



**EU-Latin America and Caribbean
Aviation Partnership Project (EU-LAC APP II)**
EU-Latin America cooperation on Civil Aviation

Qualification of new SAF pathways: Challenges and opportunities. The “EU Clearing House” concept

Daniel Brousse Rivas, Sustainability Aviation Officer

Your safety is our mission.

The project is funded by the EC and implemented by EASA

An Agency of the European Union 

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2. Qualification of new SAF pathways: Challenges and opportunities.
3. The “EU Clearing House” concept

Qualification of new SAF pathways: What it is



Sustainable Aviation Fuel (SAF) is a sustainable, non-conventional, alternative to fossil-based jet fuel. Several definitions and terminology may apply, depending on regulatory context, feedstock basis, and production technology.

EAER 2022

Conditions



Meet the technical standards that prove they have the same properties as the A-1 jet (ASTM D7566, ASTM 1655, DEFSTAN-91-91).



Meet certain sustainability criteria, which have been verified by an independent entity.



technical
standards

No Redundancy

Fuel is one of the few elements in an aircraft without redundancy, at the same time impact of fuel on fuel system and engine are critical and

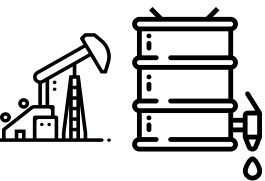
Catastrophic Consequences

Consequences of failures in fuel quality can be catastrophic.

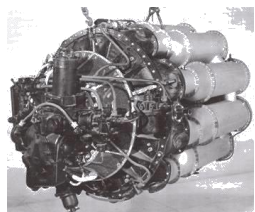
Airworthiness Handling

Fuel is an operating limitation. Approved fuels have to be identified and listed

Qualification of new SAF pathways: What it is



Engines & Aircraft Have historically been designed to operate with ASTM D1655 Fuel



1950s



1970s



1990s

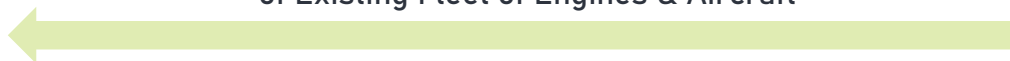


2000s



2030s

Formulate new fuel standards D7566 to meet design and operational requirements of Existing Fleet of Engines & Aircraft

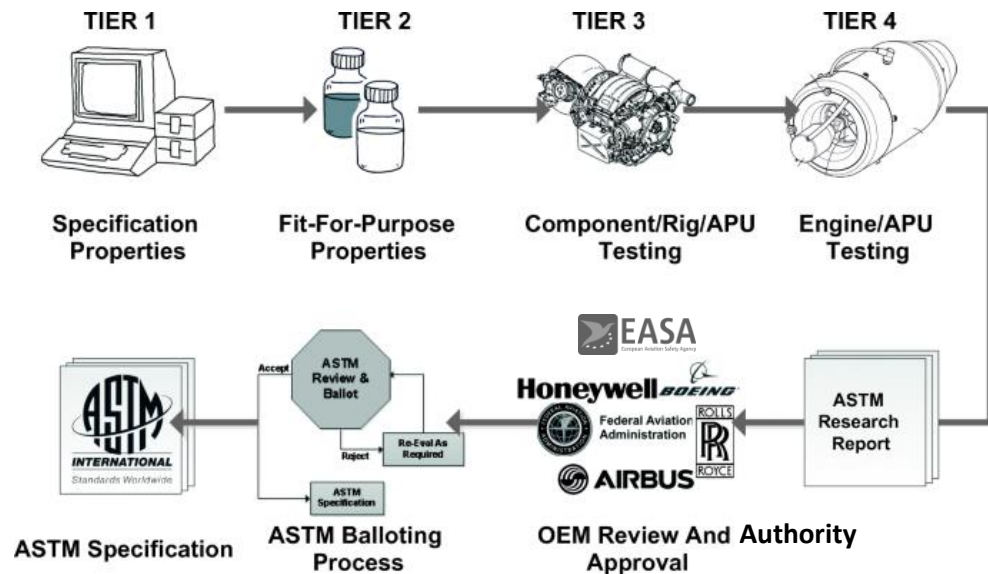


New engines can be optimized to maximize environmental benefits of new fuels



Qualification of new SAF pathways: What it is

EASA/ FAA airworthiness certification is based on voluntary consensus fuel standards from ASTM & AFC.



EASA is part of the steering group for the OEM review panel (associated to ASTM) and the ExCom of DefStan Aviation Fuel Committee

EASA/FAA role:

- Review submitted data / reports to determine acceptability
- Work with OEMs to
 - identify testing requirements
 - decide about final approval
 - If necessary, define certification activities necessary to accommodate new fuel/additive or changes to existing fuels.

ASTM D4054 Standard Practice for Evaluation of New Aviation Turbine Fuels and Fuel Additives.

Qualification of new SAF pathways: Approved Pathways

Year of approval	Blend limit	Feedstocks
2009 (FT-SPK)	50%	flexible
2011 (HEFA-SPK)	50%	Fatty acids and oils
2014 (SIP)	10%	Sugar, Lignocellulose
2015 (SPK/A)	50%	flexible
2016 (ATJ-SPK)	50%	Sugar, Lignocellulose
2020 (CHJ)	50%	Fatty acids and oils
2020 (HC-HEFA SPK)	10%	Specific algae
2023 (ATJ-SKA)	50%	starches/sugars

Co-processing:

- 5% Lipids
- 5% FT Crude
- 24% Hydroprocessed biomass

Every approved pathway will impact:

- Which kind of feedstock that can be converted into SAF and,
- pathway economics

Having a large number of approved pathways ensure:

- A large pool of type of feedstocks that can be transformed into SAF
- Different economic opportunities for companies and regions, depending of the availability of those feedstocks



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Qualification of new SAF pathways: Challenges and opportunities

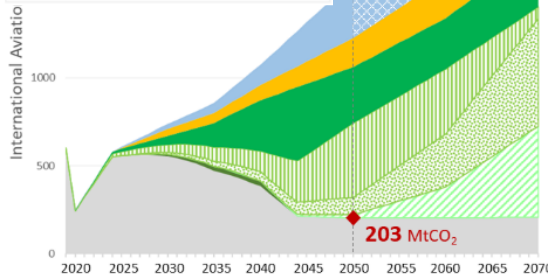


Maximize the environmental benefits by achieving the 100% SAF

IS3 LTAG Integrated Scenario 3

Legend:

- Aircraft Technology
- Operations
- LTAG-SAF Biomass based fuel
- LTAG-SAF Gaseous waste based fuels
- LTAG-SAF Atmospheric CO2 based fuels
- Non drop in fuels: Cryogenic Hydrogen
- LTAG-LCAF: Lower carbon petroleum fuels
- Residual CO2 Emissions



Jet A1



Naphthalenes

Aromatics

Isoparaffins

Cycloparaffins

Normal Paraffins

Paraffin



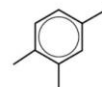
Isoparaffin



Naphthenes



Aromatic



Drop-in 100% SAF ↑

- Identical to Jet A/A-1 in terms of composition
- Fleet-wide and infrastructure-wide compatible

Non-Drop-in 100% SAF ↑↑

- Similar but not identical to Jet A/A-1 in terms of composition
- Additional environmental benefits
- Would require new engine certifications and segregated infrastructure

Qualification of new SAF pathways: Challenges and opportunities

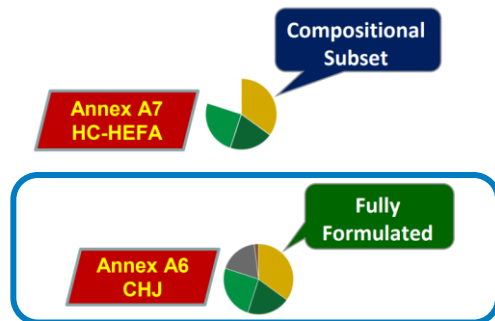
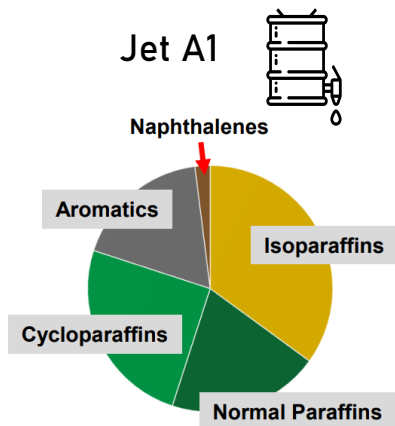


Maximize the environmental benefits by achieving the 100% SAF



Drop-in 100% SAF

- Identical to Jet A/A-1 in terms of composition
- Fleet-wide and infrastructure-wide compatible



- Single synthetic blending components
- Blend of two or more synthetic blending components

Non-Drop-in 100% SAF ↑↑

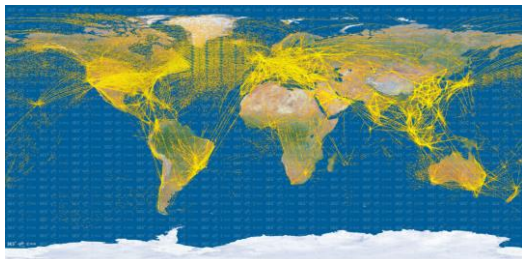
- Similar but not identical to Jet A/A-1 in terms of composition
- Additional environmental benefits (Non CO2 impacts reduction) and local air quality
- Would require new engine re-certifications and segregated infrastructure



New engines can be optimized to maximize environmental benefits of new fuels

Qualification of new SAF pathways: Challenges and opportunities

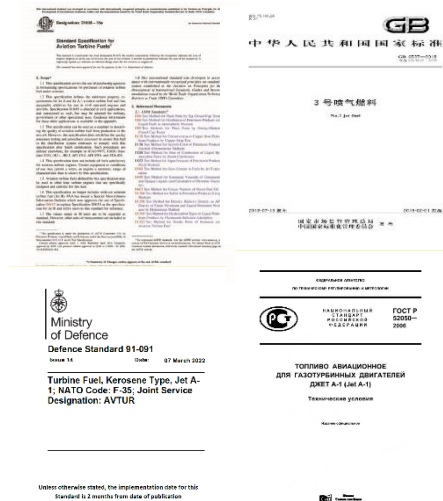
International Cooperation



Air travel is global

is enabled by internationally harmonized fuel specifications

Jet fuel is meeting the same minimum requirements worldwide.

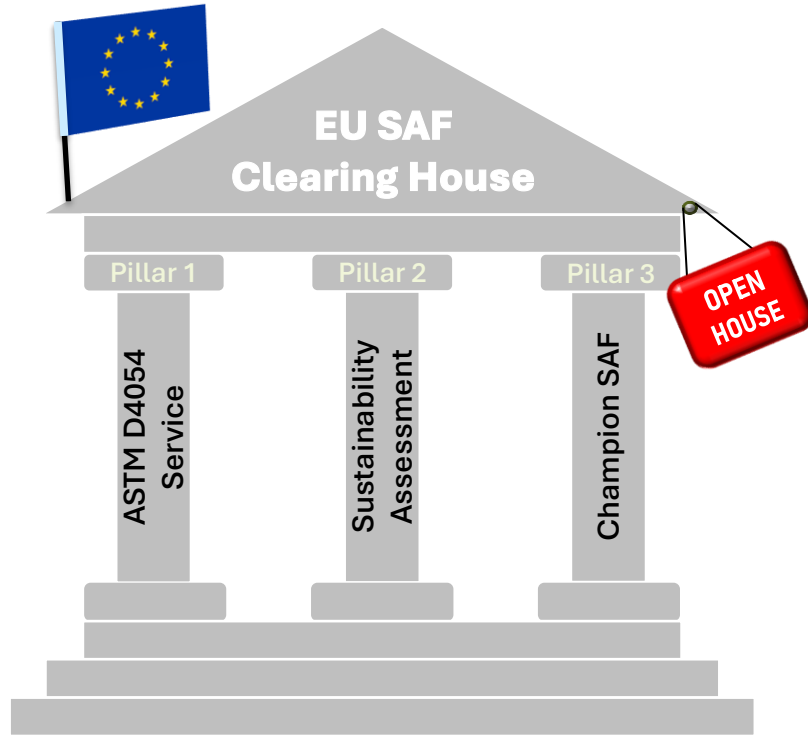


And aircraft certified to operate on specified fuels

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The “EU Clearing House” concept



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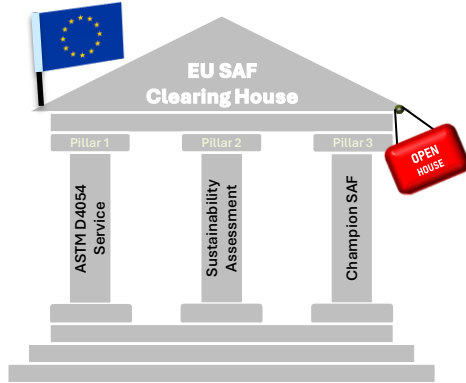
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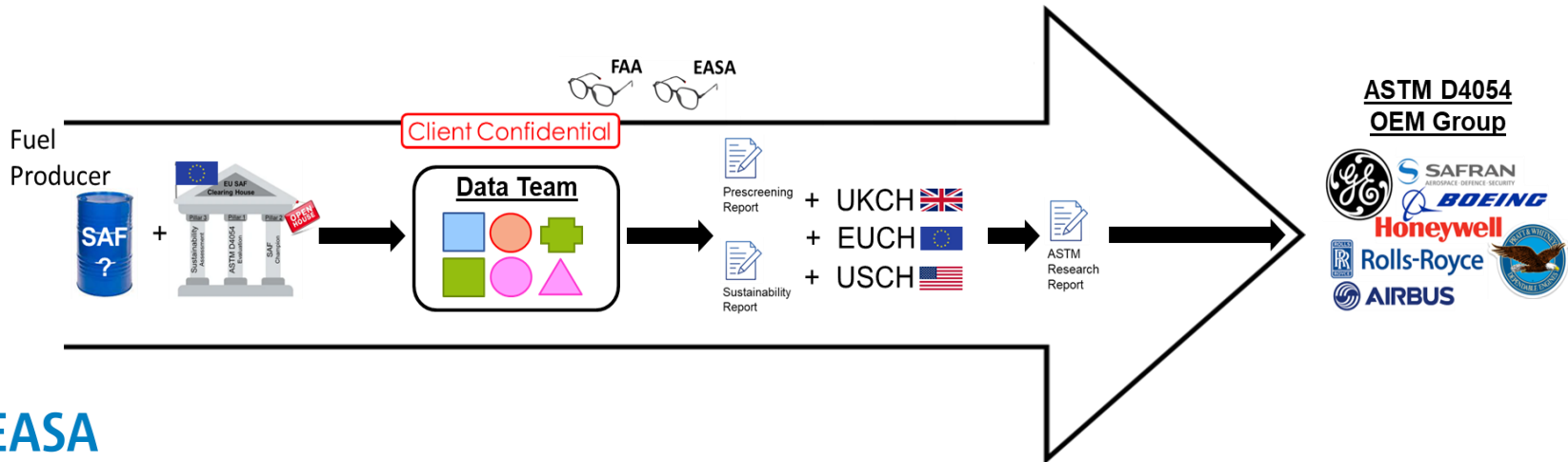


The “EU Clearing House” concept



The EU SAF Clearing House is a one-stop-shop operated as an “Open House”.

- Connect SAF Producer to OEMs efficiently.
- Coordinate existing actors in the EU.
- Continuous improvement.
- Complement services.
- Efficiency & Impact are priority



Conclusions

1. Sustainable Aviation Fuel (SAF) is a sustainable, non-conventional, alternative to fossil-based jet fuel. They meet technical standards that prove they have the same properties as the A-1 jet (ASTM D7566, ASTM 1655, DEFSTAN-91-91).
2. 100% SAF (Drop-in SAF and non drop-in SAF) will help maximize the environmental benefits of these fuels. Challenges are associated and are currently being assessed in relevant ASTM technical working groups.
3. EASA is transitioning from a primarily validating role in fuel-related technical activities towards an active engagement and eventually a technical leadership position.

easa.europa.eu/connect



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