

ICAO/UNFCCC EXPERT MEETING

Responding to the invitation of the SBSTA18, the ICAO, in cooperation with the UNFCCC secretariat, organized an expert meeting with the participation of aviation and Greenhouse Gas (GHG) inventory experts. The objectives of the meeting were:

- to consider methodological issues relating to the estimation and reporting of GHG data from aviation, under the UNFCCC process;
- to provide advice/guidance to the IPCC on possible improvements or further elaboration of the methodologies for aviation that are included in the 1996 IPCC Guidelines. The results of this meeting could serve as an input to the development of the 2006 IPCC Guidelines.

The meeting focused on the following issues:

1. Comparison of modeled data (AERO2K, SAGE, AERO etc.) with UNFCCC inventory data

- Identify differences and provide explanations for these differences

2. Methodological issues relating to the estimation of GHG emissions from international aviation:

- Distinction between domestic and international emissions
- Evaluate the IPCC 1996 methodology for separating domestic and international emissions and, if appropriate, identify possible ways to improve it
- Critical consideration of the IPCC estimation methodologies (IPCC 1996 Guidelines and IPCC Good Practice Guidance) to determine how these methodologies could be improved – The meeting focused on the following issues:
 - * Identification of alternative methods for estimating GHG emissions;
 - * New and/or updated emission factors;
 - * Identification of new procedures for activity data collection/compilation/usage; and
 - * Possible availability of models that could be used by GHG inventory compilers
- Determine how modeled data (AERO2K, SAGE, AERO etc.) could assist in the above tasks and if, and how, they could be used for future work under the Convention.

Comparison of modeled data

Comparisons of UNFCCC CO₂ and fuel consumption data with modeled data from SAGE and AERO2K, in addition to AERO, were presented for selected Annex I Parties. The modeled data were different from the UNFCCC data for a number of the selected countries. In addition, there were differences between the results of the two models. The comparison was performed for the AERO2K using data for 2002 while UNFCCC and SAGE data referred to 2000 and 2001.

The two models were at different levels of development and validation, with SAGE being further developed and committed to produce global inventories on annual basis. For the AERO2K, further checks and validation is required before results can be formally published.

The comparison proved to be a valuable exercise towards the further improvement of quality of the modeled data. It offered useful conclusions that will lead to the further improvement of both models.

Some improvements in the models for the purposes of generating data for comparing with the UNFCCC data were agreed, such as:

- Data comparison using a common (2002) year;
- Common definition of international and domestic flights and flight legs;
- Common definition of national territories (airport code/country allocation);
- Definition of commercial, general aviation and military aviation;
- Comparison of detailed model assumptions (e.g. time-in-mode, winds...);
- Comparison of annual traffic data (e.g. sources, data cleaning, flight profiling);
- Detailed individual flight fuel flow (and emissions) comparison for a variety of aircraft, ranges and altitudes).

An initial level of detailed comparison is planned for summer 2004. When this comparison work is completed the fuel-use breakdown by country from SAGE, AERO2K and FAST will provide a better basis for comparison with other methodologies, including UNFCCC data.

Methodologies

The meeting recognized the importance of complete, reliable, consistent and accurate information on emissions from aviation and that the 1996 IPCC Guidelines and the IPCC Good Practice Guidance provide useful methodologies for estimating emissions by all Parties. However, it was recognized that the IPCC methodologies are based on fuel usage and/or information on LTOs, whereas the models mentioned above (AERO, AERO2K, SAGE and FAST) use a more detailed approach using information on individual flights.

The meeting noted that a number of Annex I Parties are using a tier 1 method for estimating emissions from aviation. It was further noted that accuracy could be improved if steps were taken to enable Annex I Parties to use higher tiers.

It was noted that a number of Parties have problems disaggregating between domestic and international fuel from the total fuel sold data and use the tier 1 or tier 2a method of the IPCC because of the unavailability of the necessary information required for a higher tier approach. However, for these Parties it may be possible to improve the accuracy of the emissions through checks using other sources of data e.g. from: aviation authorities, airlines, airports, refineries and aviation inventory sources.

There was general agreement that there is scope for improving the 1996 IPCC Guidelines and the IPCC Good Practice Guidance in the following respects:

Improving the definition of domestic and international flights (it was felt that it is difficult to obtain the information on passenger and freight drop-off and pick-up at stops in the same country that is required by the latest IPCC definition contained in the Good Practice Guidance):

Adding new methodology(ies) that would take into account more detailed data including the consideration, in addition to the fuel sold data, flight movement data, which may include as an example the EMEP/UNECE CORINAIR Detailed Methodology.

Detailed methodologies that are solely based on flight movements data (origin and destination) could also be considered during the revision of the guidelines (ICAO is currently in the process of considering SAGE and AERO2K for endorsement).

A reconsideration of the decision tree of the GPG – for illustrative purposes a hierarchical tree has been attached. This is not a proposal for a new decision tree, but a visual representation of possible tiers in the new IPCC guidelines.

Revising the emission factors in the existing guidelines taking into account the latest available information in the ICAO Exhaust Emission Data Bank, information from the AERO2K and SAGE models, and any other available information in this area. The participants agreed that this work will be coordinated by ICAO/CAEP before the IPCC Energy Sector Authors meeting in September 2004.

The developers of the AERO2K, SAGE and FAST offered to examine the effects of the different IPCC tiers on the emissions levels as an input for the development of the 2006 IPCC Guidelines on a limited set of examples for which full data are available.

It was noted that some countries have difficulties in obtaining movement data that are necessary for using a more advanced methodology that requires this type of information. There was substantial discussion on the possibility of providing such data in order to assist states to improve the comparability of emissions data among Parties. It was noted that the ICAO Secretariat has a database of commercial flights (scheduled services only, airport-to-airport, aircraft type and airline).

It was also discussed whether the availability of a computer program that would provide for a user-friendly tool to estimate emissions using a detailed methodology would be useful for GHG inventory experts and if ICAO could play a role.

The meeting also noted that availability of national GHG emissions data disaggregated by commercial, general aviation and military traffic would be desirable in order to improve the comparability with modeled data. It suggested that this information could be provided by Parties in their national inventory reports.

The meeting confirmed the importance of continuing close cooperation and coordination of work under UNFCCC, IPCC and ICAO with the goal to further improve and harmonize methodologies to estimate GHG emissions from aviation.