EASA H2 Activities – General Overview

June 2023

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Head of Department – Policy, Innovation & Knowledge

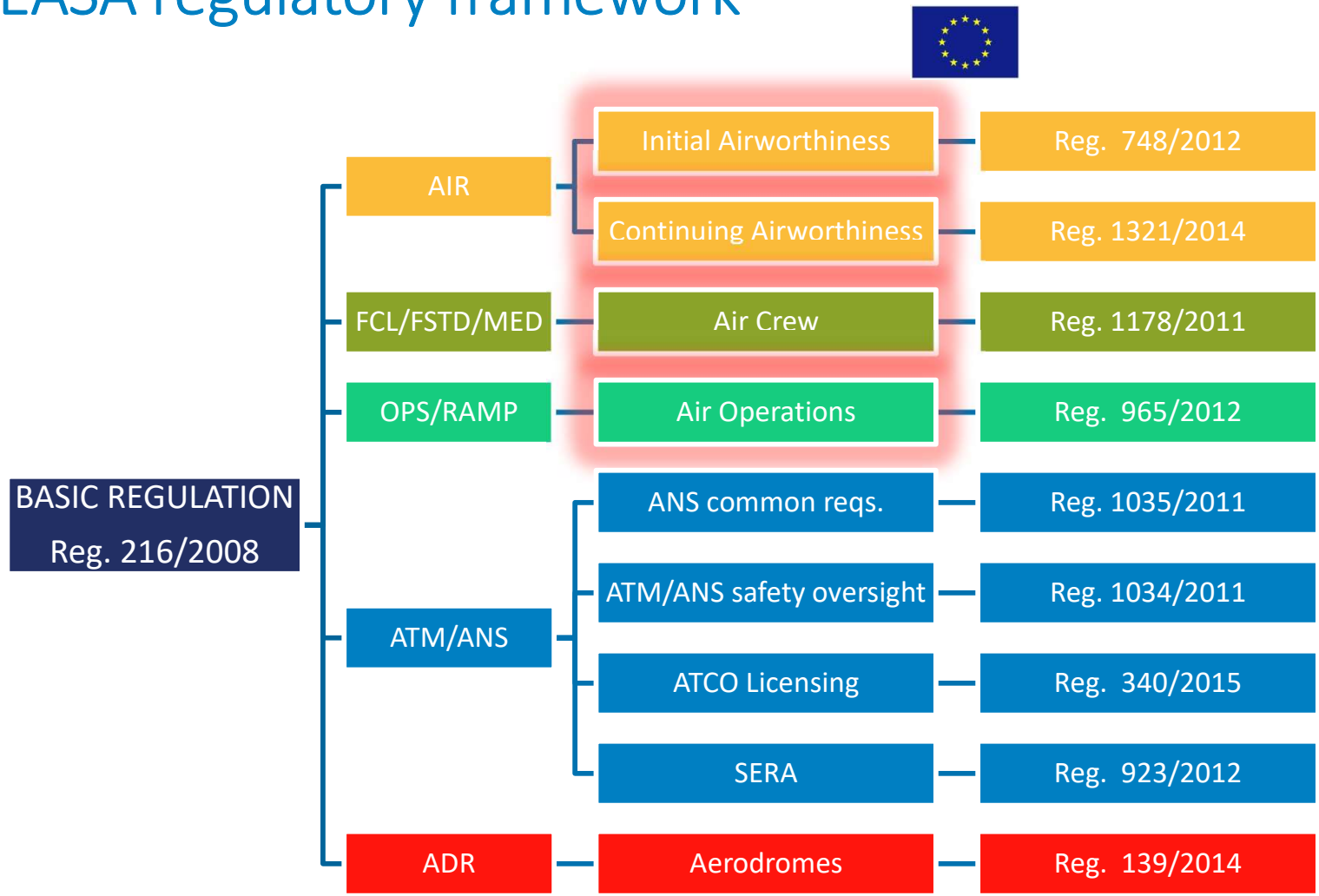
Your safety is our mission.

An Agency of the European Union

Hydrogen

- EASA Regulatory Framework
- EASA Frame to support Hydrogen powered Aviation
- Hydrogen Regulation Mapping
- Standards
- Alliance for Zero Emissions Aviation
- Clean Aviation

EASA regulatory framework



Regulations are supported by:

1) **Acceptable means of compliance** (AMC) and **guidance material** (GM)

2) **Certification Specification** (CS) for the certification of aircraft/engines/…

3) **Special Conditions** (SC) for new design not covered by Certification Specifications

Note: the full regulatory structure is available on Regulations | EASA (europa.eu

EASA framework to support Hydrogen powered aviation

Pre-Application Services with Industry

Innovative Partnership Contracts

- Allow us to work on Innovative concepts
- De-risk certification process
- Regulatory gap analysis
- Discuss need New Special conditions/Means of compliance

Pre-Application Contracts

- For more mature concepts and applicants
- Work towards defining Cert Basis and Special Conditions
- Expected to lead to Application

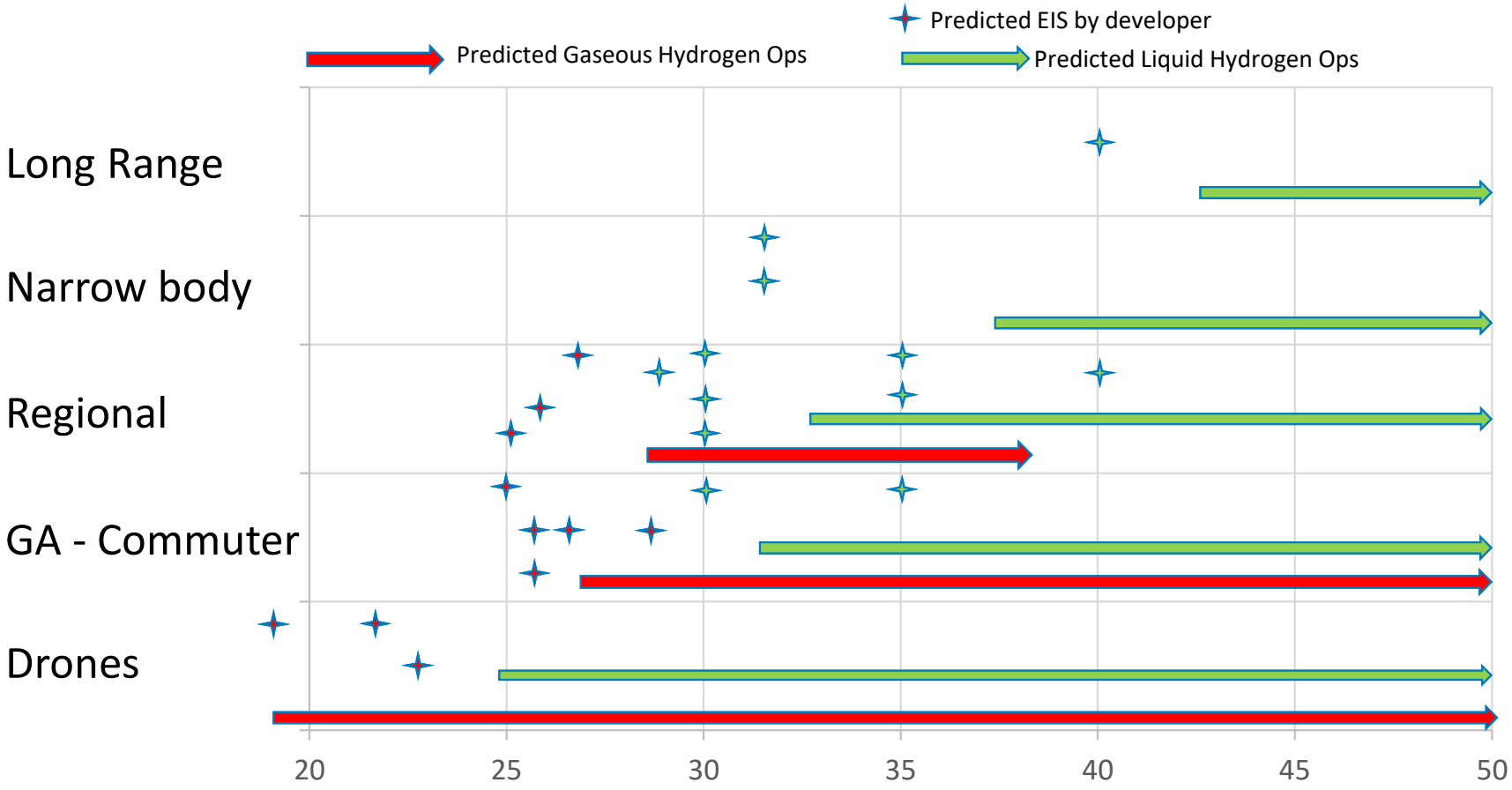
Applications Received

- Ongoing Type Certification in CS23 domain
- Ongoing Design Verification for drones

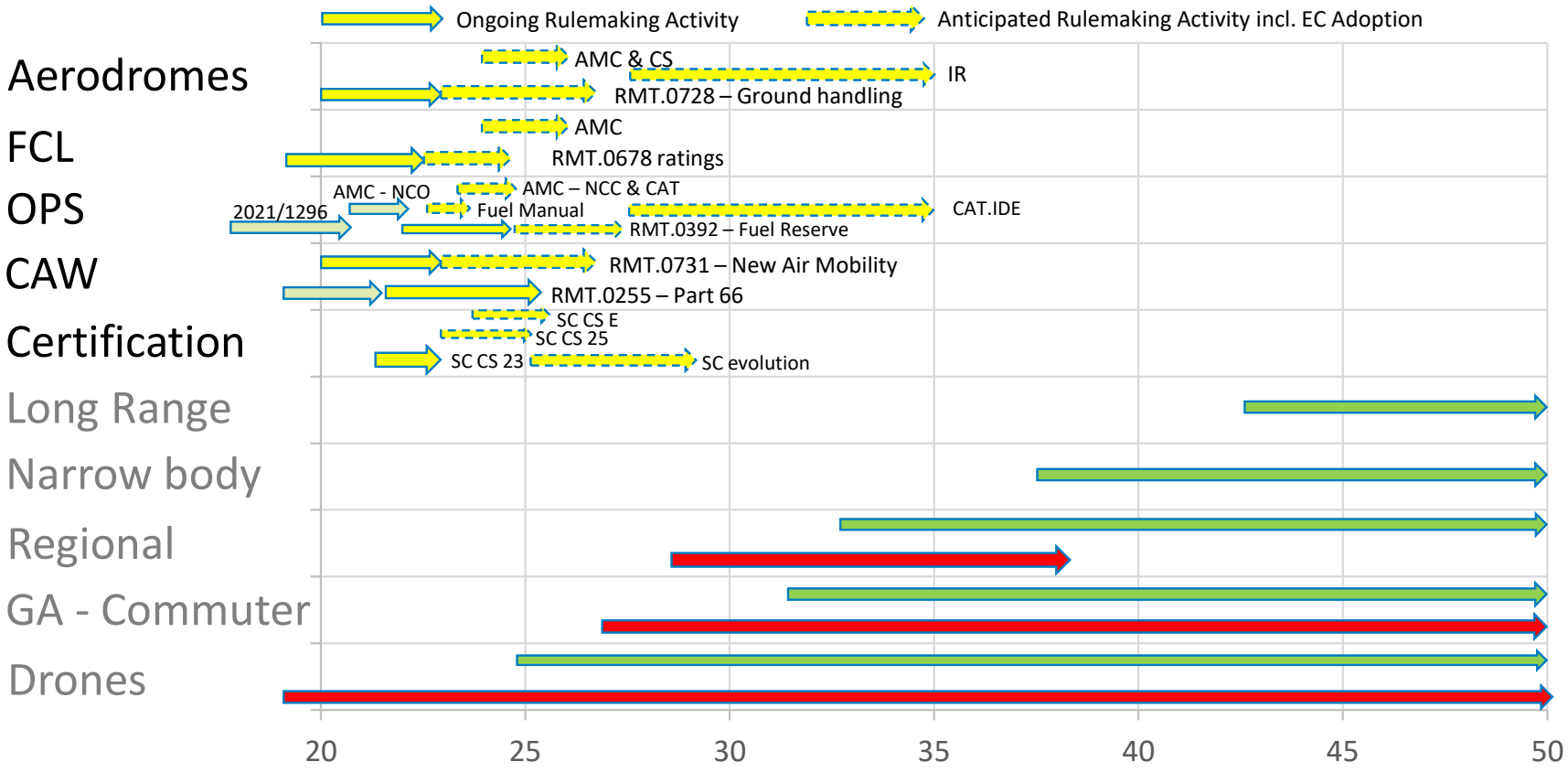
Research and Innovation

- Contribution Agreements (EU funded projects) to address Authorities' research needs
- Collaboration Agreements with Industry and Research centers (including National calls for research)
- Agreements with Clean Aviation and SESAR Joint Undertakings

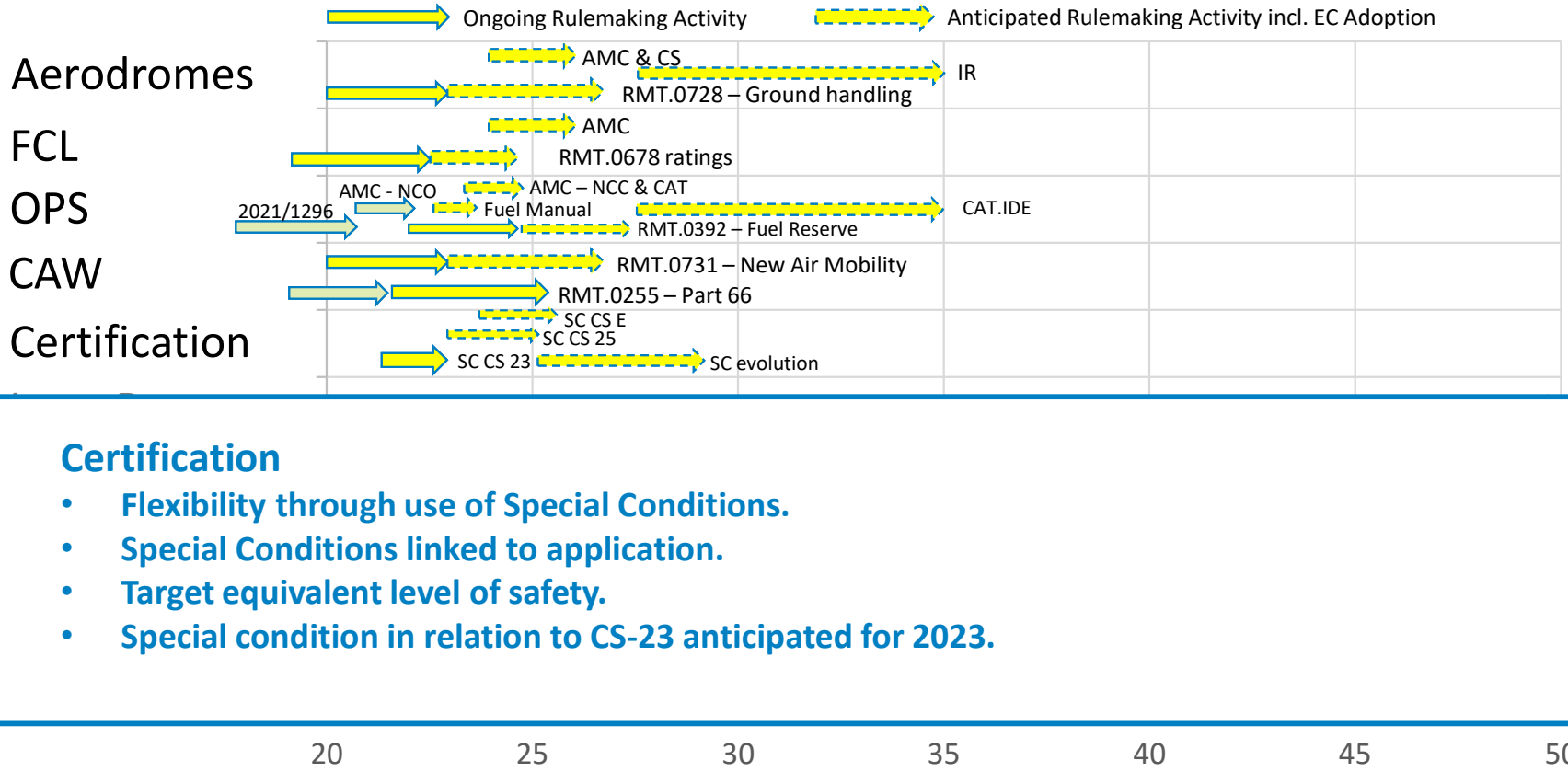
Hydrogen Aircraft Mapping



Hydrogen Regulation Mapping



Hydrogen Regulation Mapping



Certification

- **Flexibility through use of Special Conditions.**
- **Special Conditions linked to application.**
- **Target equivalent level of safety.**
- **Special condition in relation to CS-23 anticipated for 2023.**

Standards

Eurocae WG80/ SAE AE-7AFC Hydrogen Fuel Cell Systems

→ Established to develop guidelines to support qualification and certification of Hydrogen Fuel Cell Systems

SAE Steering Group on Sustainable Alternative Fuels for Aviation (SAF & H2)

→ Covering production, storage, supply and related infrastructure.

→ Outputs: Standards Gap Analyses and Standards Development roadmaps

SAE AE-5C Aviation Ground Fuelling Systems Committee

SAE AE-5CH Hydrogen Airport Task group – Hydrogen as a fuel at the airport.

ASTM H2 Fuel Group (D3-14)

→ H2 Fuel Specifications

IIWG Airport Compatibility of Alternative Aviation Fuels Task Force

→ New group with following Purpose

- → To assess possible challenges related to the integration aircraft powered by alternative or new fuel types into the legacy aviation system
- → To identify possible solutions for airport and aircraft compatibility challenges and facilitate the introduction of aircraft powered by new or alternative fuels into operations
- → To provide technical and operational expertise to ICAO on the challenges related to airport and aircraft compatibility
- → To provide a gap analysis between the existing regulatory framework and possible changes that are identified through the introduction of aircraft powered by new fuel types

Alliance for Zero Emissions Aviation (AZEA)

A European Commission initiative

- → The Alliance is a voluntary initiative of private and public partners who share the objective to prepare the entry into commercial service of hydrogen-powered and electric aircraft.
- → 6 WG in relation to Hydrogen and Electric Aviation proposed
  - WG1 Rollout scenario for electric and hydrogen-powered aircraft and related ‘figures of reference’
  - WG2 Green electricity / hydrogen supply
  - WG3 Airports (infrastructure and operations)
  - WG4 Aviation regulation, certification and standardisation **(supported by EASA)**
  - WG5 Integration of electric and hydrogen-powered aircraft into European network (supported by Eurocontrol)
  - WG6 Incentives
- → First meeting of working groups beginning of 2023
- → WG4 Mapping Regulations & Standardisation activity starting with gap analysis. First deliverables will be presented at Le Bourget.
  - Current aviation regulatory landscape for aircraft powered by hydrogen or electric propulsion
  - Current Standardization Landscape

CLEAN AVIATION'S JOURNEY TO CLIMATE NEUTRALITY BY 2050

TODAY, THE AVIATION INDUSTRY GENERATES

87.7M JOBS

2.8% OF GLOBAL CO_2

BY 2050:
DEMAND FOR FLIGHTS **x3**

IF NO ACTION IS TAKEN:
EMISSIONS **x2**

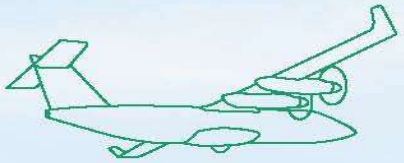
CONTEXT

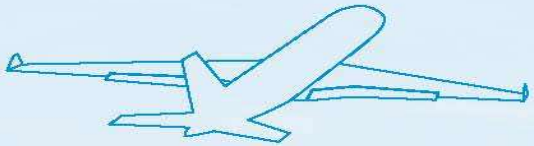
TARGETS

SOLUTIONS

OPPORTUNITY

INVESTMENT





30-50% IMPROVED ENERGY EFFICIENCY THROUGH TECHNOLOGY

100% NET GREENHOUSE GAS EMISSION REDUCTION THROUGH TECHNOLOGY, H2, SAF & OPERATIONAL MEASURES

€1.7B PLEDGED THROUGH HORIZON EUROPE

€2.4B VIA EUROPE'S AERO INDUSTRY

= **€4.1B** TOTAL INVESTMENT

KEY IMPACTFUL TECHNOLOGIES

FOR FLIGHTS OF LESS THAN 4000 KM

1. (HYBRID) ELECTRIC REGIONAL AIRCRAFT
2. ULTRA EFFICIENT SHORT/MEDIUM RANGE AIRCRAFT
3. H_2 HYDROGEN-POWERED AIRCRAFT

REPLACING OVER **40,000** AEROPLANES BETWEEN 2035-2050

= **€5 TRILLION** IN ECONOMIC VALUE

BRINGING TOGETHER THE WHOLE EU AERONAUTICS SECTOR

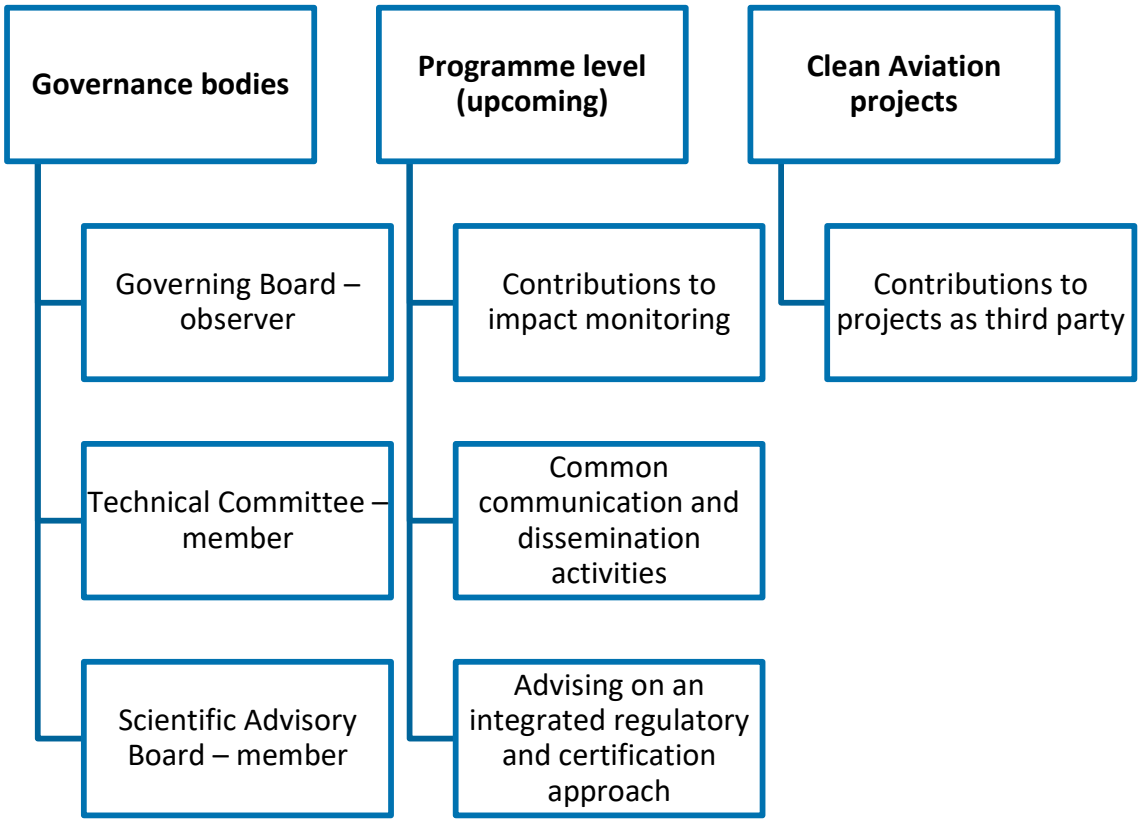
CLEAN AVIATION

www.clean-aviation.eu

EUROPEAN PARTNERSHIP

Co-funded by the European Union

Clean Aviation – EASA contributions



EASA is committed to support the Clean Aviation Programme and its projects

EASA and CAJU signed a new MoC to enable a close cooperation between both organisations

EASA Advisory role to Clean Aviation projects

- → Advise on certifiability and regulatory issues
  - → The feasibility and of new concepts and technologies
  - → New certification methods
  - → Evolution of the regulatory material and industry standards
- → Ensure the development of complete and consistent standards through
  - → Coordination amongst Agency panels for Clean Aviation projects, Innovation partnership and Pre-application contracts
  - → Active involvement to standardisation bodies (e.g. ASTM, Eurocae, ICAO)

EASA
European Union Aviation Safety Agency

Thank you

easa.europa.eu/connect

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