A Different Perspective for Global Climate Policy: Combining Burden Sharing and Climate Protection

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1. Introduction

The climate summits in Kyoto and Buenos Aires achieved some tentative first steps for international climate protection. However, an important question that was left open by both summits was the issue of strategies for long-term climate protection strategies and their consequences on emissions reduction commitments for both industrialized and developing countries. This question was later given high priority at the 6th International Workshop on 'Using Global Models to Support Climate Negotiations', in Kassel, Germany (see Onigkeit et al., 1998) and is addressed by the authors in this paper. The purpose of this paper is to provide an approach that combines the question of stabilization targets with the question of allocation of greenhouse gas (GHG) emissions. We use this approach to evaluate the implications of different long-term climate protection targets on the allocation of emissions reductions in non-Annex B and Annex B countries. This allocation is based on two indicators that reflect considerations of capability and equity. These are (1) per capita income to select the point in time when developing countries can afford to take measures in a climate protection regime and (2) a convergence of per capita emissions with the aim of overcoming the current disparity in per capita emissions between industrialized and developing countries. Why is the allocation of emissions an international issue? First of all, according to the Berlin Mandate and the Kyoto Protocol, most industrialized countries are required to begin reducing their greenhouse gas emissions. Some have argued that this is justified because of their high level of per capita emissions and their historical contribution to climate change. On the other hand, results of scenario analysis have shown that many climate targets require very significant reductions in global emissions that would be virtually impossible for Annex B countries to achieve alone. One reason is that greenhouse gas emissions from developing countries are expected to increase substantially (Alcamo et al., 1995). In response to this situation, we present here an approach that can help identify strategies for...
both long-term climate protection and sharing the burden of emissions reductions between Annex B and non-Annex B parties. This approach is one of the first attempts to combine climate protection and burden sharing with indicators for equity and capability in a single analysis. In this paper we apply this approach to two \( \text{CO}_2 \) stabilization targets, taking into account \( \text{CO}_2 \), \( \text{CH}_4 \) and \( \text{N}_2\text{O} \) emissions from the energy/industry sector as well as land-use emissions.

2. The burden-sharing concept

The main idea behind the proposed presented burden-sharing scheme is that the per capita emissions of non-Annex B parties, which are currently substantially lower than those of Annex B countries, are allowed to increase uncontrolled until they reach a specified income level (the so-called graduation criterion). Above this level, developing countries are expected to participate in international emissions regimes. In principle, the graduation income level must be set high enough so that developing countries will have a high enough national income to afford to control their emissions. The first step in participating in international regimes is to freeze per capita emissions, and the second is to reduce emissions (see Figure 1a). Reductions start when non-Annex B per capita emissions equal Annex B per capita emissions aiming at an equitable distribution of emissions rights.

In the following paragraphs we specify the rules for allocating global emissions between Annex B and non-Annex B countries. For this allocation, a baseline ('no policy') emissions pathway and an economic growth scenario are

![Figure 1. Illustration of the burden sharing concept. (a) Per capita emissions pathway of one non-Annex B country and averaged Annex B per capita emissions. (b) Illustration of the implications of different graduation criteria. A high graduation criterion stands for a high per capita income and vice versa.](image-url)