

# Societal Benefits

SUSTAINABLE  
AEROSPACE  
TOGETHER



**4.4 billion**

passengers



**\$8 trillion**

in goods  
exchanged

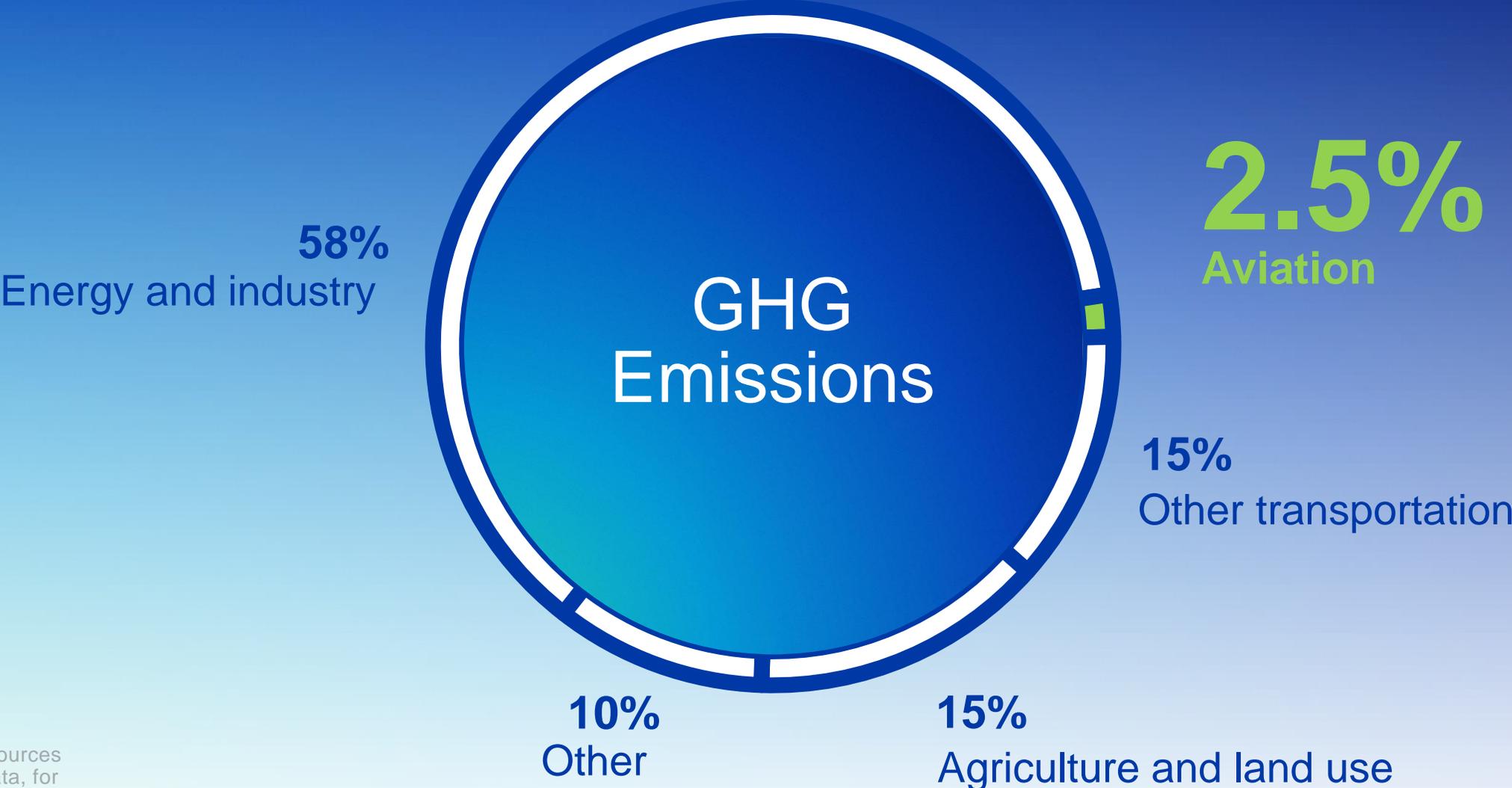


**86.5 million**

jobs  
supported

Source: ATAG, 2024

# Aviation in Context



World Resources  
Institute data, for  
CY2019

# Decarbonizing Aerospace

SUSTAINABLE  
AEROSPACE  
TOGETHER

## FLEET RENEWAL



## OPERATIONAL EFFICIENCY



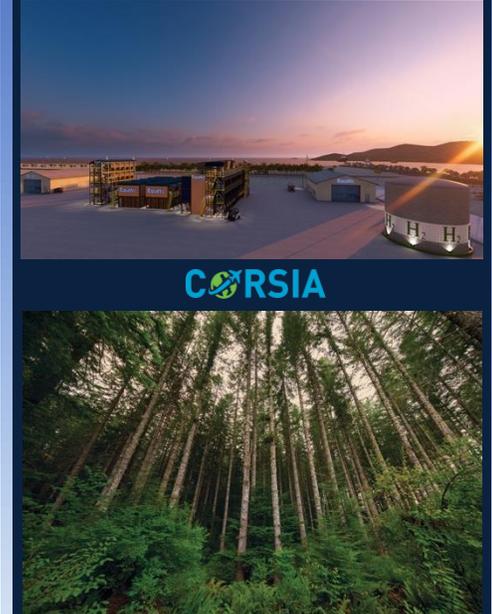
## RENEWABLE ENERGY



## ADVANCED TECHNOLOGY



## MARKET-BASED MEASURES



# Pioneering SAF for 15+ years

SUSTAINABLE  
AEROSPACE  
TOGETHER

## TECHNOLOGY & TESTING

**2008**

First biofuel test flight with Virgin Atlantic



**2010**

U.S. Navy F/A-18 supersonic flight on 50/50 SAF blend



**2011**

Led research for ASTM approval of HEFA pathway

**2008**

**2010**

**2012**

**2014**

**2016**

**2018**

**2020**

**2022**

**2024**

## OPERATIONS



**2012-current**

Use biofuel on every Boeing ecoDemonstrator program

**2018**

Launched program for biofuel delivery flights from Boeing Delivery Centers

**2022**

7.5M liters of SAF procured

**2023**

21.2M liters of SAF contracted

**2024**

23.8M liters of SAF bought

## PARTNERSHIPS & POLICY

**2009**

Sustainable Aviation Fuel Users Group (SAFUG)

**2011**

First regional multi-stakeholder roadmaps in the US, Australia

**2014**

Proposed and partnered with Neste on Green Diesel pathway

**2021**

Partnered with SkyNRG

**2022**

Region-specific roadmaps and SAF feedstock analyses with local partners (ongoing)

**2023**

Studied SAF's impact on contrails with NASA, DLR, FAA, GE, United

**2023**

Spearheaded AirCRAFT, a UAE SAF consortium

Launched APEC SAF initiative with U.S. Government

Collaborated with Masdar and Zero Petroleum

**2024**

Partnered with Wagner Sustainable Aviation Fuels

**2025**

Partnered with Norsk e-Fuel

**2021**

Committed to 100% SAF compatible airplanes by 2030

100% SAF flight with Rolls-Royce

First 100% SAF passenger flight with United Airlines, one engine

**2023**

Developed jet reference fluid to test 100% SAF compatibility

First 100% SAF transatlantic commercial flight with Virgin Atlantic, dual engine

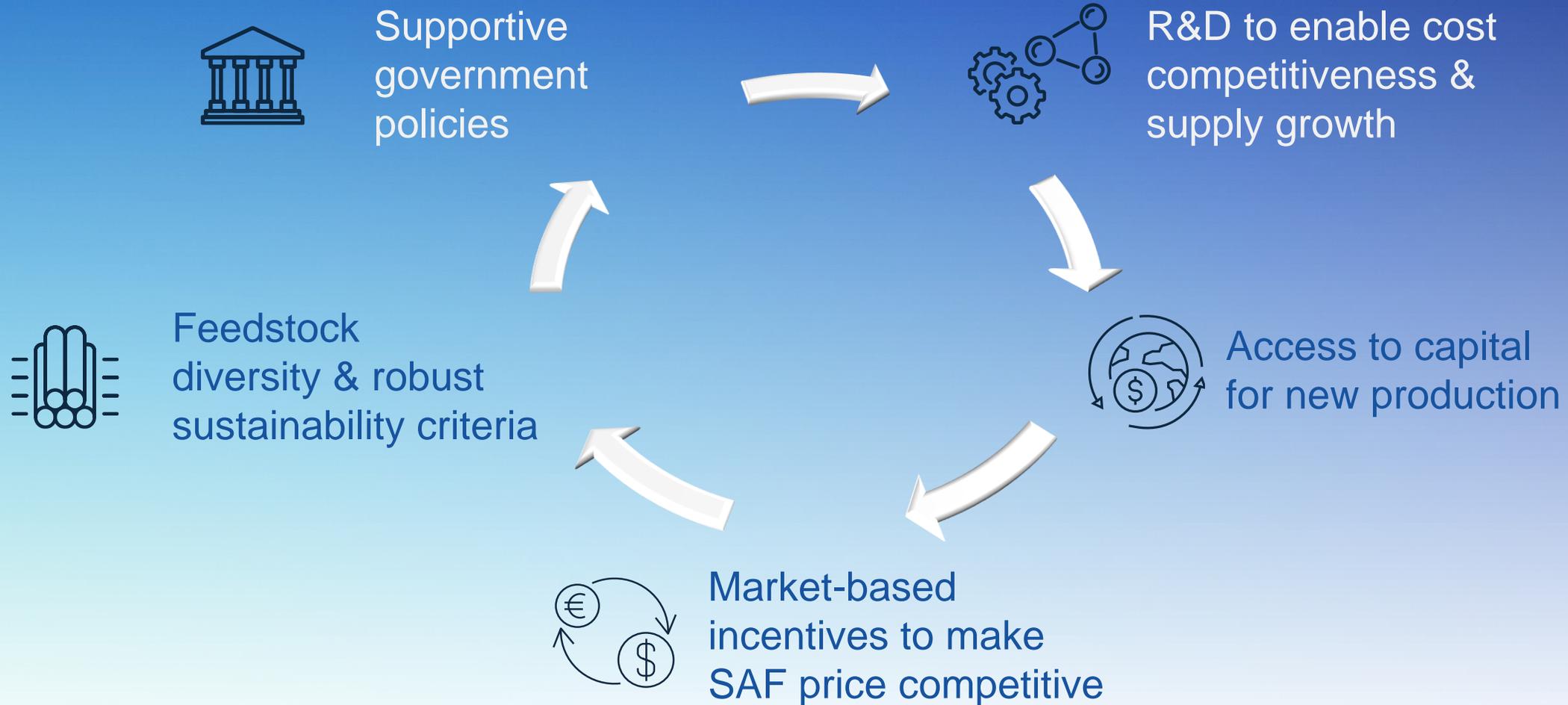
**2024**

IAEG 100% SAF Compatibility Working Group

**2021-ongoing**

SAF emissions testing with NASA

# Keys to accelerating SAF supply growth



# Boeing Public SAF Project Participation



- Boeing, KLM, Macquarie
- Pacific Northwest SAF Production
- “Best in class” future offtake contracting language
- EIS: 2029 SAF Production



- Boeing, DOE, Honeywell UOP
- Strategic partner for technology development for biocrude to SAF pathway
- EIS: 2027 Pilot Scale SAF Production



- Boeing, Clear Sky
- Sewage waste to SAF technology
- Provide training, direction and facilitation on testing
- EIS: 2029 SAF Production



- Boeing, Queensland Government
- C&D and MSW to SAF facility in Brisbane Australia (LanzaTech/LanzaJet)
- Build on Australia SAF assessment by CSIRO and Boeing



- Boeing investment into development capital fund
- Targeting first e-SAF projects in the Nordics
- Carbon capture & green H<sub>2</sub> production with renewable energy

# 100% SAF Compatibility

SUSTAINABLE  
AEROSPACE  
TOGETHER

Boeing has committed its commercial airplanes will be 100% SAF-compatible by 2030



Developing Jet Reference Fluids



Testing Materials & Systems



Mobilizing & Engaging



Modifying Airplanes

In 2019...



**39 Million**  
Flights Occurred



**1.1 Gigaton**  
CO<sub>2</sub> Equivalent Emissions

By 2050, emissions could rise to

**3.1 Gigaton**  
CO<sub>2</sub> Equivalent Emissions



Decarbonization Levers



# Industry View

~27% of CO2 emissions

~73% of CO2

	2020	2025	2030	2035	2040	2045	2050
<b>Commuter</b> 9-50 seats <60 minute flights <1% of industry CO2	SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF
<b>Regional</b> 50-100 seats 30-90 minute flights ~3% of industry CO2	SAF	SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF	Electric or Hydrogen fuel cell and/or SAF
<b>Short haul</b> 100-150 seats 45-120 minute flights ~24% of industry CO2	SAF	SAF	SAF	SAF potentially some Hydrogen	Hydrogen and/or SAF	Hydrogen and/or SAF	Hydrogen and/or SAF
<b>Medium haul</b> 100-250 seats 60-150 minute flights ~43% of industry CO2	SAF	SAF	SAF	SAF	SAF potentially some Hydrogen	SAF potentially some Hydrogen	SAF potentially some Hydrogen
<b>Long haul</b> 250+ seats 150+ minute flights ~30% of industry CO2	SAF	SAF	SAF	SAF	SAF	SAF	SAF

Source: ATAG Waypoint 2050 Report

How many flights occurred?

**320**

Thousand flights

What was the emissions impact?

**3.5 Mt**

CO2 Equivalent Emissions



Flights  
(1000s)



Emissions  
(MtCO2-eq)

Share of flights and emissions by domestic or international departures



**30% of Norway's flights accounted for over 60% of emissions**