

**Overview: shipping vs aviation and the EU ETS**  
**A short note by Sam Gordon and Tristan Smith**

**Introduction**

Shipping and aviation face increasing regulatory pressure to reduce their greenhouse gas emissions. Aviation was included in the EU ETS in January 2012, after four years of negotiations, and there is increasing speculation about whether shipping will follow the same route. In this respect, it is useful to compare the two industries and the implications of aviations' inclusion for ships.

**Climate impact**

The case for cutting carbon emissions has been firmly established. In order to limit global temperature rises to less than 2 degrees Celsius, the IPCC estimates that emissions will need to peak by 2015, and then drop to 15-50% of 1990 levels by 2050 (IPCC 2007). These cuts will require ambitious economic, legal and technological measures and strong political will.

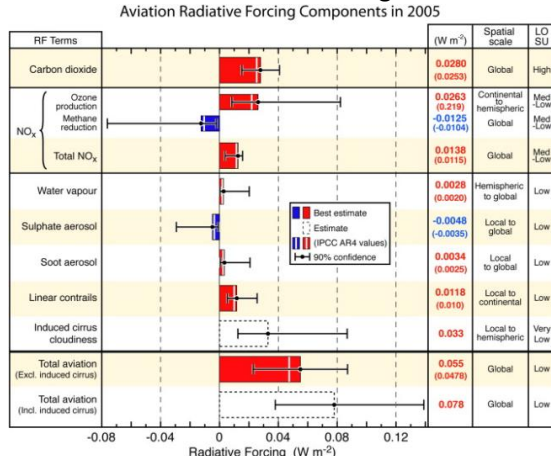
The transport sector will have a particularly tough challenge. The IPCC notes that it is already a significant contributor to climate change, adding nearly a quarter (23%) of global greenhouse gas emissions in 2007 (IPCC 2007). However, growth in this sector is significant as well. A business-as-usual scenario could see emissions from transport doubling by 2050 (IEA 2009).

Within the transport sector, the climate impact of shipping and aviation is also significant. These two industries contributed 21% of transport sector emissions in 2007 (IPCC 2007); 3.3% and 2% of global greenhouse gas emissions respectively (IMO 2009)(ICAO 2010). Both industries also emit NOx, SOx, and particulates, which impact climate in other ways.

Factor	Shipping	Aviation
Emissions of GHGs (tonnes)	1.046 billion (2007) <sup>a</sup>	0.6 billion (2006) <sup>b</sup>
Emissions from international sources (tonnes)	870 million	372 million
% contribution to global GHGs	3.3% <sup>a</sup>	2% <sup>b</sup>
National/international split <sup>c</sup>	18/82	40/60 <sup>d</sup>
% contribution of international aspect of industry to global GHGs	2.7%	1.2% <sup>d</sup>
Emissions of GHGs in 2050 (BAU)	3.1billion <sup>e</sup>	1.2-2.2billion <sup>d</sup>

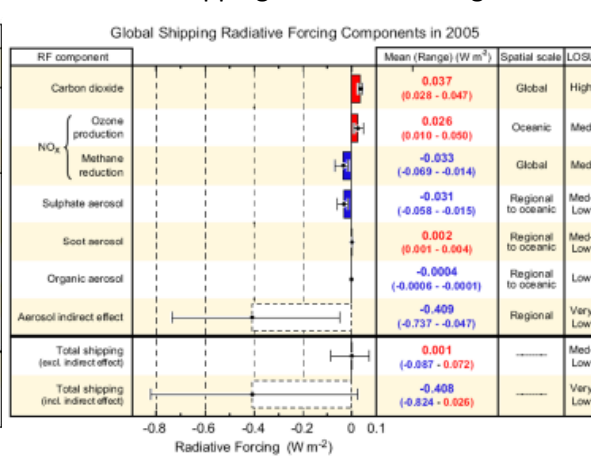
a. (IMO 2009) b. (ICAO 2010) c. 'international' means trips between countries as opposed to trips within countries. d.(Owen, Lee and Lim 2010). e. (Lloyds Register; DNV 2011).

Aviation: Radiative Forcing in 2005



Source: (Lee, et al. 2009)

Global Shipping: Radiative forcing in 2006



Source: (CCC 2011)

## Industry Overview (2007)

Statistic	Shipping	Aviation
Tonne-km of freight	18,000 billion <sup>a</sup>	202 billion <sup>b</sup>
Value of goods transported	\$US7.7 trillion <sup>c</sup>	\$US3.5 trillion <sup>d</sup>
Number of freight carriers	50-100,000 <sup>e</sup>	24,000 <sup>f</sup>

a. (UNCTAD 2010) b. based on (World Bank 2009). c. (IHS Global Insight 2009)d. (Oxford Economics 2009) e. (IMO 2009) f. (IATA 2011)

In terms of tonnes transported, the top five EU countries in 2010 were (EUROSTAT 2011):

- Air freight – Germany, UK, Netherlands, France and Belgium
- Maritime freight – UK, Netherlands, Italy, Spain, and France

## Regulatory and legal context

	Shipping	Aviation
UN Body	IMO	ICAO
Member states	170	191
Date of origin	1948	1944
Structure	Assembly – meets every two years Council (40 states) is the executive organ of the Assembly Five main sub-committees of the Council	Assembly – meets every three years Council (36 states) is the executive organ of the Assembly Seven main sub-committees of the Council
Environmental Committee	Marine Environmental Protection Committee – established 1985	Aviation Environmental Protection Committee – established 1983 (not a main sub-committee)
Key environmental concern	Oil Spills	Noise
Current regulation on pollution	2008 – MARPOL Annex VI included regulation on NOx and SOx 2011 - amendments to Annex VI regulate CO <sub>2</sub> directly via an Energy Efficiency Design Index for ships	2009 – aspirational goal of 2% fuel efficiency improvements each year
Ongoing regulation	Evaluating market-based measures to reduce CO <sub>2</sub>	Developing a global CO <sub>2</sub> standard for aircraft, expected 2013

The action of the ICAO is limited by the principle of national sovereignty. Because nation states have an inviolable right to regulate their own airspace, the ICAO is not in a strong position to drive changes in one country due to the request of others. As a result, the ICAO focuses on guiding principles and measures to help states coordinate.

The IMO is in a stronger position to affect change. Because ships can easily change both their routes and the countries where they are flagged, international regulation is vital to ensure that uniform standards apply across the world. Because the industry is more reliant on the IMO, this body has more power as a regulator.

## **EU ETS: Inclusion of aviation**

Aviation is now included in the European Union Emissions Trading Scheme (EU ETS). From January 2012, all aircraft operators that use European airports must obtain permits for each tonne of CO<sub>2</sub> they emit. Failure to comply with the EU ETS will lead to penalties of €100 for each tonne emitted, or bans from EU airports.

In this case, an aircraft 'operator' is the party who operates the aircraft. The operator can be the lessee or lessor of the aircraft, depending on how the airline is set up. An ICAO designator code is listed on all flight plans and identifies the operator. If no operator can be identified, then the owner of the aircraft becomes the 'operator' by default.

The principle of the scheme is straightforward. At the start of each year, every operator is allocated permits for the CO<sub>2</sub> they **expect** to emit. At the end of the year, they must give back permits for the CO<sub>2</sub> they **actually** emitted. Operators can buy or sell permits to make up the difference, although these come at a cost. This cost creates an incentive for operators to lower their emissions.

2004-6: Emissions 'baseline' for aviation sector

2010: 'baseline' year for individual operators, used to estimate 2012 emissions

2011: Aircraft operators predict and submit their emissions for 2012

2013: Second trading period of the EU ETS, where the number of available permits drops

Aircraft operators apply for permits based on the following principles:

- The total permits for aviation are capped at 221 million tonnes of CO<sub>2</sub>
- Each operator gets their permits from a single EU Member State
- This Member State is based on a) the country who issued the operating license, or b) the country that gets the most emissions from that aircraft operator in one year
- The operator needs to submit a verified report of their expected tonne-km
- The number of permits is based on industry average CO<sub>2</sub>/tonne-km (0.6796gCO<sub>2</sub>/tonne-km) multiplied by the operator's expected trade activity
- 85% of the permits are allocated for free
- The other 15% must be bought on carbon markets
- These carbon markets include Kyoto mechanisms like the CDM i.e. clean energy projects in developing countries

The restrictions on permits will tighten over time:

- The share of free permits will drop. Between 2013-2020, only 82% of aviations permits will be free, so that 3% can be reserved for new aircraft operators and those with unusually high growth in trade activity.
- Permits will start being auctioned from 2013. The EU is currently establishing rules for a common, non-discriminatory platform where these auctions will take place.
- The total number of permits will drop. Between 2013-2020, only 209 million tonnes of CO<sub>2</sub> will be allowed for aviation. If the sector exceeds this, they will need to buy permits from other sectors.

The total cost to the industry is unclear. Estimates by CATA suggest that Chinese airlines may lose more than \$300m (€250m) each year by 2020 (Black 2012), while an analysis in the Journal of Air Transport Management predicts a profit of \$2.6billion due to allowances being given away for free (Malinaa, et al. 2012). Yet another study estimates that airfares will rise by approximately 3% as airlines pass on the costs to passengers (OAG 2012).

Aircraft operators can be exempt from the ETS if they are based in non-EU states that have taken equivalent measures to reduce aviation's CO<sub>2</sub>.

### **EU ETS: industry response to this inclusion**

The response of the aviation industry has been broadly positive. Even though most of the industry press has been negative— about the costs, the burden to industry, or the fact that the action was unilateral – most airlines are taking part. For example, Singapore Airlines has stated that they will offset the impact by focussing on fuel efficiency, Ryanair, Delta, Lufthansa have raised their airfares, and Thai Airways is buying emission permits while the price is low. The bulk of the industry is cooperating.

Two responses have been more serious. However, neither of these has led to significant change:

- China Air Transport Association (CATA) has threatened not to cooperate. In January 2012, four airlines which CATA represents, threatened not to pay for permits. However, it is unclear whether this threat will be followed through on
- Airlines for America (A4A) carried out legal action in 2009. A4A appealed to the UK High Court about the implementation of the EU ETS, and the UK then requested that the European Court of Justice rule on the case. However, the European Court of Justice overturned the A4A appeal in December 2011.

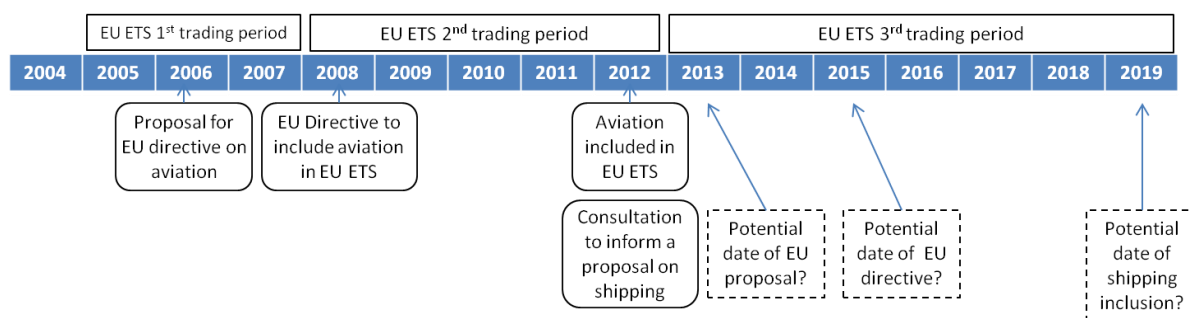
Arguments used in the A4A legal case are outlined in **Table 1**. Overall, the response of the aviation industry has done nothing to change the direction of EU policy.

### **Shipping and climate: expected regulatory developments**

There is a strong possibility that shipping will be included in the EU ETS, for the following reasons:

- It is in line with EU policy. The EU is aiming for a 60% cut in transport emissions by 2050, and a minimum of 40-50% cut in shipping will be required as part of this.
- It will have a significant impact globally. The European Climate Change Programme (ECCP) estimates that ships moving through EU ports contribute 31% of total shipping emissions.
- It builds on the precedent set with the aviation industry.

However, the pace of EU action is still not clear. It will partly depend on perceptions about how fast the IMO is acting and how effectively. It has been suggested that shipping be included in the EU ETS by 2017, but no firm targets have been set.



Shipping will not have a strong legal argument against being included in the EU ETS, as illustrated in **Table 1**.

## **Key conclusions/recommendations for Low Carbon Shipping**

- The shipping industry is much larger than the aviation industry, in terms of both its direct and indirect impacts
- The IMO is in a stronger position than the ICAO as a regulator of the industry
- There are strong reasons for shipping to be included in a European carbon reduction program in future
- There is scope for the shipping industry to shape the debate on the mechanics of this inclusion
- It is worthwhile for the industry to focus on *demonstrating* the effectiveness of programs to reduce CO<sub>2</sub>
- It is worthwhile for the industry to be proactive in terms of feeding inputs into climate policy

**Table 1: arguments for/against aviation and shipping in the EU ETS**

Argument used by Airlines for America to challenge EU ETS inclusion	ECJ rationale for overturning claim	Potential argument used by shippers to challenge EU ETS	Potential EU rationale for overturning claim
Violates customary law in <b>relation to sovereignty over national airspace</b>	EU ETS only applies to airlines choosing to fly to EU airports, not all airports. US operators still have the choice to fly somewhere else.	Violates customary law in relation to sovereignty over national EEZ	EU ETS only applies to ships that choose to use EU ports, not all ships or all ports.
Violates customary law in <b>relation to freedom of high seas</b>	EU ETS only applies to airlines choosing to fly to EU airports, not all airports. US operators still have the choice to fly somewhere else.	Violates customary law in relation to freedom of high seas	EU ETS only applies to ships that choose to use EU ports, not all ships or all ports.
Violates 2007 <b>Open Skies agreement between the US and EU</b>	Once aircraft are in EU jurisdiction, EU legislators have the remit to decide what commercial activity they permit and under what conditions	Violates free trade agreements	Once ships are in EU jurisdiction, EU legislators have the remit to decide what commercial activity they permit and under what conditions
Inclusion represents a <b>duty or tax</b>	No requirement for how much fuel planes 'have' to use – a company might not make a loss, or even profit	Inclusion represents a duty or tax	No requirement on how much fuel ships 'have' to use – a company may not make a loss, or even profit
Inclusion will restrict <b>air traffic</b>	The EU ETS does not set a limit on emissions, so it is not a restriction on air traffic. Even if a limit was set, this is still acceptable, as it is a non-discriminatory environmental measure	Inclusion will restrict marine traffic	The EU ETS did not set a limit on emissions, so it is not a restriction on marine traffic. Even if a limit was set, this isn't an issue, as it is a non-discriminatory environmental measure
ICAO is better placed to deal <b>with emissions</b>	The ICAO has had 15 years to act, since the Kyoto Protocol, and hasn't put any legally binding instruments in place	IMO is better placed to deal with this	IMO instruments have not led to significant reductions in emissions

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