Session II: Technical Details and Demonstration Results

Technical development: Overview and approach
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IMPACT MONITOR

Technical development: Overview and approach

Prajwal Shiva Prakasha and Thierry Lefebvre

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DLR

ONERA
THE FRENCH AEROSPACE LAB

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DLR Coordinated by the German Aerospace Center

Content Overview

A Scope

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

B Methodology

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

Impact Monitor
Scope

Basic Information

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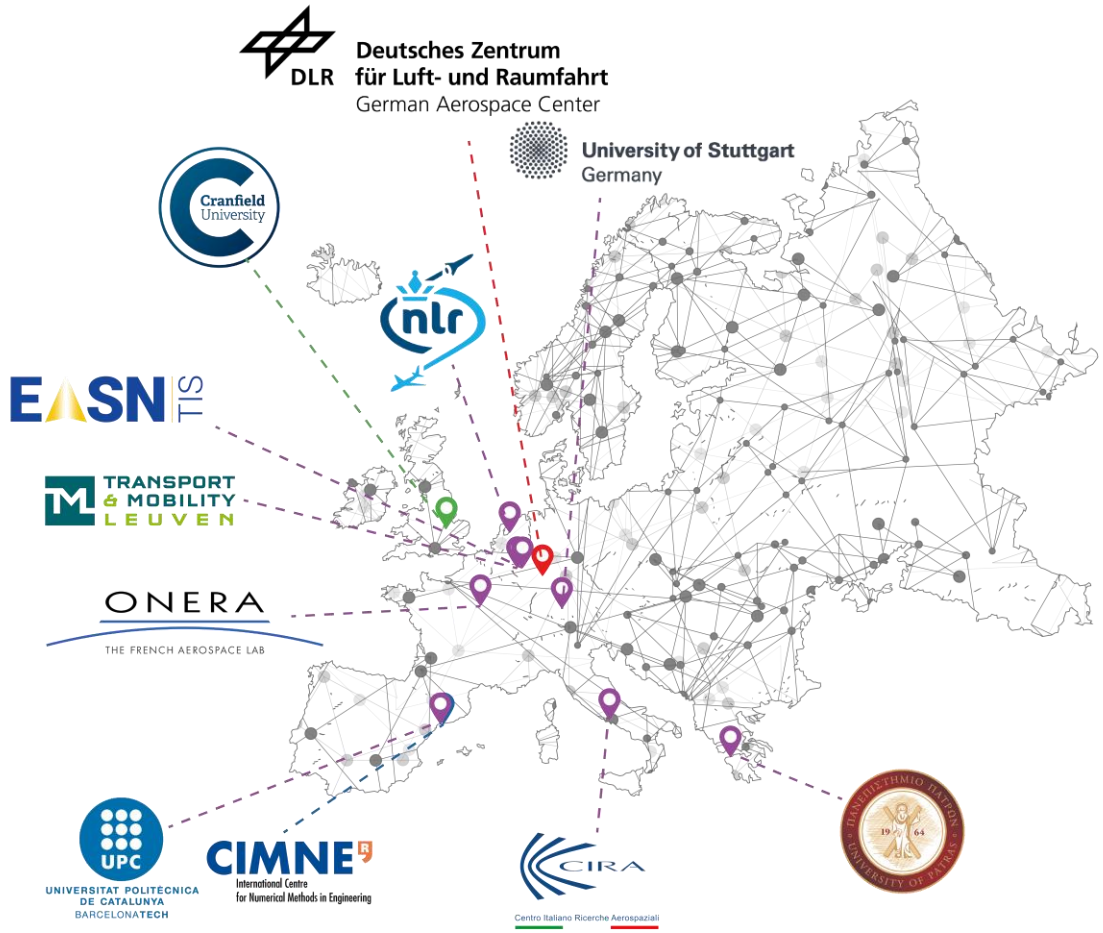
The Team



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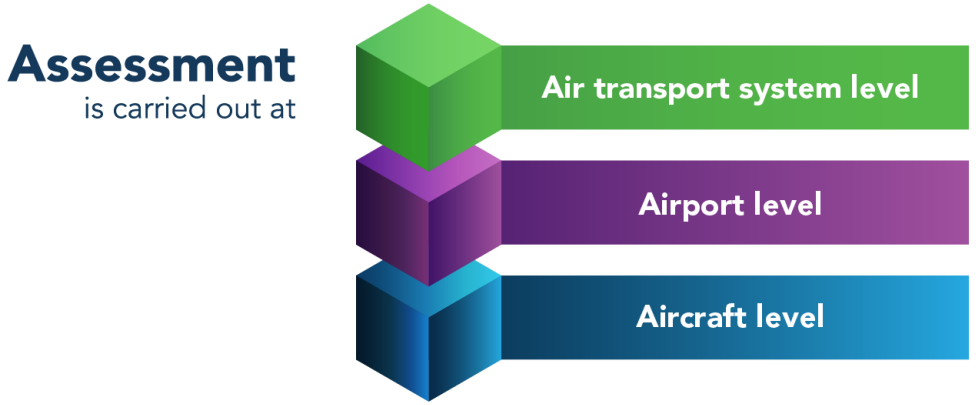
Vision

- 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.



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

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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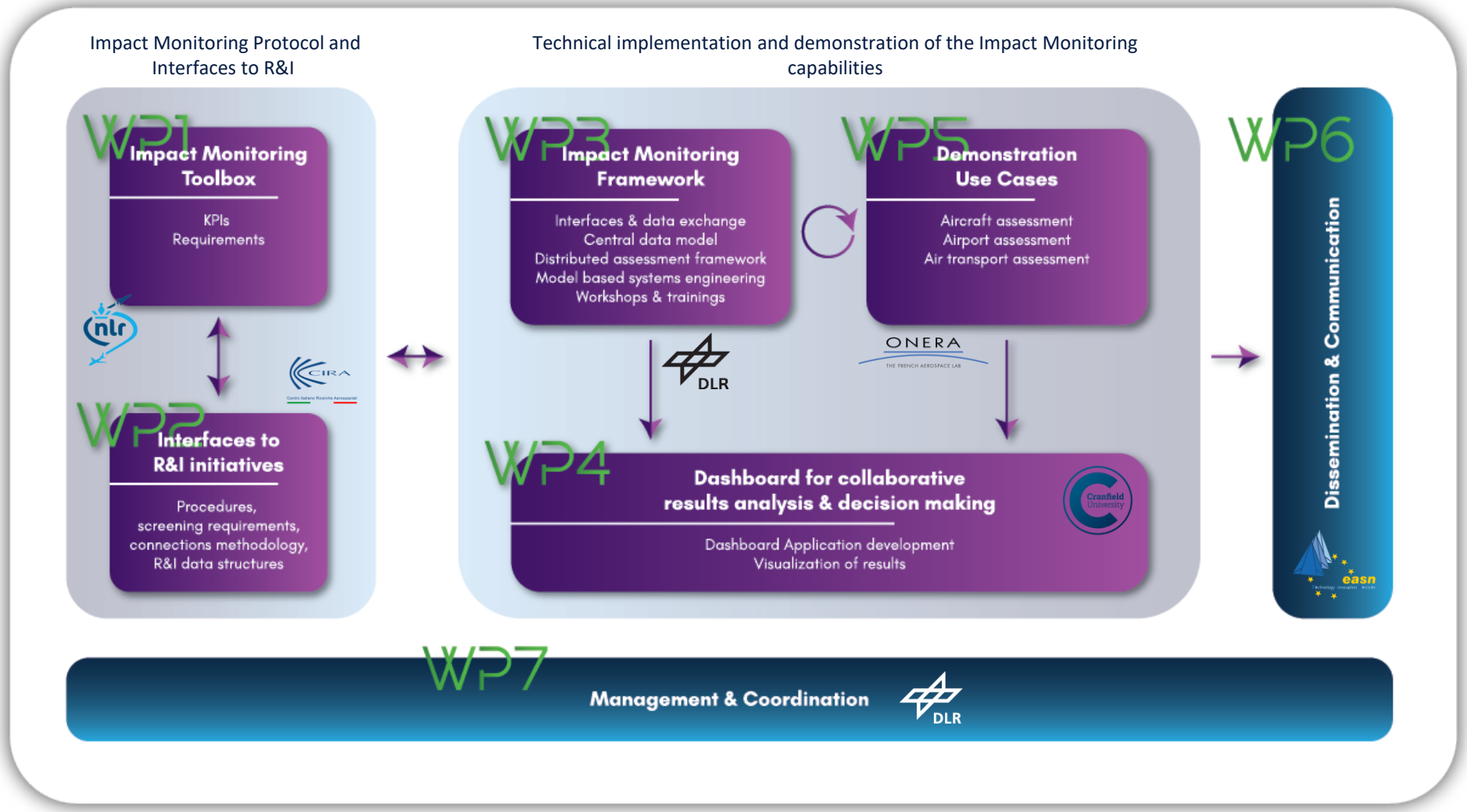
Project Pillars and Structure



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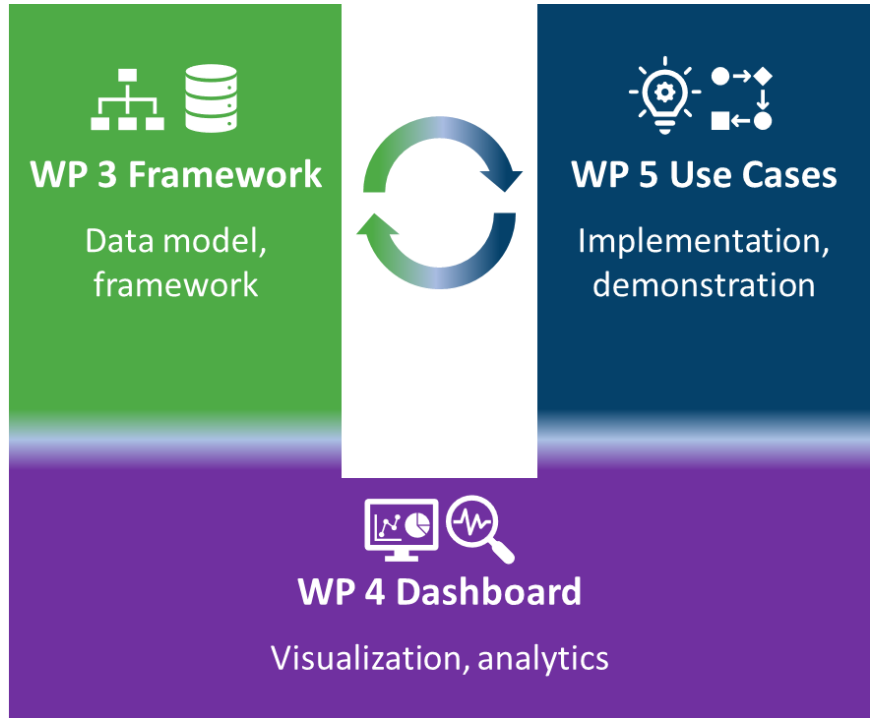
Framework Development

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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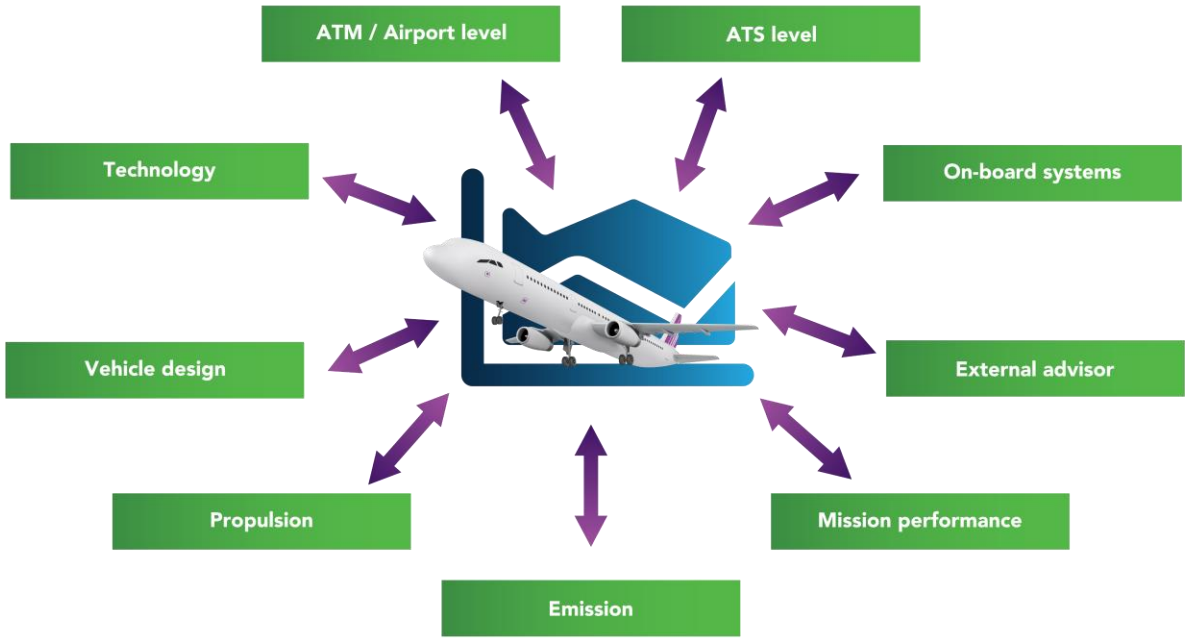
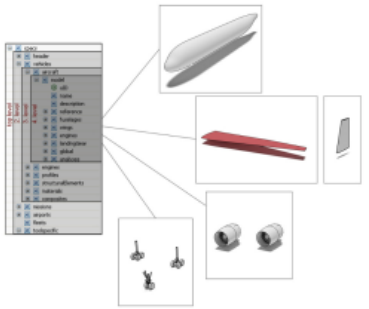
Concept of Collaborative Assessment



- **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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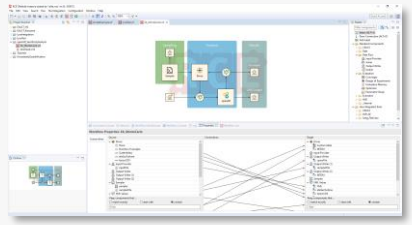
Framework Architecture

II Framework: Data repository, workflow execution, …

Workflow Execution



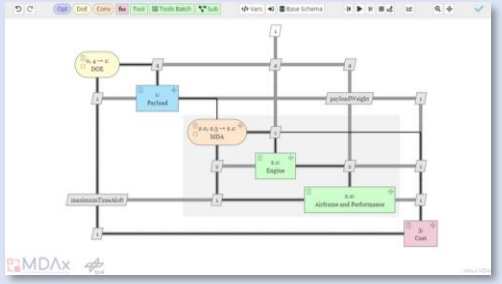
- Secure remote execution

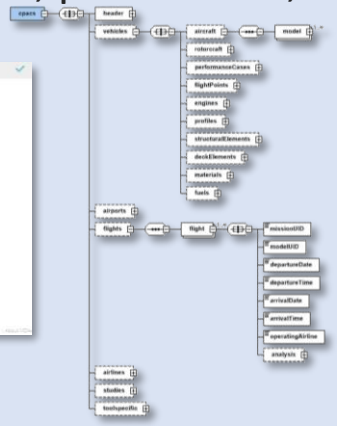
Data Management

- Documentation
- User management
- Server-based result data base

WebDAV

I Data model: Interfaces, provenance, …





III Dashboard

REST API

Back-end

Data processing and surrogate models

1. Accessing and retrieving data from results database
2. Meta models based on existing results
3. …

Front-end

Web-based dashboard application

1. KPIs & metrics from WP5 to derive default plot types
2. Data visualization and analysis based on user needs
3. User authentification form
4. …

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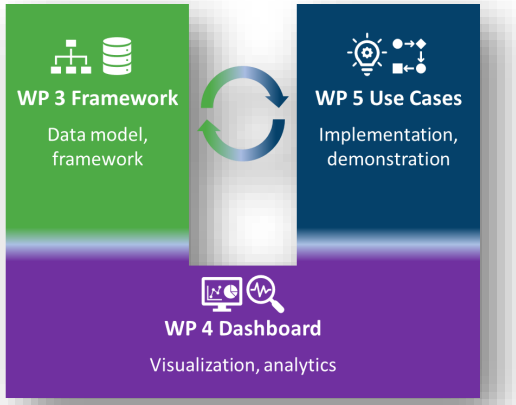
Use Cases “Philosphy “

Demonstration use cases

- Cover up to **three assessment levels** (aircraft, airport, and ATS)
- Produce key performance indicators (**KPIs**)
- Implemented in the **Impact Monitor Framework**
- Results accessible though the **Impact Monitor Dashboard Application**

But **representative use cases** inspired from R&I from Horizon Europe for three streams:

- **Aircraft technology/concepts**
- **ATM and aircraft operations**
- **Policies/regulations/market-based measures**



→The Impact Monitor Framework should be able to **demonstrate its capabilities to assess** the impact of such R&I at the appropriate assessment level(s)

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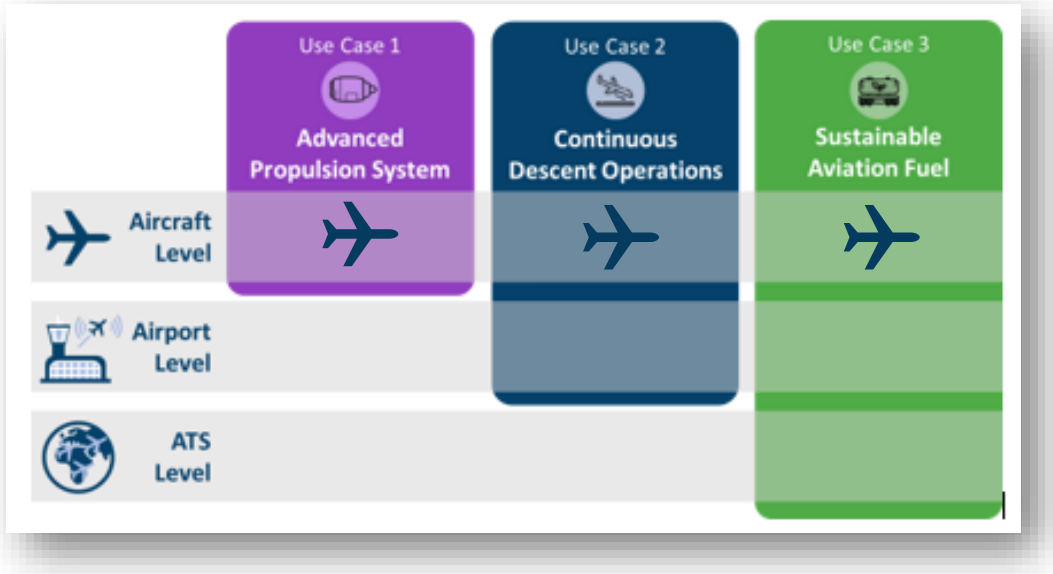
WP5 - UCs main objectives

- **UCs Specificity**

Each UC should focus on **specific demonstration** aspects

  - In terms of **assessment level(s)** coverage
    - *Aircraft / Airpot /ATS*
  - In terms of **R&I streams**
    - *Technos/ operations / policies*
  - In terms of **Framework & Dashboard** development
    - *Data model extension, Technos*

SAF



- **UCs Commonality**

All UCs should share **common features**

  - **SAF** topic is common to all UCs
  - **New Aircraft concepts** generated in UC1 are considered in UC2 / UC3 studies

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Thank you!

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