Technologies, Operations and Aviation Fuels Questionnaire:

In preparation for the ICAO Stocktaking Seminar on aviation in-sector CO_2 reductions, ICAO Member States and stakeholders are invited to return a completed questionnaire to ICAO by email (officeenv@icao.int). These questionnaires will serve as a basis for ICAO to develop a more accurate picture of the potential that indivudal measures have on reducing in-sector CO_2 emissions. Please provide as many quantitative details as possible. If any of the information provided is confidential, please specify. Expected completion time, 10 minutes.

This questionnaire is divided into four sections:

A- Introductory information
B- Technology (if applicable)
C- Operations (if applicable)
D- Aviation Fuels (if applicable)

A. Introductory Information

Institutional Details

Name of the stakeholder/institution: _____

State: _____

Type of institution: _____
(*CAA, airport, airline, manufacturer, academia, NGOs, etc.*)

Contact person and email: _____

_____

What is your main CO_2 reduction activity (please select one):

( ) Technologies ( ) Operations ( ) Aviation Fuels ( ) Other _____

Goals and roadmap

1. **Has your state/organization set specific goals that help reduce aviation CO_2 emissions? If so please specify and provide time frame.**

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_____

2. **What are the main pillars of action to achieve those goals? What are the expected quantitative results of these actions?** (*e.g., [%] fuel efficiency by [date], renewables producing specific share of electricity at the airport, sustainable aviation fuels use [volume or %], economic measures to raise money to invest in specific project, specific net reduction of fuel or CO_2 by [date])*

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Stakeholders are encouraged to complete multiple versions of the following pages in order to reflect all relevant projects and initiatives.

B- Technology

Name of project / initiative: _____

Contact person and email: _____

Website: _____

(Please select more than one answer when appropriate.)

1. What is the main focus of your approach?

( ) Propulsion ( ) Aerodynamics ( ) Materials ( ) Hydrogen
( ) Electrification (Hybrid, fuel cells, batteries, *please underline*) ( ) Other _____

2. What type of aircraft would benefit most from your approach?

( ) Narrow body aircraft ( ) Wide body aircraft ( ) Turboprop aircraft
( ) Regional jet aircraft ( ) All ( ) Other _____

3. What is the expected fuel burn reduction on a per-flight / flight phase (please underline) **basis?** *(Please provide a percentage, and state the baseline for this reduction. E.g.: 20% reduction compared to A320ceo on a flight basis, or 5% reduction in taxiing fuel burn)*

_____

4. Please provide the number of aircraft that will be benefited by this technology and specify the time-frame *(e.g. 1000 aircraft by 2035)*

_____

5. What is the current Technology Readiness Level (TRL) of your approach (1-9)? _____

6. In what year (year range) do you expect your approach to enter the market? _____
(i.*e., to start flying commercially*)

7. Can your approach be used with the current airport infrastructure? If not, what new airport infrastructure would be required for your approach to be widely usable?

( ) Yes ( ) No, _____

8. What are the three largest limitations of your approach?

( ) Financial resources ( ) Policy ( ) Technological constraints ( ) Technical know-how
( ) Human resources ( ) Infrastructure at airport ( ) Economic Market ( ) Other _____

Please provide more details:

_____

9. Does your approach present benefits beyond CO_2 reductions? If so, please give a quantified answer (e.*g., reduce turnaround time in [%], reduce aircraft separation on landing, reduced noise, reduced NO_x emissions, increased passenger comfort*).

_____

_____

_____

10. Can your approach be retrofitted?

( )Yes, it is mainly a retrofit ( ) No, needs to be incorporated from design

( ) It can be retrofitted but it is more economically and technically feasible to include it on a new design

11. Is your approach dependent on other emerging technologies and approaches? (*e.g., more efficient batteries, new construction materials, internet-of-things, etc.*)

_____

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_____

12. Do you foresee any interdependencies of your approach with other civil aviation impact factors on environment or requirement in additional environmental measures? (*e.g. noise or pollutant emission, or associated maintenance/recycling processes*)

_____

_____

_____

13. If possible provide data for the information given in this questionnaire (e.g. *website, conference or journal articles, official statement etc.*)

_____

14. Any additional information:

_____

C- Aviation Fuels

Name of project / initiative: _____

Contact person and email: _____

Website: _____

1. **If you have on-going sustainable aviation fuels initiatives, please provide the following details for each initiative:** Name of the initiative, website, project partners, country / region, project start and end date.

_____

_____

2. **Sustainable aviation fuel produced/purchased/sold/used as a part of this initiative in litres per year:** (historical data, current production or use, and future projections or estimations may be included)

Year(s)	Litres of fuel	Type of feedstock	Location of feedstock production (country, region, city)	Conversion process	Certified by a Sustainability Certification Scheme (SCS)? If yes, which one?

May ICAO may share this quantified information publicly throug the ICAO GFAAF[1]?

( ) **Yes** ( ) **No**

Otherwise, the information provided will only be included in the aggregated fuel production volumes on the SAF Stocktaking webpage[2].

[1] https://www.icao.int/environmental-protection/GFAAF/Pages/default.aspx

3- What is your expected CO_2 reduction from this fuel? (please specify the methodology used)

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4- What are the three largest limitations for development or deployment you are experiencing?

( ) Financial resources ( ) Policy ( ) Technological constraints ( ) Technical know-how
( ) Human resources ( ) Infrastructure at airport ( ) Economic Market ( ) Other _____

Please provide more details:

_____

_____

_____

5- Any additional information:

_____

_____

_____

[2] https://www.icao.int/environmental-protection/Pages/SAF_Stocktaking.aspx

D- Operations

Name of project / initiative: _____

Contact person and email: _____

Website: _____

1. What is the focus of your approach?

( ) Ground operations *(Please describe)* _____

( ) Flight operations *(Please describe)* _____

2. What type of aircraft would benefit most from your approach?

( ) Narrow body aircraft ( ) Wide body aircraft ( ) Turboprop aircraft
( ) Regional jet aircraft ( ) All ( ) Other _____

3. What is the expected fuel burn reduction on a per-flight / flight phase *(please underline)* **basis?** (*Please provide a percentage, e.g.: 5% reduction in taxiing fuel burn, 10% reduction in cruise fuel burn, etc.*)

_____

4. Does your approach require modifications to the aircraft? If so, please specify (*e.g., software, hardware, etc.)*

_____

_____

5. What is the current Technology Readiness Level (TRL) of your approach (1-9)? _____

6. In what year do you expect your approach to enter the market? _____
(*i.e., to start flying commercially*)

7. Can your approach be used with the current airport infrastructure? If not please provide details.

( ) Yes ( ) No

_____

_____

8. What are the three largest limitations of your approach?

( ) Financial resources ( ) Policy ( ) Technological constraints ( ) Technical know-how
( ) Human resources ( ) Infrastructure at airport ( ) Economic Market ( ) Other

Please provide more details:

_____

_____

9. Does your approach present benefits beyond CO_2 reductions? If so, please give a quantified answer if available *(e.g., increase turnaround time [%], reduce aircraft separation on landing, reduced noise, reduced NO_x emissions, increased passenger comfort*)

_____

_____

_____

10. Is your approach dependent on other emerging technologies and approaches? (*e.g., more efficient batteries, new construction materials, internet-of-things, etc.)*

_____

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11. Do you foresee any interdependencies of your approach with other civil aviation impact factors on environment or requirement in additional environmental measures? (*e.g. noise or pollutant emission, or associated maintenance/recycling processes)*

_____

_____

_____

12. If possible provide data for the information given in this questionnaire (e.g. *website, conference or journal articles, official statement etc.*)

_____

13. Any additional information:

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_____