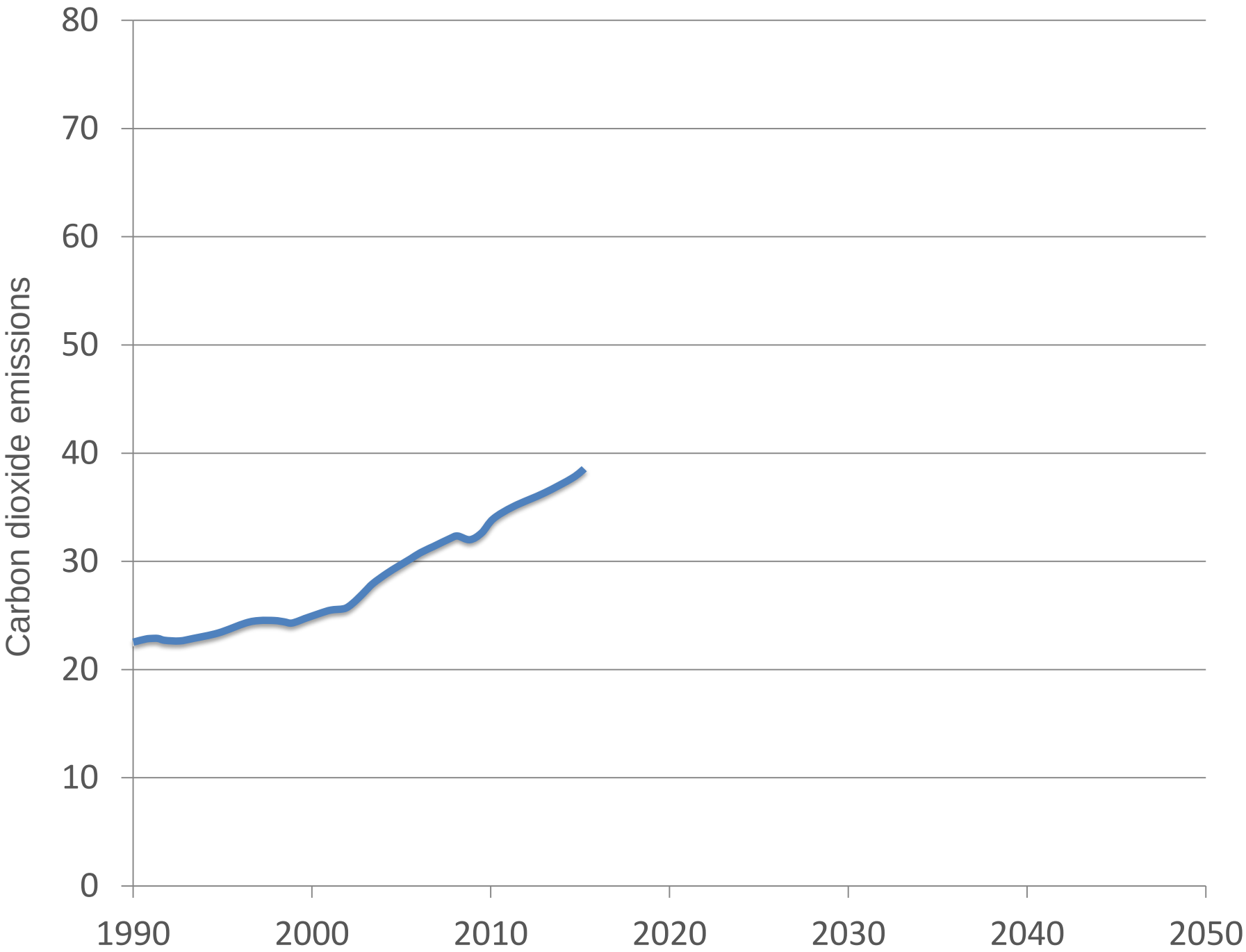


- in terms of temperature (**2°C**) rise by 2100,
- it's **carbon budgets** that matter,
- **not** long-term (**2050**) targets

i.e. the more we emit today – the less we can emit tomorrow

with fundemental political repercussions

Thinking of this graphically…


Carbon dioxide emissions
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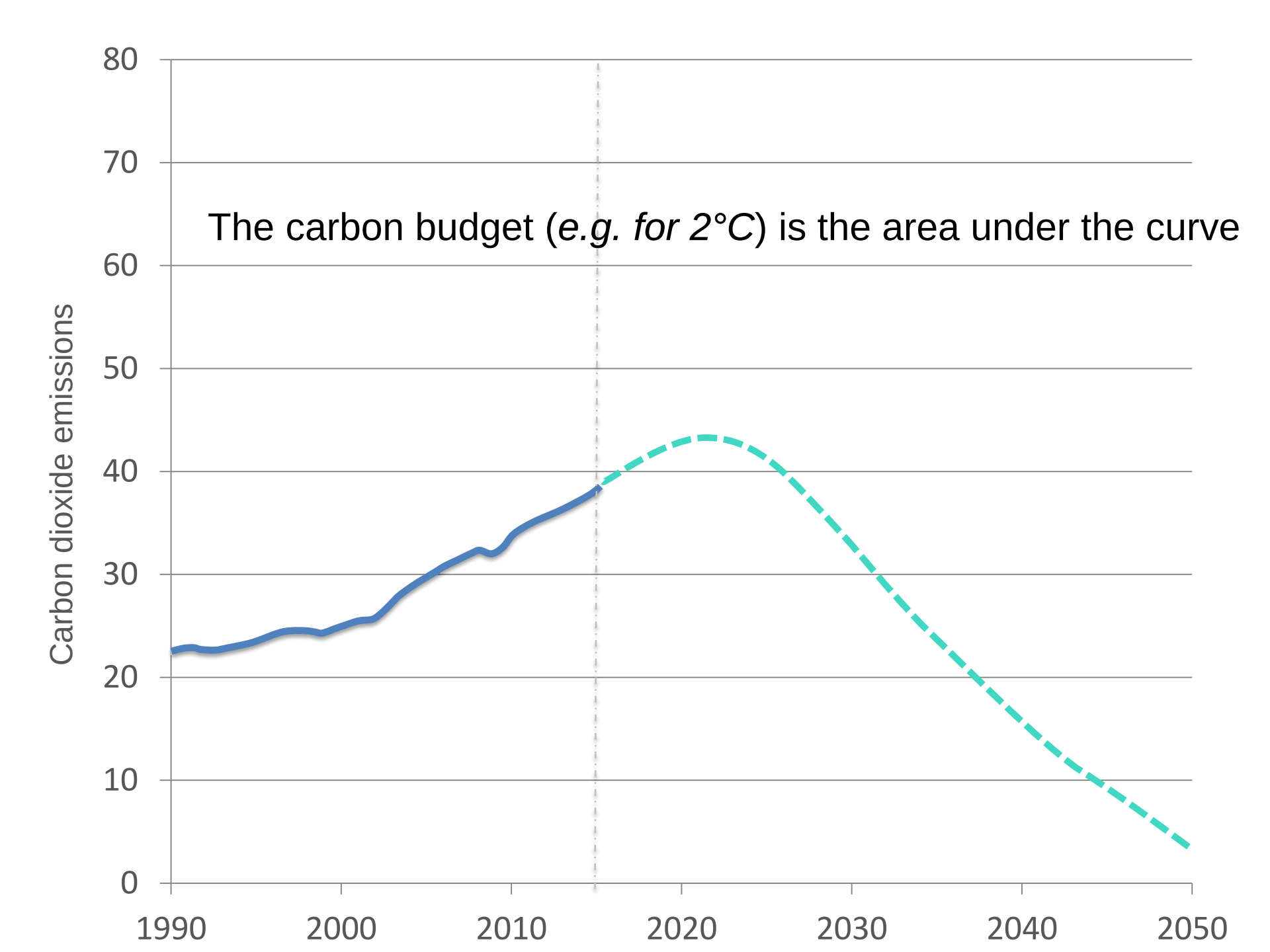
The carbon budget (*e.g. for 2°C*) is the area under the curve
Carbon dioxide emissions
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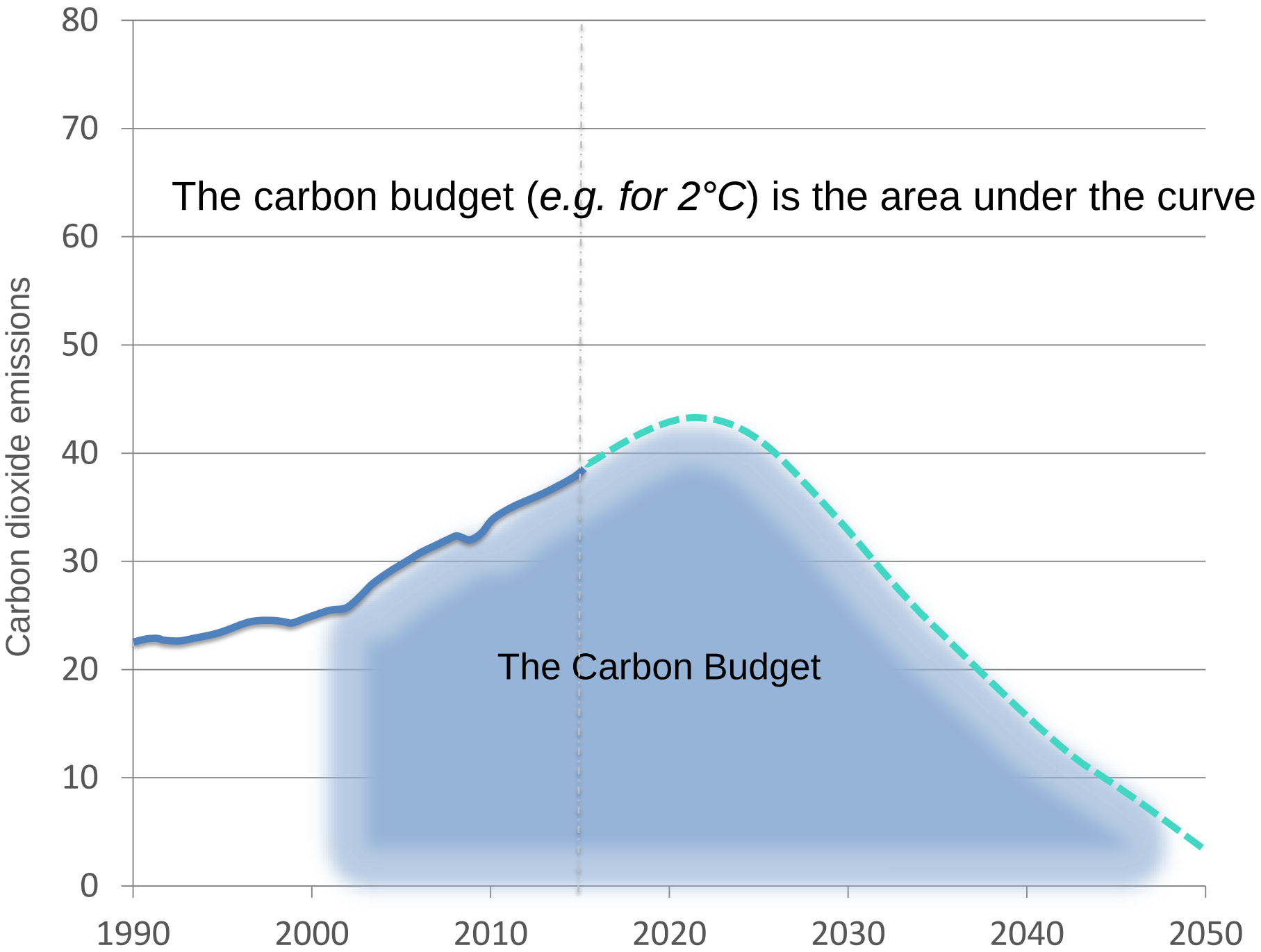
The carbon budget (*e.g. for 2°C*) is the area under the curve
The Carbon Budget
Carbon dioxide emissions
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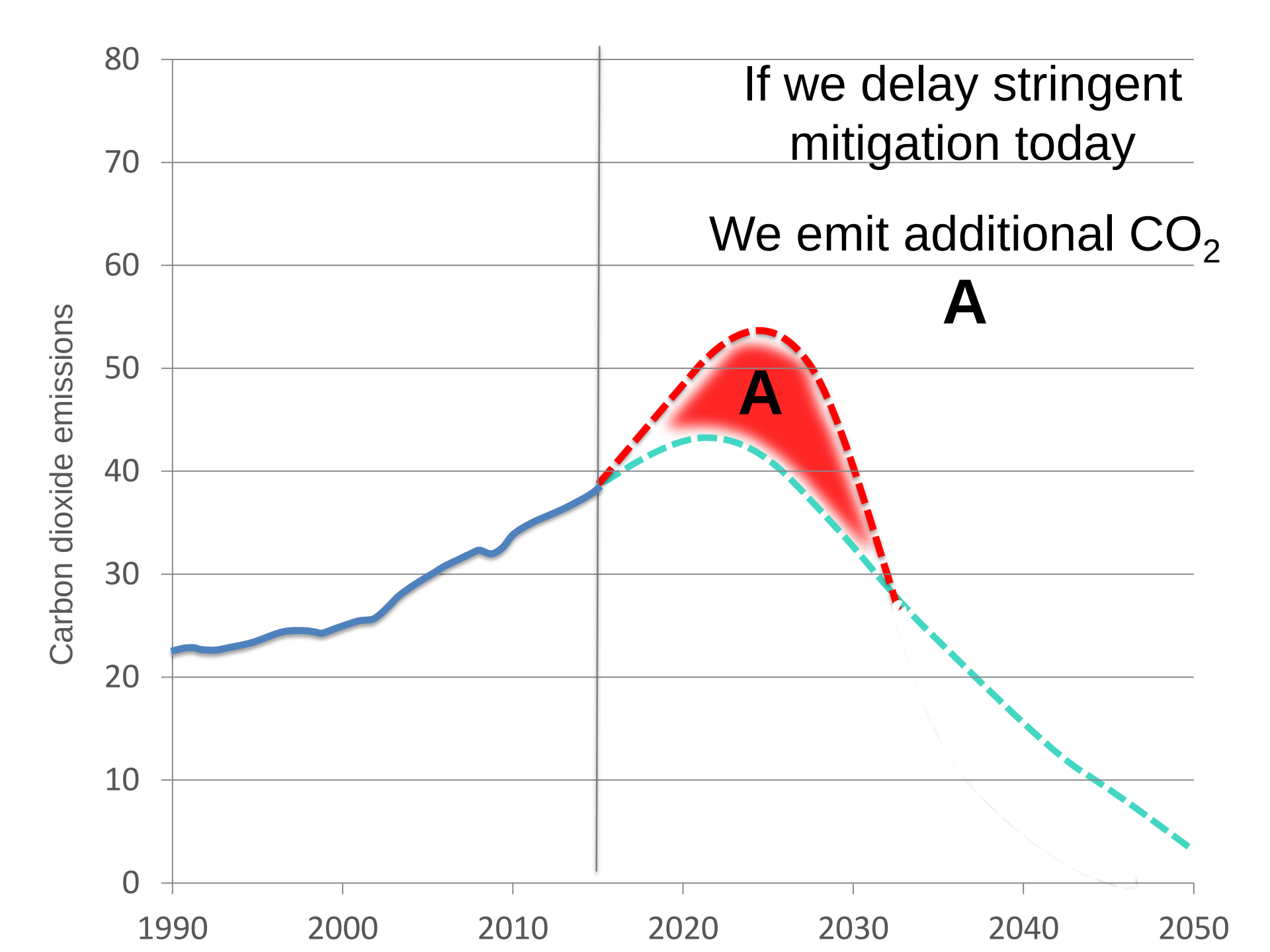
If we delay stringent mitigation today
We emit additional CO_2
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A
Carbon dioxide emissions
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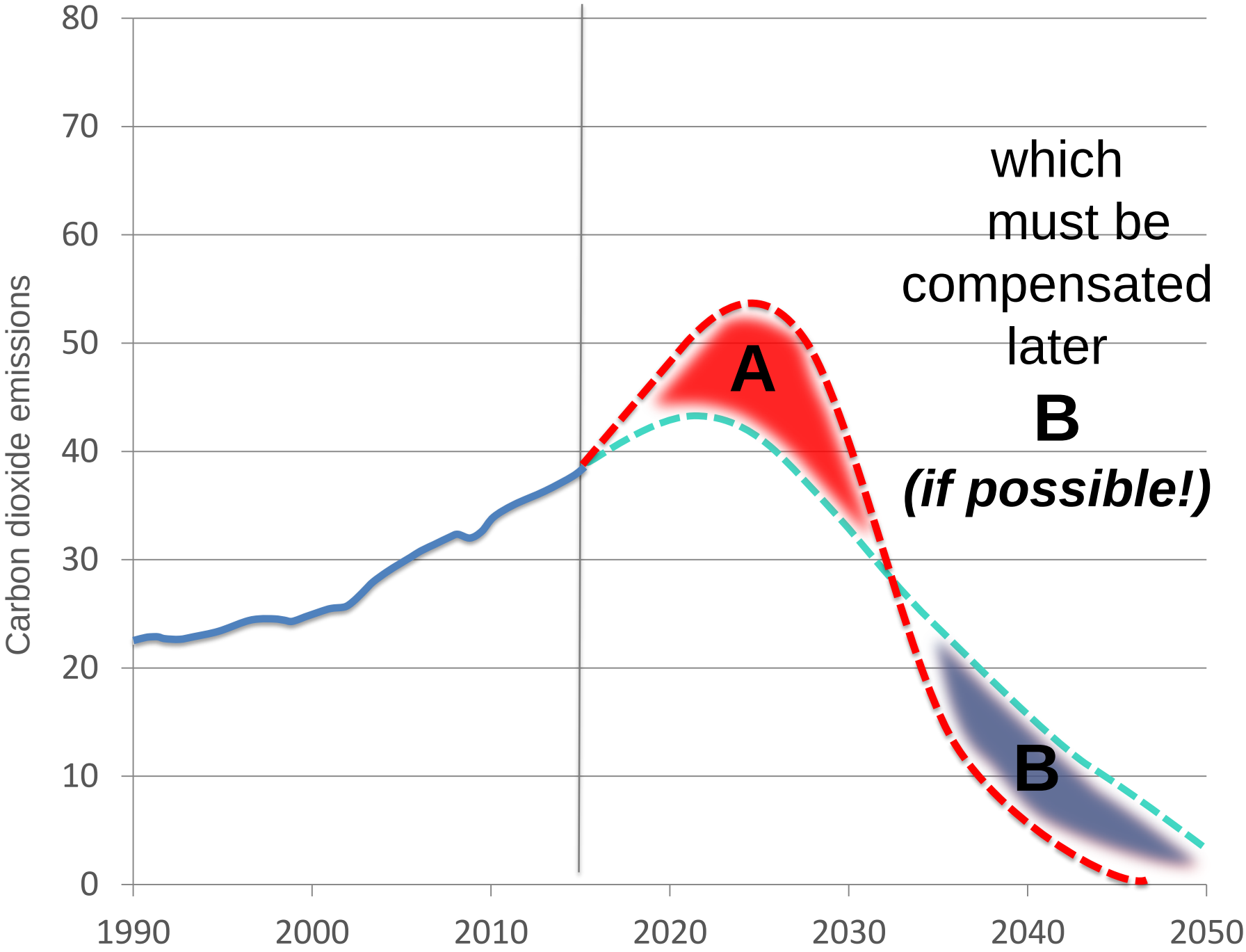
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Carbon dioxide emissions
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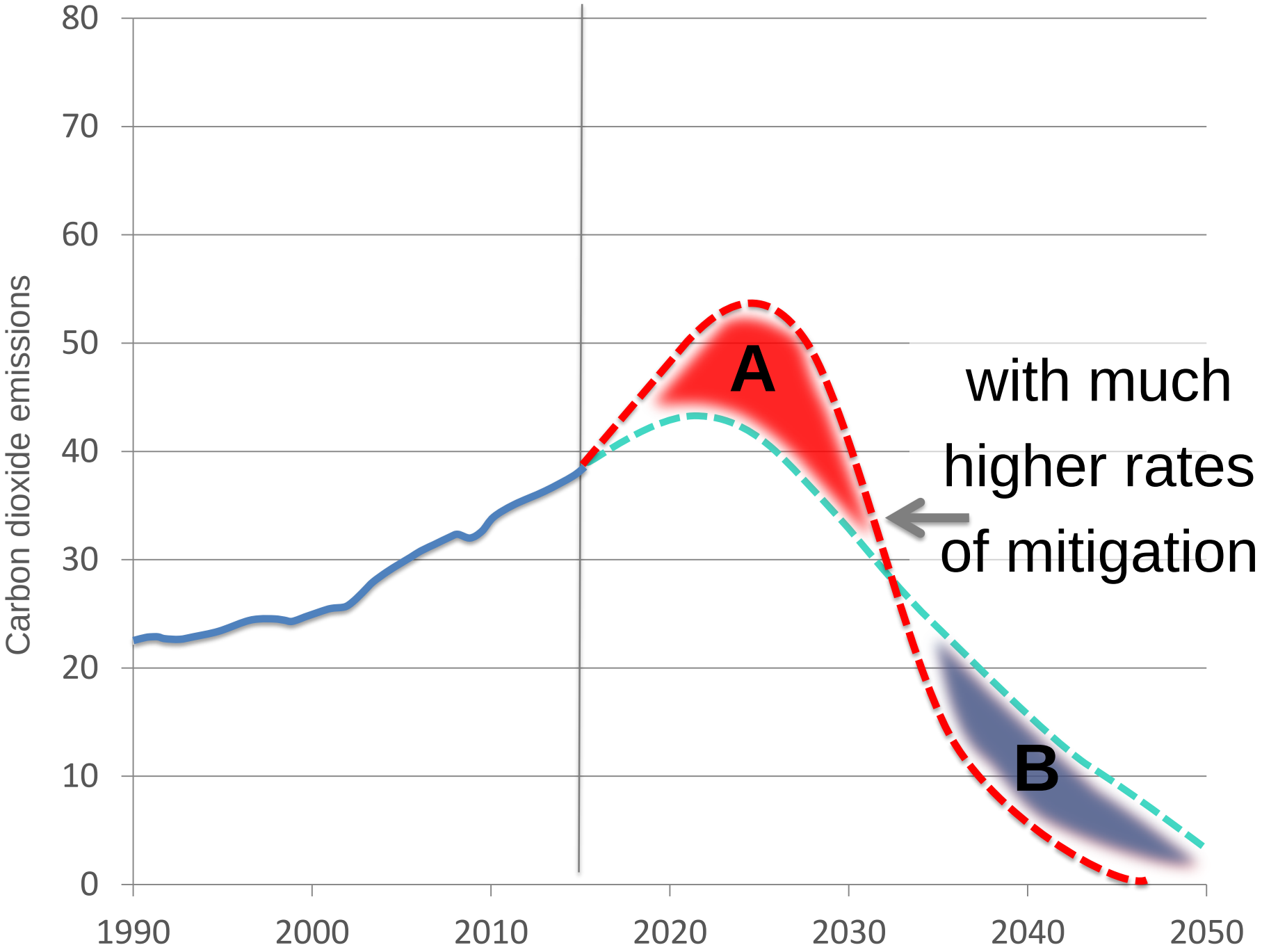
which
must be
compensated
later
B
(if possible!)


Carbon dioxide emissions
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A
B
with much
higher rates
of mitigation

Returning to the Paris Agreement

Paris Agreement

United Nations

Framework Convention on Climate Change

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

Distr.: Limited
12 December 2015

Original: English

Conference of the Parties
Twenty-first session
Paris, 30 November to 11 December 2015

Agenda item 4(b)
Durban Platform for Enhanced Action (decision 1/CP.17)
Adoption of a protocol, another legal instrument, or an agreed outcome with legal force under the Convention applicable to all Parties

ADOPTION OF THE PARIS AGREEMENT

Proposal by the President

Draft decision -/CP.21

The *Conference of the Parties*,

Recalling decision 1/CP.17 on the establishment of the Ad Hoc Working Group on the Durban Platform for Enhanced Action,

Also recalling Articles 2, 3 and 4 of the Convention,

Further recalling relevant decisions of the Conference of the Parties, including decisions 1/CP.16, 2/CP.18, 1/CP.19 and 1/CP.20,

Paris Agreement – *An important diplomatic* ***triumph***

local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity,

Also acknowledging the specific needs and concerns of developing country Parties arising from the impact of the implementation of response measures and, in this regard, decisions 5/CP.7, 1/CP.10, 1/CP.16 and 8/CP.17,

Emphasizing with serious concern the urgent need to address the significant gap between the aggregate effect of Parties' mitigation pledges in terms of global annual emissions of greenhouse gases by 2020 and aggregate emission pathways consistent with holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels,

Also emphasizing that enhanced pre-2020 ambition can lay a solid foundation for enhanced post-2020 ambition,

Stressing the urgency of accelerating the implementation of the Convention and its Kyoto Protocol in order to enhance pre-2020 ambition,

Recognizing the urgent need to enhance the provision of finance, technology and capacity-building support by developed country Parties, in a predictable manner, to enable enhanced pre-2020 action by developing country Parties,

Emphasizing the enduring benefits of ambitious and early action, including major reductions in the cost of future mitigation and adaptation efforts,

Acknowledging the need to promote universal access to sustainable energy in developing countries, in particular in Africa, through the enhanced deployment of renewable energy,

Agreeing to uphold and promote regional and international cooperation in order to mobilize stronger and more ambitious climate action by all Parties and non-Party stakeholders, including civil society, the private sector, financial institutions, cities and other subnational authorities, local communities and indigenous peoples,

Paris Agreement – *An important diplomatic* ***triumph***

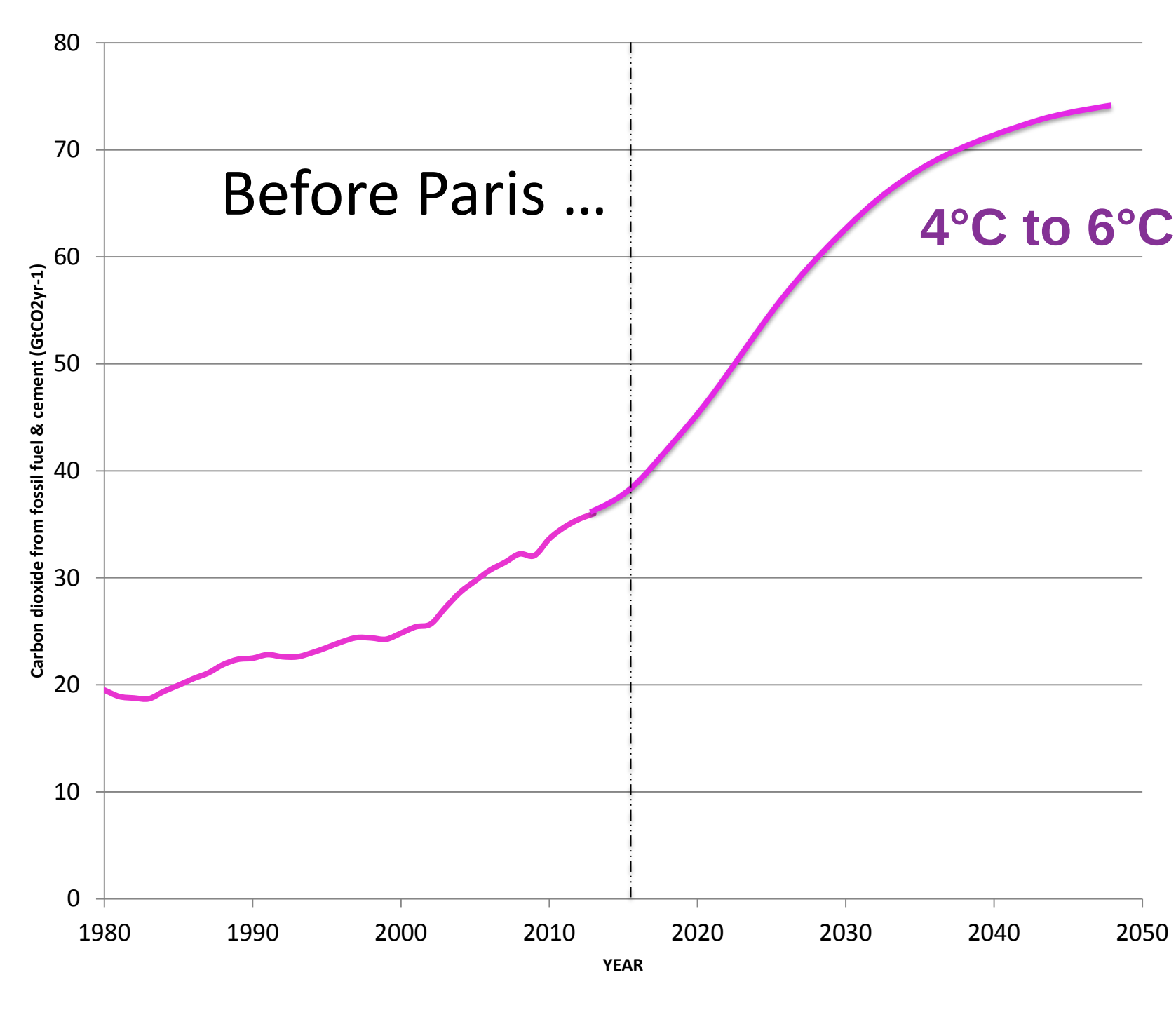
… hold the increase in global average temperature to **well below 2°C** above pre-industrial levels and pursue **efforts** to limit the temperature increase to **1.5°C**

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

…on the **basis of equity**, and efforts to **eradicate poverty**.

‘Issues’ with the Paris Agreement

- no reference to fossil fuels or decarbonisation
- aviation and shipping exempt from any action
- voluntary pledges (INDCs) equate to 3 to 4° C
- no major review of INDCs until ~2023; i.e.~300 billion tonnes of CO_2 from now
- fundamental reliance on highly speculative negative emission technologies


Before Paris …
4°C to 6°C
Carbon dioxide from fossil fuel & cement (GtCO2yr-1)
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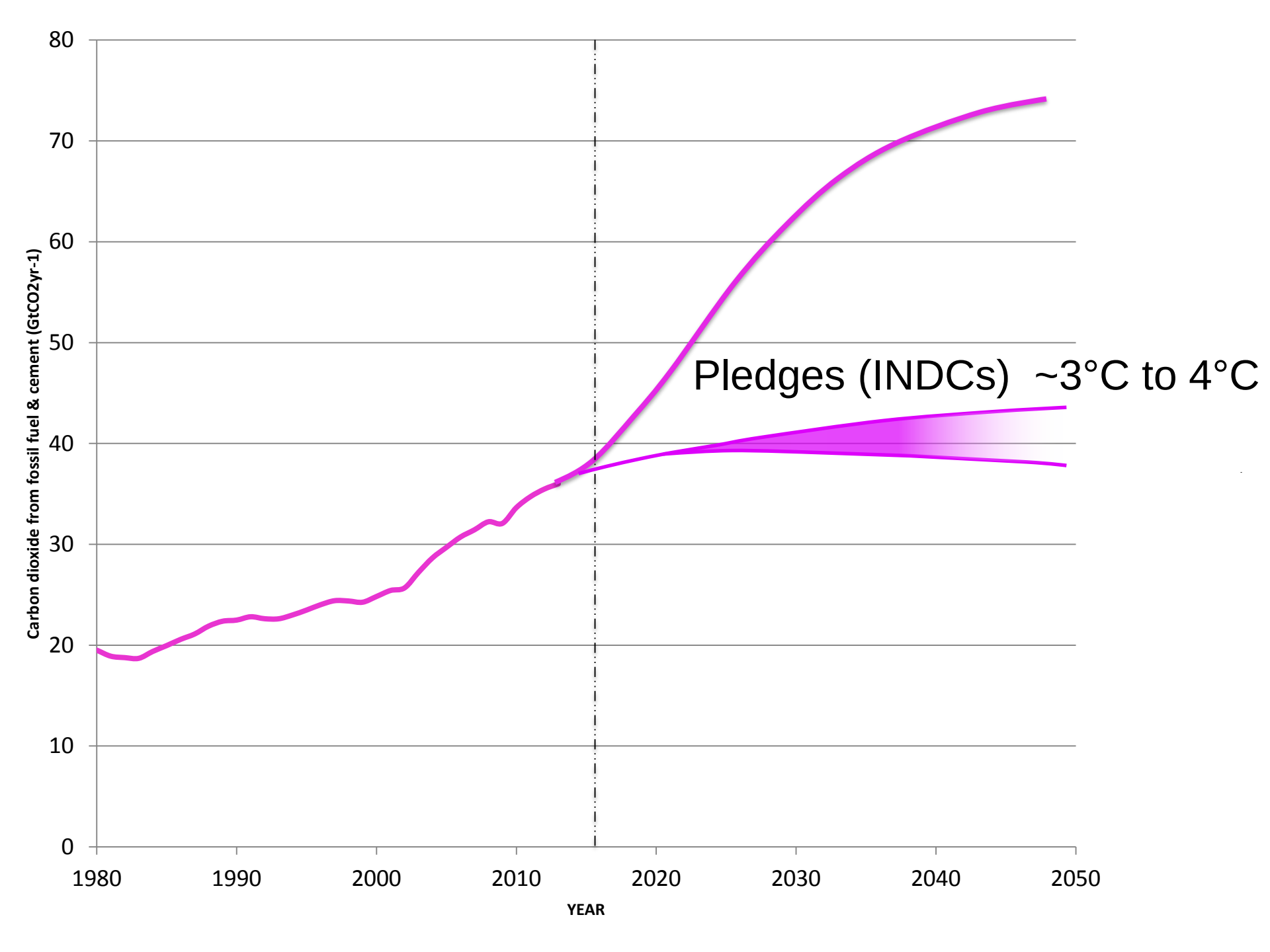
Pledges (INDCs) ~3°C to 4°C
Carbon dioxide from fossil fuel & cement (GtCO2yr-1)
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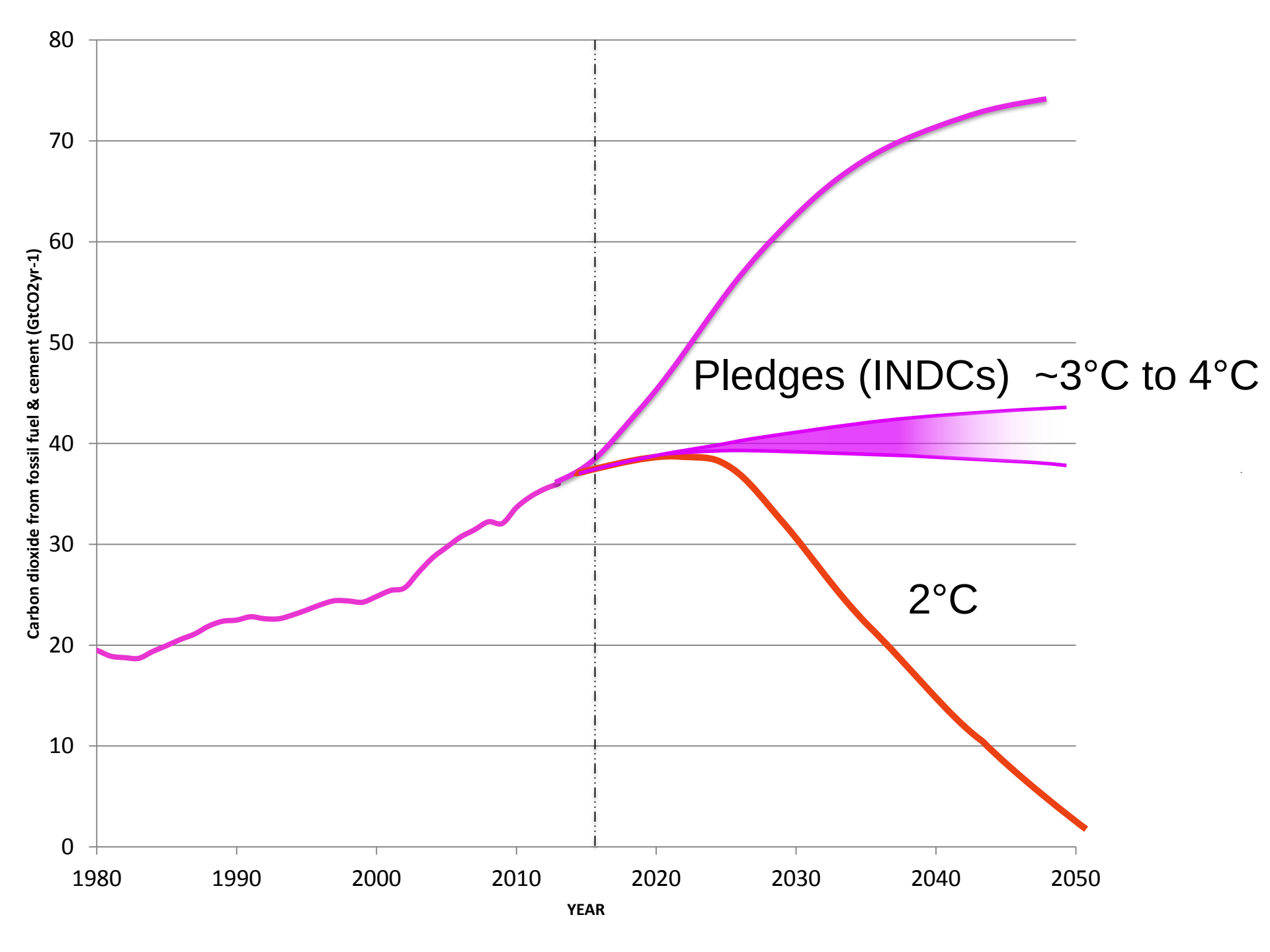
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Carbon dioxide from fossil fuel & cement (GtCO2yr-1)
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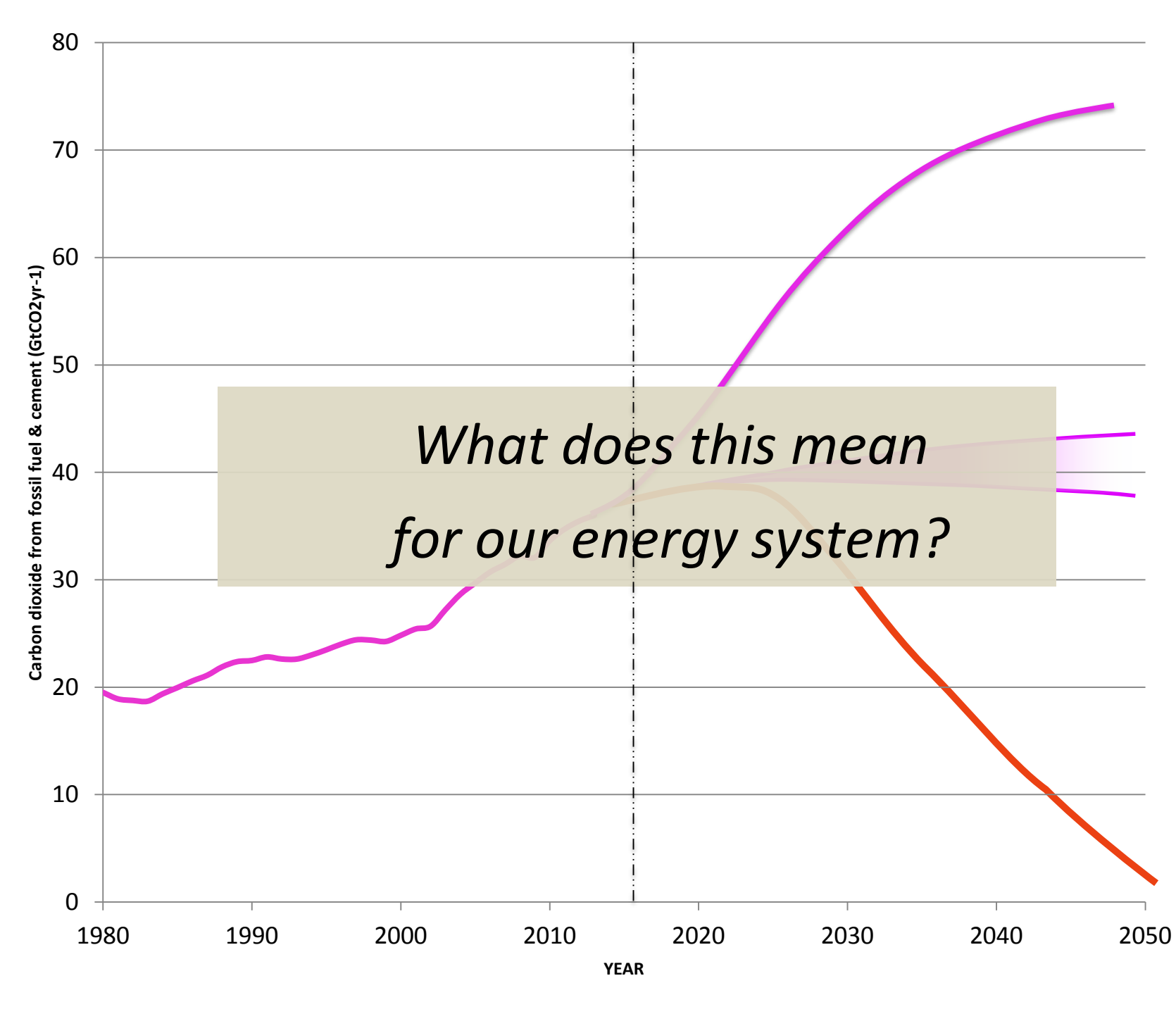
YEAR
Pledges (INDCs) ~3°C to 4°C
2°C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Carbon dioxide from fossil fuel & cement (GtCO2yr-1)
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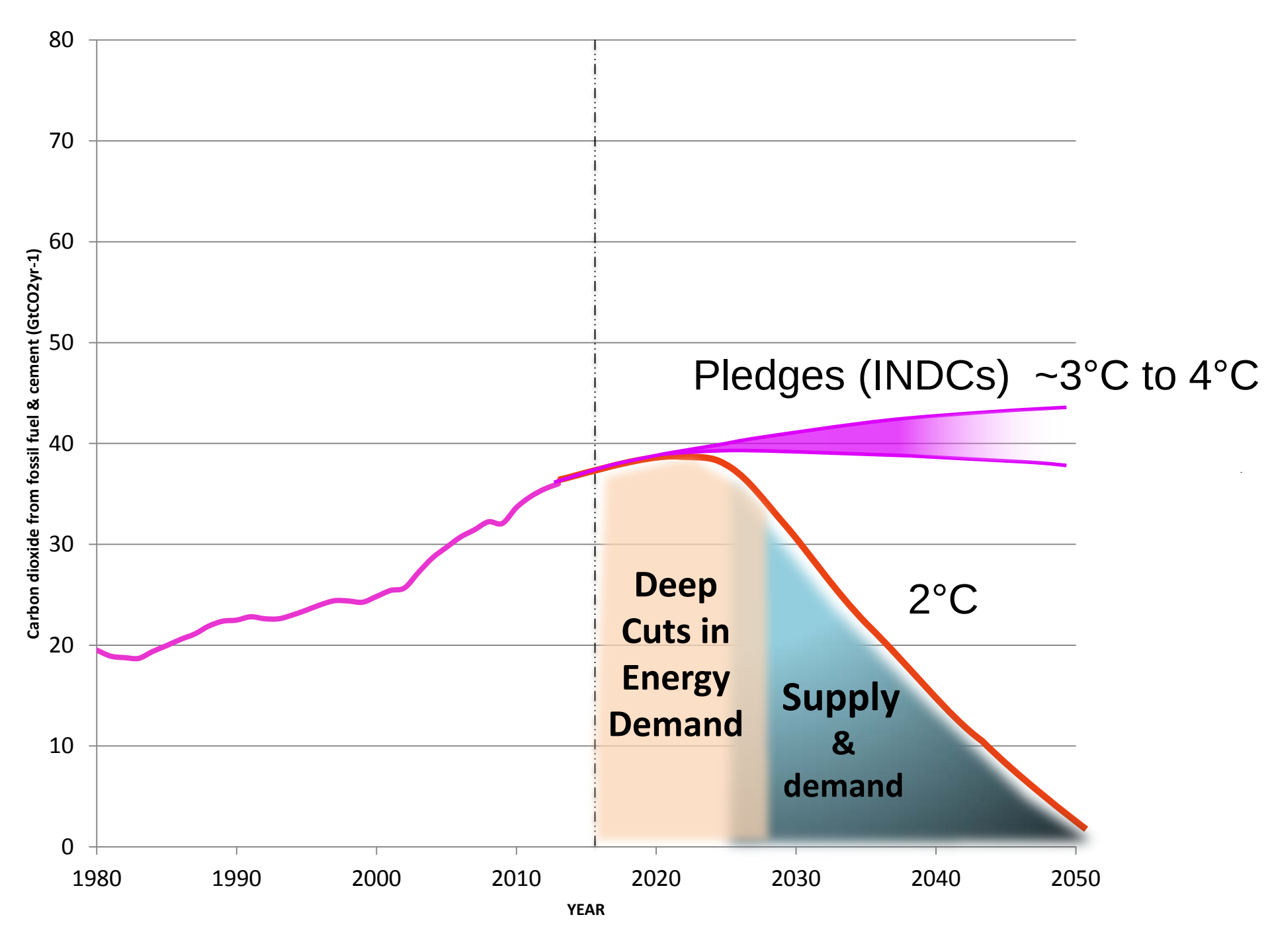
YEAR
What does this mean
for our energy system?


Pledges (INDCs) ~3°C to 4°C
Deep Cuts in Energy Demand
Supply & demand
2°C
Carbon dioxide from fossil fuel & cement (GtCO2yr-1)
YEAR
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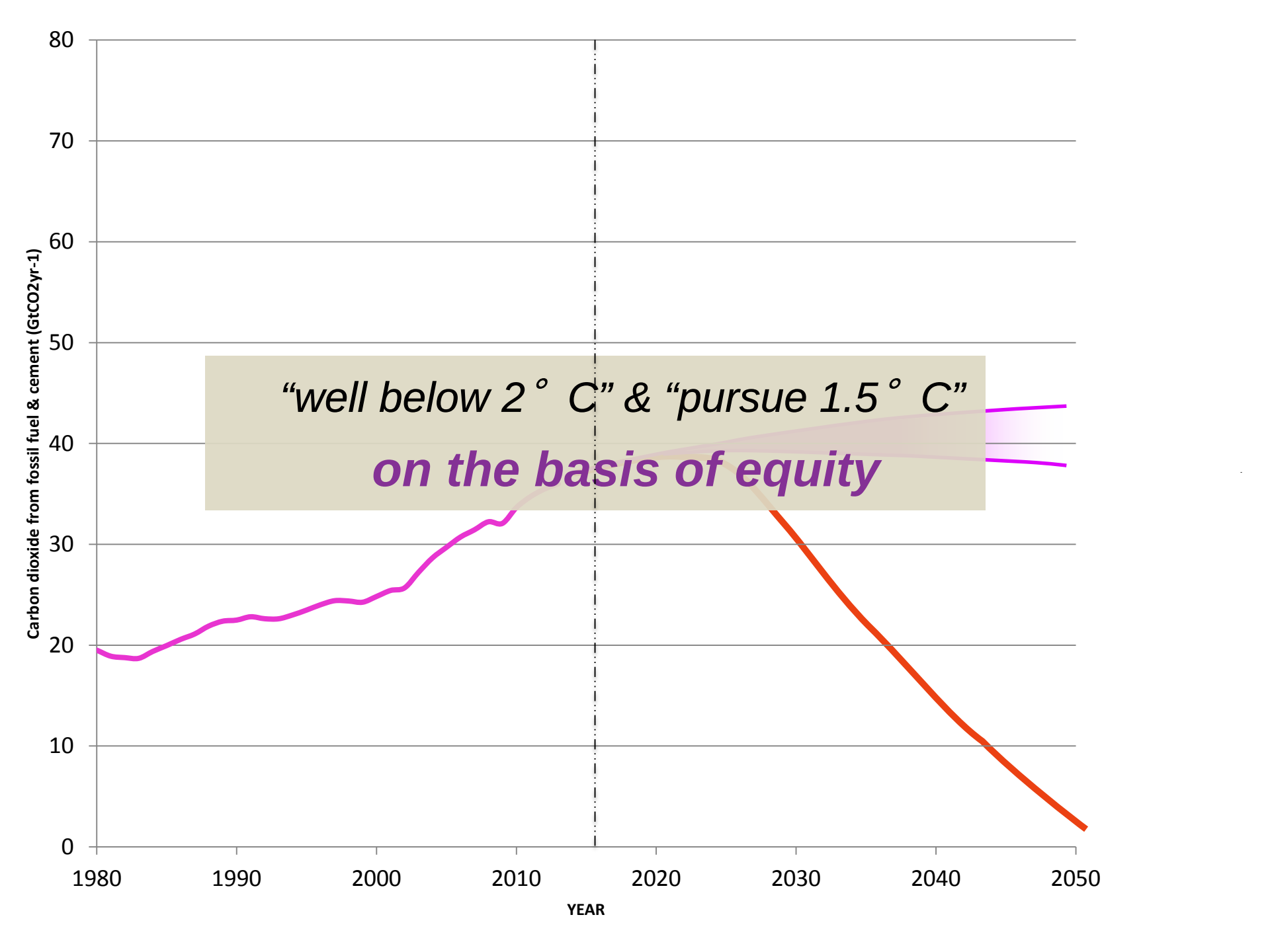
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Carbon dioxide from fossil fuel & cement (GtCO2yr-1)
1980
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YEAR
“well below 2° C” & “pursue 1.5° C”
on the basis of equity

Returning to IPCC's Carbon budgets

In 3 to 13 years we'll use all the 1.5°C energy-CO_2 budget

Pledges not reviewed in depth till 2023

… from a budget perspective

Is it now too late for 1.5°C?

… and for 2°C ?

- **66%** chance of 2°C is lost
- **50%** demands a *war-like* footing on mitigation - now
- **33%** demands mitigation beyond anything discussed in Paris

What’s this mean for poorer & richer nations?

Poorer/industrialising nations:

1. Collectively peak their emissions by 2025

2. Then rapidly increase mitigation to ~10% p.a. by 2035

3. **Fully decarbonise their energy systems by ~2050**

… then, for 2°C, **wealthy** nations require:

At least **10% reduction** in emissions year on year from **now**,

i.e:

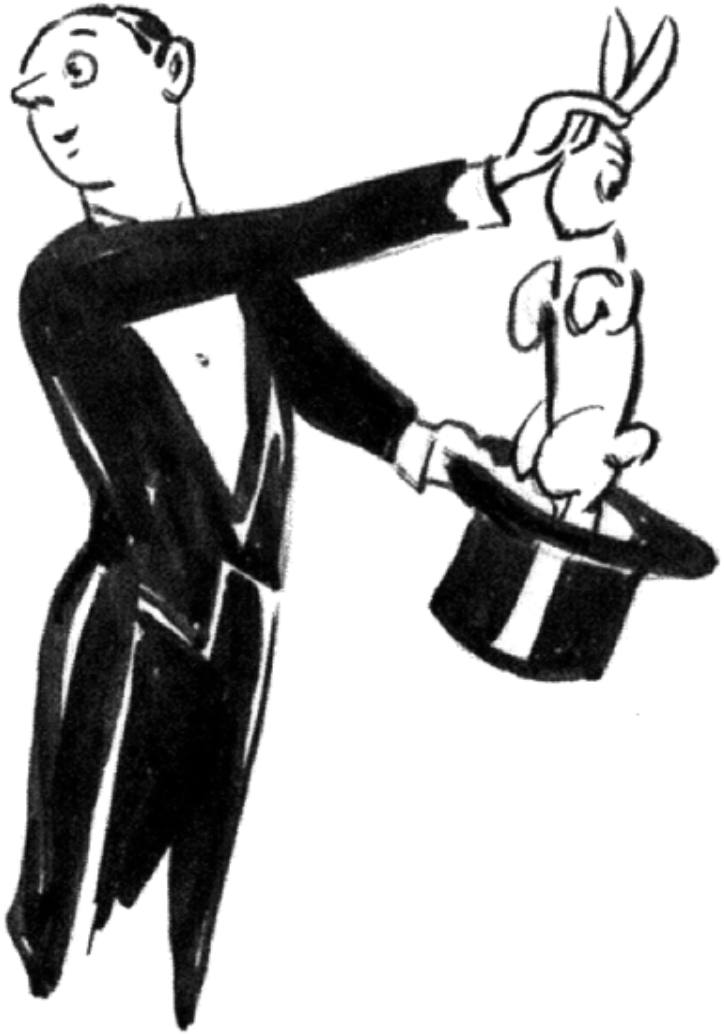
50% reduction by	~2020 (c.f. 1990)
75%	~2025
90%	~2030

Zero carbon energy by ~2035

Cf. EU's submission to Paris 40% by 2030

How can this fit with the Paris euphoria?

… by pulling a rabbit from the magician's hat



… by pulling a rabbit from the magician's hat

Negative emissions technologies (NETs)

i.e. suck CO_2 directly from the atmosphere by 2030 & beyond

… by pulling a rabbit from the magician's hat

Negative emissions technologies (NETs)

BECCS – *biomass energy with carbon capture & storage:*

Grow trees/plants

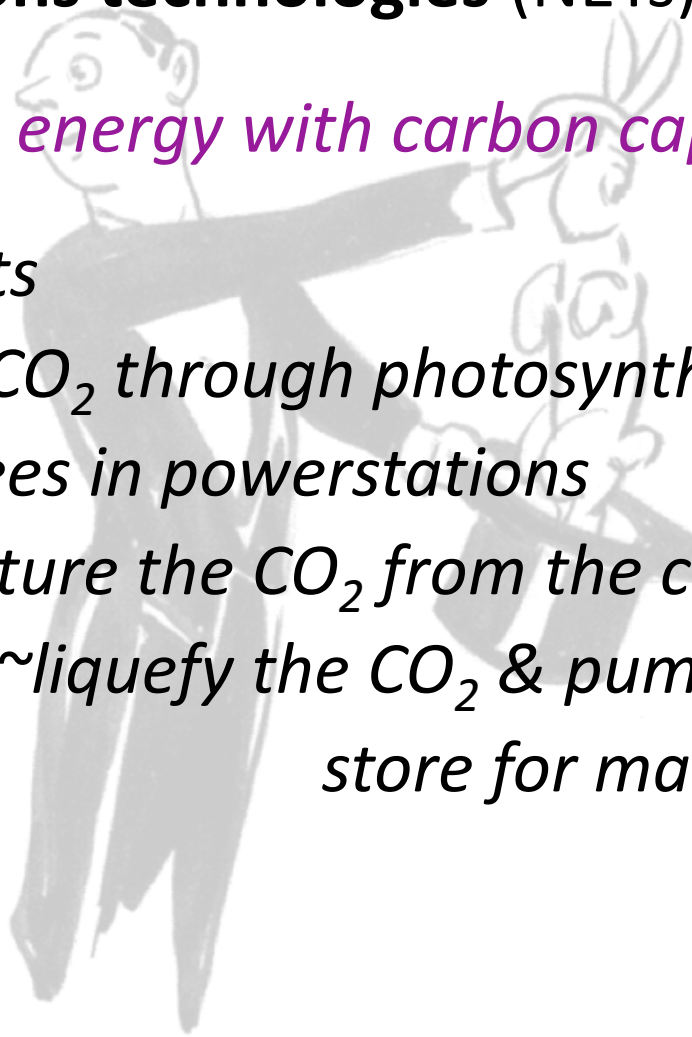
they absorb CO_2 through photosynthesis

burn trees in powerstations

capture the CO_2 from the chimney

~liquefy the CO_2 & pump it underground

store for many 1000s of years



… by pulling a rabbit from the magician's hat

Negative emissions technologies (NETs)

BECCS – *biomass energy with carbon capture & storage:*

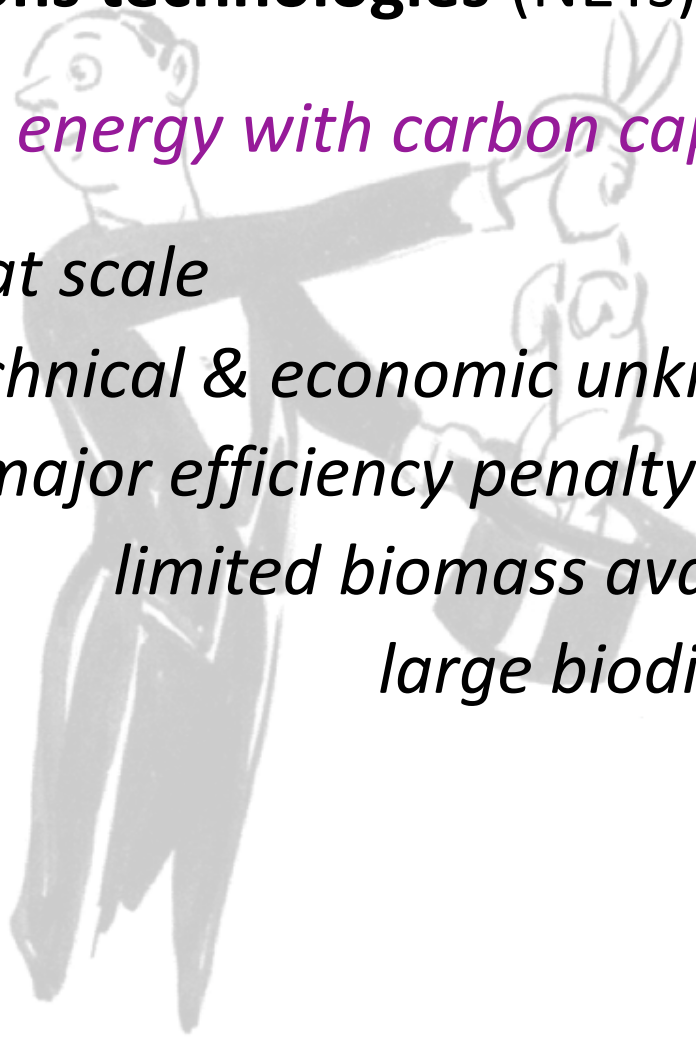
Never worked at scale

huge technical & economic unknowns

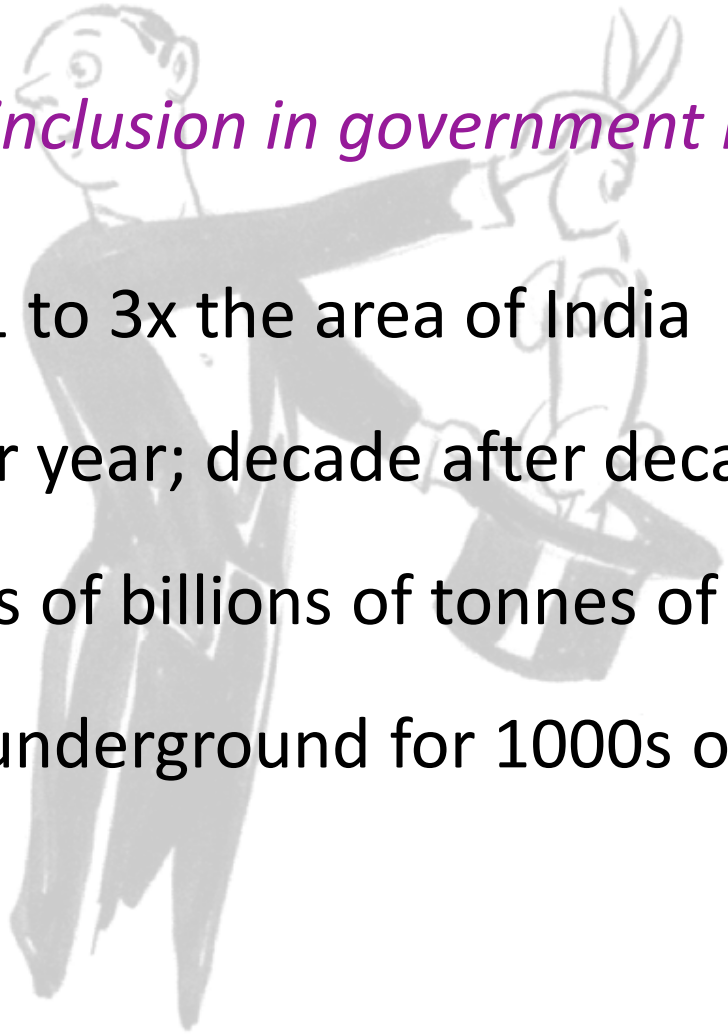
major efficiency penalty

limited biomass availability *(fuel or food?)*

large biodiversity impacts



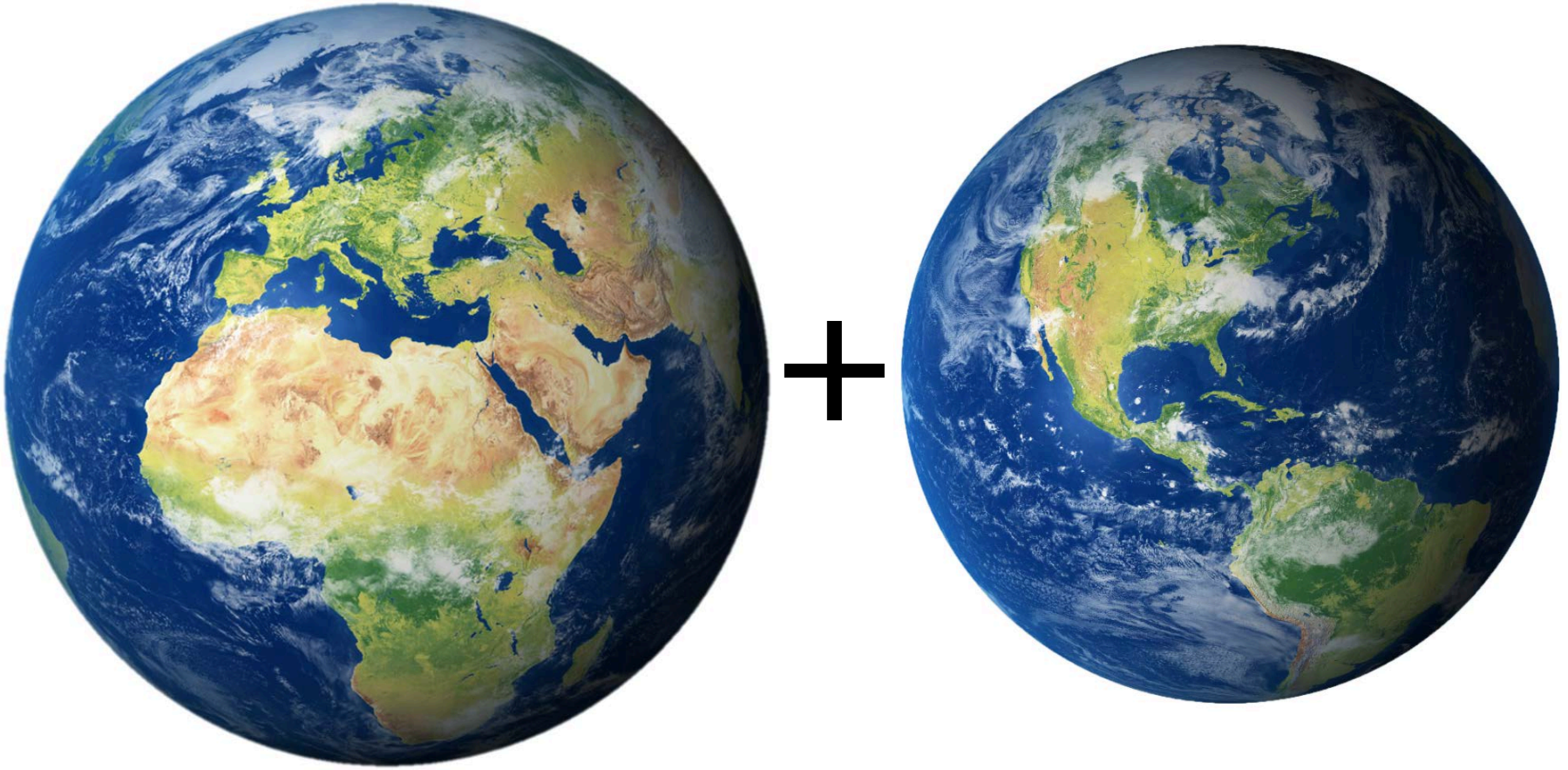
… by pulling a rabbit from the magician's hat



BECCS *– level of inclusion in government means :*

- planting 1 to 3x the area of India
- year after year; decade after decade
- store 100s of billions of tonnes of CO_2
- securely underground for 1000s of years

… or the equivalent of adding another biosphere!



… absorbs ½ of anthropogenic annual CO_2
i.e. oceans & plants absorbs ~20GtCO_2/yr.

BECCS is set to absorb 10 to 20GtCO_2/yr
i.e. up to another planet's worth of biospere

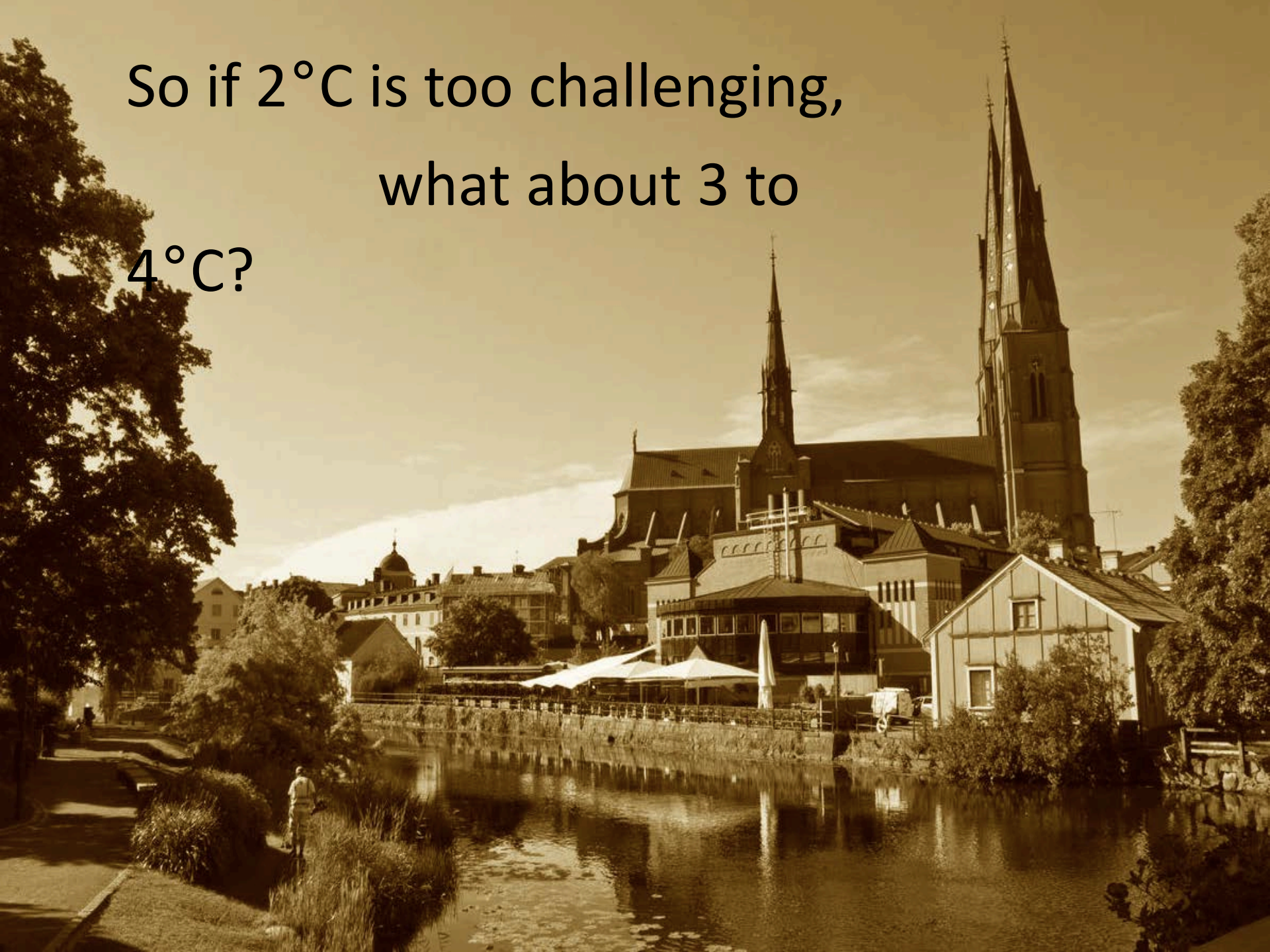
So Paris, some Academics & Politicians …

- **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*


So if 2°C is too challenging,
what about 3 to
4°C?

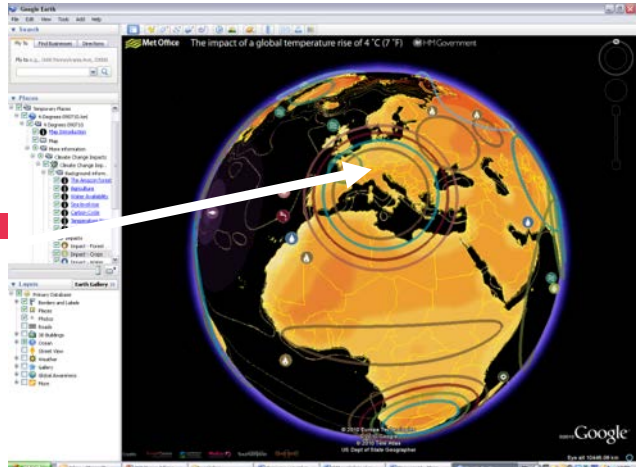
Global impacts: 4°C

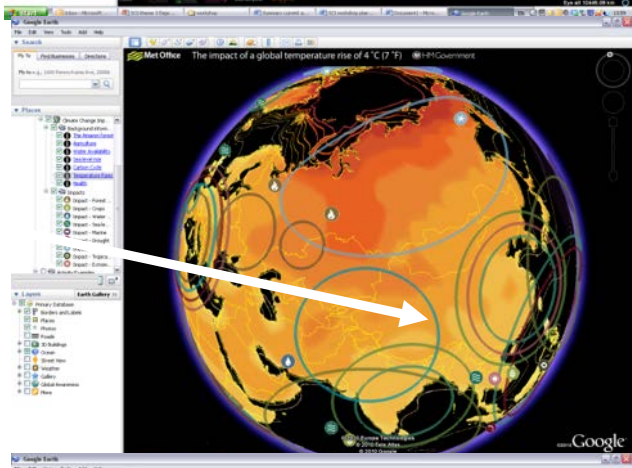
+8°C

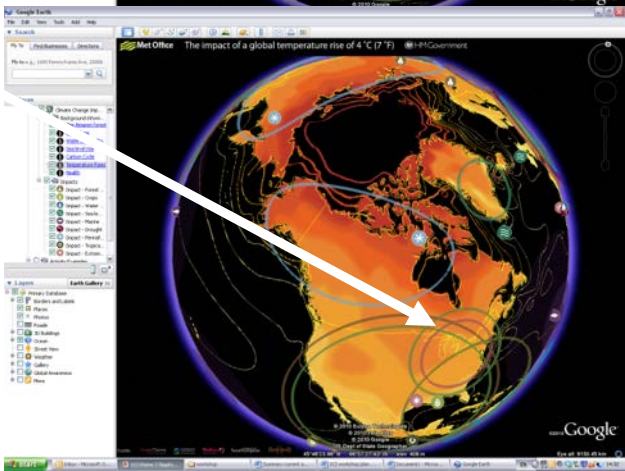
Hottest days

+6°C

+10-12°C





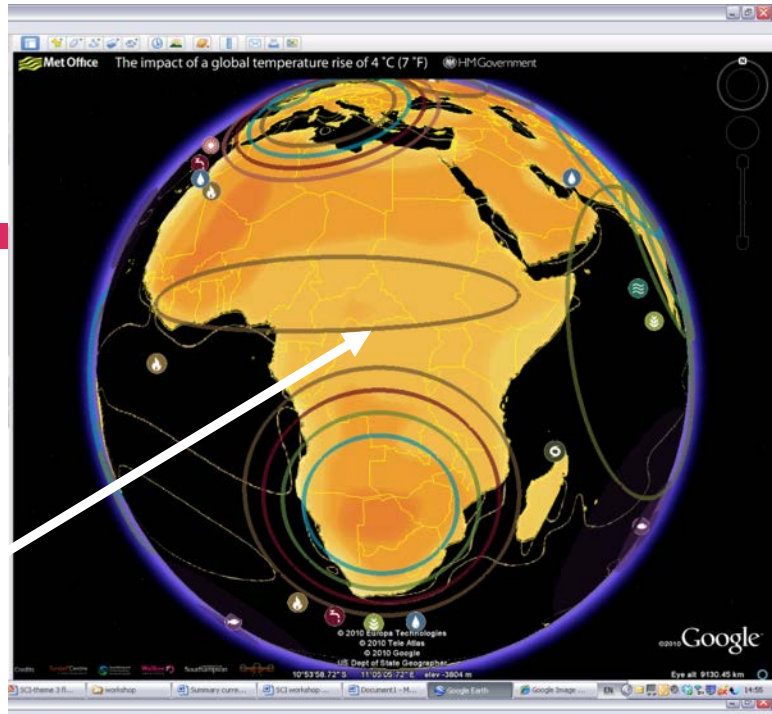


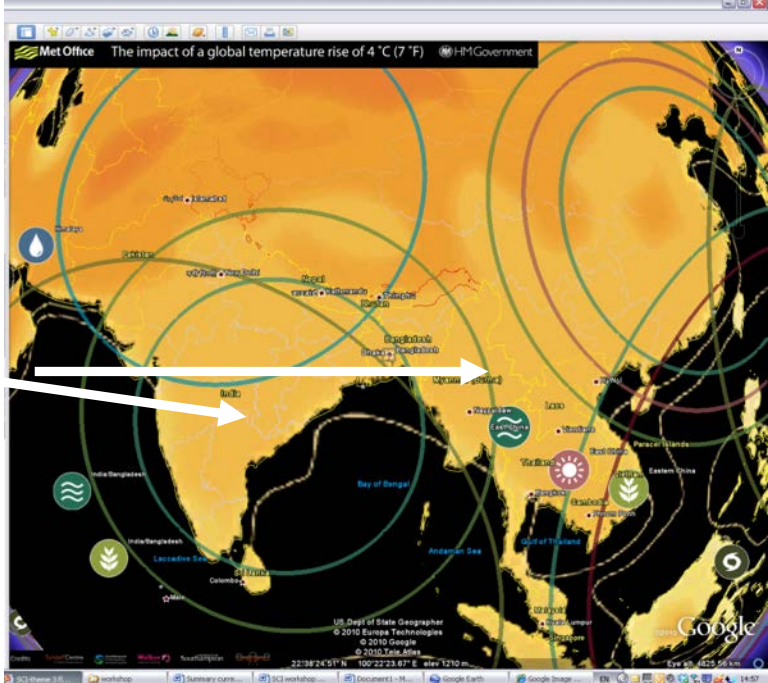
Global impacts: 4°C

Food crops

40% reduction in maize & wheat yields in low latitudes.

30% decrease in rice yields





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There is a widespread view that 4°C is…

- Incompatible with an organised global community
- Beyond ‘adaptation’
- Devastating to eco-systems
- Highly unlikely to be stable (‘tipping points’)

… consequently …

4° C should be avoided at ‘all’ costs

Returning to 2°C

… is it still a viable goal?

Hypothesis: yes … *just*

Technology:

- Supply: decadal timeframe
- Demand: near term options

Equity: immediate & near-term


Technology:
saviour of the status quo?

SUPPLY: low-CO_2 *electricity*

Tidal

Wave

Biomass

(CCS ?)

SUPPLY: low-CO_2 *energy*

- But, electricity is typically 20% of final energy demand

- So also need a massive programme of electrification

DEMAND: opportunities for near-term mitigation

The example of private cars:

- EU & US ~12-15% of emissions
- ~270 petrol/diesel models <100gCO2/km

… at no price premium

- 2/3 of car travel is by vehicles 8yrs old or younger

DEMAND: opportunities for near-term mitigation

Set a stringent CO_2 Standard

… then even existing models of petrol/diesel cars

- With no additional capital cost
- Reduced operating cost
- Identical infrastructure
- Same employment & companies

could deliver 50% to 70% reduction in ~10yrs

NB: walking, cycling, public transport, electrification & less travel are all important

DEMAND: opportunities for near-term mitigation

More generally

- Establish stringent efficiency standards
- Tighten year on year
- Providing long-term & dynamic market signal

Industrialised/wealthy nations:

(NB: accompanying policies to address issues of rebound are essential)

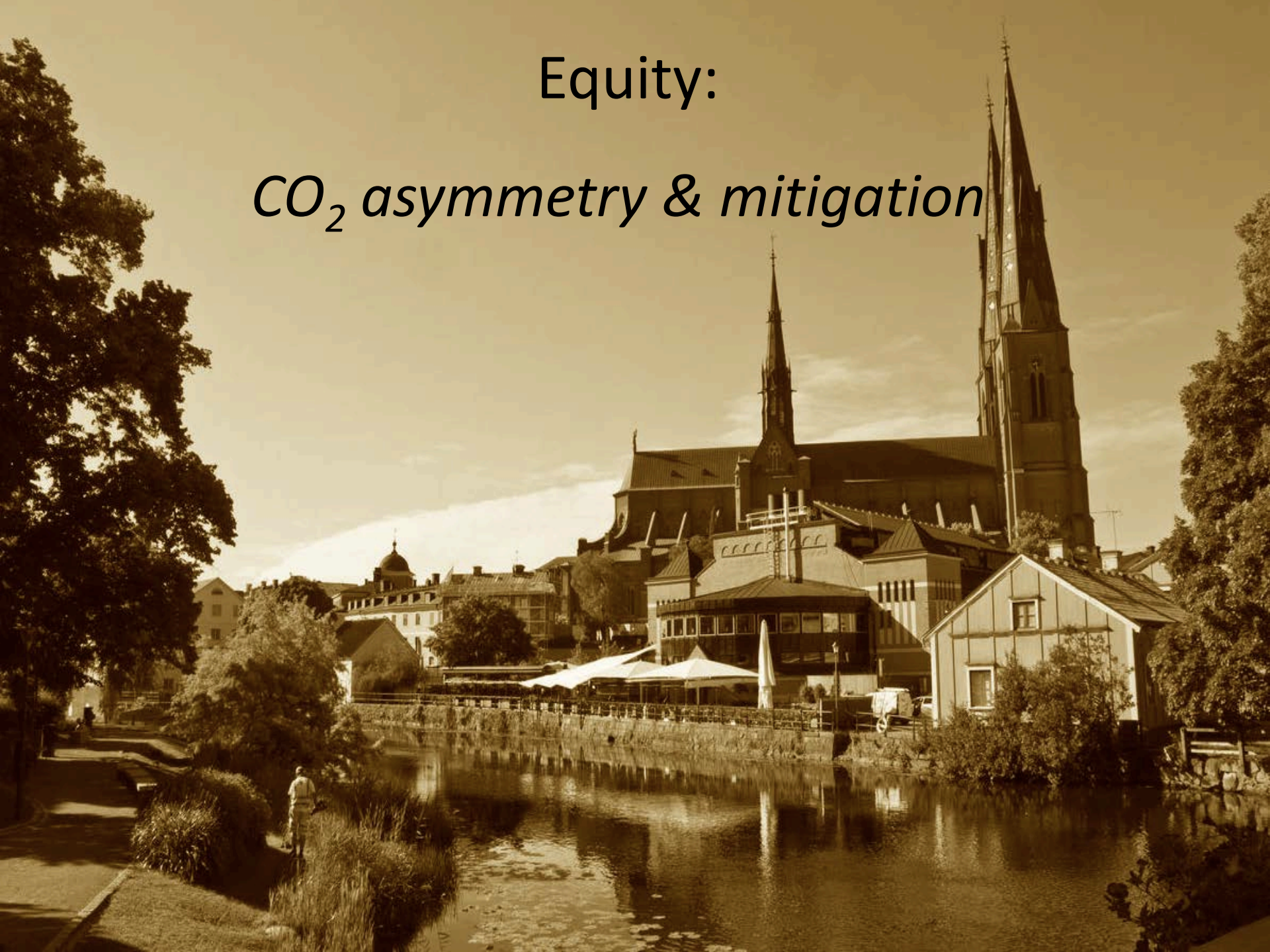
Beyond technology

But:

Technology (supply & demand) alone cannot deliver on the Paris budgets

Rapid & deep changes in *what we do, how we do it & how often we do*

is now critical



Equity:

CO_2 asymmetry & mitigation

EQUITY: extreme emission asymmetry

~50% of global CO_2 comes from ~**10%** of the population

_____

Top 1% of US emitters (~3.4 million people)

… have CO_2 footprints

2500x higher than bottom 1% globally (~70 million)

EQUITY: extreme emission asymmetry

… if the top 10% of global emitters

were to reduce their carbon footprint

to the level of a typical EU citizen

Global CO_2 emissions would be cut ~33%

So, who is in this key 10% group?

So, who is in this key 10% group?

So, who is in this key 10% group?

EQUITY: frames a new agenda for mitigation

- Most of the 7 billion have little scope to reduce emissions
- There is huge asymmetry in responsibility
- Rapid & near-term reduction in CO_2 from top 10% of emitters
- Real opportunity for leading by example
- And thereby catalysing system-change

A **Radical Plan** for 2°C – two phases

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

   *… by the **high emitters***

2. **Marshall-style** build programme of **zero carbon energy** supply

   *… with **100%** penetration by **2050***

Sweden Targets: ***50%** chance of **2°C***

Optimistic budget 2016-2100 (336MtCO_2)

- **70%** reduction of CO_2 by 2025 (c.f. 2016)
- **95%** " " " 2035

i.e. around 12% p.a. starting now

Cautious budget 2016-2100 (168MtCO_2)

- >**90%** by 2025
- ~**99%** by 2035

i.e. around 25% p.a. starting now

***NB:** much tighter still for "well below 2°C" & tighter again for 1.5°C*

Tack så mycket

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