



WORKING PAPER

**HIGH-LEVEL MEETING ON INTERNATIONAL AVIATION
AND CLIMATE CHANGE**

Montréal, 7 to 9 October 2009

Agenda Item 2: Proposals for strategies and measures to achieve emissions reductions

AVIATION ALTERNATIVE FUELS

(Presented by the Secretariat)

SUMMARY

In support of the requests from the ICAO Council and CAEP, ICAO organized the Workshop on Aviation and Alternative Fuels in February 2009 (WAAF2009). Building upon the results of the Workshop, ICAO will hold a Conference on Aviation and Alternative Fuels in November 2009 (CAAF2009). The objectives of the Conference are to stimulate a dynamic exchange of views as well as to establish a global roadmap to constitute an integral element of ICAO's proposals to COP15.

Action by the HLM-ENV is in paragraph 4.

1. INTRODUCTION

1.1 In accordance with Appendix K of Assembly Resolution A36-22, three key elements of the ICAO Programme of Action are: 1) global aspirational goals for international aviation; 2) measures to achieve emissions reductions; and 3) means to measure progress. This paper addresses the second element of the Programme of Action and focuses on alternative aviation fuels to achieve emissions reduction.

1.2 The 36th Session of the ICAO Assembly "recognized the importance of research and development in fuel efficiency and alternative fuels for aviation that will enable international air transport operations with a lower environmental impact". The Assembly further "encouraged the Council to promote improved understanding of the potential use, and the related emissions impacts, of alternative aviation fuels". Accordingly, ICAO promptly undertook efforts to "promote improved understanding of the potential use and emission effects of alternative fuels".

1.3 Regional and national consortia have done an excellent job of bringing together the expertise to consider technical issues through initiatives like the Commercial Aviation Alternative Fuels Initiative (CAAFI) and IATA's Air Transport Action Group (ATAG). As a global industry, however, international aviation requires global harmonization and consistency for optimum efficiency of

operations. As the only recognized forum to deal with international aviation, ICAO is committed to fulfilling its leadership role in achieving effective coordination among all aviation stakeholders.

2. WORKSHOP ON AVIATION AND ALTERNATIVE FUELS

2.1 In support of the requests from the ICAO Council and CAEP, the Environment Section of the Air Transport Bureau of ICAO organized the Workshop on Aviation and Alternative Fuels in February 2009 (WAAF2009).

2.2 Around 150 participants from 114 States and International Organizations attended. The objective of the workshop was to explore potential options, challenges to development and deployment as well as initiatives to promote international cooperation in alternative aviation fuels. The workshop featured 39 presentations from policy makers, regulatory and certification authorities, international airlines, NGO's, aerospace and fuel industry representatives. All of the presentation materials are available on the workshop website (<http://www.icao.int/waaf2009/>).

2.3 There was general agreement that aviation fuels can be a win-win solution for reducing aviation's dependence on fossil fuels and a key element to help reduce the impact of aviation on climate change. It was also noted that alternative fuels should be part of a comprehensive aviation energy strategy that includes technology, operational measures, and market-based measures. The following points were highlighted in the workshop:

- Given sufficient demand or incentive, significant supplies of jet fuel that offer a 50% or more reduction in life-cycle CO₂ emissions could be available in 15 years;
- Adoption of alternative fuels by aviation may be simpler than for other sectors due to the relatively small number of fuelling locations;
- Alternative fuels could be a win-win solution by reducing aviation's dependence on fossil fuels and helping to reduce the impact of aviation on climate change; and
- American Society for Testing and Materials (ASTM)/UK Defence Standards (DEFSTAN) certification for blends of alternative fuels is underway.

2.4 Over the past two years, a number of successful in-flight tests using various blends of alternative fuels have been conducted and much progress has been achieved. Expectations are high for greater use of environmentally friendly drop-in bio-fuels for aviation in the short to medium term. To fully assess the environmental impact of alternative fuels there is a strong need to standardize quantification of life-cycle carbon footprints of all fuels.

3. NEXT STEP: CONFERENCE ON AVIATION AND ALTERNATIVE FUELS

3.1 The ICAO Council, during its 187th session, approved the plan to hold an ICAO Conference on Aviation and Alternative Fuels (<http://www.icao.int/caaf2009/>) to be hosted by Brazil from 16 to 18 November 2009 (CAAF2009). The objectives of the Conference are to stimulate a dynamic exchange of views as well as to consider establishing an internationally agreed and globally harmonized roadmap involving all stakeholders for facilitating the implementation of alternative fuels for aviation.

The intent is for such a roadmap to constitute an integral element of ICAO's Programme of Action on international aviation emissions.

3.2 As with the Workshop, the conference aims to gather the best available expertise for alternative fuels in order to support data-based decision making for global aviation. All members of the aviation community involved in energy and environmental policy, including energy producers, airlines, airports and equipment manufacturers, as well as policy-makers at regional, national, and local levels, are invited. Results of this conference will provide critical input to ICAO and will allow consideration of sound policy options in aviation alternative fuels. It is envisaged that the conference will address *inter alia*:

- Framework for calculating life-cycle (well-to-wake) carbon footprints;
- A globally harmonized way of assessing technology readiness level of aviation fuels;
- A standardized vocabulary and definition of terms used in alternative fuels;
- Guidance to facilitate the estimation of airport/airline/distributor/fuel supplier costs and benefits;
- A range of means that States can apply to overcome aviation-specific global production, distribution and storage challenges associated with alternative fuels;
- Recommended areas for States to consider incentivizing investment in alternative fuels for aviation; and
- A roadmap for aviation alternative fuels, including timeline and goals that will be used in connection with the outcome of the HLM-ENV to form ICAO's position to COP15.

3.3 The conference is organized in four strategic sessions: environmental benefits; technological feasibility; economic reasonableness; and interdependencies with other environmental factors. The Environment Section, in coordination with the Conference Organizing Committee established following the Workshop, is preparing the background documentation for this conference with a view to ensure that a successful event takes place that will facilitate the establishment of a globally harmonized roadmap for development and deployment of alternative aviation fuels. The CAAF2009 documents by the Secretariat will provide background information on the discussions to date within and outside ICAO, including a summary of the challenges associated with the reduction/limitation of greenhouse gas emissions from international aviation and of the various proposals made to address these challenges. The following paragraphs summarize the four sessions currently planned for the Conference.

3.3.1 **Environmental sustainability and interdependencies.** The topics to be discussed under this agenda item will include benefits of alternative fuels versus conventional fuels, sustainability of alternative fuels in the long term, life cycle assessment, and air quality measurements.

3.3.2 **Technological feasibility and economic reasonableness.** The focus will be on research and development (what has been done, what remains to be done, progress on measurement, etc.) and the results of in-flight testing of alternative fuels.

3.3.3 **Measures to support development and use.** Topics to be discussed will include the availability of alternative fuels (short, medium, and long term) and a broad range of implementation issues.

3.3.4 **Production and infrastructure.** The key issues under consideration will include investment in new plants, infrastructures challenges for global distribution, storage and distribution, and safety aspects.

3.4 It is expected that these sessions will lead to the establishment of the necessary building blocks for establishing an internationally agreed roadmap for development and deployment of aviation alternative fuels. Significant resources are being devoted to coordinating with States and international organizations to organize this conference and to make it a success. The final output of the conference will build upon ICAO's existing positions and harmonize various research and development efforts currently underway worldwide.

4. **ACTION BY THE HIGH-LEVEL MEETING**

4.1 The HLM-ENV is invited to:

- a) agree that alternative fuels can be a key element of reducing the impact of international aviation on climate change;
- b) confirm that ICAO should continue to facilitate global efforts for the implementation of alternative fuels for aviation;
- c) urge all Contracting States and international organizations to actively participate in CAAF2009 by contributing with documentation providing information about their alternative fuel efforts and strategies to promote such efforts at the international level; and
- d) recommend ICAO to incorporate the roadmap on aviation and alternative fuels to be established during CAAF2009 into the position delivered at COP15.

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