



## ASSEMBLY — 36TH SESSION

### EXECUTIVE COMMITTEE

#### Agenda Item 17: Environmental protection

#### A COMPREHENSIVE APPROACH TO MANAGING AVIATION'S ENVIRONMENTAL IMPACTS

(Presented by Portugal, on behalf of the European Community and its Member States<sup>1</sup>, by the other States Members of the European Civil Aviation Conference<sup>2</sup>, and by Eurocontrol)

#### EXECUTIVE SUMMARY

This paper stresses the importance of addressing global and local environmental impacts in order to ensure sustainable growth in the aviation industry. It focuses on efforts to reduce emissions through the application of a comprehensive approach comprising the elements of technical standards, research and technological development, air traffic management modernisation and market-based measures. It then explains Europe's position on the last of these elements, in particular emissions trading and charges, as part of this approach.

**Action:** The Assembly is invited to:

- a) note the latest evidence from the IPCC on the consequences for climate change if current levels of greenhouse gas emissions are not reduced;
- b) note that, whereas IPCC calls for a reduction in such emissions, those from aviation are growing and are expected to continue growing despite technological and operational improvements;
- c) facilitate the use of market-based measures, including charges and emission trading, to help Contracting States manage these emissions;
- d) note Europe's commitment to a comprehensive approach to tackling aviation emissions; and
- e) re-affirm its commitment to the principle of non-discrimination on the basis of nationality in the application of environmental measures.

<i>Strategic Objectives:</i>	This working paper relates to Strategic Objective C ( <i>Environmental Protection – Minimize the adverse effect of global civil aviation on the environment</i> ).
<i>Financial implications:</i>	Not applicable.
<i>References:</i>	

<sup>1</sup> Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom. All these 27 States are also Members of the ECAC.

<sup>2</sup> Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Croatia, Georgia, Iceland, Moldova, Monaco, Norway, Serbia, Switzerland, the former Yugoslav Republic of Macedonia, Turkey and Ukraine.

## 1. AVIATION'S IMPACT ON THE ENVIRONMENT

1.1 Civil aviation has brought many benefits to modern society and is important for the global economy because it facilitates economic growth and cultural exchange and is a significant source of employment.

1.2 On the other hand, it also has negative impacts on the environment at a local as well as at a global level, caused primarily by noise and engine emissions.

### Local impacts

1.3 Aircraft operations contribute to noise problems and air pollution and these effects must be addressed if expansion in airport capacity is to continue being possible and enjoy sufficient public support. Although significant reductions in airframe and engine noise have been made, it is necessary to achieve further such improvements to counter the effect of increased aviation activity.

1.4 In Europe, air quality standards for concentrations of particulates and NO<sub>2</sub> are already breached or at real risk of not being met around several airports. With aircraft emissions of NO<sub>x</sub> expected to double within the next two decades and other sources increasingly subject to tighter regulations, the effect of aircraft engine emissions on local air quality and on health (in particular through the contribution to concentrations of NO<sub>2</sub>, secondary inorganic aerosols and ozone) is assuming increasing importance.

### Global impacts

1.5 The latest assessment from the Intergovernmental Panel on Climate Change (IPCC) states that Continued greenhouse gas emissions at or above current rates would cause further warming and induce many changes in the global climate system during the 21<sup>st</sup> Century.

1.6 It estimates that global average temperatures will rise by between 1.1 and 6.4 degrees C by the end of the century.

1.7 The impact of such climate change will be severe and widespread, and particularly hard to cope with in developing countries whose capability to adapt to changes may be lower. To prevent this from happening it is essential that all sectors contribute to limiting or reducing their greenhouse gas emissions: civil aviation is no exception.

1.8 Although aviation currently accounts for only a few percent of greenhouse gas emissions, the quantity of these emissions is growing rapidly in many countries and is projected to continue doing so in the future. Greenhouse gas emissions from international aviation reported by Annex I countries to the United Nations Framework Convention on Climate Change (UNFCCC) for 2004 show a cumulative growth of 52 per cent from 1990 levels. In Europe alone, the additional warming effect from these emissions will offset more than a quarter of the environmental impact of the emission reductions required by the European Community's target under the Kyoto Protocol if this growth rate continues.

1.9 Furthermore, scientific research indicates that aviation has a greater impact on climate than just its greenhouse gas emissions. In 1999 the IPCC estimated – based on 1992 data – that the overall radiative forcing from aviation was between 2 and 4 times greater than that of its CO<sub>2</sub> emissions alone, *excluding* the effect from changes in cirrus cloud formation.

1.10 It is fair to say that the contribution of emissions to climate change represents a most serious challenge to the sustainable growth of aviation and one that cannot be ignored.

## 2. THE NEED FOR A COMPREHENSIVE APPROACH

2.1 No single measure is capable of adequately addressing all the environmental impacts from aviation.

2.2 As regards the management of aircraft noise, in common with other ICAO Contracting States, European states are implementing the "balanced approach" and support the decision at CAEP7 for the effectiveness of this approach to be reviewed. In addition to the balanced approach, increased noise stringency standards become an essential element of future aviation growth conditions.

2.3 As regards the management of aircraft emissions, Europe is implementing a comprehensive approach, comprising a number of mutually supportive elements. These include supporting ICAO in improving technical standards, promoting research and technological development, achieving a more efficient air traffic management system effective for a positive environmental impact, and implementing market-based measures.

2.4 Europe is committed to continue supporting ICAO in developing better technical design standards to limit emissions at source as "prevention is better than cure". These standards need to be regularly reviewed and, where necessary, updated to ensure that ever better technology is developed and used.

2.5 With regard to research and development, recent EU Framework Programmes for Research and Technology Development (RTD), have supported a large number of major projects to deliver significant improvements in noise and emissions performance. The latest framework programme (FP7) was adopted in December 2006 and gives high priority to projects aimed at 'greening aviation', with some 160 million euros already available in 2007 for such projects. The programme will also provide for 'Clean Sky', a joint European Commission-industry technology initiative, which seeks to achieve the earlier introduction of technologies and products with reduced noise and emissions, together with reduced environmental impact from their design, production and maintenance.

2.6 As regards air traffic management, the EU Single European Sky ATM Research (SESAR) programme launched in 2005 aims to modernise the European ATM infrastructure. It has ambitious objectives – to improve efficiency (by halving the unit cost of ATM), to improve capacity (by tripling it), to improve safety (tenfold) and to improve environmental performance (by reducing emissions per flight by 10%). Recent European ATM operational initiatives, such as Continuous Descent Approaches (CDA) and Dynamic Management of European Airspace Network (DMEAN), are already in place and having a significant positive environmental impact.

2.7 However, these elements will not be sufficient on their own. For this reason, market-based measures need to be part of any comprehensive approach. They can usefully complement other measures by providing incentives to industry to limit or even reduce its emissions. They can give flexibility to individual companies to consider how best to respond to environmental challenges. And they are often more cost-effective than regulation by conventional 'command and control' methods.

### 3. PROGRESS SINCE THE LAST ASSEMBLY

3.1 Since the Assembly in 2004, the requested guidance on the use of charges for **emissions that affect local air quality** has been produced by ICAO Committee on Aviation Environmental Protection (CAEP) and accepted by the ICAO Council. CAEP has also carried out an analysis of the cost-effectiveness of such existing charges. The results in respect of the effects on overall emissions and on industry practice were inconclusive. However, the analysis did highlight that the effect of these charges on developing countries, which raised this issue at the 2004 Assembly, is minimal.

3.2 Turning to **emissions that affect climate**, the 2004 Assembly endorsed in Resolution A35-5 two approaches to emissions trading - the first based on voluntary agreements and the second based on the inclusion of international aviation in existing trading schemes operated by Contracting States consistent with the UNFCCC process. The Council has since respectively adopted a report on voluntary emissions trading schemes and a draft guidance document for Contracting States.

3.3 Europe welcomes the adoption of the guidance on both emissions charges and trading and invites the ICAO Assembly to urge Contracting States to implement effective measures to address aviation emissions taking this guidance into account.

### 4. CONSIDERATION

#### Emission-related charges

4.1 Although the CAEP analysis on **charges related to local air quality** was inconclusive, this is understandable given (a) the small number of airports currently applying such charges and (b) the low level of these charges. The analysis does not give grounds for doubting that such measures would indeed be cost-effective if applied more widely. Moreover, the inconclusive result does not eliminate the need to keep this option open since some airports face real difficulties in meeting acceptable air quality standards and charges are one means to help address these difficulties.

4.2 Resolution A35-5 effectively urges Contracting States to refrain from implementing **charges aimed at greenhouse gas emissions** from aviation prior to the 2007 Assembly. Although implementation of such charges by mutual agreement of States, members of a regional economic integration organization on operators of those States is not precluded, the fact that such an approach would require interested States to discriminate between operators on grounds of nationality and against their own airlines implies that this is not a realistic option for any State. Europe accepted this outcome on the grounds that it was temporary and that further guidance was to be developed and completed by the 36<sup>th</sup> Assembly. However, it has not been possible to agree on such further guidance. Although ICAO has discussed the issue since 1991, it has been able to agree neither global implementation nor guidelines that would facilitate meaningful implementation by a subset of states. As such, ICAO's work on GHG charges has not contributed to the reduction of emissions, a strategic objective of the organization and the aim of Article 2.2 of the Kyoto Protocol. Therefore, Contracting States should be free to take the measures or combination of measures they deem necessary to fulfil their international obligations to combat climate change.

## **Emission trading**

4.3 Even allowing for expected improvements in technology, the assessment of ICAO environmental goals shows a substantial forecast *increase* in CO<sub>2</sub> emissions from international aviation at a time when the evidence of the need for *reductions* becomes clearer day by day.

4.4 Emission trading is a flexible instrument: it allows a limit to be set on emissions but leaves operators the freedom to decide how to meet the limit. It is therefore more cost-effective than other forms of regulation. It also offers suitable incentives to industry. By creating a value for carbon, emission trading incentivises the reduction of emissions and provides a stimulus to innovation. Where industry has already implemented innovations, fewer emission allowances will be necessary to meet the obligations of such a scheme.

4.5 The European Community's Emissions Trading Scheme (ETS) is the largest multi-sector, operator-level emissions trading scheme in the world and is central to the European Community's efforts to address climate change. The European Community is currently considering legislation to bring emissions from international aviation within the Scheme, taking into account, as appropriate, ICAO guidance. This would contribute to the European Community's share to the collective obligation on developed countries to take a lead and address emissions from international aviation under Article 2(2) of the Kyoto Protocol by implementing action which is based on an approach worked out in ICAO. It would also ensure that increased emissions from international aviation do not undermine emission reductions made by other sectors.

4.6 In order to ensure that such an endeavour is effective and to avoid discrimination, as the Chicago Convention requires, it is fundamental that the measure be applied to all airlines operating within the scope of the scheme without distinction as to nationality. This approach is reflected in the draft guidance that the ICAO Council has adopted and authorized for publication.

## **5. CONCLUSIONS**

5.1 The failure to get its emissions under control is having an adverse effect on the image and future prospects of aviation in Europe. Without further action to address aviation's environmental impacts, public and political pressure for stringent demand management and a freeze on infrastructure development will continue to increase.

5.2 In order to counter this and ensure sustainable growth of aviation, a comprehensive approach to tackling aviation emissions, with the elements of the approach being mutually supportive, is indispensable.

5.3 In this context, the implementation of market-based measures is necessary. Such measures are more flexible and cost-effective than conventional regulatory methods.

5.4 While Europe welcomes the work undertaken by ICAO so far on market-based measures, it has no effect unless Contracting States can effectively put such measures in practice. ICAO's role should be to facilitate and encourage action by Contracting States while striving for an appropriate degree of global harmonization in the approaches applied.