

CORE DISCUSSION PAPER
2001/5

**CONSTRAINING EQUITABLE ALLOCATIONS OF
TRADABLE GREENHOUSE GASES EMISSION QUOTAS BY
ACCEPTABILITY**

Marc GERMAIN¹ and Vincent VAN STEENBERGHE²

January 2001

Abstract

Allocations of tradable greenhouse gases (GHG) emission quotas among countries may take place according to several sharing rules corresponding to a certain perception of equity. For instance, allocating quotas in direct proportion to population, in inverse relation to GDP or according to past emissions has been advocated. Taking a long term perspective, we compute such allocations of tradable quotas with a dynamic model developed on the basis of the RICE model (Norhaus and Yang, 1996). The total amount of quotas to be distributed in each period corresponds to the total optimal amount of emissions to be realised in each period. We observe that the 'equitable' quotas allocation rules the most often referred to are not acceptable by every country at every period: some of them would be better off by not co-operating. We then propose a mechanism which determines allocations of GHG emission quotas that satisfy as much as possible each 'equitable' allocation rule while keeping acceptability for each country.

Keywords: environmental economics, climate change, dynamic games, tradable permits, equitable allocations.

JEL Classification: C73, F42, H23, Q25, Q28.

¹CORE, Université Catholique de Louvain. E-mail germain@core.ucl.ac.be

²CORE, Université Catholique de Louvain. E-mail vansteenbergh@core.ucl.ac.be

This research is part of the CLIMNEG/CIMBEL projects funded by the Belgian Federal Government, SSTC/DWTC contracts CG/DD/242 and CG/10/27a. The authors wish to thank Johan Eyckmans and Jean Hindriks for carefull reading, claude d'Aspremont, Francisco Ortega and Henry Tulkens for stimulating discussions and all the members of the CLIMNEG/CLIMBEL projects for valuable

comments. This paper presents research results of the Belgian Program on Interuniversity Poles of Attraction initiated by the Belgian State, Prime Minister's Office, Science Policy Programming. The scientific responsibility is assumed by the authors.