

## **A Multi-objective Input-Output linear programming model for environmental and energy policy analysis**

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Nowadays, Sustainable Development is threatened by serious environmental problems. The Kyoto protocol, negotiated in 1997, contained legally binding targets for GHGs emissions for industrialized countries in order to prevent anthropogenic interference with the climate system. The protocol sets a target for the emissions of a basket of GHGs which had to be reached by the signatory countries in the period 2008-2012. To keep the Kyoto protocol intact when it runs out in 2012, has been a main item on the agenda of the Durban conference celebrated last year.

The importance of these agreements and the elaboration of a climate change policy make it necessary to define and establish national policy measures and adequate quantitative models for environmental and energy policy analysis in order to know the effects of these policies on the economy of country. In this paper, a multi-objective Input-Output linear programming model is proposed. To develop the model, we first consider the Input-Output model as a linear programming problem combining environmental, economic, social, energy and waste restrictions. Then, the linear programming model is extended to a multi-objective model in order to define and examine the different goals that must be implemented to reach sustainability. The model is applied to several countries of the European Union to know the economic and social effects in these economies of a reduction in the emission levels and energy requirements.