

**ATTACHMENT to State letter AN 1/17-09/093**

**QUESTIONNAIRE CONCERNING VOLUNTARY ACTIVITY FOR GHG REDUCTION/MITIGATION IN THE AVIATION SECTOR**

A copy of the questionnaire, in Microsoft Word format, has been posted on the Internet at <http://www.icao.int/icao/en/env/measures.htm>.

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**Q1.** Name of the voluntary activity.

<ol style="list-style-type: none"><li>1. Continuous Descent Approach Procedure;</li><li>2. Single Engine Taxi Procedure;</li><li>3. Winglet System Installation</li><li>4. Improved fuel economy policy – operational and maintenance measures.</li></ol>
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**Q2.** Type<sup>1</sup> of the voluntary activity.

<input checked="" type="checkbox"/> Unilateral commitment <input type="checkbox"/> Public voluntary scheme <input type="checkbox"/> Negotiated agreement <input type="checkbox"/> Other (Please describe the activity in the box below.)

**Q3.** Please mark all the participants<sup>2</sup> of the activity.

<input checked="" type="checkbox"/> Airline <input type="checkbox"/> Airline association <input type="checkbox"/> Manufacturer <input type="checkbox"/> Manufacturer association <input type="checkbox"/> Airport authority <input checked="" type="checkbox"/> Air traffic control <input type="checkbox"/> Government <input type="checkbox"/> Other (Please specify in the box below.)

**Q4.** Is the voluntary activity accompanied by a side agreement<sup>3</sup>?

<sup>1</sup>The features of each type of voluntary activity are as follows.

- Unilateral Commitment: The environmental improvement plan established by the participant itself, and declared to the stakeholders, such as employees, stockholders, consumers, etc. Target and measures to environmental improvement are established by the participant itself.
- Public Voluntary Scheme: The scheme which the participant agrees voluntarily with the standard on environmental improvement target, technology, management, etc. established by public organization such as Ministry for Environment.
- Negotiated Agreement: Contract based on negotiation between public organization (national government/local government) and industries. Both parties can independently decide whether to agree to the contract.

<sup>2</sup> If you marked “Public voluntary scheme” on Q2, the public organization which establishes the standard is included in the participants. If you marked “Negotiated agreement” on Q2, the public organization which agrees to the contract is included in the participants.

<sup>3</sup> “Side agreement” is the agreement between the participant of the activity and a third party. For example, the agreement between an airline and an engine manufacturer, which prescribes that the manufacturer assist the airline to attain its target by introducing new emission-reducing technologies, is considered as a side agreement. For more information, please refer to Part II Paragraph 6.5.2 on “Template and Guidance on Voluntary Measures”, released on ICAO CAEP website ([http://www.icao.int/icao/en/env/Caep\\_Template.pdf](http://www.icao.int/icao/en/env/Caep_Template.pdf)).

Yes (Proceed to Q4-1.)     No (Proceed to Q5.)

**Q4-1.** If the voluntary activity is accompanied by side agreement, please describe the parties and outline the side agreement.

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**Q5.** Please answer the following questions concerning the coverage of the voluntary activity:

**Q5-1.** Select all green house gases (GHGs) which are part of the voluntary activity.

Carbon dioxide (CO<sub>2</sub>)     Methane (CH<sub>4</sub>)     Nitrous oxide (N<sub>2</sub>O)     Hydrofluorocarbons (HFCs)  
 Perfluorocarbons (PFCs)     Sulphur hexafluoride (SF<sub>6</sub>)     Nitric oxide & Nitrogen dioxide (NOx)  
 Water vapor (H<sub>2</sub>O)     Other (Please specify in the next box.)

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**Q5-2.** Please select all operations<sup>4</sup> which are part of the voluntary activity.

International passenger flight     Domestic passenger flight     International cargo flight  
 Domestic cargo flight     Other (Please specify in the next box.)

Any flight when conditions (i.e. weather ) and ATC permit, will undertake CDA (continuous descent approach) procedure.

**Q6.** Please answer the following questions concerning the index to measure the effect of the voluntary activity.

**Q6-1.** Select the index used to measure the effect of the voluntary activity.

Absolute quantity of GHG emissions<sup>5</sup> (Please outline the index in the box below.)  
 Unit of GHG emissions<sup>6</sup> (Please outline the index in the box below.)  
 Introduction of specific technology  
 Introduction of specific procedure     Other (Please specify in the box below.)

1. Introduction of CDA procedure;
2. Introduction of single engine taxi procedure;
3. Winglets were installed in all Boeing 737-700 & 737-800 aircraft.
4. Improved fuel economy policy – operational and maintenance measures

<sup>4</sup> In case that the voluntary activity describes its coverage from the other viewpoint than listed above, such as “operation under IFR”, “operation of aircraft larger than specific weight”, etc. and that aim of the activity is not linked to operation directly, for example introduction of new technology which contributes reduction/mitigation of GHGs, please mark “other” and please describe feature.

<sup>5</sup> The example of the unit is Ton-CO<sub>2</sub>, Ton-C, m<sup>3</sup>-CO<sub>2</sub>, etc.

<sup>6</sup> The example of the unit is g-CO<sub>2</sub>/RPK (Revenue Passenger Kilometer), g-CO<sub>2</sub>/ASK (Available Seat Kilometer), g-CO<sub>2</sub>/RTK (Revenue Ton Kilometer), g-CO<sub>2</sub>/ATK (Available Ton Kilometer), etc.

**Q6-2.** Please outline the procedure to acquire data to calculate or describe the index of Q6-1.

Integrated IT system implemented in Flight Operations and Technical Division.  
TAROM is flying CDA procedure since 2004, with interruptions. CDA is a tactical procedure. It is therefore anticipated that local factors will constrain selected airports to apply it only for limited segments of flight or over a selective range of altitudes. Henri Coanda airport is selected for this voluntary measure.

It is therefore not anticipated that every arriving aircraft will successfully follow CDA. The aim will be to *achieve and maximise the possible benefits in a tactical and harmonised way*. It will be the responsibility of the pilots, within the aircraft operator's standard operating procedures, to determine how the aircraft avionics are used to achieve the optimum profile. Controllers have their role in clearing the CDA, while the Romanian CAA has the most important role, to approve this procedure. TAROM was involved in two t Trials on CDA with fully support from the RCAA.  
FDR data is collected and fuel flow monitored for Non-CDA flights and CDA flights, thus having a comparable unit on how much fuel & CO<sub>2</sub> (Ton-CO<sub>2</sub>) is saved per flight.

**Q7.** Please answer the following questions concerning the target of the voluntary activity.

**Q7-1.** Is the target of the voluntary activity clearly defined?

Yes (Proceed to Q7-2.)     No (Proceed to Q8.)

**Q7-2.** Please describe the target of the voluntary activity, including substance of the target, target year, base year.

We are developing our targets for the environmental indicators described at Q6-1.  
Target aims at 5% reduction in total emissions.

**Q8.** Please list the measures to attain the target or to reduce/mitigate GHGs.

Several measures are considered, apart from introduction of a new procedure (e.g. CDA). Thus, the use of APU, and a better management of ground a operations is also considered, as well as the implementation of a fuel management policy which include:

- minimize the number of non-revenue flights;
- maintain a clean and efficient airframe and engines;
- single engine taxi at Henri Coanda Airport (under implementation)
- installed winglets to all aircraft

Under consideration (from fuel management policy):

- Reducing the aircraft empty mass
- Minimizing the amount of discretionary fuel
- Using optimum flaps takeoff and landings
- Lateral Track Management
- Vertical Profile Management

**Q9.** Please answer the following questions concerning periodic review of the voluntary activity.

**Q9-1.** Is the progress of the voluntary activity reviewed periodically?

Yes (Proceed to Q9-2.)    No (Proceed to Q10.)

**Q9-2.** Please describe the frequency of the periodic review.

The environmental indicators described at Q6-1. will be measured monthly and analyzed annually on Management Review

**Q9-3.** Is a third party's opinion considered/to be considered in the periodic review?

Yes (Proceed to Q9-4.)    No (Proceed to Q10.)

**Q9-4.** Please outline the third party opinion.

ICAO, IATA and AEA recommendations are followed.

**Q10.** Please answer the following questions concerning legislative obligation.

**Q10-1.** Is there any legislative obligation on attainment of the target?

Yes (Proceed to Q10-2.)    No (Proceed to Q11.)

**Q10-2.** Please describe legislative obligation, including measures taken in case that the participant of the voluntary activity fails to attain the target.

EU ETS is a driver that TAROM takes into account for the savings initiatives.

**Q11.** Please answer the following questions concerning disclosure of information<sup>7</sup> on the voluntary activity:

**Q11-1.** Is the name of the participant of the voluntary activity disclosed to the public?

Yes    No

**Q11-2.** Is the target of the voluntary activity disclosed to the public? (If you marked "no" at Q7-1, the answer to this question shall be "not applicable".)

Yes    No    Not applicable

**Q11-3.** Are the measures taken/to be taken by the participant of the voluntary activity to attain the target/reduce or mitigate GHGs disclosed to the public?

<sup>7</sup> Item(s) to which the answer is/are "no" from Q11-1 to Q11-5, are considered but this information will not be included in the final report.

Yes  No

**Q11-4.** Is the result of each periodic review disclosed/to be disclosed to the public? (If you marked “no” at Q9-1, the answer to this question shall be “not applicable”.)

Yes  No  Not applicable

**Q11-5.** Is the effect of the voluntary activity disclosed/to be disclosed to the public?

Yes  No

**Q12.** Please answer the following questions concerning effect of the voluntary activity:

**Q12-1.** Is third party’s opinion considered/to be considered when examining the effect of the voluntary activity?

Yes (Proceed to Q12-2.)  No (Proceed to Q12-3.)

**Q12-2.** Please outline the third party opinion.

Henri Coanda Airport is involved in assessing the benefits of CDA operations, as these include also noise reduction, not only fuel save & emissions reduction.

HC Airport would like to assess noise & emissions tradeoffs (i.e. develop a tool) and is actively involved in identifying measures to reduce emissions through ground operations, thus improving local air quality.

**Q12-3.** How much of GHGs amount emitted per year, in CO<sub>2</sub> weight equivalent are reduced or mitigated/expected to be reduced or mitigated by the voluntary activity?

Following the Continuous Descent Approach Procedure leads to CO<sub>2</sub> emissions reduction up to 350 kilograms of per flight.

Winglet fitted aircrafts generates reduced emissions up to 3% and reduced noise pollution up to 6,5%.

It is expected a reduction of around 5-6 %CO<sub>2</sub> in 2010 (~ 0.6MT CO<sub>2</sub>) and through the introduction of carbon offset projects we aim at a reduction of 7% CO<sub>2</sub>

**Q13.** Please provide the website address for the voluntary activity, if any, in the box below.

[www.tarom.ro](http://www.tarom.ro)

**Q14.** Please describe additional information, if any.

TAROM is part of the EU-ETS and the mitigation measures mentioned are taken to meet the reduction under the European scheme. However, TAROM is happy to be part of a voluntary agreement and to sign a MOU with Government, provided further steps are being taken in 2010. In areas where environmental response is required, there is often voluntary action.

We will disseminate our results through different channels and would like to undertake a benchmarking exercise with a company at our size, to monitor better the emissions reduction. Apart from CO<sub>2</sub>, NO<sub>x</sub> will be introduced as on 2011.

Duly completed questionnaires should be returned to:

Voluntary Measures Focal Point  
ICAO Committee on Aviation Environmental Protection (CAEP)  
Attention: Mr. Tetsu Shimizu  
Policy Coordinator for Global Environment  
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