



# Aviation non CO<sub>2</sub> Mitigation

## What should regulators do?

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# EC Report on Aviation Non CO2

REGULATION (EU) 2017/2392 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL  
of 13 December 2017

amending Directive 2003/87/EC to continue current limitations of scope for aviation activities and to prepare to implement a global market-based measure from 2021

*“before 1 January 2020, the Commission shall present an updated analysis of the non-CO2 effects of aviation, accompanied, where appropriate, by a proposal on how best to address those effects”.*

The [2017 regulation](#) also calls on the Commission to speed up work on the 2008 NOx proposal, promote research into contrail formation and evolution into cirrus clouds, into the direct effects of sulphate aerosols and soot, and on effective mitigation including operational and technical measures.

# Work assigned to EASA

Subcontracted to a consortium led by MMU

Led by Prof David Lee

Comprising team of scientists/experts

Three working groups

- Climate impacts

- Mitigation Options

- Regulatory Options

EASA report submitted to EC – DG Move/Clima

EC report to EP ENVI Committee expected this week

Staff Working Document expected to attach EASA study

# 1. Add non CO2 impacts to GHG emissions inventories

As CO2 equivalents – CO2e

Which inventories?

- National emissions for domestic emissions
- Aviation bunkers - UNFCCC memo item
- ICAO emission reports?

At EU level

- EU GHG inventory
- EU GHG UNFCCC inventory
- EU 2030 – 2050 targets

## 2. Aviation CO2e at Point of Sale display

All websites to show the CO2e per pax per flight sector

How to implement?

car labelling Directive' (Directive 1999/94/EC) aims to

help consumers buy or lease cars which use less fuel and thereby emit less CO2  
encourage manufacturers to reduce the fuel consumption of new cars.

As a demand-side policy, the directive is complementary to help car manufacturers to meet their specific CO2 emission targets set under Regulation (EC) 443/2009

EASA has been working on its own voluntary labelling scheme

How to implement POS EU and globally?

for all flights departing an EU airport

Agreed EU calculations?

Voluntary measures = very different figures/methodologies

# 3. Action on Mitigation Options

**Technology;** radical new aircraft designs

lower mach number and cruise altitude

New aircraft technologies – electric & Hydrogen aircraft

## **Cleaner burning engines**

ICAO NvPM standard

Lean burn NOx engines – tradeoff with CO2 reduction

## **Cleaner fuels – less soot**

EU aviation Refuel initiative

ICAO/industry biofuels in initiatives

## **Improved aircraft fuel efficiency**

ICAO CO2 standard is ineffective

## **Aviation demand control**

ETS reform, fuel, ticket and carbon emissions taxes

# 4. Contrail Avoidance

AIC = 60% of aviation climate impacts

Fly higher or lower

Need to be able to predict when contrails will occur

And change flight plans – 12 hours out

Requires improved weather forecasting

And cooperation of air traffic control systems

For N Atlantic – EU and US authorities

Small CO<sub>2</sub> penalty – divert one in 20 transatlantic flights

This CO<sub>2</sub> penalty has always prevented progress

Now Covid is slowing progress

What will the EC report say?

# 5. Regulatory Options

Internalise non CO<sub>2</sub> climate costs

Then incentivise reductions through charging

First put non CO<sub>2</sub> in emissions inventories

Include in ETS – EC reluctant

Include in ticket taxes – especially longhaul

Include in aviation carbon emissions taxes - UK

Include in Corsia?

NOx charge with distance – 2008 report

ICAO cruise NOx standard?



# Pricing CO2 and non CO2

## How to regulate aviation's full climate impact as intended by the EU council from 2020 onwards

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**Table 4**

Cost for complying with the EU ETS per mile and per passenger mile in the

year 2020.

Source: DLR modelling results, based on [Scheelhaase et al. \(2014a\)](#). Belly freight has not been taken into account for the selected flights.

Departure	Destination	Distance	Cost per mile (€)	CO <sub>2</sub> regime	Cost per passenger and mile (€)	
		(miles)	CO <sub>2</sub> + Non-CO <sub>2</sub> regime		CO <sub>2</sub> + Non-CO <sub>2</sub> regime	CO <sub>2</sub> regime
AMS	CDG	248	0.13	0.09	0.0013	0.0008
CGN	TXL	289	0.12	0.07	0.0009	0.0005
BCN	DUS	726	0.19	0.04	0.0018	0.0004
DUB	FMM	814	0.23	0.06	0.0013	0.0003
MUC	PMI	756	0.25	0.06	0.0022	0.0006
DUS	DXB	3114	0.52	0.13	0.0025	0.0006
MUC	MIA	5008	0.41	0.12	0.0024	0.0007
CDG	LAX	5670	0.67	0.15	0.0028	0.0006
PRG	JFK	4082	0.50	0.12	0.0026	0.0006