

Coffee time trivia question –No. 2

By how many percent do we have to reduce our CO₂-emissions to stabilize the amount of CO₂ in the atmosphere?

- A) 10-20%
- B) 30-50%
- C) 60-80%
- D) At least 90%

C) 60 to 80%

We would have to reduce our worldwide CO₂-emissions by 60-80%. (1) However, current policies (or policies made around 1990 in the EU) would only reach a cut down to 40%. All sectors need to contribute to the low-carbon transition according to their technological and economic potential.

Action in all main sectors responsible for Europe's emissions – power generation, industry, transport, buildings, construction and agriculture – will be needed, but differences exist between sectors on the amount of reductions that can be expected.

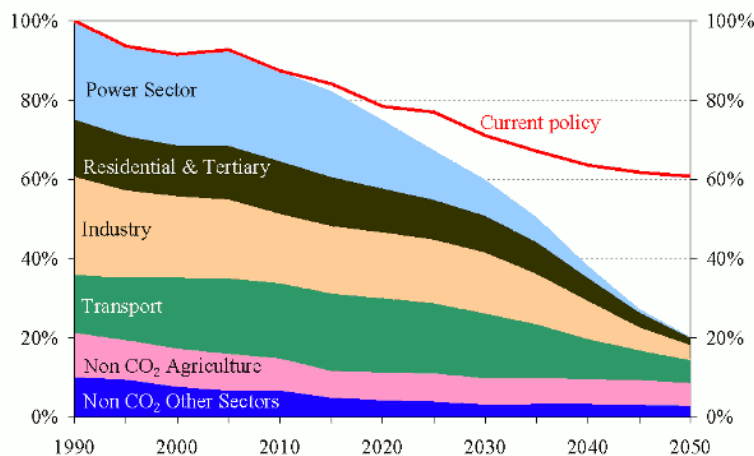


Figure 1: IPCC-Possible 80% cut in greenhouse gas emissions in the EU (100%=1990).

Unfortunately, instead of decreasing the emissions of CO₂, an increase of 2% (data from 2001 to 2002) has been detected (for the US). (3) The next figure shows, what impact different stabilization levels would have on the temperature increase. If (which is hopefully the worst case scenario) the stabilization level would be around 1130 ppm, the temperature would increase by 8°C.

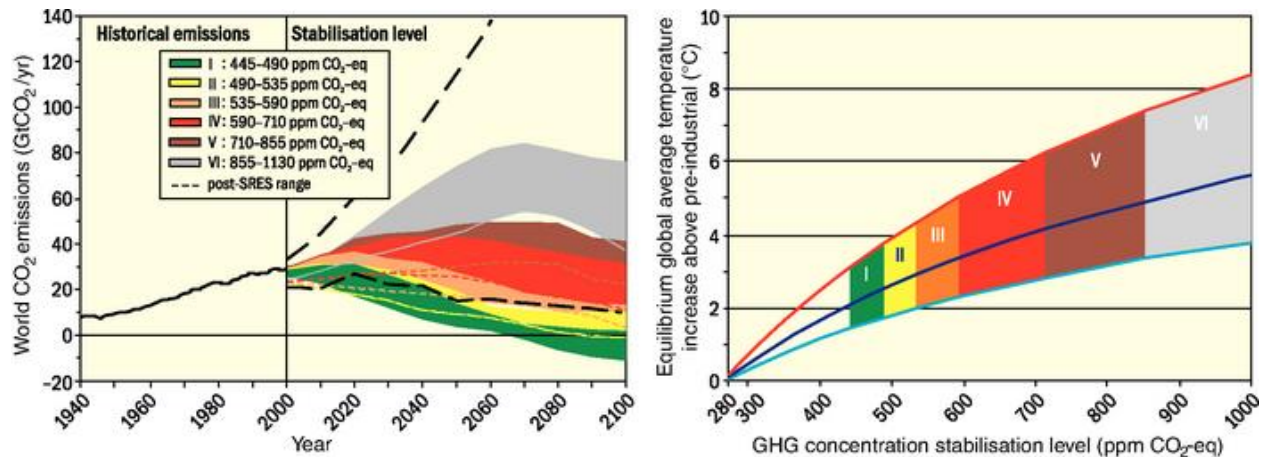


Figure 2: CO₂ emissions for 1940 to 2000 and emissions ranges for categories of stabilisation scenarios from 2000 to 2100 (left-hand panel); and the corresponding relationship between the stabilisation target and the likely equilibrium global average temperature increase above pre-industrial (right-hand panel). Approaching equilibrium can take several centuries, especially for scenarios with higher levels of stabilisation. Coloured shadings show stabilisation scenarios grouped according to different targets (stabilisation category I to VI). The right-hand panel shows ranges of global average temperature change above pre-industrial, using (i) 'best estimate' climate sensitivity of 3°C (black line in middle of shaded area), (ii) upper bound of likely range of climate sensitivity of 4.5°C (red line at top of shaded area) (iii) lower bound of likely range of climate sensitivity of 2°C (blue line at bottom of shaded area). Black dashed lines in the left panel give the emissions range of recent baseline scenarios published since the SRES (2000). Emissions ranges of the stabilisation scenarios comprise CO₂-only and multigas scenarios and correspond to the 10th to 90th percentile of the full scenario distribution. Note: CO₂ emissions in most models do not include emissions from decay of above ground biomass that remains after logging and deforestation, and from peat fires and drained peat soils. {WGIII Figures SPM.7 and SPM.8}

References:

- 1) Crutzen, Paul J. "Albedo enhancement by stratospheric sulfur injections: a contribution to resolve a policy dilemma?." *Climatic change* 77.3 (2006): 211-220.
- 2) https://ec.europa.eu/clima/policies/strategies/2050_en
- 3) Marland, G., Boden, T. A., and Andres, R. J.: 2005, 'Global, Regional, and National CO₂ Emissions'. in *Trends: A Compendium of Data on Global Change*. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, US. Department of Energy, Oak Ridge, Tenn.
- 4) https://www.ipcc.ch/publications_and_data/ar4/syr/en/figure-5-1.html