



Projecting Human Development and CO₂ emissions employing correlations

D. Rybski, L. Costa, and J.P. Kropp

Potsdam Institute for Climate Impact Research, Research Domain II: Climate Impacts and Vulnerabilities, Potsdam, Germany
(diego.rybski@pik-potsdam.de)

We find positive and time dependent correlation between the Human Development Index (HDI) and per capita CO₂ emissions from fossil fuel combustion. Based on this empirical relation, extrapolated HDI, and three population scenarios extracted from the Millennium Ecosystem Assessment report, we estimate future cumulative CO₂ emissions. If current demographic and development trends are maintained, we estimate that by 2050 around 85% of the world's population will live in countries with high HDI (above 0.8) as defined in the United Nations Human Development Report 2009. In particular, we estimate that at least 300Gt of cumulative CO₂ emissions between 2000 and 2050 are necessary for the development of developing countries in the year 2000. This value represents 30% of a previously calculated CO₂ budget yielding a 75% probability of limiting global warming to 2°C. Since human development has been proved to be time and country dependent, we plead for future climate negotiations to consider a differentiated CO₂ emissions reduction scheme for developing countries based on the achievement of concrete development goals.