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# Strategic partitioning of emission allowances under the EU Emission Trading Scheme

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ABSTRACT

The EU Emission Trading Scheme (ETS) is breaking new ground in the experience with emission trading regimes across multiple jurisdictions. Since the EU ETS covers only some industries, it implies a hybrid emission control scheme where EU member states must apply complementary domestic emissions regulation for the non-trading sectors of their economies in order to comply with their national emission reduction targets. The EU ETS thus opens up for strategic partitioning of national emissions budgets by the member states between trading and non-trading sectors. In this paper we examine the potential effects of such strategic behavior on compliance cost and emissions prices. We show that concerns on efficiency losses from strategic partitioning are misplaced. In turn, our analysis implicitly indicates significant political economy forces behind EU climate policy, as both cost-effective and strategically motivated partitioning of national emission budgets are far off from the actual break-down between trading and non-trading sectors.


## 1. Introduction

Over the last two decades emissions trading has become increasingly popular as an environmental policy instrument for air pollution control. The central advantage of emissions trading is that firms can flexibly choose to meet their targets, thereby achieving in principle the lowest overall cost for an aggregate emissions cap. In a historical context, the U.S. sulfur dioxide ($SO_2$) cap-and-trade program initiated in the mid 1990s under the Clean Air Act Amendments is considered as a successful "Grand Policy Experiment" proving substantial economic efficiency gains of market-based emission control

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policies over command-and-control policies, i.e., predetermined technologies or standards (Stavins, 1998).

Emissions trading can provide particularly high efficiency gains in climate change mitigation: carbon dioxide ($CO_2$) and other greenhouse gases have the same effect for global warming wherever they are emitted and abatement costs differ dramatically across sources. Given the considerable potential for cost savings (Weyant, 1999), where-flexibility through emissions trading became a condition-sine-qua-non for the adoption of the Kyoto Protocol in 1997.

Striving for cost-effectiveness of its climate policy, the European Union (EU) has launched an EU Internal Emission Trading Scheme (EU ETS) for emission-intensive installations as the central pillar to comply with the Kyoto Protocol (EU, 2003a, 2004). The EU ETS was established in 2005 and entered its second phase in 2008. As the first large-scale international greenhouse gas (GHG) trading program, the EU ETS represents a landmark environmental policy. To date the EU ETS covers more than 12,000 installations in 6 major industrial sectors across 27 EU countries. Each EU country must partition its national emissions budget under the Kyoto Protocol between sectors covered by the EU ETS and the rest of the economy within the so-called national allocation plans (NAPs). The EU ETS thus implies a hybrid regulation scheme as sectors (e.g., households or transport) that are not covered require complementary regulation in each EU member state to comply with the national emission reduction targets under the Kyoto Protocol.

Given its size and institutional complexity, the EU ETS has been referred to as the "Grand New Policy Experiment" for market-based mitigation programs (Kruger and Pizer, 2004). In fact, the performance of the EU ETS may be pivotal for the prospects of a global greenhouse gas trading system: environmental policy makers around the world view the EU ETS as a unique opportunity to gain critical insights into the design and implementation of a market-based environmental program. The outstanding policy relevance of the EU ETS also explains the huge interest of the academic community to draw viable lessons on actual experiences of emissions trading including key issues such as allowance allocation rules, banking and borrowing provisions, firm-level market power, provisions for monitoring, reporting and verification, innovation incentives, implications on competitiveness of firms and sectors, or global environmental effectiveness of unilateral climate policies, i.e., leakage (for an overview see, e.g., the symposium on the EU ETS by Ellerman et al., 2007).[1]

One central feature of the EU climate policy approach that has so far received little attention in the literature is the decentralized structure of emissions regulation across multiple jurisdictions. The latter may give rise to strategic behavior by governments: emission trading systems that comprise several countries, such as the EU ETS or likewise an international quota market under the Kyoto Protocol, raise a strategic question as to how many quotas or allowances a country should allocate into the trading system. A country that expects to be a net seller of allowances can find it profitable to restrict the number of allowances issued such as to raise the equilibrium price of allowances in the market. If an emission trading market only covers a subgroup of domestic emissions—as is the case for the EU ETS—the relevant question is how to partition the national emissions cap on the sectors within and outside the trading system: when a large net seller reduces its number of allowances in order to raise the price of allowances, it simultaneously increases the emissions quota available for its non-trading sectors, reducing the marginal abatement costs there. Consequently, we end up with different marginal abatement costs across countries in the sectors outside the EU ETS.

This paper investigates the policy relevance of strategic partitioning of emission allowances in the context of actual and prospective EU climate policies: to what extent can national allocation plans as submitted by EU member states for the Kyoto commitment period 2008–2012 be traced back to strategic (game-theoretic) behavior? How big is the strategic incentive for a single EU member state to alter or delay its national allocation plan? What is the overall magnitude of efficiency losses through strategic partitioning of emission allowances and may this serve as a strong argument for the EU Commission's proposal to centralize emission allocation at the EU level from 2012 onwards (EU, 2008)?

[1] A bibliography on tradable permits, which covers a larger part of the pertinent academic publications, is provided by T. Tietenberg at http://www.colby.edu/~thtieten/trade.html.