Centro Italiano Ricerche Aerospaziali


IMPACT MONITOR

# A pre-processing methodology for the identification of relevant and innovative R&I initiatives and Stakeholders' needs in the aviation domain supporting the Impact Monitor Project

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on "Innovation in Aviation and Space towards sustainability today & tomorrow"

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Thessaloniki, Greece

# Agenda

- Introduction
- Goal and objectives
- Impact Monitor – WP2 Involved Partners
- Methodological Approach
  - General Guidelines
  - R&I Project dataset buildup
  - Criteria to Interface R&I Stakeholders
  - Questionnaire submition
  - Analysis of Stakeholder's feedbacks
- Main conclusion and further steps
- Contacts

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# Introduction

The assessment of the air transportation impact on the environment, human health and social-economic aspects has become an undelayable need for our modern society, that shall understand and develop a common and shared awareness about the current and possible future effects of human activities on our planet. Different initiatives are currently on-going aiming at evaluating and assuring that the environmental impact as well as the social-economic development is really sustainable at local, global and worldwide level.

One of these initiatives is the **IMPACT MONITOR** project.

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# Goal

To develop a standardized pre-processing methodology to weight the relevance of the aviation European R&I projects vs IM assessment objectives, based on a dedicated taxonomy, which has been applied to create an effective map of aviation Stakeholders' needs by means of dedicated surveys of public info/open data and questionnaire submission referring to R&I projects relevant for "HORIZON-CL5-2022-D5-01-14" topics.

The identification of the relevant details concurs to support the IM assessment activities referring to:

- Climate neutrality by 2050;
- GHG emissions, air quality and noise reduction by 2035;
- Transport connectivity improvement by holistic impact assessment;
- EU aviation R&I collaboration expansion by open assessment tools and enabling impact assessment.

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# Objectives of WP2

- Identify relevant interfaces and requirements of key stakeholders and reference community associations to get awareness and expectations related to the air transport environmental impact research initiatives;
- Select the most effective data sources within programmes (e.g., HE, CA, SESAR3, …) and collection of data;
- Create a specific "R&I Projects Dataset" devoted to collect, identify, and classify the information over the whole life cycle phases (e.g., design, manufacturing, operations, …);
- To define the "Pre-processing methodology" identifying the stakeholders assessment needs and availability to collaborate in IM;
- To develop a "Relevance Weight Model" of the R&I projects referring to the previous reported targets/goals.

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# Methodological Approach

- General Guidelines
- R&I Project dataset buildup approach
- Identification of the possible Stakeholders
- Criteria to Interface R&I Stakeholders
- Questionnaire submition
- Analysis of Stakeholders' feedbacks

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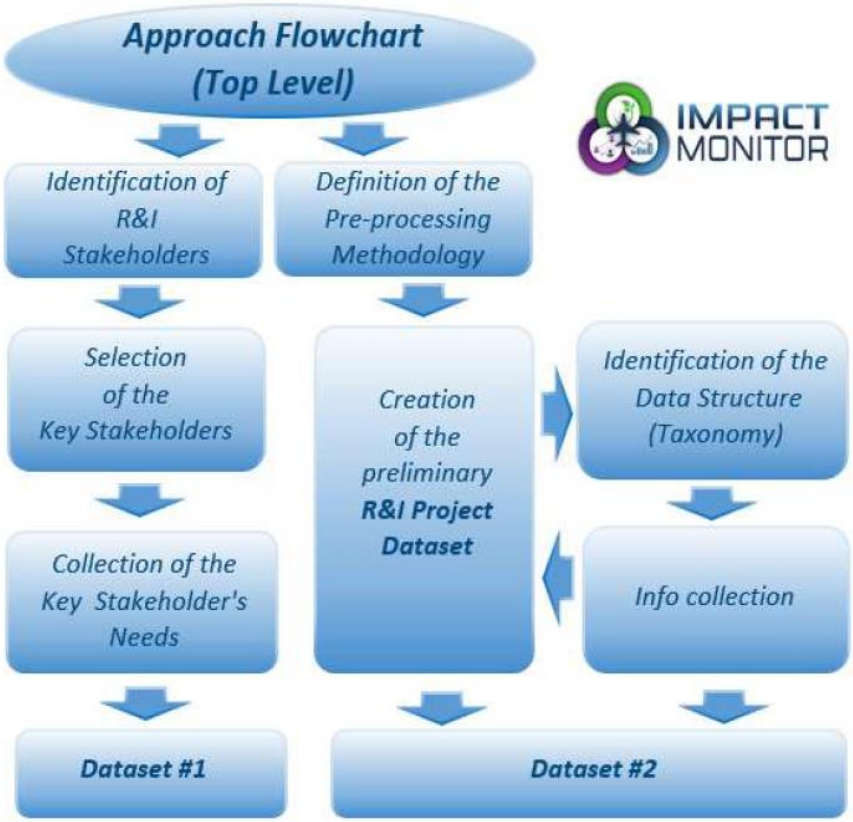
# Methodological Approach

## *General Guidelines*

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# Methodological Approach

## *R&I Project dataset buildup approach vs …*

- Targets
- Innovation streams of interest
- Enablers
- Competing objectives
- Quality requirements
- Timeframes
- Audience
- Target groups
- Sector of interest
- Assessment level

- *To achieve climate neutrality*
- *To improve local air quality and reduce noise*
- *To improve air transport connectivity*
- *To increase air traffic capacity*
- *To expand R&I collaboration*

- *Technology*
- *Operations*
- *Policy*

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# Methodological Approach

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- *Fleet renewal*
- *Aircraft technology*
- *Airport operations*
- *Flight operations*
- *Sustainable fuels*
- *Regulatory measures*
- *Market-based measures*

- *Economic competitiveness*
- *Environmental sustainability*
- *Transport affordability*
- *Transport performance*

- *Collaborative development and assessment*
- *Systematic and holistic approach*
- *Modular and flexible setup*
- *Distributed experts and tools*
- *Multidisciplinary participation and setup*
- *Open source data model and interfaces*
- *Secure data handling and storage*
- *User friendly interface*

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# Methodological Approach

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- Assessment level

- *2030*
- *2035*
- *2040*
- *2050*
- *2070*

- *EC*
- *HE/CR*
- *CA*
- *CH/EU BR*
- *SESAR*
- *ACARE*
- *SES*
- *…*

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# Methodological Approach

## *R&I Project dataset buildup approach vs …*

- Targets
- Innovation streams of interest
- Enablers
- Competing objectives
- Quality requirements
- Timeframes
- Audience
- Target groups
- Involvement vs sector of interest
- Assessment level

- *Government bodies*
- *Authorities*
- *Agencies*
- *Organization*
- *Inspectorates*
- *Industry*
- *University*
- *Professors*
- *PhD Students*

- *Airline*
- *Airport*
- *Air traffic management*
- *Government or regulatory authority*
- *Manufacturer*
- *Non-governmental organization*
- *Research and innovation*
- *Supplier or service provider*

- *Mission*
- *Airport*
- *ATS*

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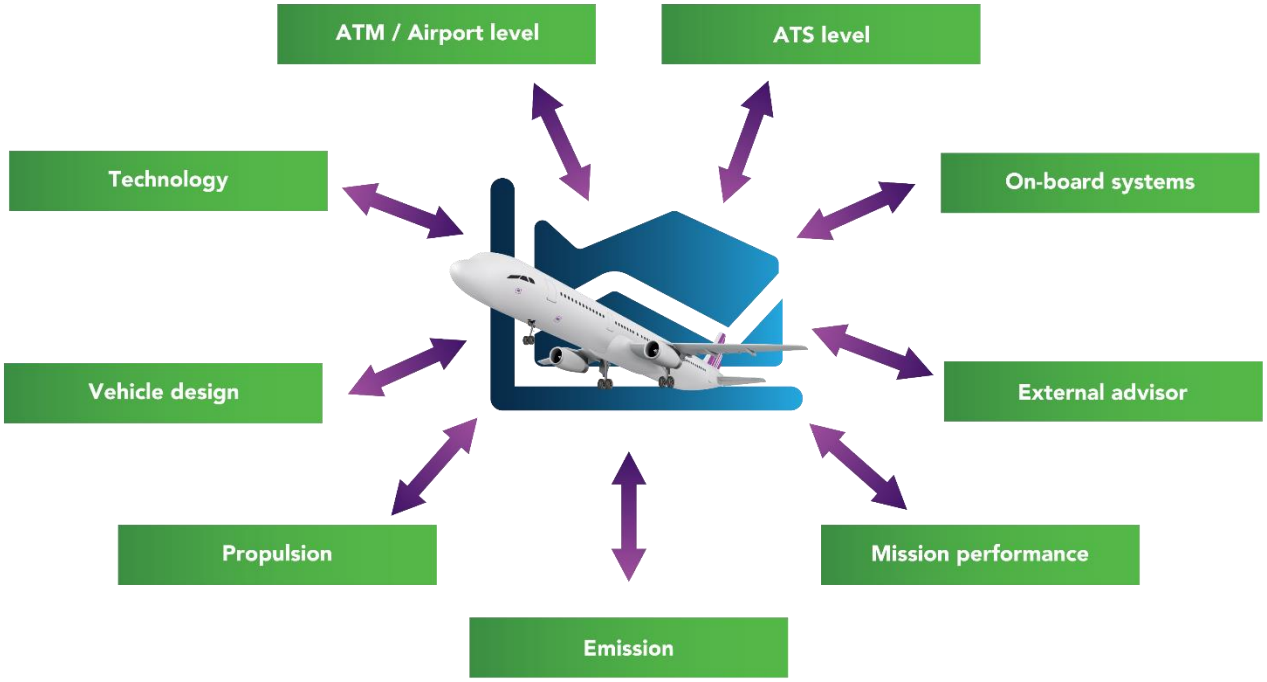
# Methodological Approach

## *Criteria to Interface R&I Stakeholders*

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# Methodological Approach

## *Questionnaire submission*

***Survey targets:***

- To expand European aviation R&I collaboration
- To enable impact assessments of CA or similar programmes

***Interfaces with stakeholders***: through ad hoc questionnaire

***Number of questions submitted***: 23

***IM purpose clarification message***:

*"The project is focused on the assessment of the environmental, economic, and social impacts of European aviation research and innovation (R&I)".*

***Key questions***:

- What should aviation R&I target for?
- What are the enablers to reach those targets?
- What are the key indicators of interest?
- What are the needs for aviation impact assessment?

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# Methodological Approach

## *Analysis of Stakeholder's feedbacks in terms of …*

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- Relative relevance of the most important targets for aviation
- Most effective aviation enablers to support targets in sustainable way
- Ranking of the competing objectives of the ATS
- Allocated priorities to the key performance areas in aviation
- Allocated priorities to the following key sustainability areas in aviation
- Relevant time horizons for the Aviation impact assessment
- Expressed interest in working with framework and toolbox
- Key performance and sustainability areas to assess per innovation stream

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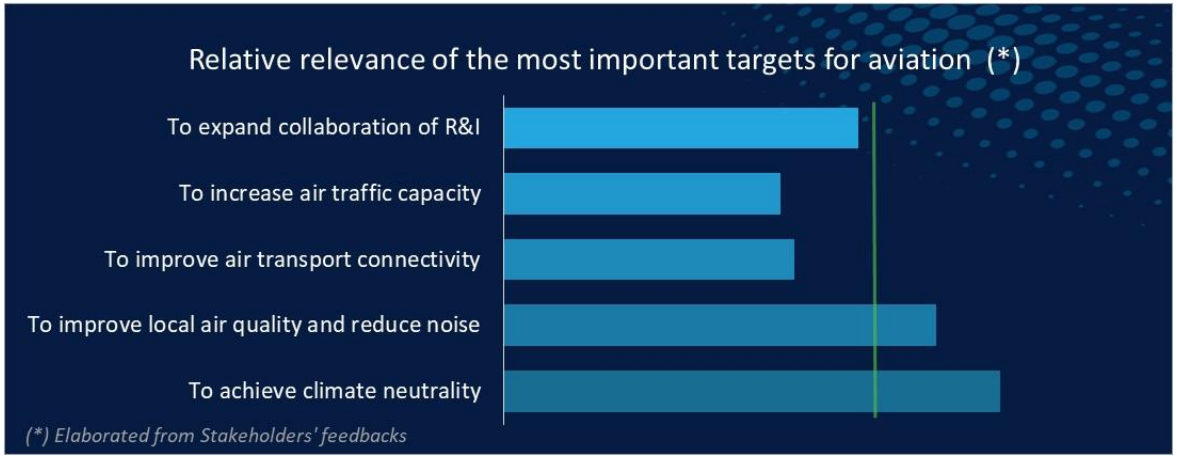
# Main Outputs




## The most important targets:

1) To achieve climate neutrality
2) To improve local air quality and reduce noise
3) To expand collaboration of R&I

(*) Note: Targets sorted according to Stakeholders' judgement

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# Main Outputs

## The relevant performance areas:

- Efficiency
- Effectiveness
- Mobility

followed by

- Capacity
- Predictability


According to Stakeholders' judgement, the efficiency is considered as a driver performance, while the gaps among all others are relatively small.

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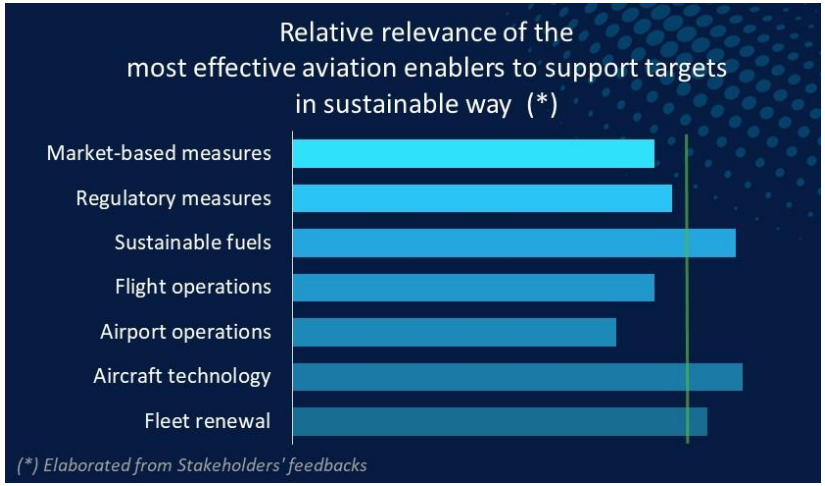
# Main Outputs

## The most important enablers are:

- Aircraft technology
- Sustainable fuels
- Fleet renewal

followed by

- Regulatory measures
- Flight operations




**Some other enablers,** suggested by Stakeholders, are related to the reduction of CO2 and non-CO2 emissions (SAF, digitalization, "physical/chemical understanding of the tropopause" behaviour, propulsion technologies (e.g., geared turbofans), understanding the effects through the full life cycle, to weight the real climate effect contributions of the human activities vs natural ones, etc.

(*) Note: Enablers suggested by Stakeholders.

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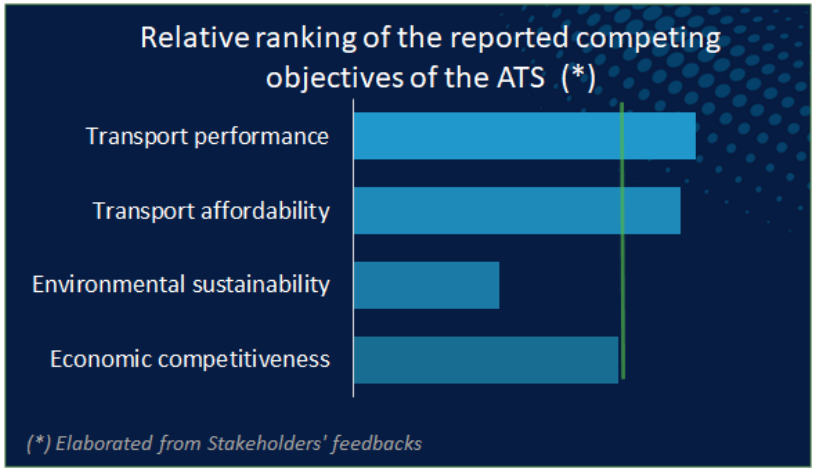
# Main Outputs

## The most important competing objectives of the ATS are:

- Transport performance
- Transport affordability
- Economic competitiveness

followed by

- Environmental sustainability




Note: The interpretation given by Stakeholders to sustainability term has been investigated and the feedbacks have been collected.

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# Main Outputs

- Most important **performance areas:**
  - *Efficiency*
  - *Effectiveness*
  - *Mobility*

  Followed by
  - *Capacity and*
  - *Predictability*

  In this case, the efficiency is considered as a driver performance, while the gaps among all others are relatively small.

- The identified **key sustainability areas:**
  - *Climate*
  - *Safety & Security*
  - *Local environment*

  While the priorities referring to
  *Economy* and
  *Society*
  (characterized by a lower relevance)

- The specified main **time horizons** are: **:**
  - *2050*
  - *2035 and*
  - *2030*

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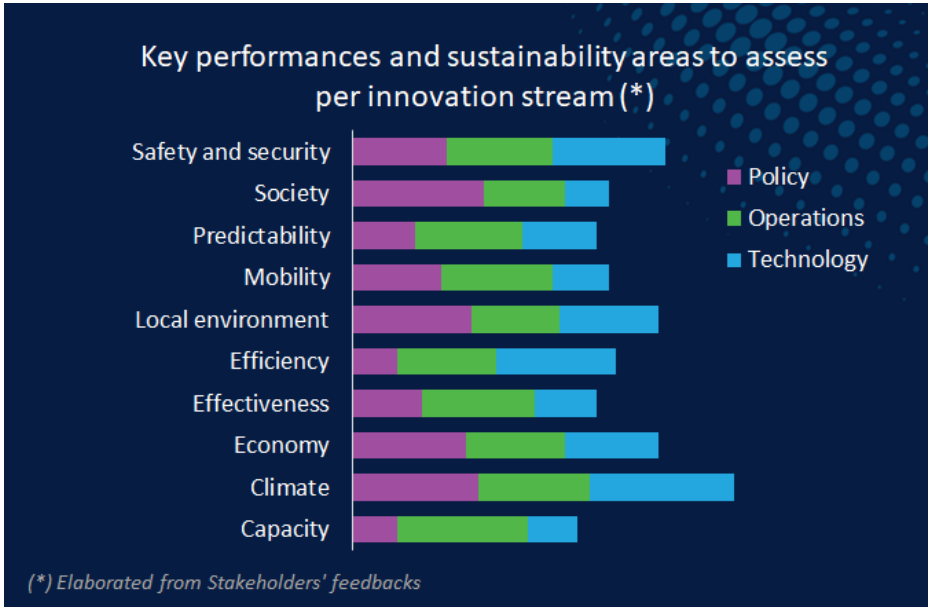
# Main Conclusions

Referring to the **IM targets**:

- *To improve transport connectivity by holistic impact assessment*
- *To expand EU aviation R&I collaboration by open assessment tools*
- *To enabling impact assessment*

***62% of the Stakeholders has provided its availability to support***




Referring to possible working ways the mainly expressed preferences are:

To **defining problems**, **use cases** and **analysing and discussing the results**.

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# Further steps

- To extend the identification of further R&I project coordinators and/or technical experts
- To expand and finalize the dataset with more information focused on air transport operations
- To support future impact monitoring activities

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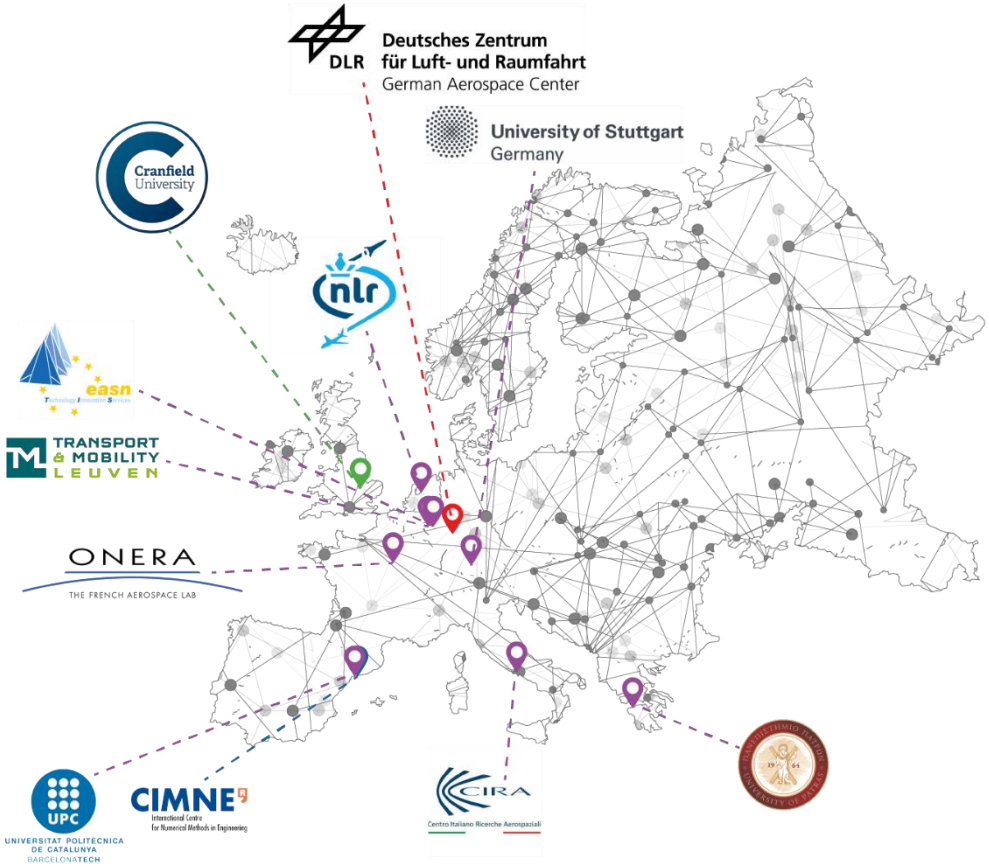
# Thank you!

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