

Organisation of a Stakeholder Webinar for dissemination of final FlyATM4E results

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FlyATM4E

FLYING AIR TRAFFIC MANAGEMENT FOR THE BENEFIT OF ENVIRONMENT AND CLIMATE

This Deliverable is part of a project that has received funding from the SESAR Joint Undertaking under grant agreement No 891317 under European Union's Horizon 2020 research and innovation programme.



Abstract

The present deliverable details the stakeholder's webinar that FlyATM4E organized to disseminate the results of the project, targeting key stakeholders. The deliverable lists the objectives of the webinar (framing them into the overall communication, dissemination, and exploitation objectives), including the identification of objectives by the target audience. The deliverable also tackles the stakeholders' engagement and identifies relevant actors (including those already conforming the Advisory Board of the project) that would be potentially targeted to attend the event. Finally, it provides practical information on the date and connection details (it would be a virtual event), the agenda, and the outcomes of the webinar



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1 Introduction

The goal of this Deliverable is to provide a description of the stakeholder webinar, which will be conducted to efficiently disseminate the main research achievements of the project to key stakeholders.

1.1 Applicable Reference material

This workshop was planned as part of the communication, dissemination, and exploitation activities of FlyATM4E project [1], which was prepared satisfying the content and activities identified in Section 3.10 of the Exploratory Research (ER) Project Execution Guidelines document [2], the article 38.1 of the Grant Agreement concerning the communication activities of the partners, and the instructions provided in the H2020 Communication Guide with regard to the communication strategy [3].

The overall objective of the FlyATM4E CDE Plan [1] is to promote the project and its results. For this purpose, the plan presented in [1] defined clear objectives and set out concrete strategic planning for the communication, dissemination, and exploitation activities in an effective manner. The plan included, among others, a description, and key take-home messages, which should be tailored upon the finalization of the projects, the objectives targeted by the audience, the strategy, and a calendar with intended communication and dissemination activities and their associated metrics to monitor the impact.

1.2 Focal Communication Contact

As nominated in [1], the communications point of contact of this project is the WP4 Leader, Manuel Soler (He will be in contact with the Project Coordinator -PC-, Sigrun Matthes). His contact details are the following:

Prof. Manuel Soler
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Tel: +34 91 624 8219
E-mail: masolera@ing.uc3m.es

Manuel Soler (leading UC3M team) and Sigrun Matthes (leading DLR team) will be organizing the webinar.

1.3 Information on funding

As indicated in [1], the webinar will display the SJU logo¹ and the EU emblem, and will include the following text:

“This project has received funding from the SESAR Joint Undertaking under grant agreement No 891317 under European Union’s Horizon 2020 research and innovation programme”.

When displayed together with another logo, the SJU logo and the EU emblem will have appropriate prominence.

The communication activity related to the action will indicate that it reflects only the author's view and that the SJU is not responsible for any use that may be made of the information it contains.

1.4 Acronyms and Terminology

Non-exhaustive list of acronyms used across the text.

Acronym	Description
AB	Advisory Board
aCCFs	Algorithmic Climate Change Functions
ACARE	Advisory Council for Aeronautics Research in Europe
ACI	Airports Council International
ANSP	Air Navigation Service Provider
ATM	Air Traffic Management
CAA	Civil Aviation Authority
CCAA	Canadian Council for Aviation & Aerospace
EASA	European Union Aviation Safety Agency
ECAC	European Civil Aviation Conference
ER	Exploratory Research
EREA	Association of European Research Establishments in Aeronautics
EU	European Union
ICAO	International Civil Aviation Organization
IPCC	Intergovernmental Panel on Climate Change
JU	Joint Undertaking
OECD	Organisation for Economic Co-operation and Development
PC	Project Coordinator

¹ The SJU3 logo will be used as indicated by SJU

SESAR	Single European Sky ATM Research Programme
SJU	SESAR Joint Undertaking
TBO	Trajectory Based Operations
USFAA	United State Federal Aviation Authority

Table 1: Acronyms

FlyATM4E Consortium

Acronym	Description
DLR	DEUTSCHES ZENTRUM FUER LUFT - UND RAUMFAHRT EV
TUD	TECHNISCHE UNIVERSITEIT DELFT
TUHH	TECHNISCHE UNIVERSITAT HAMBURG
UC3M	UNIVERSIDAD CARLOS III DE MADRID

Table 2: FlyATM4E consortium acronyms

2 Stakeholder’s Webinar Objectives

2.1 FlyATM4E WP4 overall objectives

Communication, dissemination, and exploitation activities are framed within FlyATM4E’s WP4 (see Figure 1). Thus, WP4 is gathering the research activities conducted within the technical WPs, namely WP1, WP2, and WP3, with the aim at:

- Evaluating the project’s results in relation to other ATM and MET related enablers and constraints, which includes a hindcast analysis. See Figure 2.
- Delivering recommendations for implementation of environmental-assessment of aircraft trajectories (environmental-optimization) jointly with stakeholders. See also Figure 2
- Disseminating project results at scientific conferences, in journal papers, to general stakeholders, especially industry and the general public.

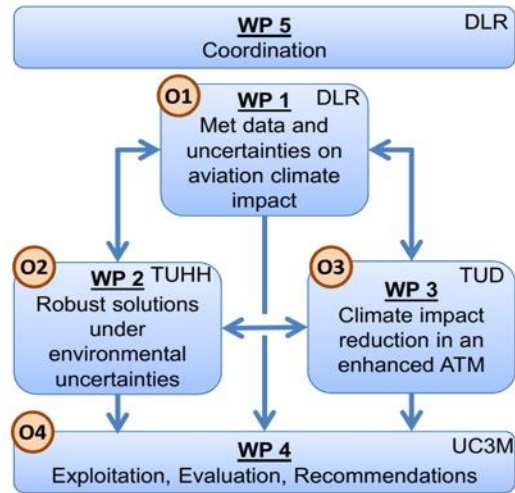


Figure 1: FlyATM4E WP structure

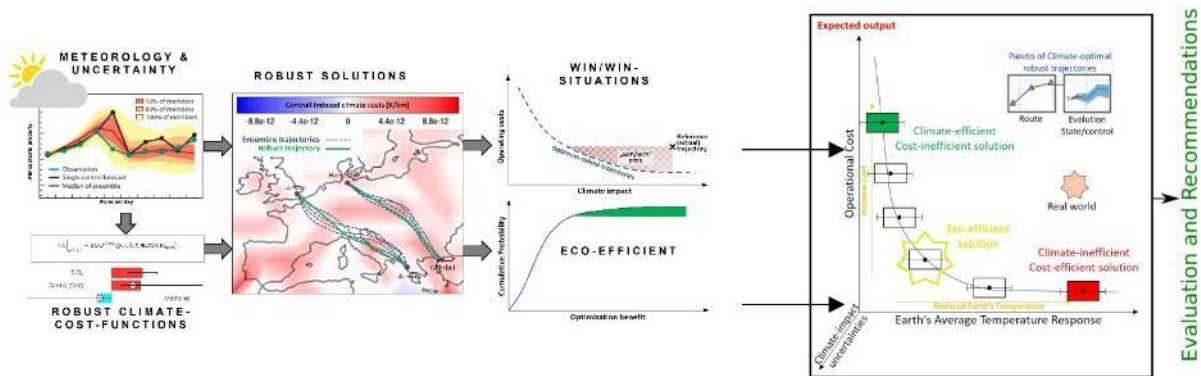


Figure 2: FlyATM4E evaluation and recommendations

2.2 Stakeholders' Webinar Objectives

The objectives of the Stakeholder's webinar are threefold:

1. To present the physical and chemical basis of aviation climate impact/physical climate metrics and, thereby, identify the fundamental research that is still required towards the understanding of both CO₂ and non-CO₂ effects of aviation on climate change.
2. To present the FlyATM4E-Sol-01 –aCCFs and the associated python library- Underpinning concepts, modelling chains, requirements, etc., will be showcased. In this manner, we ambition to make the community aware of the solution, foster its usage and, jointly, identify fundamental research that is still required to model the climate impact of aviation.
3. To briefly present the trajectory optimization approach we have followed in FlyATM4E, and present and discuss the climate mitigation potential results obtained from the top 100 routes scenario (linked with FlyATM4E-Sol-02 –Aircraft trajectory optimization, climate change, uncertainties-). We ambition to identify fundamental research that is still required at this level, e.g., in the quantification of climate mitigation costs.

All in all, the webinar will host scientific talks on advancements and concepts but also aims for industrial perspectives on applications. A panel discussion will foster exchange about challenges and opportunities for future ATM developments for the climate impact of aviation mitigation.

2.3 Objectives by target audiences

It is important to highlight that the FlyATM4E Consortium strategy for the exploitation of results is primarily oriented towards policymaking. To wake up interest in the institutions and foster industrial acceptance, involving stakeholders, understanding their needs, and identifying the barriers are key.

Consequently, the FlyATM4E stakeholder's webinar will be targeted to:

1. **The scientific community.** The goal is to maximize the dissemination of scientific research, including other scientific disciplines. This will enhance excellence and scientific reputation. It will also help in finding follow-up ideas and collaborations via discussions in scientific forums.
2. **Stakeholders such as airlines, met offices, the network manager, etc.** The goal is to attract the industry's interest towards making aviation climatic-friendly.
3. **Stakeholders such as the regulatory community.** The goal is to draw the attention of different institutions, e.g., European Commission and SESAR, National Governments, Regional Governments, National Regulators on Aviation matters, international institutions (ICAO, EASA) and/or groups within them (ICAO's TBO group), to make them aware of FLYATM4E results and make them visible to their agendas. This will facilitate the allocation of more funding and the revision/modification of standards, including the establishment of market-based mechanisms to incentivize greener aviation.

3 Stakeholder’s Engagement

The impact maximisation of FlyATM4E results is key and strategic to us. We ambition the highest possible impact of transitional, intermediary, and outcomes and ensure that benefits are accrued within scientific, regulatory, industrial, and societal stakeholder groups.

3.1 List of potential stakeholders

We provide a stakeholder portfolio analysis. This identifies and prioritises the key stakeholder groups.

High Influence – High Interest: Key Players	
Group	Stakeholders
Regulators	EASA, ICAO, EEA
OEM	Engine manufacturers, aircraft manufacturers.
Aligned EU and other projects	e.g. Eco2Fly, ENGAGE, PJ18 4DTM, ACACIA, ClimOp
European Organisations	e.g. ECAC, ACARE
Internat. civil aviation bodies	e.g. USFAA, CCAA, CAA
High Influence - Moderate Interest: Stakeholders requiring attention	
Group	Stakeholders
Aircraft operators	Airlines, e.g. Lufthansa
Air Navigation Service Prov.	National ANSPs
Airports	airport industry bodies, e.g. ACI
National authorities	National agencies, e.g. German ministry of environment, BMU
Moderate Influence – High Interest: Stakeholders requiring attention	
Group	Stakeholders
International structures and interest groups	E.g., working groups from IPCC, and WMO, OECD
EU Interest groups (organ.).	E.g., EREA, AET
Manufacturing and consulting organisations	Software developers, carbon trading organisations
Provider of Avionics	E.g., Selex, Thales
Universities/Research Establishments	Individual universities and research centres
Moderate Influence - Moderate Interest: Stakeholders requiring moderate effort	
Group	Stakeholders
Specialised media	Trade magazines (Aviation Week Network, Green Aviation)
General media	National media, including news agencies and e-media.
Consultants	Individuals, e.g., CE Delft

Table 3: Stakeholder portfolio analysis according to (high-low) influence and (high-low) interest.

3.2 FlyATM4E Advisory Board members

It is worth mentioning that an Advisory Board was established at the beginning of the project. So far, we have had six meetings, fostering a rich and fruitful dialogue with relevant stakeholders and they have been invited to join the stakeholder workshop.

The AB is composed of a group of external experts with representatives from different stakeholders (already listed in Table 3) in the field of aviation and climate change. The individual institutions are:

- Eurocontrol
- Lufthansa
- Leonardo
- NATS
- Flightkeys
- Airbus



Figure 3: Institutions represented in the Advisory Board

3.3 Strategy for stakeholder engagement

The strategy to maximize the impact of the webinar is as follows:

- The objectives and topics of discussion, mode (Online, On-Site, Hybrid), type and duration, and the date has been agreed upon with the FlyATM4E consortium and the AB members. This ensures focus and alignment of interest and a minimum required participation of key stakeholders.
- The invitation will be then circulated to other relevant stakeholders, using the FLYATM4E communication media (web, social media) and targeting direct invitations to key stakeholders. Table 4 present the strategy to be followed to engage different stakeholders. The strategy differs by stakeholder target group, as identified in Section 0.

High Influence – High Interest		Key Players
Strategy: Closely engage. Communicate frequently. Active request management, utilise feedback.		
Group	Stakeholders	Prime engagement methods
Regulators	EASA, ICAO, EEA	<ul style="list-style-type: none"> • Key stakeholders will be invited to form Advisory Board. • Strategic meetings for two-way communication • Workshops, symposiums, and conferences (face2face &online) • Web site and social media
OEM	Engine manufacturers, aircraft manufacturers.	
Aligned EU and other projects	e.g. Eco2Fly, ENGAGE, PJ18 4DTM, ACACIA, ClimOp	
European Organisations	e.g. ECAC, ACARE	
Internat. civil aviation bodies	e.g. USFAA, CCAA, CAA	
High Influence - Moderate Interest		Stakeholders requiring attention
Strategy: Keep informed. Utilise interest, maintain as a supporter or advocate		
Group	Stakeholders	Prime engagement methods
Aircraft operators	Airlines, e.g. Lufthansa	<ul style="list-style-type: none"> • Invitation to Advisory Board
Air Navigation Service Prov.	National ANSPs	

Airports	airport industry bodies, e.g. ACI	<ul style="list-style-type: none"> • Circulate FlyATM4E results • Utilise interested association bodies, e.g., ACI as dissemination channels
National authorities	National agencies, e.g. German ministry of environment, BMU	
Moderate Influence – High Interest		Stakeholders requiring attention
Strategy: Keep informed. Engage interest, communicate regularly, consult and involve		
Group	Stakeholders	Prime engagement methods
International structures and interest groups	E.g., working groups from IPCC, and WMO, OECD	<ul style="list-style-type: none"> • Key stakeholders will be invited to participate on Advisory Board. • Utilise interested association bodies such as EREA as dissemination channels. • Conferences, workshops and scholarly outputs to disseminate new knowledge and findings.
EU Interest groups (organ.).	E.g., EREA, AET	
Manufacturing and consulting organisations	Software developers, carbon trading organisations	
Provider of Avionics	E.g., Selex, Thales	
Universities/Research Establishments	Individual universities and research centres	
Moderate Influence - Moderate Interest		Stakeholders requiring moderate effort
Strategy: Monitoring needs and keeping updated		
Group	Stakeholders	Prime engagement methods
Specialised media	Trade magazines (e.g., Aviation Week Network, Green Aviation)	<ul style="list-style-type: none"> • Website, press release, and newsletter • Social media, including LinkedIn and ResearchGate
General media	National media, including news agencies and e-media.	
Consultants	Individuals, e.g., CE Delft	

Table 4: Strategy for stakeholder engagement

4 Webinar practical information

4.1 Date and venue

The stakeholder workshop took place on 20 October 2022 on a virtual basis (Zoom meeting).

4.2 Agenda

The agenda was as follows:



The poster features a dark blue background with a white airplane silhouette flying upwards. The title 'FlyATM4E Stakeholder Workshop' is prominently displayed in white and green. A green box highlights the date and time: '20 OCTOBER 9:30 – 12:30 CEST'. The agenda is listed in white text, detailing various sessions and breaks. At the bottom right, the 'POWERED BY sesar JOINT UNDERTAKING' logo is visible.

FlyATM4E
Stakeholder Workshop

20 OCTOBER
9:30 – 12:30 CEST

AGENDA

- 09.30 - 09.40 — Opening.
- 09.40 - 09.55 — Physical and chemical basis of aviation climate impact and climate metrics: Key results of FlyATM4E.
- 09.55 - 10.10 — Discussion session.
- 10.10 - 10.25 — The FlyATM4E-Solution-01 – The merged aCCFs concept and the associated CLIMaCCF python library: paving the way towards aviation-induced climate impact as a MET service.
- 10.25 - 10.40 — Discussion session.
- 10.40 - 11.00 — *Coffee break.*
- 11.00 - 11.15 — The FlyATM4E-Solution-02 – Aircraft trajectory optimization, climate change, and its associated uncertainties: quantifying the cost of climate mitigation flight operations.
- 11.15 - 11.30 — Discussion session.
- 11.30 - 11.45 — Implementation and next steps
- 11.45 - 12.30 — Discussion

POWERED BY **sesar**
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Figure 4: Agenda of the FlyATM4E Stakeholders' workshop

4.3 Advertisement

A web post with online registration, twitter, and linked-in posts were created to advertise the event. In addition, relevant stakeholders were identified and directly invited via e-mail.



Figure 5: FlyATM4E Stakeholders' workshop advertisement in Linked-in

4.4 Material

The objectives of WP4 were included in the workshop as a discussion basis (see Figure 6). The outcomes of the project have been disseminated in a web post (<https://flyatm4e.eu/2022/10/20/flyatm4e-stakeholder-workshop-highlights/>), including the slides that were presented during the meeting and a ClimaCCF video tutorial.

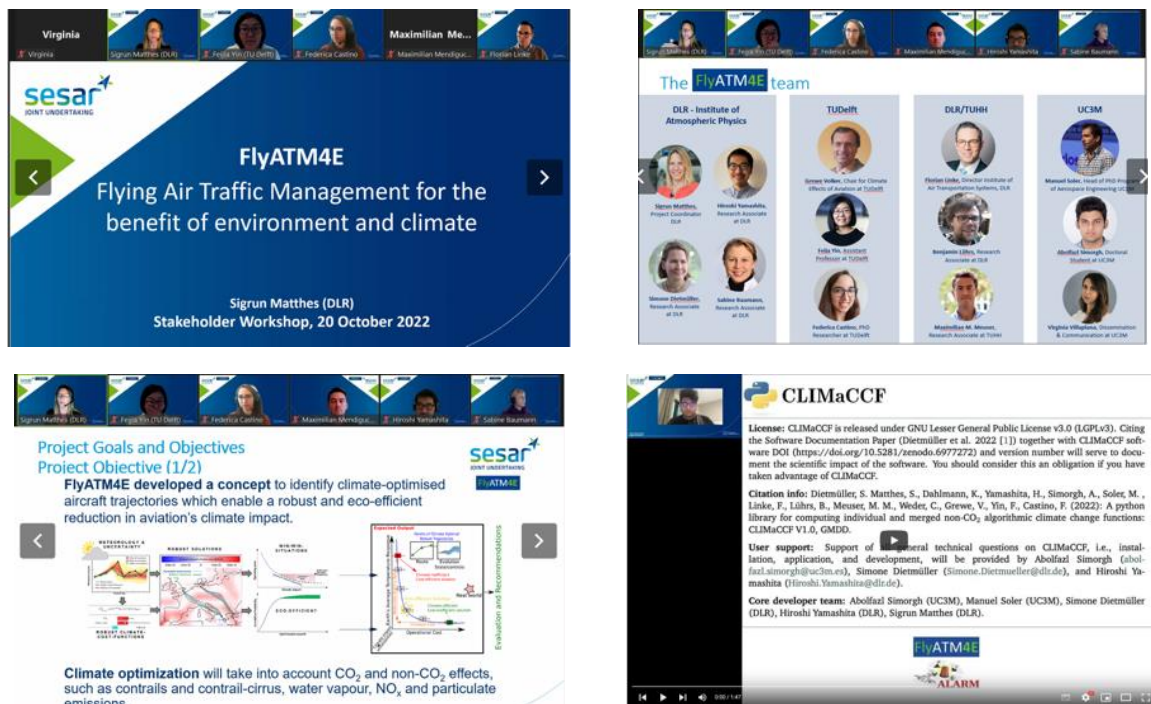


Figure 6: FlyATM4E Stakeholders' workshop material

4.5 Outcome

The outcomes of the Workshop can be summarized as follows:

1. There is a strong interest in the community regarding challenges and concepts for climate-optimized trajectory planning, involving various types of different stakeholders. This can be seen in the broad variety of the involved stakeholder groups comprising aircraft manufacturers, airlines, service providers, weather services, regulators, aircraft manufacturers, engine manufacturers, airlines, national aviation bodies, service providers, software provider, regulators, universities/research establishments, consultants, European Organisations, NGOs.
2. Stakeholders showed strong interest in the enabling solution which increases situational awareness on climate effects of aviation, which can be provided as an spatially and temporally resolved information to the airspace users. However, technical questions arose on how to technically implement such a MET-Service climate effect of aviation emission in their trajectory planning tools, but also to what extent this is linked to a particular weather service or service provider. Additionally, technical questions came up on how an optimizer reacts on such aCCF fields showing strong gradients. In this sense, the stakeholders' welcomed the initiative of the easy to use open-source python library CLIMaCCF.
3. Some industrial stakeholders are planning to implement FlyATM4E solutions, in particular the CLIMaCCF library, as they identified such a MET-service as a pre-requisite for planning for alternative climate-optimized aircraft trajectories.
4. Stakeholders require dedicated input for robust decisions under uncertainty conditions. Thus, the uncertainties in the aCCFs, which arise e.g. from weather forecast and level of scientific

understanding in climate science, must be further understood and, if possible, reduced. As an alternative the concept of estimating confidence intervals from a risk analysis which takes into account identified ranges of uncertainties was well received. However concerns were expressed how to operationally implement such a complex procedure. Interest was expressed from stakeholders on the forecast quality, and in particular on the quality of key meteorological fields, e.g. upper tropospheric humidity.

5. Stakeholders asked for extending the aCCF prototypes to more seasons and geographical domains. New versions of aCCFs are thus demanded as the current version of the aCCFs are prototypes with validity limited to summer/winter season and to the North Atlantic flight corridor.
6. A thorough quantification of cost of flying climate-optimized trajectories is also seen as a need. Key Performance Indicators should be defined and quantified. Policy making is also very much needed.
7. Stakeholders clearly expressed their requirement for an incentive for flying such climate-optimized trajectories, while requesting that any accounting procedure would need to be able to demonstrate such benefits from alternative trajectory planning (flight guidance). The need for a dialogue with policy makers and regulators in order to define environmental performance indicators was expressed.

4.6 Metrics for measuring success

The metrics proposed to measure the success of the workshop were the following:

- The number of attendants to the webinar (>25 expected), including multiple nationalities (> 10) and a sufficient variety of stakeholders groups (see Table 4) represented (>5).

The FlyATM4E Stakeholder Workshop has ended with a very rich picture in terms of discussions, but also regarding the heterogeneity of the group showing the broad interest in this topic:

- + 55 attendees from different institutions
- + 14 countries from all over the world.
- Groups included: airlines, universities, research centers, engine manufacturers, aircraft manufacturers, aircraft operations services, ANSP, the NM, Meteorological services, aviation authorities.

When it comes to the mapping of the outcomes with the webinar objectives initially established:

1. We have been able to exchange ideas on the fundamental research that is still required towards the understanding of both CO₂ and non-CO₂ effects of aviation on climate change. Outcomes #4 and #5 are some examples.
2. We presented FlyATM4E-Sol-01 – aCCFs, linked to the ClimaCCF library, which was presented to the public, making the audience aware of it and its usage. Indeed, some stakeholders manifested its intention to implement them (see outcome #3).
3. We presented FlyATM4E-Sol-02 – Aircraft trajectory optimization, climate change, uncertainties, including the results we have obtained in FlyATM4E, which intend to provide a

preliminary quantification of the cost of mitigating climate impact. We jointly identified work to be done, including the reduction of uncertainty (key for reliability), the development of indicators, the need to make policy and incentivize climate-aware flight planning.

5 References

- [1] Matthes, Soler, et al., Communication, Dissemination, and Exploitation Plan. D5-2, Ed. 01.00 FlyATM4E project, Grant 891317. *SESAR 2020 Exploratory Research Call H2020-SESAR-2019-2 (ER4)*.
- [2] SJU, *EProject Handbook of SESAR 2020 Exploratory Research Call H2020-SESAR-2019-2 (ER4) (Programme Execution Guidance)*. 14th March 2019. Edition 3. 2019.
- [3] European Commission, *Communicating EU research and innovation guidance for project participants. Version 1.0, 25 September 2014*. 2014.

