

Results from a long-term GHG emissions budget approach by WWF/ECOFYS – Towards an equitable distribution

An offer for discussion

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Starting points

1. Emissions trajectory between now (2009) and 2050 needs to be distributed in an equitable way with appropriate distinctions between rich and poor; between high and low per capita emitters
2. Worked with ECOFYS to elaborate on practicalities and implications of methodologies under discussion
 - a. Contraction and Convergence
 - b. Common but differentiated Convergence
 - c. Greenhouse Gas Development Rights

Disclaimer

- While social and equitable distribution of allowable carbon space is focus of WWF, we are not promoting any particular approach
- Irrespective of approach, the cumulative budget cannot change substantially; if we relax trajectory of one country, another country needs to pick-up the bill





Starting points

Any long-term cumulative GHG budget must

1. **comply with staying well below 2 degree global warming eventually,**
2. while accounting for uncertainty of temperature responses to atmospheric CO₂e concentrations
3. incentivise an early peak and decline of global GHG emissions well before 2020
4. lead to global emissions reductions of about 30% below 1990 by 2030 and at least 80% below 1990 by 2050
5. support mid-term targets for 2020, 2030, 2040 and 2050
6. include ideally all gases, sectors, countries
7. be limited to periods of 1990/2000/2010 – 2050
8. become reviewed regularly based on new science
9. ***be re-distributed to all nations based on equitable principles, such as capacity to pay, poverty thresholds and per capita emissions***





Carbon Budget

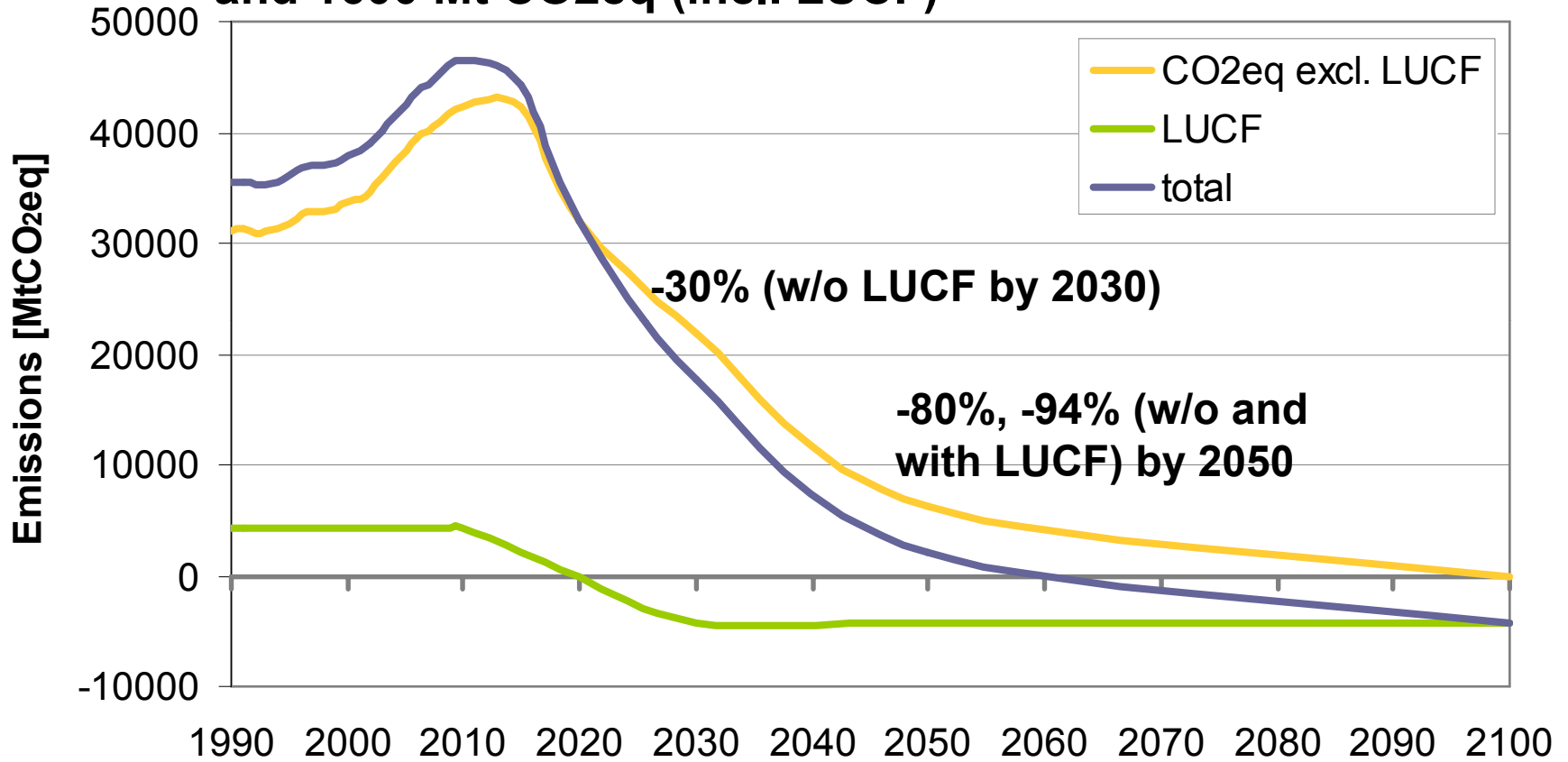
To be consistent with staying well below 2 degree C

1. Emission budget of 1660 GtCO₂eq between 1990 and 2050 excluding LUCF, or about 1000 GtCO₂eq between 2010 and 2050 (taking account of emissions 1990 – 2010)
2. Assuming that emissions from LUCF remains constant at 4GtCo₂ until 2010 and decline to zero between 2010 and 2020; becoming a stable net sink of emissions afterwards
3. Allowable global emission of ~ 22 GtCO₂eq/year globally on average 2010 – 2050. Compared to >50 GtCO₂eq/y today.



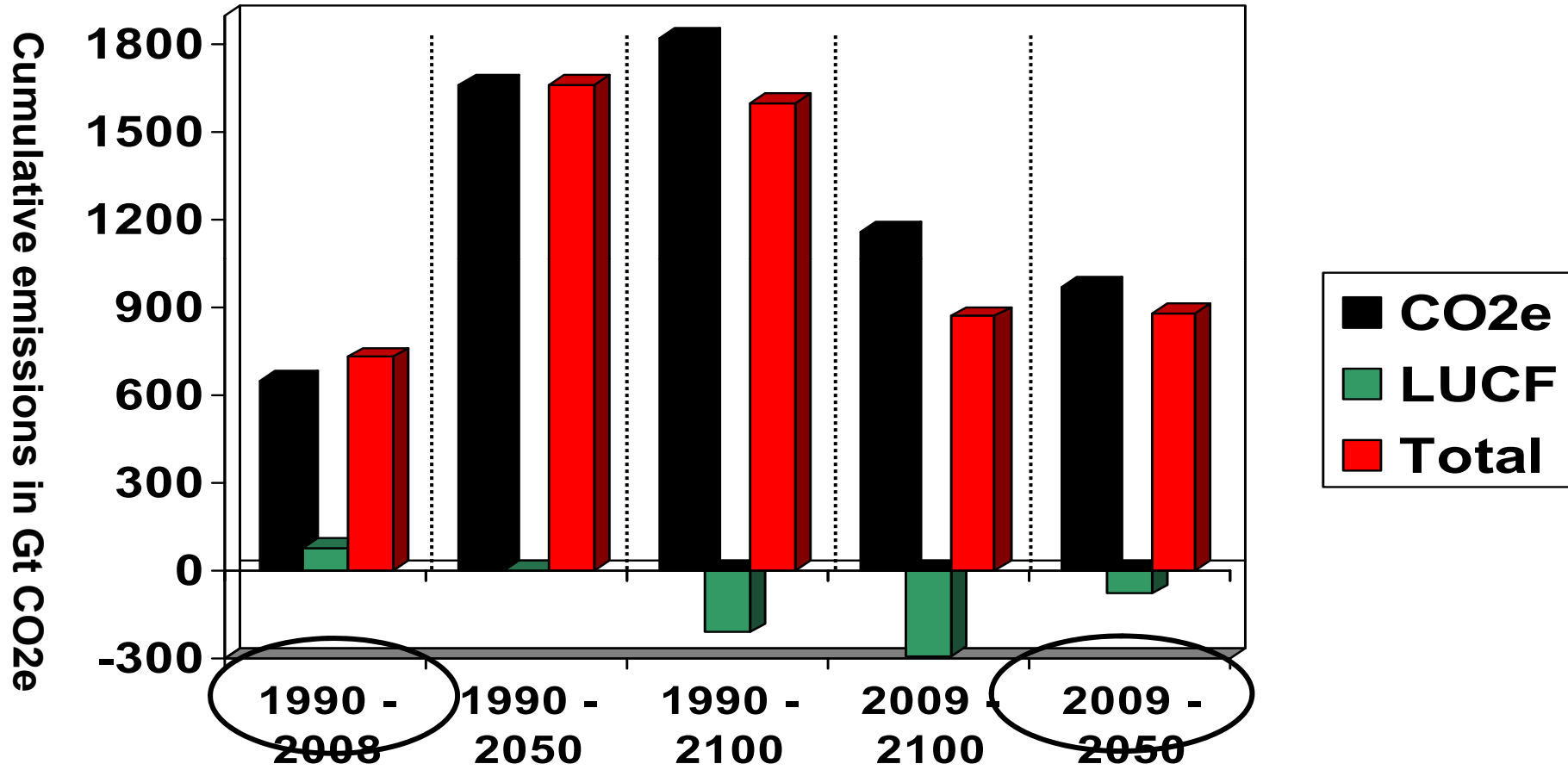


Possible global GHG emissions pathway between 1990 and 2100 according to a global carbon budget of about 1800 Mt CO₂eq (excl. LUCF) and 1600 Mt CO₂eq (incl. LUCF)





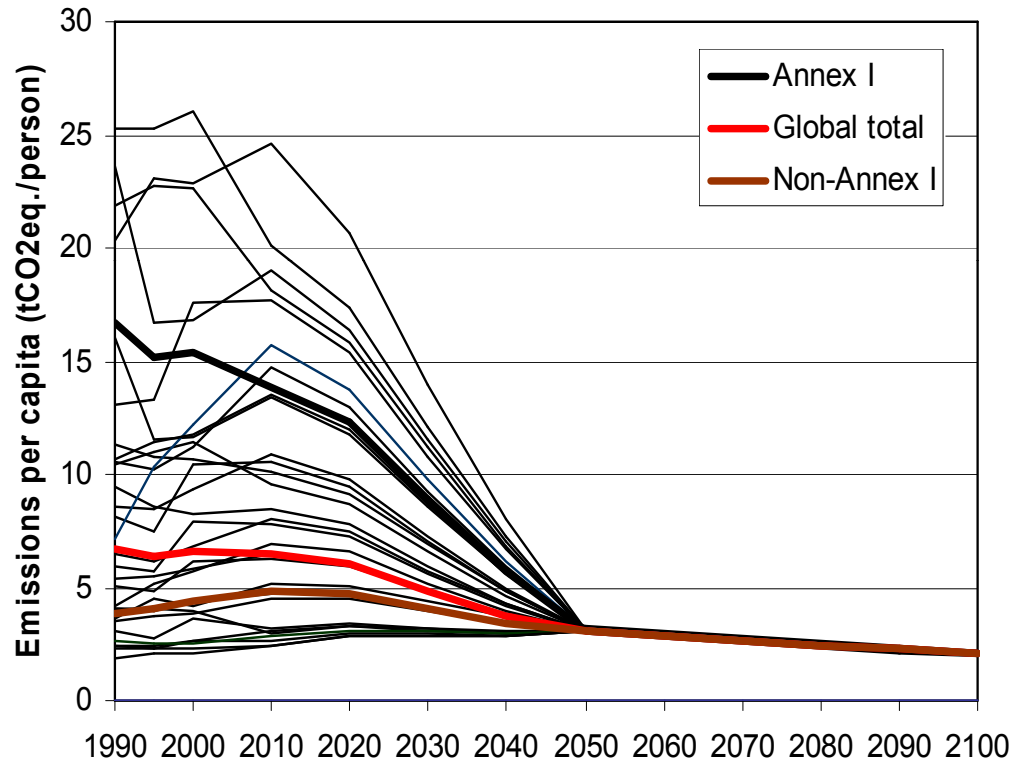
For a global cumulative GHG budget 1990 – 2050, we have used up already 40% today





Contraction and Convergence

- Contraction: Agreement on a global emission pathway
- Convergence: Per capita emission converge until 2050 (0.6-0.75 tCO₂eq/cap)



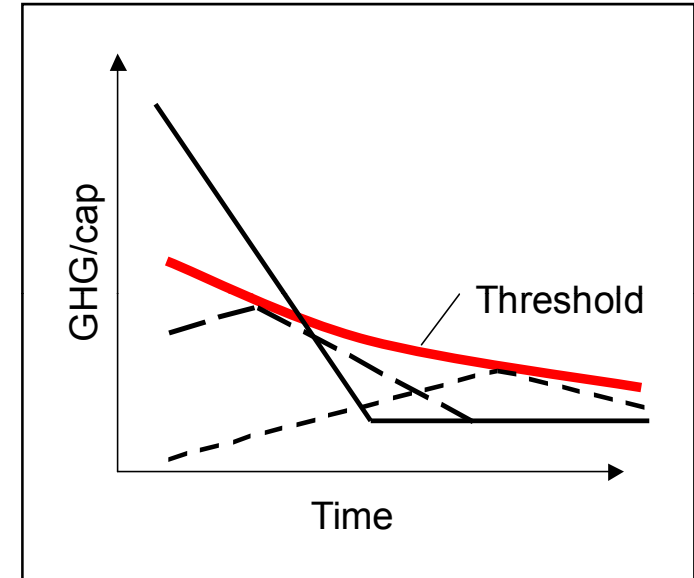
Origin of the approach: Global Commons Institute www.gci.org.uk/briefings/ICE.pdf





Common but differentiated convergence (CDC)

- Three stages
 - No commitments
 - “No-Lose” targets
 - Convergence of per capita emission level to the same level (here 0.4-0.7tCO₂e per cap) in the same period (27 years)
- Participation threshold:
 - 25% to 37% below (time dependent) global average per capita emissions



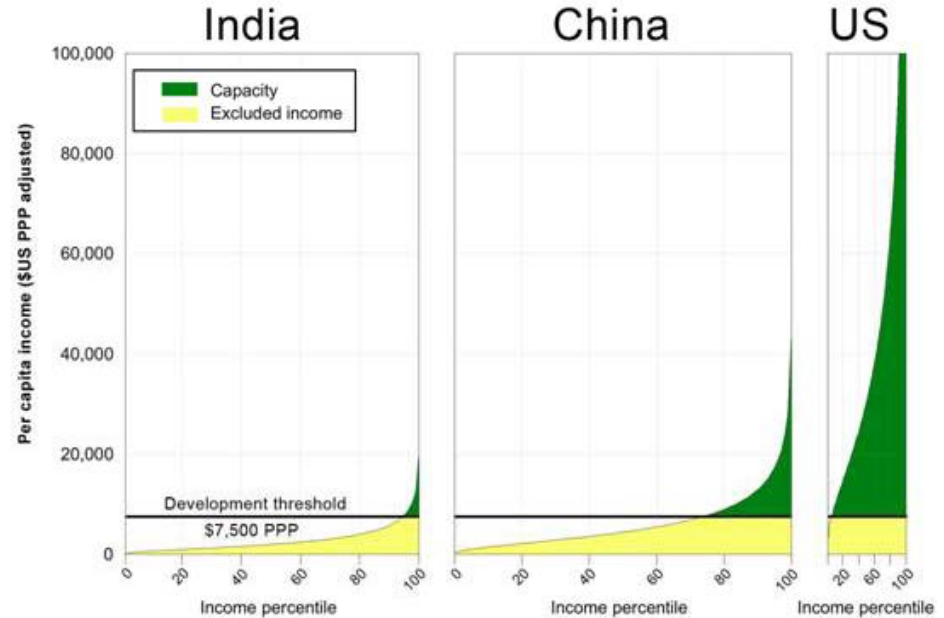
Höhne, den Elzen, Weiss: “Common but differentiated convergence” accepted at Climate Policy 2005





Greenhouse development rights

- Responsibility/Capability Index
 - Sum of income above participation threshold (25US\$ per day)
 - Sum of emissions above participation threshold
- Reduction
 - All countries reduce from their BAU proportional to their share of the index



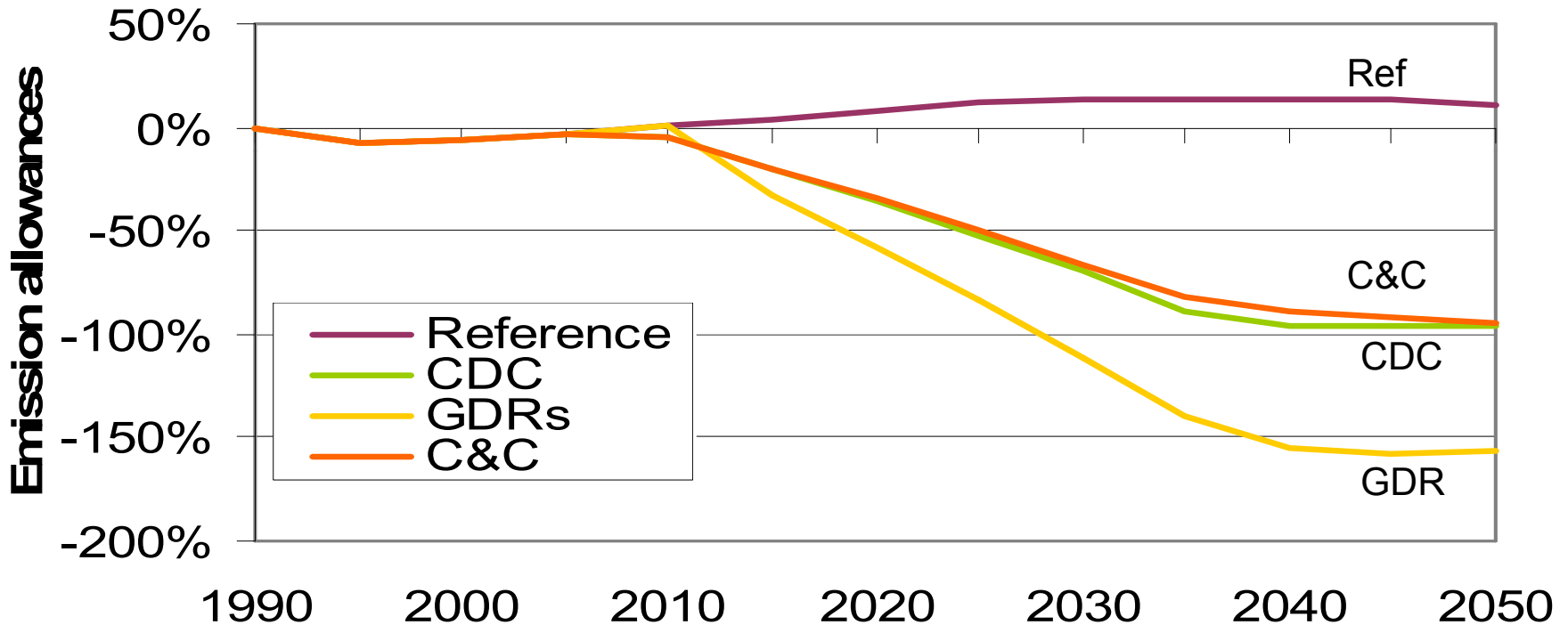
Baer, Athanasiou, Kartha, Kemp-Benedict 2008: Greenhouse development rights
<http://www.ecoequity.org/GDRs/>





Emission allowances for ANNEX I (excl LUCF) – Greenhouse Development Rights require ZERO emissions by 2030 and ‘negative’ allowances henceforth

Annex I



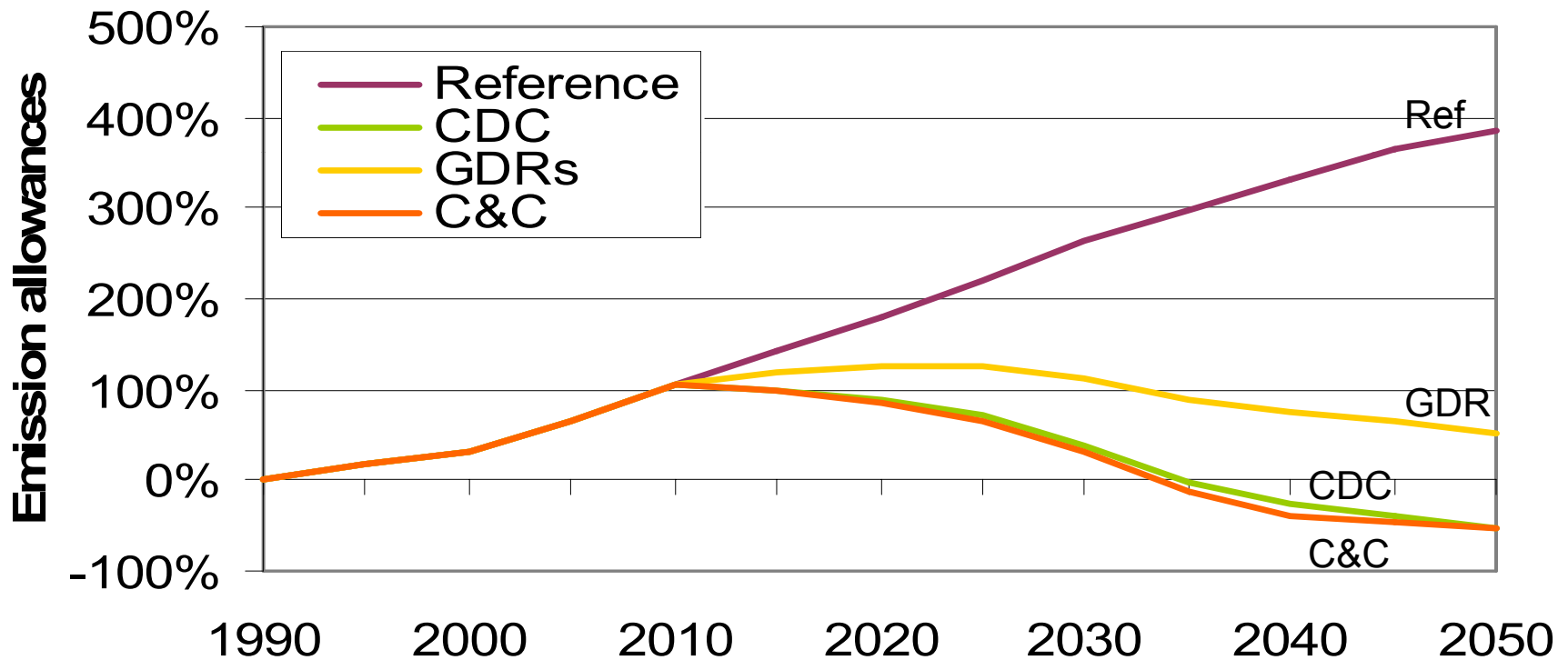
Annex 1 Countries
An impossible target?
No, A Dual Target: Finance and Emission Reduction





Emission allowances (excl LUCF) for non ANNEX I – Greenhouse Development Rights allow for approx. 50% growth by 2050 over 1990, other approaches require deeper cuts

Non-Annex I





For emerging economies, three equity approaches provide space for economic growth and social development, with different peaking periods in medium term

Annual Emission Allowances by 2020 Compared to 1990 levels			
	CDC	C&C	GDR
Brazil	29%	42%	45%
China	71%	94%	165%
India	235%	169%	215%
South Africa	16%	8%	35%





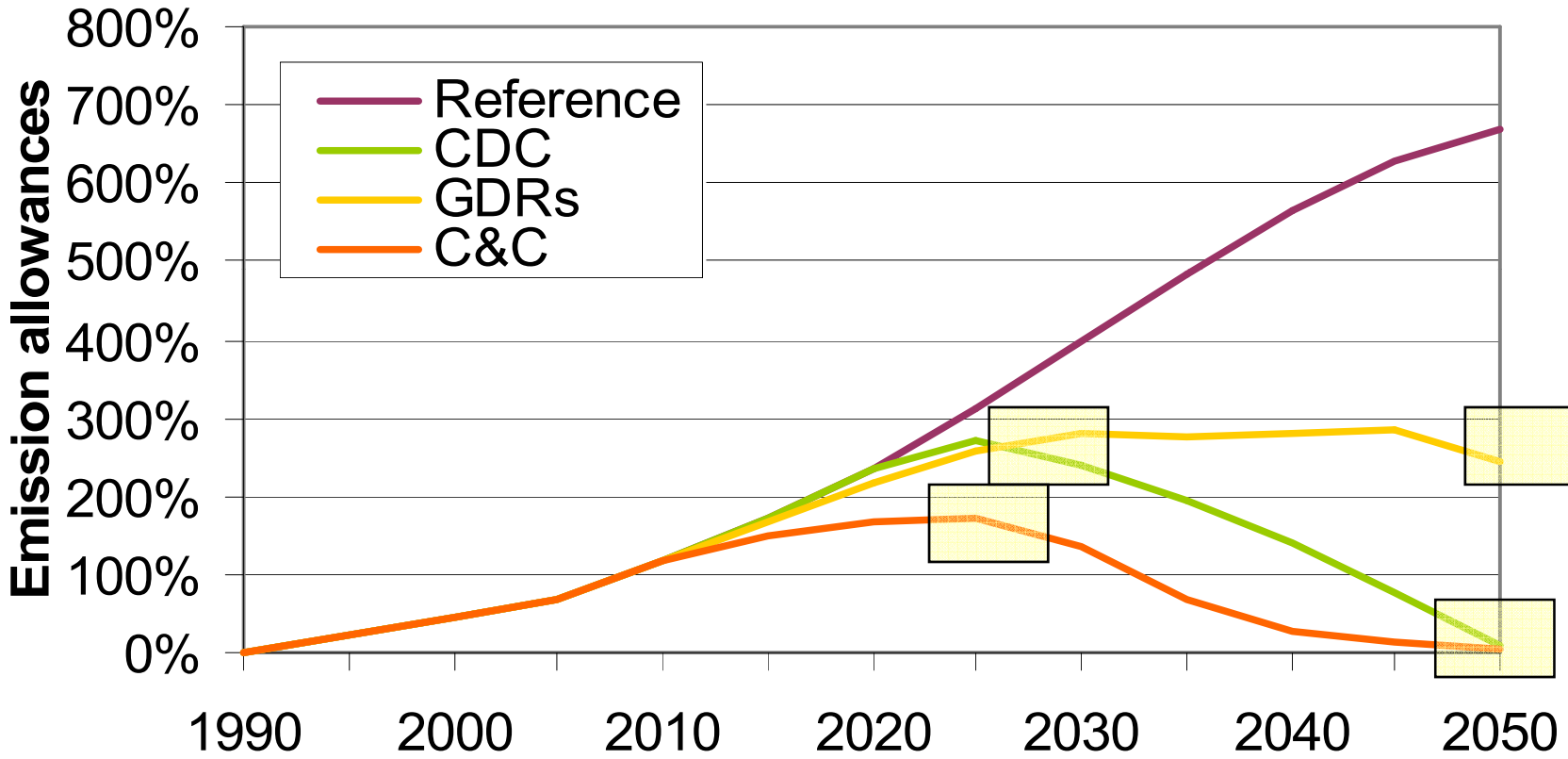
In long-term it would require them to reduce their emissions by integration of low carbon actions as part of development strategy

Annual Emission Allowances by 2050 Compared to 1990 levels			
	CDC	C&C	GDR
Brazil	-77%	-73%	-125%
China	-76%	-73%	<u>10%</u>
India	7%	2%	<u>242%</u>
South Africa	-83%	-81%	-7%





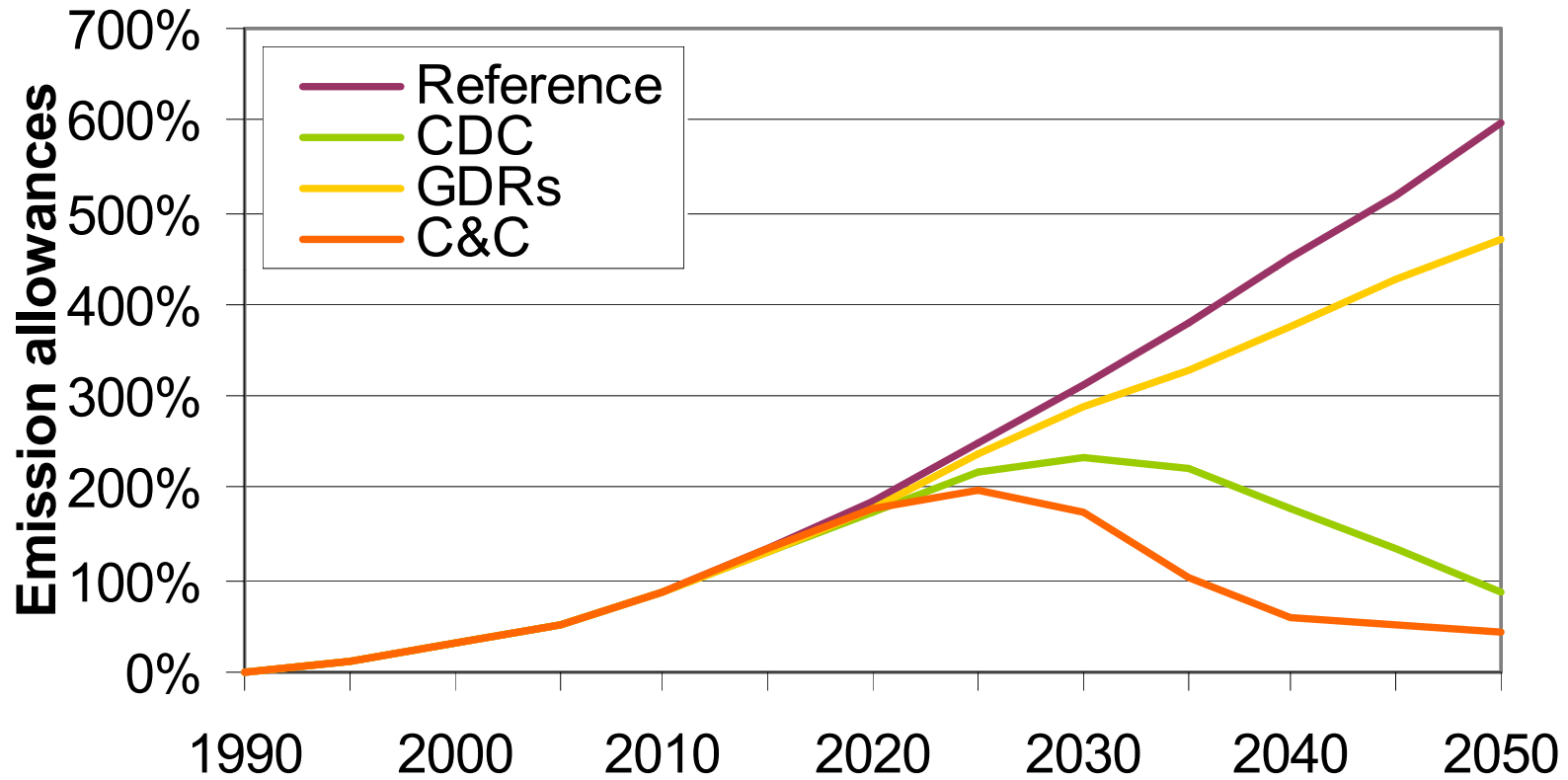
India





Least Developed Countries

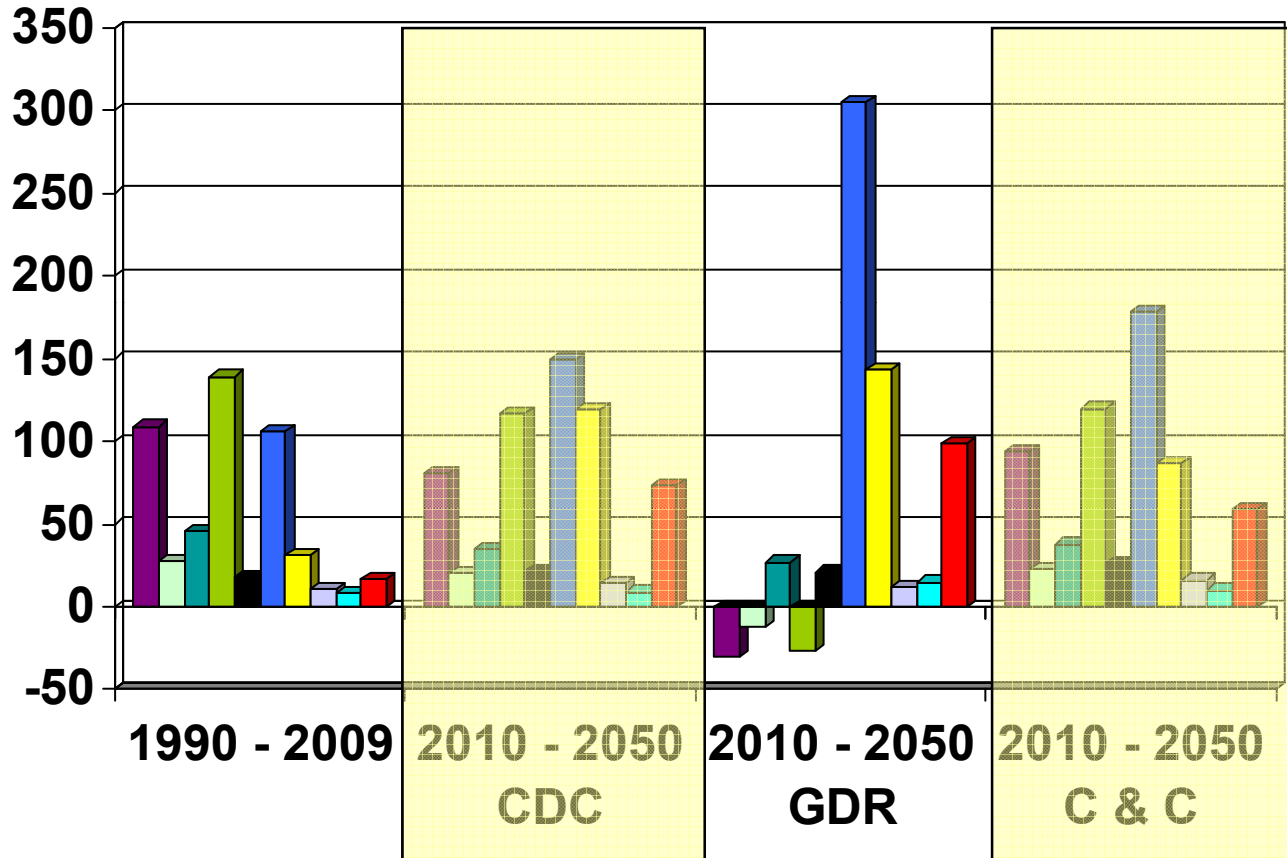
LDCs





Cumulative allowable emissions under different allocation methodologies

Cumulative emissions in Gt CO₂e (excl LUCF)

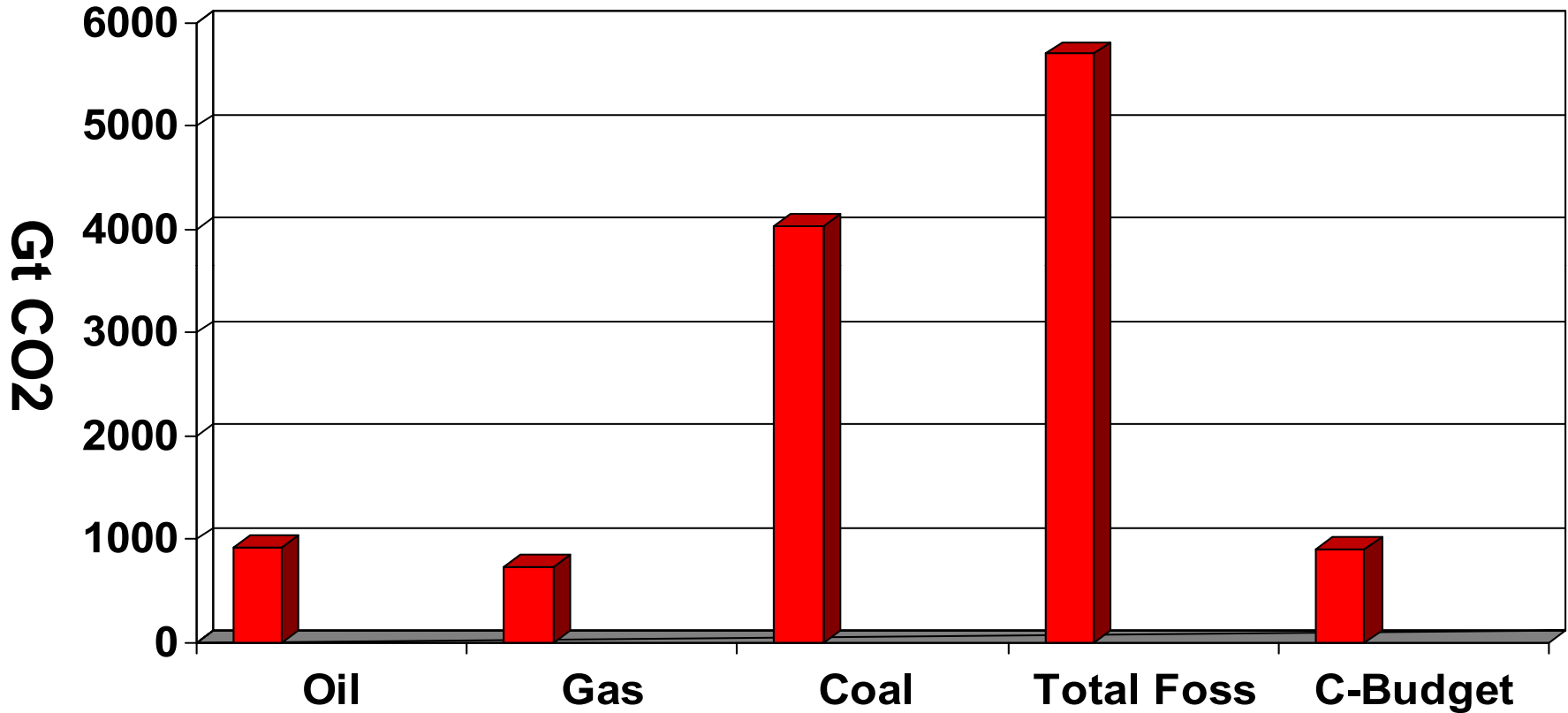


- EU27
- Japan
- Russia
- USA
- Brazil
- China
- India
- Mexico
- S Africa
- LDC





'Our' global GHG budget requires to retire about 87% of all known conventional and unconventional fossil fuel *recoverable* reserves and excl. CCS until 2050



Source: IPCC, 2001





Conclusions

- We have already used ca. 40% of our 1990 - 2050 long-term cumulative budget *if* we want to stay well below 2 degree
- Greenhouse Development Rights imply stronger targets for Annex I than other allocations – opposite for non-Annex I;
 - for emerging economies it provides space through allowances for emerging economies to grow, however, other equity approaches requires them to reduce more rapidly
- ‘Negative’ allowances for Annex I reflect on substantive funding requirements for poorer nations to get *below* their allowances
 - Negative allowances for Annex 1 countries, also provide opportunities for emerging economies to grow, but by integrating low carbon development path. An emissions budget of about 900/1000 Gt CO₂e (2009-2050) requires to leave about 80% of all known conventional and unconventional recoverable fossil fuel reserves ***under ground***
- Driven by energy security, emerging economies and few other developing countries have already in place strong domestic policies and measures and have proposed ambitious policies for long-term





**THANK YOU FOR YOUR
ATTENTION**

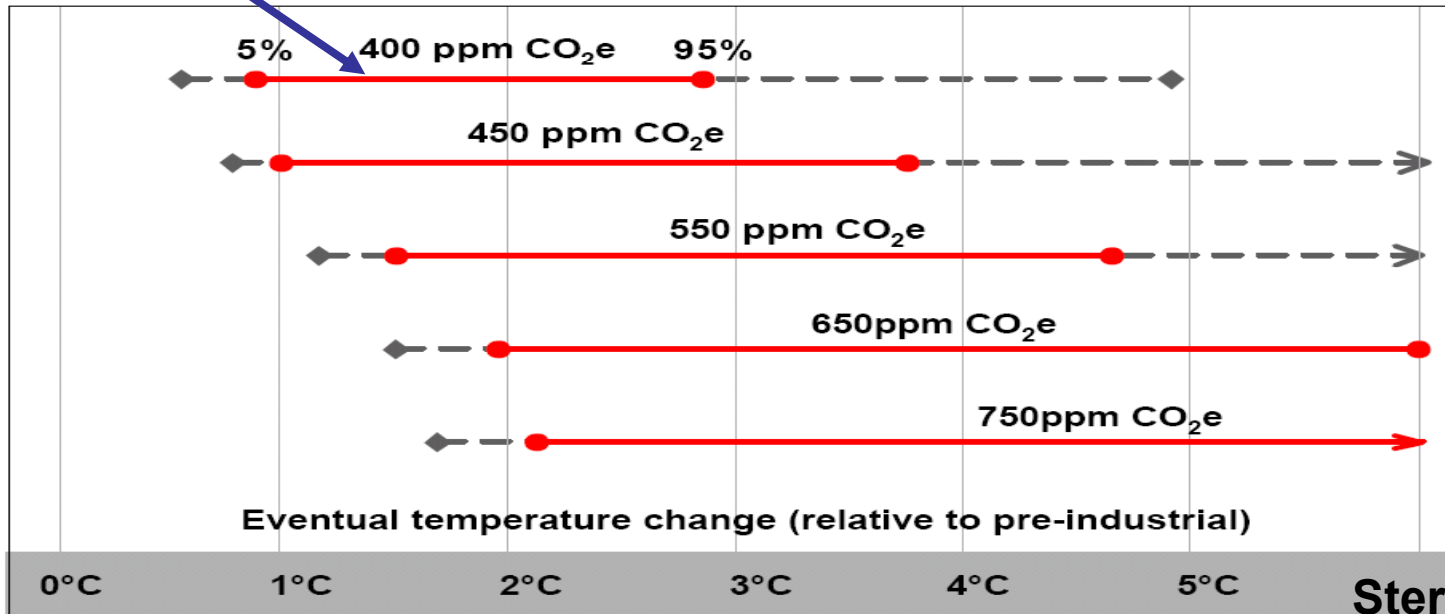




Atmospheric concentrations and probability ranges (5% - 95%) of warming consequences

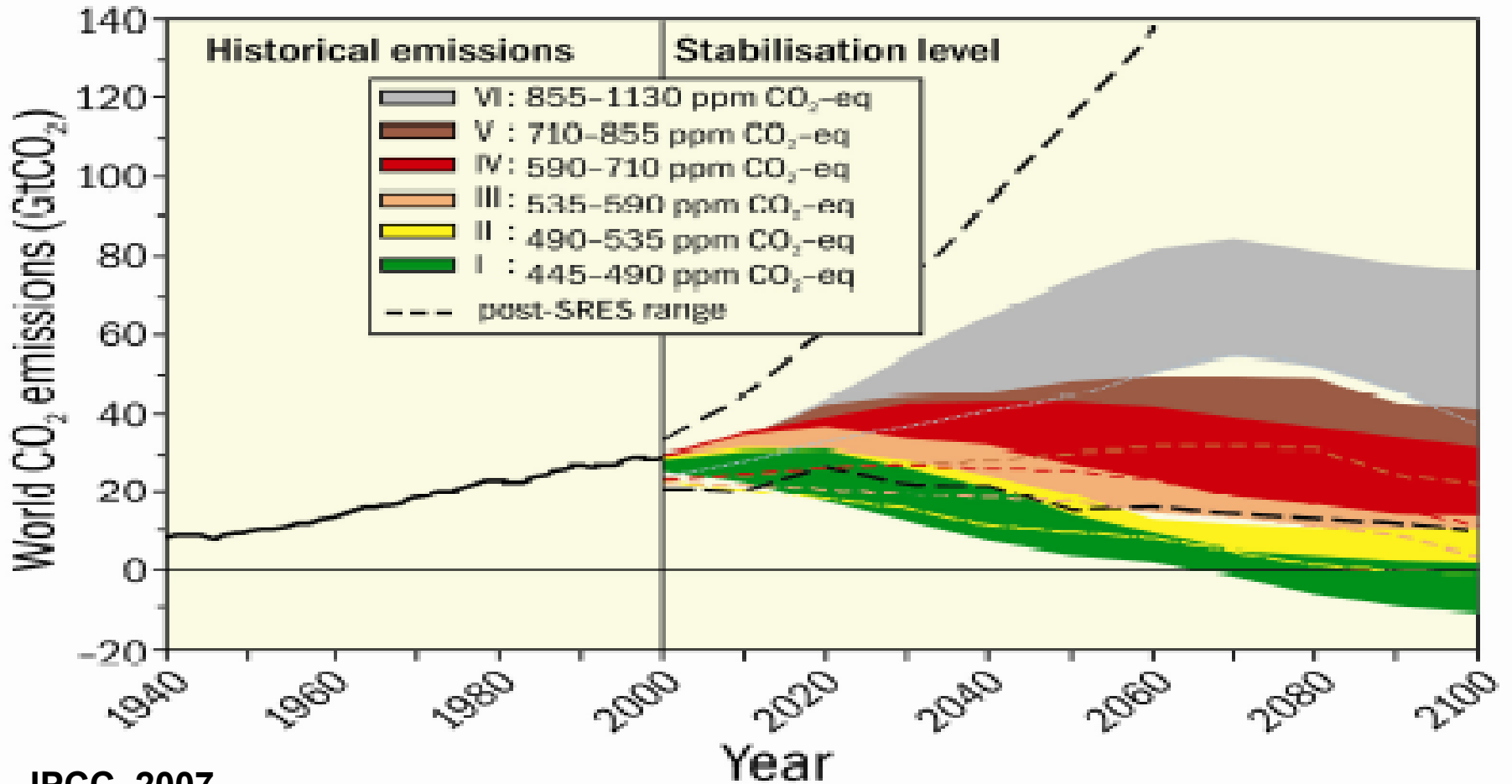
400 ppm CO₂e equals approx 350 ppm CO₂

Stabilisation and Commitment to Warming





Low atmospheric concentration requires net zero emissions world by 2070





IPCC: Cumulative CO2 emissions of scenarios – a start

