EASA
European Union Aviation Safety Agency

EU-CORSIA
Africa & Caribbean

CAPACITY BUILDING ON SAF & CORSIA ELIGIBLE FUELS NAMIBIA

SAF Production and Supply

Mark Latimer
Environment Expert

Windhoek, Namibia
16 to 18 July 2025

Working for quieter and cleaner aviation.

Your safety is our mission.

An Agency of the European Union

Contents

- → SAF Market Outlook for 2030
- → Global SAF capacity announcements
- → SAF capacity announcements in Europe
- → Use of SAF in European Airports
- → SAF Supply Networks
- → An example SAF delivery in the UK

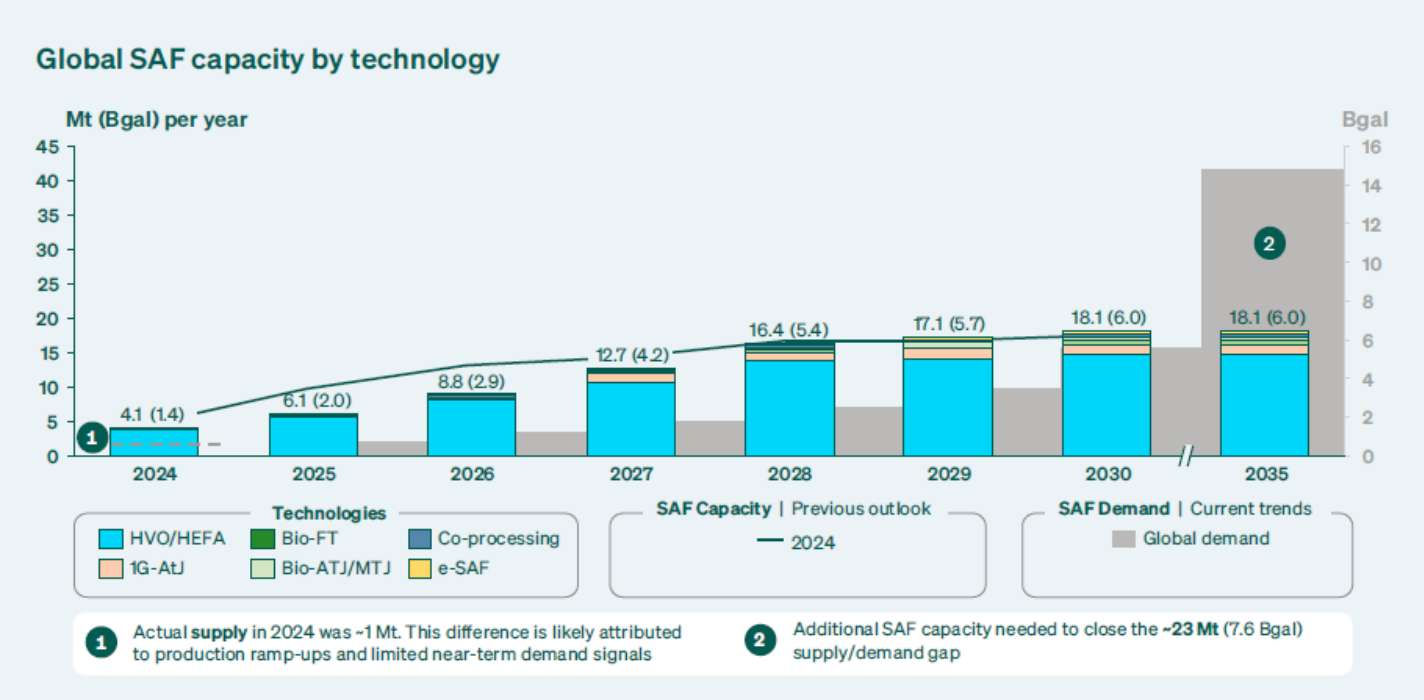
SAF Market Outlook for 2030

- 2025 marks a year of maturation for SAF with the start of the UK and EU mandates and other voluntary market deployment:
  - EU - 0.9 Mt (0.3 Bgal) of SAF demand in the EU in 2025
  - UK – 0.25 Mt (0.1 Bgal) in the UK in 2025
  - Voluntary Market in Singapore, British Columbia, China, and the US: projected to approach 2 Mt (0.7 Bgal)
- Important challenges: delayed or cancelled projects have increased, slowing the growth in announced capacity
- HEFA remains the most significant production pathway representing ~83% of announced capacity in 2030
- Extrapolating current trends to 2030, global SAF demand is expected to grow to 15.5 Mt (5.1 Bgal) by 2030, out of which 4.4 Mt (1.5 Bgal) is projected to come from mandates in place
- 60 airlines set specific SAF targets for 2030 which is equivalent to roughly 13 Mt (2.3 Bgal) of voluntary demand

Source: 2025 SAF Market Outlook by SkyNRG and ICF

Global SAF capacity announcements until 2030

Based on publicly available information

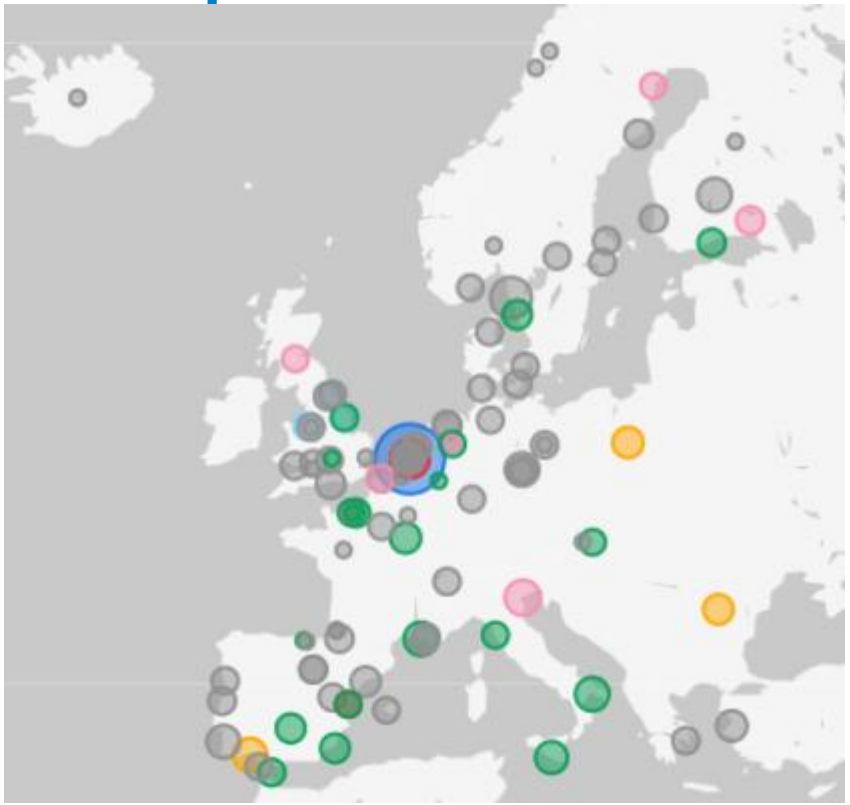


Source: 2025 SAF Market Outlook by SkyNRG and ICF

Figure 1: Global SAF capacity is expected to grow to 18.1 Mt (6.0 Bgal) by 2035, leaving a supply gap of ~23 Mt (7.6 Bgal)

SAF capacity announcements in Europe

→ ICAO tracker providing information on SAF facilities (existing and announced) that could produce Sustainable Aviation Fuels



Note: capacity numbers refer to total capacity, including SAF and other renewable fuels

Capacity (ML/year)

0,0 • 9,8 mil

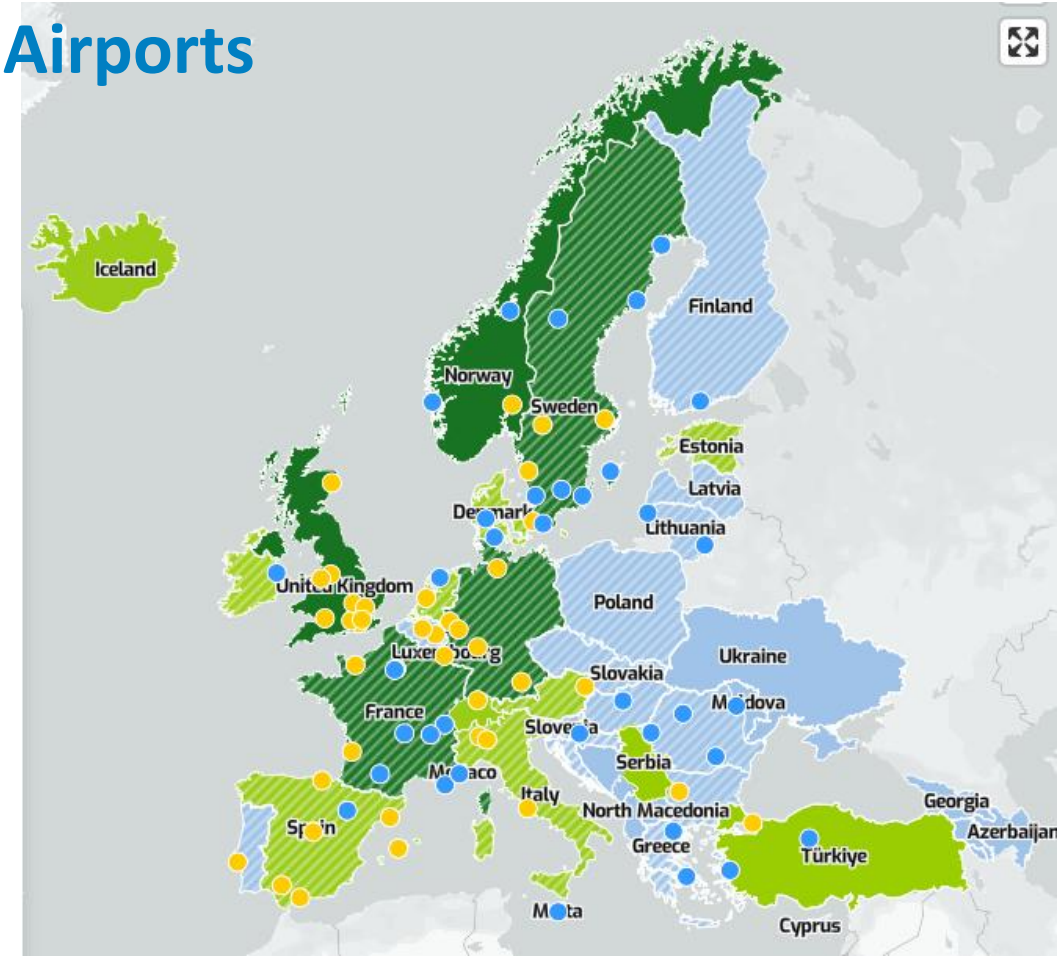
Facility Status

1 - Initial Announcement
4 - In service - producing other renewable fuels
6 - Producing CORSIA SAF
2 - Front End Engineering Design (FEED)
0 - cancelled/dormant project
3 - Under construction
5 - In service - producing SAF

Source: ICAO - https://www.icao.int/environmental-protection/SAF/Pages/Production-Facilities.aspx

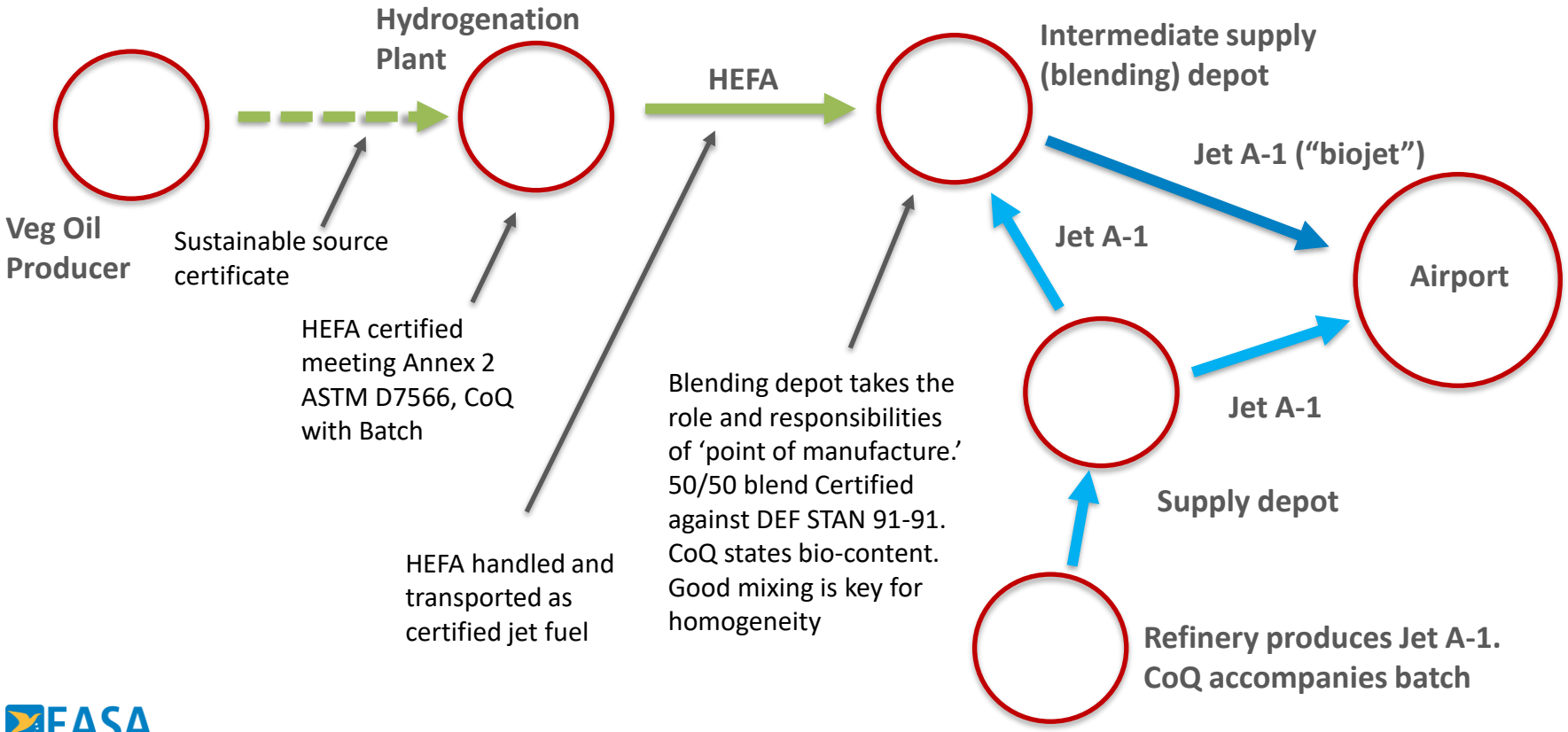
Use of SAF in European Airports

- EUROCONTROL and the European Civil Aviation Conference (ECAC) interactive SAF map
- Based on available information collected by EUROCONTROL and the European Civil Aviation Conference (ECAC)



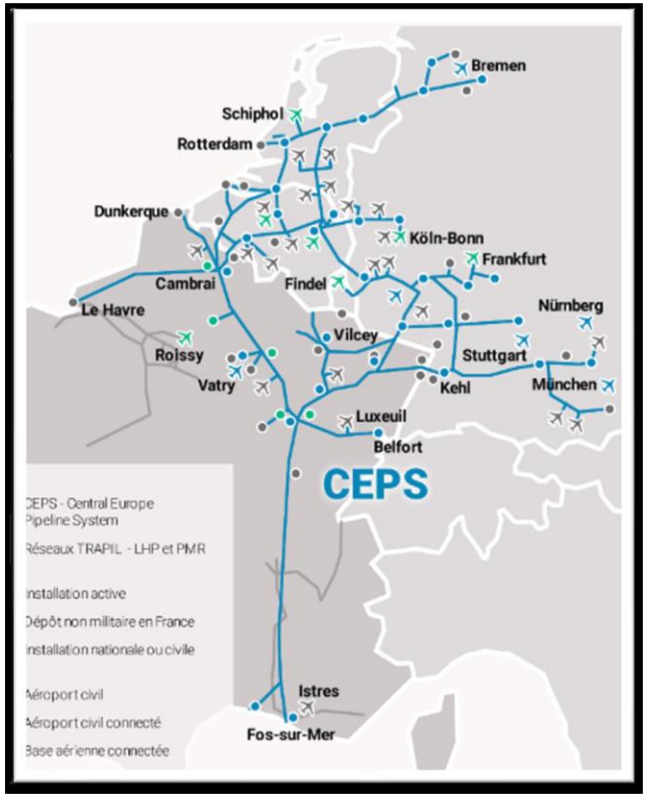
Source: Eurocontrol - https://www.eurocontrol.int/article/sustainable-aviation-fuels-saf-europe-eurocontrol-and-ecac-cooperate-saf-map

SAF Certification – HEFA example



Europe – Central European Pipeline System (CEPS)

- From 1 January 2023 SAF meeting DEF STAN 91-091 can be pumped into the CEPS network
- Not allowed previously due to not all military aircraft being certified to use SAF
- The use of the CEPS network for SAF will facilitate the delivery of SAF to a large number of airports
- CEPS does not provide chain of custody guidance



UK – Exolum-PS (formerly the Government Storage and Pipeline System)

- Former GPSS is a network of underground pipeline built during WW2 by the MoD
- The network is currently used by both military and commercial aviation
- The MoD changed the aviation fuel standards in November 2020 to allow SAF to be blended with conventional jet fuel
- This opened the network to the transport of SAF
- Numerous other private pipeline systems also exist

Blending in Europe

- As the product specification adhered to in Europe, DEF STAN 91-091, does not allow continuous blending at airport depots, blending must take place in upstream terminals or refineries
- Currently there are very few SAF blending facilities in operation in the UK and mainland Europe – this will need to change as the majority of announced SAF projects will require blending services
- Most SAF producers are specialist sustainable fuel producers that do not have access to fossil jet, and do not intend to invest in on-site blending facilities
- Significant investments in upgrade terminals by adding SAF blending capabilities are underway (e.g., Essar in Stanlow, Vopak in Antwerp)

EI 1533

- EI 1533 provides quality assurance requirements and recommendations for the manufacture of synthetic (jet fuel) blending components (in accordance with ASTMD7566), their export and import, blending with conventional jet fuel/jet fuel components to produce semi-synthetic jet fuel (Sustainable Aviation Fuel), and the export/import of this semi-synthetic jet fuel from its point of origin through to delivery to airports
- Includes design of equipment and documentation requirements

https://publishing.energyinst.org/topics/aviation/aviation-fuel-handling/1533

EI 1533 Blending Methods

- Inline Blending
  - Blending occurs in the pipeline due to the convergence of two streams of product, fossil jet and SBC
  - Further mixing occurs due to velocity of the product entering the batching tank
  - An inline static mixer may be required to improve blending in the pipeline

- Sequential Blending
  - Blending occurs in-tank where the batch of fossil jet is pumped into a tank already containing SBC (or vice versa)
  - Typically, the inlet velocities into the tank will not be sufficient to assure a homogenous mix
  - Additional capabilities typically required include side-entry agitators, venturi jet mixers, or the ability to re-circulate the product

An example SAF delivery from the UK

Gatwick Proof of Concept – easyJet and Q8 Aviation

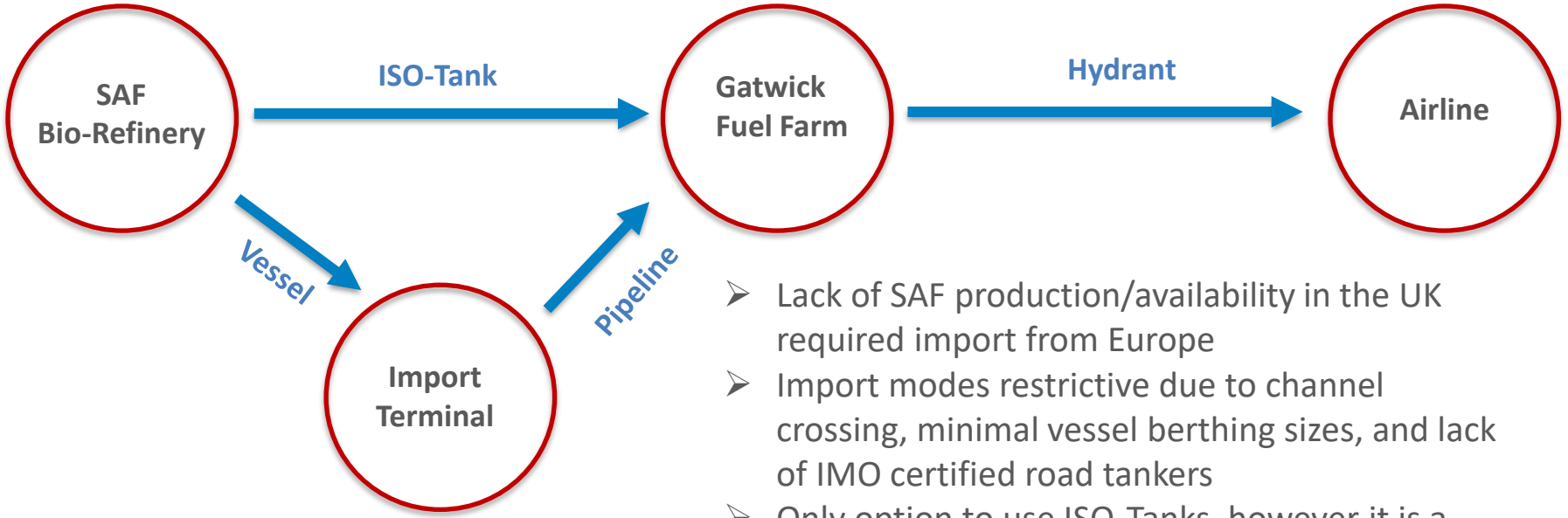
→ Proof of Concept details

- → 3 x ISO-tanks were discharged into Gatwick main storage during October 2021
- → Non-routine delivery modes were required to under-developed SAF logistical structure in the UK
- → The delivered volume was mass balanced across 42 easyJet flights from LGW-GLA at a 30% blend ratio covering all flights during COP26

→ Achievements

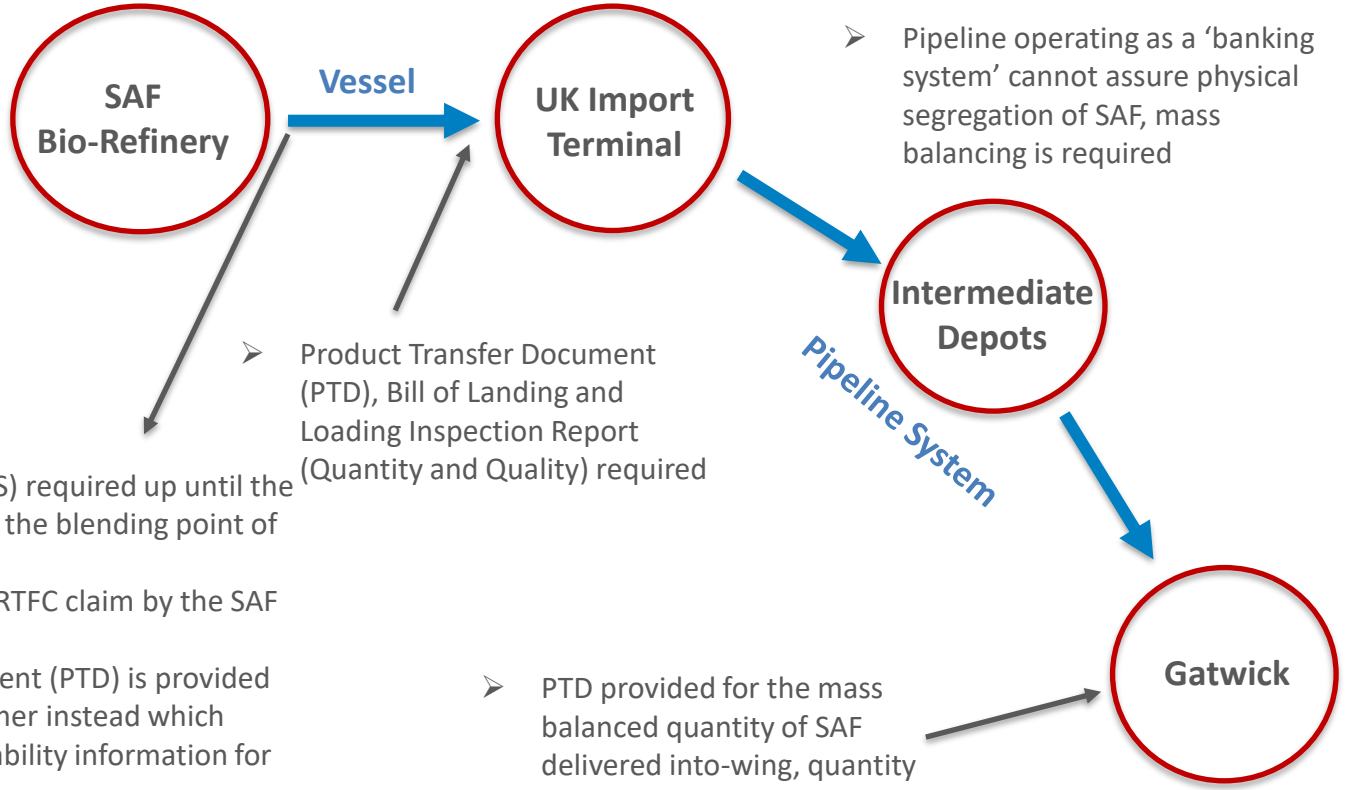
- → 1st delivery of SAF To Gatwick Airport
- → 1st sourcing of SAF for an easyJet flight
- → Positive media exposure for all stakeholders
- → Collaboration with the Environment Agency (UK ETS Regulator)and the Department for Transport

Gatwick Proof of Concept – Supply Chain



- Lack of SAF production/availability in the UK required import from Europe
- Import modes restrictive due to channel crossing, minimal vessel berthing sizes, and lack of IMO certified road tankers
- Only option to use ISO-Tanks, however it is a non-standard supply mode, so Management of Change required
- ISO-Tank delivery reduces chain of custody complexity, but mass balancing still required

Chain of Custody example – pre-blended vessel import (UK)



- Pipeline operating as a 'banking system' cannot assure physical segregation of SAF, mass balancing is required
- Product Transfer Document (PTD), Bill of Landing and Loading Inspection Report (Quantity and Quality) required
- Proof of Sustainability (PoS) required up until the RTFC 'Assessment Point' – the blending point of the SAF
- PoS is 'retired' during the RTFC claim by the SAF blender
- A Product Transfer Document (PTD) is provided to the downstream customer instead which includes the main sustainability information for the bio-component
- PTD provided for the mass balanced quantity of SAF delivered into-wing, quantity removed from the Mass Balance for the location


Capacity Building
GHG Emissions
Sustainability
FT-SPK
Drop-in Fuel
RSB
Sustainability Criteria
Certification
PtL
Used Cooking Oil (UCO)
Safety
CAPEX
Life Cycle Emissions
ASTM D1655 DEF Stan 91-091
HEFA
SAF
Co-processing
'neat' SAF
ASTM D4054
ISCC
Environmental
Feedstock
Alternative
Cost
Municipal Solid Waste
ASTM D7566
CORSIA Eligible Fuels
Sustainability Certification Schemes
Socio-Economic
Approved ASTM Pathways
AtJ
Risk
CO_2
Land use change
Technology
Blending

EASA
European Union Aviation Safety Agency

EU-CORSIA
Africa & Caribbean

Thank you for your attention

Working for quieter and cleaner aviation.

Your safety is our mission.

easa.europa.eu/connect

An Agency of the European Union