



## ICAO WORK ON SUSTAINABLE AVIATION FUELS (SAF)

### In-person Seminar

Second Phase of the ICAO Assistance Project  
with the EU Funding : *“Capacity Building for CO<sub>2</sub>  
Mitigation from International Aviation –  
Development of ICAO States’ Action Plans for 10  
States”*

Praia, 28 & 29 July 2022  
Cabo Verde



Neil Dickson  
Chief, Environmental Standards  
ICAO



## Historic on ICAO and SAF

# 12 years ago

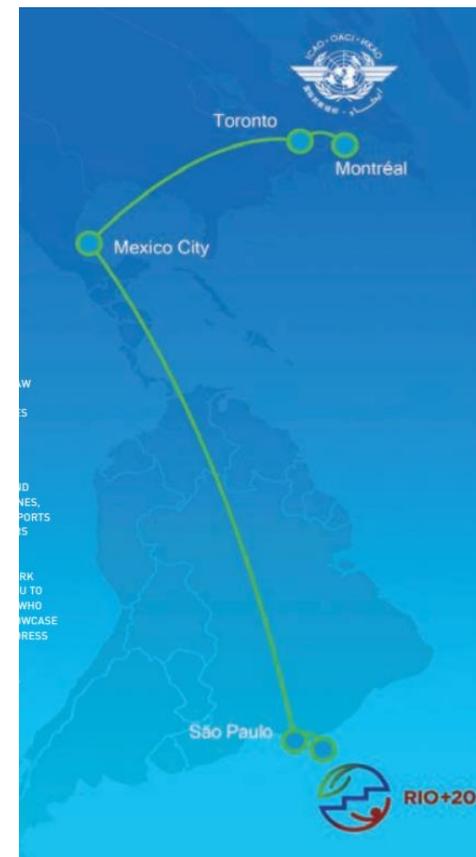
- **Technical feasibility and safety under consideration**
- **No certified conversion processes**
- **Very few demonstration flights**
- **Then, in 2009, the First Conference on Aviation and Alternative Fuels (CAAF/1) was convened in Rio de Janeiro and recommended:**
  - the use of SAF as a means to reduce aviation emissions;
  - the establishment of the ICAO Global Framework for Aviation Alternative Fuels (GFAAF);
  - the development of life cycle analysis methodologies;
  - the development of Sustainability requirements



## Historic on ICAO and SAF

### Over the past 10 years...

- 2010 – Inclusion of SAF as a measure to reduce aviation CO<sub>2</sub> emissions (ICAO resolution A37-17)
- **2012 – Rio + 20 conference – SAF flight from Montréal to Rio with ICAO Secretary General**
- 2017 – Second Conference on Aviation and Alternative Fuels (CAAF/2)
- 2018 – CORSIA adoption (including SAF provisions)

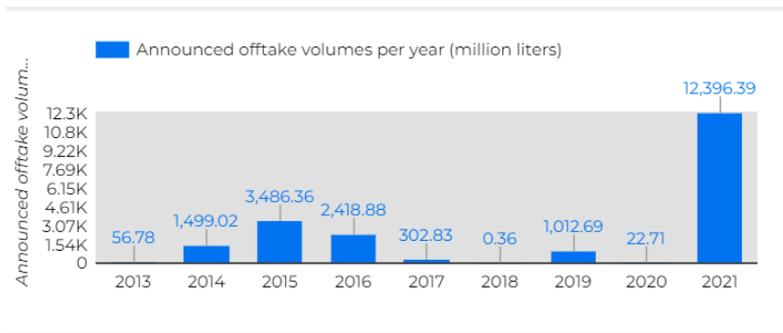




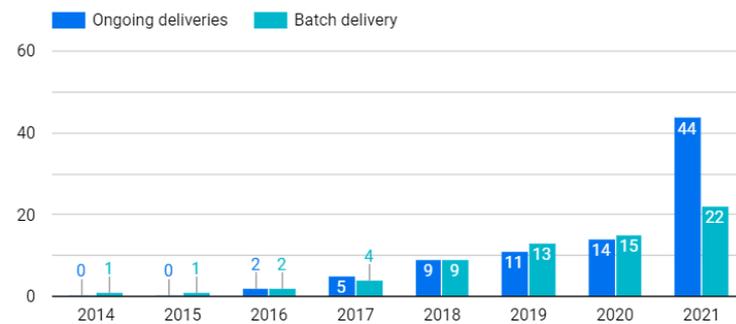
# The Present of SAF

## 2021 is the year of SAF

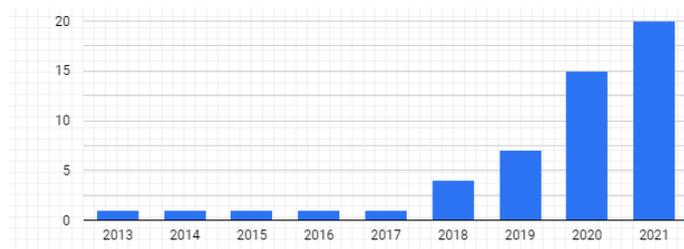
### Offtake agreements



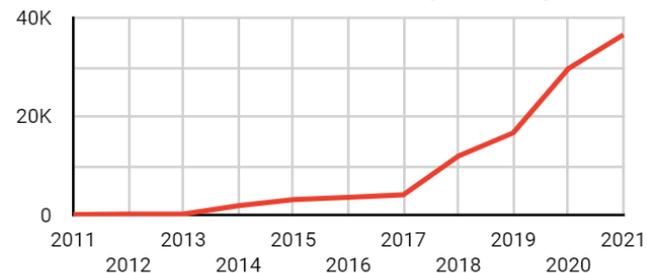
### Airports distributing SAF



### Policies



### Production capacity

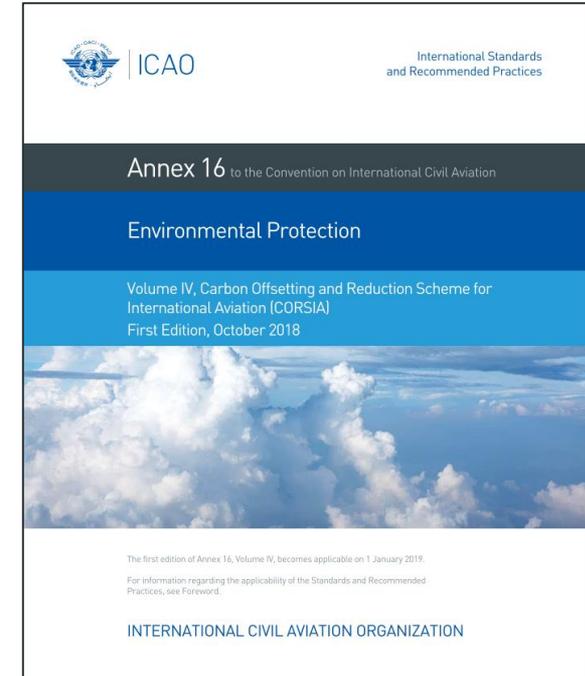




## What is SAF?

### Annex 16 Vol IV definitions

- **Feedstock.** A type of unprocessed raw material used for the production of aviation fuel.
- **Conversion process.** A type of technology used to convert a feedstock into aviation fuel.
- **Pathway.** A specific combination of feedstock and conversion process used for the production of aviation fuel.
- **CORSIA Sustainable Aviation Fuel** - a renewable or waste derived aviation fuel that meets the CORSIA Sustainability Criteria under this Volume.





## Conversion processes and feedstocks

To date, 9 conversion processes have been approved by ASTM to produce SAF.

Most commonly used are:

Hydroprocessed esters and fatty acids (HEFA)*	Fischer Tropsch (FT)*	alcohol-to-jet (ATJ)
<p>animal tallow</p>  <p>Vegetable oils</p>  <p>used cooking oil</p> 	<p>forestry residues</p>  <p>miscanthus</p>  <p>Municipal solid waste (MSW)</p> 	<p>waste gases (e.g. steel mill)</p>  <p>Sugarcane</p>  <p>Crop residues</p> 

- HEFA and FT can also be co-processed at conventional petroleum refineries

For details on all conversion processes:

<https://www.icao.int/environmental-protection/GFAAF/Pages/Conversion-processes.aspx>



## ICAO Activities on SAF

### ICAO is facilitating SAF development and deployment by:

- 1) Establishing **Policies, measures and goals**
- 2) Developing globally-accepted **Standards, sustainability criteria, and life cycle methodologies for SAF use in CORSIA.**
- 3) fostering **capacity building and assistance to ICAO Member States**
- 4) Outreaching **information and best practices**





## ICAO Outreach activities

### ICAO Stocktaking Seminars

#### ICAO STOCKTAKING SEMINAR TOWARD THE 2050 VISION FOR SUSTAINABLE AVIATION FUELS

ICAO Headquarters, Montréal | 30 April - 1 May 2019

LEARN MORE

#SustainableFuels



- Held since 2019; 4 editions to the moment
- 2019 edition focused on SAF
- 2021 Edition included one pre-stocktaking seminars on Synthetic fuels
- All presentations available on ICAO.tv

<https://www.icao.int/Meetings/SAFStocktaking/Pages/default.aspx>

<https://www.icao.int/Meetings/Stocktaking2020/>

<https://www.icao.int/Meetings/Stocktaking2021/>

<https://www.icao.int/Meetings/Stocktaking2022/>



ICAO / Meetings & Events / ICAO Stocktaking Seminar on aviation in-sector CO<sub>2</sub> emissions reductions



## ICAO Outreach activities

### SAF tracker tools

46

airports  
distributing  
SAF

23

policies  
adopted or under  
development

25.8

Billion liters of  
SAF under  
offtake  
agreements

9

conversion  
processes  
certified for  
aviation

&gt;360k

commercial  
flights have used  
SAF

#### Latest news (click for details)

Date ▾	Link
Jul 15, 2022	<a href="#">Exxon successfully delivers SAF to Changi airport</a>
Jul 14, 2022	<a href="#">British Airways and Phillips 66 sign SAF deal</a>
Jul 14, 2022	<a href="#">Aer Lingus signs deal for Sustainable Aviation Fuel (SAF) supply</a>
Jul 14, 2022	<a href="#">Twelve and Alaska Airlines to collaborate with Microsoft to advance sustainable aviation fuel derived from recaptured CO2 and renewable energy</a>
Jul 14, 2022	<a href="#">Bolloré Logistics and Air France KLM Martinair Cargo extend SAF agreement</a>

- Updated daily
- Transparent – all data available for consultation
- **New tool – SAF production facilities map**

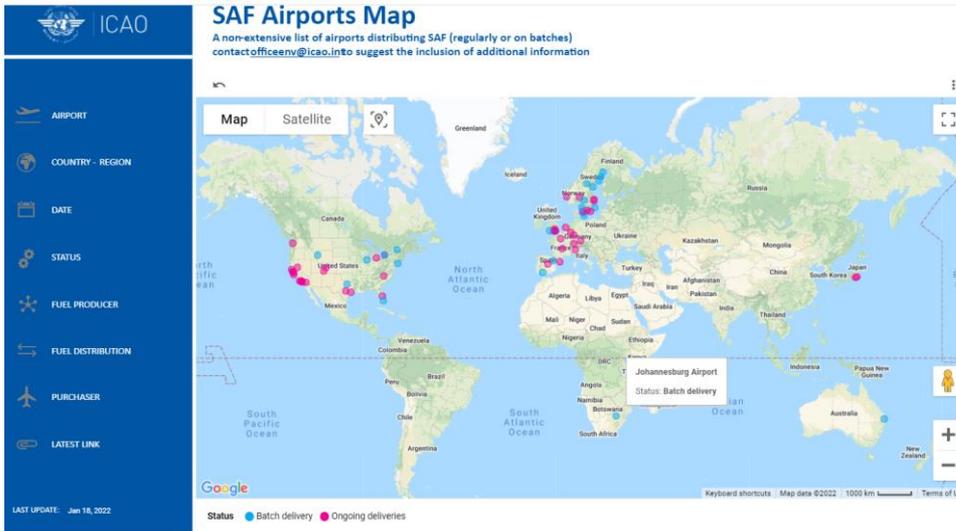


<https://www.icao.int/environmental-protection/pages/SAF.aspx>  
(or google it "Sustainable Aviation Fuels")



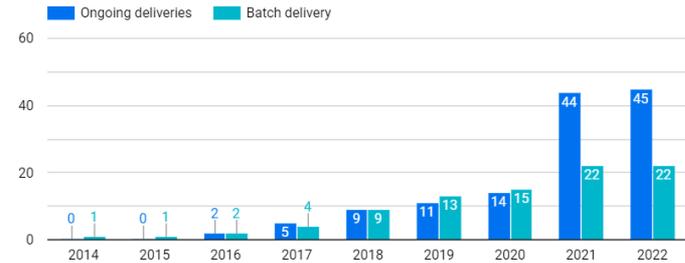
## Airports tracker

- Tracker of airports offering Sustainable Aviation Fuels, either continuously or in batches



Date ▾	Airport	Status	Source
1.. Jan 18, 2022	Jacqueline Cochran Regional Airport	Ongoing deliveries	<a href="https://www.hydroc...">https://www.hydroc...</a>
2.. Dec 28, 2021	Milan Linate Airport	Ongoing deliveries	<a href="https://www.ainonl...">https://www.ainonl...</a>
3.. Nov 12, 2021	Dallas Fort Worth Airport	Batch delivery	<a href="https://www.aviatio...">https://www.aviatio...</a>
4.. Oct 24, 2021	Gatwick Airport	Batch delivery	<a href="https://www.kuna.n...">https://www.kuna.n...</a>
5.. Oct 13, 2021	Ångelholm Airport	Batch delivery	<a href="information receive...">information receive...</a>
6.. Oct 13, 2021	Sundsvall Timrå Airport	Batch delivery	<a href="information receive...">information receive...</a>
7.. Oct 13, 2021	Skellefteå Airport	Batch delivery	<a href="information receive...">information receive...</a>
8.. Oct 6, 2021	Toronto-Pearson Airport	Ongoing deliveries	<a href="https://www.blfuel...">https://www.blfuel...</a>

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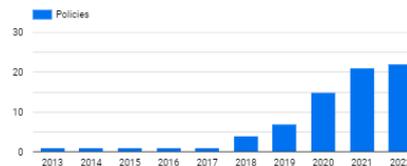
22

policies  
adopted or under  
development

- Tracker of Policies adopted or under development to foster SAF development

Date	State	Policy Title	Policy Description	Status	Source
Jan 2, 2022	Denmark	Denmark Targets 2030 For Fossil Fuel-Free Domestic Flights	under development	<a href="https://simpleflying.com/denmark-fossil-fuel-free-flights/">https://simpleflying.com/denmark-fossil-fuel-free-flights/</a>	
Dec 10, 2021	Japan	Japanese government officials are working on plans to slash carbon emissions by the country's airlines. They say that by 2030, their planes should be powered by 10 percent biofuel.	under development	<a href="https://www3.nhk.or.jp/nhkworld/en/news/20211210_30/">https://www3.nhk.or.jp/nhkworld/en/news/20211210_30/</a>	
Sep 9, 2021	United States	Sustainable Aviation Fuel tax credit as part of the Build Back Better Agenda. This credit will help cut costs and rapidly scale domestic production of sustainable fuels for aviation. The proposed tax credit requires at least a 50% reduction in lifecycle greenhouse gas emissions and offers increased incentive for greater reductions.	under development	<a href="https://www.whitehouse.gov/briefing-room/statements-releases/2021/09/09/fact-sheet-biden-administration-advances-the-future-of-sustainable-fuels-in-american-aviation/">https://www.whitehouse.gov/briefing-room/statements-releases/2021/09/09/fact-sheet-biden-administration-advances-the-future-of-sustainable-fuels-in-american-aviation/</a>	
Jul 23, 2021	United Kingdom	Proposes the introduction of an obligation on fuel suppliers to reduce the carbon footprint of jet fuel used in the UK, to be achieved through greater use of sustainable aviation fuels. UK is seeking comments on the need for a SAF mandate, high-level ambition and design of the proposed SAF mandate, fuel eligibility criteria, interactions between SAF and other domestic and international policy, compliance, reporting and verification principles that will steer the creation of the scheme.	under development	<a href="https://www.gov.uk/government/consultations/mandating-the-use-of-sustainable-aviation-fuels-in-the-uk">https://www.gov.uk/government/consultations/mandating-the-use-of-sustainable-aviation-fuels-in-the-uk</a>	
Jul 16, 2021	Regional (European Union)	reFuelEU	proposed mandate of SAF use, starting from 2% in 2025 up to 6% in 2030	under development	<a href="https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12040-re-fuel-eu-aviation-sustainable-aviation-fuels_en">https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12040-re-fuel-eu-aviation-sustainable-aviation-fuels_en</a> <a href="https://ec.europa.eu/info/sites/default/files/refuelev_aviation_sustainable_aviation_fuels.pdf">https://ec.europa.eu/info/sites/default/files/refuelev_aviation_sustainable_aviation_fuels.pdf</a>
Jun 13, 2021	New Zealand	Sustainable Biofuels Mandate	Proposed policy requires fuel suppliers to reduce the GHG emissions from transport fuels by a defined percentage each year. It applies to all transport fuels, including domestic aviation fuel, and requires biofuels to meet sustainability criteria to certify that they do not impact on food production or indigenous	under development	<a href="https://www.transport.govt.nz/area-of-interest/environment-and-climate-change/biofuels/">https://www.transport.govt.nz/area-of-interest/environment-and-climate-change/biofuels/</a>

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ICAO

COUNTRY

DATE

STATUS

POLICY TITLE

LATEST LINK

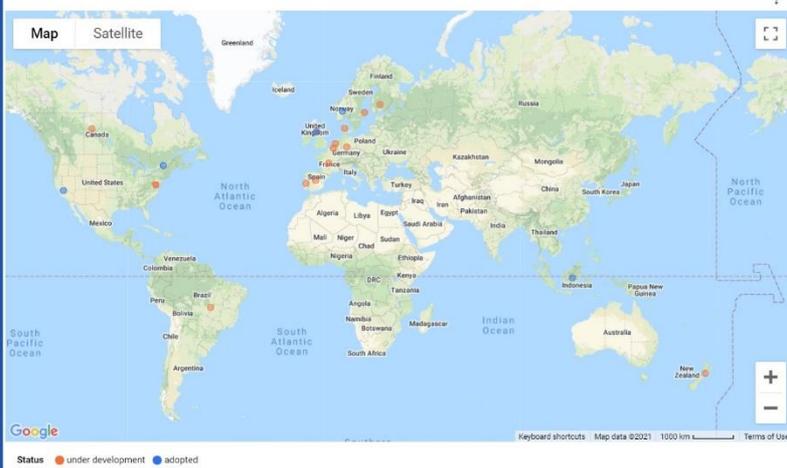
POLICY TYPE

POLICY DESCRIPTION

LAST UPDATE: Sep 9, 2021

### Environmental Policies on Aviation Fuels

The following map and table provides a summary of the policies (adopted and under development) to foster the use of Sustainable Aviation Fuels and Lower Carbon Aviation Fuels.



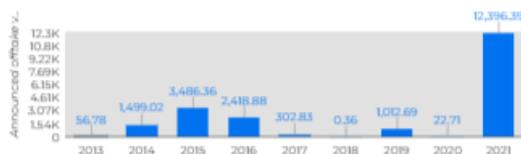


## Offtake Agreements tracker

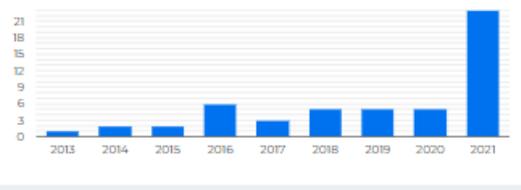
- information on SAF purchase agreements

21.2  
Billion liters of  
SAF under  
offtake  
agreements

Announced offtake volumes per year (million liters)



Number of announced offtake agreements



	Date	Fuel producer	Fuel Supplier	Fuel User / Purchaser	total offtake volume (million liters)	Length of offtake agreement (years)	Source
1.	Dec 14, 2021	BP		Qantas	30	3	<a href="https://www.qantas.com/agencyconnect/bu/kn/agency...">https://www.qantas.com/agencyconnect/bu/kn/agency...</a>
2.	Dec 4, 2021	OMV		Austrian Airlines	19	1	<a href="https://simpleflight.com/austrian-airlines-to-take-1500-...">https://simpleflight.com/austrian-airlines-to-take-1500-...</a>
3.	Dec 2, 2021	Phillips 66		British Airways			<a href="https://www.businesswire.com/news/home/2021/20200...">https://www.businesswire.com/news/home/2021/20200...</a>
4.	Dec 1, 2021	Aemetis		American Airlines	424	7	<a href="https://news.aa.com/news/news_details/2021/American_...">https://news.aa.com/news/news_details/2021/American_...</a>
5.	Dec 1, 2021	Aemetis		oneworld	106	7	<a href="https://www.airport-technology.com/news/aemetis-airi...">https://www.airport-technology.com/news/aemetis-airi...</a>
6.	Nov 12, 2021	Neste		Deutsche Post DHL			<a href="https://www.environmentalleader.com/2021/11/Deusch...">https://www.environmentalleader.com/2021/11/Deusch...</a>
7.	Nov 10, 2021	Velocys		IAG	276.3	10	<a href="https://www.velocys.com/2021/11/10/saf-offtake-with-iaq...">https://www.velocys.com/2021/11/10/saf-offtake-with-iaq...</a>
8.	Nov 10, 2021	Velocys		Southwest Airlines	829	15	<a href="https://www.prnewswire.com/news-releases/southwest-...">https://www.prnewswire.com/news-releases/southwest-...</a>
9.	Oct 4, 2021	Atmosfair		Lufthansa Cargo / Ku..	0.1	5	<a href="https://newsroom.lufthansa-group.com/lufthansa-air-l...">https://newsroom.lufthansa-group.com/lufthansa-air-l...</a>

Summary per fuel producer

Fuel producer	Total offtake volume (million liters)	Number of offtake agreements	
1.	Fulcrum	6,799.1	3
2.	Alder Fuels	5,678.12	1
3.	SG Preston	2,536.22	1
4.	Aemetis	1,476.31	3
5.	Velocys	1,105.34	2
6.	ECB Group	1,050.08	2
7.	SkyNRG	936.98	1
8.	SG Preston	677.59	2
9.	Wastefuel	378.54	1
10.	Cevo	208.2	4
11.	RedRock	158.99	2
<b>Grand total</b>	<b>21,196.02</b>	<b>52</b>	

Summary per fuel purchaser

Fuel purchaser	Total offtake volume (million liters)	Number of offtake agreements	
1.	United Airlines	9,179.62	4
2.	Jet Blue	2,911.83	3
3.	AirBP	2,192.71	2
4.	Cathay Pacific	1,419.53	1
5.	Delta	985.34	6
6.	KLM	937.04	4
7.	Southwest Airlines	829	1
8.	Shell	750.08	1
9.	American Airlines	495.89	3
<b>Grand total</b>	<b>21,196.02</b>	<b>52</b>	



## SAF facilities map

- Facilities (existing and announced) that could produce Sustainable Aviation Fuels.



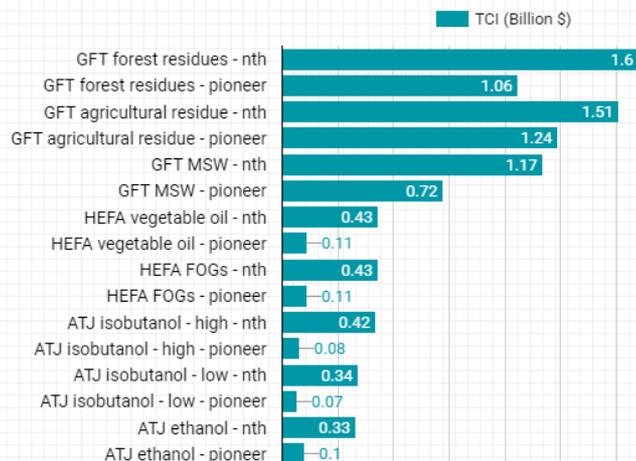
<https://www.icao.int/environmental-protection/pages/SAF.aspx>  
(or google it "Sustainable Aviation Fuels")



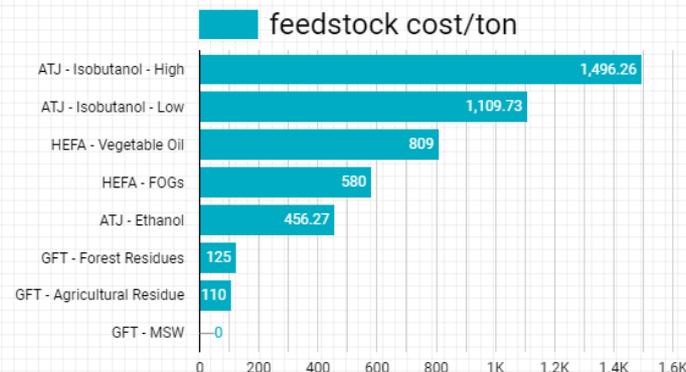
## SAF high-level numbers

- Estimations related to SAF, including:
  - yield per feedstock type
  - Investments needed for SAF facilities
  - Feedstock costs
- Allows to estimate tradeoffs between variables.

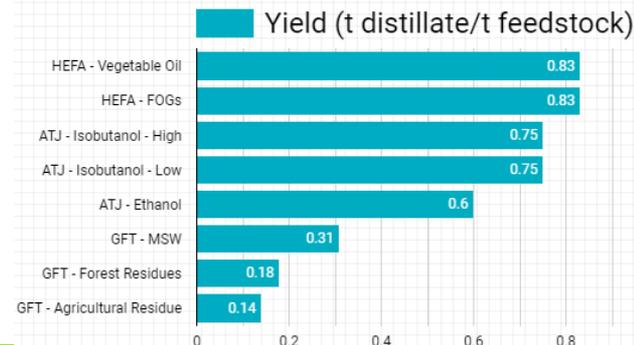
Total Capital Investment (TCI) for production facility (billion USD)



Feedstock cost per ton



Feedstock Yield  
(ton of distillate yielded per ton of feedstock)





## CORSIA and SAF

The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) is on track, including SAF-related elements

For all the details

<https://www.icao.int/environmental-protection/CORSIA/Pages/CORSIA-Eligible-Fuels.aspx>

(or Google it – “CORSIA eligible fuels”)

First Global approaches for an industry sector

Sustainability certification of fuels

Sustainability criteria

Life cycle Assessment of fuels





## Sustainability

# CORSIA sustainability criteria for CORSIA eligible fuels

## First global approach to sustainability for an industry sector



Sustainability Themes
1. Greenhouse Gases (GHG)
2. Carbon stock
3. Water
4. Soil
5. Air
6. Conservation
7. Waste and Chemicals
8. Human and labour rights
9. Land use rights and land use
10. Water use rights
11. Local and social development
12. Food security

Carbon-reduction themes  
(CORSIA pilot phase, 2021-2023)

Environmental and socio-economic Themes for SAF  
**Adopted by the ICAO Council for next CORSIA Phases\***  
(10/Nov/2021)

\* <https://www.icao.int/Newsroom/Pages/ICAO-Council-approves-CORSIA-Sustainability-Criteria-for-sustainable-aviation-fuels.aspx>



# Life Cycle Assessment of SAF

In CORSIA, there are two options to obtain the life cycle emissions of SAF.

ICAO document  
 “CORSIA Methodology for Calculating Actual Life Cycle Emissions Values”



Allows calculation of specific emissions values to a given SAF

ICAO document  
 “CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels”



Default emission values, as a function of the feedstocks and conversion processes.

Conversion process	Feedstock	Core LCA (gCO <sub>2</sub> e/MJ)	ILUC* (gCO <sub>2</sub> e/MJ)	Default life cycle value (gCO <sub>2</sub> e/MJ)	% reduction (Relative to CORSIA baseline – 89 gCO <sub>2</sub> e/MJ)
HEFA	Soy	40.4	27.0	67.4	24%
ATJ (isobutanol)	Sugarcane	24.0	7.3	31.3	65%

**First Global Approach to life cycle assessment**



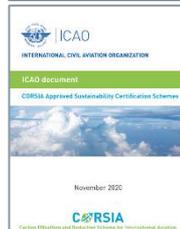
## Sustainability Certification

ICAO-approved “Sustainability Certification Schemes (SCS) ” are responsible for:

- Ensuring compliance with the Sustainability Criteria
- Ensuring that the Life Cycle Emission value of the fuel has been applied/calculated correctly.

ICAO document  
“CORSA Eligibility  
Framework and  
Requirements for SCSs”

ICAO document “CORSA  
Approved SCSs”



Requirements that an SCS needs to meet.

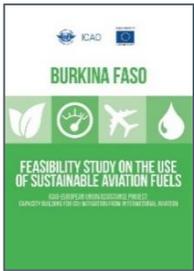
List of approved SCSs under CORSA.  
Currently two approved SCSs:  
-ISCC  
-RSB

***Open invitation for SCSs to apply -*** [www.icao.int/environmental-protection/CORSA/Pages/CORSA-SCS-evaluation.aspx](http://www.icao.int/environmental-protection/CORSA/Pages/CORSA-SCS-evaluation.aspx)



## ICAO Capacity building activities

**ICAO SAF Feasibility studies** - Four successful feasibility studies were developed as part of the ICAO-EU assistance project "Capacity building for CO<sub>2</sub> mitigation from international aviation".

 <p><b>BURKINA FASO</b></p> <p>FEASIBILITY STUDY ON THE USE OF SUSTAINABLE AVIATION FUELS</p> <p>ICAO EUROPEAN UNION ASSISTANCE PROJECT CAPACITY BUILDING FOR CO<sub>2</sub> MITIGATION FROM INTERNATIONAL AVIATION</p>	<p>Feasible feedstocks identified :</p> <ul style="list-style-type: none"> <li>• Tropical grasses like elephant grass</li> <li>• Agricultural residues from sorghum</li> <li>• Jatropha</li> <li>• Municipal Solid waste (MSW)</li> <li>• Cashew and shea nutshell oil</li> <li>• Waste animal fats (tallow)</li> </ul>
 <p><b>DOMINICAN REPUBLIC</b></p> <p>FEASIBILITY STUDY ON THE USE OF SUSTAINABLE AVIATION FUELS</p> <p>ICAO EUROPEAN UNION ASSISTANCE PROJECT CAPACITY BUILDING FOR CO<sub>2</sub> MITIGATION FROM INTERNATIONAL AVIATION</p>	<p>Feasible feedstocks identified :</p> <ul style="list-style-type: none"> <li>• used cooking oil (UCO)</li> <li>• municipal solid waste (MSW)</li> <li>• sugarcane byproducts (cane tops)</li> <li>• water hyacinth</li> </ul>

<https://www.icao.int/environmental-protection/pages/SAF.aspx>



## ICAO Capacity building activities

### ICAO SAF Guide

information on how sustainable aviation fuels can be produced, description of fuel production pathways, usage constraints, environmental and other benefits, and policy perspectives on the use and development of SAF.

<https://www.icao.int/environmental-protection/pages/SAF.aspx>  
(or google it “Sustainable Aviation Fuels”)





## State Action Plans (SAPs)



Dynamic communication tools for States to present their aviation and climate change coordinated plan and for facilitating green financing



Sharing of information and best practices on latest green innovations and longer-term low-carbon strategies including SAF deployment projects



## State Action Plans (SAPs)

- States\* are already including SAF related information in their SAPs including:
  - SAF Policies in place/planned
  - SAF R&D Projects
  - Feasibility Studies
  - Demo Flights
  - Public & Private Partnerships
  - Pilot Projects



## State Action Plans (SAPs) and SAF

All States in the ICAO Assistance Project, with the EU funding, Phase 2 are encouraged to include SAF information into their State Action Plans (SAPs)

### Reasons to include SAF deployment projects into a State Action Plan

- Showcase their commitment to the production and use of SAFs to reduce CO<sub>2</sub> emissions from international aviation.
- Prepare feasibility studies and identify assistance needs for implementation
- Facilitate green investment and finance for SAF deployment projects
- Initiate collaboration between the all stakeholders including public and private sectors, which will be critical to implementing a work plan for the deployment of a value chain for SAFs
- Advance the social and economic development associated with the UN Sustainable Development Goals (SDGs) by the development and deployment of SAF



## SAF Goals

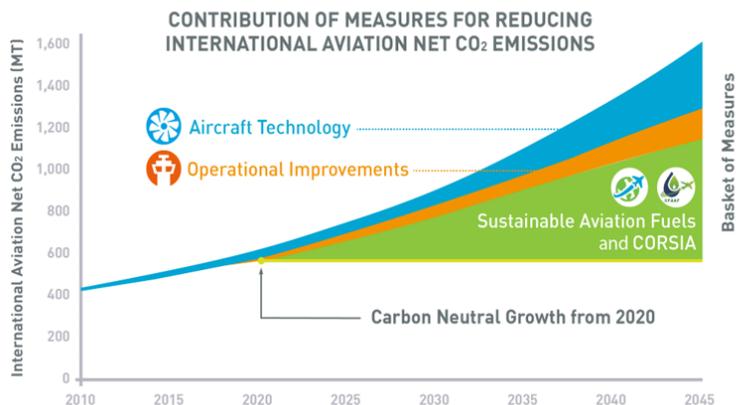
### **ICAO is working to define quantified goals for SAF**

2050 ICAO Vision for Sustainable Aviation Fuels	ICAO work on a long term global aspirational goal for international aviation (LTAG)
Calls for a <b>significant proportion of SAF use by 2050</b> , and a <b>level-playing field with other sectors</b>	combined scenarios of <b>technology, operations, and fuels</b> , in terms of timing, readiness, attainability and CO <sub>2</sub> reductions.
A <b>quantified long-term goal for SAF</b> to be defined in CAAF/3 (by 2025)	Results to be presented to the next ICAO Assembly (2022).

**Ongoing Stocktaking process to support the definition of these goals**



# Work on a Long-Term Aspirational Goal



2019

ICAO Assembly requested the ICAO Council to:

- explore the feasibility of a long-term global aspirational goal (LTAG)

2010

ICAO adopted two Global Aspirational Goals

- 1- 2% annual fuel efficiency improvement through 2050
- 2- Carbon neutral growth from 2020 (CNG2020)



BASKET OF MEASURES

Complemented by

CORSIA

2022

41<sup>st</sup> ICAO General Assembly

Results of the feasibility of LTAG will be presented.



## ICAO LTAG Report

The ICAO Committee on Aviation Environmental Protection (CAEP) undertook:

- (1) **data gathering** from internal and external sources in a transparent and inclusive manner,
- (2) **development of combined in-sector scenarios** from technology, fuels, and operations that represent a range of readiness and attainability, and
- (3) **conducted final analysis** to:
  - understand impacts on CO<sub>2</sub> emissions ,
  - estimate costs associated with the scenarios,
  - place results in context of the latest scientific knowledge.

The LTAG report is now available at the LTAG Website.

<https://www.icao.int/environmental-protection/Pages/LTAG.aspx>

(or search “ICAO LTAG”)





# Main takeaways from ICAO LTAG Report

## IS1 LTAG Integrated Scenario 1

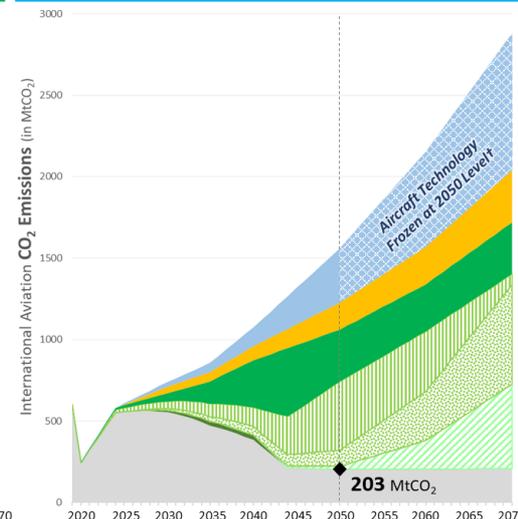
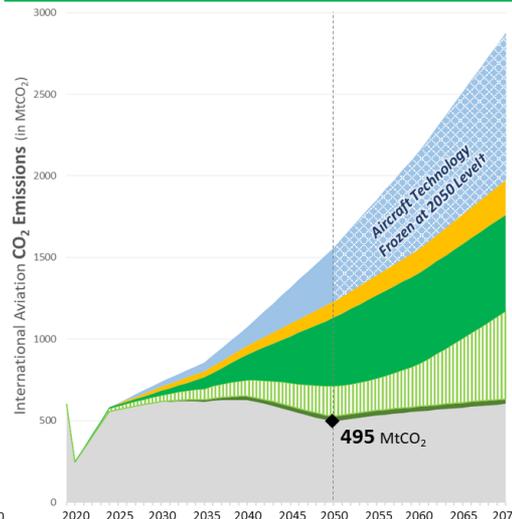
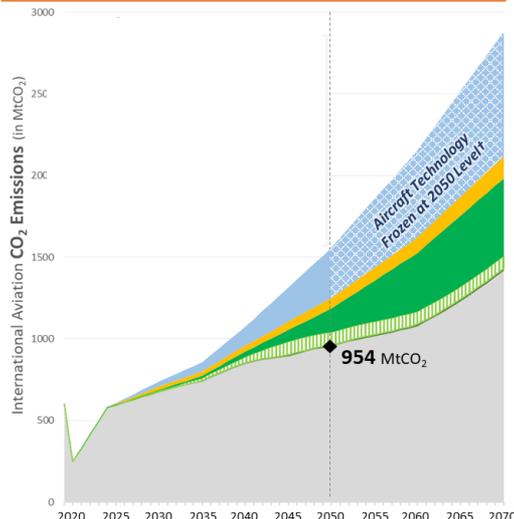
## IS2 LTAG Integrated Scenario 2

## 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

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### Metrics

IS1

IS2

IS3

CO<sub>2</sub> Emissions in 2050 after Reductions

≈950 MtCO<sub>2</sub> in 2050  
(160% of 2019 CO<sub>2</sub> emissions)

≈500 MtCO<sub>2</sub> in 2050  
(80% of 2019 CO<sub>2</sub> emissions)

≈200 MtCO<sub>2</sub> in 2050  
(35% of 2019 CO<sub>2</sub> emissions)

Reduction in 2050 from the Baseline

**39% total** through: Technologies - 20%,  
Operations - 4%, **Fuels - 15%**

**68% total** through: Technologies - 21%,  
Operations - 6%, **Fuels - 41%**

**87% total** through: Technologies - 21%,  
Operations - 11%, **Fuels - 55%**

Cumulative residual Emissions from 2020 to 2070

23 GtCO<sub>2</sub> (2020 to 2050)  
23 GtCO<sub>2</sub> (2051 to 2070)

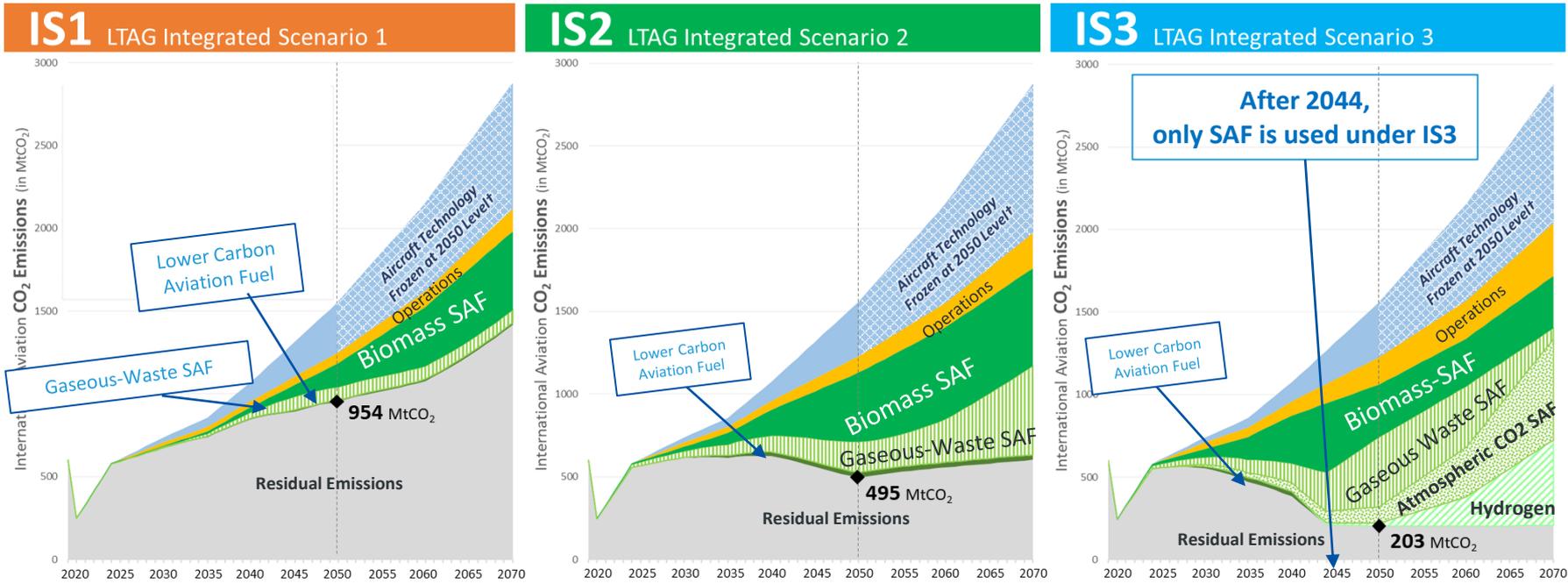
17 GtCO<sub>2</sub> (2020 to 2050)  
11 GtCO<sub>2</sub> (2051 to 2070)

12 GtCO<sub>2</sub> (2020 to 2050)  
4 GtCO<sub>2</sub> (2051 to 2070)



# Main takeaways on Fuels

Largest CO<sub>2</sub> reductions by 2050 coming from fuels



Results to be considered at the next ICAO General Assembly (September 2022)



## Roadmaps for LTAG Implementation

### Implementation Roadmap

- ICAO CAEP considered technical aspects of implementation without prejudging future decisions

### Monitoring of progress

- State Action Plans may be used for States to report progress towards a goal, without duplicating existing processes
- If a goal were adopted, ICAO could conduct future work on possible metrics, reporting mechanisms, etc.

### Review

- ICAO may need to review any goal to ensure it remains appropriate

Annual review process could be considered similar to the CORSIA Periodic Review

### Capacity building

- Possible needs for capacity building and assistance e.g.:
  - **workshops** on measures, including understanding costs
  - **assistance** on monitoring and measuring CO<sub>2</sub> emissions
  - an **overarching training programme** similar to ACT-CORSIA



# ACT-SAF Programme





## What is the ICAO ACT-SAF programme?

- Launched on 1 June 2022
- An ICAO initiative to facilitate the development and deployment of sustainable fuels, while recognizing “not one approach fits all”
- Tailored support for States in various stages of SAF development and deployment
- Facilitate partnerships and cooperation on SAF initiatives under ICAO coordination
- Platform to facilitate knowledge sharing and recognition (progress monitoring) of all SAF initiatives





## Why ICAO ACT-SAF Programme?

- Builds on existing ICAO “ACT” experience, through partnerships and cooperation amongst States – All States/stakeholders can be part of
- ICAO LTAG report foresees largest CO<sub>2</sub> reductions coming from fuels/cleaner energy sources
  - Need for immediate action to fully realize SAF potentials
- Aligned with Resolution A40-18, 2050 ICAO SAF Vision, ICAO NCLB, and three pillars of UN sustainability (Environmental/Economic/Social)
- Stepping stone to explore additional action to support aviation CO<sub>2</sub> reductions



## Promoting SAF together

- Importance of moving forward internationally supporting SAF development and deployment, aiming to address:



**Sustainability of the fuel**



**Affordability and price**



**Diversification of feedstock, stakeholders, cleaner energy**



# Promoting SAF together

- All stakeholders in collaboration to advance ACT-SAF efforts
- Connects with existing projects/programmes
- Promotes and accounts for actions globally
- Active participation of Regional offices on outreach, promotion and support for SAF initiatives in the region





## How will ACT-SAF work

1) States/Organizations express interest in participating*	2) ICAO coordinates with interested participants the details of the offers and requests, and suggest possible projects	3) Memorandum of Understanding (MoU) is signed and projects defined	4) ICAO connects ACT-SAF Participants
<p><b>Supporting State / Organization*</b> can participate by providing experts and/or resources</p> <p><b>Requesting State</b> can participate by providing a focal point for coordination</p>	<p><b>Possible projects:</b></p> <ul style="list-style-type: none"> <li>•Feasibility Studies</li> <li>•Training programmes</li> </ul> <p>Support for SAF certification</p> <ul style="list-style-type: none"> <li>•Support for Policy implementation</li> </ul>	<p><b>MoU will contain:</b></p> <p>Details on the cooperation terms, including the roles and responsibilities of ICAO and each participant</p>	<p><b>Criteria for connection:</b></p> <ul style="list-style-type: none"> <li>•Matching expertise</li> <li>•Language, cultural and geographical aspects</li> <li>•Resources availability</li> </ul>

Instructions to Join ACT-SAF are available at  
<https://www.icao.int/environmental-protection/Pages/act-saf.aspx>



## SAF efforts in WACAF/ESAF

- There is opportunity for support in the region for SAF development and deployment
- Many States have incorporated SAF elements into their State Action Plans - Cooperation via ACT-SAF can assist in this process

State	Initiatives
Benin	SAP (2020-2022)
Burkina Faso	SAP (2015)
Cameroon	SAP (2015)
Cape Verde	SAP (2020-2022)
Chad	SAP (2015)
Congo	SAP (2016)
Côte d'Ivoire	SAP (2020-2022)
Democratic Republic of Congo	SAP (2016)
Equatorial Guinea	SAP (2016)

State	Initiatives
Gabon	SAP (2016)
Gambia	SAP (2020-2022)
Ghana	SAP (2020-2022)
Mali	SAP (2020-2022)
Niger	SAP (2018)
Nigeria	SAP (2020-2022)
Sao Tome and Principe	SAP (2016)
Senegal	SAP (2020-2022)
Togo	SAP (2018)



## SAF efforts in WACAF/ESAF (continued)

State	Initiatives
Botswana	SAP (2022)
Kenya	SAP (2015), Participating in ACT-SAF
Seychelles	SAP (2022)
South Africa	SAF Production Plans
Tanzania	Participating in ACT-SAF



## Next steps of the ICAO ACT-SAF Programme

- Invitation to join ICAO ACT-SAF
  - State Letter sent to States (deadline 15 July 2022)
- Scoping the needs and potential contributions from stakeholders
  - Update of State Action plans
- Under ICAO coordination:
  - Mapping out States SAF development needs
  - Identifying, matching, and setting up specific SAF implementation projects
  - Establish the ACT-SAF platform
  - Monitoring progress



## Conclusions

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- **Sustainable Aviation Fuels are a reality – technology and supporting policies are ready**
- **Opportunities exist for States in developing this new industry**
- **Leadership from States will be of paramount importance to drive the CO2 reductions from SAF**
- **Important to include SAF related opportunities in the State Action Plan**
- **Challenges remain for further deployment**
  - Further policies are needed to drive cost down and increase volumes
  - Level playing field with ground transportation
  - Harmonized approach
- **ACT-SAF will facilitate cooperation**



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THANK YOU