



# Historical Aviation CO<sub>2</sub> Emissions Calculation

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DG Climate Action  
European Commission

# Introduction



- ★ Historical aviation emissions provide the basis of the additional emissions cap for aviation
- ★ Directive says that Commission to decide on historical aviation emissions for EU 27
- ★ EEA Joint Committee to decide on historical aviation emissions for EEA 30
- ★ Based on best available data

# Background



- ★ Initial work carried out in 2009
- ★ Draft decision prepared in summer 2009
- ★ The Decision was not ultimately adopted by the Commission
- ★ Airlines requested additional work on APU use
- ★ Commission Decision adopted on 7 March 2011
- ★ EEA JCD adopted on 1 July 2011

# Approach to 2011 Decisions



## ★ Basic approach

- Emissions calculated on the basis of comprehensive flight data
- Updated data developed in 2009 to reflect latest knowledge of aircraft operators covered by the EU ETS

## ★ Additional data on fuel consumption at airports now included – reflecting the use of auxiliary power units (APUs) on aircraft

# Calculation of flight based data



## ★ In 2009

- Commission asked Eurocontrol to calculate emissions
- Methodology subject to external, independent validation (INNAXIS and Technical University of Madrid)
- Methodology reviewed by experts:
  - European Environment Agency,
  - Commission's Joint Research Centre,
  - European Aviation Safety Agency
- Feedback from Member States experts
- Strong agreement by the experts on proposed approach & methodology

# Agreed methodology for flight emissions



## ★ Air traffic management information from:

- Eurocontrol databases: CRCO + CFMU
- complemented by additional data from national aviation authorities

## ★ Emissions methodology:

- ANCAT 3 + CASE on flight-by-flight basis
- actual fuel burn information from aircraft operators
- reconciling methodology: recalculation of emissions using aircraft operator derived fuel consumption coefficients

# 2009 results



	2004	2005	2006
CRCO	205 768 287	217 293 873	225 161 413
Estonia	21 094	22 965	26 398
French Overseas Departments	309 594	303 058	269 224
Latvia	29 803	59 471	68 491
Lithuania	11 514	16 226	17 421
Poland	137 342	140 823	153 947
Other data	5 705	7 956	2 177
Total	206 283 339	217 844 372	225 699 071

**Arithmetic average: 216 608 927 tonnes  
CO<sub>2</sub>**

# Further adjustments in 2011



- ★ Updated information on status of aircraft operators and inclusion in scope of EU ETS
- ★ Based on feedback from MS competent authorities (e.g. commercial status) which showed more exempt flights
- ★ Enabled more accurate calculation of flight based emissions

	<b>2004- 2006 Average Emissions (t CO<sub>2</sub>)</b>
2009 calculation	216,588,594
Revised 2011 calculation	216,018,858



# Additional study on CO<sub>2</sub> from APUs



- ★ The Commission asked Eurocontrol to look into APU use
- ★ Very little data available
- ★ Discussions with aviation trade associations
  - submitted methodology in late 2010
- ★ Eurocontrol improved the methodology
  - applied Eurocontrol's comprehensive air traffic data (e.g. number of flights by different aircraft types)
  - applied APU emissions factors and operating times from ICAO guidance (Airport Air Quality Guidance Manual)
    - Short haul – 45 minutes with 80 kg of fuel
    - Long Haul – 75 minutes with 300 kg of fuel

# Adjustments to reflect ground power



- ★ Commission considered that base methodology likely to overestimate APU fuel consumption as assumes no use of ground power
- ★ Survey of 26 major airports in Europe to assess the extent of use of ground power
- ★ Adjustments made to:
  - reflect actual use of ground power in the major European airports surveyed; and
  - avoid overlaps with scope of the calculation for flight based emissions (measured from block-off to block-on)
- ★ Highly conservative approach, no ground power assumed to be used in any other airports outside 26 surveyed

# 2011 Results for EU 27



	<b>2004- 2006 Average Emissions (tonnes of CO<sub>2</sub>)</b>
Flight CO <sub>2</sub>	216,018,858
APU CO <sub>2</sub>	3,457,485 (+ 1.60%)
Total CO <sub>2</sub>	219,476,343

# Historic aviation emissions for EEA 30



	<b>2004- 2006 Average Emissions (tonnes of CO<sub>2</sub>)</b>
EU 27	219 476 343
EEA-EFTA 3	1 943 935
Total for EEA 30	221 420 279



# Any questions?

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