

# **European Climate Change Programme II**

## **Aviation Working Group**

### **Final report**

**April 2006**

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## Background

On 27 September 2005 the European Commission adopted a Communication on Reducing the Climate Change Impact of Aviation<sup>1</sup>. A key conclusion of the Communication was that in view of the likely future growth in air traffic, further policy action is needed to prevent this from leading to continued growth in its climate impact. Having analysed a number of options, the Commission considered that the best way forward is to include the aviation sector in the EU Greenhouse Gas Emissions Trading Scheme.

On 2 December 2005 the Council of Ministers adopted conclusions<sup>2</sup> in which the Council recognised that the inclusion of the aviation sector in the EU Emissions Trading Scheme (EU ETS) seems to be the best way forward and urged the Commission to urgently put forward a legislative proposal. It also emphasised the need for a further detailed impact assessment and contained a number of preliminary guiding principles largely mirroring the recommendations in the Commission's Communication. At its meeting on 15/16 December 2005<sup>3</sup>, the European Council (the heads of state and government) confirmed the key conclusions reached by the Council and echoed the request for a legislative proposal.

## Role of the working group

To prepare for the necessary decisions to be taken, the Commission set up an Aviation Working Group (AWG) under the second European Climate Change Programme (ECCP II). This group was assigned the task of considering ways of including aviation in the EU ETS in accordance with the terms of reference annexed to the Communication. The terms of reference were translated into a work plan which was discussed at the stakeholder conference launching the ECCP II, held on 24 October 2005 in Brussels.

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<sup>1</sup> See [http://europa.eu.int/comm/environment/climat/aviation\\_en.htm](http://europa.eu.int/comm/environment/climat/aviation_en.htm)

<sup>2</sup> See [http://ue.eu.int/ueDocs/cms\\_Data/docs/pressData/en/envir/87368.pdf](http://ue.eu.int/ueDocs/cms_Data/docs/pressData/en/envir/87368.pdf)

<sup>3</sup> See [http://ue.eu.int/ueDocs/cms\\_Data/docs/pressData/en/ec/87642.pdf](http://ue.eu.int/ueDocs/cms_Data/docs/pressData/en/ec/87642.pdf)

The role of the group has thus been to consider and discuss issues on which the Commission has identified a need for further expert advice. The purpose was not to take final decisions but rather to consider options and identify the advantages and disadvantages of various design and policy choices.

## **Process**

The Commission invited representatives and experts from Member States and key stakeholder organisations including industry, consumer and environmental organisations to participate in the working group. For each meeting a background paper summarising relevant parts of the findings of the feasibility study prepared for the Commission by CE Delft<sup>4</sup> was distributed and used as a common reference for the discussion. Some experts were invited on an *ad hoc* basis for meetings where their expertise was particularly relevant. The Commission services chaired the meetings and acted as secretariat for the group. After each meeting draft minutes were circulated to the participants for comments before a final version was edited. This document constitutes the final report of the working group. It consists of a compilation of the minutes of the 4 meetings (of which the 3<sup>rd</sup> was a 2-day meeting).

## **Further documentation**

In addition to the minutes annexed to this report, the **agendas, background papers and presentations** from each meeting **are publicly available on the internet** on the following address:

***"CIRCA" Web Site for ECCP Aviation WG:***

[http://forum.europa.eu.int/Public/irc/env/eccp\\_2/library?l=/work\\_group\\_aviation&vm=detailed&sb=Title](http://forum.europa.eu.int/Public/irc/env/eccp_2/library?l=/work_group_aviation&vm=detailed&sb=Title)

Also available on this web site are **position papers submitted by stakeholders** to complement the views recorded in the minutes. Annex 5 lists the position papers received by the Commission on the date of release of this report, but more may be added during May 2006.

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<sup>4</sup> See [http://europa.eu.int/comm/environment/climat/pdf/aviation\\_et\\_study.pdf](http://europa.eu.int/comm/environment/climat/pdf/aviation_et_study.pdf)

## AVIATION & THE EU EMISSION TRADING SCHEME

### MINUTES OF FIRST MEETING OF THE AVIATION WORKING GROUP

HELD ON 28 NOVEMBER 2005  
AT AVENUE DE BEAULIEU 5, BRUSSELS

These minutes summarise the discussions in the first meeting of the Aviation Working Group, set up under the 2<sup>nd</sup> phase of the European Climate Change Programme to consider the modalities of extending the EU Emissions Trading Scheme to include emissions from aviation.

This meeting considered the following two issues:

- 1) thresholds for determining inclusion in or exclusion from the scheme
- 2) flights to be covered in the scheme (scope of the scheme)

A list of organisations represented in the Group is set out in Annex I. Comments are not attributed to individual organisations.

**Note that these minutes record the views expressed in the Group: they do not necessarily reflect the views of the Commission.**

EUROCONTROL gave a presentation on the Compendium of additional data they had prepared for the meeting. The Compendium supplements the data included in the CE Delft study. The presentation and the Compendium are available at:

[http://forum.europa.eu.int/Public/irc/env/eccp\\_2/library?l=/work\\_group\\_aviation&vm=detailed&sb=Title](http://forum.europa.eu.int/Public/irc/env/eccp_2/library?l=/work_group_aviation&vm=detailed&sb=Title)

#### 1) Thresholds

The Commission's Communication stated that the Commission considers that aircraft operators should be the entities responsible for complying with the EU ETS as it is aircraft operators which have direct control over the type of aircraft in operation and the way in which they are flown as well as the monitoring data. Placing the obligations under the scheme on aircraft operators should ensure the most effective and efficient incentives for emissions reductions.

However, there is a question as to whether all aircraft operations should be included or whether some should be excluded on the basis, for example, that their emissions were *de minimus* and the administrative burden was disproportionate. The Emissions Trading Directive (2003/87/EC) already includes thresholds for the inclusion of activities in the scheme (e.g. activities of a combustion installation are only included if they have a thermal rated input of over 20MW). The basic principle should be that an operation should be included unless there were compelling reasons for its exclusion. The Group was invited to consider whether there was a case for excluding certain operations and if so to identify clear, simple threshold criteria that could be used to determine what was in the scheme and what was not.

The feasibility study considered the following options:

- flights with a military purpose
- Visual Flight Rules
- aircraft weight
- number of operations of the trading entity

CE Delft presented the analysis and conclusions reached in their study. Copies of the presentation are available at:

[http://forum.europa.eu.int/Public/irc/env/eccp\\_2/library?!=/work\\_group\\_aviation&vm=detailed&sb=Title](http://forum.europa.eu.int/Public/irc/env/eccp_2/library?!=/work_group_aviation&vm=detailed&sb=Title)

### *1.1 Military aircraft*

In general, participants thought that military aircraft should be excluded from the Emissions Trading Scheme. State aircraft are excluded from the Chicago Convention (i.e. aircraft used in military, customs and police services) and aircraft flying under military flight rules are not required to submit information to EUROCONTROL.

The group considered how military flights would be identified. The identification of military flights may present some difficulties because military flights do not always fly under military flight rules and may not always use aircraft registered as military aircraft. It was argued that any exclusion of military aircraft should therefore also extend to aircraft chartered to a Ministry of Defence. Also, the point was made that civil aircraft performing both civil operations and operations with a military purpose should not be able to gain a competitive advantage by being exempted due to the latter. One Member State highlighted the need to consider how flights for civil protection and humanitarian purposes would be covered by any exclusion.

Some Member States suggested that any exclusion should be defined by reference to the purpose of the flight (i.e. any flights with a military purpose that is carrying military cargo or personnel should be excluded).

One option would be to decide if a flight is a military flight based on the code used in its flight plan. When a military flight is made under civil flight rules, the flight plan would usually be submitted with an 'M' code. This code would be submitted by the operator of the flight. However there may be some differences in practice between states. There was a question as to whether operators could register civil flights with an 'M' in order to avoid the scheme. **EUROCONTROL will confirm who has the authority to register a flight with an 'M' code and what the criteria are for doing so.**

There was a general agreement that other types of state aircraft should also be excluded from the scheme since the Chicago Convention does not apply to state aircraft. The Chicago Convention provides that "aircraft used in military, customs and police services shall be deemed to be state aircraft".

### *1.2 Aircraft operating under Visual Flight Rules (VFR)*

There was general agreement that flights under visual flight rules should be excluded from the scheme provided it could not be used to avoid the scheme. This was considered unlikely since

an aircraft cannot be flown in flight airways using VFR. Emissions from flights using VFR account for a small percentage of total emissions and data is not kept by EUROCONTROL.

There was some discussion about whether exclusion of aircraft operating under VFR would be necessary at all if a weight threshold (of MTOW of 8,816kg) were applied. Such a threshold would exclude small aircraft which would also be most likely to fly under VFR. However some participants considered that there was a possibility that a weight threshold would not exclude all flights using VFR, although the number would be small. Examples might be flights for testing, maintenance or training purposes.

A Member State expert pointed out that as some flights are mixed, any exclusion should be for VFR flights only i.e. only flights that operate exclusively under VFRs.

### *1.3 Weight threshold*

Possible thresholds highlighted in the feasibility study are: MTOW of 8,618kg and 34,000kg, which are used in the context of ICAO aircraft noise standards.

Other weight thresholds currently used are 2,000kg, which is used in the context of applying route charges and 5,700kg, which is used in airworthiness legislation (Regulation 2042/2003/EC)

There was general agreement that a threshold of 34,000kg would be too high and could result in economic distortions between airlines. In particular it could create an incentive to use smaller aircraft to avoid the scheme. A threshold of 8,618kg would be less likely to result in competitive distortions but further consideration needed to be given to its impact on the business jet sector. Such a threshold could split the sector and therefore result in economic distortions. A threshold of 2,000 kg or 5,700 kg would lead to the inclusion in the scheme of virtually all aircraft used in general aviation and aircraft operated by air carriers.

There was also concern that on some routes small aircraft compete with larger aircraft and that a weight limit which excluded some aircraft could distort competition, particularly as smaller regional jets are often flown to feed larger long distance flights.

Airline associations expressed reservations about a threshold based on weight since aircraft are all operated below the MTOW and there are large operators which also operate small aircraft: in which case there is no legitimate argument for excluding them.

### *1.4 Activity threshold*

There were mixed views in the Group about the value of a threshold based on the number of flights per year. There was some support for a threshold of >52 flights per year. However it was also considered a risk that the application of an activity level threshold could cause more problems than it would solve.

An activity threshold would not necessarily result in distortions of competition since as soon as an airline grew above the threshold it could be included in the scheme. However it could give an advantage to operators serving only one route.

There was a concern that such a threshold could encourage operators to split their operations in order to avoid the scheme. This was considered a greater risk in the business sector as operators do not require an AOC. However there are plans to require certification of such flights from 2008.

Further there was concern about how operators and regulators know who is above the threshold. This could vary from year to year.

### *1.5 Other suggested thresholds*

A number of airline associations were opposed to the application of a threshold at the level of the aircraft. They asserted that thresholds should be applied instead to the operator, based on the emissions from the total fleet of aircraft operated by that operator. Either all flights or none of the flights of an operator should be included (regardless of the number of flights or the type of aircraft). It was argued that the concept of an installation as applied in the current Emissions Trading Directive could not be translated to an aircraft for the aviation sector. The NGOs also favoured further consideration of a threshold based on the level of emissions.

Some participants thought it might be better to combine a weight threshold with a threshold on the number of passengers. This approach was adopted in regulation 89/629/EEC and subsequent measures. A 5 passenger limit would lead to the inclusion in the scheme of the vast majority of business jets. A combination of a weight threshold of 34,000kg and less than 20 passengers would exclude business jets from the scheme. A passenger threshold would need to be based on the maximum certificated passenger capacity of the aircraft type and not on the actual number of seats in an individual aircraft since configurations differ within the same type of aircraft depending on the commercial use of the aircraft. This approach would also work for cargo aircraft.

A number of participants in the group queried whether flights for maintenance and training purposes should be covered by the scheme.

One Member State expert suggested that the scheme should only apply to “fixed wing” aircraft to exclude helicopters.

On a more general level, several participants emphasised the following two points:

- the need to clarify who would be considered to be the operator. This in their view is a more complicated question in relation to the aviation sector than for existing ETS sectors because of the different types of operator and the financial arrangements in the industry. They asserted that it should not simply be assumed that an individual aircraft can be equated to an “installation” under the existing scheme.<sup>5</sup> Some airline representatives asserted that who gets the revenue from the flight should be the key to determining who is the operator; It was further suggested that, in order to reduce the complexity of the scheme, air carriers should be the operator for flights for which they are technical operators and also for flights operated under their name with a leasing agreement.

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<sup>5</sup> Some participants were also concerned about how the rules in relation to “new entrants” would be applied to aircraft operators. This was a question to be considered in the third meeting which will consider questions relating to the allocation of allowances to the aviation sector.

- the need to base decisions on actual data and not on estimates provided to EUROCONTROL in relation to air charges.<sup>6</sup>

## 2) Scope

The Commission's Communication provided that "in environmental terms, the preferred option is to cover all flights departing from EU airports, as limiting the scope to intra-EU flights which both depart and land in the EU would address less than 40% of the emissions from all flights departing from the EU".

The options considered in the CE Delft report were:

- intra-EU
- intra-EU + 50% of routes to and from the EU
- all flights departing from the EU
- emissions in EU airspace
- all flights departing from the EU and EU airspace
- intra-EU and routes to and from countries that have ratified the Kyoto Protocol

CE Delft presented the analysis and conclusions reached in the study. Copies of the presentation are available at:

[http://forum.europa.eu.int/Public/irc/env/eccp\\_2/library?l=/work\\_group\\_aviation&vm=detailed&sb=Title](http://forum.europa.eu.int/Public/irc/env/eccp_2/library?l=/work_group_aviation&vm=detailed&sb=Title)

Another option, put forward by low cost airlines and NGOs, was all flights arriving in and departing from the EU.

Of these options, the Commission had identified the following 3 as the ones with most support

- intra-EU only
- all flights departing from the EU
- all flights arriving or departing from the EU

The Working Group agreed that it should focus on these options. However one NGO representative considered that an option based on EU airspace should not be ruled out definitively at this stage.

The Working Group considered the *pros* and *cons* of each of these options on the basis of the following criteria: environmental effectiveness, economic distortions for airlines, economic distortions for airports, impacts on tourism, impacts on ultra-peripheral regions (UPRs) and suitability as a model for expansion.

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<sup>6</sup> Questions relating to future monitoring and reporting of emissions for the purposes of determining the number of allowances each operator is required to surrender will be considered in the fourth meeting of the working group.

A table of the *pros* and *cons* identified in the meeting is included in Annex II to these Minutes.

### *2.1 Environmental effectiveness*

The group recognised that the larger the scope of the scheme, the more emissions would be covered and the greater the potential environmental benefit.

A manufacturers' representative pointed out that the intra-EU market is not large enough to have an impact on the behaviour of manufacturers.

However in considering the environmental effectiveness it was also necessary to consider how quickly each option could be put into operation. Some thought it might be better to introduce a narrower scheme earlier and then expand it at a later stage if it would take significantly longer to solve any issues relating to a broader scheme.

### *2.2 Impact on competitiveness*

There was general agreement amongst representatives of airlines that the broader the approach the less the distortions on competition.

Representatives of airlines indicated that they disagreed with the analysis in the feasibility study especially the impact on airlines costs, the ability to pass on costs in ticket prices and the competitiveness of airlines. **IACA indicated that it had carried out its own impact assessment and agreed to share this with the Commission shortly.**

There was no consensus in the group regarding whether the inclusion of the aviation sector in the EU ETS would lead to additional cross-subsidisation between EU and international routes. This could lead to distortions in competition both between EU carriers and non-EU carriers and between EU carriers. The feasibility study did not look at the risk of distortions in competition between carriers who only operate in the EU and EU carriers which are also international carriers. Some participants concurred with the conclusions of the feasibility study that it is already possible for cross-subsidisation to take place and therefore there is no reason why the inclusion of aviation in the ETS would change this. Others considered that there is a real risk of additional cross-subsidisation, particularly if the scheme is intra-EU only. The reasoning was that the intra-EU market following liberalisation is highly competitive and price elasticities are higher on intra-EU routes. Therefore it was argued that airlines operating in less competitive markets may simply be able to absorb the additional costs of emission trading from the profits made on those routes.

Some airline representatives expressed concern that the scheme could disadvantage airlines with a hub in the EU because passengers may choose to fly a route which is not covered by the scheme or covered by the scheme to a lesser extent. For example, a passenger could take an alternative routing overflying the EU without landing or a longer journey rather than a direct flight. However others argued that the increase in ticket prices would be insufficient to have this effect, especially as such a change would be less convenient for the passenger where this was not otherwise required.

The feasibility study did not consider whether the risks of a border effect could be greater for cargo since freight can be transported more easily than passengers and the price sensitivity could therefore be higher in this market.

### *2.3 Impact on airports*

Representatives of airports emphasised that if airlines moved their hub outside the EU or lost passengers to airlines with a hub outside the EU this would have a negative impact on EU airports. Assuming airports would not be directly regulated under the scheme, this was considered to be the biggest risk for airports.

### *2.4 Impact on Tourism*

Representatives of Member States deriving a relatively high percentage of their income from tourism emphasised the need to ensure that the scope of the scheme minimises the impacts on tourism. Participants recognised that there was some risk that tourists would opt for destinations not covered by the scheme e.g. holiday in Turkey rather than Spain. This risk would be greater in the case of an intra-EU only scheme. Representatives of some airlines emphasised that the leisure sector is susceptible even to small price movements. **Representatives of the low fares airlines indicated that they could provide some figures to support this view.**

Distortions could be reduced if the scheme included Switzerland and EEA countries.

### *3.5 Impact on ultra-peripheral regions (UPRs) and peripheral regions*

A number of Member States were concerned about the socio-economic impacts which the scheme might have on the UPRs (as defined in Article 299(2) of the EC Treaty) and peripheral regions dependent on aviation within the EU such as islands or large less-densely populated areas such as northern parts of Finland or Sweden. In some cases aviation is the only transport link to these regions. It was considered that this issue was not adequately considered in the feasibility study, although it provided data to evaluate the emissions on the routes to and from these regions.

This would be a greater problem if flights to the UPRs or peripheral regions are treated differently from flights to neighbouring areas. Member States and some airline associations identified a risk that direct services to some UPRs might be withdrawn and that there would only be direct flights to neighbouring regions whose airports would take on the role of hub. Participants agreed that the risk would be greater if the scheme were limited to intra-EU flights only.

There might be other ways of dealing with any adverse effects such as Public Service Obligations (PSOs) and state aid schemes that already provide support in specific circumstances. However, some Member States were not in favour of significant further use of PSOs and pointed out that it might in reality be politically difficult to use such options.

### *3.6 Model for expansion*

There was general agreement amongst the group that the long term objective should be to expand the scheme to countries outside the EU. A scheme which covered “all departing flights” could be adopted by other countries and, if adopted by all countries, would result in global coverage.

Some participants argued that the EU should adopt a staged or stepped approach.

### *3.7 Impacts on the existing ETS*

Representatives of existing ETS participants emphasised the need to consider fully the impact which the inclusion of aviation in the ETS could have on allowance prices. This would depend *inter alia* on the additional allowances allocated to take account of the inclusion of aviation in the scheme and the amount of growth in the aviation sector. One representative also thought that the price elasticity of demand for the aviation sector would be a factor.

### *Impacts on third countries operators and implications for international relations*

In addition to the criteria considered above, participants emphasised the need to consider carefully the extent to which the scheme would impact on third countries. Participants agreed that, in accordance with the non-discriminatory provisions of the Chicago Convention, under all options the scheme should apply to non-EU carriers on the same basis as to EU carriers. Some participants expressed concern that adopting a broader approach would effect to a greater extent operators from third countries who may seek to challenge the approach. Several participants urged the Commission to consider further all aspects of the legal analysis in the feasibility study. The Commission confirmed it would do this. Whether or not justified or successful, any challenge could potentially cause delay to the implementation of the scheme. Some participants therefore stressed the need to consider discussing with non-EU states the application of any rules to their carriers and to build up a strong case to be presented to the ICAO Assembly in 2007.

**The next meeting of the working group will be on 26<sup>th</sup> January 2006. The meeting will consider the types of emissions to be included in the scheme.**

**ANNEX I**

**LIST OF ORGANISATIONS/COUNTRIES ATTENDING THE 1<sup>st</sup> WG MEETING**

ACI Europe (Airports Council Int. - European Region)
AEA (Association of European Airlines)
ASD (The Aerospace and Defence Industries Association of Europe)
CAN-EUROPE (Climate Action Network Europe asbl)
ALLIANCE OF ENERGY INTENSIVE INDUSTRIES C/O CEMBUREAU (The European Cement Association)
DELFT CE (consultants working for the Commission)
EBAA (European Business Aviation Association)
EEA (The European Express Association)
ELFAA (European Low Fares Airlines Association)
ERA (European Regions Airline Association)
EURELECTRIC
EUROCONTROL
IACA (International Air Carrier Association)

IETA (International Emissions Trading Association)
T&E (European Federation for Transport and Environment)
Experts nominated by the following Member States: <ul style="list-style-type: none"><li>• Finland</li><li>• France</li><li>• Germany</li><li>• Ireland</li><li>• Italy</li><li>• Malta</li><li>• Netherlands</li><li>• Portugal</li><li>• Spain</li><li>• Sweden</li><li>• United Kingdom</li></ul>
European Commission (DG Environment, DG Transport and Energy, DG Research, DG Enterprise, Joint Research Centre)

**ANNEX II**

**COVERAGE OF FLIGHTS  
ASSESSMENT OF THE OPTIONS**

Criteria	Intra-EU	All departing	Departing and arriving
Environmental effectiveness	52 Mt - intra EU market might be not large enough for manufacturers (incentives)	131 Mt	208 Mt
Economic impacts: airlines	-Must include non-EU carriers -Distortions between EU carriers (cross subsidisation)?	-Must include non-EU carriers -risk of cross-subsidisation by non EU carriers? -cost-effective to fly via a hub outside the EU (e.g. from Asia to the US)?	-Must include non-EU carriers -don t have to discriminate between flights -risk of cross-subsidisation by non EU carriers -cost-effective to fly via a hub outside the EU?
Economic impacts: airports	Border effect?	Border effect?	Border effect?
Tourism	-Incentive to go to holiday destinations outside the EU (e.g. Turkey instead of Spain)		
UPRs and peripheral regions	-risks of reduction of services to <i>peripheral regions (economic distortion)</i>	- smaller risk of reduction of services to <i>peripheral regions</i>	No risk
Current EU ETS sectors	Impact on EU allowance price	Impact on EU allowance price	Impact on EU allowance price
Model for expansion	Could start intra EU followed by extension later on	Big bang will not work	

## AVIATION & THE EU EMISSION TRADING SCHEME

### MINUTES OF SECOND MEETING OF THE AVIATION WORKING GROUP

**HELD ON 26 JANUARY 2006  
AT AVENUE DE BEAULIEU 5, BRUSSELS**

These minutes summarise the discussions in the second meeting of the Aviation Working Group, set up under the 2<sup>nd</sup> phase of the European Climate Change Programme to consider the modalities of extending the EU Emissions Trading Scheme to include emissions from aviation.

This meeting considered the extent to which the full climate impacts of aviation can be addressed through the EU ETS or through a combination of emissions trading and other complementary measures. It specifically considered the following issues:

- 1 The risks of not including all climate impacts from aviation (i.e. including CO<sub>2</sub> only). This relates to the question whether incomplete coverage of the climate impacts of aviation in the scheme would incentivise the reduction of one impact at the expense of one or more impacts outside the scheme.
- 2 The *pros* and *cons* of the use of a CO<sub>2</sub> multiplier as a method to capture non-CO<sub>2</sub> climate impacts from aviation within the ETS.
- 3 The *pros* and *cons* of the use of an effect-by-effect approach to capture non-CO<sub>2</sub> climate impacts from aviation within the ETS.
- 4 The *pros* and *cons* of various ancillary instruments implemented in parallel to the inclusion of aviation CO<sub>2</sub> emissions only in the ETS.

A list of organisations represented in the Group is annexed.  
Comments are not attributed to individual organisations.

**Note that these minutes record the views expressed in the Group: they do not necessarily reflect the views of the Commission.**

#### **The impacts of aviation on climate change**

Professor David Lee gave two presentations. The first on the impacts of aviation on the climate and why a different approach may be necessary to address its non- CO<sub>2</sub> climate impacts; and the second on the options to address the non-CO<sub>2</sub> climate impacts considered in the CE Delft Study. Both presentations are available at:

[http://forum.europa.eu.int/Public/irc/env/eccp\\_2/library?l=/work\\_group\\_aviation&vm=detailed&sb=Title](http://forum.europa.eu.int/Public/irc/env/eccp_2/library?l=/work_group_aviation&vm=detailed&sb=Title)

There is a good understanding of the CO<sub>2</sub> effects of aviation. The effect of CO<sub>2</sub> emissions from aviation is not affected by the altitude at which it is emitted and therefore has the same effect as a ground based source. Therefore, one tonne of CO<sub>2</sub> emitted by aviation has the same climate impact as one tonne of CO<sub>2</sub> emitted by ground sources. This is not the case for aviation NO<sub>x</sub> emissions where the impact depends not only on the altitude at which it is emitted but also the climatic conditions.

It was acknowledged that scientific uncertainty about the non-CO<sub>2</sub> impacts of aviation remains but has improved, in particular in relation to NO<sub>x</sub> effects. Significant uncertainty remains in relation to its effect on cirrus cloud formation. Aviation may induce cirrus cloud formation or increase in a number of ways:

- line-shaped contrails increase thin cirrus cloud as they spread out;
- soot and sulphate particles in aircraft emissions may affect the nucleation properties of particles and enhance cirrus formation; and
- particles emitted by aircraft in the upper atmosphere may result in cirrus cloud formation at a later time, if and when the temperature and humidity conditions are favourable.

The IPCC [1999] estimated the contribution of aviation to the total radiative forcing would be 5% in 2050. This excluded any effect from cirrus enhancement. It is likely that this figure may change because of improvements in scientific understanding of cirrus cloud formation (lower estimate for contrail formation). It was noted that current traffic growth is ahead of forecast traffic at this time. However it was not currently possible to present a revised RF percentage estimate because no new calculations for 2050 have yet been done.

### **Risks of not including all climate impacts from aviation**

Colin Beesley, Rolls Royce on behalf of ASD, gave a presentation on engine technology outlook and implications for CO<sub>2</sub> and NO<sub>x</sub> trade-offs. This presentation is available at:

[http://forum.europa.eu.int/Public/irc/env/eccp\\_2/library?l=/work\\_group\\_aviation&vm=detailed&sb=Title](http://forum.europa.eu.int/Public/irc/env/eccp_2/library?l=/work_group_aviation&vm=detailed&sb=Title)

The debate focused on whether there would be a trade-off between CO<sub>2</sub> and NO<sub>x</sub> emissions i.e. whether measures to reduce CO<sub>2</sub> could lead to an increase in NO<sub>x</sub> emissions. There was general consensus that many measures to reduce CO<sub>2</sub>, at least in the relatively short-term, would also result in lower emissions of NO<sub>x</sub>. Examples include technological measures such as the use of lighter aircraft construction materials, and more aerodynamic aircraft designs, and operational measures such flying slower and reducing holding over airports. However the implication of incentives for engine design was more questionable.

The long lead time for the development of new engine types meant that it would take considerable time before a new engine design would have an impact. This increases the importance of giving the right incentives now.

Engine manufacturers confirmed that when designing an engine, a trade-off exists between CO<sub>2</sub> emissions, NO<sub>x</sub> emissions and noise as the optimum specifications for each of these factors are different. However, they also asserted that, even if the emissions trading scheme only covered CO<sub>2</sub> emissions, there would not be an incentive to increase NO<sub>x</sub> emissions. There are ICAO standards for LTO NO<sub>x</sub> emissions which have become more stringent over

time. Manufacturers are also developing new technology on the basis of anticipated continual reduction requirements. Engines currently being designed will be in use until 2040/50. Airlines they said want low costs, low CO<sub>2</sub>, low NO<sub>x</sub> and low noise engines that will meet all the international standards during their lifetime. For this reason the manufacturers considered the ICAO CAEP process is a powerful incentive.

Further all manufacturers are working towards challenging goals for the reduction of NO<sub>x</sub> emissions as defined by ACARE (and the NASA equivalent in the US). The most relevant of these goals aims to reduce fuel burn per passenger kilometre by 50% from and to reduce NO<sub>x</sub> emissions by 80% by 2020. The baseline for the goals is the year 2000. Although the reference point/baseline for the ACARE NO<sub>x</sub> goal is not clear, manufacturers interpret their contribution as being to develop by 2020 engines that outperform CAEP/2 LTO standards by 80%. Airline manufacturers indicated that, while not binding, the ACARE goals are driving the development of engines with lower NO<sub>x</sub> emissions.

Some Member States considered that ICAO standards were not setting, but following technical progress. According to them, other policy measures, e.g. NO<sub>x</sub> emission trading or charges, were needed in order to reduce NO<sub>x</sub> emissions.

Engine manufacturers, however, believed that the introduction of a multiplier for non-CO<sub>2</sub> climate impacts could, depending on its magnitude, change the direction of technological developments, so that they might decide to focus on reducing CO<sub>2</sub> emissions at the expense of further NO<sub>x</sub> emissions. Others believed that this was inconsistent with the general assertion of the engine manufacturers that a CO<sub>2</sub> only scheme would not result in a negative CO<sub>2</sub>-NO<sub>x</sub> trade-off because there are sufficient incentives to reduce NO<sub>x</sub> emissions.

### **Should non CO<sub>2</sub> climate impacts be addressed?**

Several Member States and NGOs argued in favour of addressing non-CO<sub>2</sub> impacts to the extent possible. They argued that the impacts of non-CO<sub>2</sub> emissions are more considerable than for other sectors currently included in the EU ETS (although an airline requested evidence in support of this point). Failure to address these impacts could be counterproductive in terms of climate change and would be inconsistent with both the precautionary and the polluter pays principles. One Member State pointed out that NO<sub>x</sub> emissions had increased in latest inventories and therefore a strong incentive to reduce NO<sub>x</sub> is required.

There were, however, different suggestions on how to address these impacts. To address NO<sub>x</sub> impacts, some argued in favour of relying on international standards,<sup>7</sup> while others argued that economic instruments are a powerful tool to reduce emissions. Arguments put forward in favour of standards were their global scope (when agreed on as ICAO standards) and their ability to reduce emissions (note that this ability was contested by others). Some feared that non-global measures would drive high NO<sub>x</sub> emitting aircraft out of the EU, but not out of

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<sup>7</sup> A Member State asserted that standards could, in particular, be used to reduce emissions of sulphur dioxide and of particles. The ICAO/CAEP committee is working on the characterisation of emissions of particulate matter in this perspective and the directive 93/12/EEC of March 1993 on the sulphur content of certain liquid fuels indicated that the Commission would present a draft proposal defining new limits (among other things) for aircraft kerosene. He suggested that the group consider these works in its recommendations.

operation which would not reduce greenhouse gases overall. Engine manufacturers doubted the effectiveness of economic instruments, while they believed that tighter standards would reduce NO<sub>x</sub> emissions and would have greater effect as they apply to all globally to all aircraft.

Some participants argued for a staged approach whereby the scheme would initially only cover CO<sub>2</sub> emissions and then be expanded later to cover non- CO<sub>2</sub> emissions. Various reasons for proposing this approach were put forward.

One Member State would like all climate impacts of aviation to be addressed in the future, but argued that the scheme should initially cover only CO<sub>2</sub>. In this way, it would be possible to include aviation in ETS before 2012. Trying to cover non-CO<sub>2</sub> impacts from the outset would slow down the process of including aviation in ETS. Another Member State agreed and considered that if the legislative proposal limited the scheme to just CO<sub>2</sub> initially, it should also make clear that the scheme would be expanded subsequently to cover all impacts.

Others argued that inclusion should start with CO<sub>2</sub> only, because of the uncertainties in the non-CO<sub>2</sub> climate impacts. This would also be in line with how sectors currently included in ETS are treated. One NGO asserted that the current uncertainties about non -CO<sub>2</sub> climate effects of aviation should not be used as an excuse to postpone action. It argued that action can be taken despite uncertainties by, for example, using a conservative default value with a process for review. It pointed to UNFCCC emission inventories as an example of an area where ways were found to deal with uncertainties.

One Member State pointed out that, when thinking about ways to address non-CO<sub>2</sub> impacts and trade-offs, it is important to think not just about the trade-off between NO<sub>x</sub> and CO<sub>2</sub> but also about other possible trade-offs such as that between fuel quality improvements (in particular the reduction of the sulphur content of fuels) and emissions at refineries.

### **The *pros* and *cons* of the use of a CO<sub>2</sub> multiplier**

Arguments in favour of a CO<sub>2</sub> multiplier are that it offered a means to internalise external costs of non-CO<sub>2</sub> impacts in line with the precautionary principle and the polluter pays principle. It has the advantage of simplicity as it would enable all impacts to be captured by one single instrument without the need for additional flanking instruments such as charges. It could also be introduced quickly compared to other options.

However many participants were concerned by the disadvantages of the approach.

There was concern that a CO<sub>2</sub> multiplier would amplify any negative trade-offs as it benefits those who optimise their CO<sub>2</sub> emissions. Some Member States felt that the use of a multiplier could unjustly reward those airlines that have made no effort to reduce NO<sub>x</sub> emissions, while not rewarding those airlines that have invested in low NO<sub>x</sub> engines. This would be accentuated if the allocation were based on CO<sub>2</sub>-only emissions. It would be inconsistent with the polluter pays principle.

Some Member States argued that the uncertainties in the understanding of the size of non-CO<sub>2</sub> climate impacts would make it hard to calculate a multiplier. Since no clear numerical comparison of the impact of these emissions from aviation with those from other sectors is yet available these Member States felt that a multiplier would be undesirable.

Several participants argued that a multiplier would be inconsistent with the basic concept under the ETS i.e. that every tonne of CO<sub>2</sub> (or the equivalent of other greenhouse gases) would be treated equally.

A trade association representing participants in the existing ETS also saw a multiplier in a negative light since it considered that a multiplier would push up prices in the ETS more than a CO<sub>2</sub> only approach. This was based on the assumption that airlines were more likely to be buyers than sellers of allowances in the ETS.

One Member State felt that the introduction of a multiplier would not help to expand the system to other parts in the world.

Finally, it was suggested that, as an alternative, the non-CO<sub>2</sub> effects might be taken into account by setting a more stringent cap. There was a question of whether these two approaches would be equivalent. Although most participants agreed that both a multiplier and a tight cap would reduce CO<sub>2</sub> emissions effectively, there is one crucial difference: a more stringent cap for aviation would encourage the sector to reduce CO<sub>2</sub> emissions within the sector while the costs of doing so were lower than the price of emission allowances; whereas a multiplier would encourage the sector to take measures to reduce CO<sub>2</sub> emissions while costs lower than the price of allowances *multiplied* by the multiplier. It would thus encourage the sector to reduce emissions further *within* the sector, and to a lesser degree close an eventual gap between target and actual emissions by buying fewer allowances from other sectors. In economic terms, in the case of a multiplier the marginal costs of measures taken within the sector would be higher than in case of a more stringent cap.

### **The pros and cons of the use of an effect-by-effect approach**

All participants felt that an effect-by-effect approach would reflect the concepts underlying ETS better than a multiplier. The effect-by-effect approach would be based on specific emissions and would therefore be fairer and more accurate.

However participants generally considered that scientific understanding of the non-CO<sub>2</sub> climate effects of aviation is currently not yet sufficiently mature and therefore the effect-by-effect approach is not feasible at this time. One NGO suggested that the optimum would be to bring in other non-CO<sub>2</sub> climate impacts from the start through the multiplier but gradually shift to the effect-by-effect over time as scientific knowledge improves.

Some participants argued that the effect-by-effect approach would distort the current CO<sub>2</sub> market and that it would increase the administrative burden on airlines. This was contested by other participants, who argued that in principle the impact of NO<sub>x</sub> emissions and contrails could be calculated from currently available data, such as engine emission factors and EUROCONTROL data, or could be collected by airlines. Furthermore, it was suggested that a reasonably accurate prediction of NO<sub>x</sub> emissions during the cruise phase can be calculated from LTO certification data by using the 'P<sub>3</sub> - T<sub>3</sub>' which is based on manufacturers' proprietary data. However an airline and engine manufacturer pointed out that this data would be theoretical and would not take into account the actual operation and therefore emissions of the aircraft.

### **Evidence about the correlation between LTO and cruise level NO<sub>x</sub> emissions**

Professor David Lee gave a short presentation on the correlation between LTO and cruise level NO<sub>x</sub> emissions.

The presentation included a graph of NO<sub>x</sub> emissions from staged combustors showing a peak of NO<sub>x</sub> emissions between two ICAO certification points in the LTO cycle. The engine manufacturers explained that use of staged combustors is to get round the problem of providing a combustor that will operate with low NO<sub>x</sub> which is easy to light and burns with a stable flame. Measurements of a spike in NO<sub>x</sub> emissions occurred at a transition between different combustion settings, which should not occur during cruise.

Engine manufacturers agreed that there is a good correlation between NO<sub>x</sub> emissions during LTO and at cruise. On the basis of the future technologies they have in mind, they do not anticipate that this would change. Theoretically, it might be possible, for example if engines were to be designed with water injection, but engines currently on the drawing board have strong correlation between LTO NO<sub>x</sub> emissions and cruise NO<sub>x</sub> emissions.

It was mentioned that ICAO's CAEP WG 3 is working on methodologies on how to calculate NO<sub>x</sub> emissions at any stage of flight, based on the measured emissions in the LTO test cycle. With this guidance, it should be possible to calculate NO<sub>x</sub> emissions with greater accuracy, also taking weather conditions and other factors into account. An airline argued that this would still be theoretical.

### **Ancillary instruments**

One option for an ancillary instrument would be airport charges determined on the basis of NO<sub>x</sub> emissions.

Kalle Keldusild gave a presentation on the Swedish NO<sub>x</sub> airport charge. This presentation is available at:

[http://forum.europa.eu.int/Public/irc/env/eccp\\_2/library?l=/work\\_group\\_aviation&vm=detailed&sb=Title](http://forum.europa.eu.int/Public/irc/env/eccp_2/library?l=/work_group_aviation&vm=detailed&sb=Title)

In 1998 Sweden introduced a LTO NO<sub>x</sub> charge and today the charge is 50 SEK, or about €5 per kg of NO<sub>x</sub> emitted during LTO. Landing charges were reduced to ensure that the airport revenue was unchanged. For aircraft, this amounts to 150 - 400 SEK per LTO. The charge is for specific aircraft-engine combinations. It is revenue-neutral as the additional proceeds are used to lower the overall level of airport charges. There is some evidence that this may have incentivised airlines to use low NO<sub>x</sub> engines: around the same time, an airline operating out of Swedish airports bought lower NO<sub>x</sub> engines. Although the airline has indicated that it also had other strategic and political reasons to invest in low NO<sub>x</sub> engines, the NO<sub>x</sub> charge enabled the airline to recover some of the additional cost of the engines (including higher operating/maintenance costs).

A number of the participants were favourably minded to the option of using airport NO<sub>x</sub> charges as an initial way to address the indirect climate impacts of NO<sub>x</sub> emissions from aviation. As LTO NO<sub>x</sub> emissions are assumed to scale up with NO<sub>x</sub> cruise emissions (see above), airport charges would provide also an incentive to reduce cruise NO<sub>x</sub> emissions. One Member State argued that if LTO NO<sub>x</sub> charges were also used to capture NO<sub>x</sub> cruise emissions, higher charges may be justified.

An engine manufacturer commented that an LTO NO<sub>x</sub> charge based on ICAO certification values would provide no incentive for reducing NO<sub>x</sub> emissions through operational measures. Others engine manufacturers confirmed this, but emphasised that an LTO NO<sub>x</sub> charge as a flanking instrument would still tackle the main potential risk of emission trading based on a CO<sub>2</sub>-only scheme: the CO<sub>2</sub>-NO<sub>x</sub> trade-off.

Other airports have also introduced NO<sub>x</sub> charges. Following a decision in 2002, the Franco-Swiss airport of Mulhouse-Basel takes into account the performances of aircraft engines related to NO<sub>x</sub> emissions. This system – similar to the Swedish system – has not been extended to other airports in France as it has not demonstrated its capacity to influence the choice of aircraft engines. London Heathrow and Gatwick have introduced LTO NO<sub>x</sub> charges recently, but none of the Working Group participants was aware of any *ex-ante* or *ex-post* impact assessment as yet.

An alternative might be a cruise NO<sub>x</sub> charge. Some participants noted that it might be hard to establish who owned the proceeds of such a charge, since an aircraft may fly over through the airspace of several territories and over the high seas. Others did not agree and stressed that the principles for the charge need not differ from those for current airport charges.

*The pros and cons of inclusion of CO<sub>2</sub> emissions only in the ETS and the parallel introduction of ancillary instruments*

The following arguments were mentioned in favour of this approach:

- it would allow swift progress in the inclusion of aviation in ETS
- it would leave room for a tailored approach for other impacts, in line with the scientific understanding of these impacts
- if an LTO NO<sub>x</sub> charge or NO<sub>x</sub> route charge are effective, there would also be - beneficial in terms of reducing local air pollution
- it would be consistent with the principles underlying the EU ETS
- differentiation of airport charges would be possible in the relatively short term, since such charges are already applied in some Member States
- differentiation of airport charges in the EU would encourage over time a gradual global phase-out of high NO<sub>x</sub> engines.

The following arguments were mentioned against this approach:

- limitations on data availability may affect the parallel introduction of ancillary instruments
- lack of scientific understanding of non-CO<sub>2</sub> impacts may limit the parallel introduction of ancillary instruments;
- it is not yet clear whether such charges are effective: a relatively small difference in charges may not provide sufficient incentive to change airline behaviour
- it is not yet clear which instruments would be most appropriate;
- some third countries claim *en-route* emission charges are incompatible with the Chicago Convention

- differentiation of airport charges in the EU may lead to the removal of high NO<sub>x</sub> engines from EU but not necessarily from service elsewhere. It would therefore not necessarily contribute to reducing the climate effects of aviation.

It was generally agreed that an impact assessment of different ancillary instruments is needed to know whether the goal of mitigating the climate impacts of aviation NO<sub>x</sub> emissions can be achieved at reasonable costs.

**The Commission encouraged Members of the group to share any further thoughts or analysis on these issues with them in the coming weeks.**

**ANNEX**

**LIST OF ORGANISATIONS/MEMBER STATES ATTENDING THE 2<sup>ND</sup> WORKING GROUP MEETING**

ACI (Airports Council International – European Region)  
AEA (Association of European Airlines)  
Alliance of Energy Intensive Industries c/oCEMBUREAU (The Cement Association of Europe)  
ASD (The Aerospace and Defence Industries Association of Europe) represented by Rolls Royce  
CAN-EUROPE (Climate Action Network Europe)  
CE DELFT (Consultants working for the Commission)  
DLR German Aerospace Centre  
EEA (The European Express Association)  
ELFAA (European Low Fares Airline Association)  
ERA (European Regions Airline Association)  
EURELECTRIC  
IACA (International Air Carrier Association)  
IETA (International Emissions Trading Association)  
GE Aviation  
SAFRAN  
T&E (European Federation for Transport and Environment)  
Pratt & Whitney

Experts nominated by the following Member States:

- Finland
- France
- Germany
- Ireland
- Italy
- Malta
- Netherlands
- Poland
- Portugal
- Spain
- Sweden
- United Kingdom

European Commission (DG Environment, DG Transport and Energy, DG Research, DG Enterprise, Joint Research Centre)

Observer from the European Parliament

## **AVIATION & THE EU EMISSION TRADING SCHEME**

### **MINUTES OF THIRD MEETING (DAY 1) OF THE AVIATION WORKING GROUP**

#### **HELD ON 16 FEBRUARY 2006 AT AVENUE DE BEAULIEU 5, BRUSSELS**

These minutes summarise the discussions in the first day of the third meeting of the Aviation Working Group. The group was set up under the 2<sup>nd</sup> phase of the European Climate Change Programme to consider the modalities of extending the EU Emissions Trading Scheme to include emissions from aviation.

This meeting considered the mechanics of including aviation in the EU Emissions Trading Scheme - specifically how to resolve the difficulties created by the exclusion of international aviation from international emissions trading under the Kyoto Protocol.

From the second phase of the EU ETS (2008–2012) onwards, Commission Regulation 2216/2004/EC provides for allowances for use in the EU ETS to be created from assigned amount units (AAU - the main international currency unit provided for under the Kyoto Protocol). Allowances will be created by adding an allowance identifier to an AAU.

This creates a difficulty for the inclusion of aviation in the EU ETS because international aviation is not included in the targets under the Kyoto Protocol and the EU's Burden Sharing Agreement (Decision 2002/358/EC). Member States will not therefore hold AAUs in respect of international aviation.

The position is different for domestic aviation which is included in the targets. AAUs will be issued in respect of emissions from domestic aviation and Member States will be required to retire AAUs to cover such emissions.

The meeting considered six methods for integrating aviation into ETS:

- 5 Extending the scope of the Kyoto Protocol.
- 6 Borrowing AAUs from other sectors not covered by the EU ETS.
- 7 No allocation of allowances to the aviation sector, combined with an obligation to surrender allowances for all emissions.
- 8 No allocation of allowances to the aviation sector, combined with an obligation to surrender allowances for emissions growth above a certain baseline.
- 9 Semi-open trading for aviation.
- 10 Trading with a gateway.

A list of organisations represented in the Group is set out in Annex I. Comments are not attributed to individual organisations.

**Note that these minutes record the views expressed in the Group: they do not necessarily reflect the views of the Commission.**

Ron WIT gave a presentation setting the scene for the discussion and explaining the solutions outlined in the feasibility study. The presentation is available at:

[http://forum.europa.eu.int/Public/irc/env/eccp\\_2/library?l=/work\\_group\\_aviation&vm=detailed&sb=Title](http://forum.europa.eu.int/Public/irc/env/eccp_2/library?l=/work_group_aviation&vm=detailed&sb=Title)

### **The need to address interplay with the Kyoto Protocol**

One participant wondered whether the EU should design complicated methodologies to ensure that the inclusion of aviation, along with its allowances which are not recognised under the Kyoto Protocol, does not disrupt the accounting system set up to ensure a harmonised interaction between the EU ETS and the Protocol. The participant argued that, as long as the design of the system including aviation was environmentally credible (i.e. as long as emissions were reduced both from land based sources and in aviation), meaning that the EU would be contributing to the goals of the Kyoto Protocol and the United Nations Framework Convention on Climate Change (UNFCCC), then it may not be difficult for the UNFCCC Secretariat and other Parties to accept aviation allowances?

The Commission explained that it does not want to set a precedent for breaking existing Kyoto Protocol rules, even if this was done in a way that would contribute to the overall UNFCCC goal of stabilising climate change. In addition, it was not a decision which could be taken unilaterally. If in 2015 the European Community was retiring non-Kyoto units against its emissions limitation under Kyoto (as a consequence of widening the cap to aviation), the UNFCCC Secretariat would be obliged to refer the Community to the compliance committee for not having met its Kyoto obligation. The group generally agreed that aviation must be integrated in a way which does not undermine the existing accounting system.

The Commission explained to participants that the same accounting problem already arises in relation to Malta and Cyprus. These Member States do not have targets under the Kyoto Protocol for the 2008-2012 period and therefore will not have AAUs distributed to them for this period. Therefore, finding a solution for Malta and Cyprus will, in any case, require a change to the Registries Regulation.

One Member State emphasised that in finding a solution to the accounting problem, it is important to recall the objective of the trading scheme of being the most cost effective abatement system. This requires the administrative burden to be low. Several participants pointed out that the best mechanism for dealing with this issue depends on when aviation will be brought into the emissions trading scheme. There is still much uncertainty about the shape of international emissions trading after 2012. If it is intended to bring aviation into the scheme as soon as possible then it would be necessary to find a solution which works under the current architecture of the Kyoto Protocol which could also be adapted if and when the international architecture changes.

The Group considered the pros and cons of each of the options set out in the feasibility study. See attached table.

### **The pros and cons of option 1: extension of the Kyoto Protocol**

All participants agreed that the extension of the Kyoto Protocol to include international aviation should remove the accounting problems created by the inclusion of aviation in the EU ETS. One Member State considered that the extension of the Kyoto Protocol to include international aviation emissions would make the inclusion of aviation in the ETS more

consistent with the objectives of the scheme and would reduce the changes required to include aviation. At first sight it appeared a simple solution and would maximise market efficiency by avoiding complex rules. One representative of the aviation sector emphasised the importance of the scheme being well designed in order that aviation is able to achieve CO<sub>2</sub> emissions reductions cost-effectively. In this context, they considered that the capacity of the aviation sector to trade allowances should not be limited and felt that only option 1 did not introduce such a limitation. In addition, they felt that option 1 could have the lowest administrative costs.

However, most participants doubted the feasibility in the short term of an extension of the Kyoto Protocol to include aviation. Such an extension was generally deemed improbable before 2012 and it was considered too early to predict the shape of a post-2012 regime. Participants pointed at the slow progress in UNFCCC negotiations on allocating responsibility among Parties for bunker fuels.

Some representatives of the aviation sector argued that working through ICAO would be the best way to bring aviation into a future climate policy regime. Other participants noted that inclusion of aviation in the ETS would be in line with the current ICAO standpoint not to develop a global emissions trading scheme for aviation but to support the integration of aviation into existing emissions trading schemes.

Many participants stated that the EU should not assume an extension of the Kyoto Protocol to international aviation but should consider other options to ensure that the inclusion of aviation in the ETS is compatible with the Kyoto accounting system.

One Member State stated that, even if the Kyoto Protocol were extended, it could not be taken for granted that all problems would disappear. For example, the scope of the Protocol may not be extended to international aviation emissions from all countries, leading to problems remaining, for instance, for flights between Annex I countries and non Annex I countries, and between signatories and non-signatories.

### **The pros and cons of options 3 and 4: no allocation**

Under options 3 and 4, the aviation sector would not be allocated any allowances. Under option 3, trading entities would have to buy allowances for all their emissions on the ETS market. For option 4, they would have to buy allowances on the market to cover their emissions above a certain baseline.

Both of these options would remove the accounting problem since no additional allowances would be created for the aviation sector. Most participants agreed that these options were relatively simple to implement, mainly on the grounds that there would not be two different types of allowances created and no registry gateway mechanism needed. Therefore, the administrative burden, both on administrations and on aircraft operators, would be low. Of these options, option 4 is more complex, since it would involve establishing an overall baseline for aviation as well as individual baselines within the aviation sector. Some participants pointed out that option 3 would have the same allocation advantages as auctioning, as Member States and the Commission would not need to establish individual allocation quantities. In contrast, since option 4 involves setting individual baselines, it would mean a return to the usual allocation discussions and complications. For example, depending on how individual baselines would be set, they could also discourage early action to reduce

emissions, and raise questions regarding how to treat new entrants and closures. However, these same problems would apply to any of the options which necessitate an allocation methodology beyond establishing the total quantity of allowances.

From an environmental perspective it was noted that option 3 would be more effective because it would require all emissions from aviation to be offset in other sectors and so would provide an incentive to reduce all aviation emissions, not only emissions above a predetermined baseline. The group also recognised that any option which restricted sales/net sales of allowances from aviation into the core-ETS (options 4-6) would remove aviation's incentive to reduce emissions below the aggregate baseline. However, one participant pointed out that preventing net sales from the aviation sector into the core-ETS would reduce any incentive to over-allocate aviation allowances to the sector.

One Member State pointed out that option 4 would involve an additional loss of efficiency, since the aviation sector would not be able to trade amongst itself. One Member State also questioned how new entrants would be treated and argued that the baseline approach could disadvantage fast growing airlines if the baseline is determined on the basis of historical emissions or activities, without taking into consideration the potential for growth.

Some participants raised concerns that option 3 might impose a large financial burden on the aircraft operators, which could distort competition between EU and non-EU carriers. One Member State stressed placing a large financial burden on aircraft operators could lead to a significant price increase which would have a greater impact on demand in the new Member States where incomes are lower. It would also potentially treat aviation differently from other sectors covered by the EU ETS which currently receive allowances largely free of charge.

Furthermore, some Member States and representatives of participants in the existing scheme questioned the impact option 3 would have on the price of allowances in the scheme. Effectively the aviation sector would be required to purchase a large quantity of allowances, with the consequence that reductions would have to be made in the core-ETS or outside of the ETS (Kyoto project mechanisms) to cover emissions from aviation. Participants called for a thorough assessment of this impact.

Finally, one Member State felt that, even though options 3 and 4 were similar in the sense that no allowances were granted to the aviation sector, in reality, option 4 was closer in design to options 5 and 6. This was because, under all these options 4-6, aviation was not permitted to make net sales of aviation allowances into the core-ETS but aviation's ability to trade freely was progressively increased.

### **The pros and cons of option 5: Semi-open trading for aviation**

Option 5 would allow trading entities in the aviation sector to trade aviation allowances within the sector and to buy normal allowances from the core-ETS but would not allow entities in the aviation sector to sell aviation allowances to the core-ETS sector.

A number of Member States expressed concern that under option 5 the market would be less efficient than under option 6, and certainly less efficient than under options 6 and 2. However, it would be more efficient than under option 4. This degree of efficiency would become a

more important issue if aviation were a net seller (which in turn depends on the total number of allowances allocated to the aviation sector and the core-ETS).

Several Member States felt that the two different types of allowances (allowances with AAUs attached and aviation allowances without AAUs attached) created under options 5: semi open trading and option 6: gateway option could have different values. This is because aviation allowances would have no value for other sectors included in the ETS and so their price could be less than the normal allowance price.

One Member State suggested that option 5 could be simplified by implementing it without a gateway system. In other words, the AAU would not need to be taken off the core-ETS allowance and cancelled at the point of transfer into an aviation account, but instead cancelled upon surrender.

Participants noted that the use of ERUs and CERs could mitigate the problems created by a semi-open trading scheme. However, several participants pointed out that this may only provide a partial solution unless the supply of ERUs/CERs is further increased to meet demand.

### **The pros and cons of option 6: a gateway**

Under this option a gateway would be used to prevent any transactions which would result in a net transfer of allowances from the aviation sector to the ETS sector. On passing through the gateway between the aviation sector and other sectors an AAU would be attached to or detached from the allowance.

Many Member States stated that option 6 was their preferred option, for a number of reasons:

- The market efficiency would be greater than under a semi-open trading system.
- The administrative burden on aviation would be limited as the registry could be designed to add or detach AAUs as allowances pass through the gateway.
- It would allow greater flexibility for the aviation sector than a semi-open trading system as individual aircraft operators could sell to other sectors.
- Member States were optimistic that the registries system could be adapted to operate a gateway. In this context it was noted that a gateway is operational under the UK emissions trading scheme, although this gateway does not interact with AAUs, and so this issue would need to be considered further.

However, a representative of participants in the existing scheme pointed out that it is still an imperfect solution since allowances could not be freely traded. One Member State argued that any option which creates two types of allowances would increase the administrative burden of the scheme and require more complicated amendments to the Emissions Trading Directive and related legislation.

Some Member States were concerned about the effect on the market if the gateway closed. Some airlines were concerned that the uncertainty could increase transaction costs for airlines. Other Member States argued that this effect would be minimal if operators are informed of the status of the gateway as is the case in the registry for the UK Emissions Trading Scheme. Participants could also develop a trading strategy to manage the risk of the gateway closing, for example by opening trading accounts on the other side of the gateway.

As regards the level at which the gateway should operate, most participants considered it would be most efficient if the gateway were applied at a central level, with the Community Independent Transaction Log keeping track of net transfers into the core-ETS. Some participants argued that the gateway could be operated like a banking system, where some borrowing could be allowed, rather than having a strict point at which transactions were blocked. The Commission pointed out that this was the intention behind option 2.

One participant noted that currently, most ETS contracts are forward contracts, which usually expire on the same date. This could result in increased demand on a particular date which could introduce extra uncertainty in the system.

As for option 5, the use of ERUs and CERs could mitigate the market inefficiencies created by the gateway but this would be limited by the supply of such credits.

### **The pros and cons of option 2: Borrowing from non-ETS sectors**

Under this option AAU would be borrowed from non-ETS sectors in order to cover allowances transferred from the aviation sector to the other ETS sectors.

The advantage of this approach would be that allowances could be freely traded between the aviation sector and other ETS sectors.

However, several participants agreed that this option carried the risk that Member States would have fewer AAUs in their possession to meet their Kyoto targets. If the aviation sector were to be a net seller of allowances then not all the AAUs borrowed could be returned. In such a case, either non-ETS sectors would have to reduce their emissions further or Member States would have to buy additional Kyoto units to cover the net transfer of allowances from aviation to the other ETS sectors. Some Member States felt that this risk may be too large for them. Member States also argued that this option would require the most sophisticated changes to the registry system and establish a need for rules on how AAUs are borrowed from Member States and returned to them, and rules on what happens if not all borrowed allowances can be returned.

### **Proposal of other options**

One alternative option would be to have a closed trading scheme for aviation. However, several Member States and representatives from the airline industry argued that a closed scheme would not be cost-efficient and could impose a higher burden on aviation. Including aviation in the ETS is also more consistent with ICAO policy statements.

Some participants also suggested an emissions charge, the revenues from which could contribute to a climate fund used to buy and cancel ETS allowances and JI/CDM credits or used to fund research and development projects (for example to facilitate reductions in greenhouse gas emissions in air transport). However the Commission pointed out that the question of whether charges can be applied to emissions has been controversial in ICAO. In support of this approach, one Member State argued that since emissions reductions are likely

to be made outside the aviation sector the environmental effects of this approach would be equivalent to the inclusion of aviation in the ETS.

A further alternative suggested was for Member States to create a fund with AAUs, CERs and ERUs. Aviation could buy allowances from this fund at the current price of allowances. Any proceeds would go into emission reductions in sectors where abatement costs are lower or to fund research and development. The sector could also buy and sell from the existing ETS. Such an approach would avoid accounting problems and could potentially reduce pressure on the aviation sector and other sectors. Some participants questioned the costs of creating such a fund and doubted whether Member States would be willing to set up such a fund given the global nature of aviation.

### **Treatment of domestic aviation**

Most Member States agreed that domestic aviation should also be included in the ETS. As domestic aviation emissions are included in the Kyoto targets the meeting considered whether domestic aviation emissions should be treated differently to other aviation emissions.

Most participants argued that there should not be any difference in treatment between domestic and international aviation. A difference in treatment could cause competitive distortions and would create additional barriers to the market (particularly for airlines wanting to change from domestic to international flights). This suggested that any harmonised allocation rules applied to international aviation should also apply to domestic aviation. One Member State argued that finding a solution to the accounting problems for international aviation would reduce the differences between international and domestic aviation.

One Member State argued that, after aviation is included in the ETS, emissions from domestic flights should be treated in the same way as ground based emissions and that they should be included in Member States' NAPs in accordance with the current provisions of the Emissions Trading Directive.

### **NOTE**

The meeting started with a discussion of the transfer of RON WIT from CE Delft to *Stichting Natuur en Milieu*, a Dutch environmental NGO. Some representatives of the aviation sector expressed surprise that they had not been aware of this transfer from the start of the aviation working group and questioned his independence. The Commission clarified that it has a contract with CE Delft and that Ron Wit is assisting in the preparation and running of the aviation working group in his capacity as an employee of CE Delft. In addition, his role is to present the results from the previously completed feasibility study rather than undertake new work. Finally, the aviation working group operates according to transparent procedures: the minutes of the meeting record the views of all participants and all participants have an opportunity to comment on the draft before they are published. Ron Wit also clarified that he had sent a letter to a large number of stakeholders announcing his new job, and he regretted that this letter had obviously not reached some of the representatives of the aviation sector present at this meeting.

**ANNEX**

**LIST OF ORGANISATIONS/MEMBER STATES ATTENDING THE 1<sup>ST</sup> DAY OF  
THE 3<sup>RD</sup> WORKING GROUP MEETING**

ACI (Airports Council International – European Region)  
AEA (Association of European Airlines)  
Alliance of Energy Intensive Industries c/o CEMBUREAU (The Cement Association of Europe)  
CAN-EUROPE (Climate Action Network Europe)  
CE DELFT (Consultants working for the Commission)  
EEA (The European Express Association)  
EEA (European Environment Agency)  
ELFAA (European Low Fares Airline Association)  
ERA (European Regions Airline Association)  
EURELECTRIC  
EUROCONTROL  
IACA (International Air Carrier Association)  
IETA (International Emissions Trading Association)  
T&E (European Federation for Transport and Environment)

Experts nominated by the following Member States:

- Finland
- France
- Germany
- Ireland
- Malta
- Netherlands
- Poland
- Portugal
- Spain
- Sweden
- United Kingdom

European Commission (DG Environment, DG Transport and Energy, DG Research, DG Enterprise, Joint Research Centre)

Observer from the European Parliament

**INTERPLAY WITH KYOTO PROTOCOL**

	<b>Option 1 Extending Kyoto</b>	<b>Option 2 Borrowing</b>	<b>Option 3 No allocation</b>	<b>Option 4 No allocation (above baseline)</b>	<b>Option 5 semi trading</b>	<b>Option 6 gateway</b>
<b>Ability to be implemented by EU</b>	<p>Relevance partially depends on likelihood of inclusion of aviation in ETS pre-2012 and expectations for the shape of the Kyoto Protocol after 2012.</p> <p>No recent progress on incorporating aviation into the Protocol: discussions on bunker fuels stalled.</p> <p>Any design solution under the Kyoto Protocol may not be consistent with that under the ETS.</p>	<p>Possible - as long as gateway mechanism can be programmed.</p> <p>Need agreement of Member States to borrow AAUs and solution if not all can be returned.</p>	Possible	Possible	Possible	Possible – as long as gateway mechanism can be programmed.

<p><b>Impact on ETS</b></p>	<p>An increase in compliance costs for other sectors depends on the nature of the cap set. However, impact less than under option 3.</p> <p>Integration with core-ETS may be easier.</p> <p>Changes to registries regulation already required for Malta and Cyprus 2008-2012, so aviation is not the first example of this type of issue.</p>	<p>An increase in compliance costs for other sectors depends on the nature of the cap set. However, impact less than under option 3.</p> <p>If borrowing enabled, over-allocation to the aviation sector could undermine system.</p>	<p>Need to assess impact on ETS = may cause allowance prices to increase and therefore also places burden on other sectors (increase in compliance costs)</p> <p>If allowance prices increase, need to consider impacts on power prices and energy intensive industry.</p>	<p>An increase in compliance costs for other sectors depends on the nature of the baseline (cap) set. However, impact less than under option 3.</p>	<p>An increase in compliance costs for other sectors depends on the nature of the cap set. However, impact less than under option 3.</p>	<p>An increase in compliance costs for other sectors depends on the nature of the cap set. However, impact less than under option 3.</p>
<p><b>Market efficiency</b></p>	<p>Potentially fully fungible allowances which would not restrict trading.</p>	<p>Most efficient option compared to options 4-6 as no trade restrictions.</p> <p>Risk of over allocation to</p>	<p>Ensures environmental integrity and adherence to the polluter pays principle.</p> <p>Greatest incentive</p>	<p>If aviation can reduce emissions at less than market-wide marginal abatement cost, there is in reality no incentive to reduce emissions below baseline.</p>	<p>If aviation can reduce emissions at less than market-wide marginal abatement cost, there is in reality no incentive to reduce emissions below</p>	<p>If aviation can reduce emissions at less than market-wide marginal abatement cost, there is in</p>

		aviation sector.	<p>to reduce emissions since aviation included in amount already allocated.</p> <p>Efficient market, but price impacts more dependent on the supply of JI and CDM credits than under other options.</p>	<p>If aviation is a seller, prevents equalisation of price = marginal abatement costs in the market place.</p> <p>Lack of ability to trade below baseline. Therefore, less efficient than options 2, 5-6.</p> <p>Market restrictions ameliorated if aviation can use JI/CDM credits.</p>	<p>baseline.</p> <p>If aviation is a seller, prevents equalisation of price = marginal abatement costs in the market place.</p> <p>More efficient than option 4 (can trade within sector but cannot sell to other sectors). Less efficient than options 2 and 6.</p> <p>Market restrictions ameliorated if aviation can use JI/CDM credits.</p>	<p>reality no incentive to reduce emissions below baseline.</p> <p>If aviation is a seller, prevents equalisation of price = marginal abatement costs in the market place.</p> <p>More efficient than options 4-5 (can buy and sell through gateway). Less efficient than option 2.</p> <p>Market restrictions ameliorated if aviation can use JI/CDM credits.</p>
<b>Additional registry requirements</b>	Potentially no gateway required.	Could be more complicated as two types of	No gateway.	No gateway.	Potentially no gateway required. If gateway used,	Could be more complicated as two types of

		<p>allowance.</p> <p>Additional complexity may not be justified if aviation not likely to be a net seller</p>			<p>could be more complicated as two types of allowance.</p>	<p>allowance.</p> <p>Additional complexity may not be justified if aviation not likely to be a net seller</p> <p>As all forward transactions have same date, this could cause additional uncertainties.</p>
<p><b>Administrative complexity for Member State</b></p>	<p>Potentially reduced complexity if no gateway.</p> <p>Potentially no additional requirements for Member States (or non-EU ETS sectors)</p>	<p>Risk for Member States that there will be a net transfer from aviation to other sectors leading to insufficient AAUs in registry. A solution would need to be worked out in advance and enacted.</p> <p>Could use JI CDM credits to cover any AAU</p>	<p>Simple.</p>	<p>Simple but have to establish individual baseline which will then become as complicated in this respect as under all other options (unless full auctioning used).</p>	<p>Potentially reduced complexity if no gateway.</p>	<p>If single gateway at EU-level, then potentially less complex.</p>

		deficit but additional complexity and costs.				
<b>Administrative complexity for registry administrator</b>	Potentially reduced complexity if no gateway.	Depends on design of system – potentially more complex.	Simple.	Simple.	Potentially reduced complexity if no gateway.	If single gateway at EU-level, then potentially less complex.
<b>Administrative complexity for operators</b>	Potentially the same as for existing scheme.	Borrowing system would not affect existing operators. Same as for existing scheme.	Same as for existing scheme.	Same as for existing scheme.	More complicated as 2 types of allowance and potentially a gateway system.	More complicated as 2 types of allowance and a gateway system.
<b>Competition impacts</b>	If any design solution under the Kyoto Protocol is not consistent with that under the ETS, then inclusion of aviation in ETS could raise competition questions (Annex I vs non-Annex I, signatories vs non-signatories).	Aviation would be treated in same way as other sectors = all operators can buy and sell to anyone.	A particular need to assess impact on competition if allowance prices rise more significantly under this option than under other options.  Asking aviation to purchase a greater proportion of allowances than other sectors.	Depending on how individual baseline determined may disadvantage airlines that are growing  Could restrict competition between airlines as growing operators cannot buy from other operators = could disincentivise new efficient aircraft (although can buy from other sectors).	Better than option 4 = removes buying restriction, but still selling restriction to other sectors.	Better than option 4 = removes buying restriction, but still selling restriction to other sectors (although more limited).  Gateway closing could cause significant market

	Aviation would potentially be treated in same way as other sectors = all operators can buy and sell to anyone.					distortions = could be partially addressed by publishing status of gateway.
<b>New entrants</b>	Same as for existing scheme - can be complex unless full auctioning.	Same as for existing scheme - can be complex unless full auctioning.	Simple as all receive same treatment (as under full auctioning).	Same as for existing scheme - can be complex unless full auctioning.	Same as for existing scheme - can be complex unless full auctioning.	Same as for existing scheme - can be complex unless full auctioning.

**AVIATION & THE EU EMISSION TRADING SCHEME  
MINUTES OF THIRD MEETING (DAY 2) OF THE AVIATION WORKING GROUP  
HELD ON 17 FEBRUARY 2006  
AT AVENUE DE BEAULIEU 5, BRUSSELS**

These minutes summarise the discussions in the second day of the third meeting of the Aviation Working Group. The group was set up under the 2<sup>nd</sup> phase of the European Climate Change Programme to consider the modalities of extending the EU Emissions Trading Scheme to include emissions from aviation.

This meeting considered issues connected to setting a cap on greenhouse gas emissions for aviation, and the distribution of allowances. All presentations are available at:

[http://forum.europa.eu.int/Public/irc/env/eccp\\_2/library?l=/work\\_group\\_aviation&vm=detailed&sb=Title](http://forum.europa.eu.int/Public/irc/env/eccp_2/library?l=/work_group_aviation&vm=detailed&sb=Title)

A list of organisations represented in the Group is set out in Annex I. Comments are not attributed to individual organisations.

**Note that these minutes record the views expressed in the Group: they do not necessarily reflect the views of the Commission.**

Olivia Hartridge gave a presentation on the way in which the cap on emissions is set and distributed in the EU ETS according to the emissions trading Directive (2003/87/EC). She highlighted several differences between the ETS sectors and aviation, which may justify a more harmonised allocation methodology for aviation:

- There is no pre-determined burden sharing agreement between Member States which affects international aviation emissions.
- There seems to be a greater degree of mobility in the aviation sector, enabling differences in general fiscal or regulatory policies to be exploited.
- There seems to be a greater degree of homogeneity within the aviation sector, as compared to within other sectors.

Jan Middel (Dutch National Aerospace Laboratory NLR) presented the AERO model. This model is capable of simulating the environmental and economic impacts of policy measures aimed at reducing emissions in aviation.

Dan Yeo (Defra UK) presented the results of a study on the impact of the inclusion of aviation in the ETS on EU allowance prices, which was commissioned by Defra and conducted by ICF Consulting. The main result of the study is that only a limited, or perhaps even no, impact on EU allowance prices can be expected from including aviation in the EU ETS, assuming a stabilisation of CO<sub>2</sub> emissions in 2012 at 2008 levels. One of the main reasons for reaching this conclusion is that the model assumes that the aviation sector has access to Joint Implementation/Clean Development Mechanism project credits.

After the presentations, participants asked mainly clarificatory questions. With regard to the AERO presentation, questions mainly focused on the marginal abatement cost curve used for the aviation sector, its current degree of accuracy, and when and how this would be updated. With regard to the ICF Consulting report, it was generally felt that the market model used should be made more transparent. Also, some participants questioned whether the

assumptions made are correct. For example, one participant felt that the marginal abatement cost curve was quite flat over a wide range of emission reductions. One representative from the airline industry expressed scepticism that the report predicted a limited impact on the EU allowance price from the inclusion of the aviation sector in the EU ETS.

### **Should there be a harmonised approach to setting the cap and allocating allowances to the aviation sector?**

A large majority of participants supported the idea of a harmonised approach. This was considered the best way to prevent competitive distortions and promote transparency. It was also considered to be in line with the single European market for aviation.

Some Member States clarified that it would still be possible with a harmonised allocation methodology to delegate the work of actually distributing allowances in line with the methodology to competent authorities.

Several Member States noted the importance of taking into account differing national circumstances. Examples given were differing proximity to central EU regions (the most extreme case being the ultra peripheral regions) and the availability of alternatives to air transport (which are more limited for the Mediterranean Islands)<sup>8</sup>.

One Member State argued that aviation should be treated as any other ETS sector and included in Member State's national allocation plans. It reminded the group of the conclusion in the feasibility study that the aviation industry is by definition geographically bounded, with passengers having relatively fixed origins and in many cases also relatively fixed destinations. This conclusion, it argued, suggests that the cap and allocation should be performed at the national level. There could be some harmonisation of allocation approaches through extending the criteria for national allocation plans set out in Annex III of the Emissions Trading Directive

### **Principles for setting a cap for the aviation sector**

Le Thi Mai (Association of European Airlines) gave the first part of her presentation concerning recommended principles for setting a cap. The AEA proposes to calculate a baseline for the aviation sector by taking average actual emissions from a period of several years. Thereafter, the cap for a future compliance period would be calculated by multiplying this baseline by business as usual emissions projections (which combine expected annual growth in flights with historic average fuel efficiency improvements).

Some participants, including the Commission, noted that it was important that the baseline once set, should not change in the future. It was explained that keeping a baseline fixed was a separate question from how to set the cap. However, keeping baselines fixed meant that participants investing in emission reductions in the years following the baseline period maintained the benefits in future compliance periods. One Member State felt that setting the baseline using pre-2008 data should be considered, so as to prevent aircraft operators having an incentive to increase emissions now in order to be rewarded with a higher baseline.

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<sup>8</sup> Note that this issue was raised in the context of the Environment Council's conclusions of 2 December 2005, specifically paragraphs 6-7: [http://europa-eu-un.org/articles/fr/article\\_5400\\_fr.htm](http://europa-eu-un.org/articles/fr/article_5400_fr.htm)

Several participants argued that the cap should not increase over time, but decrease to maintain the environmental integrity of the ETS. An NGO argued that aviation should take on drastic cuts in emissions, and take them soon, otherwise aviation would take up most of the emissions available to Europe under credible climate mitigation scenarios (citing a scenario where aviation would account for 40% of total CO<sub>2</sub> emissions in 2050 if the target of 550 ppm was achieved through mitigation efforts in other sectors).

Most participants indicated that they had considered principles for setting a cap, but had not yet reached a final view on an exact methodology. Many participants brought forward conditions that a cap should satisfy, such as:

- The cap should be stringent and scientifically robust.
- The cap should not distort competition in the single market.
- The cap should be based on actual emissions data.
- The cap should be consistent with the main objective of the UNFCCC which is to stabilise climate change i.e. aviation should play its part in meeting long term climate goals.
- The effort required of the aviation sector to reach the cap should be reasonable and take into account the cost to the sector of reducing emissions.
- The cap should reward early action.
- The cap should not create perverse incentives.
- The cap should avoid unduly increasing the burden on ETS sectors and the non-trading sector.
- The cap should be in line with the Polluter Pays Principle.

One Member State argued that the cap should take the high growth rate of aviation in most new Member States (due to the current under-development of services) into account. This was supported by one airline association. Others felt that the focus should not be on differing growth rates in different countries, but rather on there being an equal opportunity to grow within a single, liberalised market. One participant suggested that this issue could be tackled through a new entrant reserve which could be used to allocate allowances to airlines which provide a new service. One representative of the aviation sector considered that any economic costs for e.g. the tourist industry from potentially reduced growth in the aviation sector should be addressed.

The criterion that the effort required of the aviation sector to reach the cap should be reasonable led to a discussion on the possibility of calculating this burden. Firstly, it was recognised that questions remain as to the possibility for the aviation sector to pass on additional costs to consumers. The Commission noted that, if some of the costs could be passed on, then the question of windfall profits to the sector would be raised unless a relatively high proportion of allowances were auctioned. Furthermore, some participants questioned whether there were reliable marginal abatement cost estimates that could be used to construct a marginal abatement cost curve for the aviation sector. The Commission considered that up-to-date data must be available since some representatives of different parts of the aviation sector have given presentations recently on what types of emission reductions are possible and at what cost. It urged the aviation sector to submit whatever data it had available, if necessary on an anonymous basis. Participants noted other sources for data that might be used to construct a cost curve, such as Committee on Aviation Environmental Protection (CAEP) estimates under the International Civil Aviation Organisation (ICAO).

### **Allowance distribution methods**

Ron Wit gave a presentation on the allowance distribution options considered in the CE Delft study with a focus on the data requirements for different methods.

Chris Essex (ELFAA) gave a presentation on the principles for the distribution of allowances according to ELFAA. An emphasis was given on the importance of recognising early action.

Le Thi Mai (Association of European Airlines) gave the second part of her presentation focusing on the organisation's recommended distribution methodology: benchmarking, and explaining the different ways in which the same benchmark (emissions per payload kilometre) could be interpreted.

The discussion centred on three distribution methods: grandfathering, benchmarking and auctioning. The "baseline" and "no allocation" options were not discussed in detail by any of the participants.

In contributing to the discussions, most Member States stated that they had not reached a final position on distribution methods.

Many participants expressed their support for benchmarking, but saw difficulties in finding a generally agreed benchmark parameter, particularly in the light of the presentation given by AEA. Some representatives of the aviation sector felt it may also favour certain business models over others, depending on the benchmark metric chosen. In addition, some representatives of the aviation sector commented that it may be hard to integrate both freight and passenger transport models into the same benchmark given their different approaches and limitations when carrying payload. In response to this point, one Member State felt that volume may be an important consideration with respect to freight transporters.

The Member States which argued in favour of benchmarking considered that the main advantages were that it would reward early action, that it would not create perverse incentives and that it would not impose a significant financial burden on the sector. These Member States noted that an acceptable metric for a benchmark still needs to be developed. However, the Commission commented that benchmarks are generally simpler to develop when the sector displays a degree of homogeneity in providing a good or service, such as in the aviation sector, than when a sector produces many different goods or services.

Many participants agreed that any benchmark parameter and the monitoring of emissions should be based on actual data (actual distance, actual fuel consumption and actual payload transported). It was stressed that this is important to allow aircraft operators the flexibility to take operational emission reduction measures (e.g. load factor improvements, network optimisation, flight operations, etc.). In line with the latter, some mentioned that benchmark parameters such as revenue tonne kilometres (RTK) and actual takeoff weight kilometres (ATOWK) (based on actual payload) are preferred over capacity based parameters such as available tonne kilometres (ATK) and maximum takeoff weight kilometres (MTOWK).

An NGO argued that all options except for auctioning would be unfair to the consumer, because free allocation could allow the aviation sector to benefit from windfall profits and auction revenues which could be recycled to the benefit of the rest of the economy would be

forgone. Moreover, it pointed out that auctioning was a non discriminatory measure, thereby leaving the competitive market intact.

In response, some participants agreed that auctioning may not distort competition on routes affected or competition between EU carriers. However, they considered that auctioning could have an impact on EU carriers' profit margins and therefore could indirectly affect competition versus non-EU carriers. They emphasised the need for an impact assessment on this point. One representative of the aviation sector voiced their disagreement to the possibility that free allocation of allowances could lead to windfall profits, considering that it would be difficult to pass costs on to the consumer given the degree of competition in the airline sector and companies being in very different financial situations.

Several Member States advocated total or partial auctioning in order to offset or minimise the possibility of windfall profits. They considered that windfall profits in the power sector were contributing to public resistance towards distributing allowances for free. Furthermore, they noted that auctioning would minimise design difficulties regarding new entrants and closures that exist with free allocation methodologies (grandfathering and benchmarking). However, one Member State considered that auctioning would be difficult domestically and another considered it may not be feasible at present.

One participant considered that finding a rule for the distribution of auction revenues is similar to the problem of finding a rule for distributing allowances under grandfathering or benchmarking. For example, revenues could be distributed proportionally to the production of airlines (e.g. RTKs). One Member State suggested that auction revenues could be used to purchase/borrow Kyoto units in order to facilitate complete integration of the aviation sector into the EU ETS market (see minutes from day 1 of the 3rd meeting of the aviation working group).

Some Member States argued in favour of grandfathering since they felt that this would put aviation on an equal footing with other ETS sectors. This is because grandfathering was the dominant distribution methodology for the 2005-2007 period of the scheme. However, one Member State found grandfathering unacceptable, since as a free allocation methodology it could create windfall profits. Also, unlike benchmarking, it could reward carbon-intensive aircraft fleets and punish early action (depending on how the baseline is set and if it is updated). One participant considered that the definition of grandfathering indicated that it was a transitory methodology, and another participant felt that grandfathering may be the easiest methodology as a starting point.

One Member State raised the question whether anybody could participate in an auction and if it is possible to exclude certain entities? The Commission replied that it is not legally feasible to exclude certain organisations from an auction, since this would compromise the principle of non-discrimination. One Member State considered that an assessment of this issue would need to be made as it may lead to difficulties for smaller airlines when bidding for allowances in an auction open to all players in emissions trading. In particular, anti-competitive practices would need to be prevented so that large entities, whether large airlines or large entities in other sectors, could not force smaller airlines out of business through the auctioning process.

One Member State suggested taking into account any relevant allocation guidance drafted in ICAO in order to facilitate an expansion of the scheme to other regions in the world in the future.

Without prejudice to formal positions being reached in the future, one Member State stated that it would like to see an auctioning/benchmarking combination, whilst two other Member States gave their preference order as: 1) auctioning, 2) benchmarking, 3) and grandfathering.

One Member State stressed the importance of avoiding discrimination against new services. It argued that a new entrant reserve should be created from which allowances would be granted on the basis of ATK. An airline which increases its ATK would be allocated additional allowances from the reserve to cover the same proportion of new emissions as its original allocation. Airlines would be eligible for an allocation if they increase their ATK either by creating new regular air connections or increasing capacity on existing ones.

**General comments/questions**

*Question:* will the Commission deliver a final report of the aviation working group? *Answer:* All minutes (in their final form, following comments on the draft forms being incorporated) taken together will form the final report. No separate report will be drafted.

Next meeting: 11<sup>th</sup> April in DG Environment, Brussels (note this has been delayed as compared to the original date).

**ANNEX**

**LIST OF ORGANISATIONS/MEMBER STATES ATTENDING THE 2<sup>ND</sup> DAY OF  
THE 3<sup>RD</sup> WORKING GROUP MEETING**

ACI (Airports Council International – European Region)  
AEA (Association of European Airlines)  
Alliance of Energy Intensive Industries c/o CEMBUREAU (The Cement Association of Europe)  
ASD (The Aerospace and Defence Industries Association of Europe)  
CAN-EUROPE (Climate Action Network Europe)  
CE DELFT (Consultants working for the Commission)  
EEA (The European Express Association)  
EEA (European Environment Agency)  
ELFAA (European Low Fares Airline Association)  
EURELECTRIC  
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IACA (International Air Carrier Association)  
IETA (International Emissions Trading Association)  
T&E (European Federation for Transport and Environment)

Experts nominated by the following Member States:

- Finland
- France
- Germany
- Ireland
- Italy
- Malta
- Netherlands
- Poland
- Portugal
- Spain
- Sweden
- United Kingdom

European Commission (DG Environment, DG Transport and Energy, DG Research, DG Enterprise, Joint Research Centre)

Observer from the European Parliament

**DISTRIBUTION METHODS  
PROS AND CONS**

	<b>Grand-fathering</b>	<b>Bench-marking</b>	<b>Auctioning</b>	<b>Baseline</b>	<b>No allocation</b>
<b>Environmental rationale</b>	<p>Difficult to ensure environmental integrity.</p> <p>Depending on base period could be incentive to delay introduction of new technology.</p> <p>Does not favour early action.</p>	<p>Sets the right incentives to reduce emissions.</p> <p>Does not encourage delay to introduction of new technology.</p> <p>Benefits those that have taken early action.</p> <p>Depending on parameters might reduce cost of adding passengers (if payload advantage).</p>	<p>Sets the right incentives to reduce emissions.</p> <p>Does not encourage delay to introduction of new technology.</p> <p>Benefits those that have taken early action.</p>	<p>No incentive to reduce emissions below the baseline.</p> <p>Individual baselines could be set using grandfathering or benchmarking (see other columns).</p>	
<b>Economic efficiency</b>	<p>Less efficient than auctioning, and potentially inefficient over time depending on base period.</p>	<p>Less efficient than auctioning, but more efficient over time than grandfathering .</p>	<p>Most efficient allocation mechanism: "double dividend" where receive benefit of most efficient allocation mechanism plus revenues can be used to compensate other parts of the economy through e.g. reduction in taxes on profits/labour.</p>	<p>No incentive to reduce emissions below the baseline.</p> <p>Individual baselines could be set using grandfathering or benchmarking (see other columns).</p>	<p>= efficiency of auctioning, but no "double dividend" because no auction revenues.</p>
<b>Revenues</b>	No.	No.	Yes.	No.	No.
<b>Administrative feasibility</b>	Used as predominant methodology	Potentially complicated depending on	Less complicated than	Individual baselines could be set	Least complicated methodology.

	in first phase of ETS because easiest way to start, particularly if low on data/ complicated product market.	parameters chosen.	grandfathering /benchmarking  But have to decide what to do with auction revenues.	using grandfathering or benchmarking (see other columns).	
<b>Data Requirements</b>	Potentially less difficult data requirements for the regulator depending on quality of historical emissions data.	Most demanding data requirements.  More work on options needed if feasible - Eurocontrol could provide details of data available = see if data be split in appropriate way.	Less difficult data requirements for the regulator, except regarding how to recycle revenues.  Same as other options at operator level as operators need to know how many allowances they need to purchase.		Least data requirements for the regulator.  Same as other options at operator level as operators need to know how many allowances they need to purchase.
<b>Impact on prices</b>	Depends on overall cap set.	Depends on overall cap set.	Depends on overall cap set.	Depends on overall cap set.	No cap set for aviation sector, so depends on stringency of cap set for other sectors. Potentially higher impact on prices of goods/ services.
<b>Impact on allowance prices</b>	Depends on overall cap set.	Depends on overall cap set.	Depends on overall cap set.	Depends on baseline set.	No cap set for aviation sector, so depends on stringency of cap set for other sectors. Potentially higher impact on allowance prices.

<p><b>Impact on competitiveness</b></p>	<p>Potential for windfall profits to aircraft operators.</p> <p>Adverse effect – allowance distribution may be based on historic, not current, market share.</p> <p>Need to assess consequence of impact of any increase in ticket prices on tourist industry.</p>	<p>Potential for windfall profits to aircraft operators.</p> <p>Choice of parameters may favour particular business models.</p> <p>If allocate on basis of GCD could disadvantage short haul carriers but all operators on same route would be treated the same.</p> <p>Need to assess consequence of impact of any increase in ticket prices on tourist industry.</p>	<p>As % auctioning increases, reduces potential for windfall profits to aircraft operators.</p> <p>All airlines treated the same.</p> <p>Greater upfront cost to aircraft operators: if high % auctioning, this could create distortions between EU and non-EU aircraft operators.</p> <p>Need to assess consequence of impact of any increase in ticket prices on tourist industry.</p> <p>If high% auctioning, could treat aviation differently from other ETS sectors (depending on degree of auctioning in other sectors post-2012).</p> <p>Need to ensure well designed auction, otherwise companies with more</p>	<p>Individual baselines could be set using grandfathering or benchmarking (see other columns).</p>	<p>No windfall profits to aircraft operators.</p> <p>All airlines treated the same.</p> <p>Likely to lead to greatest impact on allowance and ticket prices, since this option likely to lead to tightest cap: this could create distortions between EU and non-EU aircraft operators.</p> <p>Need to assess consequence of impact of any increase in ticket prices on tourist industry.</p> <p>Since = 100% auctioning, could treat aviation differently from other ETS sectors (depending on degree of auctioning in other sectors post-2012).</p> <p>Need to ensure competitive market for allowances, otherwise companies with more market power</p>
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			market power could buy majority of allowances.		could buy majority of allowances.
<b>Market Access</b>	No historic data for new entrants: requires different methodology if new entrants receive free allocation.	Can apply same benchmark to new entrants, if new entrants receive free allocation, although replacement to historic data still needed to multiply up benchmark.	Equality between incumbents and new entrants.	Individual baselines could be set using grandfathering or benchmarking (see other columns).	Equality between incumbents and new entrants.

## **AVIATION & EU EMISSIONS TRADING SCHEME**

### **MINUTES OF THE FOURTH MEETING OF THE AVIATION WORKING GROUP**

**HELD ON 11 APRIL 2006  
AT AVENUE DE BEAULIEU, BRUSSELS**

These minutes summarise the discussions in the fourth meeting of the Aviation Working Group. The group was set up under the 2<sup>nd</sup> phase of the European Climate Change Programme to consider the modalities of extending the EU Emissions Trading Scheme to include emissions from aviation.

This meeting considered the administrative requirements which should apply to the aviation sector such as permitting and monitoring, reporting and verification of emissions and the enforcement of obligations under the scheme.

A list of organisations represented in the Group is set out in Annex I. Comments are not attributed to individual organisations.

All presentations referred to below are available in the folder for the 4<sup>th</sup> meeting at:  
[http://forum.europa.eu.int/Public/irc/env/eccp\\_2/library?l=/work\\_group\\_aviation&vm=detailed&sb=Title](http://forum.europa.eu.int/Public/irc/env/eccp_2/library?l=/work_group_aviation&vm=detailed&sb=Title)

**Note that these minutes record the views expressed in the Group: they do not necessarily reflect the views of the Commission.**

#### **Monitoring, Reporting and Verification of Emissions**

Ron Wit (CE Delft) gave a presentation setting the scene for discussion on monitoring and reporting aviation emissions and explaining the options considered in the feasibility study.

Stefano Mancini (EUROCONTROL) gave a presentation on the types of data (in relation to flights, fleets and airspace) collected by EUROCONTROL (updated from the position explained at the first meeting of the aviation working group).

EUROCONTROL possess information about flights based on different sources. Operators are required to submit flight plans to EUROCONTROL for the purpose of managing air traffic flow. These include the type of aircraft and the route intended to be flown. In addition, for the purpose of allowing EUROCONTROL to collect en-route charges, national authorities notify EUROCONTROL when a flight is operated from its territory specifying inter alia the type of aircraft and its destination. The information from the various sources is combined and consolidated in EUROCONTROL's PRISME data warehouse and could conceivably be used for verification purposes. Information about fuel burn is not compulsory although some airlines supply the information voluntarily. EUROCONTROL also has modelled data on emissions, which is probably not accurate enough to use for verification purposes.

Andy Kershaw (British Airways) gave a presentation on how BA monitors and reports CO<sub>2</sub> emissions for the purposes of the UK Emissions Trading scheme.

Under the UK scheme, BA is responsible for the emissions from operations within the UK of any entity which is wholly owned by BA. Therefore it is responsible for operations by its subsidiaries over which it has management control but not for franchisees. Emissions are calculated using one of two methods. Under the first method, fuel consumption is calculated by subtracting the calculated arrival fuel from the actual departure fuel. The arrival fuel is calculated by deducting the fuel uplifted for the next flight from the departure fuel for the next flight. This ensures that the calculation captures fuel used by the auxiliary power unit (APU) between flights (for example to run air conditioning in the plane). Emissions from the APU would not be captured if the fuel was measured on departure and on arrival. This procedure means the APU emissions at the end of each flight are included in the total emissions for that flight. Method 2 calculates estimated fuel consumption where method 1 cannot be applied using the following tiers:

- Tier A: average historical consumption for the aircraft-sector combination
- Tier B: flight planning predicted consumption data for the aircraft-route combination
- Tier C: average historical burn rate for the aircraft type per hour or per nautical mile
- Tier D: generic manufacturers burn rate per hour or per nautical mile

The highest possible tier is used.

BA's presentation concluded that aircraft operators have access to accurate fuel and operational data and that airlines can meet M&R and verification requirements for CO<sub>2</sub> under an ETS. It proposed that the airline industry should propose a methodology for the monitoring and reporting of emissions under the EU ETS. This proposal received support from some airline associations. The Commission explained that the monitoring and reporting guidelines for the ETS were developed from existing methodologies for monitoring emissions from the sectors covered by the scheme and therefore in developing the requirements for the aviation sector, the Commission would look at the BA methodology, the IPCC guidelines for national GHG Inventories and any relevant ICAO methodologies.

There was a general agreement in the group that reporting of actual fuel use by airlines would be most accurate method and that it would provide the broadest possible range of incentives to implement reduction measures including operational measures that would not be encouraged if modelled consumption were used. It should therefore be the preferred approach. An airline association pointed out that airlines hold the most accurate information and that the information held by EUROCONTROL is mainly provided by the airlines.

One Member State argued that the objective should be to use the existing procedures in the ETS as much as possible and that the requirements for monitoring and reporting and verification should be as harmonised as possible in order to avoid competitive distortions between carriers.

Representatives of airlines confirmed that major airlines already collect detailed data for internal purposes. Several participants expressed concern that smaller airlines may not currently have the systems in place to provide actual data on a flight by flight basis. A representative of regional airlines explained that all commercial airlines know costs over a period (6-12 months). One airline association indicated its support for the use of actual data and explained that this position had been also agreed by its smaller members knowing that it would require them to put in place additional procedures. Some Member States suggested that a similar approach should be taken to the tier system under the monitoring and reporting

guidelines for the Emissions Trading Scheme. Under this approach the most accurate tier should be used unless it is not economically or technically feasible to do so. A lower tier might be used in cases of non-compliance, to fill in partial data gaps or for small operators. One participant pointed out that, as is the case under the UK scheme, if it is not possible to use actual data, then monitoring can be based on historical methods. Estimation should be used only as a last resort. All participants agreed that if the future rules made recourse to estimated data as a lower tier e.g. in cases where operators failed or refused to submit data, such estimates should be conservative (higher than actual consumption) to prevent operators from gaining by non-compliance. This would also provide an incentive for all operators to put in place adequate and accurate monitoring systems.

One Member State suggested that an alternative approach would be for airlines to record all fuel that they buy. Some industry representatives agreed that fuel bought would be a good estimation of fuel burned, as long as the aircraft operates wholly within the system. The utility of data on fuel bought would thus to some extent depend on the scope of the scheme (discussed at meeting 1). A representative of business aviation argued an obligation to recording fuel usage could impose an excessive administrative burden on operators of small business jets (if they are not excluded from the scheme through the use of thresholds).

Several participants emphasised the importance of verifying data reported by industry. Some participants suggested that EUROCONTROL flight data could be used to check flight data supplied by aircraft operators. Some participants suggested that EUROCONTROL emission models could be used to check the integrity of the system. Several Member States argued that it was important for EUROCONTROL to further develop its models, in order to be able to perform an integrity check of the system as a whole. The EUROCONTROL representative indicated that their radar tracking of individual flights has an error of only about 3% - 5%.

There was some debate as to whether EUROCONTROL emission model estimates could be used to fill in data gaps for airlines or to establish emissions for airlines that are not in compliance. Some participants argued that EUROCONTROL's database was designed for use in modelling and not determining emissions for the purposes of a scheme such as the ETS. One Member State explained that under the ETS, operators are required to have their emissions reports verified by an independent accredited verifier who checks that the methodology has been applied correctly. This approach could also apply to aviation operators. As a kind of combination of the two approaches, it was conceivable that EUROCONTROL estimates were made available to the verifiers as one of the tools they could use to fulfil their task. Several participants argued that, as is the case under the current ETS, the level of accuracy for the monitoring and reporting of emissions must be specified in the rules for verification. Under the monitoring and reporting guidelines for the ETS a misstatement is likely to be classed as material if it leads to aggregate errors in the total emissions figure of greater than 5%.

The Commission explained that there is a difference between uncertainty and materiality. There is some uncertainty which is built into the monitoring requirements. For example if a particular gauge is required to be used then the inbuilt uncertainty of this gauge will be known. Materiality is however the assessment of whether the monitoring requirements have been applied correctly and whether there are omissions, misrepresentations or errors which affect the information reported.

Some participants questioned whether there could be different emissions factors applied to different fuels. However there was wide agreement that emissions factors are not a big issue in the aviation sector as the fuel used is relatively very homogenous compared to many other industries including some of those already subject to the EU ETS (the international requirements on fuel specification are quite strict). Some participants considered that this could become more of an issue in the future if, for example, biomass is used in fuels. Even if/when alternative fuels were to be used to a higher degree, corresponding changes/differences in emissions factors could be handled through the definition and the application of monitoring guidelines as it is currently done for other sectors.

Several participants expressed concern that whilst many airlines currently record detailed data there is currently no requirement, particularly for non-EU airlines to report this information. The Commission confirmed that the purpose of the discussion was to consider what information could be used and what information operators could reasonably be asked to provide. The legislation could create an obligation to provide this information to the relevant authorities. A representative from EASA pointed out that EASA might be able and well placed to undertake tasks related to monitoring in the context of the planned future extension of its competencies, since these could include formulating additional requirements to be met by all aircraft operators. A participant also commented that there should be a link between the standards being drawn up for future aircraft to ground datalinks under the SES legislation and any future requirements for reporting.

One Member State argued that it is important to be able to distinguish between domestic and international aviation emissions. The Commission indicated that data would be likely to include city pairs and therefore domestic emissions could be identified.

Several participants argued that for reasons of commercial confidentiality, data should only be required to be published at an aggregated level.

## **Permitting**

Hans de Waal (Netherlands) gave a presentation on Monitoring and Reporting requirements in the Netherlands.

Hans de Waal explained that under the EU ETS operators of stationary installations are required to hold a permit. The permit includes an obligation to monitor and report emissions from the installation. Monitoring issues should be addressed at an early stage in the permitting process. It is important to ensure that monitoring requirements are enforced to guarantee the integrity of the scheme.

Steve Arrowsmith (EASA) gave a presentation on the role of EASA and the permitting requirements for aircraft operators and aircraft.

EASA confirmed that an AOC will list the aircraft operated by an operator. If an aircraft is the subject of a dry lease then the AOC of the lessor and lessee are amended to remove the aircraft from the lessor's AOC and include it on the lessee's AOC. A wet lease would not, however, require a change to AOCs and can consequently be arranged more quickly. Aircraft are listed in the AOC by reference to their registration mark on the associated national register. The EUROCONTROL database does not contain AOC details but registration marks are used by the Central Route Charges Office to calculate and collect charges.

Air Operations standards are not completely harmonised across the EU. Currently national authorities apply national legislation based on the JAA JAR-OPS requirements. An EU Regulation is expected to be adopted during the first half of 2008 to incorporate air operations requirements into EU law and place them under the responsibility of EASA. National Authorities currently apply national requirements for operations outside the scope of JAR-OPS. For aircraft registered in a third country the operational requirements of the state that issued the AOC apply. If this is an ICAO Member State, these requirements will be based on ICAO Annex 6 standards and recommended practices. While it has been previously been assumed that all ICAO Member States are giving proper effect to ICAO standards, it is now proposed that EASA's role should be extended to include checks that non-EU operators comply with operational requirements.

Some Member states apply a system of route licenses, but this is not standardised. The ICAO system distinguishes between scheduled services, which may only operate with the permission of the States being overflown, or where landings take place, and non-scheduled services which are entitled to operate without obtaining prior permission. Slot allocations are used at congested airports.

The Group considered whether a permitting system would be necessary. A Member State argued that, so far as possible, the provisions of the existing scheme should also apply to aviation. A Member State argued that a permitting approach is useful to identify the responsible entities and to approve the monitoring protocol proposed by the operator. The Commission explained that it might be possible to include obligations currently in the permit directly in legislation (either at Community or Member State level). If operators could be easily identified and a single monitoring protocol could be applied to all operators, a permit may not be necessary. One Member State agreed that this may be the case for aviation and that if this is so, not requiring a permit would reduce the administrative burden on operators and, potentially, regulators. Another Member State argued that while a permitting procedure may not be necessary, it could have three merits:

- To identify the responsible entity in real time and in a transparent way all over Europe;
- To check that the monitoring protocol proposed by the responsible entity comply with the EU legislation; and
- To identify the authority or authorities in charge of distributing quotas, verifying declarations and the enforcement of obligations under the scheme.

Some participants expressed concern that a requirement for third country operators to hold an ETS permit in order to land at and/or take off from an EU airport could conflict with traffic rights under bilateral air service agreements. A representative from EASA explained that there are already examples of additional conditions being imposed. For example, the US has imposed additional security requirements. However any additional requirements would need to be consistent with existing legal obligations such as the Chicago Convention.

The Group briefly considered who might be the appropriate permitting authority.<sup>9</sup> One Member State argued that the permitting authority could be at the Community level or at the national level. If at the national level then responsibility could be divided, in relation to EU

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<sup>9</sup> This is linked to the wider question of how to divide responsibilities for allocation, permitting and enforcement between the Community and Member States.

operators, on the basis of the state in which an operating licence is granted under Regulation 2407/92 and in relation to non-EU airlines on the basis of bilateral agreements. However another Member State pointed out that it would be a problem if every third country airline had to report to different authorities. The Commission explained that Regulation EC/785/2004 on insurance requirements for air carriers and aircraft operators provides an example of how it is possible to clearly divide the responsibility for regulatory oversight/enforcement to cover EU/non-EU operators and air carriers/non-air carrier operators. A similar combination of roles might be envisaged for the ETS<sup>10</sup>.

The group considered the question of whether it is necessary to have a concept similar to that of an "installation" for the aviation sector. Under the existing scheme the concept of an "installation" is used to:

- Identify the technical unit in which activities covered by the scheme are performed (this may be an aggregation of more than one activity);
- Link that unit to a single operator who is responsible for meeting the requirements of the scheme in respect of that installation.

A number of the obligations under the Emissions Trading Scheme apply at the level of an installation. Operators must hold a permit for each installation,<sup>11</sup> monitor and report emissions from the installation and surrender allowances in respect of the installation. It is also the level at which allocations are made and is pivotal in the definition of new entrant.

Given the large number of aircraft which could be covered by the scheme, it might not be appropriate to apply this concept directly to the aviation sector.

Most participants questioned whether it was necessary to have a concept equivalent to the concept of installation for the aviation sector: it was simply necessary to identify the flight operations within the geographical scope of the scheme and the entity responsible for those operations. The key question is who will be responsible for the emissions. One Member State reminded the group that the Council Conclusions state that the responsible entities should be aircraft carriers and operators. However whilst these terms are defined in Community legislation, it recalled the need to determine who would be responsible for emissions from leased aircraft, aircraft operated by non-EU operators and jointly operated flights. The Member State suggested that a possible solution was that air carriers be held accountable responsible for the flights for which they are the actual operators and for the flights they lease, and that for flights jointly operated all the airlines involved would be responsible unless they designate a responsible entity.

Some Member States suggested it might be possible to divide responsibility on the basis of an air operators certificate (AOC) as each aircraft is linked to one operator. A representative of business aviation confirmed that in cases of fractional ownership in Europe, the aircraft would be operated on the same AOC. However an airline organisation pointed out that the holder of

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<sup>10</sup> However, under the insurance regulation non-Community air carriers shall provide each competent authority of the Member States concerned to or from which the flights are operated with a deposit of an insurance certificate or other evidence of valid insurance, whereas EU carriers only deal with the authority in the Member State where they are licensed. The impacts of and options for avoiding such differences in treatment need to be considered.

<sup>11</sup> This is subject to the limited exception that a permit may cover more than one installation on the same site operated by the same operator.

the AOC will not always be responsible for purchasing fuel. For example, one company may operate a flight and hold the AOC and another may buy seats on the flight and fuel.

Under the UK ETS, BA are responsible for emissions from all wholly owned entities and are therefore responsible for emissions from aircraft leased in regardless of whether this is done on the basis of a wet lease or dry lease. Some participants queried whether this should be the case under a mandatory scheme including all airlines and suggested that all flight operations by air carrier licence might be more appropriate. A member state highlighted that if the commercial or marketing air carrier is the responsible entity then it raises issues of code-sharing and the variety of agreements between wet and dry leases. EUROCONTROL explained that, where an aircraft is leased, bills for route charges are sent to the marketing agent. If the lease agreement contains a clause that the lessor pays the route charges then the airlines would either agree on a transfer between themselves or the lessee would refuse to pay and EUROCONTROL would bill the lessor.

One Member State also recommended that the Commission should consider whether there are concepts used in international aviation which might be useful. For example, the concept of "contracting carrier" and "actual carrier" in the 1999 Montreal Convention (Convention for the Unification of Certain Rules for International Carriage by Air).

None of the participants thought that it was practical or desirable to apply the rules of the trading scheme by equating each aircraft to an installation. They argued that the concept of an "installation" is used for fixed sources. Aircraft are different and may operate outside of the scope of the scheme. A participant argued that the large number of aircraft operating in the EU would make this approach administratively unfeasible. EUROCONTROL confirmed that this is one of the reasons why it does not bill for route charges at an aircraft level. Several participants considered that this would also be the case for categorisation by flight routes, noting that, even if the scope of the scheme is limited to intra-EU, the number of city pairs which would be included in the scheme are in the order range of ten thousand to one hundred thousand.

Some participants were concerned about the relationship between the concept of "installation" and "new entrants". One Member State argued that there might be advantages of treating each flight route separately so that aircraft operators starting new routes might have access to allocations from a new entrant reserve.

One participant questioned how an approach where emissions from all flight operations by an operator were treated together would fit with the possible application of thresholds to be covered by the scheme.

## **Penalties**

Andrew Watt (EUROCONTROL) gave a presentation on the enforcement measures used where airlines fail to pay route charges.

He explained that EUROCONTROL relies on the enforcement measures provided in the national legislation in the UK (detention of aircraft) and Germany (requests for pre-payment and, in case of non-payment, refusal to provide service) to assist it in enforcing route charges.

One participant asked what happens where an airline is unable to pay route charges because it is insolvent. EUROCONTROL undertook to provide a written response to this question.

A Member State reminded the group that it is important that the obligations imposed under the scheme is enforceable as the scheme is only as strong as its enforcement mechanism. The majority of participants agreed that the penalties provided for in Article 16 of the Emissions Trading Directive would also be appropriate for the aviation sector.

### **Other Business**

One Member State, with support from some airline associations, requested the Commission to draw up, either itself or with the aid of a consultant, a description of how an aviation emissions trading would operate (taking account of the comments at the four consultation meetings) and to hold a 5<sup>th</sup> consultation meeting at which the description could be considered. The description should focus on the operational arrangements (e.g. issuing allowances, calculating emissions produced, surrendering allowances, allowance trading, administrative bodies involved) rather than on the questions of sizes of allowances allocated. The purpose would be to allow the consultative group to consider whether the practical issues of designing an emissions trading system for aviation had been taken into account. The Member State noted that, as this is a very complex subject, there is considerable scope for misunderstanding and this would be reduced by this additional consultative process. The Member state also pointed out that, as with the initial 4 meetings, the Commission would not be bound by the outcome of the 5<sup>th</sup> meeting. Another Member State remarked that clarifying technical issues - such as the collection and verification of the data necessary for the implementation of the scheme - in technical groups before the examination in Council of the future directive could facilitate this examination. The Commission did not commit itself to follow these suggestions but indicated that they would be recorded in the minutes for future consideration.

**ANNEX-LIST OF ORGANISATIONS/MEMBER STATES ATTENDING THE 4TH  
WORKING GROUP MEETING**

AEA (Association of European Airlines)  
Alliance of Energy Intensive Industries c/oCEMBUREAU (The Cement Association of Europe)  
British Airways (presentation on monitoring & reporting experiences)  
CAN-EUROPE (Climate Action Network Europe)  
CE DELFT (Consultants working for the Commission)  
DLR German Aerospace Centre  
EASA  
EBAA (European Business Aviation Association)  
EEA (The European Environment Agency)  
EEA (The European Express Association)  
ELFAA (European Low Fares Airline Association)  
ERA (European Regions Airline Association)  
EURELECTRIC  
EUROCONTROL  
IACA (International Air Carrier Association)  
IETA (International Emissions Trading Association)  
T&E (European Federation for Transport and Environment)

Experts nominated by the following Member States:

- Finland
- France
- Germany
- Ireland
- Italy
- Malta
- Netherlands
- Poland
- Portugal
- Spain
- Sweden
- United Kingdom

European Commission (DG Environment, DG Transport and Energy, DG Enterprise)

Observer from the European Parliament

## **Stakeholder Position Papers**

The following lists contains position papers received by the Commission services by 28 April 2006 and accompanied by an explicit request to publish them on the Circa web site<sup>12</sup>. Other papers may follow during May 2006 and will be uploaded to the internet as they are received.

### **AeroSpace and Defence Industries Association of Europe:**

- ASD position paper on the coverage of the total climate impact of aviation in the context of the EU Emissions trading scheme

### **The International Emissions Trading Association (IETA) and Eurelectric:**

- Comments for 2<sup>nd</sup> AWG meeting
- Comments for 3<sup>rd</sup> AWG meeting

### **European Low Fare Airlines Association (ELFAA):**

- Economic consideration of extending the EU ETS to include aviation (report prepared for ELFAA by Frontier Economics)

## **Organisations attending one or more AWG meetings**

ACI (Airports Council International – European Region)  
AEA (Association of European Airlines)  
Alliance of Energy Intensive Industries c/o CEMBUREAU (The Cement Association of Europe)  
ASD (The Aerospace and Defence Industries Association of Europe)  
British Airways (4<sup>th</sup> meeting - presentation on monitoring & reporting experiences)  
CAN-EUROPE (Climate Action Network Europe)  
CE DELFT (Consultants working for the Commission)  
DLR German Aerospace Centre  
EASA European Aviation Safety Agency  
EBAA (European Business Aviation Association)  
EEA (The European Express Association)  
EEA (European Environment Agency)  
ELFAA (European Low Fares Airline Association)  
ERA (European Regions Airline Association)  
EURELECTRIC  
EUROCONTROL  
GE Aviation  
IACA (International Air Carrier Association)  
IETA (International Emissions Trading Association)  
NLR Dutch National Aerospace Laboratory  
Pratt & Whitney  
SAFRAN  
T&E (European Federation for Transport and Environment)

Experts nominated by the following Member States:

- Finland
- France
- Germany
- Ireland
- Italy
- Malta
- Netherlands
- Poland
- Portugal
- Spain
- Sweden
- United Kingdom

European Commission (DG Environment, DG Transport and Energy, DG Research, DG Enterprise, Joint Research Centre)

Observer from the European Parliament