Journal of Air Transport Management 67 (2018) 55–62

Contents lists available at ScienceDirect

Journal of Air Transport Management

journal homepage: www.elsevier.com/locate/jairtraman

EU ETS versus CORSIA – A critical assessment of two approaches to limit air transport's CO_2 emissions by market-based measures

Janina Scheelhaase*, Sven Maertens, Wolfgang Grimme, Martin Jung

German Aerospace Center (DLR), Institute for Air Transport and Airport Research, Cologne, Germany

ARTICLE INFO

Keywords:
Air transport policy
Climate impact
Environmental economics
EU ETS
CORSIA
Emissions trading

ABSTRACT

To limit air transport's climate relevant emissions, two important CO_2 trading schemes for aviation are in force, or will be in the future: The EU Emissions Trading Scheme (EU ETS) for aviation, which was introduced in 2012, and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) as agreed at International Civil Aviation Organization (ICAO) level in October 2016. The authors analyze and compare both schemes from an environmental and competition perspective. Also, options for proceeding with the EU ETS are discussed.

Main results indicate that a continuance of the EU "Reduced Scope" regime (following the European Commission's "Stop the Clock Decision") beyond 2020 and a parallel coverage of international flights by CORSIA would be the best option. In this case, emissions from both flights within the European Economic Area and flights to and from this area would be covered by a CO_2 reduction scheme.

1. Background

The air transport sector drives anthropogenic climate change by emitting substantial amounts of carbon dioxide (CO_2), along with NO_X, SO_X, H_2O, soot, triggered contrails and contrail cirrus (e. g. Sausen et al., 2005). In 2005, aircraft-induced CO_2 contributed 1.6% to total anthropogenic radiative forcing. If the other climate species are also considered, aviation's contribution to total radiative forcing is about 4.9% (Lee et al., 2009; Grewe et al., 2017). To mitigate CO_2 emissions, two important trading schemes for aviation are in force, or will be in force in the near future: The EU Emissions Trading Scheme (EU ETS) for aviation and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), the latter of which has been agreed at International Civil Aviation Organization (ICAO) level in 2016.

Both regulatory approaches can be classified as so-called market-based measures, along with levies. These measures can lead to considerable benefits compared to rather traditional 'command-and control' politics as Dales (1968) or Siebert (1976) had already shown many decades ago for environmental politics in general. The main advantage compared to 'command-and control' measures is that market-based instruments are able to guarantee the achievement of predefined environmental targets in a cost-efficient manner as they put - directly or indirectly – a price tag on emissions to incentivize producers to reduce or eliminate negative externalities (see for instance Nordhaus, 1982; Smith, 2015). Recently, Preston et al. (2012) or Peter et al. (2016) have demonstrated the benefits of market-based measures in the context of aviation.

In 2012, international aviation became part of the EU ETS (Council of the European Union, 2009a; 2009b; Preston et al., 2012; Anger and Köhler, 2010; Zanin et al., 2016). Until (at least) 2020, all flights from or to European airports were envisaged to be included in the scheme, apart from a few exemptions. In light of strong international opposition (Bartels, 2012) and to ease ongoing negotiations on ICAO level, however, the EU decided to limit the coverage of the EU ETS to emissions from all flights within the European Economic Area (EEA) for the period 2013 to 2016 (so-called "Stop the Clock" decision; Commission of the European Union, 2013).

In October 2016, CORSIA has been agreed on at the 39th ICAO Assembly after decades of difficult international negotiations (ICAO, 2016). It will be in force from 2020 onwards with an increasing number of participating states over time.

In light of Assembly Resolution A39-3, the EU will have to decide how to continue with the EU ETS for aviation in the years to come. This is because the so-called "Stop the Clock" legislation was limited until the end of 2016 with clear reference to the outcome of the ICAO Assembly. Apart from extending the "Reduced Scope" regime, a possible approach for adjusting the EU ETS could be amending its geographical scope.

The aim of this paper is to compare the EU ETS for aviation with CORSIA from an environmental and economic perspective. In light of this analysis, different options for the EU for proceeding with the EU ETS for aviation are discussed. This paper is organized as follows: In

* Corresponding author. Linder Hoehe, 51147 Cologne, Germany.
E-mail address: Janina.Scheelhaase@dlr.de (J. Scheelhaase).

https://doi.org/10.1016/j.jairtraman.2017.11.007
Received 18 July 2017; Received in revised form 17 November 2017; Accepted 19 November 2017

section 2, some basic facts, the legal background and the current situation of the EU ETS are presented. The new CORSIA scheme will then be explained in detail in the third section. In section 4, the EU ETS for aviation and CORSIA are compared with each other. Options for proceeding with the EU ETS are discussed in section 5 of this paper. Section 6 provides conclusions and recommendations.

2. EU ETS for aviation: basic facts, legal backgrounds and current situation

Legal frameworks for the EU ETS for aviation are the EU Directives 2008/101/EC and 2009/29/EC (Council of the European Union, 2009a, 2009b). According to this legislation, European and third-country aircraft operators are responsible for holding and surrendering allowances for CO_2 emissions for most flights to, from and within Europe. For compliance, EU Allowances (EUAs) as well as permits from the Kyoto-based "Clean Development Mechanism" (CERs) and "Joint Implementation" (ERUs) are accepted.

From 2013 until 2020, the total quantity of allowances allocated to aircraft operators is limited to 95 per cent of the average historical aviation emissions of the years 2004–2006 (so-called overall "cap") (Meleo et al., 2016; Dae Ko et al., 2017). Allowances allocated to aircraft operators are valid within the aviation sector only, but aircraft operators are free to purchase additional permits from other markets. Aircraft operators may further use emission permits from "Joint Implementation" and "Clean Development Mechanism" for up to 1.5 per cent of the number of allowances individually required for surrendering in a given year. This figure was a political compromise agreed upon after long and controversial negotiations (Scheelhaase et al., 2012). According to EU Directive 2009/29/EC, flights from third countries which have introduced 'equivalent' CO_2 reducing measures may be excluded from the EU ETS. It will be up to the European Commission to decide whether a third country measure is equivalent (Council of the European Union, 2009b). In practice, due to the lack of equivalent measures in countries of relevance, this option does not (yet) play a role.

Some exemptions from the EU ETS are granted. Inter alia, flights performed within the framework of public service obligations (PSO) on routes within outermost regions or on PSO routes with an annual capacity of less than 30,000 seats are excluded. Another exemption refers to flights performed by commercial air transport operators operating either fewer than 243 flights per four-month period for three consecutive four-month periods (so-called 'de minimis' clause) or operators with total CO_2-emissions of less than 10,000 tonnes per year. The rational behind the 'de minimis' clause was to reduce the administrative costs for operators with a low number of flights to and from Europe (Scheelhaase et al., 2012).

In 2013, the Council of the EU and the European Parliament agreed to temporarily limit the coverage of the EU ETS to flights within the European Economic Area (EEA) only - which covers the EU Member States, Norway and Iceland. This so-called "Stop the Clock" decision was originally limited to the period 2013 to 2016, but as of July 2017, this geographical limitation is still in force and may be extended until more clarity will have been gained on CORSIA's implementation (Commission of the European Union, 2017).

3. CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation): background, basic principles, timeline, open questions and challenges

The Kyoto Protocol, signed in 1997, is a treaty extending the United Nations Framework Convention on Climate Change which aimed at reducing greenhouse gas (GHG) emissions in a world-wide context. For this, the protocol contained binding reduction goals for developed signatory countries (so-called Annex I parties). The protocol did not explicitly put limits on emissions from international aviation. However, Article 2 tasked ICAO to work on measures to control emissions from international air transport (UNFCCC, 1997). Likewise, the Paris agreement does not explicitly refer to aviation (ICAO, 2017c).

Hence, from 1997 on, ICAO has been working on possible policy measures for the limitation or reduction of international aviation's greenhouse gas emissions. As it is the case with many UN agencies, negotiations turned out to be difficult and progress was slow. Milestones were the Assembly Resolutions A37-19 (ICAO, 2010), A38-18 (ICAO, 2013) and A39-3 (ICAO, 2016), agreed upon in 2010, 2013 and 2016, respectively.

At the 37th ICAO Assembly (Assembly Resolution A37-19), the goal of carbon neutral growth from the year 2020 onwards – the "CNG 2020 goal" – had been agreed, meaning that aviation's net carbon footprint in any given year post-2020 shall remain below the net emissions from the baseline year 2020.

The rationale behind this goal is to reduce the environmental footprint stemming from aviation's GHG emissions. At the 38th Assembly, this goal was reaffirmed and the development of a global market-based measure (GMBM) scheme for international aviation for decision by the 39th ICAO Assembly was agreed (ICAO, 2013).

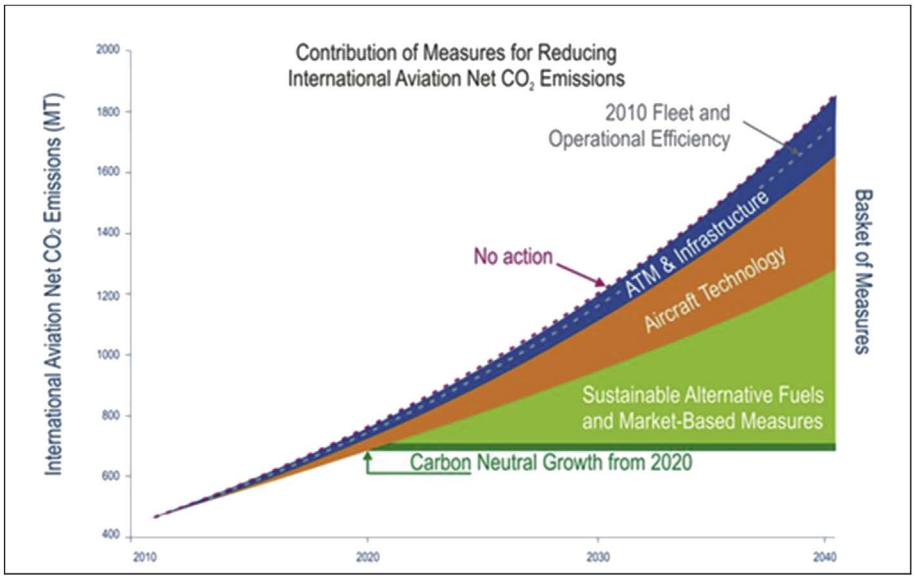

Fig. 1. ICAO CAEP environmental trends assessment to 2040.
Source: ICAO, 2017b.