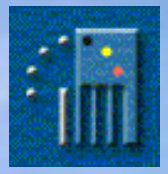
Aviation and the Belgian Climate Policy : Integration Options and Impacts

ABC Impacts

Potential mitigation measures for non-CO_2 climate impacts



Workshop on non-CO_2 aviation climate impacts

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ULB
Vrije Universiteit Brussel
Electrical Engineering and Energy Technology
Vrije Universiteit Brussel
Department of MOSI – Transport and Logistics
UCL Université catholique de Louvain ASTR

Overview of the non-CO_2 mitigation options

1. Regulation (emission standards)
2. Financial/economic tools
3. Infrastructure
4. R&D
5. Voluntary actions

1. Regulation

- Existing ICAO standards on NO_x engine emissions with new requirements since 2008

Advantages	Drawbacks
➢ international implementation	➢ based on LTO cycle
➢ additional benefits = reduction local air pollution (if no growth in traffic volume)	➢ no consideration related to the altitude where emissions occur
	➢ decision process very slow => in phase with technological progress ?
	➢ applicable to other climate impacts precursors ?

1. Regulation (2)

- Potential more stringent EU standards :
  - improvement of local air quality impacts (if no growth in traffic volume) => in phase with NEC directive, etc.

  but

  - no global implementation => market distortion ?
  - evasion risk => questionable positive impacts on global climate change
  - standard on cruise emissions => methodology to assess these emissions to be developed (aircraft/engine couple + weight) ?

2. Financial/economic instruments

2.1. Market mechanisms

2.2. Tax on emissions

2. Financial/economic instruments (1)

2.1. Market mechanisms

- **Integration** in the EU-ETS
  - with a multiplier
    - fix (trade-offs between GHGs not taken into account ; simplicity)
    - variable (based on simplified indicators such as the altitude, the route, the season, the aircraft type, etc. => more accurate but need more data)
  - with separate certificates to be traded in parallel (conversion with CO_2 certificates?)
- **Separate trading scheme for non-CO_2 emissions** (feasible for NO_x but difficult for other climate impacts ; conversion with CO_2 certificates ? ; other sources to be included ?)

2. Financial/economic instruments (3)

2.2. Tax on emissions

- Tax on NO_x emissions
  - revenue-neutral scheme (Sweden and Switzerland) or not (UK)
  - LTO charge (no link with altitude and real climate impact ; simplicity)
  - en-route charge (methodology to assess the real emissions and associate climate impact to be developed)

3. Infrastructure

Slot allocation based on environmental performances ?

- Process of slot allocation very different from one airport to another => feasible ?

4. R&D

4.1. Engine improvements

4.2. Alternative fuels

4.3. Meteorological forecasts

4.4. Optimisation of operational measures (ATM)

4. R&D (2)

4.1. Engine improvements

- trade-off between fuel efficiency, noise and AIC
- ACARE project aims at reducing emissions at source
- OK for CO_2 and NO_x (+/- LT) if no traffic growth ; quid for AIC (cf. better fuel efficiency linkedd with more AIC formation)?

4. R&D (3)

4.2. Alternative fuels

- production process to be taken into account
- potentially greater AIC impacts (cf. biofuels have lower carbon content)

4. R&D (4)

4.3. Meteorological forecasts + ATM

- German project UFO evaluates the possibilities to predict ice super saturated areas (where AIC are produced)
- Lufthansa's LIDOL software to optimise flight patterns taking into account AIC formation (cf. ISSA are quite thin : +/- 300m)

Remark : trade-off between AIC avoidance and increased fuel consumption calculated on the basis of an "energy metric" of contrails (estimated RF * duration * surface occupied) compared to the "energy metric" of CO_2 (RF * 100 years * world-wide surface)

4. R&D (5)

4.4. Optimisation of operational measures (ATM)

- Camera on aircraft : easily feasible but difficult to predict fuel use
- Continuous Descent Approach
- SESAR and other projects to improve airspace capacity and reduce congestion at airports : ok at short term to reduce fuel consumption but impact at longer term (cf. example of the highways) ? + do not take into account AIC formation

5. Voluntary actions

5.1. Manufacturers voluntary agreements

- Engine and/or aircrafts manufacturers

5.2. Voluntary offsets

Many thanks for your attention !

Any questions ?

More details and information available on :

http://www.climate.be/abci