EASA
European Union Aviation Safety Agency

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CAPACITY BUILDING ON SAF & CORSIA ELIGIBLE FUELS NAMIBIA

An introduction to SAF policy

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Working for quieter and cleaner aviation.

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Contents

Introduction

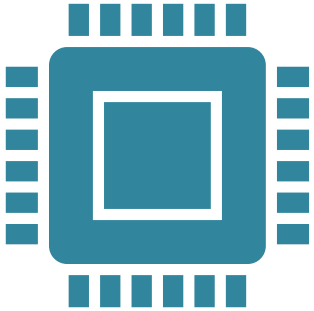
What is Sustainable Aviation Fuel?

A reminder…

- SAF is a generic word for non-conventional i.e., an ‘alternative’ aviation fuel that meets the technical ASTM (D7566) specifications
- SAF can be made from a range of biological and non-biological feedstocks
- SAF is almost chemically identical to conventional fossil-based jet fuel and is a safe replacement for it – this means it can be used in existing supply infrastructure and aircraft **without** any changes
- SAF has the potential to provide significant life-cycle emissions reductions as well as conventional air quality pollution emissions
- Sustainability (environmental, economic and social issues) is assessed using specific Sustainability Criteria and checked by Accredited Certification Bodies certified by a Sustainability Certification Scheme (e.g., RSB, ISCC or ClassNK SCS).

Challenges to commercial SAF Development

Technology



Funding

Risk

Cost of SAF

Introduction to Policy

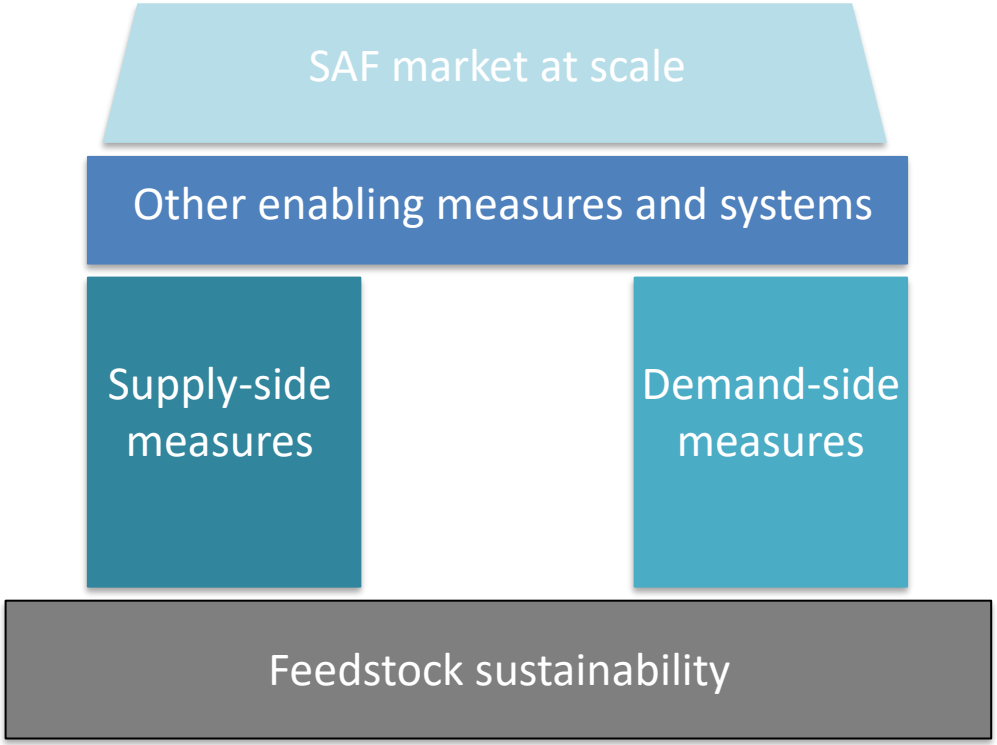
- Policies aim to overcome challenges to scale SAF production

- Three key themes influence policy effectiveness:
  - **Feasibility**
    practicable and straightforward to implement
  - **Effectiveness**
    successful in producing the desired/intended result
  - **Practicality**
    the policy targets the outcome rather than a theory/set of ideas

SAF Policy Effectiveness – policies should…

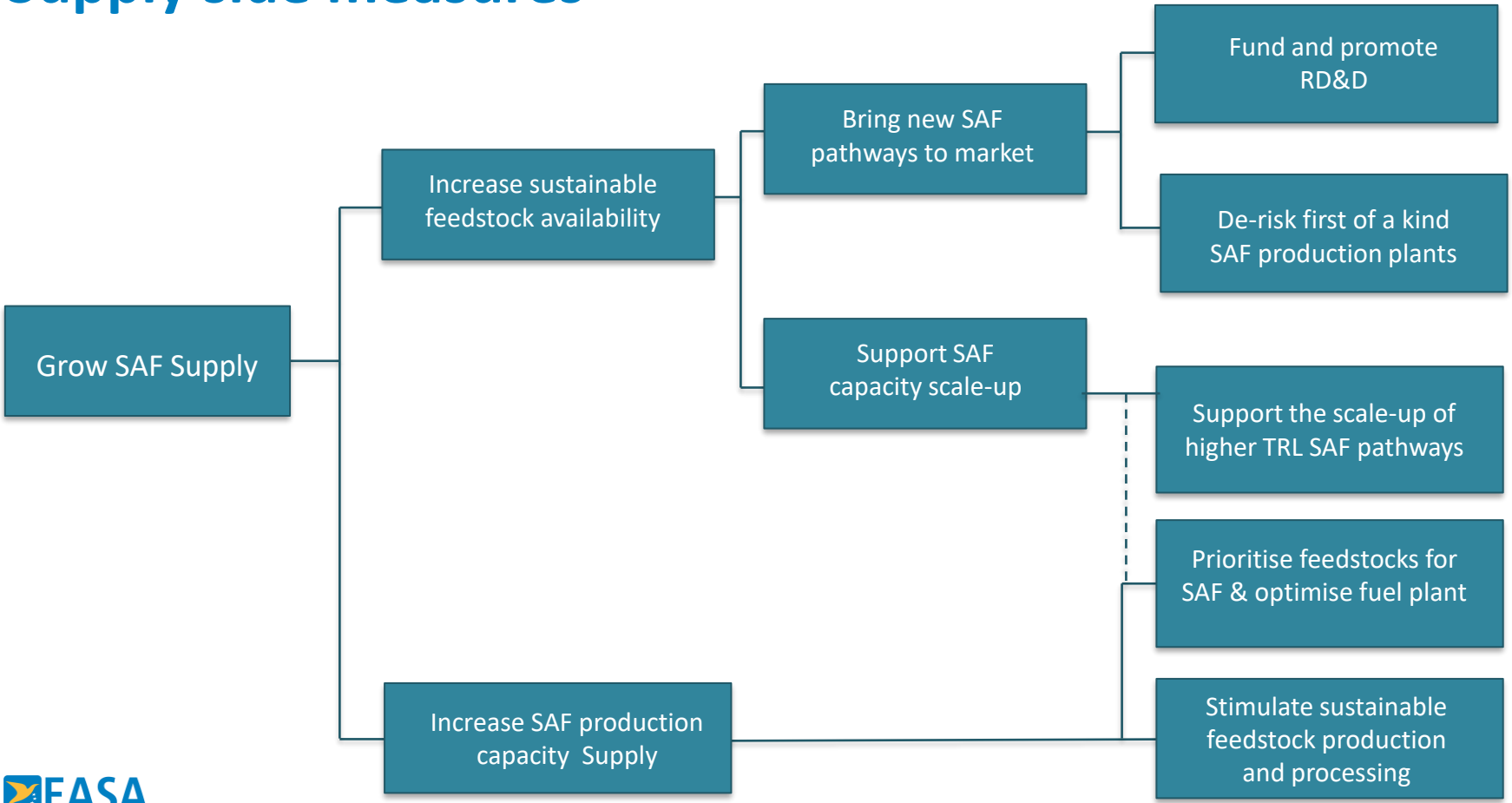
- → Be stable, predictable and consistent to enable private sector investment
- → Be of sufficient duration to reflect project development timelines (10 years+)
- → Be 'Stackable' with other incentives (credits from multiple incentives at the same time)
- → Technology-neutral to enable the development of diverse production pathways and supply chains
- → Link incentives to performance (e.g., recognise higher GHG emissions reductions)
- → Allow access to a compliance credit market to mediate prices between renewable and fossil fuels
- → Recognise needs of pre-revenue companies (clear access to non-dilutive capital via loans and grants)
- → Incorporate mechanisms to encourage significant advances in SAF production capacity expansion, further technology innovation and drive efficiencies to provide enough supply
- → Ideally be national in scope to allow more effective innovation and project development
- → Be designed with broad political support to reduce reversal risk. A broad range of benefits should help with this - including rural development, job creation, environment and technology innovation
- → Be customised to unique resources, economic and social factors, political barriers and existing regulatory structure

Overview of regulatory framework for SAF

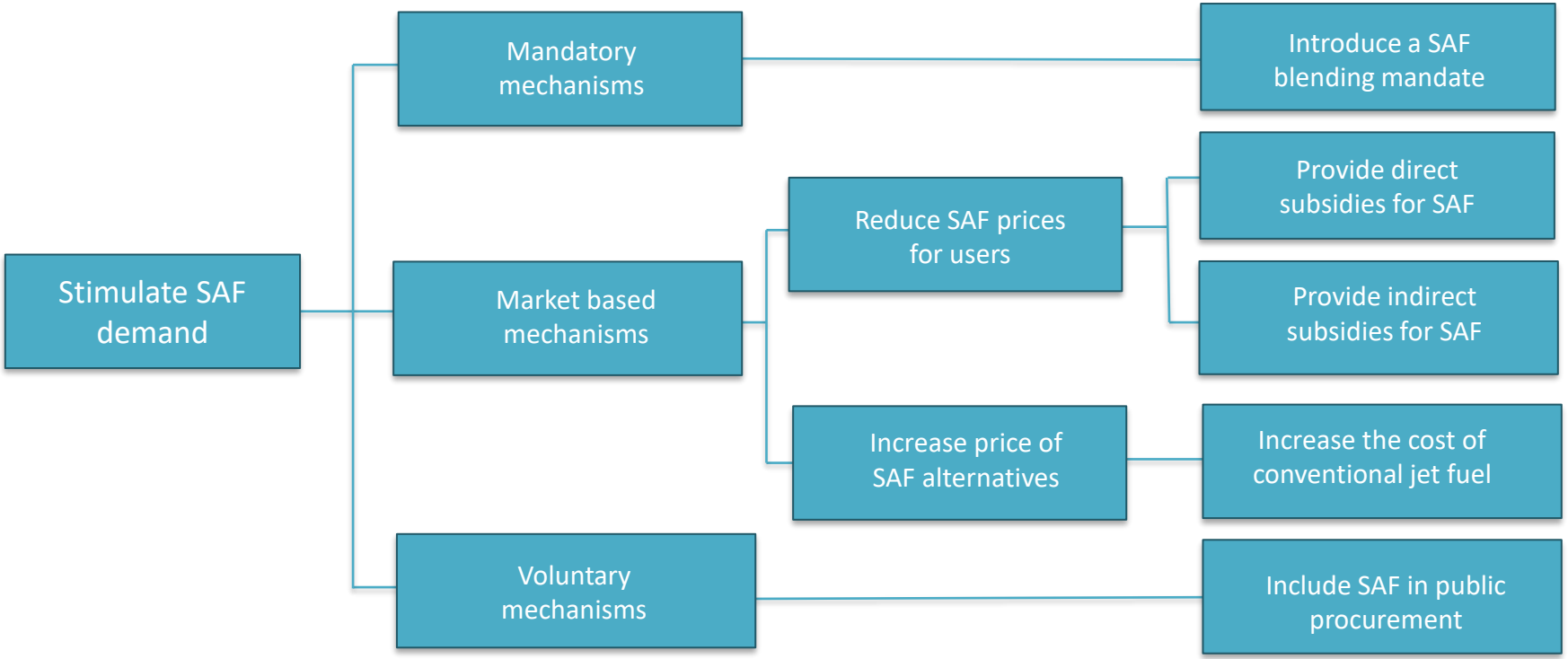


Source: adapted from *'Clean Skies for Tomorrow: Sustainable Aviation Fuel Policy Toolkit'* (Nov 2021)

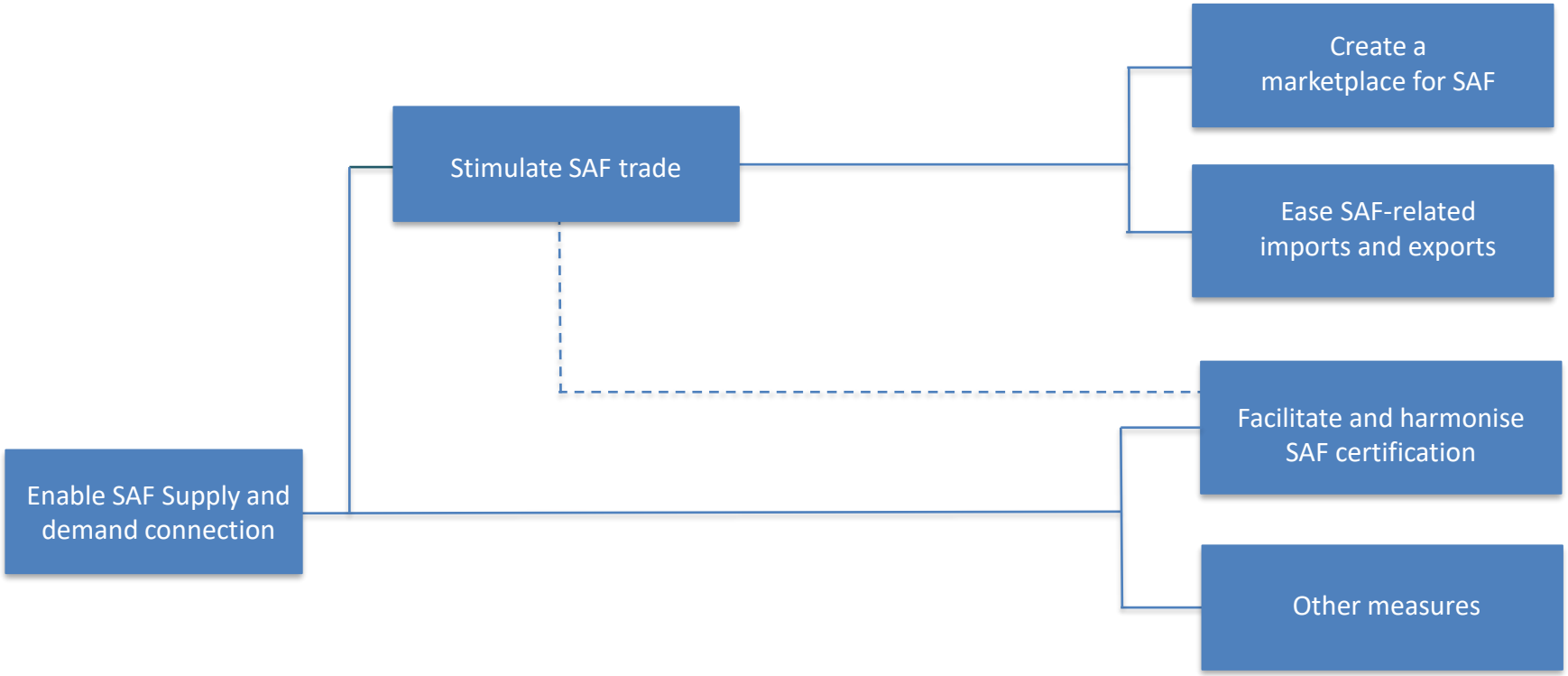
Supply side measures



Demand side measures



Enabling measures



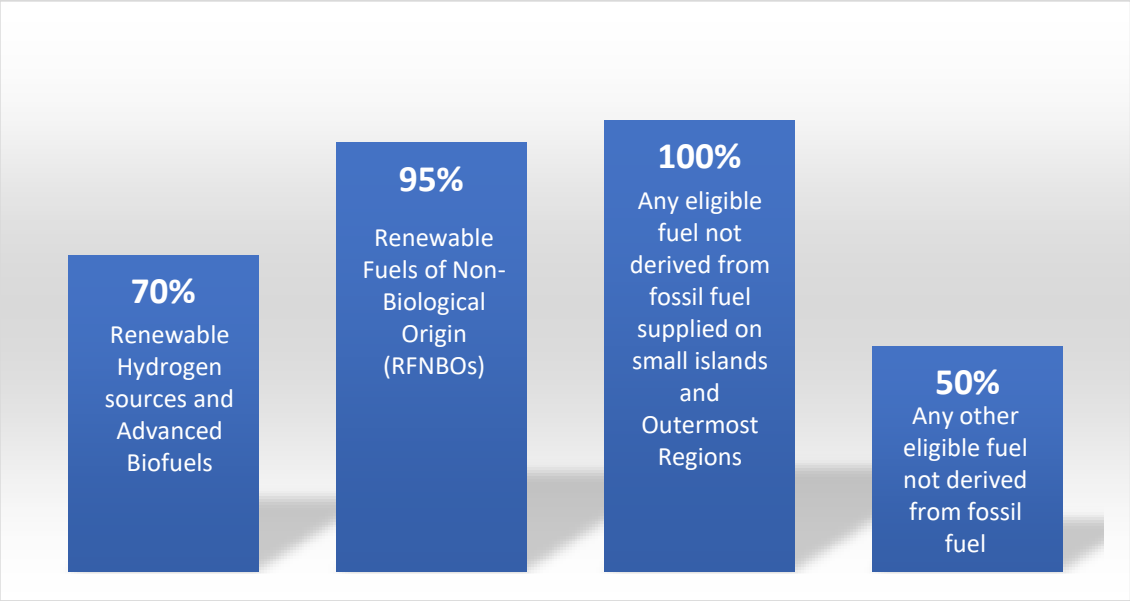
Policies in Europe

EU ETS and UK ETS

- → Aircraft operators must report their CO_2 emissions from the flights that fall under the reporting requirements of these schemes
- → Aircraft operators must then surrender allowances equivalent to these emissions
- → Aircraft operators can reduce their emissions and the allowances that they need to surrender by ‘using’ SAF and making a SAF Emissions Reduction Claim

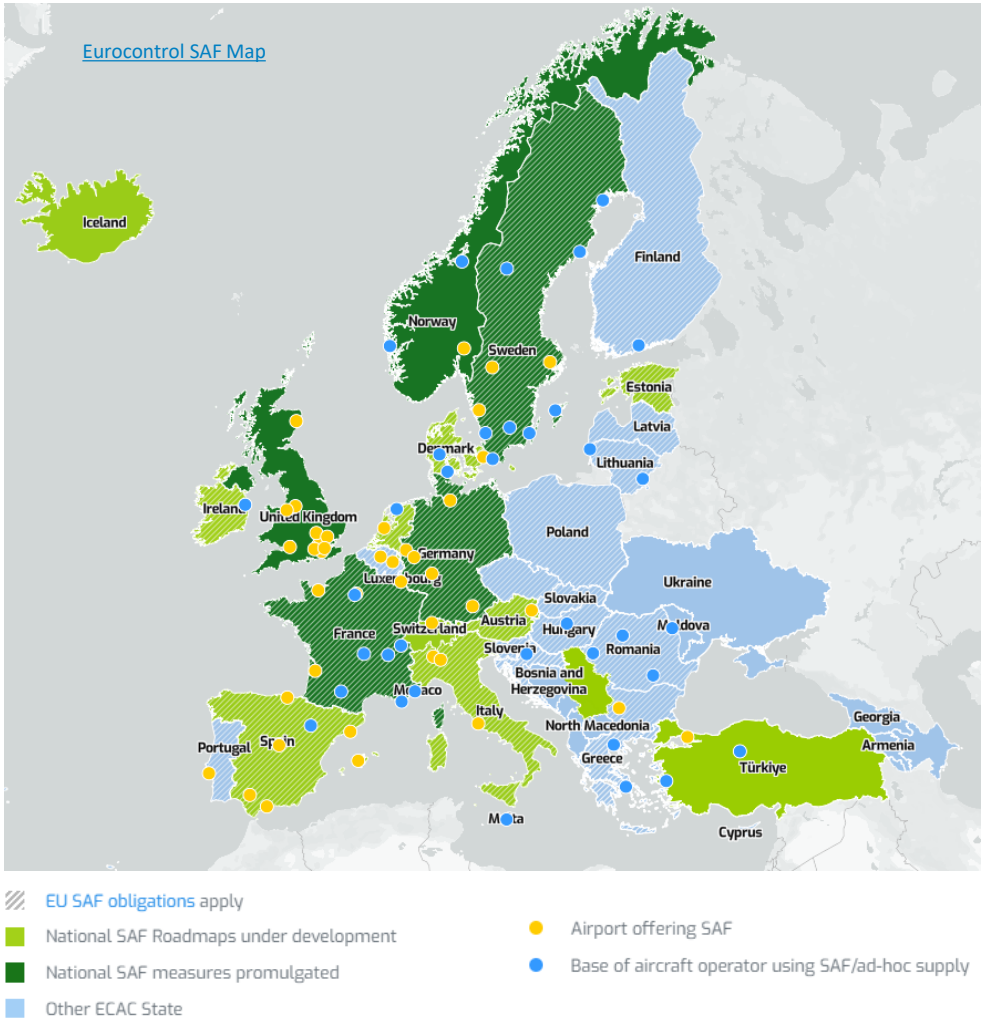
EU ETS from 2024 – SAF Allowances

→ 20 million allowances set aside for commercial aircraft operators to cover all, or part of the price differential between the use of conventional aviation fuel and SAF and other aviation fuels not derived from fossil fuels



State SAF Policy

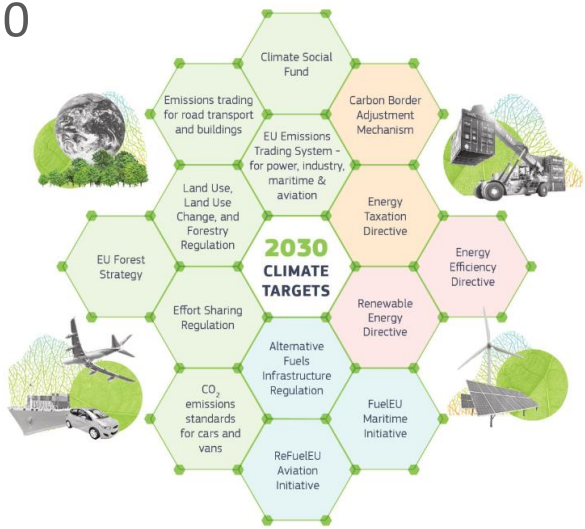
- Several states within Europe have implemented national SAF policies, including mandates, annual emissions targets/reductions
- Within the European Union (EU), ReFuelEU Aviation – the EU's SAF Mandate applies from 1 January 2024, with some aspects applying from 1 January 2025



ReFuelEU Aviation – in context

- European Green Deal – Climate Neutral in 2050
- ‘Fit for 55’ - EU intermediate target to reduce emissions by at least 55% by 2030 (vs 1990) levels
- ReFuelEU Aviation is part of the ‘Fit for 55’ package, focusing on aviation and SAF
- Contributes to ICAO LTAG

EU ‘Fit for 55’ Package



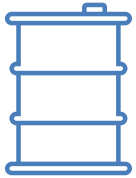
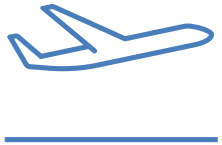
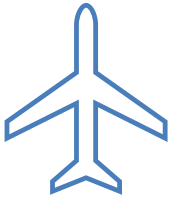
Source: European Union, 2021

ReFuel EU Aviation – Objectives

Encourage the uptake of SAF in the EU and ensure the availability of SAF to help decarbonise the aviation sector

Ensure a level playing field in aviation in the EU through a harmonised approach

ReFuel EU Aviation – Scope and Obligations

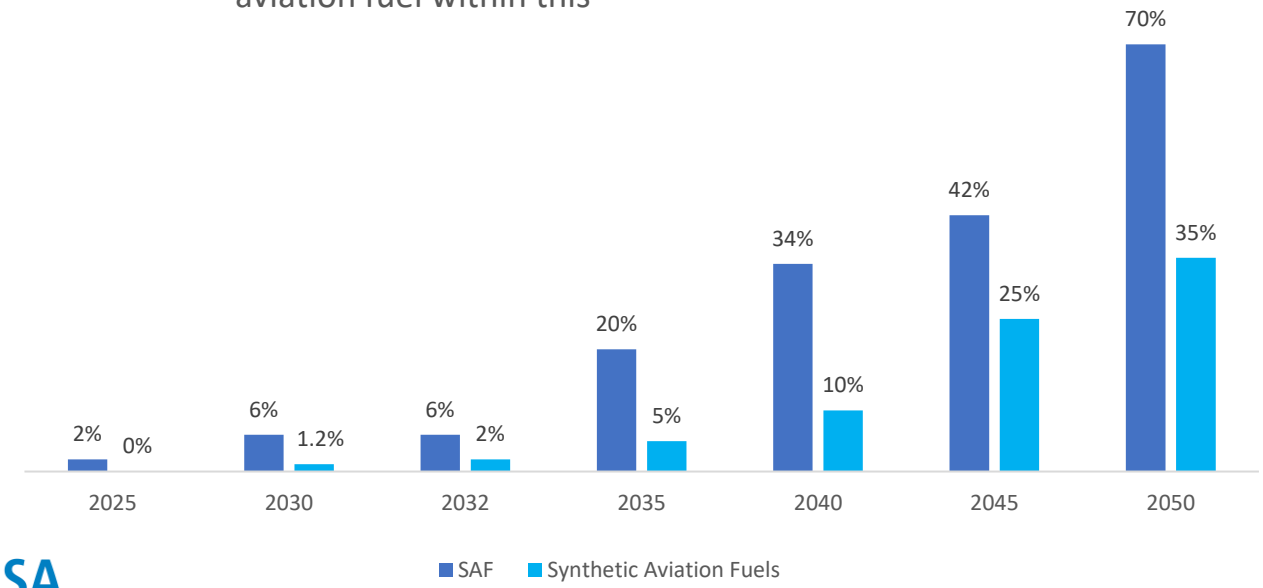
	Aviation Fuel Suppliers	Union Airports	Aircraft Operators
			
Who?	Aviation fuel suppliers supplying Union Airports	> 800,000 passengers > 100,000 tonnes or freight Opt-in for airports below the threshold, and those in outermost regions	≥ 500 passenger flights from Union Airports ≥ 52 all cargo flights from Union Airports Opt-in for other commercial operators and non-commercial operators
What?	To supply increasing amounts of SAF at Union Airports (flexibility from 2025 to 2034)	To facilitate access to SAF	To uplift aviation fuel at Union Airports and avoid 'tankering'

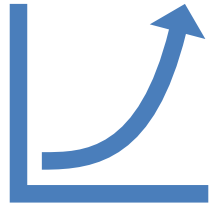
Reporting Obligations

Ramp-up of SAF

Synthetic Aviation Fuels (or e-fuels)
Synthetic fuels, e-fuels or Power-to-liquid (PtL) fuels are fuels made from renewable sources other than biomass, e.g., wind and solar power.
In simple terms, the renewable energy and water are used in an electrolyser to produce hydrogen, which is subsequently synthesised with CO_2 into syngas. The resulting syngas is then further processed into fuel

Volume shares
The minimum share of SAF and the minimum share of synthetic aviation fuel within this





Penalties

€

- Member States to set rules on penalties and notify the Commission – they must be effective, proportionate and dissuasive, and consider the nature, duration, recurrence and gravity of the infringement
  - Penalties for aircraft operators who fail to comply with the refuelling obligation at Union Airports i.e., ‘tankering’
  - Penalties for Union airport management body who fail to take the required steps to address the lack of access to aviation fuel containing minimum shares of SAF
  - Penalties for aviation fuel suppliers who fail to comply with supplying the required share of SAF and the minimum share of synthetic aviation fuels at Union Airports

The role of EASA

- EASA will play a key role in ensuring the target objectives of the Regulation are met
- EASA will issue an annual report that will provide clarity on:
  - The origin, quantity, and characteristics of SAF supplied to Airport Operators and purchased by Aircraft Operators
  - State of the SAF market, trends in SAF production and price gap between SAF and conventional aviation fuel
  - Declaration of GHG schemes that Aircraft Operators participate in
  - Compliance of Aircraft Operators, Aviation Fuel Suppliers and Airport Operators with ReFuelEU obligations
  - The average content of aromatics, naphthalene and sulphurs

Supporting Measures

Fostering **cross-sectoral collaboration** and match making

(RLCF – Renewable and Low-Carbon Fuels Value Chain Industrial Alliance)

Strengthening global collaboration at **ICAO**

(LTAG, CORSIA, ACT-SAF)

Accelerating qualification of **new SAF pathways** and permitting **new plants**

(EU SAF Clearing House, Net-Zero Industry Act)

Financing to **narrow down the price gap** between SAF and fossil fuel

(SAF Allowances and ETS, energy taxation)

Financing to **de-risk SAF production** at all technology maturity stages

(Horizon Europe, Innovation Fund, InvestEU)

Increasing **transparency** on SAF uptake and sustainable investments

(EU Taxonomy, environmental label)

UK SAF Mandate

- Primary objective to deliver GHG emissions reductions contributing to the UK's 2050 net zero target
- Create an opportunity for a new UK industry that can provide green growth and jobs
- Annual target on fuel suppliers to blend a proportion of SAF into their fuel supply
- Starts 1 January 2025

UK SAF Mandate in numbers

Overall SAF demand of
2%
of UK jet fuel in 2025

Overall SAF demand of
10%
of UK jet fuel in 2030

Overall SAF demand of
22%
of UK jet fuel in 2040

GHG emissions reductions of
7%
from SAF by 2030

Additional GHG emissions reductions of
2.7 Mt CO_2e
by 2030

GHG emissions reductions of
15%
from SAF by 2040

Additional GHG emissions reductions of
6.3 Mt CO_2e
by 2040

Minimum GHG savings of
40%
compared to fossil jet fuel figure of 89gCO_2e/MJ

HEFA capped at
100%
of overall trajectory UK jet fuel in 2025

HEFA capped at
71%
of overall trajectory UK jet fuel in 2030

HEFA capped at
35%
of overall trajectory UK jet fuel in 2040

PtL mandate to begin in
2028

PtL obligation
0.2%
in 2028

PtL obligation
3.5%
in 2040

EASA

Policies in the United States (US)

US SAF Policy Landscape

→ Financial incentives to drive SAF supply at a Federal and State level

Federal	State
SAF Grand Challenge	Low Carbon Fuel Standard - LFS[1]
Inflation Reduction Act - IRA	State Level Tax Credits
Renewable Fuel Standard – RFS	

1) States with an LCFS program in place include California, Oregon and British Columbia. States considering such a program are Washington, Colorado, the Midwest (Iowa, Kansas, Nebraska, Minnesota, South Dakota), Connecticut, Massachusetts, New York, Pennsylvania, Delaware, Maine, Maryland, New Hampshire, New Jersey, Rhode Island, Vermont and Virginia

The SAF Grand Challenge

- The U.S. Department of Energy (DOE), the U.S. Department of Transportation (DOT), the U.S. Department of Agriculture (USDA) launching a Memorandum of Understanding (MoU) that will attempt to expand SAF supply and end use, reduce the cost of SAF and enhance the sustainability of SAF
- Objectives:
  - SAF should achieve a minimum of 50% reduction in life cycle greenhouse gas emissions compared to conventional fuel
  - Domestic SAF production of 3bn gallons by 2030
  - SAF able to meet 100% of aviation fuel demand by 2050

Feedstock Innovation

Conversion Technology Innovation

Building Supply Chains

Enabling End Use

Policy and Valuation Analysis

Communicating Progress and Building Support

Inflation Reduction Act - IRA

- Major tax and spending package, including tax credits to incentivise domestic SAF production
- Applies to SAF Blenders and Producers (depending on the specific credit system)
- Most provisions of the Inflation Reduction Act 2022 effective on 1 January 2023
- Minimum of 50% net emissions reductions[1]
  - No biomass from high carbon stock lands
  - Direct Land Use change emissions must be considered
  - GHG Lifecycle calculation methodology being determined (GREET or CORSIA)
- SAF Blenders Credits, Clean Fuel Production Credits, CCUS Credits, Clean Hydrogen Production Credits

UPDATE

Renewable Fuel Standard – RFS

- Requires a certain volume of diesel and gasoline sales in the US to be renewable
- Applies to fuel suppliers (refiners, blenders, importers)
- Annual targets set until 2025 – later targets to be approved
- Fuel suppliers show compliance with RINs – Renewable Identification Numbers
- RINs are generated by the production of each gallon of renewable fuel and can be traded on the market
- SAF production generates RIN credits – 1.6 RINs per gallon
  - RIN credits covers half of the SAF premium (vs cost price)

UPDATE

The One Big Beautiful Bill (OBBB)

- Signed on 4 July 2025
- Makes significant changes to the tax credits available under the Inflation Reduction Act
- Changes to the Renewable Fuel Standard
- The credits for SAF are extended for 2 years until 31 December 2029
- The value of the credit for SAF is reduced from $1.75/gallon to $1.00/gallon for fuel produced after 2025
- The excise tax credit for SAF is removed for any sale or use after 30 September 2025
- Double counting on credits removed
- Fuel feedstocks must come from the United States, Mexico or Canada to generate a credit

Low Carbon Fuel Standard - LCFS

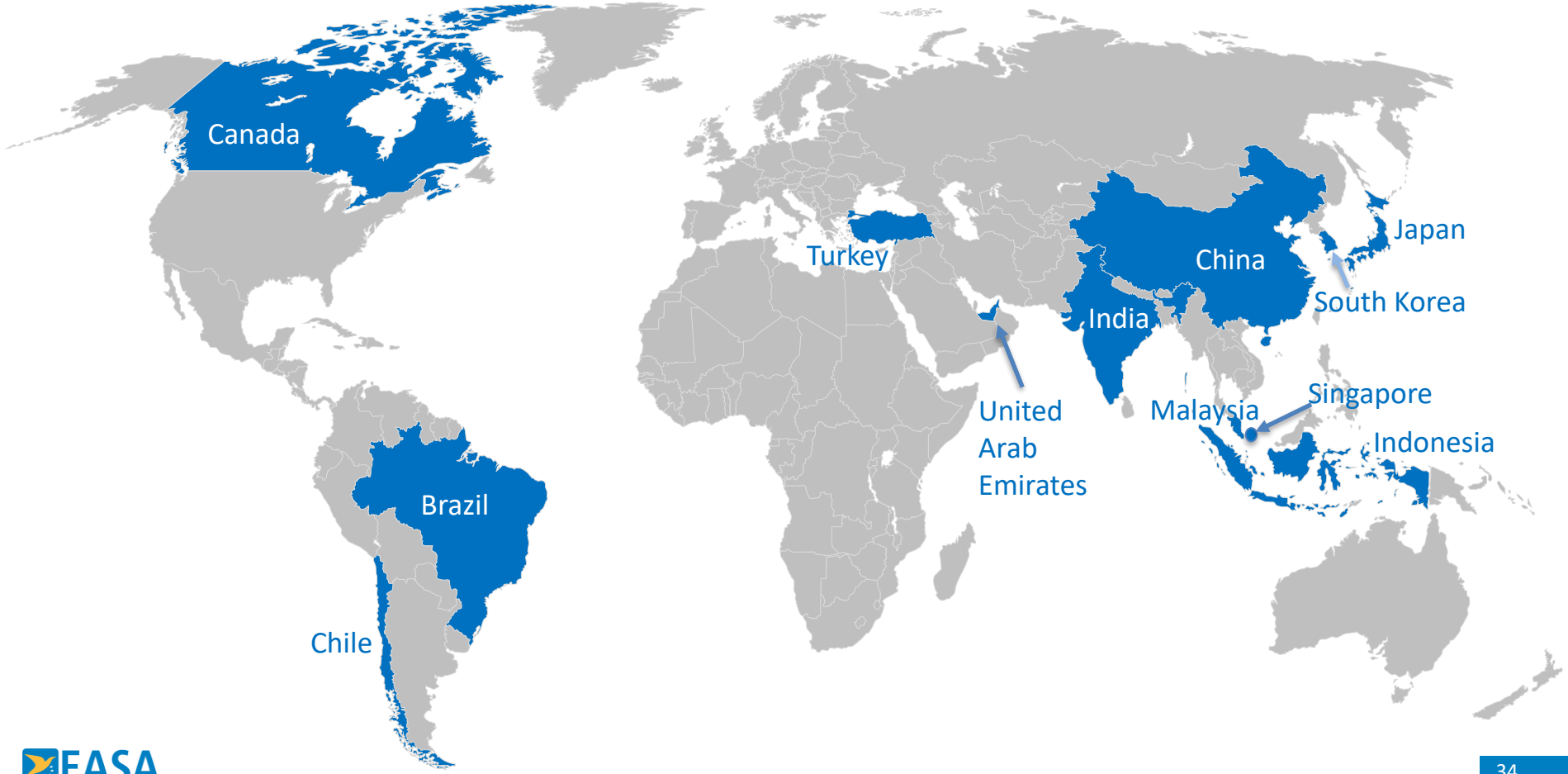
- Mandate on **maximum carbon intensity of fuel** for fuel suppliers, with a tradeable **credit system**
- Aim is to decarbonise Californian transportation fuel mix and reach 20% GHG emissions reduction in 2030
- Petroleum refiners, importers and wholesales in California are obligated
- Annual decreasing carbon intensity (CI) target is set for different bio(fuels), which shows the accepted GHG life cycle emissions (in gCO2eq/MJ)
- Fuels with a higher CI generate deficits, fuels with a lower CI generate credits
- Credits are traded via the LCFS Credit Banking and Transfer System (CBTS)

Jet fuel not obligated but can be used as an opt-in

Producing jet fuel with lower GHG emissions than the set CI generates LCFS credits

The higher the emissions reduction the more credits received

Policies in the Rest of the World


Canada
Turkey
China
Japan
South Korea
India
United
Arab
Emirates
Malaysia
Singapore
Indonesia
Brazil
Chile

Asia

United Arab Emirates

Under the General Policy for SAF (December 2023), the UAE has set a voluntary target to supply 1% locally produced SAF by 2031 (0.1 Mt) to national airlines at UAE airports.

India

Plans to introduce a SAF mandate of 1% by 2027 (0.1 Mt), increasing to 2% in 2028 (0.2 Mt). The blend is expected to rise to 5% by 2030 (0.6 Mt).

China

A SAF blending mandate is expected to be introduced under the 15th five-year plan (2026 to 2030). Details pending but could be up to 15% by 2030 (~7.2 Mt).

Asia

Malaysia
Under the 2023 National Energy Transition Roadmap, Malaysia has set a long-term target of a 47% SAF blending mandate by 2050 (~ 2.6 Mt).

Singapore
Proposed a national SAF target of 1% by 2026 (0.05Mt), potentially increasing to 3-5% by 2030 (0.15 – 0.2Mt of SAF). Singapore plan to introduce a SAF levy on air ticket sales beginning in 2026, with the funds used to centrally procure SAF.

Indonesia
Plans to mandate a 1% SAF blend for international flights starting in 2027, rising up to 2.5% by 2030 (~0.2 Mt), 12.5% by 2040 (~1 Mt), and 30% by 2050 (~2.9 Mt).

Asia

South Korea

Has introduced a SAF mandate requiring all international flights departing from South Korea to use at least 1% SAF in their fuel mix by 2027 (~0.07 Mt). Tax breaks and other incentives provided to local refiners who invest in SAF production.

Japan

A 10% SAF blend mandate by 2030 (1 Mt) announced but not formally adopted. Government support through financial incentives, including a 30 yen/litre tax credit to stimulate domestic production.

Information based on public information
Source: 2025 SAF Market Outlook by SkyNRG and ICF

Rest of the World

Turkey
A draft SAF regulation is in development, with a probable goal of 5% by 2030 (~0.4 Mt).

Canada
British Columbia has a SAF mandate: aviation fuel suppliers to supply a 1% blend into jet fuel by 2028 increasing 3% blend in 2030 (0.05 Mt). British Colombia requires jet fuel in the province to meet a CI reduction of 10% by 2030.

Rest of the World

Brazil

Under the ‘Fuel of the Future’ legislation (Bill 528/20) air operators must reduce emissions starting with a 1% reduction in 2027, increasing to 10% by 2037 (0.8 – 0.9 Mt), assuming average SAF life cycle GHG reductions of 70-80%.

Chile

Plans to achieve a 50% SAF blend in its domestic and international flights by 2050 (~1 Mt). Chile’s SAF Roadmap 2050 states an aim to build an operational large-scale domestic SAF facility by 2030 to ensure that a significant proportion of the country’s SAF needs can be produced domestically.


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
Co-processing
SAF
'neat' SAF
ASTM D4054
ISCC
Environmental
Municipal Solid Waste
Alternative
Cost
Feedstock
ASTM D7566
CORSIA Eligible Fuels
Sustainability Certification Schemes
Socio-Economic
Approved ASTM Pathways
AtJ
Risk
CO_2
Land use change
Technology
Blending

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