EU Emissions Trading – Adding Aviation

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Summary

- EU Climate Goals
- Emissions Trading
- How does aviation fit in?
- Implementation and potential issues
- Possible future developments

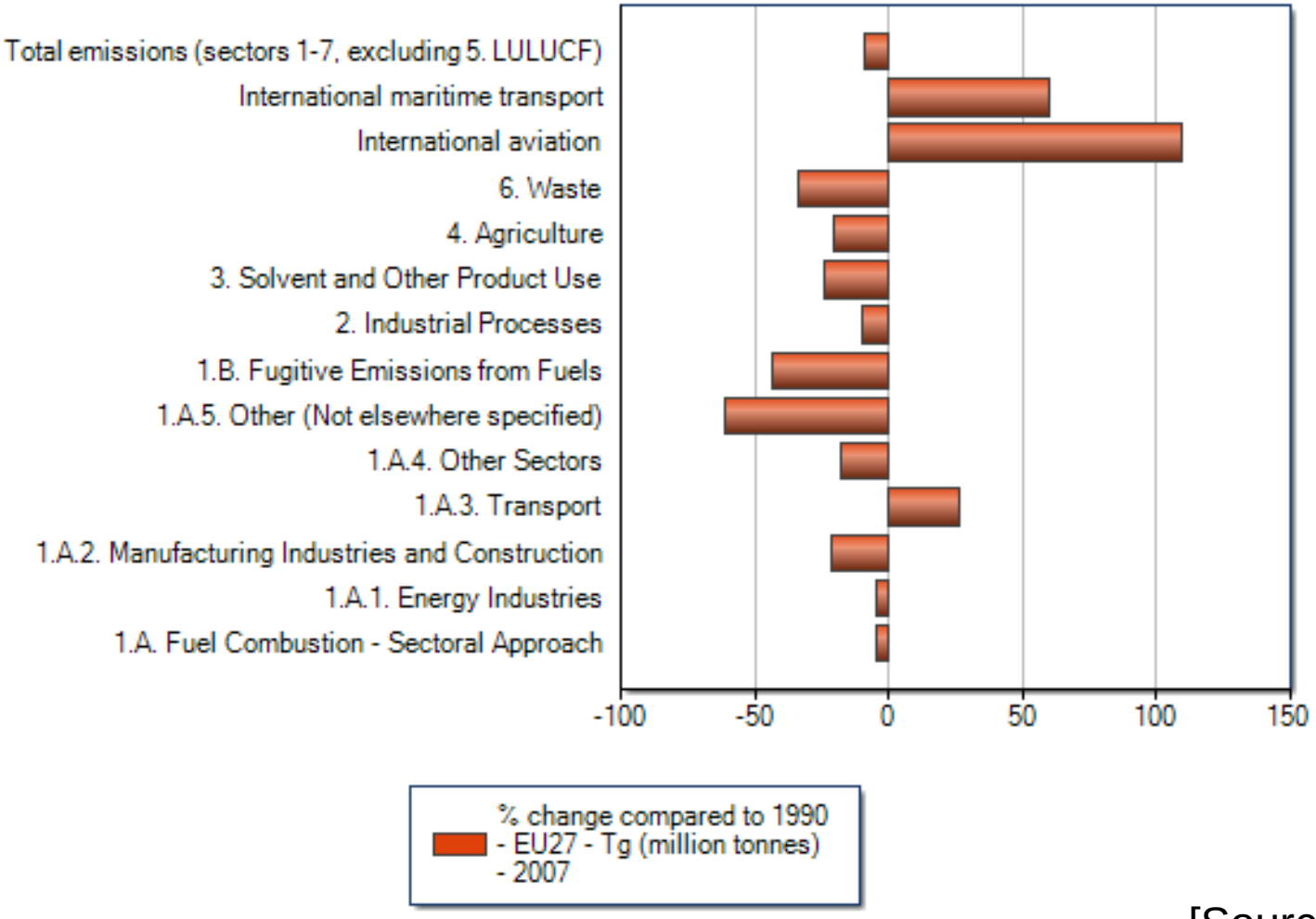
EU Climate Goals

- Kyoto Protocol first commitment period is 2008-2012
  - Imposes cap on total GHG emissions
  - E.g. For EU15 – 8% lower than 1990 levels
  - European Council has announced 2020 goal of 20% reduction from 1990 levels
- EU goal is to limit global temperature rise to 2°C
  - Likely requires stabilisation of atmospheric CO_2 equivalent levels at concentration of 450-550 ppm
  - Environmental consequences increase rapidly with temperature rise (see e.g. Stern 2006)

EU Climate Goals

- How does aviation fit in to this?
  - International aviation and shipping are not covered by Kyoto – no formal obligation to lower emissions
  - However, aviation emissions are rising, those from many other sectors are falling
  - Political issue in much of Europe
- Some countries also have individual targets, e.g. UK commitment to reduce aviation CO_2 to below 2005 levels in 2050

EU Emissions – Change since 1990



[Source: EEA]

Emissions Trading

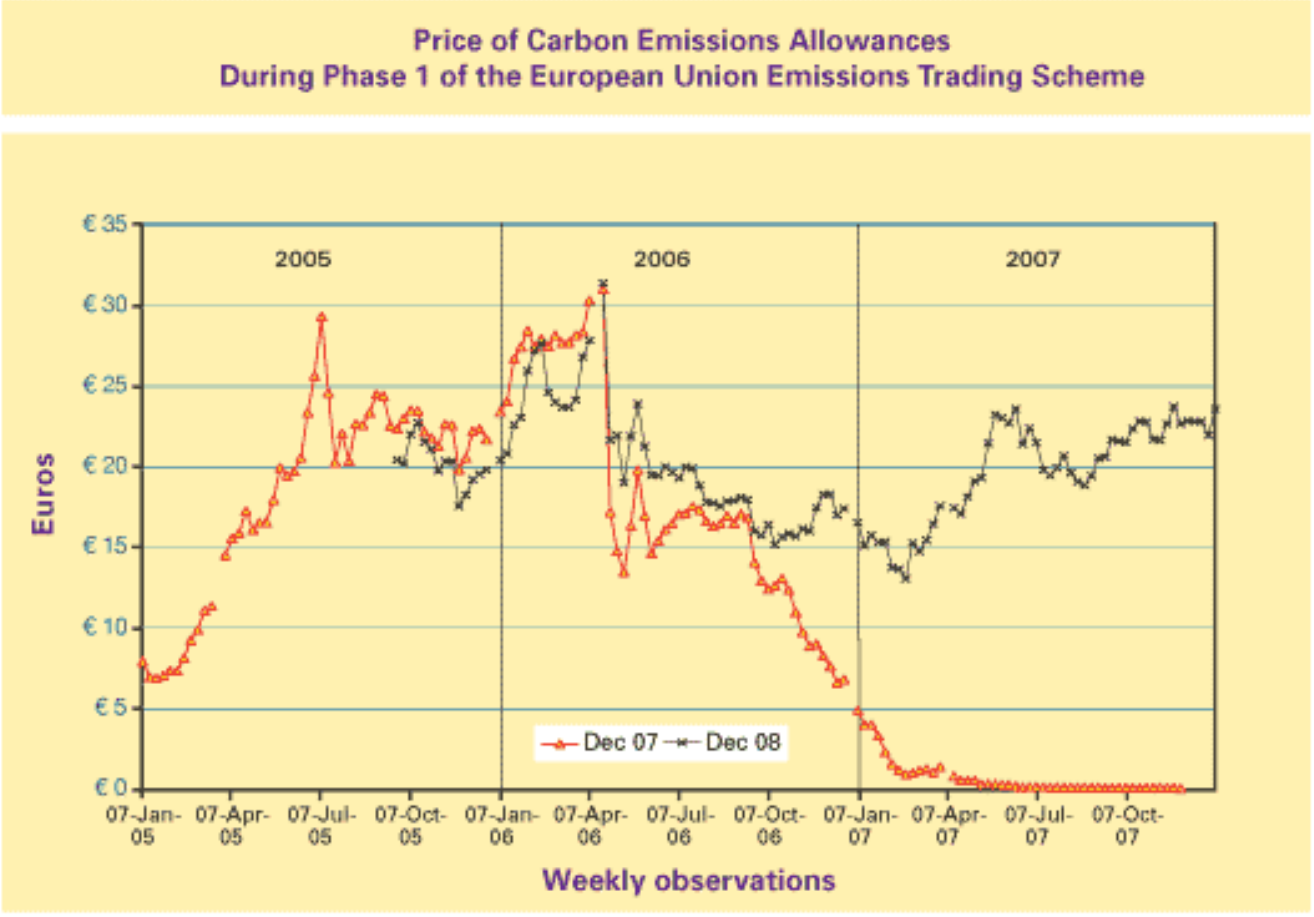
- Basic principle: “cap and trade”
  - Set a cap on emissions for a given year (e.g. 10000 tonnes of CO_2)
  - The number of available allowances adds up to this amount (e.g. 10000 permits for 1 tonne of CO_2)
  - Allocate these allowances to emitters by some method (often based on past emissions)
  - Allow trading in allowances to account for difference in ease/cost of reducing emissions
    - Emissions > Number of allowances → Buy allowances
    - Emissions < Number of allowances → Sell allowances
- Should result in lowest-cost pollution reduction solution (if working well!)

The EU ETS

- Covers a subset of Kyoto emissions
  - Currently, around 50% of Kyoto-covered CO_2 is in EU ETS
  - Power sector, some industrial sectors, combustion facilities
  - Intention is to expand coverage
- First proposed in 2001
  - “Trial period” 2005-2007
  - Now in second trading period, 2008-2012
- Partially linked to non-EU GHG reduction schemes (Linking Directive; CERs and ERUs)

The EU ETS

- Historical permit prices



[Source: MIT Energy Initiative]

The EU ETS

- Future allowance prices depend on cap level, demand, etc.
- Research suggests the effect of adding aviation on allowance prices will be small (e.g. EC, 2006; DEFRA, 2006)
- Analyses of future ETS development typically use a range of €5 - €60 per tonne of CO_2, with a midrange price of around €20
- Evidence from other emissions trading schemes (e.g. US EPA acid rain program) suggests prices may be subject to volatility

Adding Aviation to the EU ETS

- Suggested in 2005
- Endorsed by ICAO (open scheme only) and compatible with Chicago Convention
- Aviation growth still allowed
  - However, aviation likely to be a net buyer of allowances due to costs of abatement
- Requires airline actions pre-2012: monitoring and reporting of TKM and emissions
- EU is pursuing technological and operational measures for emissions reduction as well, e.g. SESAR

Scope

- All flights to or from an EU airport by any operator, with the exception of:
  - Heads of state/reigning monarchs/etc.
  - Military flights by military aircraft
  - Search and rescue/firefighting/medical/public service obligation flights
  - Scientific research
  - Circular or training flights
  - VFR-only or MTOW < 5700 kg
  - Commercial operators who fall under the de minimis rule
- Open scheme, 15% access to CERs and ERUs

Allowance Allocation

- No allocation
  - All allowances must be purchased on the market
- Benchmarking
  - Free allowance distribution based on benchmark year RTK
- Grandfathering
  - Free allowance distribution based on past emissions
- Auctioning
  - Allowances issued against payment

2012 Agreement: 15% Auctioning

Post-2012: Auctioning component may be increased

New Entrants / Small Emitters

- Special reserve of allowances (3%) to account for:
  - New operators
  - Rapidly expanding operators (TKM increasing by >18% per year)
- Different procedures for small emitters
  - Fewer than 243 flights per four-month period *or*
  - Annual emissions below 10000 tonnes CO_2
  - Commercial operators are exempt from ETS
  - Non-commercial operators have simplified reporting procedures.

Number of Aviation Allowances

- 2012 : Cap set at **97%** of historical emissions (historical = average of 2004-2006)
- Post-2012: **95%**
- 2010 benchmark RTK data used to determine what share each operator has of total free allowances
  - Does not determine cap

Administration

- Each aircraft operator administered by a member state
  - Typically state granting operating licence
  - If non-EU airline: EU state where most emissions occured in base year
  - More information:

http://ec.europa.eu/environment/climat/pdf/aviation/alloc_operators_110209.pdf

- Each member state has a Competent Authority (CA) designated by the member state to carry out administration
  - More Information:

http://www.airets.org/links.html

Operator Timetable

Date	Action
31 August 2009	Submit TKM monitoring plan (if applying for benchmarked allowances) and annual emissions monitoring plan to CA
2010	Benchmarking year – TKM monitoring
Early 2011	Compile and verify TKM report
31 March 2011	Submit verified annual emissions report (2010) and application for allowances with verified TKM
30 September 2011	EU decides benchmark (kg CO_2/TKM)
31 March 2012	Submit verified annual emissions report (2011)
31 August 2012	Submit revised annual emissions monitoring plan
31 March, following years	Submit previous year's verified annual emissions report
30 April, following years	Surrender allowances for previous year

Likely Impact on Aviation

- Models suggest:
  - Passenger demand decrease compared to ‘no aviation ETS’ baseline will be small (a few percent at most)
  - Ticket price increases: by 2020, €1 - €40 per round trip depending on distance
  - By 2020, annual CO_2 reduction will be around 190 Mt (compared to baseline)
  - Much of this reduction will be from non-aviation sectors
- Disagreement on:
  - Whether airlines will pass the full cost on to passengers (typically 30-100% in different models)
  - Whether airline profits will be significantly affected

Carbon Leakage

- ETS may prompt movement of emissions sources to outside the EU
- For Aviation: potential effect on routing and hubbing
- E.g JFK-LHR-DEL vs. JFK-DXB-DEL

  MLA-CAI-PEK vs. MLA-FRA-PEK

  LHR-HKG vs. LHR-DXB-HKG
- Mainly affects major international hubs and edges of Europe
- Research suggests this effect is likely to be small at projected permit prices (Albers et al. 2009)
  - Flying longer routes and/or changing hubs incur costs

Future developments

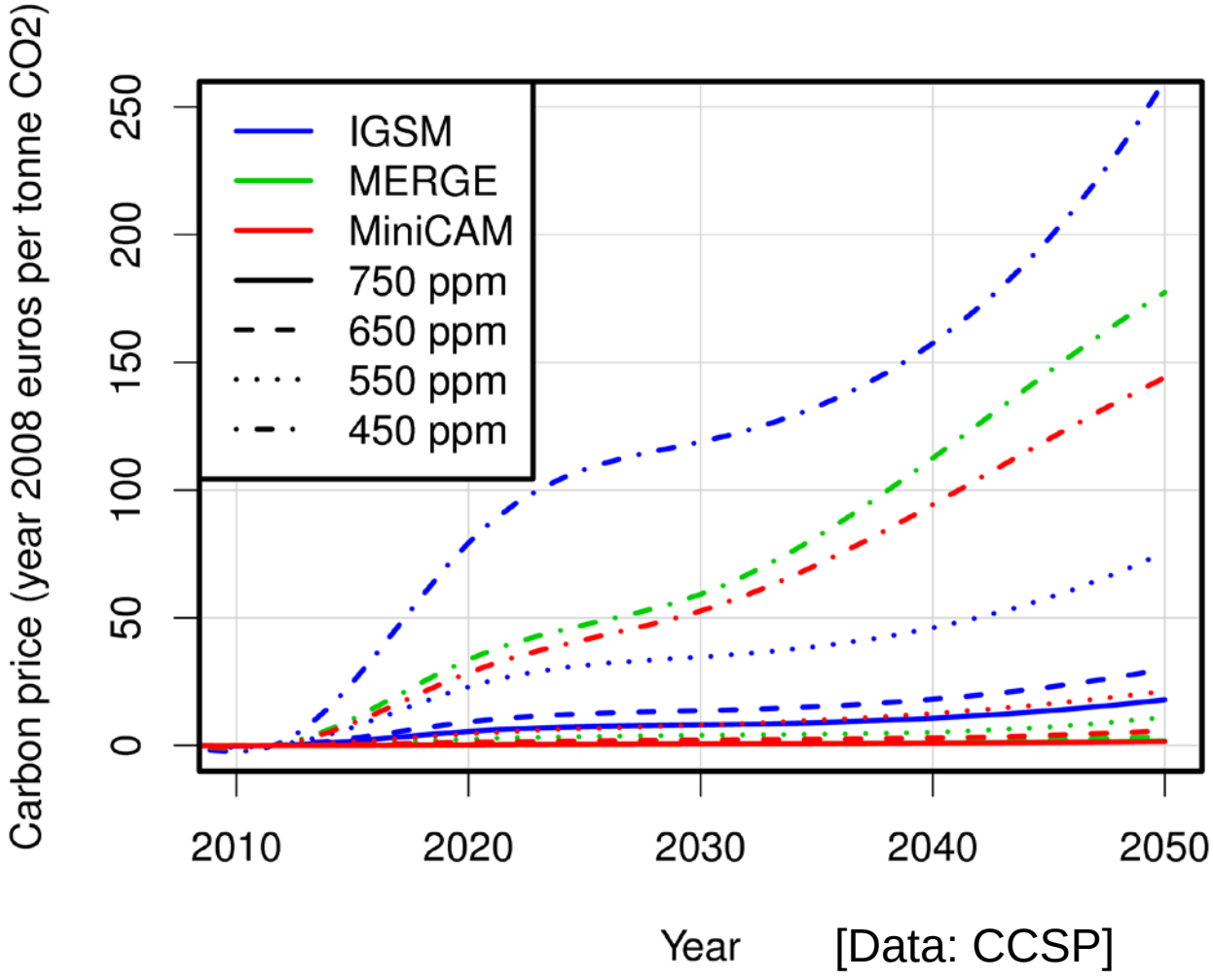
- EU ETS and global climate policy likely to evolve
- Global ETS possible:
  - Dec 2009 UN Climate Change Conference in Copenhagen
  - Envisaged as successor to Kyoto (“Washington Declaration”)
- Aviation emissions could be subjected to an uplift factor
  - This was previously part of the proposal for adding aviation to the EU ETS
- Goals for cap level/acceptable atmospheric CO_2 levels may change

Global vs. Regional ETS

- Global scheme has many benefits:
  - More low-cost abatement opportunities → lower permit prices
  - Cap can be directly linked to climate effect
  - Less distortion of competition
- European emissions trading may be amended significantly depending on agreement for global scheme
- If a global scheme is **not** set up, the EU ETS is likely to be linked to other regional schemes

Cap Level and Permit Prices

- CCSP (2007) models of open global ETS



Uplift factors

- Aviation's global warming contribution is not limited to CO_2
  - Some proposals try to account for this by introducing an 'uplift factor' (ETS-liable emissions = Uplift x CO_2)
- Previous Aviation/EU ETS proposal: Uplift = 2
- Main problem: calculated factor depends on time horizon

Pollutant	Time in Atmosphere
CO_2	Hundreds of years
NO_x	decades
Contrails/Induced Cirrus	<1 day

- Over long time horizons Uplift ~1

Further Information

ETS guidance for Aviation Industry

http://ec.europa.eu/environment/climat/pdf/aviation/nl_guidance.pdf

Models looking at the likely effect of emissions trading on the European aviation industry

http://ec.europa.eu/environment/climat/pdf/aviation/sec_2006_1684_en.pdf

http://www.europarl.europa.eu/meetdocs/2004_2009/documents/dv/tran20070627_summeandy_pres_/tran20070627_summeandy_pres_en.pdf

http://www.omega.mmu.ac.uk/Events/FINAL - Opportunities for Reducing Aviation-related GHG Emmissions 230209.pdf

Background on the EU ETS

http://www.pewclimate.org/docUploads/EU-ETS-In-Perspective-Report.pdf