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RENEWABLE AND LOW-CARBON EMISSION FUELS VALUE CHAIN ALLIANCE (RLCF)

*Valérie Guéron – Safran Aircraft Engines
ICAO stocktaking seminar, 12 July 2023*



Driving innovation to decarbonize aviation: a clear roadmap

01

**Deliver technologies
for ultra-efficient aircraft**



RISE program with GE Aviation :
disruptive technologies for future narrowbody
engine providing -20% fuel burn

Lightweight materials
More electric aircraft

02

**Enable the transition
to low-carbon fuels**



Technologies for 100% drop-in
sustainable aviation fuels

Prepare hydrogen solutions

03

**Unlock the potential
of electric/hybrid propulsion**



Mature hybrid and electric propulsion
technologies for new air mobility,
helicopters, commuters and regional

Less fuel, better fuel

SAFRAN : SAF comprehensive strategy

Research & Technology

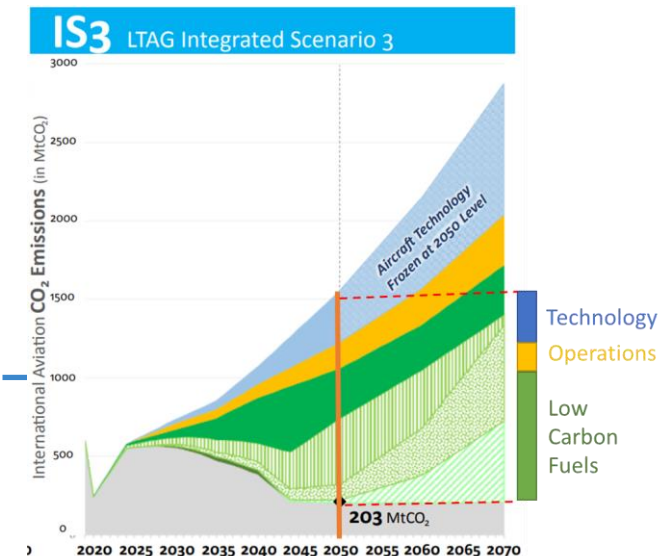
- Enhance and support SAF certification process
- Ensure 100% SAF compatibility of our technologies
- Non-CO2 emissions research

Lead by example

- 35% SAF for Safran own usage (engine test) by 2025

Support SAF deployment and advocacy

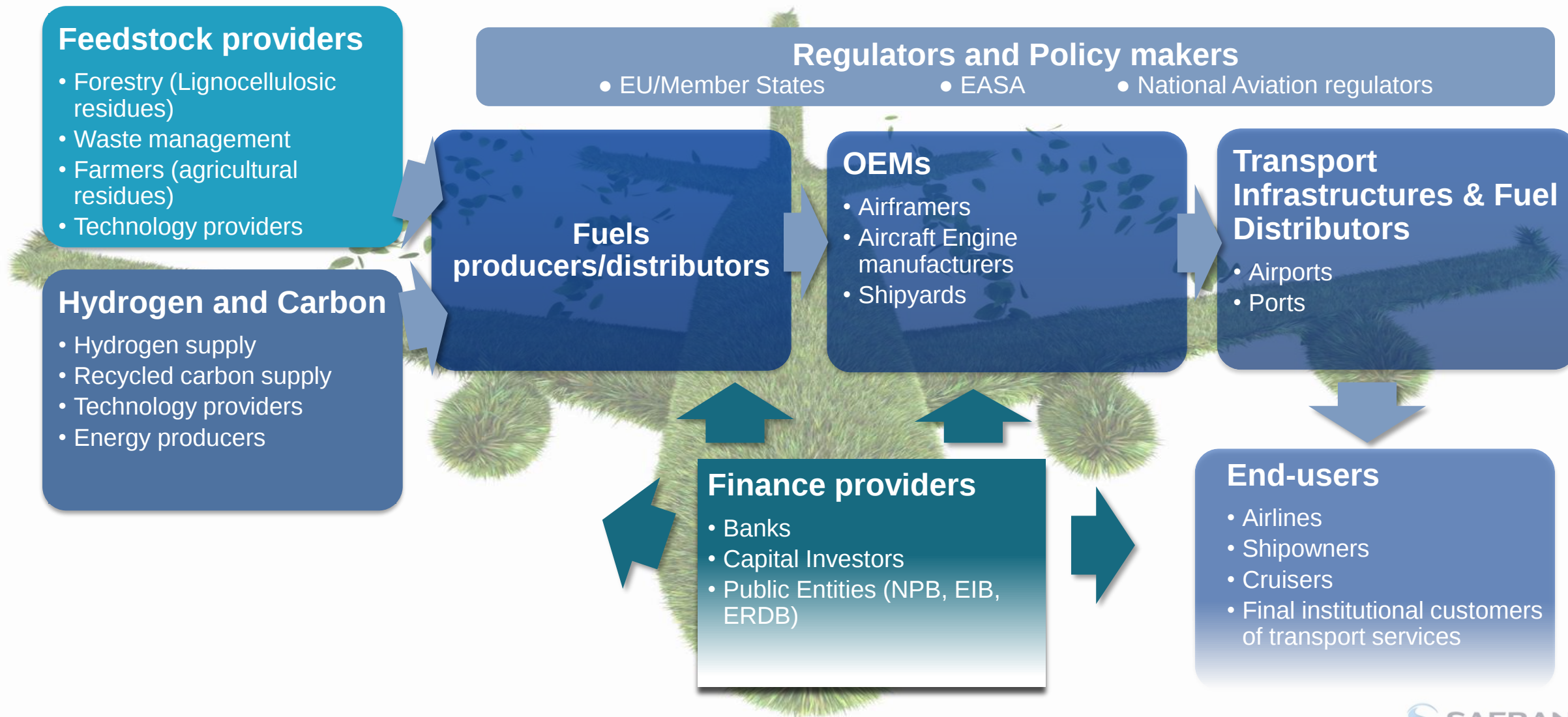
- Investment in Ineratec
- Bring support to SAF projects around the world : SAF India, SAF in Asia (China)
- Strong involvement in ICAO ACT-SAF initiative (see joint Safran / Airbus / FAA lecture on SAF certification process)
- **Chairmanship of the Aviation chamber of the RLCF Alliance**



What is the EU RLCF Alliance about ?

- In the context of the EU « Fit for 55 » regulatory package, announcement of the « *Renewable and low-carbon fuels value chain Alliance* » covering both aviation and maritime - “Hard-to abate”- sectors
- A flanking measure accompanying the « ReFuel EU Aviation » and « FuelEU Maritime » regulations that will introduce a minimum SAF blending mandate for aviation and emission reduction targets for maritime fuels in the EU
- Strong commitment from the European sustainable fuels industry to boost the supply and demand for alternative fuels for both sectors
 - **Coordinate European industry and stakeholders** representing the whole value chain from energy producers and fuels producers to end-users such as airlines or ship owners incl. technology providers, OEMs, ports, airports
 - **Identify a pipeline of R&D and industrial projects** in Europe (i.e. building industrial capacities - e.g conversion units, plants - and infrastructures) and **mobilize private and public funding**
 - **An open and inclusive alliance :**
 - European and national public authorities, R&T organizations, certification entities, NGO's...
 - Third countries industrial partners
 - International partnerships

Coordinate the whole value chain to boost the supply and demand for sustainable fuels



Official launch of the Renewable and Low-Carbon Emission Fuels Alliance (RLCF) on 6 April 2022

- **General objective:** ensure that aviation and waterborne transport have sufficient access to renewable and low carbon fuels

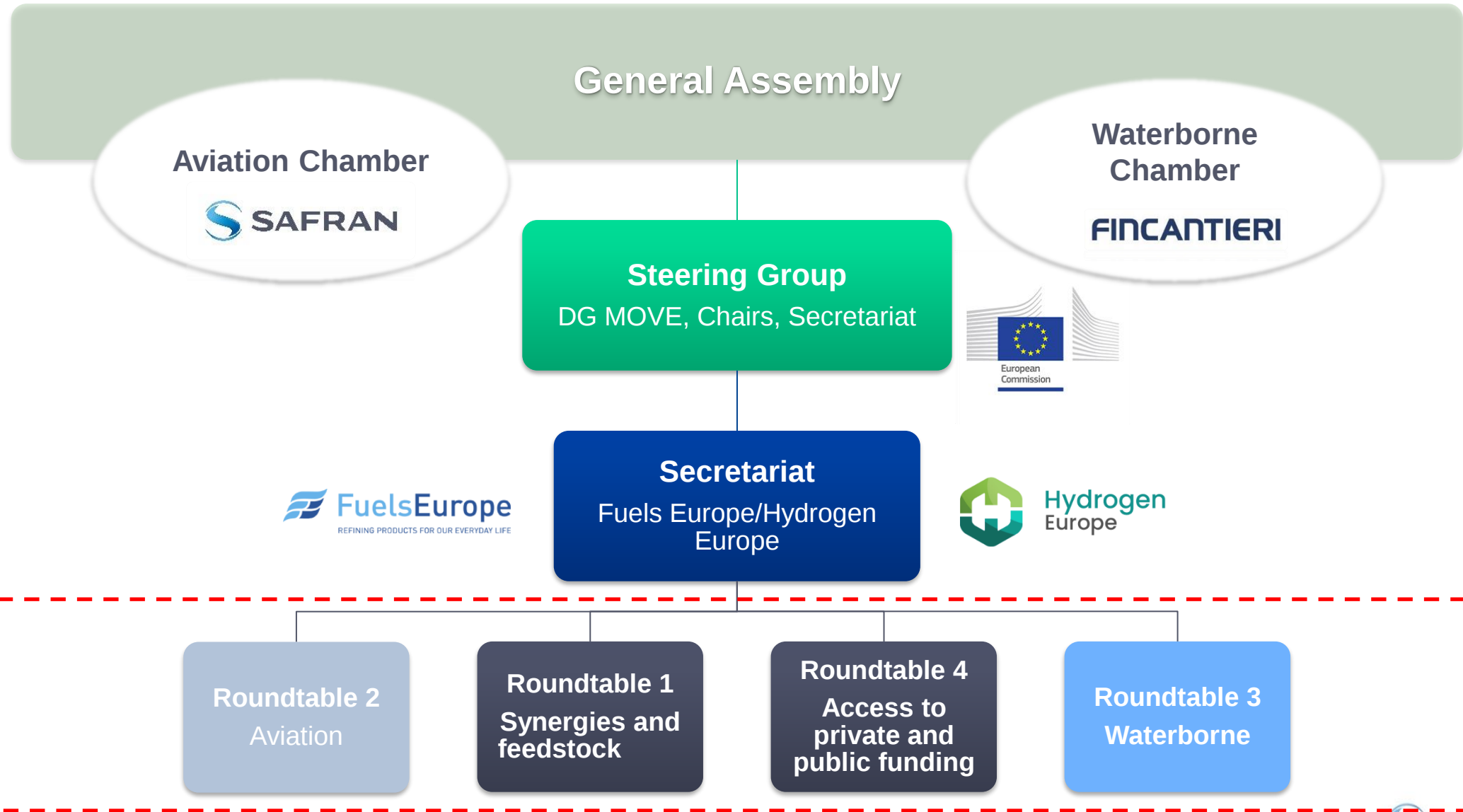
Four ambitious objectives for 2022-2023

- **Objective 1:** Work on alternative fuels value chain
 - identify transport fuels which are most economically and environmentally suitable for scaling up
 - evaluate strong and weak points of the value chain and assess investment needs
- **Objective 2 :** Assess the enabling conditions (demand and supply incl. local availability of feedstock; skills, standardization/certification etc...)
- **Objective 3 :** Identify financing opportunities and instruments to support the deployment of sustainable fuels
- **Objective 4 :** Create a pipeline of investment projects



- **First annual work Programme 2022-2023 adopted**
- **First General Assembly 12 July 2022**

Governance structure of the RLCF Alliance around 5 key partners



RLCF Alliance Work Program 2022/2023

- Current energy demand and availability of resources to support the EU climate ambition (availability of feedstocks and raw materials; bottlenecks in the value chain and the integration of the other sectors (agri, chemicals, forestry, waste and recycling); enabling conditions; risks linked to technical feasibility, costs and unintended consequences for the society; "no silver bullet" and key actions to replace the (fossil) liquid demand
- Synergies among all transport sectors, especially in the transitional phase
- Technological paths and the associated costs

- **Common knowledge basis** (stocktaking exercise)
- **Technology and Commercial Readiness Levels** for different Fuel Products
- Feasibility of **utilisation of different RLCF** and of **defining Sustainable Maritime Fuels (SMF)**
- **RLCF certification framework**
- **Guidance for drafting of Fuel Supply Contract templates** for Maritime Operators
- **Common pipeline** of existing/new projects

Availability of
feedstocks,
synergies
among sectors
and Just
transition

Production
Pathways and
value chain -
Aviation

Production
Pathways and
value chain -
Waterborne
Transport

Access to
public and
private
finance

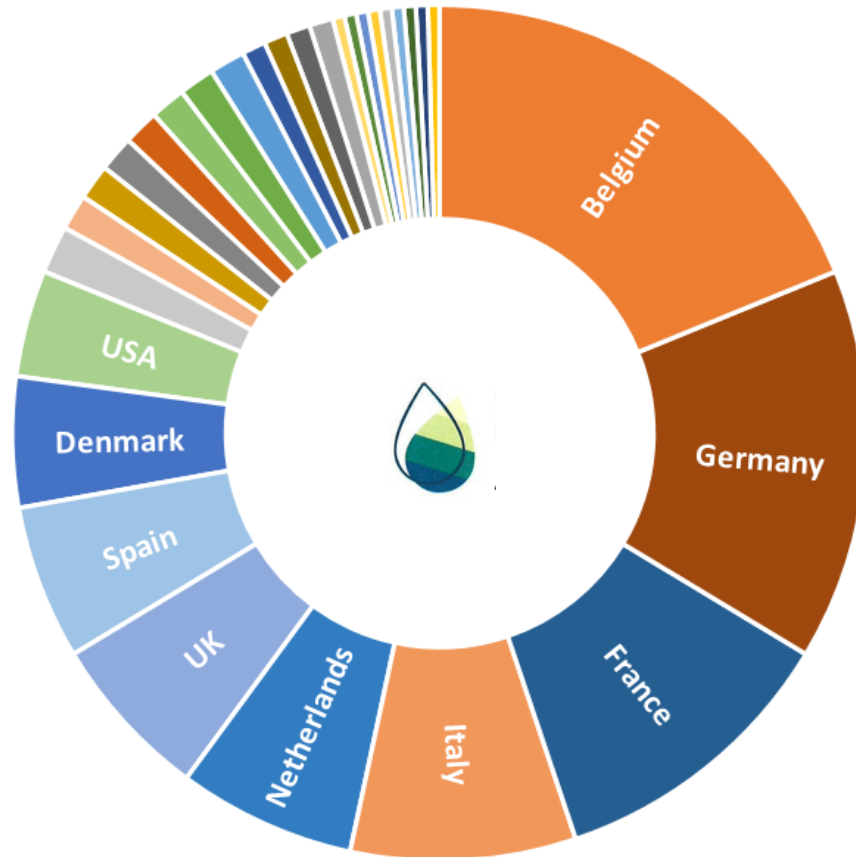
- **Common knowledge basis** (stocktaking exercise)
- **Roadmap for scaling up SAF** taking into consideration the diverse maturity of SAF pathways (certified and new ones)
- **European SAF dynamic market**
- **Certification of new SAF pathways (EU Clearing House)**
- **Investment pipeline** with sustainable aviation fuels projects

- **Engage with public and private financial institutions** to invite them to join the Alliance and provide **expertise** on the existing funding and financing schemes, including in view of the preparation and implementation of the project pipeline.
- Map the availability, conditions and suitability of existing tools, and build an **F&F Investment Guide**
- Organise **dedicated exchanges** on the different funding and financing instruments and potential new ones, sequencing tasks for structuring industrial projects, business models and bankability of projects.

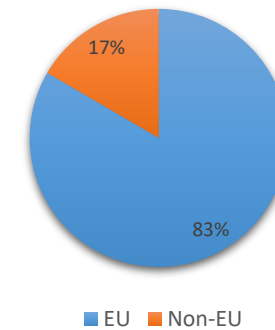
**POWERED
BY TRUST**

Geographical origin of RLCF Members : An EU alliance open to non-EU partners

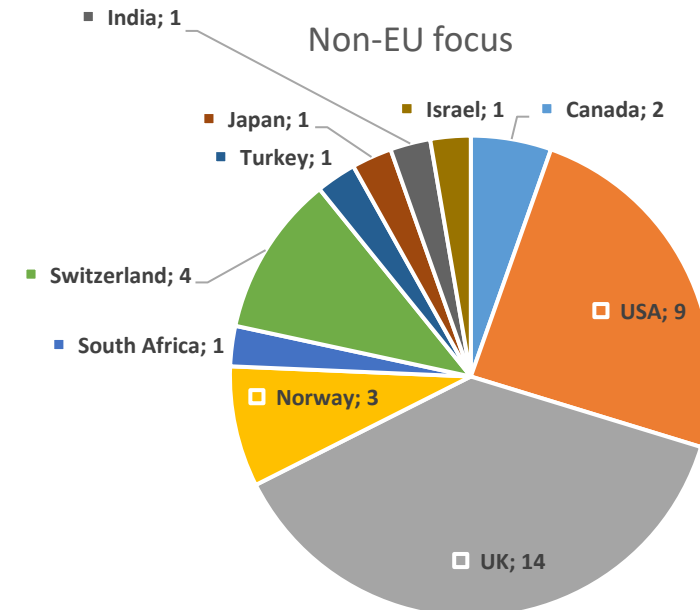
RLCF Members Countries (headquarter location)



EU-Non EU



Non-EU focus



* Belgium high presence is misleading. It is often the European headquarters of industry associations

** The Indian member is non Aviation: Indian Register of Shipping

SAFRAN/RLCF/ICAO

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Roundtable aviation : 46 members – strong commitment from the members – result oriented



- Chairmanship : **AF-KLM / P2X**

Creation of small workings groups to work on specific topics:

1. **Documentation / common source of knowledge** : Top SAF readings on SAF
2. **SAF demand scenarios in Europe**: give visibility on the evolution of the demand in Europe to investors
3. **SAF Roadmap** (including identification of current barriers for production) : to help identify where investment should focus on and prioritize the most relevant SAF production pathways
4. **SAF pipeline of projects**: Alliance to build a pipeline of projects (Aviation and maritime) and help priority projects leaders in finding industrial partners or investors (matchmaking or ad hoc meeting).
5. **EU SAF Clearing House** : accelerate and facilitate the qualification of new SAF pathways for producers at ASTM Level
6. **Funding**: help identifying new market-based mechanism and public support instrument to boost specifically SAF production and uptake (main target: **close the price gap**)



Around 210 members to date

Feedstock	Producers/Suppliers	Energy Producers	Techno Providers	OEMs	Airports	Users	Financial Sector	Regulators	Member States	RTO
•Fertilizers Europe	•Fuels Europe •CEPSA (ES) •Lanzajet (US)/Lanzatech •Velocys (UK) •UPM Biofuels (FI) •Total Energies •Shell (NL/UK) •Sasol (South Africa - Both) •Enerkem (CAN-Biofuels) •Infinium (US) •Repsol (ES) •Preem AB (SE) •P2X Europe (DE) •ENI (IT) •SkyNRG (NL) •IFPEN •Norks e-fuels (NO)	•EDF (FR) •Engie (FR) •Uniper (DE) •Orano (FR)	•Ineratec (DE) •Next Chem (IT) •Elyse Energy •Clariant (SW) •KHIMOD •Air Liquide •Haldor Topsoe	•SAFRAN (FR) •Airbus (FR, DE, ES) •GE Aviation (US, IT) •Leonardo (IT) •Dassault Aviation (FR) •Rolls Royce (UK) •ULPower Aero Engines (BE) •ASD •Pratt&Whitney •ATR •MTU •Boeing (US) •GAMA	•ACI Europe •ARC •AENA •SOWAER •Groupe ADP •Aeroporti di Roma	•AF-KLM Group •Iberia (ES) •LOT (PL) •Cargolux •Luxair •Aercap •Easyjet •Wizzair •Deutsche Post DHL Group •Aercap	•BNP Paribas •Meridiam •CA-CIB •Intesa San Paolo •Goldman Sachs •EIB •EBRD	•EASA •EUROCONTROL •SENASA •ENAC (IT)	•France (DGAC) •Espagne	•DLR •Politecnico di Torino •Franhauffer
Others : Académie de l'air et de l'espace, GICAN, Chantiers de l'Atlantique, WEF_CSFT, RSB,...										

