

Chapter 15

Emissions Trading Schemes in the Transportation Sector

Alexandra Maragkogianni
Technical University of Crete, Greece

Spiros Papaefthimiou
Technical University of Crete, Greece

Constantin Zopounidis
Technical University of Crete, Greece

ABSTRACT

The transportation sector is a constantly growing source of greenhouse gas emissions, and its inclusion in the European Union Emissions Trading Scheme (EU-ETS) has become inevitable, aiming to mitigate climate change effects. This chapter summarises the operation of the scheme, the accompanying legal framework, the induced implications, and the necessary requirements for the inclusion of transportation sub-sectors in the scheme. The implementation of the EU-ETS in aviation, shipping, and road transport is described, while details on the emissions trading and allowances allocation are provided. The processes of monitoring, reporting, and verification of emissions are reported along with the energy challenges, environmental, and financial impacts of the anticipated market based measures.

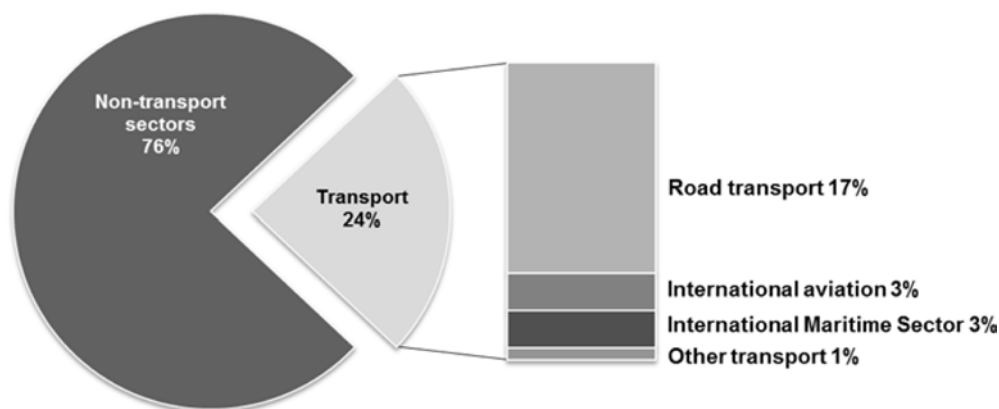
INTRODUCTION

The stabilization and reduction of carbon dioxide (CO₂) emissions levels are main targets in order to overcome the problem of climate change. In a world where pollution has no price, the consequent result is, as a default decision, to pollute. The carbon market could prove to be a mean that will help steer the world to lower pollution levels.

Greenhouse Gas emissions (GHG) originating from the transport sector have been constantly increasing during the past decades and only few actions have been taken towards their mitigation. As presented in Figure 1, in 2009 European transport sector (including international aviation and maritime) was responsible for 24% of total CO₂ emissions from fossil fuel combustion, with the road sector largely dominating in terms of emissions volume while shipping and aviation present highest growth rates (EEA). Thus, it is undeniable

DOI: 10.4018/978-1-4666-4098-6.ch015

Figure 1. Transport sector contribution to total GHG emissions



that transportation has a great impact on climate and consequently strategic actions for mitigating the corresponding CO₂ emissions are necessary.

This chapter describes some important operational processes and the accompanying legal framework for the implementation of a European emissions trading method in the transport sector. The inclusion of aviation and road transport sector into this scheme are described and the role of shipping industry in global emissions market is also presented.

BACKGROUND

The Kyoto Protocol Targets

Nowadays, climate change is considered as one of the most demanding environmental issues that global community faces, as it entails serious social and technological aspects. Since the Rio conference in 1992, the main target has been to mitigate the climate change origins, i.e. emitted gases in the atmosphere and thus mainly to stabilize CO₂ levels. Although international agreements for climate change require directly from participating countries to reduce carbon emissions from land-based sources, there has only been limited progress in mitigation of emissions from transport sector.

In 1997, the Kyoto Protocol introduced primary targets for constrain of GHG emissions. It was the 25th April 2002, where the European Union (EU), through its 2002/358/EC Council Decision, approved the Kyoto Protocol targets and the member states on 16th February 2005 ratified it in the United Nations Framework Convention on Climate Change (UNFCCC). It was the first time that national governments adopted a national environmental policy towards the reduction of their GHG emissions.

Following the Kyoto Protocol requirements, the member states agreed to obtain the specified common targets implementing differentiated strategies, and EU has proved to be a frontrunner in succeeding on emissions mitigation and addressing the climate change issue. The reduction targets, set by the Kyoto Protocol, can be met by reducing GHG emissions (through domestic-regional emissions trading schemes and other policy measures), or by utilising flexible project-based mechanisms allowed under the Kyoto Protocol: Clean Development Mechanisms (CDM) and Joint Implementation (JI). CDM is a GHG offset mechanism; its role is international and all countries having ratified the Kyoto Protocol are involved. These countries are divided in two categories (i.e. Annex I and II) and CDM's major target is to mitigate GHG emissions through a cost-effective way from An-

19 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/emissions-trading-schemes-transportation-sector/76560

Related Content

Discriminating Biomass and Nitrogen Status in Wheat Crop by Spectral Reflectance Using Artificial Neural Networks

Claudio Kapp Junior, Eduardo Fávero Caires and Alaine Margarete Guimarães (2014). *International Journal of Agricultural and Environmental Information Systems* (pp. 38-49).

www.irma-international.org/article/discriminating-biomass-and-nitrogen-status-in-wheat-crop-by-spectral-reflectance-using-artificial-neural-networks/114685

Trusted Integration of Wireless Sensor Networks into Herd Control Monitoring Application

Laurent Gomez and Michel Riveill (2013). *International Journal of Agricultural and Environmental Information Systems* (pp. 1-24).

www.irma-international.org/article/trusted-integration-of-wireless-sensor-networks-into-herd-control-monitoring-application/102942

Analysis of Extraction Algorithm for Visual Navigation of Farm Robots Based on Dark Primary Colors

Jin Wang, Yifei Cui, Hao Wang, Mohammad Ikbali and Mohammad Usama (2021). *International Journal of Agricultural and Environmental Information Systems* (pp. 61-72).

www.irma-international.org/article/analysis-of-extraction-algorithm-for-visual-navigation-of-farm-robots-based-on-dark-primary-colors/275243

Approaches and Initiatives to Green IT Strategy in Business

Amit Goel, Amit Tiwari and Heinz Schmidt (2011). *Handbook of Research on Green ICT: Technology, Business and Social Perspectives* (pp. 169-183).

www.irma-international.org/chapter/approaches-initiatives-green-strategy-business/48426

Instrumented Color Determination and Sensory Analysis of Tomato Fruits (*Lycopersicon Esculentum* Mill)

Celina de Almeida, Inacio Maria Dal Fabbro and Jonathan Gazzola (2017). *International Journal of Agricultural and Environmental Information Systems* (pp. 49-62).

www.irma-international.org/article/instrumented-color-determination-and-sensory-analysis-of-tomato-fruits-lycopersicon-esculentum-mill/176438