

COMMENTARY

# Environmental tax reform: efficiency and political feasibility

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## Abstract

Although market-based environmental measures like uniform CO<sub>2</sub> taxes reach a given standard at minimal cost, they do not prevail in real world policies. An efficiency oriented environmental policy fails, as it involves a redistribution of pollution rights, resulting in a strong and generally effective opposition of the groups that forego economic rents. The present paper analyzes the tradeoff between efficiency and political feasibility of several CO<sub>2</sub> tax and reimbursement schemes, using a computable general equilibrium model of Switzerland. The simulation results indicate that a policy combining a uniform CO<sub>2</sub> tax with differentiated labor subsidies preventing intersectoral redistribution is a better solution for the tradeoff than the presently existing tax schemes in various countries. © 2002 Elsevier Science B.V. All rights reserved.

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## 1. Introduction

At the UN climate convention in Kyoto 1997, the industrialized world agreed on reducing greenhouse gas emissions over the next 15 years by, on average, 5% down from the 1990 level. The European Union member states committed themselves to an 8% reduction.<sup>1</sup> However, with

the refusal of the new US government to ratify the treaty, the concerted action to tackle the greenhouse gas problem reached an impasse which was only overcome by a series of concessions among the remaining nations. The present paper does not address the adequacy of the global emission reduction goal nor the scope for unilateral action by the EU. Our focus is on the set of measures that would allow the countries to achieve their goal.

It is well known from the economic literature that a uniform effluent charge ensures that a given environmental standard is achieved at

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<sup>1</sup> Kyoto Protocol to the United Nations Framework Convention on Climate Change, Annex B. see <http://www.unfccc.de/resource/convkp.html>.

minimal cost.<sup>2</sup> Since a uniform rate equalizes the marginal abatement costs across polluters, it minimizes the total cost of an environmental constraint. This so-called price standard approach dates back to Baumol and Oates (1971). With respect to the greenhouse problem, the advantage of the approach has recently been illustrated in a special issue of the *Energy Journal* on the costs of the Kyoto protocol, edited by Weyant and Hill (1999). In this overview, all models result in the lowest abatement costs if trade in CO<sub>2</sub> is unrestricted, i.e. a uniform price of carbon emissions applies.

Originally, the option of different uses of revenues from applying effluent charges was not discussed, as it was implicitly assumed that revenues are redistributed to households by means of a lump sum.<sup>3</sup> Over the last few years, however, the debate on ecological tax reform has highlighted the importance of the way in which redistribution takes place. With prior tax distortions, the use of environmental tax revenues to finance cuts in distortionary taxes rather than to redistribute a lump sum enhances efficiency, since the former allows for a lower overall excess burden of taxation in the economy. The welfare gain from recycling schemes that involve the reduction of existing distortionary taxes is undisputed nowadays—it is commonly referred to as the *weak* double dividend of ecological tax reform (Goulder 1995a).

Although the efficiency argument in favor of economic measures in environmental policy is strong, these instruments constitute the exception rather than the rule in the real world. Moreover, the measures that have been implemented do not correspond to textbook versions. For instance, energy taxes almost always include exemptions granted for energy-intensive sectors. This policy increases the shadow value of the environmental

standard, which from the perspective of economic efficiency appears to be disappointing. From a political viewpoint, however, this policy is not surprising. Although economic measures such as effluent charges do minimize the cost of an environmental standard, they also redistribute income among economic agents. Agents on the losing side will oppose an efficient scheme in environmental policy and possibly prevent its realization, provided their political influence is sufficiently strong.

The contribution of the present paper combines an analysis of efficiency and of political feasibility of environmental policy. Employing a computable general equilibrium model (CGEM) for Switzerland, it investigates the efficiency of different environmental measures that compensate sectors for paying environmental taxes, so that little or no intersectoral transfers take place. Within this framework, the tradeoff between the efficiency and political feasibility of different environmental instruments is highlighted and environmental tax schemes superior to existing procedures in various countries are identified.

The paper is organized as follows. Section 2 gives a brief overview on the political economy of environmental economics and the existing CO<sub>2</sub> tax schemes in Europe. Section 3 introduces the tax reform scenarios that are analyzed in this paper. Section 4 presents the key structure of the Swiss CGEM. Section 5 reports on and discusses the welfare results of the different scenarios, and Section 6 concludes.

## 2. Political economy and existing CO<sub>2</sub> tax schemes in Europe

The main public choice aspects of environmental charges have been analyzed by Buchanan and Tullock (1975). In particular, they compare the political feasibility of environmental charges with a command-and-control (CAC) approach that obliges the emitters to uniformly reduce their emissions. One of their key arguments is based on the observation that with the introduction of an effluent charge, pollution rights are entirely relocated from the polluters to the government, since polluters have to pay taxes even after having

<sup>2</sup> As an alternative, a system of tradable permits would also lead to minimal cost. Our focus, however, is on effluent charges, as this approach is already applied or under consideration in many European countries.

<sup>3</sup> As an exception, see Sandmo (1975) for an early and thorough discussion of this issue within a Pigouvian tax framework.

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