

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

Q1. Name of the voluntary activity.

“Sky Eco[2010]” (JAL Group Environment Action Program)

Q2. Type¹ of the voluntary activity.

Unilateral commitment Public voluntary scheme Negotiated agreement
 Other (Please describe the activity in the box below)

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Q3. Please mark all the participants² of the activity.

Airline Airline association Manufacturer Manufacturer association
 Airport authority Air traffic control Government
 Other (Please specify in the box below)

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Q4. Is the voluntary activity accompanied by a side agreement³?

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.

¹The feature of each type of the voluntary activities is 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: Public: 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 issue.
- 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.

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

³ “Side agreement” is the agreement between the participant of the activity and 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 third 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).

- Carbon dioxide (CO₂)** Methane (CH₄) Nitrous oxide (N₂O) Hydrofluorocarbons (HFCs)
 Perfluorocarbons (PFCs) Sulphur hexafluoride (SF₆) Nitric oxide & Nitrogen dioxide (NO_x)
 Water vapor (H₂O) Other (Please specify in the next box)

Q5-2. Please select all operations⁴ 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.)

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 emission⁵ (Please outline the index in the box below)
 Unit of GHG emission⁶ (Please outline the index in the box below.)
 Introduction of Specific technology
 Introduction of specific procedure Other (Please specify in the box below)

g-CO₂/ATK (Available Ton Kilometer)

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

We have calculated the data based on fuel consumption.

$$\text{g-CO}_2 = \text{fuel consumption(K}\ell) \times 2.510 \times 10^6$$

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,

⁴ 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.

⁵ The example of the unit is Ton-CO₂, Ton-C, m³-CO₂, etc.

⁶ The example of the unit is g-CO₂/RPK(Revenue Passenger Kilometer), g-CO₂/ASK(Available Seat Kilometer), g-CO₂/RTK(Revenue Ton Kilometer), g-CO₂/ATK (Available Ton Kilometer), etc.

base year.

JAL set itself a goal to reduce CO2 emissions per ATK by 20% by 2010, comparing with 1990 level.

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

- **Renewal and downsizing of our aircraft to smaller, more fuel-efficient ones**
- **Reducing weight onboard the aircraft; JAL has reduced the weight of its in-flight tableware and magazines, changed wine bottles served in economy from glass to plastic bottles, use new light-weight material cargo containers instead of aluminium ones**
- **Flight operation methods; eco-friendly flight operation procedures such as CNS/ATM, UPR (User Preferred Route) and CDA(Continuous Descend Approach) on routes to Hawaii, Sydney and at Kansai and San Francisco Airports.**
- **Flight simulator usage instead of actual aircraft for flight crew training**
- **Preferentially usage of GPU(Ground Power Unit) during aircraft parking at airports and thereby reducing the usage of APU(Auxiliary Power Unit)**
- **Keeping the cabin shades of parked aircraft closed so as to minimise the heating up of the cabin interior and thereby reducing the need for air-conditioning by APU**
- **Periodic Engine water-washing to recover fuel efficiency**
- **Optimizing fuel loading for the Flight Plan by monitoring daily operational performance data**

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.

Annual review is conducted.

Q9-3. Is 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.

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.

Q11. Please answer the following questions concerning disclosure of information⁷ 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?

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.)**

⁷ 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.

Q12-2. Please outline the third party.

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Q12-3. How much of GHGs amount emitted per year, in CO₂ weight equivalent are reduced or mitigated/expected to be reduced or mitigated by the voluntary activity?

In 2008, CO2 emissions per ATK has attained 18.0% (3067 thousand tons) reduction comparing with 1990 level.

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

<http://www.jal.com/en/environment/>

Q14. Please describe additional information, if any.

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