

# The Ostrich or the Phoenix?

*... cognitive dissonance or creativity  
in a changing climate*



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Oct. 2013

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for Climate Change Research

# Finally,

“... this is not a message of futility, but a wake-up call of where our rose-tinted spectacles have brought us. Real hope, if it is to arise at all, will do so from a bare assessment of the scale of the challenge we now face.”

**Anderson & Bows**  
*Beyond ‘dangerous climate change’*  
**Philosophical Transactions of the Royal Society**  
**Jan 2011**

# My headline conclusion:

**Stabilisation at 2°C remains a feasible goal of the international community**

***just***

***... with economic (oikonomia), but not financial (chrematistia), benefits***

# *Fredag* in Stockholm: IPCC science report released

- Offered neither surprise nor solace to our fossil-fuel hungry world
- The science message for policy-makers, business leaders, civil society and *engineers* has changed very little during the last twenty years
- Small adjustments and refinements have occurred – but this is a mature science

# So what has changed?

- An additional 200 billion tonnes of CO<sub>2</sub> pumped into the atmosphere
- Annual emissions now 60% higher than at the time of the first report in 1990
- Atmospheric CO<sub>2</sub> levels probably higher than for over 2 million years.

What are we doing about it?

# 2013 UK Context

- Tax breaks for shale gas development
- Osborne's (Chancellor) 37GW of unabated CCGTS
- Highest investment ever in North Sea oil
- Possible reopening of Scottish coal mines
- Expanding aviation & more ports
- EU Car legislation watered down to be little more than BAU
- Rejected 2030 decarbonisation target
- Shell – Arctic exploration
- Myth of CCS – 50-80gCO<sub>2</sub>/kWh

# 2013 China & India Context

China emissions (CO<sub>2</sub> only 2012)

9.2GtCO<sub>2</sub> (~29% global)

GDP growth p.a. (ten year trend)

10.5% p.a.

Energy growth

6-10% p.a.

India emissions (CO<sub>2</sub> only 2010)

1.65GtCO<sub>2</sub> (6% global)

GDP growth p.a. (ten year trend)

7.4% p.a.

Energy growth

5-8% p.a.



# $\Sigma$ China & India...

- Emission in 2020 15-20GtCO<sub>2</sub> (*~2/3 global 2010*)
- Peak ~2025-30
- Population ~40% of global figure
- GDP/capita < 5% OECD in 2010
- GDP growth ~5-8% p.a.

# The **Global** context of Climate Change

## ... the IEA view

*“When I look at this [CO<sub>2</sub>] data, the 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

## ... and according to the World Bank, at just 4°C

*"There will be water and food fights everywhere,"*

Jim Yong Kim – WB president

So what of Annex 1 nations  
commitments?

# Signatories to the:

- Copenhagen Accord
- Reaffirmed at Cancun, Doha & Durban
- & last May in the(2012) G8 Camp David Declaration

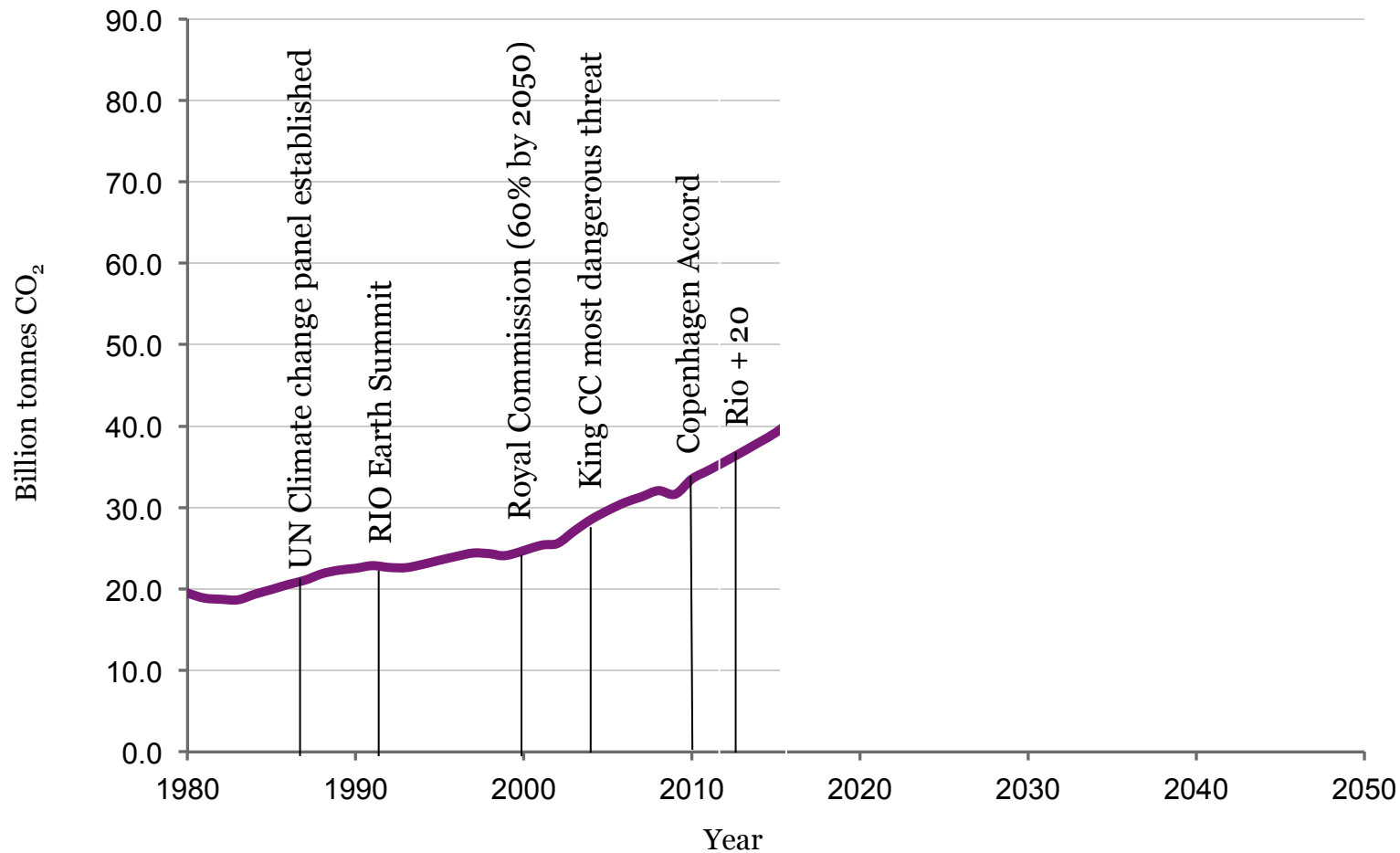
So, we are committed to make our ***fair*** contribution to

*“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**”*

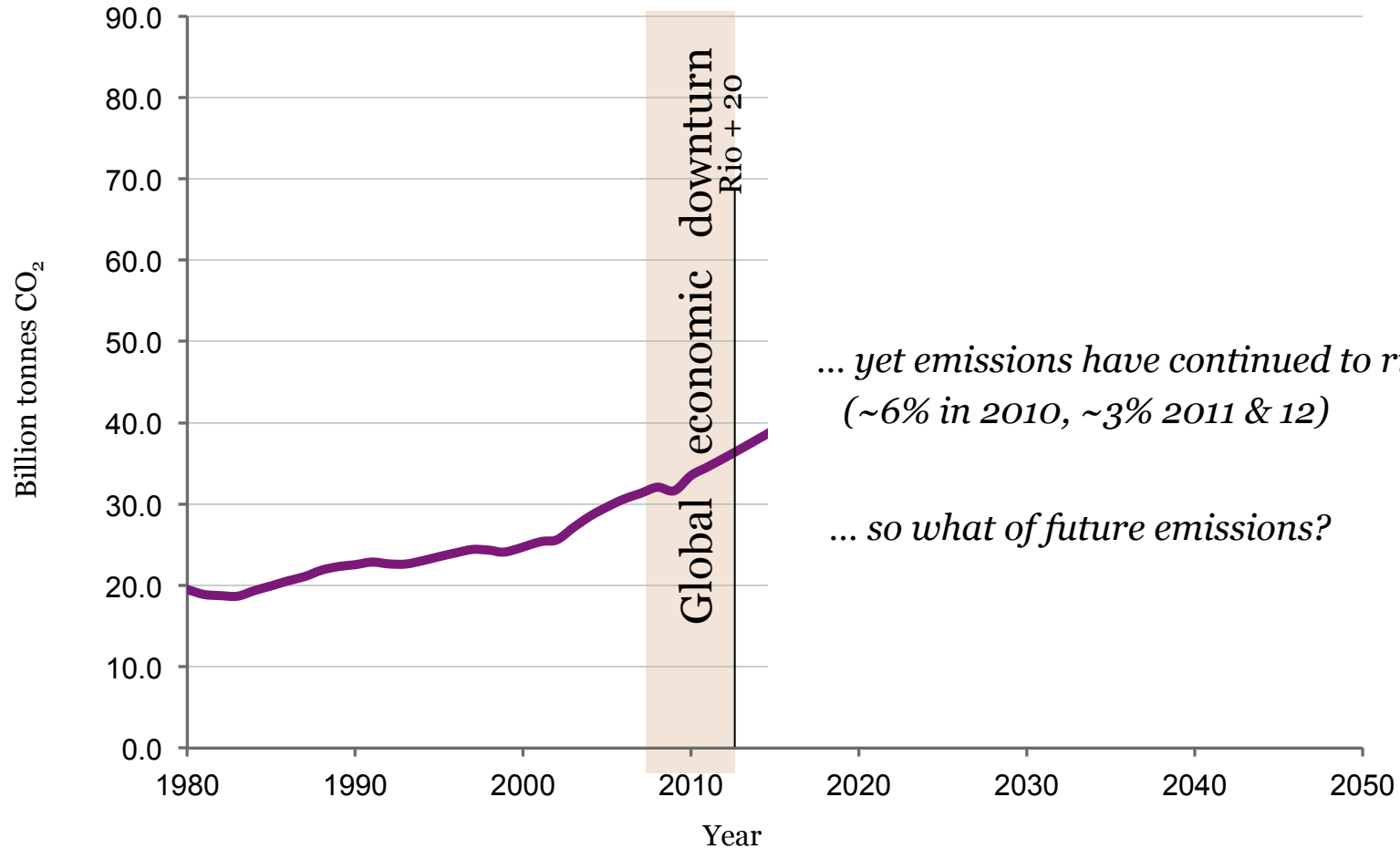
*How consistent are 2°C & 4°C futures  
with emission trends?*



## Global emission of fossil fuel CO<sub>2</sub> (inc. cement)

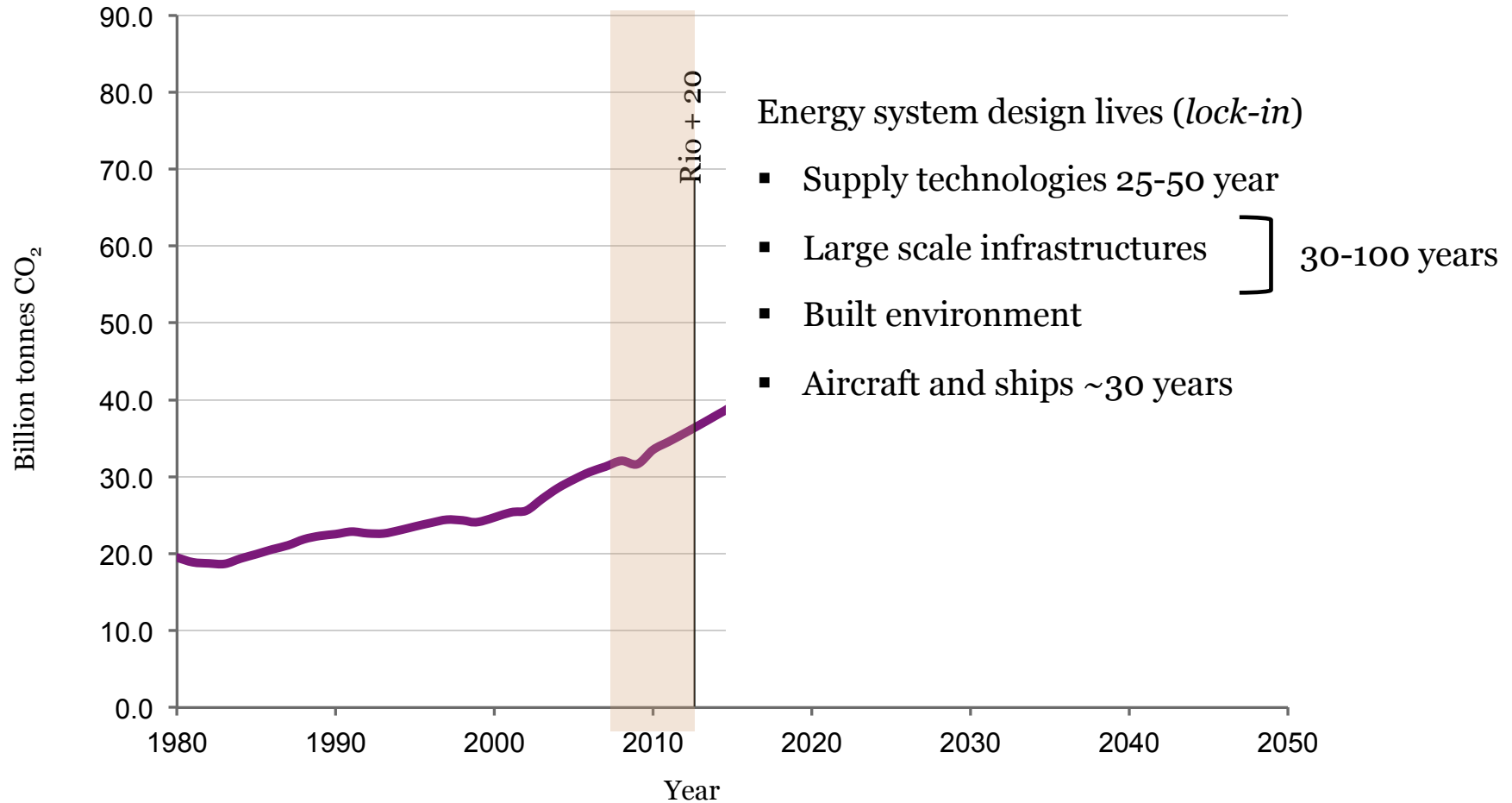


## Global emission of fossil fuel CO<sub>2</sub> (inc. cement)

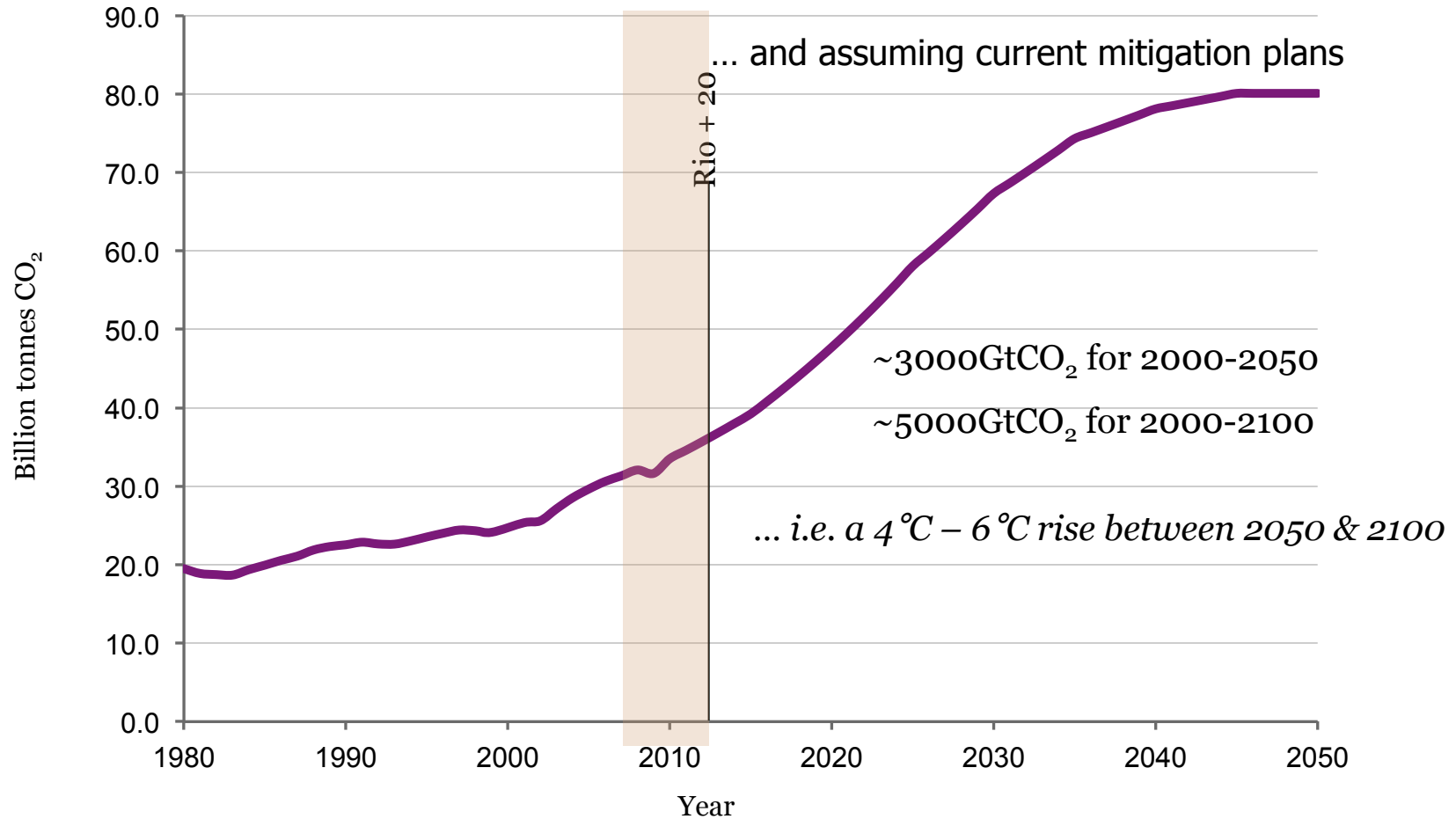




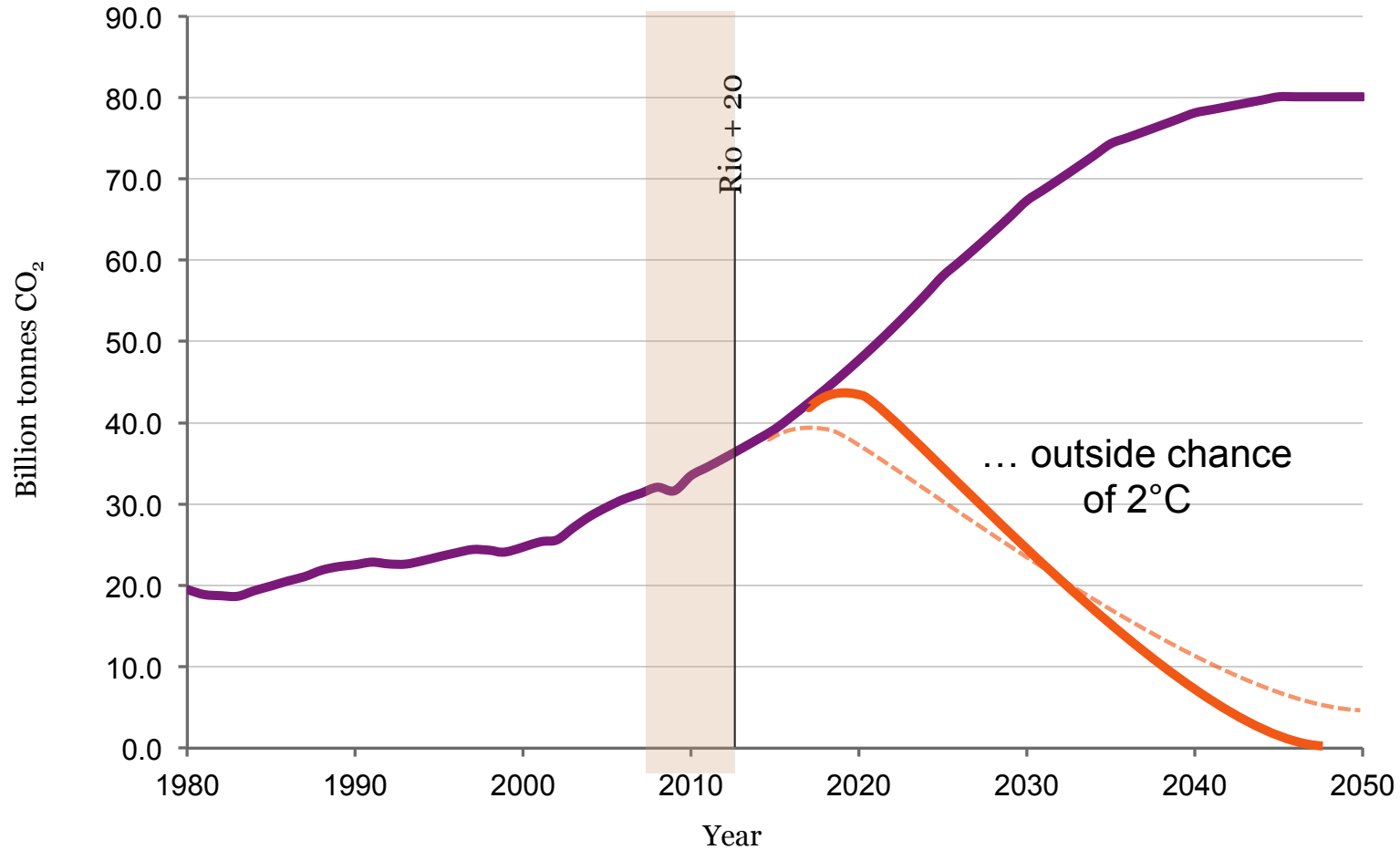
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*The 'orthodox' view on transitioning  
to 2°C mitigation*



*“To keep ... global average temperature rise close 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.”*

*CCC first report p.xiii & 7 (2009/11)*



*2°C – a alternative take ...*



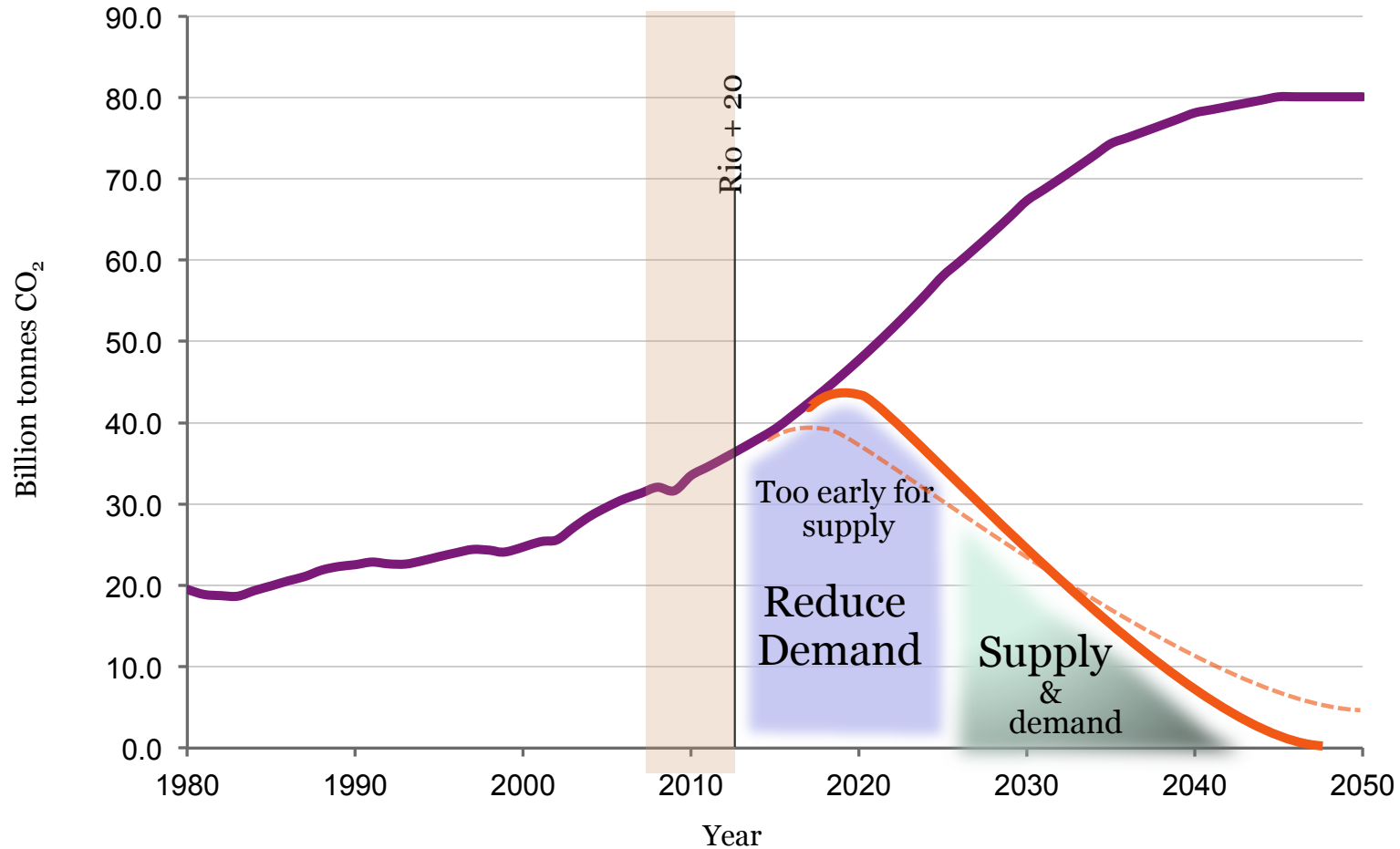
If we consider it appropriate for poorer nations to have emission space to enable them to develop and improve their welfare,

*“... it is difficult to envisage anything other than a **planned economic recession** being compatible with stabilisation at or below 650ppmv CO<sub>2</sub>e [ $\sim 4^{\circ}\text{C}$ ]”*

Anderson & Bows 2008/11

... at least until low carbon energy supply is widespread

## Global emission of fossil fuel CO<sub>2</sub> (inc. cement)





How can such radically different interpretations arise from the same science?



- Probability of exceeding 2°C is much higher (60-80%) – *i.e. bigger carbon budgets (~2x)*
- Apportionment of global emissions to wealthy nations (Annex 1) is very inequitable
- Peak year choice ‘Machiavellian’ (*typically 2010-2016, and before 2020 for China*)
- Emission reduction rate universally dictated by economists
- Geoengineering (negative emissions) is widespread in low carbon scenarios

\*\*\*\*\*

***... and policy is still dominated by long-term targets***

*e.g. 80% reduction by 2050 - despite such targets having no scientific basis*

***it's cumulative emissions that matter***

*i.e. the carbon budget – and hence emission reductions between now & 2025*

# Why aren't scientists whistle-blowing these fudges

1. *We are collectively applying Thomas Moore's maxim "Qui tacet consentiret": **Silence gives consent***
2. *We are culpable as a research community of a '**conspiracy of silence**', – we don't agree with what's going on but don't want to bite the hand that feeds us*
3. *We are **ignorant** of some of the fundamental underpinnings for our research*
4. *We don't care – and anyway flagging up these concerns would likely raise difficult questions about our own **lifestyles***



$2^{\circ}\text{C}$  ... a political & scientific creed?



## Senior political scientist

*“Too much is invested in 2°C for us to say its not possible – it would undermine all that’s been achieved*

*It’ll give a sense of hopelessness – we may as well just give in*

*Are you suggesting we have to lie about our research findings?*

*... well, perhaps just not be so honest – more dishonest ...”*

# Senior Government Advisor

*“We can’t tell them (ministers & politicians) it’s impossible*

*We can say it’s a stretch and ambitious – but that, with political will, 2°C is still a feasible target”*

# UK energy & climate change Minister

*- day before attending Copenhagen*

*“Our position is challenging enough, I can’t go with the message that 2°C is impossible – it’s what we’ve all worked towards”*

So, where does this leave us?





## Consequently, very different results for 2°C arise

	Typical 2°C scenarios	Anderson/Bows
% chance of exceeding 2°C	50-80%	37%
Global peak in emissions	2010-16	2020
Poorer nations' emissions peak	2017-18	2025
Deforestation considered	no	yes
<b>Mitigation rate</b>	<b>~3-4%</b>	<b>~10%</b>

**If 2°C looks too difficult**  
**... what about a 4°C future?**

*(i.e. a larger carbon budget and lower rates of mitigation)*

For **4°C** global mean surface temperature

**5°C - 6°C** global **land** mean

**... & increase °C on the hottest days of:**

**6°C - 8°C** in China

**8°C - 10°C** in Central Europe

**10°C -12°C** in New York

In low latitudes **4°C** gives

up to **40% reduction** in maize & rice

as population heads towards **9 billion** by 2050

**... but 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



2°C mitigation requires (*for Annex 1/OECD nations*)

10% reduction in emissions year on year, i.e.

~**40% reduction by ~2018** (c.f. 1990)

~**70%** ~**2024**

~**90%** ~**2030**

i.e. *non-marginal* reductions considered *impossible*

but is a 4°C global temperature rise by 2050-2100 *less impossible*?

Before despairing ...

Have we got the **agency** to achieve the unprecedented reductions rates linked to an outside chance of 2°C ?

# Agency

- Equity – a message of hope – perhaps?
- Technology – how far, how fast & how soon?
- Growth – useful proxy or obstructive dogma?



Equity – *who are the emitters?*



Little chance of changing policies aimed  
at 7 billion

... but how many people need to make the  
necessary changes?

# Pareto's 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**

Or more realistically:

**~40% to 60% from ~1% to 5%**

## - who's in the 1% to 5%?

- Climate scientists
- Climate journalists & pontificators
- OECD (& other) academics
- Anyone who gets on a plane once a year
- ... if you're on ~£30k or more?

***mitigation is mostly about the few not the many***

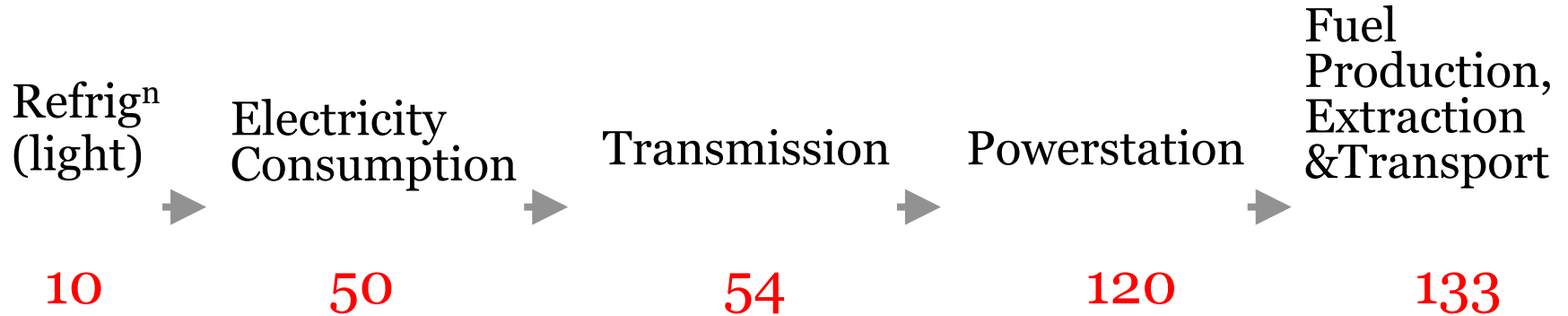
***... it's a consumption and not a population issue!***

Technology – *refocus on the demand*





# The Electricity system



**Demand opportunities dwarf  
those from supply in short-term**

Growth – *a misguided proxy*



**Stern, CCC & others:**

**Mitigation of over 4% p.a. incompatible with  
economic growth**

*... but at the same time the economy has stalled, self-regulated markets have failed to regulate and £350 billion of QE has been squandered*

*We have an unprecedented opportunity to think differently*



Growth is a proxy for many social goods, including:

- Welfare (health, life expectancy)
- Employment/income
- Equity
- Literacy rates
- Etc.

*Growth itself has no meaningful value*

A major programme of greening the UK's built environment and infrastructure could help improve all of the meaningful indicators

e.g. Retrofit the UK's housing stock & commercial buildings:

- Reduce fuel poverty (over 5 million homes)
- Reduce energy bills (& emissions)
- Increase resilience to volatile energy prices
- Provide mass skilled & *semi-skilled* employment

as well as:

- *Reduce emissions*
- *Increase resilience to a changing climate*

To summarise



# Uncomfortable implications of conservative assumptions

## If ...

- Link between cumulative emissions & temp' is broadly correct
  - Industrialising (non-OECD) nations peak emissions by 2025/30
  - There are rapid reductions in deforestation & food emissions
  - No 'discontinuities' (tipping points) occur
- & Stern/CCC/IEA's "feasible" reductions of 3-4% p.a. is achieved

**2°C stabilisation is virtually impossible**

**4°C by 2050-2070 looks 'likely' (... on the way to 6°C ...?)**

## For policy makers the message is simple but uncomfortable

- Should avoid 4°C at all costs
- Annex 1 nations need ~70% decarbonisation over next decade or so
- Only small % of global population need radical mitigation
- Low carbon energy supply is too little too late in the West
- Principal response is to reduce energy demand now
- *Carbon trading & prices are not viable for non-marginal (large) reductions*

# Ultimately

We must escape the shackles of a twentieth century mind-set if we are ever to resolve twenty-first century challenges

This will demand leadership, courage, innovative thinking, engaged teams & difficult choices

As Robert Unger noted ...

“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.”



# Thank you

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*Oct. 2013*