

Extra Credit Exercise, due 4/21 in class.

Take-home messages from Dr. James Hansen, private citizen.

Part 1: In 250 words or less, summarize the argument for a CO₂ stabilization cap that is less than today's atmospheric CO₂ mixing ratio of 385 ppm. For those of you who missed the lecture, similar lectures and papers are available for download at <http://www.columbia.edu/~jeh1/>. Of the many materials available, I can suggest i) under "Scholarly Publications", the 2008 "Target CO₂..." (focussing on section 4) or ii) under "Presentations and Links", the December 2008 "Climate threat.." lecture PDF, as most relevant to my question.

Part 2: Choose one of the following.

A) In his lecture, Dr. Hansen noted that sea-ice was melting fast and sea-ice loss would change the planet. He added that the sea-ice loss might yet be reversible "if we can restore the energy balance of the planet". It is unlikely that most of the audience understood what was meant, but we should. Referring to my on-line notes on "commitment warming" (date: 3/17) and/or section 4.2 of the "Target CO₂..." paper above, outline briefly what his statement means. Hint: From my lecture notes it is apparent that as long as the radiative forcing is increasing, there is a flux of energy into the ocean. This influences the balance between energy coming in and going out at the top of the troposphere. Is Dr. Hansen advocating waiting for the system to come into equilibrium with the present level of CO₂ or reducing the CO₂ level and thus the radiative forcing to match the current radiation to space?

OR

B) Setting a target of 350 ppm and achieving it are two very different things. Dr. Hansen suggests a carbon tax scheme that is designed to help achieve the target. It is described in US Senate testimony available at the URL above under "Communications" (Date: 26 Feb.). Briefly indicate whether you think the proposed tax represents a sound approach or is flawed, and why.

Credit: I will give a score of 100% for answers that I deem to be satisfactory. This will replace your lowest homework score or a missed homework.