



**GROUP ON INTERNATIONAL AVIATION AND CLIMATE CHANGE (GIACC)
FOURTH MEETING**

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Agenda Item 2: Review of aviation emissions-related activities within ICAO and internationally

**EXISTING, PLANNED OR ENVISAGED SCHEMES INCLUDING
MARKET-BASED MEASURES**

(Presented by the Chairman of the Market-based Measures Working Group)

1. INTRODUCTION

1.1. This Information Paper contains the contributions by members of the MBM WG which serve as the background to its report. They should be reviewed together with contributions by the Industry, contained in other Information Papers.

2. EXISTING OR ANNOUNCED SCHEMES

2.1. New Zealand scheme

2.1.1. The New Zealand Emissions Trading Scheme will cover liquid fossil (transport) fuels used in New Zealand from 1 January 2011 (subject to potential changes as a result of a review that is anticipated to report back in May 2009). It covers petrol, diesel, aviation gasoline, jet kerosene, light fuel oil, and heavy fuel oil. Emissions from fuel used for international aviation and marine transport are exempt from the scheme, consistent with the Kyoto Protocol.

2.1.2. The scheme applies to liquid fossil fuels as far up the supply chain as possible – in other words, when refined oil products leave the refinery or are imported. This means that fuel suppliers who take fuel from the refinery or who import it are required to participate in the scheme and will have a responsibility to report on emissions and to ‘surrender’ emission units. This currently includes BP, Caltex, Gull, Mobil, and Shell. Private citizens (such as motorists) will not be directly involved in emissions trading.

2.1.3. Large users of jet fuel (currently Air New Zealand, Qantas and Virgin Blue) can also participate voluntarily in the scheme from this date. Once they ‘opt-in’ they take on all legal obligations associated with the fuel they buy from fuel suppliers that is used on domestic flights.

2.1.4. The emissions trading scheme sets up a process through order in council to consider the potential inclusion of two sources of fuel that are otherwise excluded from the scheme: fuel used by international cargo carriers on domestic legs when domestic cargo is carried; and fuel used while fishing in the exclusive economic zone but where the fuel was not purchased in New Zealand. These two provisions, if progressed, would ensure that the same

emission trading costs are faced by all carriers of domestic cargo and all vessels fishing in New Zealand waters.

2.1.5. The government will not give fuel suppliers free emission units because fuel suppliers are able to pass on the cost of emission units. In addition, while there is some transitional assistance being provided to trade-exposed industry and the agriculture sectors to cover increased costs associated with the emissions trading scheme, liquid fossil fuel cost increases are not included in the scope of the free allocation.

2.1.6. It is expected that the cost of emission units will be passed through to consumers of liquid fossil fuels. The price impact on fuels such as petrol, diesel, jet fuel, av gas and fuel oils is expected to be around 7 cents a liter (assuming that the price of carbon is about NZ\$25 per tonne of carbon dioxide equivalent).

2.2. Key aspects or the EU-ETS

2.2.1. **Entry into force.** The Directive on Aviation ETS entered into force on 2 February 2009. In practice the scheme will work from 2012, when aircraft operators will have to account for their CO₂ emissions by surrendering emissions allowances to the regulatory authority at the end of each year. There are 2 years of pre-compliance emissions reporting, so aircraft operators will have to start reporting emissions in 2010 on the basis of monitoring plans approved at the end of 2009.

2.2.2. **Scope.** All flights arriving at and departing from an aerodrome in EU territory will be covered by the scheme. However there are a number of exemptions in the directive, such as State, military, customs and police, SAR, fire-fighting, medical, VFR, training, circular flights. Flights of aircraft below 5700 kg are also excluded from the scheme. In addition a 'de minimis' exemption applies to commercial operators having a limited number of flights per year (approx 2 flights a day), or emitting low quantity of CO₂ per year (below 10,000 tonnes).

2.2.3. **Emissions cap.** The scheme works by capping emissions from the sector. If emissions from aviation grow above the cap, it will be necessary for aircraft operators to buy allowances from other sectors participating in the EU ETS. The emissions cap will be based on the annual average of all the emissions from all EU related flights in years 2004 – 2006. In the first trading period (year 2012) the total amount of allowances allocated will be equal to 97% of the cap. For the next trading period (2013-2020) the amount of total allocated allowances will be reduced to 95% of cap.

2.2.4. **Administering Member State.** For the purpose of simplicity, each aircraft operator will be allocated to one EU Member State – for EU commercial carriers to the State which delivered its operating licence, for the other operators on the basis of the greatest attributed aviation emissions. Each Member State will assign a competent authority (CA) responsible for the implementation of the scheme. The Commission published on 11 February 2009 a preliminary list of aircraft operators included in the scheme, specifying the administering member state for each operator. The list will be updated at least once a year to include new operators.

2.2.5. **Allocation of allowances.** Most aviation allowances (85%) will be distributed to aircraft operators free of charge. Benchmarking will be used to distribute free allowances to aircraft operators. The benchmark is based on the activity of the operator in 2010 in terms of RTK. The remaining part of the aviation allowances (15%) will be auctioned by EU Member States. Some 3% of allowances will be allocated to a special reserve for new and fast-growing aircraft operators in the trading period starting in 2013.

2.2.6. **Monitoring obligations.** There are two types of reporting for aircraft operators. Emissions reporting and activity data (benchmarking) reporting. Aircraft operators are obliged to monitor emissions and report these each year. Monitoring and reporting of emissions will serve as a basis for surrendering allowances. The amount of allowances surrendered each year shall be equal to the total emissions from the aircraft during the preceding calendar year. Tonne-kilometre data is a basis for allocation of free emission allowances to aircraft operators. This is expressed as great circle distance between two airports multiplied by payload. Application for emissions allowances is made *by reporting tonne-km data* to the Competent Authority of the administering Member State. This monitoring will take place in 2010 and is not an annual process. The next tonne-km monitoring period is one calendar year, ending two years before the beginning of trading period. For both types of reporting, the first action to be taken by the aircraft operators is development of monitoring plans in 2009, and submission of these plans to the competent authority (CA) in the administering Member State. Detailed monitoring, reporting and verification guidelines as approved by the European Commission's climate change committee have been published on February 27.

2.2.7. **Auctioning.** Detailed provisions on a harmonised auctioning method will be set out in a specific future European Commission regulation. Work has now started to develop such regulation. In this context, a stakeholder's consultation will take place later this year.

2.2.8. **Use of auctioning revenues.** Revenues from the auctioning of allowances are collected by EU Member States. The legislation states that these revenues should be used to tackle climate change in the EU and third countries. In addition the legislation contains a compulsory requirement to report the use made of these revenues to the Commission.

2.2.9. **Interaction with third country and international measures.** The legislation foresees different options to avoid double regulation on certain flights and ensure optimum interaction between the EU aviation ETS and measures with equivalent effect adopted by third countries. This includes in particular the possibility to (1) exempt flights arriving at EU aerodromes, (2) amend the Directive to modify its scope, (3) conclude an agreement between the EU and the third country in question ensuring the optimum interaction of measures. In addition, if an international agreement on global measures to reduce greenhouse gas emissions from aviation is reached, the Commission will consider amending the EU aviation ETS legislation as necessary.

N.B. More information, including the relevant legislation, can be found on the following European Commission website: http://ec.europa.eu/environment/climat/aviation_en.htm

2.3. **Australia's Domestic Emissions Trading Scheme – Carbon Pollution Reduction Scheme**

2.3.1. The Australian Government's climate change policy is guided by three underlying principles: reducing Australia's carbon pollution emissions; adapting to unavoidable climate change; and helping to shape a global solution. The Carbon Pollution Reduction Scheme (CPRS) is Australia's primary domestic tool for achieving its emissions reduction objectives. Proposed for commencement on 1 July 2011, the CPRS is a cap-and-trade system with a long term target of a 60 per cent reduction in greenhouse gas emissions below 2000 levels by 2050.

2.3.2. The Government has set a medium term emission reduction target of 5 to 15 percent below 2000 emission levels by 2020. The 5 per cent below 2000 levels figure represents a minimum (unconditional) commitment to reduce emissions by 2020, irrespective of actions by other nations. The 15 per cent below 2000 levels figure represents a commitment to reduce emissions in the context of a global agreement where all major economies commit to substantially restrain emissions and all developed countries take on comparable reductions to that of Australia.

2.3.3. Australia's domestic transport industry as a whole (excluding international aviation and shipping) contributed a total of 79.1 Mt CO₂-e or 13.7 per cent of the nation's total emissions in 2006. Of the transport total, 7.7 per cent or 6.1 Mt CO₂-e was due to domestic aviation. In terms of Australia's total net emissions from all domestic sectors, domestic aviation contributed 1.1 per cent in 2006.

2.3.4. The domestic transport sector (including aviation) will be included in the CPRS from Scheme commencement with Scheme obligations being applied to upstream suppliers of transport fuels. For the aviation sector, the Scheme will only apply to domestic air travel and will exclude international flights and domestic legs of international flights.

2.3.5. Scheme obligations can be transferred by agreement from fuel suppliers directly to airlines. If an airline agrees to accept Scheme obligations, it will be required to monitor and report on its annual emissions and acquit one carbon pollution permit for each tonne of carbon dioxide equivalent that it emits during the compliance year. In this situation, the domestic aviation sector would be able to trade permits with other sectors covered by the Scheme.

2.4. **Proposals under review in the United States**

2.4.1. An extract of a discussion draft summary of the American Clean Energy and Security Act of 2009, addressing reducing global warming pollution, is reproduced below:

TITLE III – REDUCING GLOBAL WARMING POLLUTION

The global warming provisions in the discussion draft are modelled closely on the recommendations of the U.S. Climate Action Partnership (USCAP), a coalition of electric utilities, oil companies, chemical companies, automobile manufacturers, other manufacturers and energy companies, and environmental organizations.

Global Warming Pollution Reduction Program. The draft establishes a market-based program for reducing global warming pollution from electric utilities, oil companies, large industrial sources, and other covered entities that collectively are responsible for 85% of U.S. global warming emissions. Under this program, covered entities must have tradable federal permits, called "allowances," for each ton of pollution emitted into the atmosphere. Entities that emit less than 25,000 tons per year of CO₂ equivalent are not covered by this program. The program reduces the number of available allowances issued each year to ensure that aggregate emissions from the covered entities are reduced by 3% below 2005 levels in 2012, 20% below 2005 levels in 2020, 42% below 2005 levels in 2030, and 83% below 2005 levels in 2050.

Supplemental Pollution Reductions. The draft directs EPA to achieve additional reductions in global warming pollution by entering into agreements to prevent international deforestation. By 2020, these supplemental reductions will achieve reductions equivalent to 10% of U.S. emissions in 2005. These are low-cost reductions in global warming pollution that can be secured by devoting approximately 5% of the allowance value to the program.

Offsets. The draft allows covered entities to increase their emissions above their allowances if they can obtain "offsetting" reductions at lower cost from other sources. The total quantity of offsets allowed in any year cannot exceed 2 billion tons, split evenly between domestic and international offsets. Covered entities using offsets must submit five tons of offset credits for every four tons of emissions being offset.

Banking and Borrowing. To provide additional flexibility without compromising environmental goals, the draft permits unlimited banking of allowances for use during future compliance years. The draft also establishes a rolling two-year compliance period, effectively allowing covered entities to borrow from one year ahead without penalty. Allowances from two to five years in the future can be borrowed under limited circumstances.

Strategic Reserve. The draft directs EPA to create a “strategic reserve” of about 2.5 billion allowances by setting aside a small number of allowances authorized to be issued each year thereby creating a cushion in case prices rise faster than expected. The draft directs EPA to make allowances from the reserve available through an auction when allowance prices rise to unexpectedly high levels. The proceeds of the auction will be used to purchase additional offsets that will replenish the strategic reserve.⁴

Carbon Market Assurance and Oversight. The draft provides for strict oversight and regulation of the new markets for carbon allowances and offsets. It ensures market transparency and liquidity and establishes strict penalties for fraud and manipulation. The Federal Energy Regulatory Commission is charged with regulating the cash market in emission allowances and offsets. The President is directed to delegate regulatory responsibility for the derivatives market to an appropriate agency (or agencies), based on the advice of an interagency working group.

Additional Greenhouse Gas Standards. The draft directs EPA to set emission standards on sources that are not covered by the allowance system. In addition, it creates special programs to reduce emissions of two pollutants that contribute to global warming: hydrofluorocarbons (HFCs) and black carbon. HFCs are chemical products that are used in refrigeration, air conditioning, and insulation, among other things. The draft adds HFCs to the list of similar substances that EPA currently regulates because they deplete the ozone layer. Under this regulatory program, EPA will be directed to phase down the production of HFCs. Black carbon, or soot, is the product of incomplete combustion of fossil fuels or biomass. It is a major contributor to warming in the Arctic. EPA is directed in the draft to use its existing authority under the Clean Air Act to reduce emissions of black carbon domestically and study opportunities for reductions internationally.

Clean Air Act Exemptions. The draft provides that CO₂ and other greenhouse gases may not be regulated as criteria pollutants or hazardous air pollutants on the basis of their effect on global warming. The draft also provides that new source review does not apply to these global warming pollutants.

3. PROPOSED SCHEMES, SCENARIOS OR CONCEPTS

- 3.1. A proposal by AEA was reviewed by the MBM Working Group.
- 3.2. A proposal by AGD was reviewed by the MBM Working Group.
- 3.3. **Canadian considerations for a sectoral approach**

(NOTE: the comments below are intended to contribute to discussion of policy options in the context of GIACC deliberations. They do not represent Canadian policy).

3.3.1. **Option**

The AGD approach includes following elements:

- Global sectoral approach

- Covers all international emissions
- A global emissions reduction target for the sector as a whole
- Aviation integrated within overall CC framework ie open access to global carbon markets
- * Individual carriers surrender allowances proportionate to carbon content of their annual fuel purchases.
- * Allowances can be free, from auction, from CDM or JI or other recognized credits under CC framework.
- An international body of the UN administers the system.
- Funds collected (auction of allowances) to be reinvested including substantial proportion to projects in developing countries. Not treated as general revenue of governments.

A variation of this approach could keep many of the same foundation elements but without the asterisked elements noted above:

- Accountability at sectoral level (collectively), not at carrier level. Instead of allowances at the carrier level, compliance and all administration could remain at a consolidated sectoral level.
- Funds generated for the sector as a whole by a passenger based levy. The levy would be adjusted over time to account for changing costs.
- Disbursement of collected funds for agreed upon objectives, including purchase of sufficient credits on global CC markets to offset emissions above agreed upon sectoral targets, managed by an administrative body.
- Voluntary participation by States in the scheme but with consideration for built in incentives for broad participation. For example, States which chose not to participate could be excluded from the benefits of reinvestment. Alignment of sectoral targets with the agendas of advanced players could stimulate their participation.

3.3.2. Discussion

- **How to get broad based participation** - A key challenge for any sectoral approach would be how to incentivize broad based participation globally. Otherwise, there is a risk of non-competitive situations. Any option has to consider this. Under the variant above, while participation in the approach would be voluntary, several features could encourage countries to participate:
 - No restriction on growth of the aviation sector – as long as sufficient credits at reasonable cost were available
 - (Relatively) simple administration for participating countries and affected airlines
 - Potential to harmonise with other measures to regulate the same emissions
 - Funds flow to participating countries only – objective to reduce international aviation emissions; investment only in credits or adaptation measures from/in participating countries (or could consider some variant skewing investment in this direction)
- **The perception of buying growth** - The variant option would allow international aviation to grow as long as the sector as a whole is willing and able to purchase credits to offset emissions above the sectoral target. The AGD proposal would allow individual carriers to grow as long as they were able to purchase credits. Different carriers would be expected to have different capabilities (funding flexibility inter alia) to purchase credits. Depending on how the levy was structured, the variant could eliminate any carrier specific considerations. This would have advantages and disadvantages that would need to be weighed.

- The variant may be viewed by the environmental community as “a freebie” i.e. it may be perceived as (relatively) easy for the sector as a whole to raise funds through a passenger charge and continue to emit as much as it wants. At the least, this would be a communications challenge.
- **Accountability for emissions** - The issue of accountability for emissions merits discussion. The AGD proposal would appear to incentivize carriers to be as efficient as possible. Under the variant option, if collected as a straight per passenger charge, all carriers would be treated equally re levy collection. Under this scenario, the sole purpose of the levy would be to generate funds. Such an approach would rely on the inherent motivation of carriers to reduce fuel costs as a built in incentive to reduce emissions. However, another approach would be to calculate the levy taking into account each carrier’s efficiency i.e. different carriers would incur different costs under such an approach. See further discussion below. The value of incentives at the carrier level is open to debate – while intuitively compelling, depending on the aggressiveness of a target, there may be limited scope for the industry to take measures ie there is no option but to buy credits at some point. The issue then becomes whether some carriers may be better positioned than others to purchase such credits.
- Collection of funds on a sectoral basis for sectoral use (for recognized objectives) could pre-empt pressure at the UNFCCC to use aviation as a funds generator unrelated to emissions reductions.
- **Equity** – both the AGD and the variant are consistent with the ICAO principle of universal treatment for all air carriers. The proposed levy under the variant could be imposed equally on all airlines that offer outbound international flights from participating countries regardless of the nationality of the carrier. (Depending on how the levy was structured, there could be some cost differences for different airlines resulting in different carriers on the same route collecting a different charge based on the efficiency of their operations.) Some developing countries have argued that efforts to regulate international aviation emissions should be consistent with the UNFCCC principle of “common but differentiated responsibilities and respective capabilities” with developed countries taking the lead. Both the AGD option and the variant would address this principle through the financial flows. Since most airline customers are from developed countries, most revenue would come from those countries and most of the revenue would be used for adaptation in and credit purchases from developing countries.
- **Scope for more than one model?** - Consideration could be given to whether the variant (voluntary global sectoral approach) could be a transition approach to a carrier specific sectoral ETS such as proposed by the AGD. A global sectoral approach, managed at the sector level, without allocation to individual carriers – could buy time for the industry to become familiar with emissions management, for the carbon credit market to evolve, and for more complex administrative arrangements based on reliable data to be put into place. Over time, as targets become more ambitious and credits become more expensive and fewer, it may be more appropriate to shift to a carrier based approach.

3.3.3. Operational Considerations

- **Carrier accountability** - Any proposal which includes commitments at the carrier level will require State commitment to ensure that its carriers comply (possibly via a Protocol linked to the UNFCCC). This would be true under the AGD proposal as well as the variant option described. The variant would require State commitment to ensure that its carriers collected the levy and possibly to validate via data reporting that the funds forwarded are compliant with actual activity within whatever rules are established. There may be some lessons for how this would work in the approach proposed under the Terrorist Risk Convention under discussion at the ICAO Diplomatic Conference (April 20-May 2, 2009). In the case of the Terrorist Risk Convention, States would decide whether to become Parties to the Convention and then ensure that domestic measures are in place requiring their carriers to collect a levy which would go into a global pool.

- **Determining the Size of a Levy (variant option):** The levy described under the variant option could be set in advance of each calendar year and remain fixed for the calendar year. The levy would use a transparent formula that could include the emissions cap, the projected emissions, forecast credit prices, planned contribution to the cost of measures to reduce international aviation emissions, planned contributions, and any accumulated surplus or deficit. Actual emissions and/or credit prices higher or lower than those assumed when the levy was set could lead to a deficit or surplus of funds. A deficit/surplus could be accommodated through an adjustment to the levy for the next calendar year or through increased investments in approved areas.
- **Implementing a Levy -** The levy could be a straight per passenger charge or implemented as a charge for each ticket/waybill based on the international legs of the itinerary, aircraft type and class of service calculated using the ICAO emissions calculator and the levy per tCO₂. The latter would necessitate the need for good data, reporting and more administrative complexity both for carriers as well as for the sector. The levy could be limited to “outbound” international legs for all tickets departing from a participating country. This would apply the charge only to international legs for one direction of the trip, but to all tickets for trips out of the participating country including visitors returning home. This would ensure equal treatment for all airlines serving a given route. The levy could apply to passengers and freight on [airlines whose fleet exceeds 200 tonnes aggregate maximum take-off mass, ...]. The levy could be incorporated into the price of the ticket/waybill and be collected through the IATA clearinghouse and other components of the international accounting and payment system. The funds collected through the levy could be remitted directly to a trustee account supervised by an entity to be determined.
- **Potential Use of Funds Collected :**
 - Purchase internationally recognized credits equal to the difference between actual emissions and the emissions cap
 - Contribute to the cost of measures to reduce international aviation emissions
 - Contribute to the cost of adaptation measures in developing countries
- **Process for Disbursement** – whether under the AGD or a variant, an entity would need to be established to allocate resources. Emission reduction projects, such as improved air traffic control systems and airframe and engine research, could be proposed by the governments of participating countries on behalf of the implementing organizations. Considerations could include the share of project costs to be funded and the share could be higher for countries with lower per capita GDP. Under the variant, purchase of the required quantity of internationally recognized credits could be undertaken by qualified brokers selected by the managing entity through a competitive bidding process. In order to create incentives for broad based participation, purchases could be restricted to credits from emission reduction actions in countries collecting the levy. Similarly, contributions to the cost of adaptation measures in developing countries could take the form of a financial contribution to the Adaptation Fund under the UNFCCC – under the variant option there could be an added provision that the funds be used only in countries that collect the levy.
- **Integration with Other Measures to Regulate Greenhouse Gas Emissions from International Aviation** – Any sectoral option would need to consider linkages with other systems already underway. For example, the entity managing a sectoral approach could seek to negotiate appropriate exemptions from or harmonization with other regulations that impose a financial charge on greenhouse gas emissions from international aviation.