

The efficiency costs of separating carbon markets under the EU emissions trading scheme: A quantitative assessment for Germany

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Available online 8 November 2005

Abstract

From 1 January 2005 onwards the European Union has launched the first large-scale international carbon emissions trading program. As the EU Emissions Trading Scheme (EU-ETS) covers only part of domestic carbon emissions, it implies a segmented environmental regulation scheme: Each EU Member State must specify additional domestic abatement policies for the sectors outside the EU-ETS in order to meet its emissions budget under the EU Burden Sharing Agreement. We highlight the generic problems of segmented carbon regulation in terms of information requirements for international carbon prices and domestic abatement costs of sectors outside the EU-ETS. Based on numerical simulations for Germany, we quantify the excess costs of segmented carbon regulation and conclude that inefficiencies can be much better explained by lobbying of influential EU-ETS sectors than by information problems.

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JEL classification: D61; H21; Q48

Keywords: Emissions trading; National allocation plans

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1. Introduction

Since long, economists have advocated the efficiency advantages of market-based instruments, i.e., emission taxes or tradable emission allowances over command-and-control standards. The basic reasoning behind this is that taxes or tradable allowances can achieve the same marginal costs for each use of a given pollutant so that the economy as a whole will employ the cheapest abatement options. While a deliberate design of standards could in principle also achieve cost-effective abatement, the fundamental advantage of market-based regulation is that cost-efficiency can be obtained by decentralized market mechanisms: There are no information requirements for the regulator on the specific abatement options across different pollution sources to assure equalization of marginal abatement costs.

During the last decade, in particular emission taxes have played a growing role in domestic environmental policies of OECD countries—not at least because efficiency arguments promoted overall political feasibility (OECD, 2001). The most recent prominent example for the market-based course in environmental policy design is the European Union's Emissions Trading Scheme (EU-ETS) in force since the first of January 2005 (EU, 2003a). Its key objective is to foster cost-efficiency of carbon reduction under the EU Burden Sharing Agreement (EU-BSA) that entails specific emission reduction targets across EU Member States (EU, 1999) in line with the EU's overall reduction commitment under the Kyoto Protocol.¹

Initially, the EU-ETS will only cover carbon dioxide (CO₂) emissions from selected energy-intensive sectors including: production and processing of iron and steel; production of cement, glass, or ceramic; energy transformation (electricity generation and oil refineries). According to Article 10 of the EU-ETS-Directive, emission allowances to these sectors will be grandfathered, i.e., given for free.² Each Member State is obligated to set up a National Allocation Plan (NAP) where it defines the cap on emission allowances for sectors (installations) included in the trading scheme and the specific allocation rule for grandfathering. The NAPs for the first trading period from 2005 to 2007 had to be submitted to the EU Commission by April 2004 for official review and approval.

As the EU-ETS covers only a part of CO₂ emission sources, it implies a segmented environmental regulation scheme. Each Member State must complement the EU-ETS with specific domestic abatement policies for the sectors outside the EU-ETS in order to meet the country's total emissions budget under the EU-BSA. The segmentation of the emission market into multiple domestic markets and a single international market creates a fundamental information problem for environmental regulation that seems to be widely ignored in the public policy debate. Under a segmented scheme, the domestic regulator must have perfect information on the international price of tradable emission allowances and the marginal abatement cost curves across all domestic emission sources that are *not* included in the emissions trading scheme in order to implement the (single) cost-minimizing NAP. Hence, segmented emission regulation as implied by the EU-ETS discards a key element of market-based regulation, i.e., the rigorous use of decentralized market mechanisms.

¹ Under the Kyoto Protocol the EU is committed to cut its annual greenhouse gas emissions during 2008–2012 by 8% on average as compared to 1990 emission levels (UNFCCC, 1997).

² More specifically, Member States must allocate at least 95% of emission allowances for free in the “warm-up” phase from 2005 to 2007. In the next phase – from 2008 to 2012 – this threshold can be reduced to 90%, whereas the ceilings for later phases have not yet been decided upon.

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