



# FLY NET ZERO

## Managing aviation's CO<sub>2</sub> impact: an introduction to carbon offsetting

A basic introduction for industry | Virtual briefing | 1 June 2023



**FLY  
NET  
ZERO**



**Welcome**

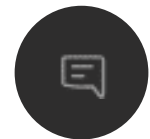
**Haldane Dodd**

Executive Director, ATAG

# Virtual briefing protocol



Please mute your line while listening and disable your camera



Use the **chat** function to submit any questions, **mentioning which speaker the question is for**. These will be addressed at the end (time permitting)



The briefing is being recorded

**Reminder:**  
This session is designed as a basic overview of carbon offsetting and out-of-sector measures.

# Agenda

1 **Setting the scene: aviation's climate strategy**

Haldane Dodd



2 **Understanding carbon offsetting, pricing, removals and other out-of-sector measures**

Ellen Lourie



3 **Understanding ICAO CORSIA and the IATA Aviation Carbon Exchange**

Michael Schneider



4 **Putting carbon pricing into practice**

Jonathon Counsell



5 **Question and answer session**

All

Welcome

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# FLY NET ZERO

1

## Setting the scene: aviation's climate action strategy



The Power of Flight

Haldane Dodd  
Executive Director, ATAG

# A global commitment to climate action



*“Global civil aviation operations will achieve net-zero carbon emissions by 2050, supported by accelerated efficiency measures, energy transition and innovation across the aviation sector and in partnership with governments around the world.”*

**F**

A transition away from fossil fuels by mid-century as part of a wider aviation energy shift.

**T**

Research, development and deployment of evolutionary and revolutionary airframe and propulsion systems (potentially electric and hydrogen )

**O**

Continued improvements in efficiency of operations and infrastructure across the system.

**M**

Investments in high-quality offsets in the near-term and carbon removals opportunities to address residual CO<sub>2</sub> emissions in the longer-term.

Commitment by the full air transport sector:



AIRPORTS COUNCIL INTERNATIONAL



International Business Aviation Council



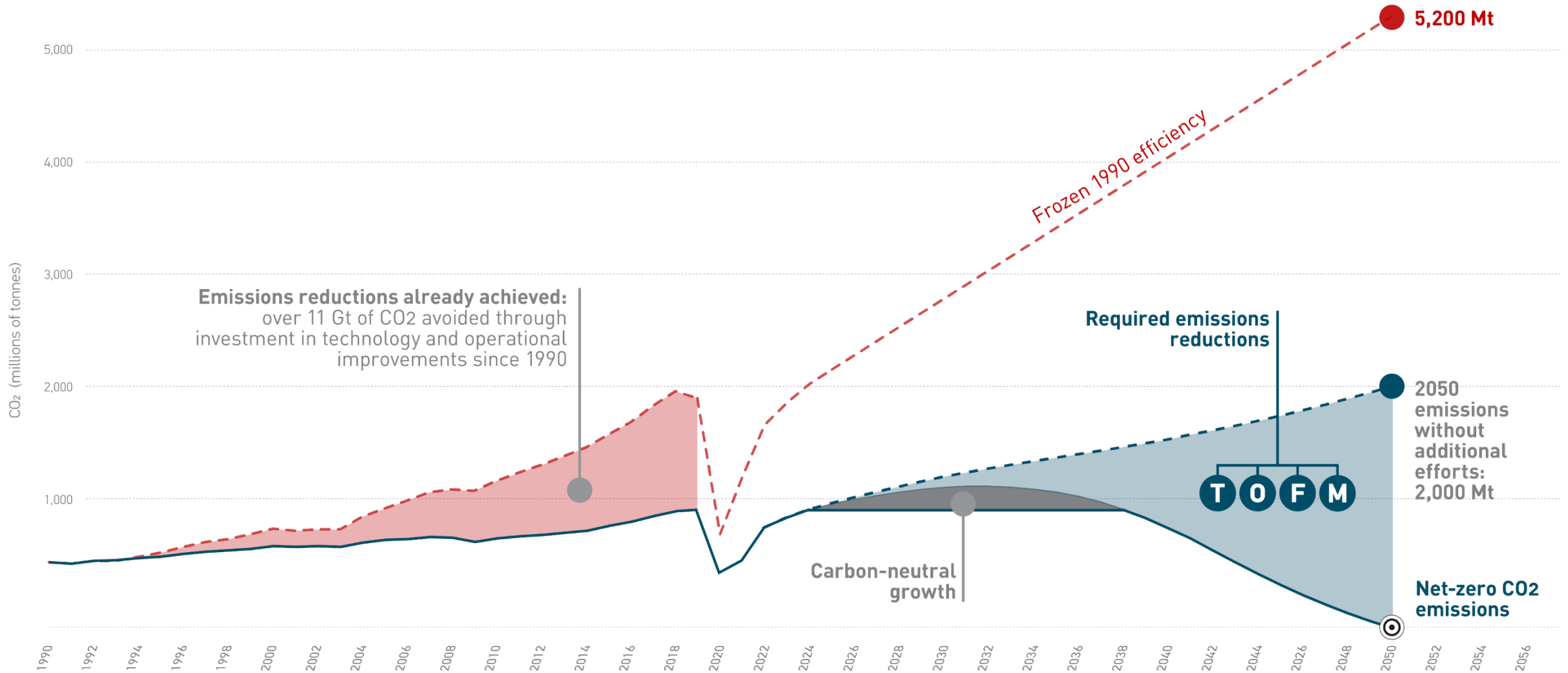
Supported by innovation and action throughout the supply chain:



The Power of Flight



# Charting a course to net-zero





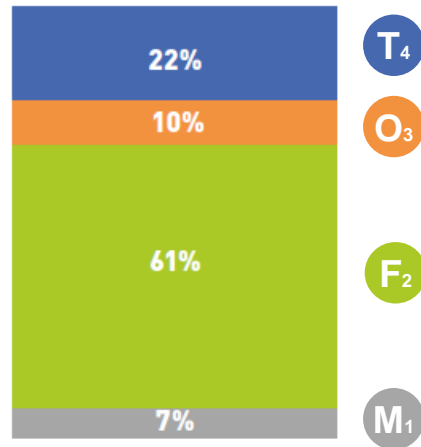
# SAF most significant, but MBMs will be needed

## Scenario 1

### Pushing technology and operations

Industry prioritises technology and operational improvements

Emissions reduction contributions in 2050



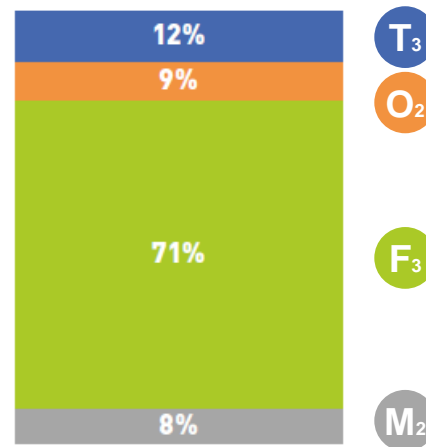
Electric and hybrid short-range (<100 seat) aircraft from 2035/2040. High-range operational improvements. 380 Mt of SAF by 2050.

## Scenario 2

### Aggressive sustainable aviation fuel deployment

Industry prioritises investment in sustainable aviation fuel over technology

Emissions reduction contributions in 2050



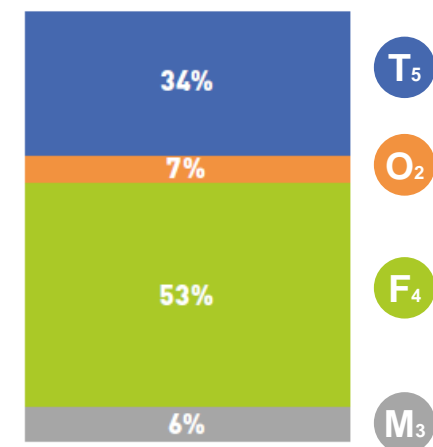
New airframe configurations such as blended wing body. Mid-range operational improvements. 445 Mt of SAF by 2050.

## Scenario 3

### Aspirational and aggressive technology perspective

Highly ambitious technology developments: electric and/or hydrogen for up to 200 seat aircraft before 2035

Emissions reduction contributions in 2050



Very aggressive zero emissions aircraft (electric, hydrogen) by 2035-2040. Mid-range operational improvements. 330 Mt of SAF by 2050.



# FLY NET ZERO

## Understanding carbon offsetting, pricing, removals and other out-of-sector measures



The Power of Flight

Ellen Lourie

Director, NCS & Aviation, IETA

Angela Foster-Rice

Legal Counsel / Senior Vice President –  
Policy and Market Innovation, Everland

# ABOUT IETA

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**IETA is a non-profit group with a vision of a common global carbon price produced by markets of high environmental integrity.**

IETA's diverse membership benefits from a full range of views – industrials, verifiers, lawyers, project developers, investors, standards, traders & consultants – from every market in the world.

We pride ourselves to be involved in and influence policy design, thought leadership, global capacity building, best practice and knowledge transfer.

We value our global Partnerships & Strategic initiatives with UNFCCC, World Bank, OECD, IEA, ICAO, IATA & other multilateral organisations.



# IETA MEMBERS



# A BRIEF HISTORY OF CARBON MARKETS

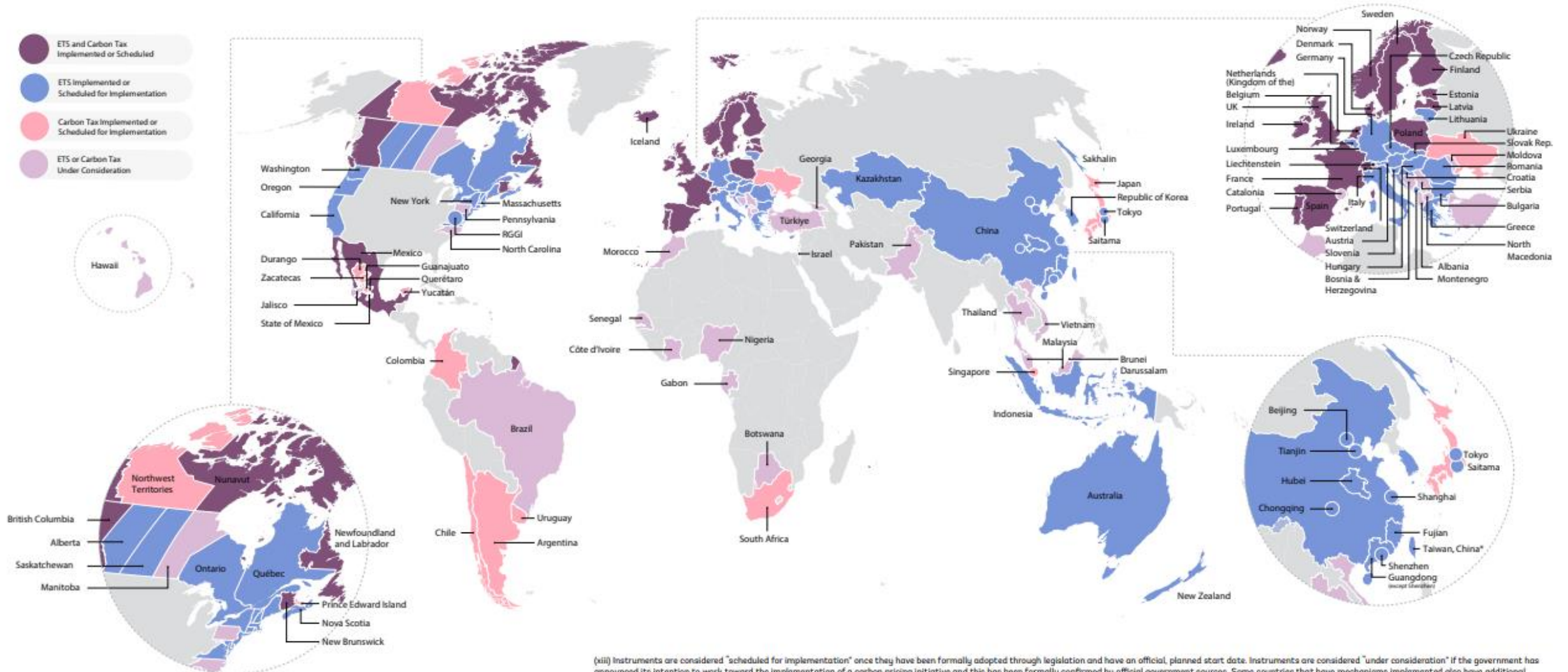
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- The first carbon market emerged under the Kyoto Protocol in 1992
- In the past decade, the share of global emissions covered by carbon taxes and emissions trading systems (ETSs) has grown from 7% to around 23%
- In 2021 the value of the voluntary carbon market reached \$2 billion



# STATE OF PLAY: STATE & TRENDS 2023

FIGURE 5  
MAP OF CARBON TAXES AND ETSs<sup>(iii)</sup>



(iii) Instruments are considered "scheduled for implementation" once they have been formally adopted through legislation and have an official, planned start date. Instruments are considered "under consideration" if the government has announced its intention to work toward the implementation of a carbon pricing initiative and this has been formally confirmed by official government sources. Some countries that have mechanisms implemented also have additional instruments under consideration. For subnational jurisdictions only the subnational instrument is reflected.

# STATE OF PLAY: MOVING PARTS



## Unimpeachable quality

Promote social and environmental integrity in the generation of carbon credits by developing a Core Carbon Principle (CCP) threshold standard for what constitutes a high-integrity credit, along with governance to ensure proper oversight

Eligible programs and approved categories will be announced before the end of this year



## Honest claims

Ensure integrity in the use of carbon credits by defining high-integrity corporate claims and creating norms around their use in the context of a robust net-zero pathway

On 28 June, VCMI will launch an operable Claims Code for corporate buyers looking for guidance on credible voluntary use of carbon credits

## Compliance Markets

- Government regulated carbon pricing systems, e.g.:
  - EU ETS\*
  - UK ETS
  - Canadian Output-Based Pricing System (OBPS) & Carbon Levy
  - California Cap and Trade System
- Rules are set by government (emissions cap, price, coverage)

\*Implementation of ICAO's CORSIA through the EU ETS directive – *Special relevance to aviation sector*

- EU ETS will apply for intra-European flights (including UK & CH)
- CORSIA will apply for extra-European flights
- From 2027, EU ETS coverage of flights to third countries not applying CORSIA
  - Except Least Developed Countries (LDCs) and Small Island Developing States (SIDSs)
- Maintains EU ETS ambition, general EU ETS linear reduction factor applies



## Voluntary Markets

- Not mandatory
- Private-sector driven
- Carbon credits used to meet voluntary corporate targets /to become carbon neutral
- Interest and activity in the VCM is rapidly increasing
  - In part driven by explosion of corporate commitments to net zero by 2050

### *Special relevance to aviation sector*

- The VCM offers opportunities for the aviation sector to fund emissions reductions beyond CORSIA, and to meet internal / voluntary climate targets
  - Including offering passengers the ability to offset their flights

## International Markets

- Article 6 of the Paris Agreement
- CORSIA

# WHAT IS AN OFFSET



- In compliance markets – it is common for only certain sectors to be covered by the carbon price
  - Mostly power sector and industry
- In some compliance markets “offsets” can be used to allow for emissions reductions in other sectors to be incentivised
- Offset projects often take place in non-industrial sectors, including forestry & agricultural

## Example: EU ETS for Aviation

- Emission units for which assurance is given for use by EU-based airlines for CORSIA:
  - Units under Article 6 of the Paris Agreement
  - Approved units by ICAO Council
  - Third country agreements under the ETS (provision in Article 11a(5))
  - Credits issued from Union-level projects under the EU ETS (provision in Article 24a)
- All units must come from a country participating in the Paris Agreement
- And, from 2027, participating in CORSIA – an incentive for countries to participate

*CORSIA is an offsetting system that complements the other elements of the basket of measures by offsetting the amount of CO<sub>2</sub> emissions that cannot be reduced through technological improvements, operational improvements, and SAF with emissions units from the carbon market.*

# OFFSETS IN THE VCM

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- In the VCM, these offsets are based on methodologies established by independent standards bodies, such as:
  - Verra (The Verified Carbon Standard)
  - Climate Action Reserve
  - American Carbon Registry
  - Architecture for REDD+ Transactions
- Landowners, farmers, NGOs, businesses (project developers) use these methodologies to develop their projects
  - Ultimately generate carbon credits that are purchased by corporations



# OFFSETS DEEPDIVE: REMOVALS



- Achieving the Paris Agreement climate targets requires strategies that actively remove carbon from the atmosphere
- Carbon removal will be particularly important for hard-to-abate sectors, like aviation
- Up to 3.4 gigatonnes of carbon may need to be removed by 2050 to counterbalance non-CO<sub>2</sub> emissions from aviation
- Carbon removal methods include:
  - Natural strategies like tree restoration and agricultural soil management;
  - Technological strategies like direct air capture and enhanced mineralization; and
  - Hybrid strategies like enhanced root crops, bioenergy with carbon capture and storage, and ocean-based carbon removal

# OFFSETS DEEPCDIVE: NATURAL CLIMATE SOLUTIONS



- Actions that conserve, restore or improve the use or management of natural ecosystems that can be harnessed to limit climate change
- Three different ways natural systems can limit climate change
  - Reducing emissions from natural sources (improved forest management)
  - Avoid the release of emissions (forest conservation)
  - Enhancing the capture and storage of carbon in nature (reforestation / afforestation)
- There are different project types based on the above activities
  - REDD+ (broad tropical forest conservation project)
  - Soil Enrichment
- Methodologies are developed to measure, monitor, and verify project activities and results
  - Developed by third party standards or governments
  - Ultimately, these projects issue offsets credits



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and counting



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3

# Understanding ICAO CORSIA and the IATA Aviation Carbon Exchange



The Power of Flight

Michael Schneider

Assistant Director Sustainability Programs, IATA

# CORSIA Overview

Michael Schneider

Assistant Director Sustainability  
Programs

May 2023



31 May 2023



2.5b  
tonnes of CO<sub>2</sub> will  
be mitigated  
by 2035



\$40b  
will be generated  
in climate finance  
by 2035

2019  
Binding standards  
apply since  
1 January 2019



# CORSIA

Carbon Offsetting and Reduction  
Scheme for International Aviation

Why?

Who?

How?



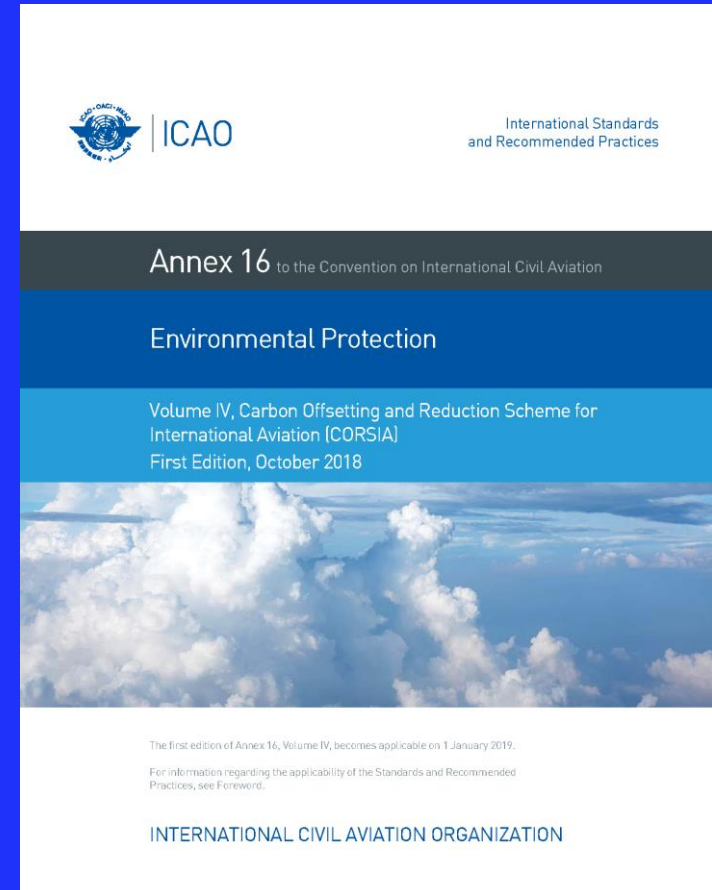
# Requirements

1. Annual CO<sub>2</sub> emissions reporting.
2. Investment in offsets, or “emission units”, for the growth in CO<sub>2</sub> emissions covered by the scheme.
3. CORSIA Baseline

**Carbon Offsets**  
from a range of  
climate projects,  
mainly in  
developing  
nations

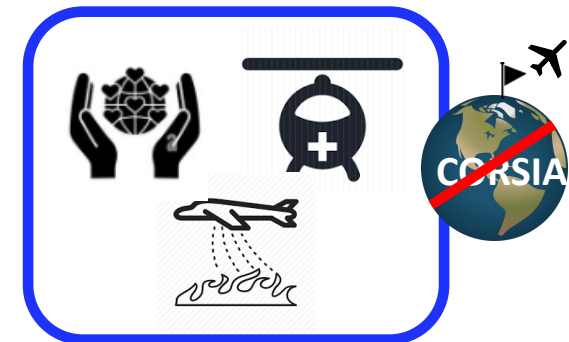
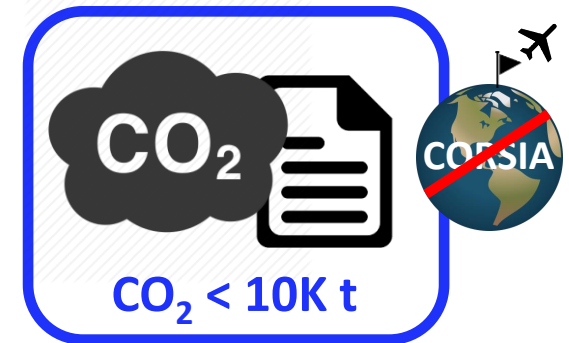
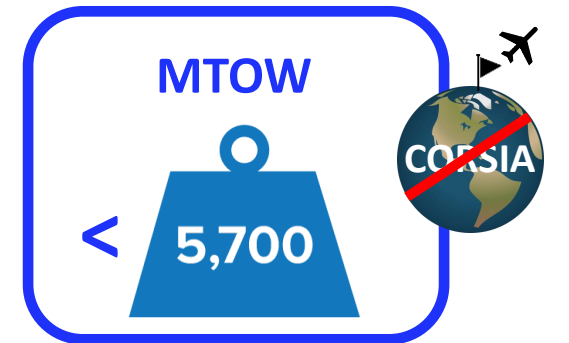
**Allowances** (e.g.,  
EU ETS) are not  
covered under  
CORSIA

# Annex 16



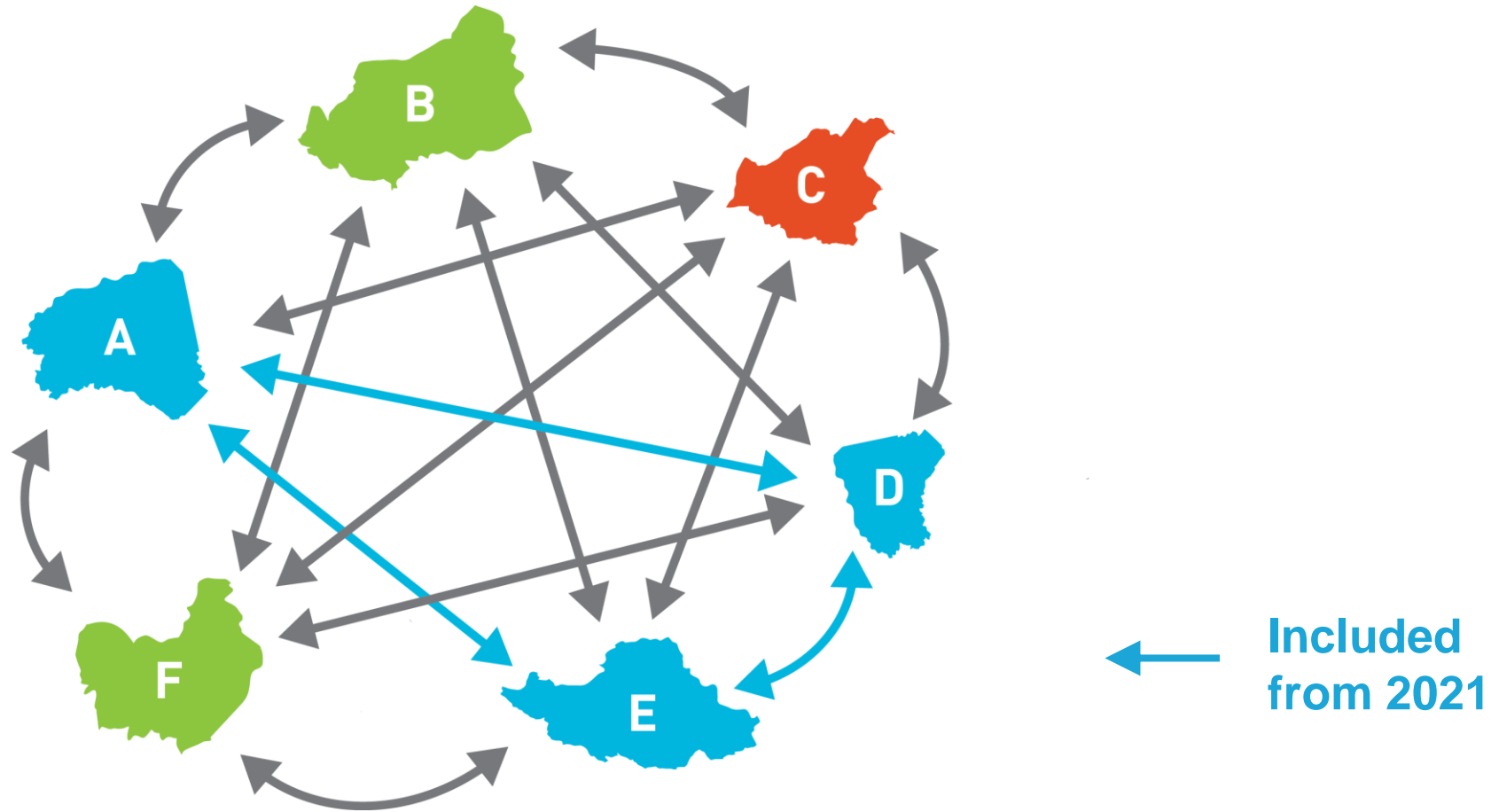
# Airlines Subject to CORSIA & Technical Exemptions

- **International** flights only.
- Close to 1,000 airline operators affected.
- Phased implementation of CORSIA.
- CORSIA baseline
  - Pilot Phase - 2019 emissions
  - First Phase - 85% of 2019 emissions



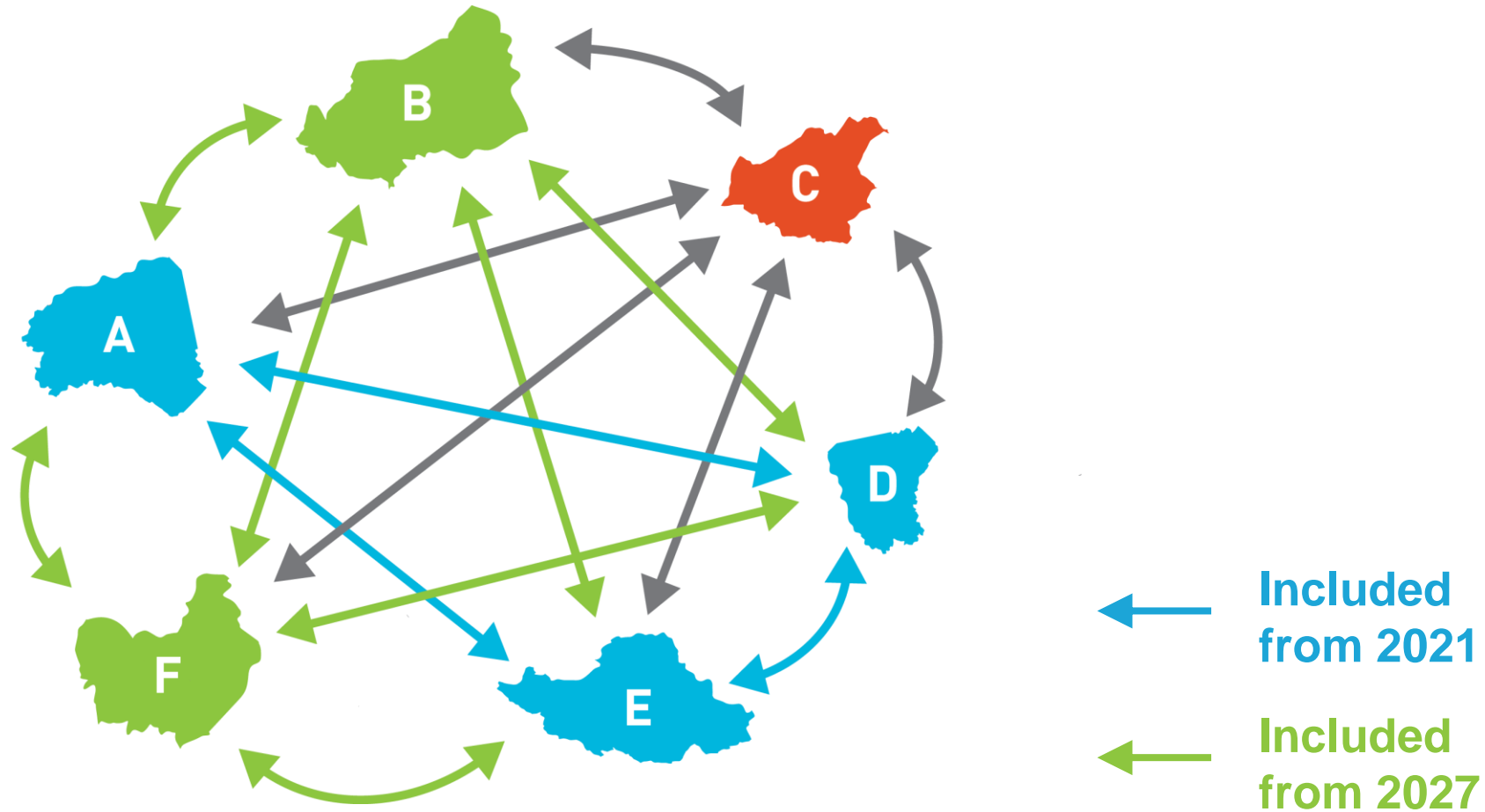
# Phased implementation: pilot and first phase

- From 2021 until 2026 the scheme will only apply to international flights between **States that volunteer** to participate in the pilot and/or first phase.



# Phased implementation: second phase

- From 2027, participation is mandatory for States meeting certain criteria
- Least Developed Countries (LDCs), Small Island Developing States (SIDs) and Landlocked Developing Countries (LLDCs) are exempt, unless they volunteer



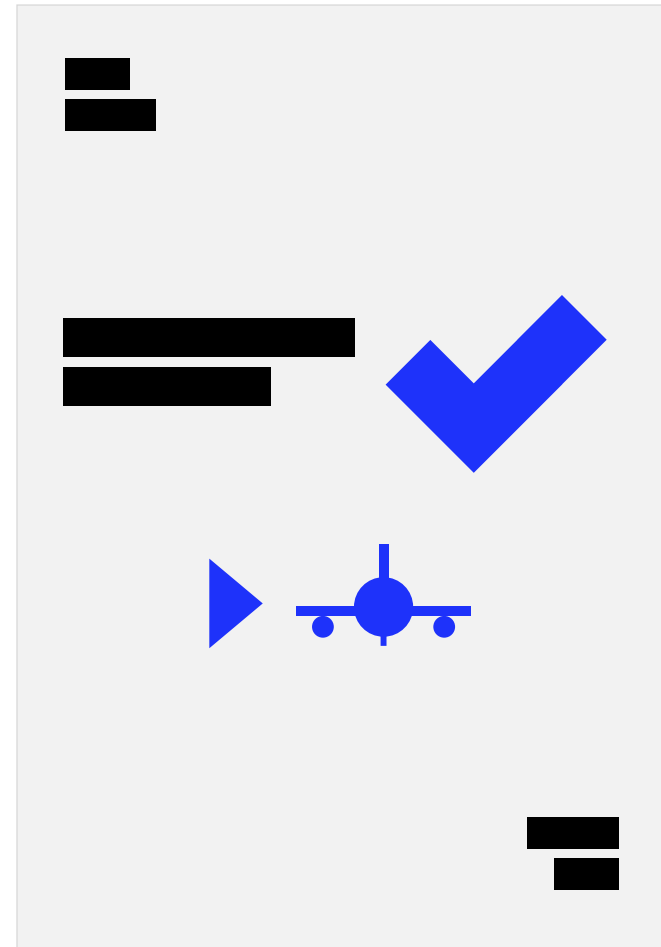
# Preparing for the next steps

## **MRV for 2022 emissions**

Remains mandatory

## **Preparing for offsetting requirements**

With 85% of 2019 as CORSIA's baseline, offsetting requirements will likely kick off in 2024.



# Step 1) Emissions Reporting (MRV)

- Emissions reporting obligation.
- IATA offers free online application **FRED+** to generate CORSIA emissions report
- Use of CORSIA standard templates (as per SARPs)
- Annual process.
- Verification of data.
- Data submission to CAAs or other administering authorities.



# Step 2) Offsetting Obligation

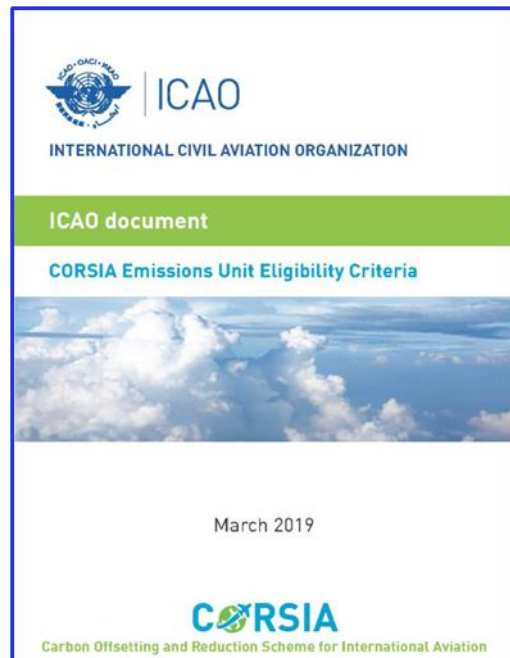
- In order to calculate its offsetting requirements, each airline needs:
- Its sectoral component, which is based on:
  - The industry's sectoral factor
  - The operators' total CO<sub>2</sub> emissions
- Between 2033-2025 an individual component based on:
  - Its growth in CO<sub>2</sub> emissions above its own baseline emissions (85 % sectoral and 15% individual)



# Emissions Units Criteria

Only **specific carbon credits** that meet all environmental eligibility criteria under CORSIA can be used for compliance.

= **CORSIA Eligible Emissions Units**



# Key Integrity Criteria

Criteria for assessment of emissions units:

- Additionality, permanence and leakage
- Baseline and quantification of emissions reductions
- Traceability
- No double-counting
- Do no net harm



# Offset Eligibility & TAB

Technical Advisory Body (TAB) makes recommendations to the Council on the basis of EUG.

TAB receives the applications from programs/standards for review and acceptance under CORSIA.

Information on eligibility is publicly available.

## Approved Programs/Standards

### Pilot Phase (2021-2023)

- American Carbon Registry (ACR)
- Architecture for REDD+ Transactions (ART)
- China GHG Voluntary Emission Reduction Program
- Clean Development Mechanism (CDM)
- Climate Action Reserve (CAR)
- Global Carbon Council (GCC)
- The Gold Standard (GS)
- Verified Carbon Standard (VCS)



ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ICAO document

CORSIA Eligible Emissions Units



March 2023

CORSIA

# Approved Programs/Standards First Phase (2024-2026)

- American Carbon Registry (ACR)
- Architecture for REDD+ Transactions (ART)

Vintage Restriction – 2021  
First activity year - 2016

- **Conditionally Eligible** (subject to further review)
  - Climate Action Reserve (CAR)
  - Global Carbon Council (GCC)
  - The Gold Standard (GS)
  - Verified Carbon Standard (VCS)



# Offset Procurement Options

## Buy from Project Developer

- The project developer is seller in the contract (Emission Reduction Purchase Agreement - ERPA)
- The seller's margin is included in the price of offsets.
- Can be selected via competitive tender
- May be exclusive partner

## Buy from Intermediary

- The intermediary is seller in ERPA.
- Margins of project developer and intermediary is included in offset price
- There are over 100 intermediaries in the carbon market
- Can be selected via competitive tender.
- May be exclusive partner

## Buy from Exchange

- Exchange is seller in the transaction
- Buyer needs to be set up as approved party
- In spot exchanges, offsets and payments are settled on same day
- Exchange receives a fee per transaction or tonne

# Carbon Market Challenges

- Who to engage with?
- Identifying CORSIA eligible credits.
- Limited understanding of the financial exposure.
- Transacting is technical & complex.
- Very limited price transparency.
- Limited access to larger portfolios.
- Disjointed carbon registry infrastructure.
- Risk of investing in credits that are worthless under CORSIA.
- Lack of carbon market intelligence.



# IATA Aviation Carbon Exchange

- Available to all airlines & aviation stakeholders.
- Settlement of trades via IATA Clearing House.
- Market overview of available credits, including CORSIA credits or GEO contracts.
- Price discovery & transparency.
- 2022 trading volume 15mt, 75m USD.

ORDER ENTRY:		BIDS & OFFERS															
Place Bid   Place Offer   Report Trade		Actions		Instrument		Buy											
ORDER MANAGEMENT:	Hold All   Release All   Kill All	Standard	Project Type	Country	B Vintage	B Project	Info	Bid Sum	A	X	Bid Vol	Bid	Ask1	Ask Vol	Lift	X	
ORDER MANAGEMENT: Hold All   Release All   Kill All  DISPLAY CURRENCY: Listed Currency  STANDARD: <input checked="" type="checkbox"/> Verified Carbon Standard <input checked="" type="checkbox"/> Gold Standard <input checked="" type="checkbox"/> Climate Action Reserve <input checked="" type="checkbox"/> American Carbon Registry <input checked="" type="checkbox"/> Verified Carbon Standard (REPORTED)  PROJECT TYPE: <input checked="" type="checkbox"/> Agriculture <input checked="" type="checkbox"/> Alternative Energy <input checked="" type="checkbox"/> Emissions <input checked="" type="checkbox"/> Energy <input checked="" type="checkbox"/> Other <input checked="" type="checkbox"/> Forestry <input checked="" type="checkbox"/> Waste <input checked="" type="checkbox"/> Landfill		VCS-VCU	Energy Industries - renewable/non-renewable sources	Asia/China								USD 0.66	150,451				
												USD 0.70	93,423				
												USD 0.94	98,245				
												USD 0.95	50,000				
												USD 1.00	40,474				
			GS-VER	Wind	Asia/Turkey								USD 1.30	105,431			
			VCS-VCU	Manufacturing Industries	Asia/India								USD 1.50	20,775			
			VCS-VCU	Energy Industries - renewable/non-renewable sources	Asia/Turkey								USD 1.50	20,775			
													USD 1.60	40,000			
													USD 1.60	20,000			
			GS-VER	Biomass - Cogeneration	Asia/China								USD 1.60	6,633			
			GS-VER	Wind	Asia/India								USD 1.95	54,743			
			VCS-VCU	Waste handling and disposal	Asia/Thailand								USD 2.20	20,043			
													USD 2.20	4,311			
													USD 2.20	10,530			
												USD 2.20	776				
												USD 2.20	4,426				
		VCS-VCU	Energy Industries - renewable/non-renewable sources	Asia/India								USD 2.21	75,000				
												USD 2.21	75,000				
												USD 2.60	405				
		VCS-VCU	Forest Carbon	Latin America/Brazil								USD 2.50	350,714				
												USD 2.50	13,498				
												USD 2.50	1,337,216				



# Final Step: Cancellation of CORSIA Emissions Units

Your location: Home > CDM Registry

16:19:30 Nov 17

CERs cancelled to date in the CDM Registry



Show 10 entries

Search:

Project/POA number	Project name	Project type	Host country	Quantity of units cancelled	Unit type	Reason/Beneficiary	Date of completion	Link to the attestation
0530	ARAPUtanga Centrais ELébricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project	Energy industries (renewable - / non-renewable sources)	Brazil	22,279	CERs	GMR Hyderabad International Airport Ltd (GHIAL) is responsible for operation, management and development of Rajiv Gandhi International Airport (RGIA), Shamshabad, India. GHIAL is fully committed for climate change mitigation and to ensure sustainable development of RGIA. Since 2012, RGIA has been participating in Airports Council International's (ACI) Airport Carbon Accreditation Programme for greenhouse gas emissions management. RGIA achieved "Level 2 : Reduction" in 2012, and Level 3 : Optimization in 2013 under this Programme. In continuation of this journey, GHIAL has aimed towards Level3+: Neutrality by offsetting its scope 1 & 2 and scope 3 (employees business travel) emissions. As part of this approach, GHIAL commissioned a 5 MW solar power plant in 2015 and started offsetting of its emissions. And also purchased CERs for offsetting of the residual emissions. Consequently, GMR Hyderabad International Airport Ltd has achieved ACI- Level3+: Neutrality of the Airport Carbon Accreditation (ACA) in 2016. Further, GHIAL needs 22,279 certified emission reduction (CERs) for offsetting the residual emissions for the calendar year 2016 towards renewal of the Level3+: Neutrality accreditation.	22/11/2017	Attestation letter
2342	14 MW Wind Power Project in Maharashtra	Energy industries (renewable - / non-renewable sources)	India	2,120	CERs	Retired on 17.11.2017.	17/11/17	Attestation letter
6275	Los Santos Wind Power Project	Energy industries (renewable - / non-renewable sources)	Costa Rica	172	CERs	Voluntary cancellation made by Anaconda Carbon S.A. on behalf of FACO (Franz Amrhein y Compañía S.A.) to offset emissions generated by 10,000 kilometers of new Honda vehicles sold by FACO in the month of October 2017. For more information please visit: <a href="http://www.hondacostarica.com/co2">www.hondacostarica.com/co2</a>	15/11/2017	Attestation letter
6275	Los Santos Wind Power Project	Energy industries (renewable - / non-renewable sources)	Costa Rica	28	CERs	SDR ha adquirido de Anaconda Carbon certificados de compensación voluntaria de 28 toneladas de CO2 equivalente para la neutralización de sus emisiones durante el periodo 2016.	15/11/2017	Attestation letter
2910	K-water 0.96MW bundle small-scale hydroelectric power plants project	Energy industries (renewable - / non-renewable sources)	Republic of Korea	4,878	CERs	This request is submitted to cancel the 4,878 CERs of K-water 0.96MW hydropower CDM project and use them as offset in Korean Emissions Trading Scheme. And the beneficiary of this request is Korea Water Resources Corporation ("K-water").	13/11/2017	Attestation letter
5553	Renewable Wind Power generation for promoting energy security	Energy industries (renewable - / non-renewable sources)	India	800	CERs	Chooose x Matoma: The climate positive tour	13/11/2017	Attestation letter
5619	Modelo del Callao Landfill Gas Capture and Flaring System	Waste handling and disposal	Peru	13,511	CERs	Voluntary Cancellation of 13511 CERs to neutralize the carbon footprint of all the operations of Petramas S.A.C during 2013 in the solid waste management in the cities Lima, Callao y Huarochiri.	08/11/2017	Attestation letter
1713	Community-Based Renewable Energy Development in the	Energy industries (renewable - / non-	Pakistan	146	CERs	The Government of Canada has withdrawn from the Kyoto Protocol and requested IBRD as Trustee of Carbon Funds to cancel all emission reductions resulting from its participation in these Funds.	07/11/2017	Attestation letter

Thank You







# FLY NET ZERO

## Putting carbon pricing into practice



The Power of Flight

Jonathon Counsell  
Group Head of Sustainability, IAG



# Flightpath net zero

<https://www.iairgroup.com/sustainability/flightpath-net-zero>

Announced 10 October 2019

A faint, grayscale world map is visible in the background of the slide, centered behind the text.

# Long Term Target – Net Zero Emissions by 2050

IAG Commitment 10<sup>th</sup> October  
2019

A faint, grayscale world map serves as the background for the slide. The text is centered over the map.

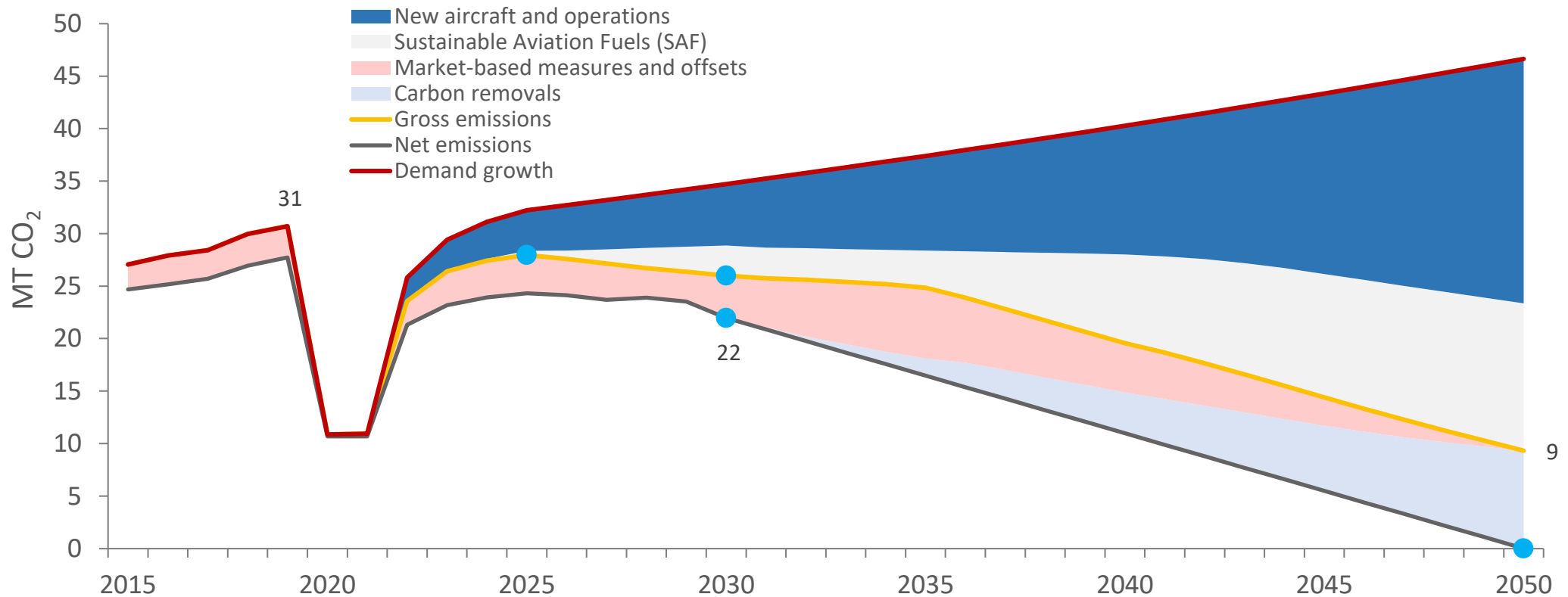
# **Commitment to 10% Sustainable Aviation Fuels by 2030**

**1 million tons SAF pa  
saving 2 million tons CO<sub>2</sub> pa**

**Announced April 22nd 2021 (Earth Day)**

# Latest IAG roadmap scenario

- Gross emissions 70% lower than in 2019, emissions intensity 80% lower, dependent on policy support.
- Compliance and voluntary offsets are 10% of cumulative emissions reductions





Our future sourcing strategy is to have a mixed portfolio of deals; optimised for capital efficiency and supported by policy

IAG 2030 Target of 1.0m tonnes of SAF

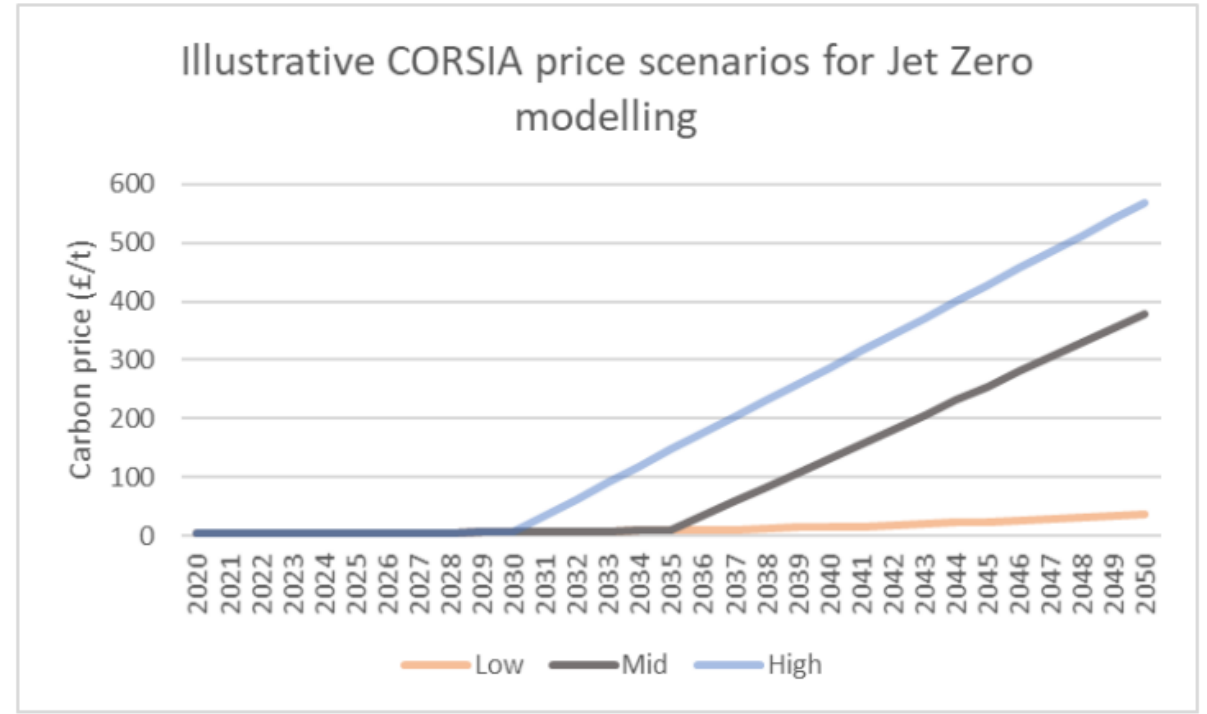
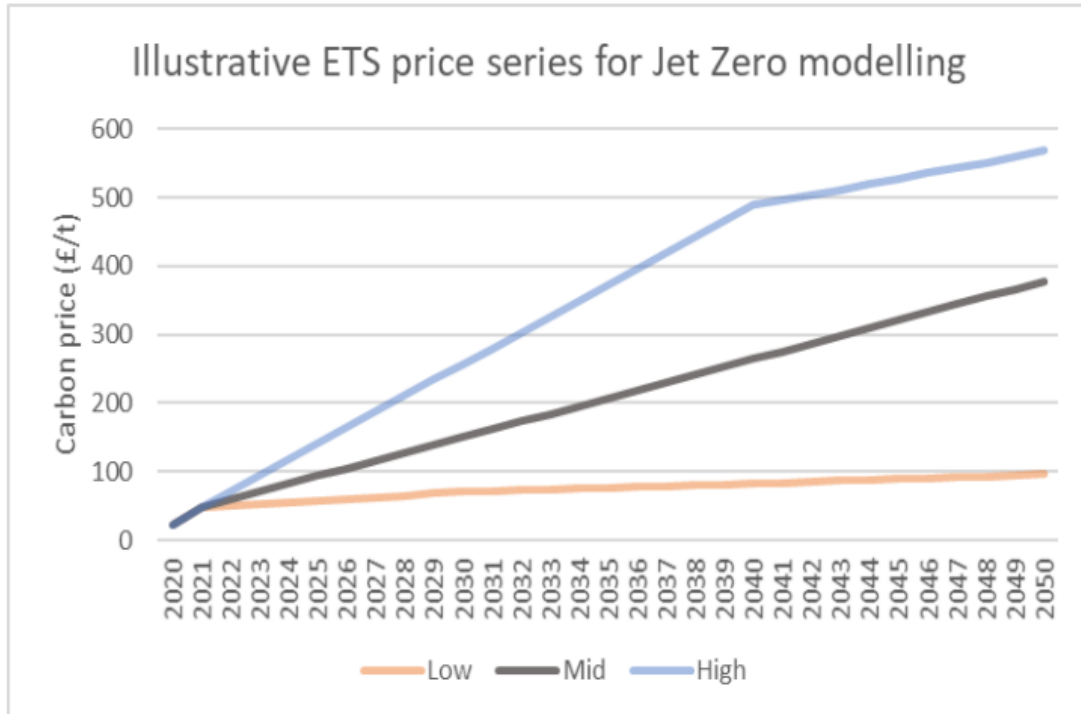
Government mandates require SAF be sourced in the EU+UK ...

- EU / UK carbon pricing supports the business case
- Requires investing in start-ups
- In exchange for access to SAF

... allowing the remaining SAF to be sourced in the US

- CORSIA will support but relatively small benefit today
- Requires volume commitments
- Stable carbon markets & best policy support

# UK Government Illustrative Carbon Pricing Assumptions



Through our accelerator we engage with cutting edge technologies and teams

## CHOOOSE

CHOOOSE

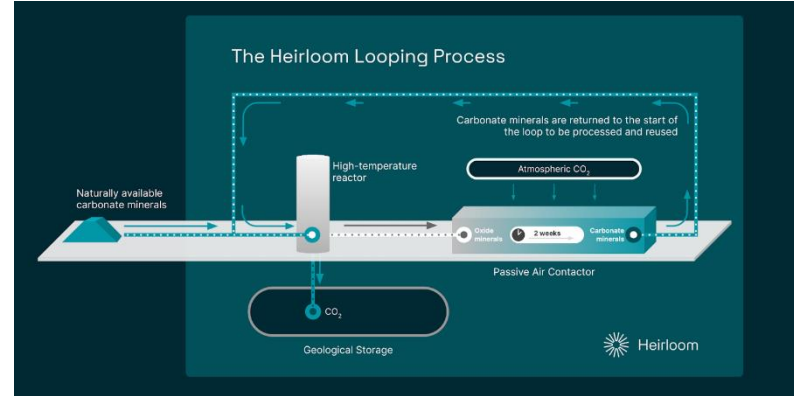
Seamless climate software solutions



## NAV FLIGHT SERVICES



## HEIRLOOM



## Ecovadis

ecovadis  
Business Sustainability Ratings



## ZeroAvia



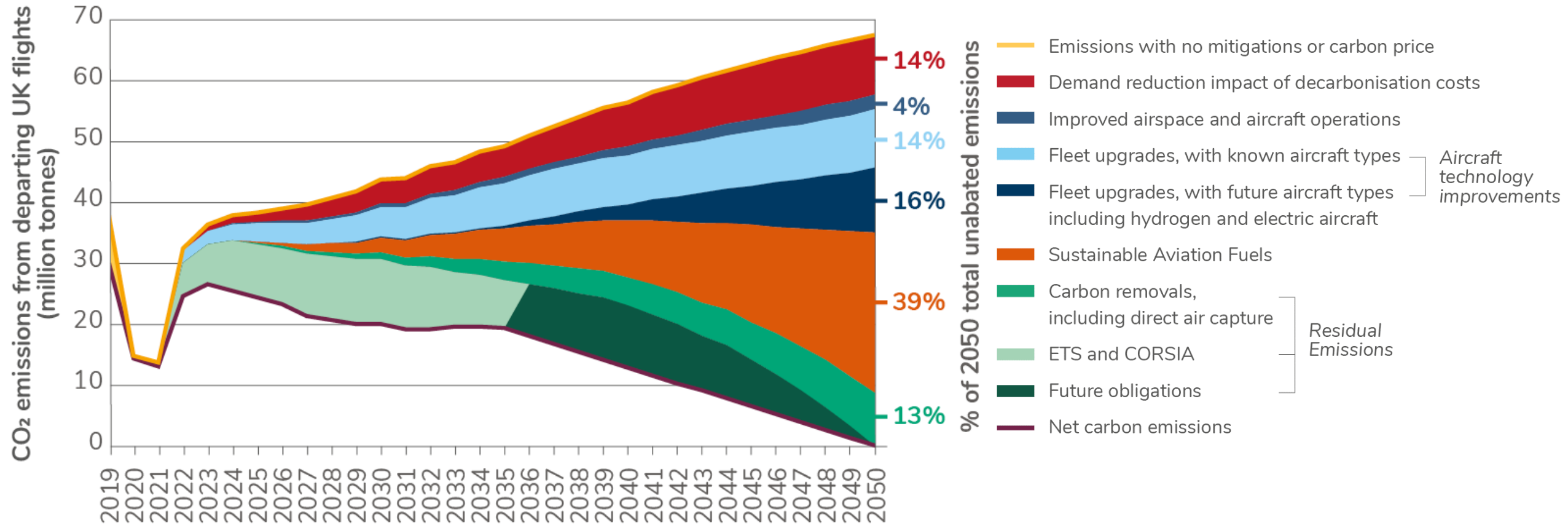
## Technologies we are exploring

- Zero-emission flight
- Customer engagement
- Carbon removals
- Operational efficiency
- Future fuels
- Waste management



# UK Sustainable Aviation Carbon Roadmap 2023

## Demand impact of decarbonisation





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5

**Question and answer session**



The Power of Flight

Q&A

Questions?



The Power of Flight

# Where do I get more information?



[www.aviationbenefits.org/W2050](http://www.aviationbenefits.org/W2050)

[www.aviationbenefits.org/FlyNetZero](http://www.aviationbenefits.org/FlyNetZero)