Historical Aviation $\text{CO}_2$
Emissions Calculation

6 July 2011, Brussels

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.
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

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

**Arithmetic average:** 216 608 927 tonnes CO$_2$
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

<table>
<thead>
<tr>
<th></th>
<th>2004-2006 Average Emissions (t CO₂)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009 calculation</td>
<td>216,588,594</td>
</tr>
<tr>
<td>Revised 2011 calculation</td>
<td>216,018,858</td>
</tr>
</tbody>
</table>
Additional study on CO$_2$ 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

<table>
<thead>
<tr>
<th></th>
<th>2004- 2006 Average Emissions (tonnes of CO$_2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flight CO$_2$</td>
<td>216,018,858</td>
</tr>
<tr>
<td>APU CO$_2$</td>
<td>3,457,485 (+ 1.60%)</td>
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<tr>
<td>Total CO$_2$</td>
<td>219,476,343</td>
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</table>
## Historic aviation emissions for EEA 30

<table>
<thead>
<tr>
<th></th>
<th>2004- 2006 Average Emissions (tonnes of CO$_2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU 27</td>
<td>219 476 343</td>
</tr>
<tr>
<td>EEA-EFTA 3</td>
<td>1 943 935</td>
</tr>
<tr>
<td>Total for EEA 30</td>
<td>221 420 279</td>
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Any questions?

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