Session I: Overview, Key Results and Student Academy

Impact assessment of aviation
Björn Nagel (DLR)

Project overview and vision
Prajwal Shiva Prakasha (DLR)

Toolbox: Practical guidance for complete cycle of holistic impact assessments of European aviation R&I
Michel van Eenige (NLR)

Demonstration use cases and key results: Assessing the impact of aviation at multiple levels
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Academy: An educational initiative to broaden the horizon of young talents
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Overview and Vision

Prajwal Shiva Prakasha, Patrick Ratei, Björn Nagel

14th EASN International Conference | Thessaloniki | 9th October 2024

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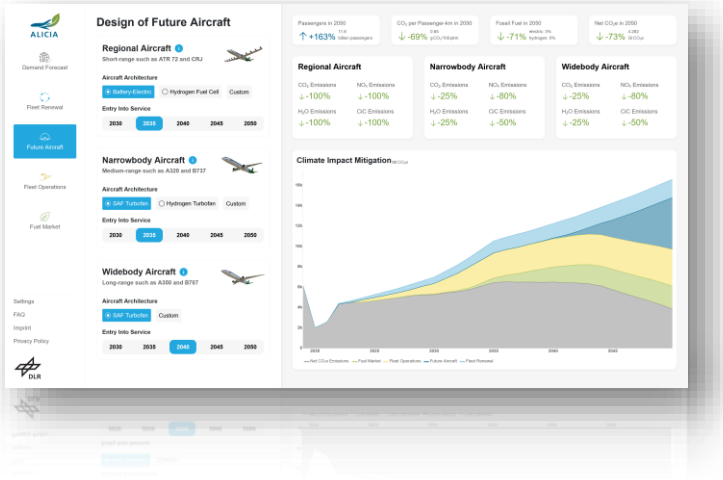
Impact Assessment Vision

Cross organization assessment
Research Organization,
Academia, SME and Industry



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Content Overview

A Scope

- Basic information
- The team
- Vision
- Timeline & background
- Objectives

B Methodology

- Pillar structure & exchanges
- Concept of Collaborative Assessment
- Dashboard Application
- Demonstration Use Cases

Impact Monitor
Scope

Basic Information

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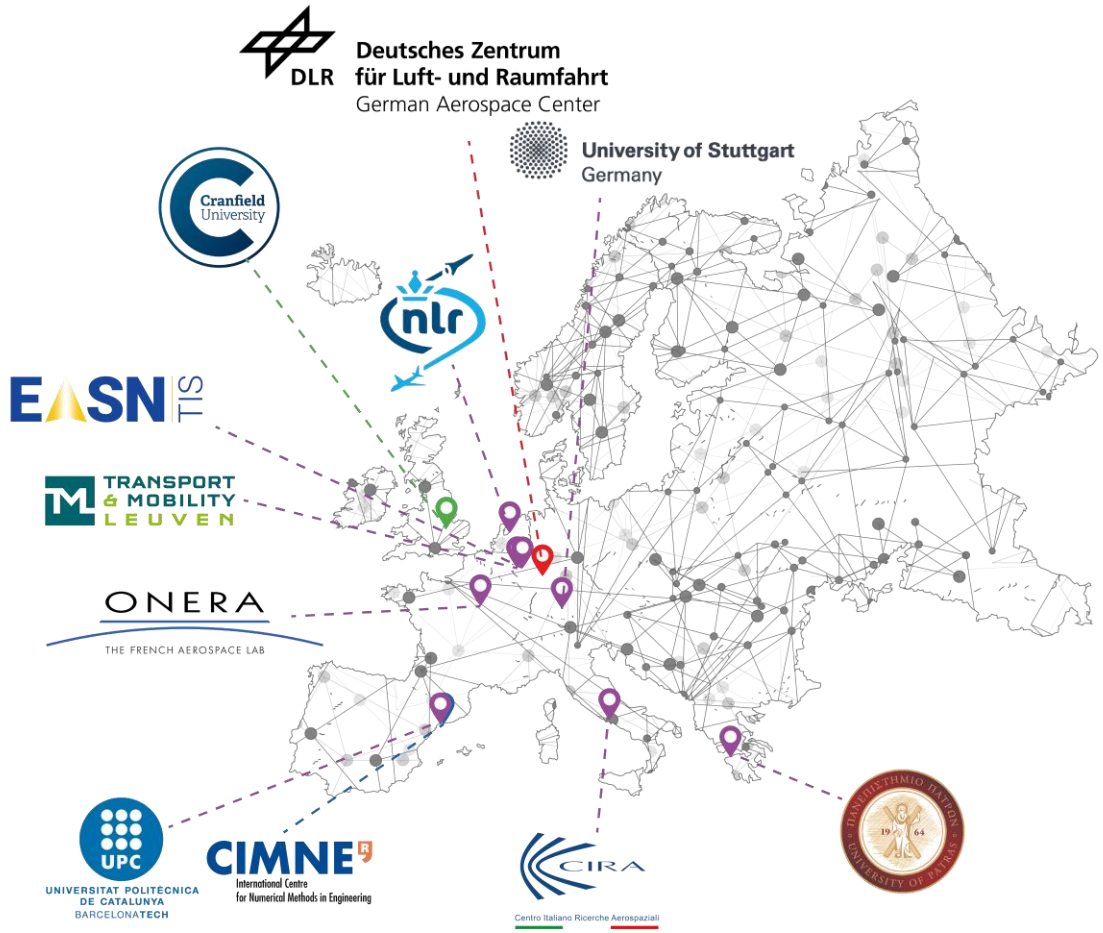
The Team



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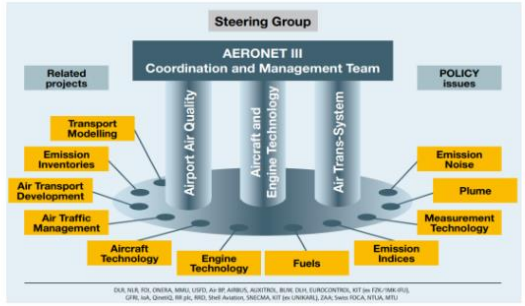
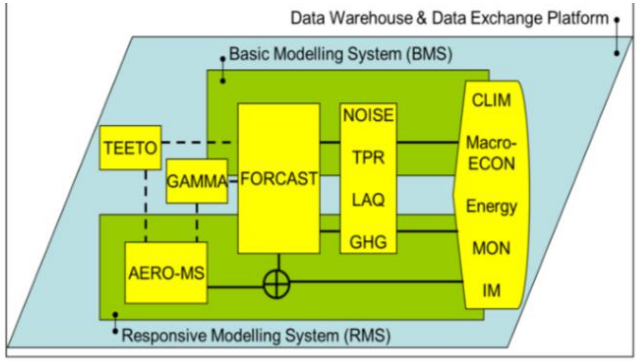
The Team

Previous EU Research Activities



EU AERONET – Aviation Emission & Reduction Technologies
AERONET I, AERONET II, AERONET III (1997 – 2010)

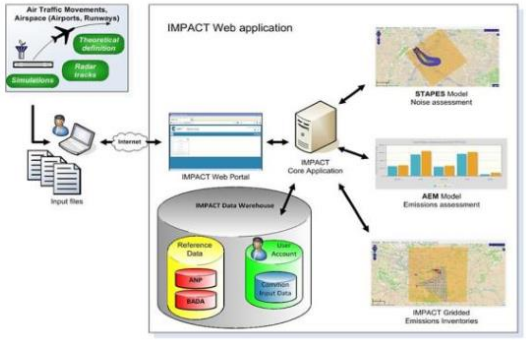


TEAM_Play - Tool Suite for Environmental and Economic
Aviation Modelling for Policy Analysis (2010-2012)

AGILE Aircraft 3rd Generation MDO for Innovative Collaboration of Heterogeneous Teams of Experts

AGILE 4.0

2000 2005 2010 2015 2020 2023



*EUROCONTROL IMPACT (** - Ongoing)*
Aviation Environmental Modelling Tool Suite

Clean Sky Technology Evaluator (2009 - 2024)

IMOTHEP GETTING HYBRID ELECTRIC

TRANSCEND

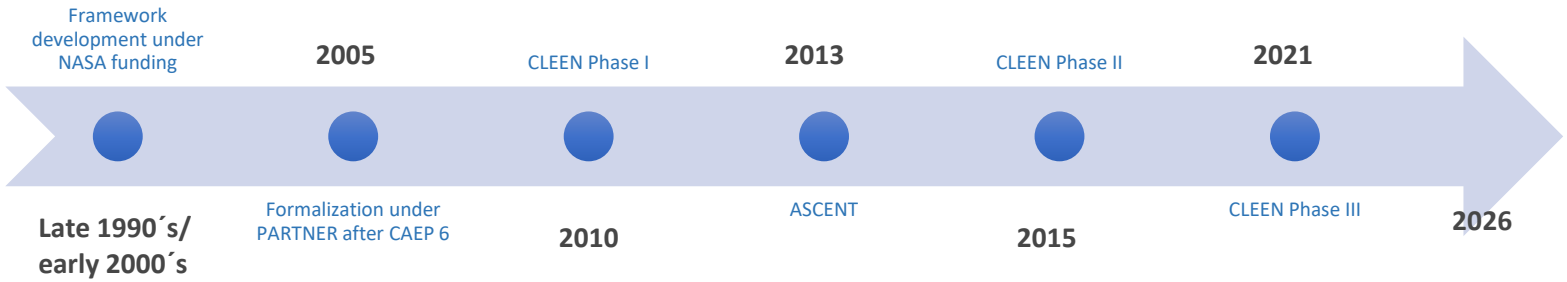
IMPACT MONITOR

COLOSSUS COLLABORATIVE SYSTEM OF SYSTEMS

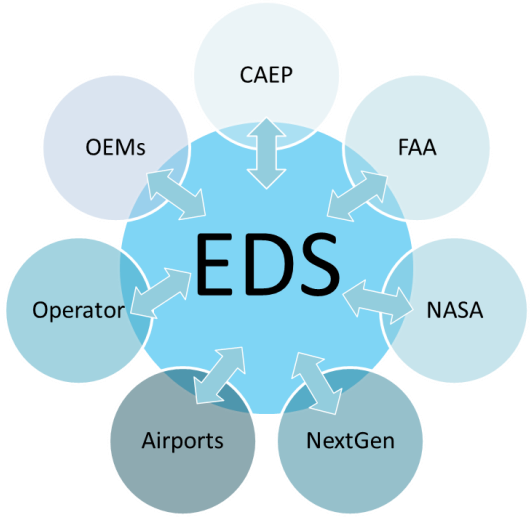
Clean Sky 1 , Clean Sky 2 , EU H2020 & EU Horizon Europe, Clean Aviation, SESAR

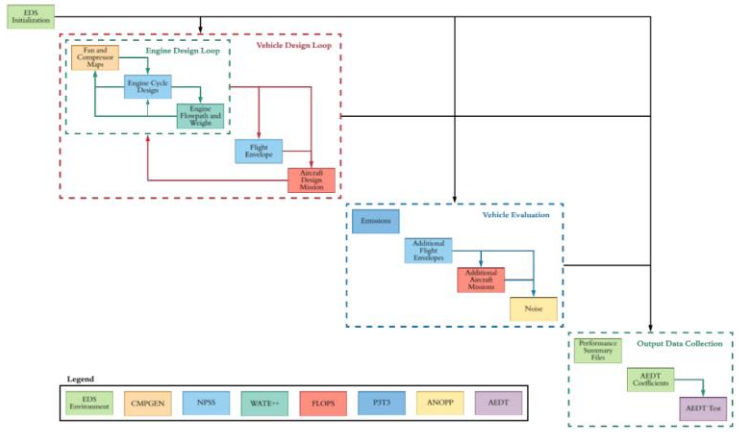
Impact Monitor Project benefits from the experiences of legacy & Ongoing Assessment activities in EU

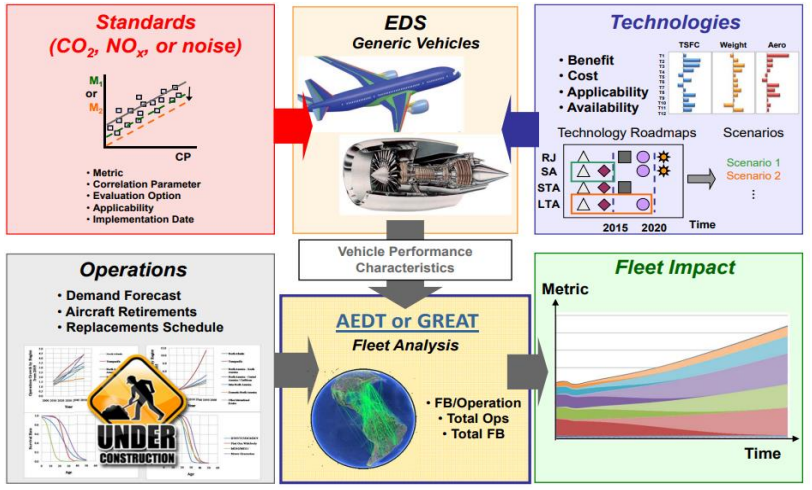
US Aviation Assessment Activities



CLEEN - Continuous Lower Energy, Emissions, and Noise Program (2000 – 2035)







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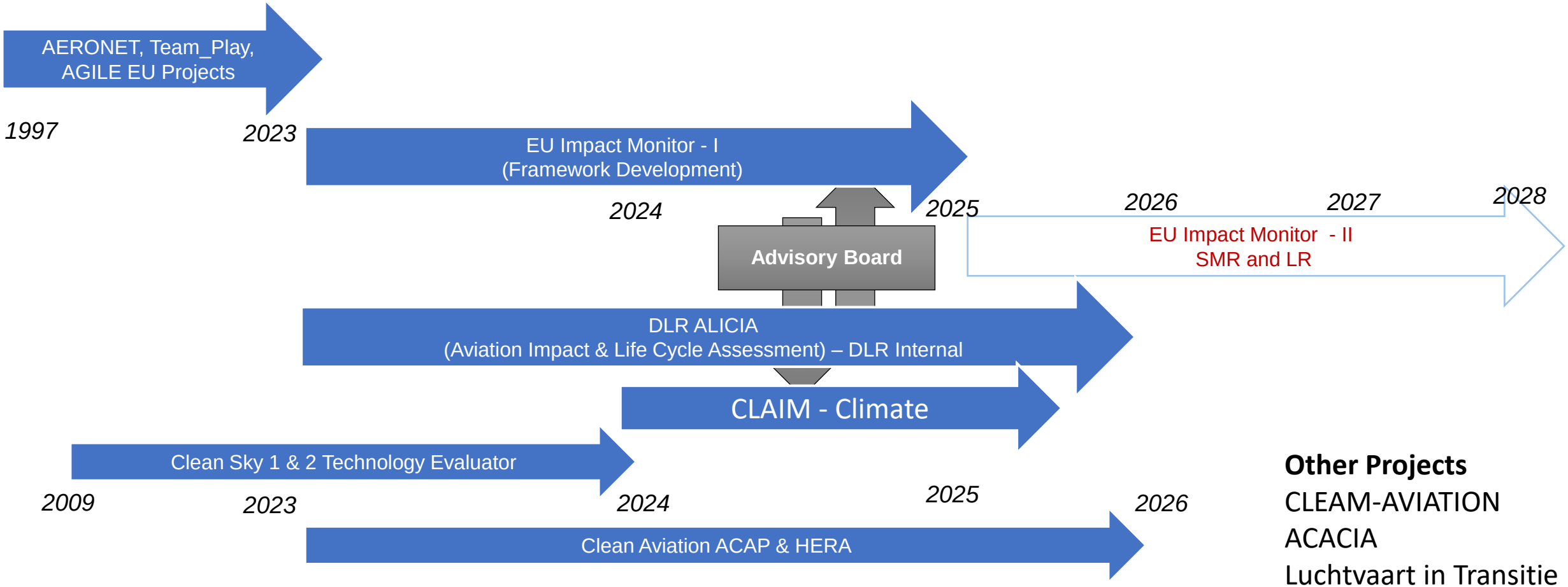
Impact Monitor Timeline



Other Projects

CLEAM-AVIATION
ACACIA
Luchtvaart in Transitie
DEPA 2050
EXACT

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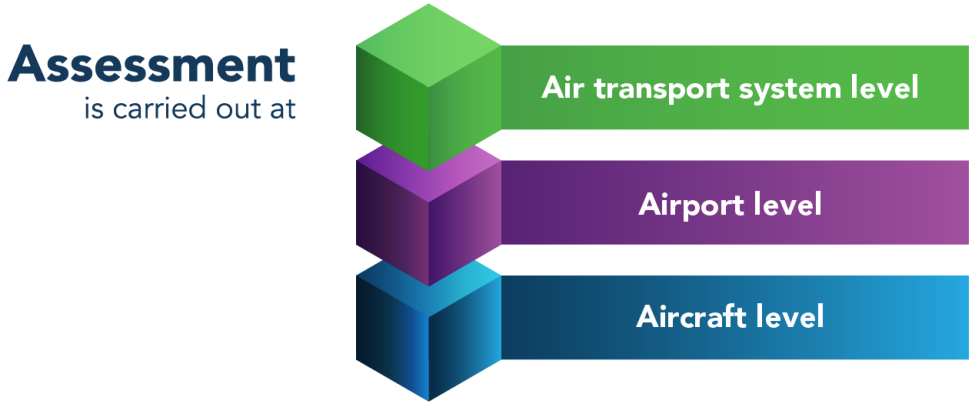
EU Impact Monitor Vision

- Impact Monitor is a 2-year EU Project to deliver a **coherent, collaborative and holistic demonstration framework and toolbox** for technology and policy assessment of the environmental, economic, and societal impact of European aviation R&I.
- Focus of the Impact Monitor project is to **demonstrate with approximate use cases** the collaborative assessment of future Technologies, Vehicles and Operational Strategies.



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Timeline & Background

Impact Monitor builds on and advances the approaches used in EC Better Regulation guidelines and toolbox as well as in the EC projects TEAM_Play, Clean Sky TE, and AGILE/AGILE 4.0.

Impact Monitor also benefits from the experiences of legacy & ongoing assessment activities in EU

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Objectives

Assessment framework & toolbox

Evolve an assessment framework/toolbox that provides a systematic approach of the complete cycle of performing holistic environmental, economic and societal impact assessments of European aviation R&I

Collaborative assessment framework

Develop a scalable, open source, distributed, multidisciplinary, modular, and model independent collaborative assessment framework & toolbox to support holistic impact monitoring

Multi-level use cases

Demonstrate the collaborative framework robustness via multi-level use cases

Interfaces with key stakeholders

Establish interfaces with, and reach out to key stakeholders in European aviation R&I

Impact Monitor Academy

Educate students and broader community with broader access to the assessment toolbox and the collaborative assessment framework through initiating an Impact Monitor Academy

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Impact Monitor
Methodology

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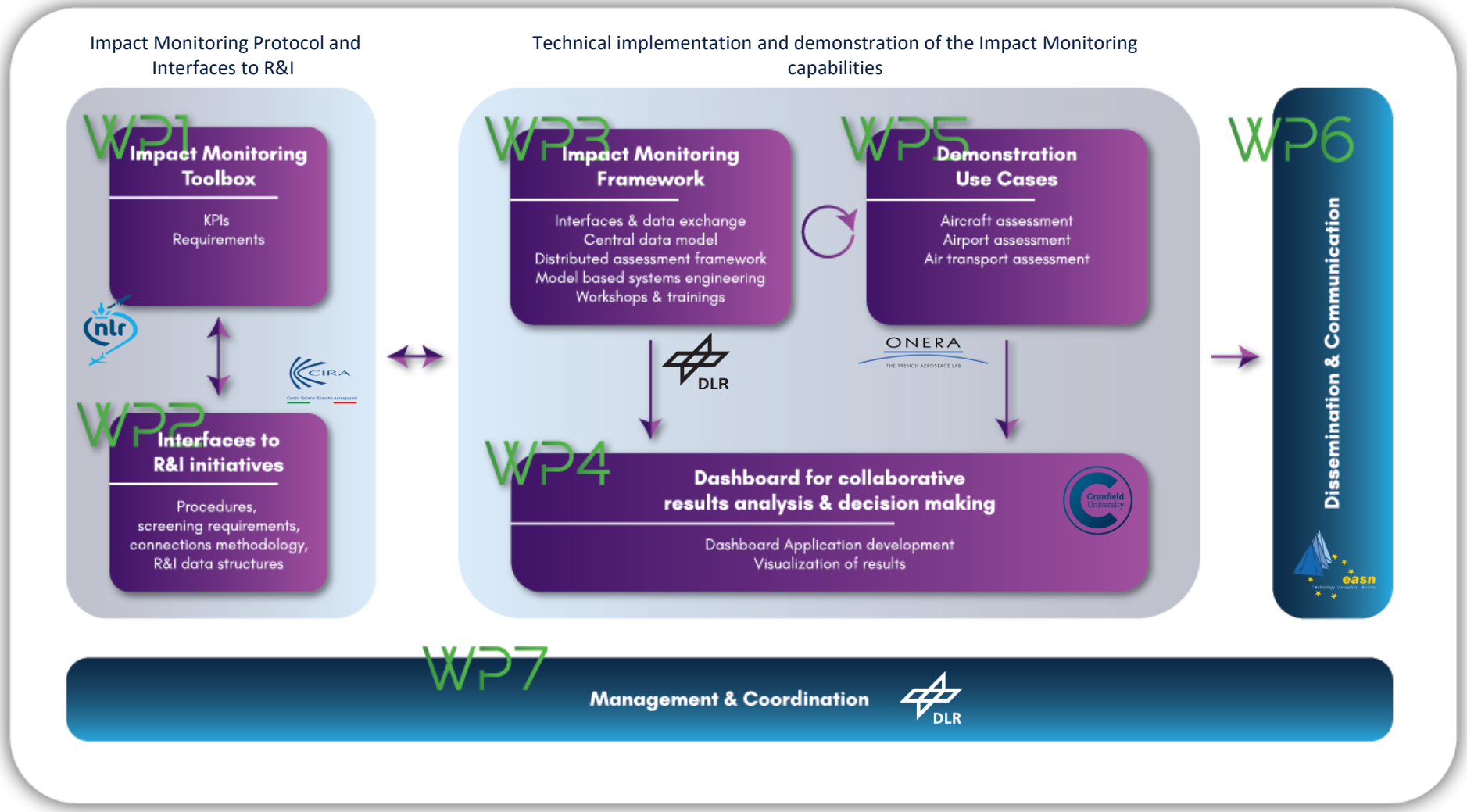
Project Pillars and Structure



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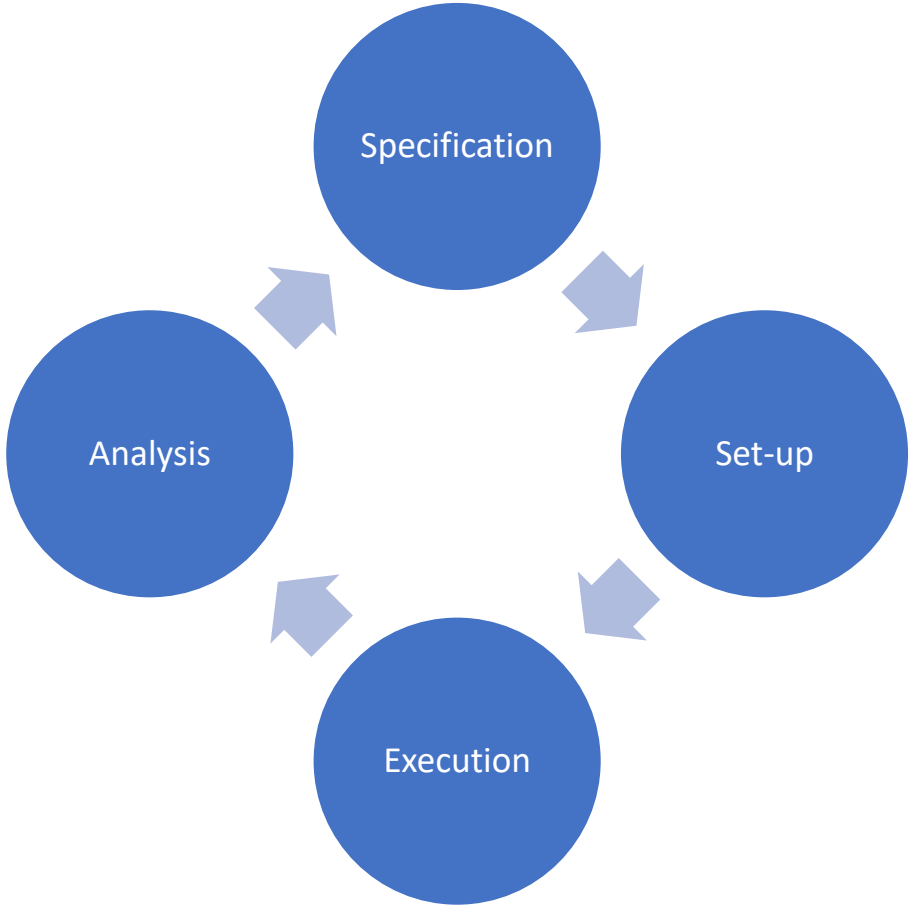
Impact Monitor Toolbox

- Assessment process – **Basics and organisation**
- Assessment and monitoring – **Specification**
- Assessment and monitoring – **Set-up**
- Assessment and monitoring – **Execution**
- Assessment and monitoring – **Analysis**



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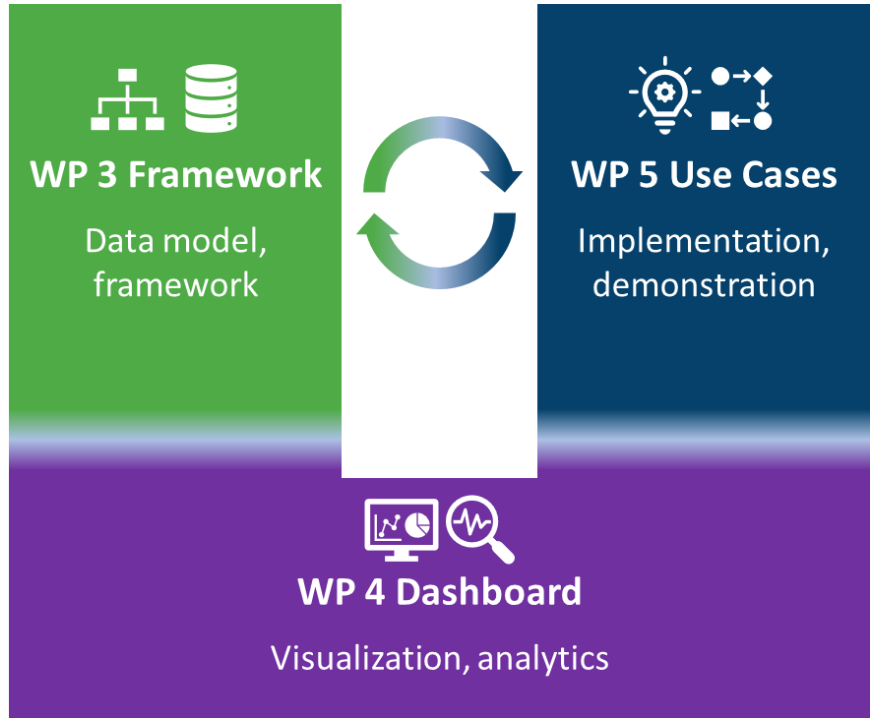
Framework Development

Collaboration across technical disciplines

- WP3 will deliver and iterate the use-case neutral assessment framework
- WP4 focuses on creating visualization of results of application case using a web-based dashboard. It interfaces to the central data repository of WP3
- WP5 focuses on use-case specific implementations of the framework to provide the proof-of-concept



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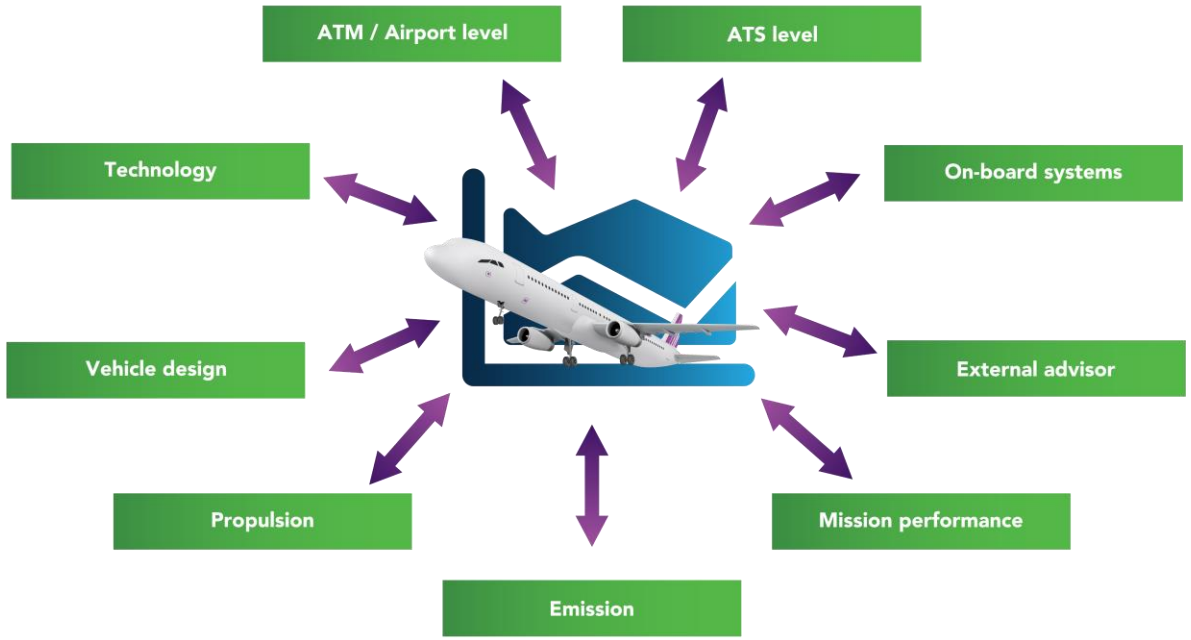
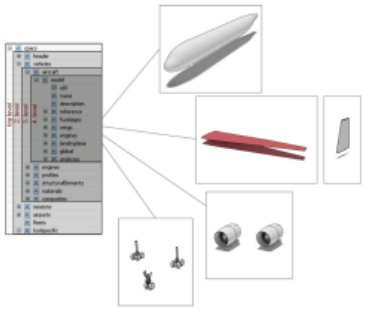
Concept of Collaborative Assessment



- **Open-source** collaborative framework & toolbox available for Impact Monitor partners
- The framework is tightly connected with the demonstration **use cases** to provide the proof of concept, and the web-based **dashboard application** for the visualization of results of the application cases

cpacs
A Common Language for Aircraft Design



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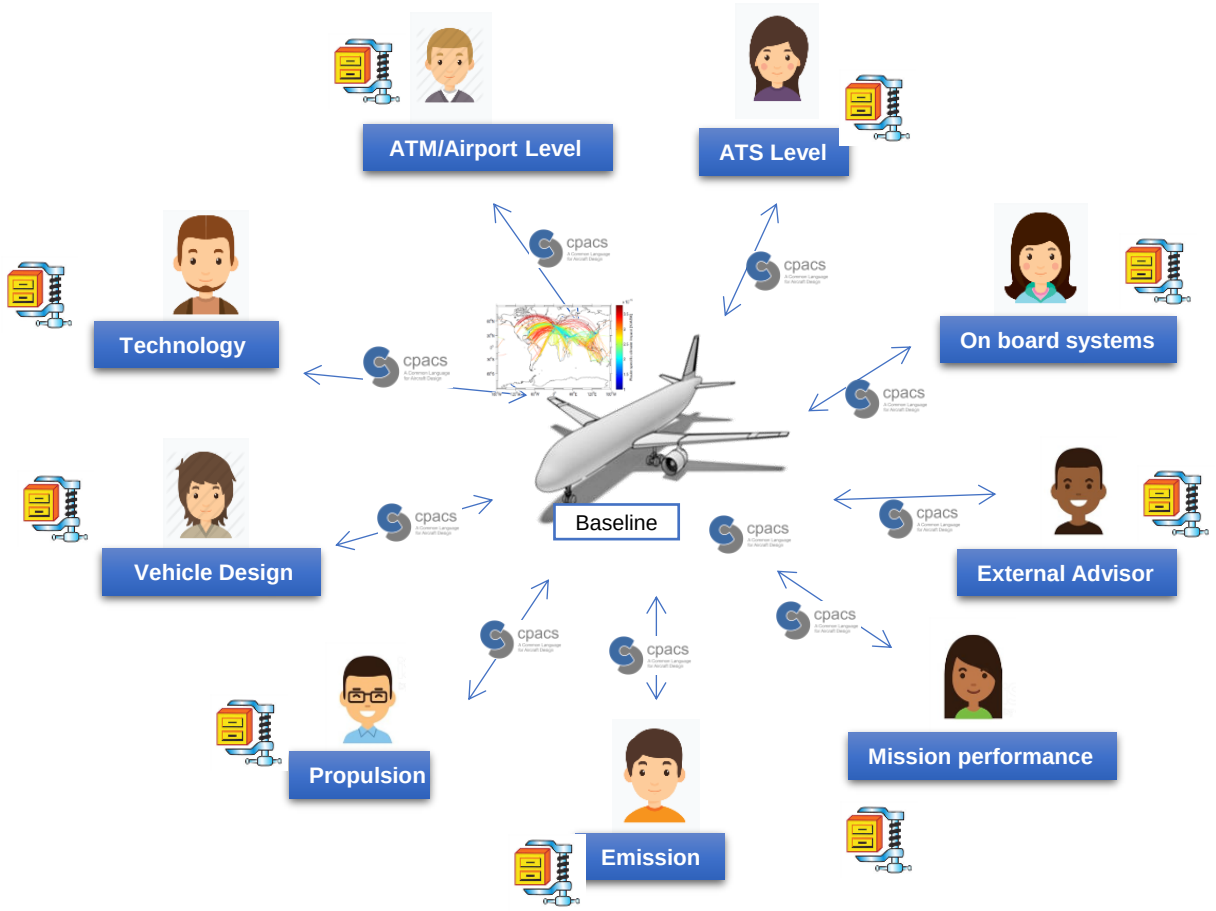

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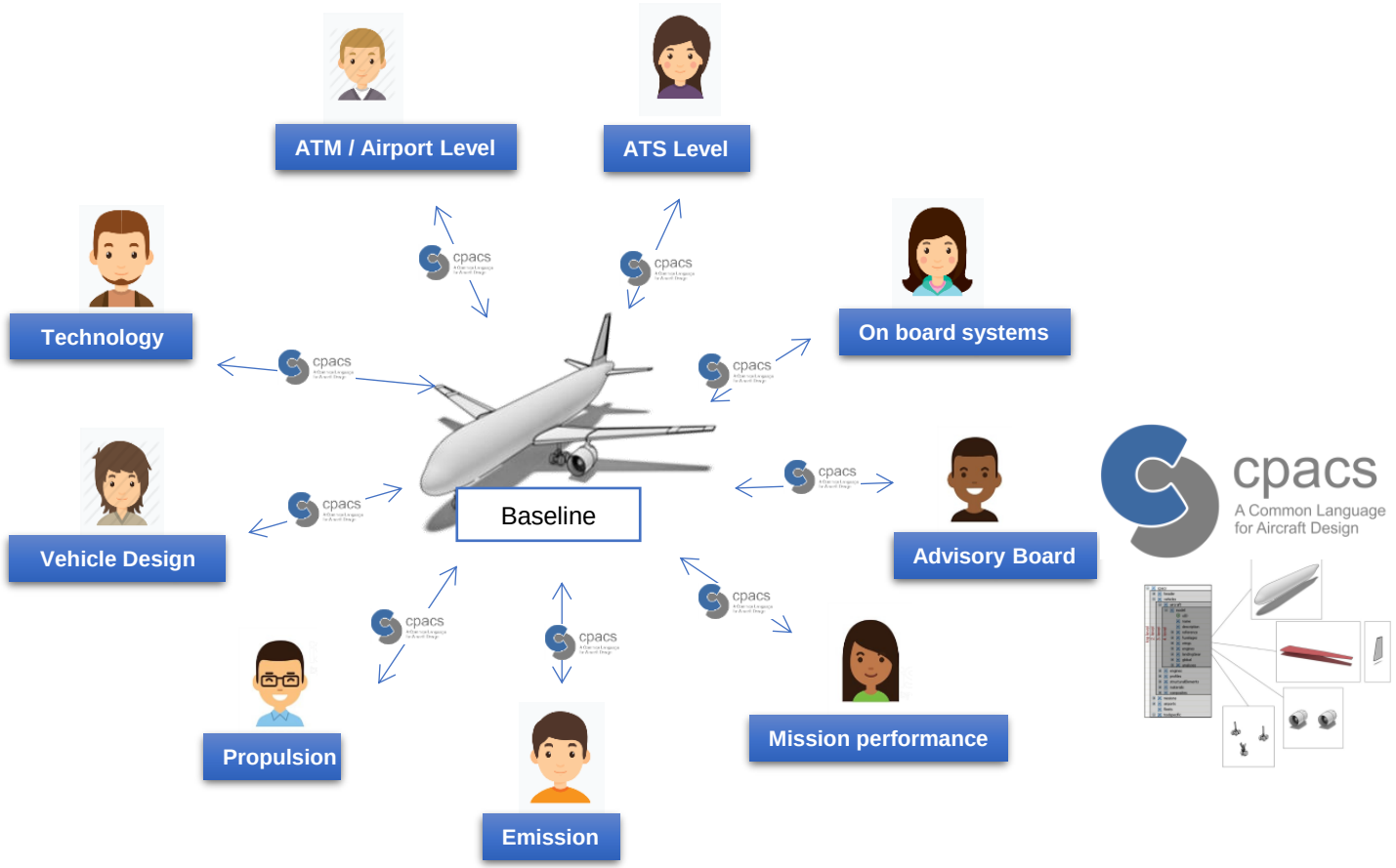
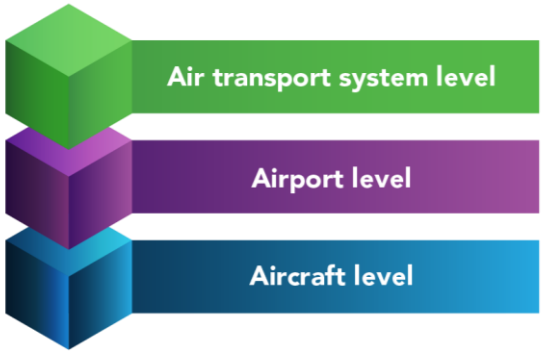
Concept of Collaborative Assessment



Representative Future Aviation Architecting

Demonstration Use Cases

- Aircraft agnostic use cases are derived to demonstrate the **capabilities** of the framework
- For **demonstrative purposes**, three multilevel use cases are implemented



Characteristics:

- Related to, at least, the **three streams** among European aviation R&I categories; aircraft technology and concepts, operations, policies and regulations
- Demonstrate the ability to smoothly connect up to **three levels of assessment**, depending on the metrics targeted by the application
- Take advantage of the flexibility brought by the framework to integrate a representative set of **assessment models** tailored to the demonstration objectives

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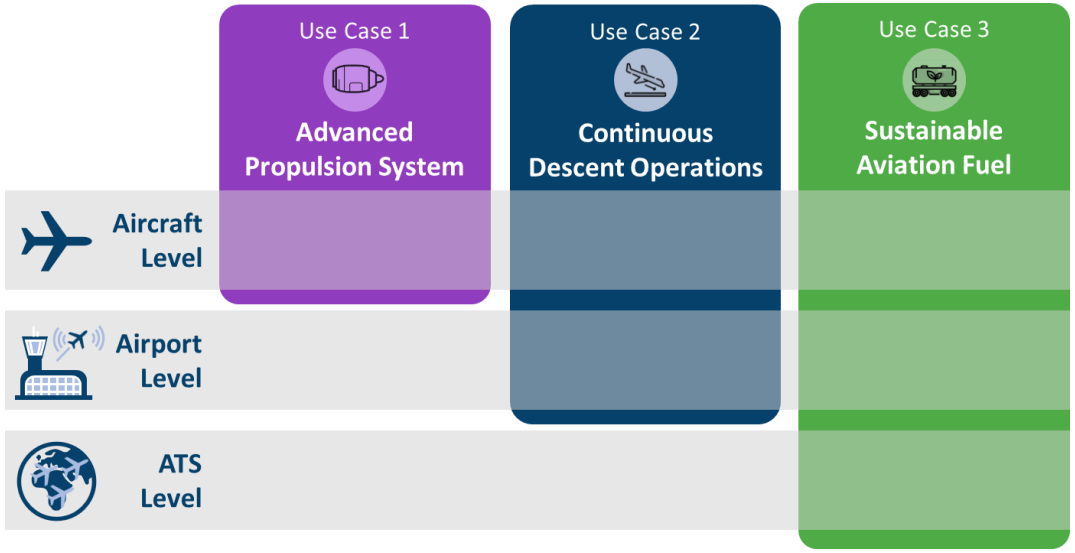
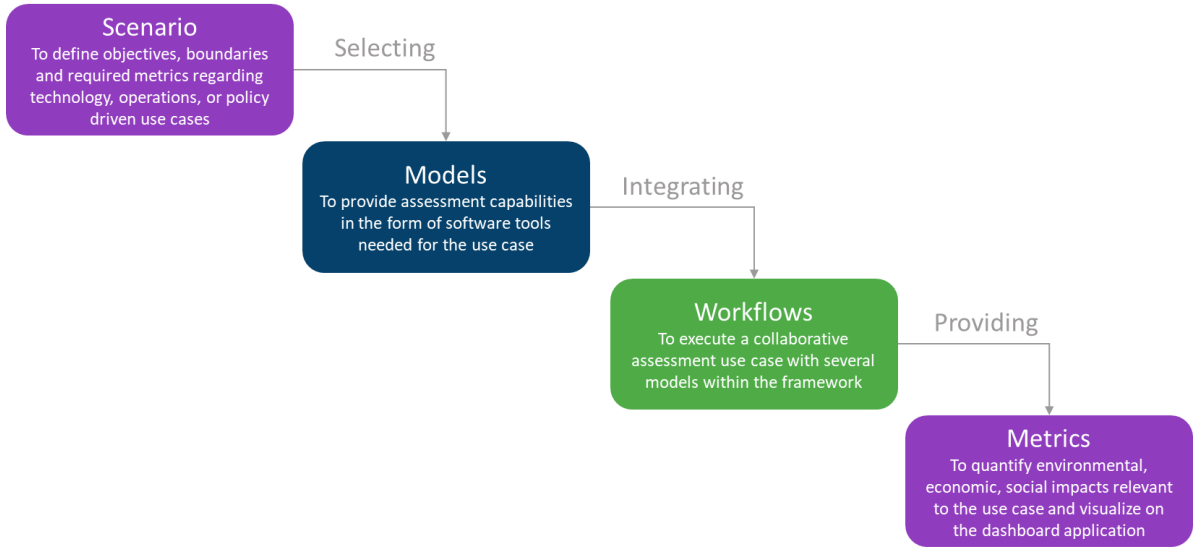
Demonstration Use Cases

- **Environmental, economic and/or societal impact assessment** of an exemplary (although hypothetical) R&I innovation in aviation
- For **demonstrative purposes**, three multilevel use cases are implemented
- Based on **validated models and tools**, which are documented in models and tools catalogue
- Four-step process is consistently followed **across all three use cases**





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Dashboard Application

- Specification of **requirements** for the different groups of stakeholders and users
- Development of the capability for reading and writing **CPACS** files

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Outlook and Vision

- Goal is **holistic impact assessment** of transportation
- Focus on aviation **technologies and operations**
- **Collaboration and synergies** across DLR and EU projects
- Open for **future collaboration** and **Impact Monitor Academy**

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IMPACT MONITOR

19 – 21 FEBRUARY 2025

Public Event,
Hamburg, Germany

Save the Date!

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Thank you!

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