Flying in the face of Climate Change

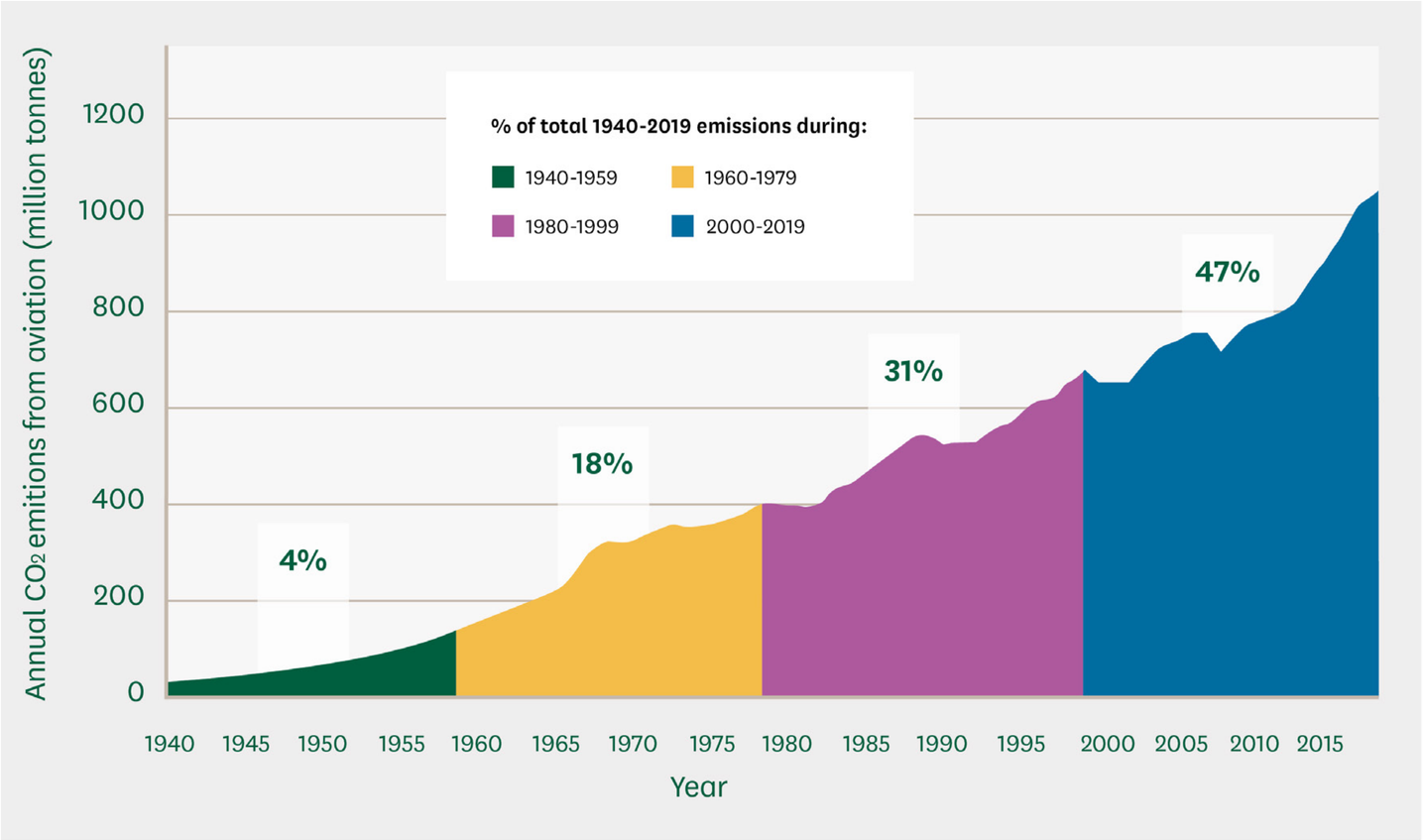
Geoff Collis November 2025


every day, low fares
SNOOPY AND CHARLIE BROWN
THE PEANUTS MOVIE
ONLY IN CINEMAS

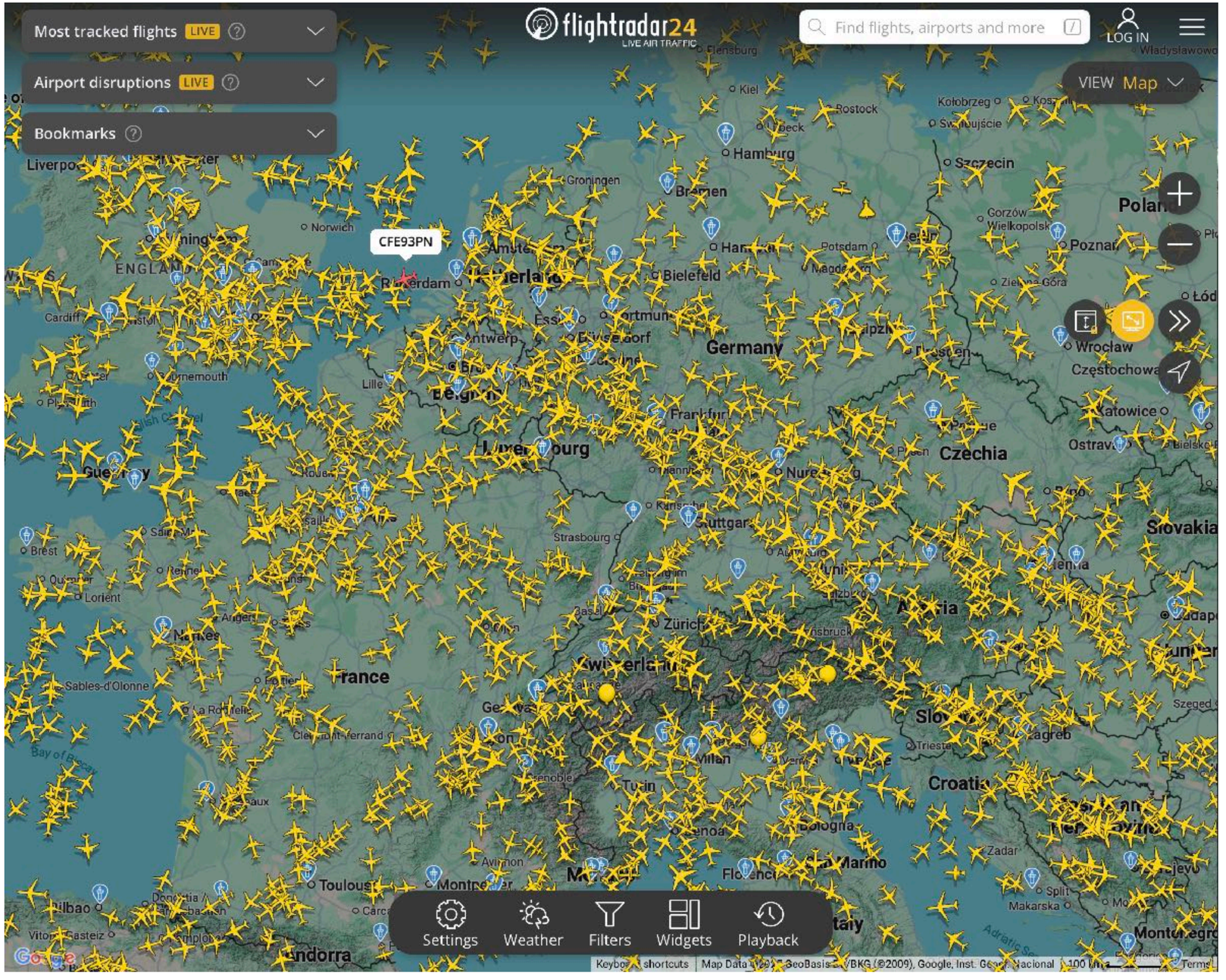

Std
VH-OYT JK-AD
MACH
ALT CRZ
NAV
CRUISE

Nearly 50% of aviation emissions have occurred since 2000.

Figure 1: Annual global CO_2 emissions from aviation (1940–2019) with percentage of total cumulative emissions broken down into 20 year periods

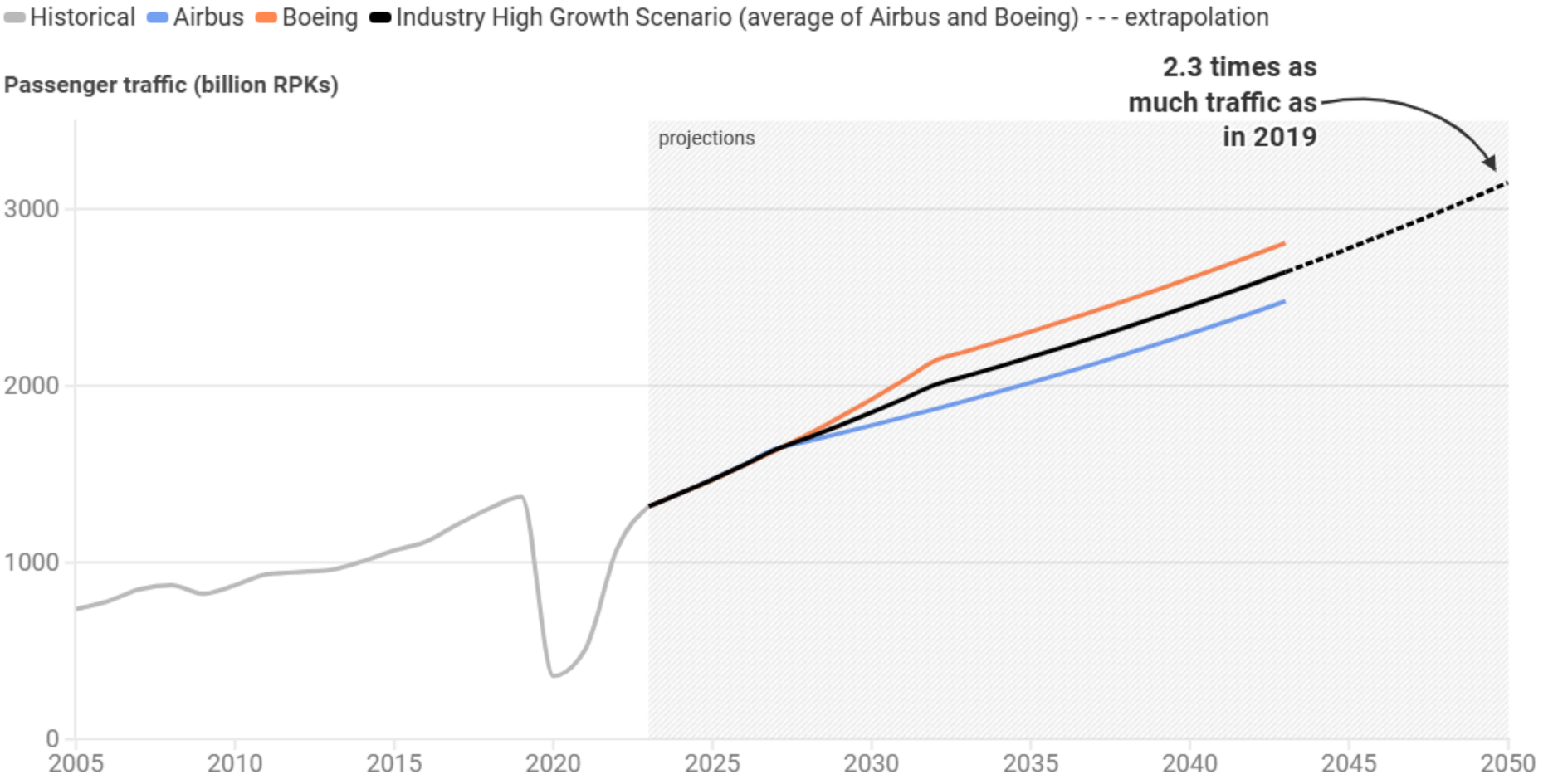


Source: European Union Aviation Safety Agency, *European Aviation Environmental Report 2022*, p. 47


Most tracked flights LIVE
Airport disruptions LIVE
Bookmarks
flightradar24
LIVE AIR TRAFFIC
Find flights, airports and more
LOG IN
VIEW Map
CFE93PN
Settings
Weather
Filters
Widgets
Playback

Airbus and Boeing forecast EU air traffic to more than double in 2050

Compared to 2019, the year with the highest traffic on record before the pandemic

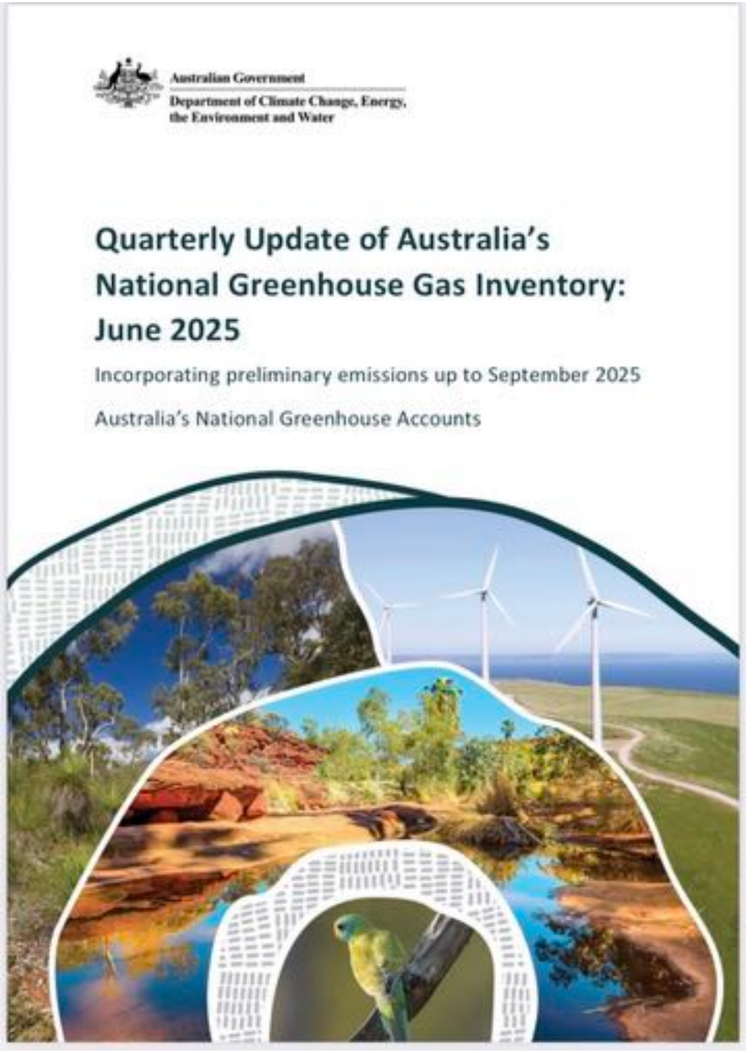


T&E analysis of Boeing and Airbus market outlooks • Airbus and Boeing projections are extrapolated from 2043 to 2050

T&E

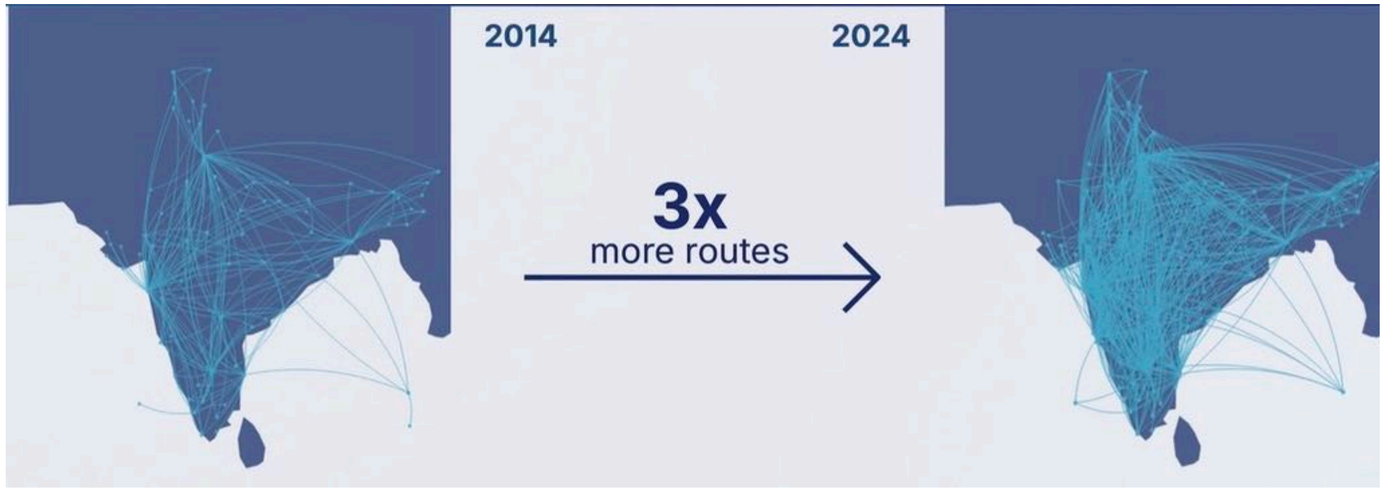
Australian Greenhouse Gas data - 2024/25

- Australia’s emissions ↓ 2.2%
- Transport emissions ↑ 0.3%
- Domestic jet fuel consumption ↑ 2.9%
- Does not account for international air travel



Growth hotspots

- India - Domestic traffic 8.9%
- “Emerging Asia” to China 8.5%
- China - Domestic traffic 5.4%
- EU 960M tonnes CO_2



Figures from Airbus global forecasts 2025-2044

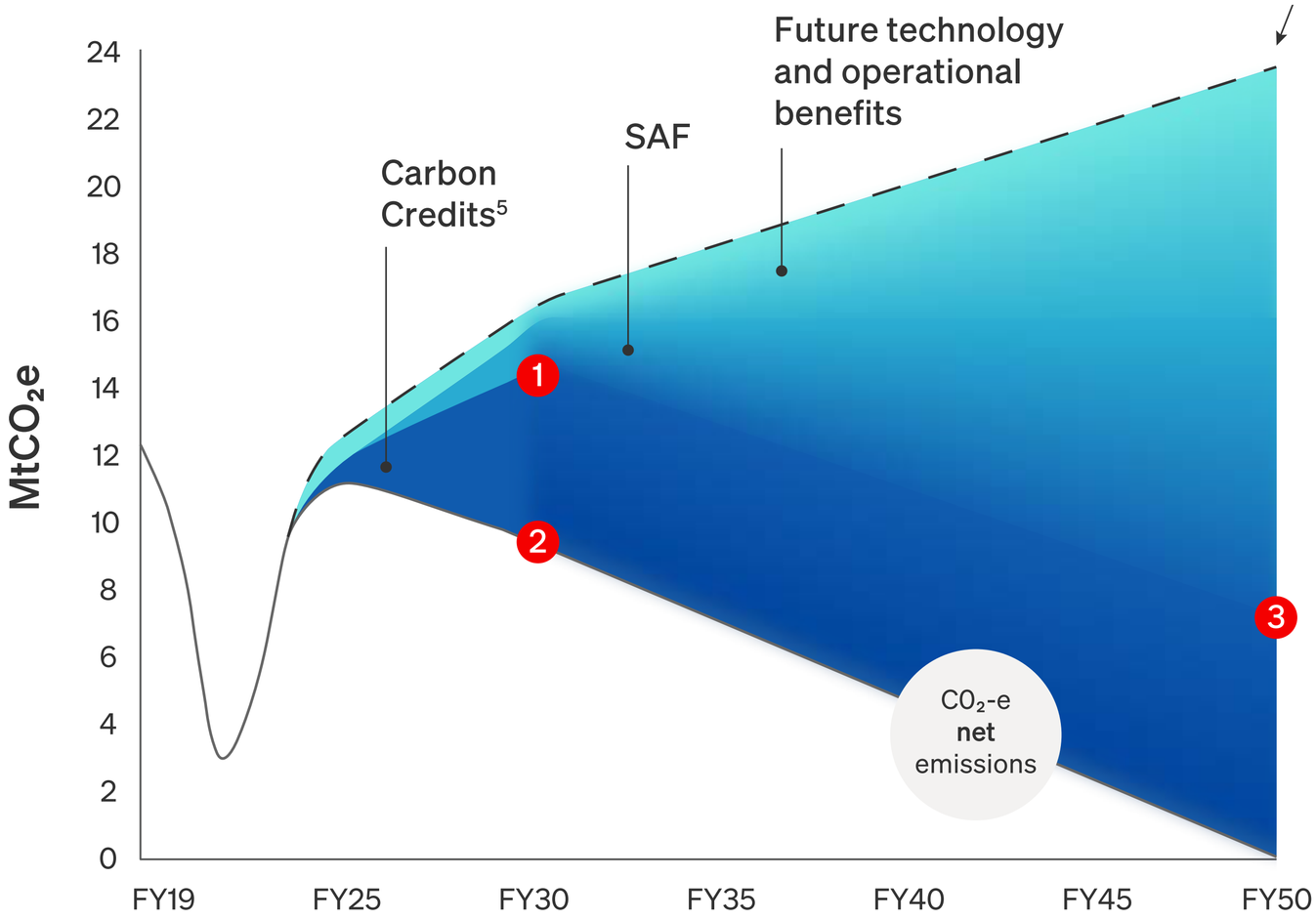
How is aviation planning to manage these emissions?

- IATA has set a target of Net Zero by 2050
- International aviation emissions are not covered by the Paris Agreement
- ICAO manages a voluntary offset and reduction scheme - “CORSIA”

How is aviation planning to manage these emissions?

- SAF - Sustainable Aviation Fuel
- Low Carbon Aviation Fuel
- Carbon offsets
- Technological and airspace efficiencies
- Alternative fuel/propulsion

Qantas Sustainability Report 2025



KEY: 1 FY30 SAF target: **10%** 2 FY30 Scope 1 net emissions to FY19: **-25%** 3 FY50 SAF target: **~60%**

SAF - Sustainable Aviation Fuel

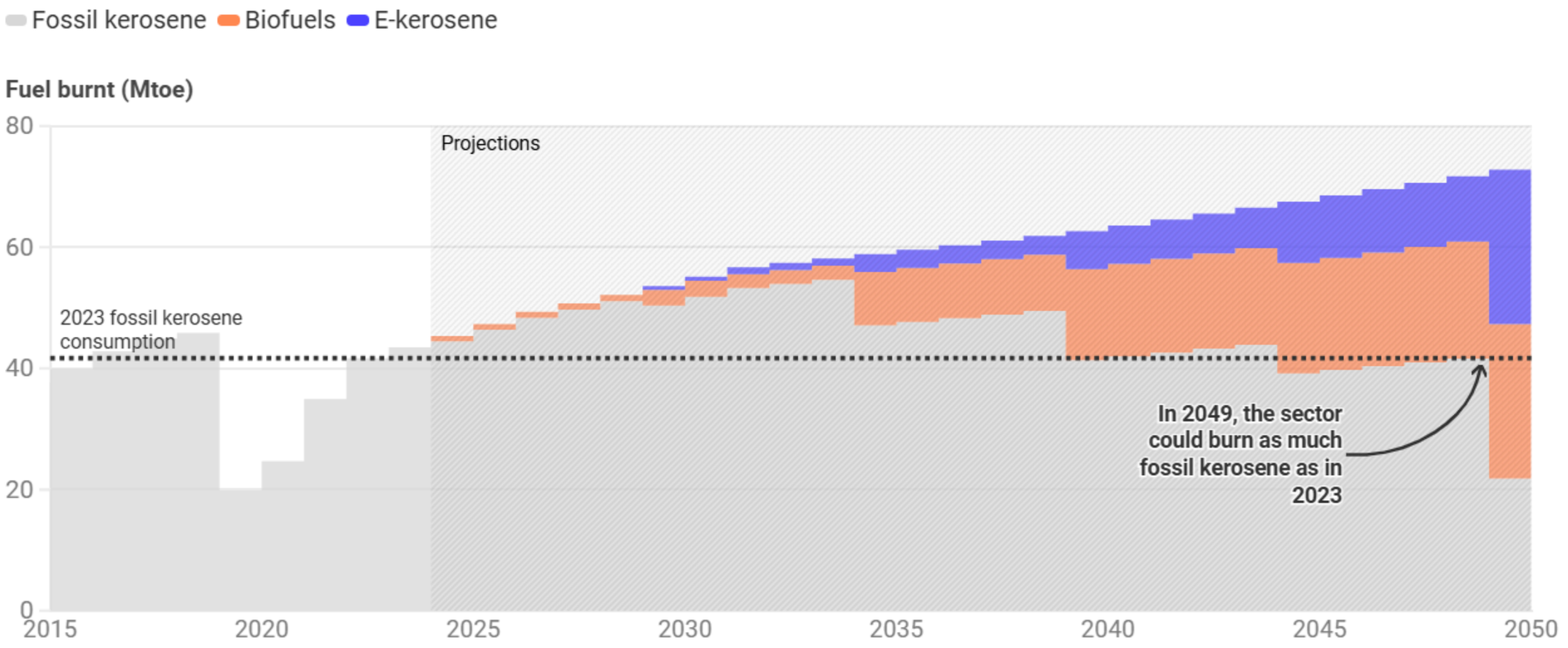
“up to 80% emissions reduction”

- Burning 1kg jet fuel = 3kg CO_2 emissions
- Reduction in “lifecycle emissions”
- Biofuels
- Crop residue
- Woodwaste
- Used cooking oils
- E-kerosene

SAF and growth in the EU

The EU's sustainable aviation fuel mandate will only barely cancel out the growth in energy demand

In 2049, the sector could be burning as much fossil kerosene as in 2023, while complying with sustainable aviation fuel mandates

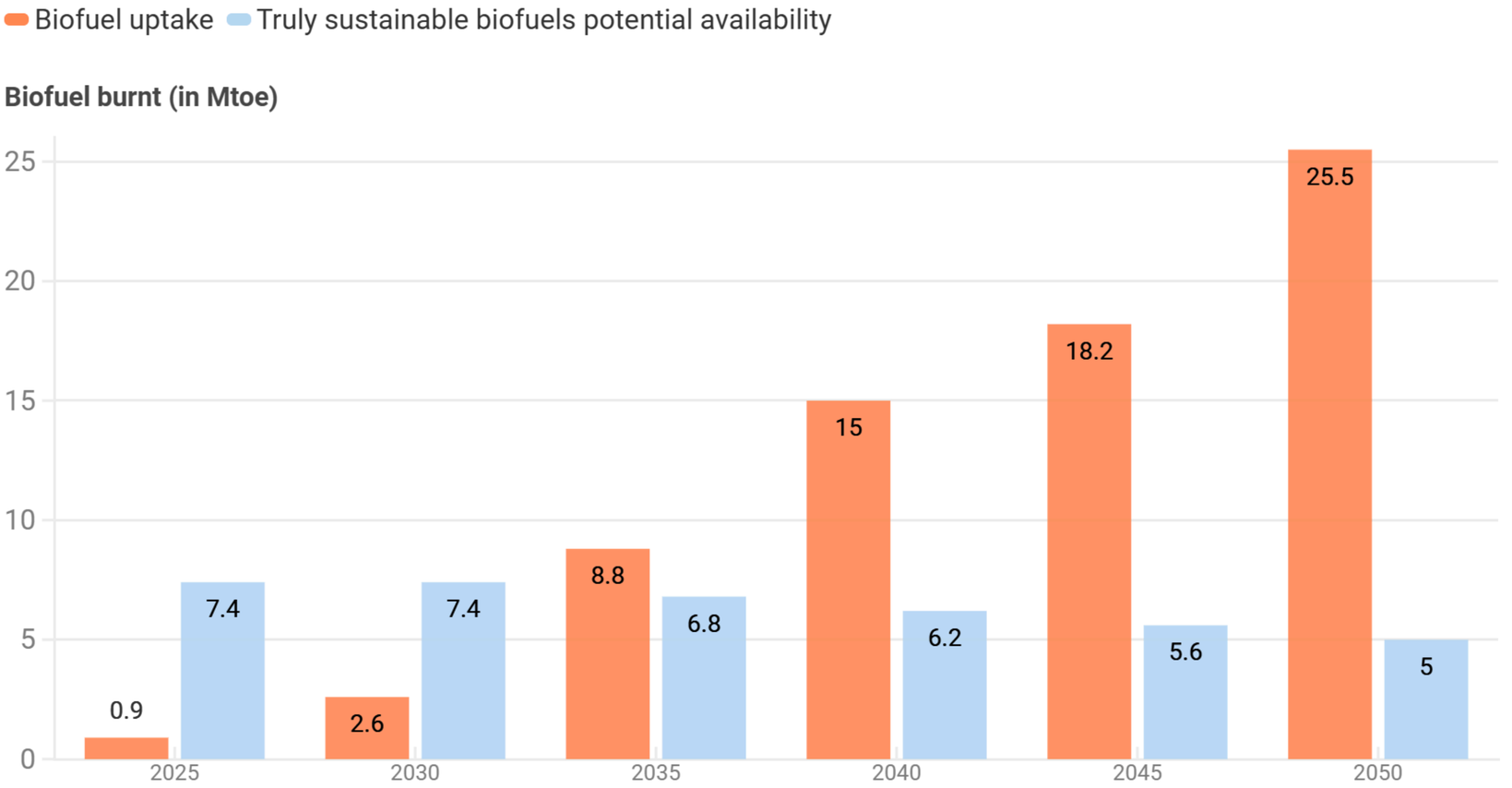


Source: T&E modelling based on Airbus and Boeing market outlooks

T&E

SAF and growth in the EU

Biofuel demand to largely exceed the sustainable available potential



T&E modelling based on Airbus and Boeing traffic projections, T&E (2024), The advanced and waste biofuels paradox: Availability and sustainability of advanced and waste biofuels

T&E

“Low Carbon” Aviation Fuel

- Fossil based jet fuel
- Certified by ICAO under the CORSIA scheme
- At least a “10% reduction in life cycle emissions”
- Transporting and pumping your 100% oil derived jet fuel using renewable energy can claim CORSIA certification

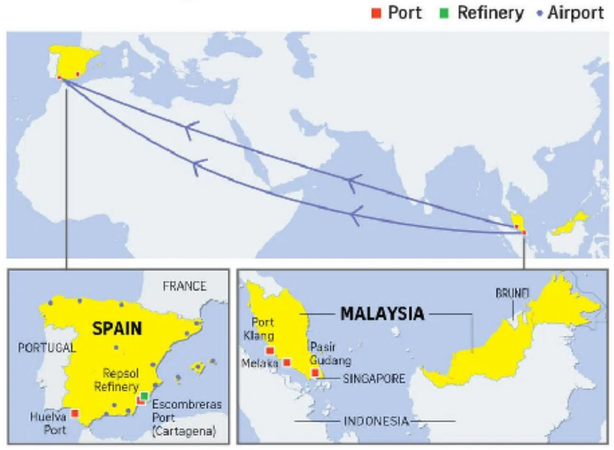
Used cooking oil - UCO

- Waste oil product
- Ryanair 2030 target alone would consume all the UCO in Europe
- EU mandates see UCO being shipped from Asia to European refineries
- Virgin palm oil passed off as UCO

Turbulence ahead: How used cooking oil could hinder aviation's green fuel hopes

A joint investigation by The Straits Times and Climate Home News reveals how soaring demand for this key ingredient in sustainable aviation fuel has led to 'ridiculous' data and suspected fraud – undermining the industry's climate goals.

Plane sailing? The global journey of used cooking oil

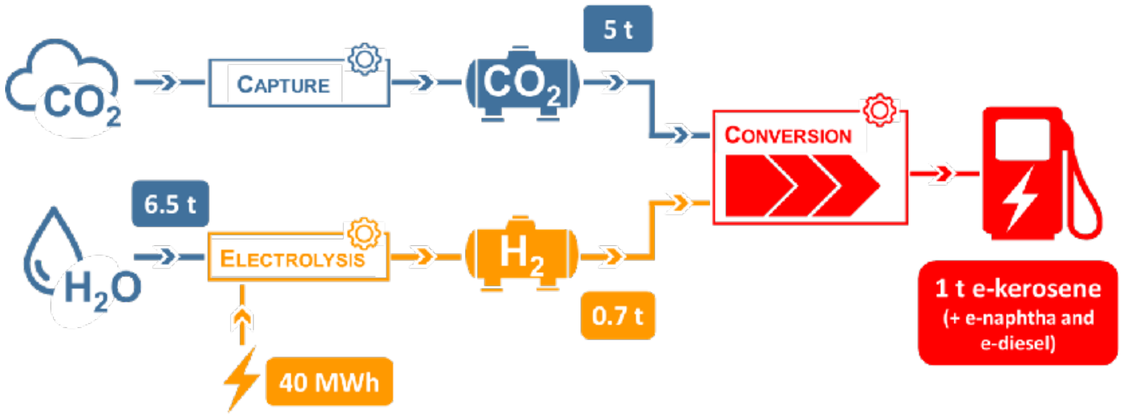


SOURCE: CLIMATE HOME NEWS

STRAITS TIMES GRAPHICS

E-Kerosene

- Produced from CO_2 and water
- E-kerosene production is electricity intensive.
- Required energy is ***4 X*** that of the final product.
- By 2050 mandated EU production will require 585TWh of ***renewable*** electricity
- In 2023, German electricity demand was 506TWh



SAF in Australia

- Zero domestic industry - >9 000 000 litres/day required
- CSIRO/Boeing “roadmap” (2023)
- Entirely powered by green hydrogen
- Currently non-existent
- Widely dispersed low energy feedstock
- 50km likely limit of transport range
- Did not consider reduced agricultural land
- Lanzajet plant - TSV, CNS

SAF in Australia

- Fuel is typically an airline's largest single operating cost - 20-30%
- SAF is currently 2-10 x the cost of fossil jet fuel. SIN levy 2026.
- Currently 1.7% of global jet fuel production
- To meet Net Zero 2050, IATA estimates between 3000 and 6500 *additional* renewable fuel plants will be required

Emissions offsets

- IEA 1.5°C pathway - aviation to avoid carbon offsets
- *“last resort, not a licence to pollute” (Snyder)*
- *“182 forest regeneration projects failing…” (ANU)*
- Vacant land to plant trees *(Yale)*
- *“Not a credible or feasible strategy” (PRI)*
- Easyjet ceased using offsets in 2022 - *“Assist passengers to reduce their footprint”*

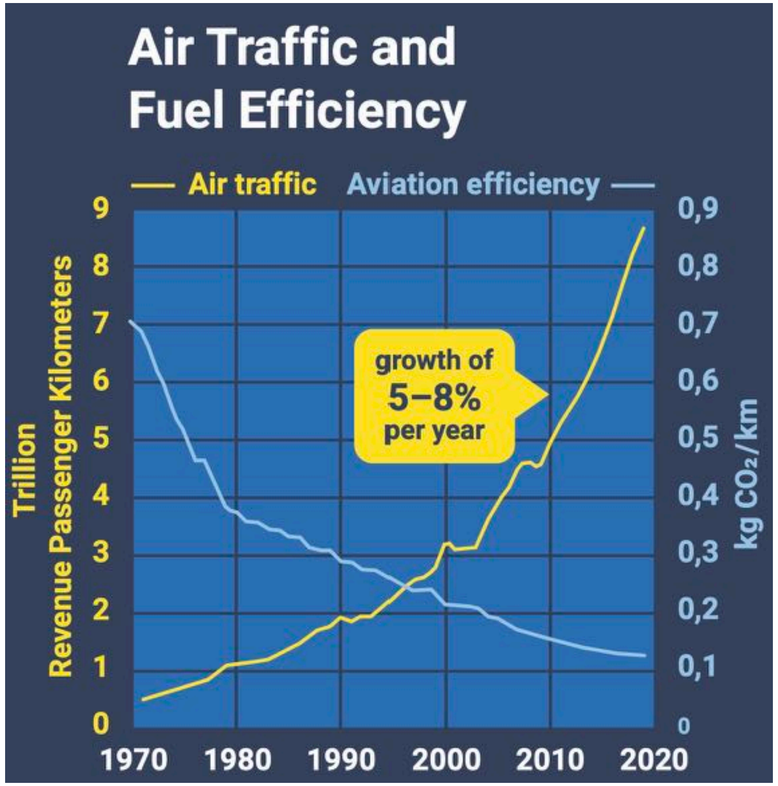
Carbon offsets used by major airlines based on flawed system, warn experts

Guardian investigation finds carbon credits generated by forest protection schemes are based on flawed system

What is carbon offsetting and how does it work?

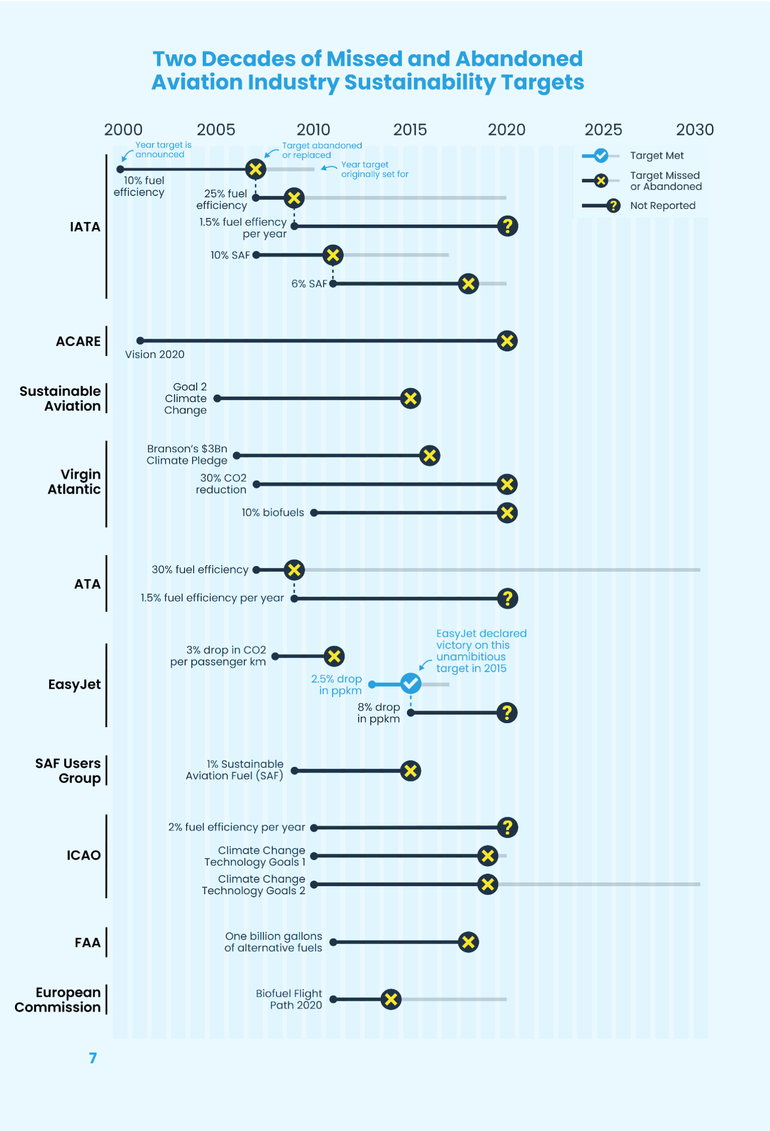
Technological and airspace efficiencies

- New generation Airbus A320NEO 17% more fuel efficient
- Efficiency dividend decreasing
- Air traffic growth will overwhelm any efficiencies
- Older aircraft “handed down” not retired



A history of missed targets and greenwashing

- CO_2 emissions targets 2000-2021
- 20 of 21 missed, abandoned or forgotten
- Air NZ ditched 2030 reduction goal
- Qatar Airways CEO *“industry will not meet Net Zero”*
- IATA calls for softening green fuel mandate
- KLM “sustainable future” advertising illegal
- EU and 20 airlines eco claims



Qantas Group -

a case study in tokenism and double standards

Qantas Group -

a case study in tokenism and double standards

We acknowledge your concerns about aviation's role in climate change. The Qantas Group, including Jetstar, recognises our responsibility to reduce emissions and is actively investing in solutions such as SAF, fleet renewal, operational efficiency improvements, and emerging technologies. As these solutions scale, carbon credits remain an important tool for managing our emissions. High-integrity credits allow us to take immediate action on emissions that cannot yet be eliminated while also delivering broader environmental and community benefits.

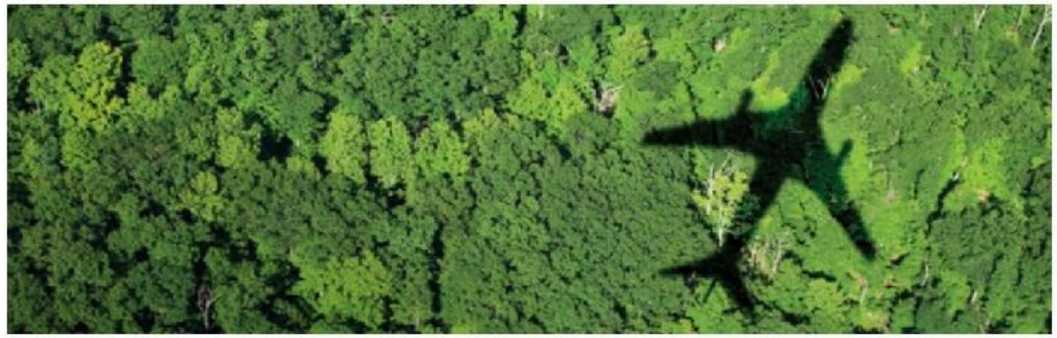
Leading the way on CO2 emissions

Jetstar has been ranked as one of the airlines with the lowest CO2 emissions. The ranking comes from a report commissioned by Cirium, a leading aviation analytics firm.

We're able to keep our emissions down through our ongoing fleet renewal program, alongside our operating model focussed on efficiency. We now have 20 A321LRs and five A320neos in or fleet, with more LRs on the way, as well as XLRs from 2027.

It's also down to our ops teams, including our pilots, keeping a laser focus on emissions and fuel reduction initiatives. This includes reducing APU usage during ground activities, reducing onboard weight through increased waste removal and more lightweight ULDs, and flight optimisation software on our 787 fleet to reduce fuel burn.

A huge thank you to everyone across the business driving these efforts to reduce fuel consumption and ensure a sustainable future for us all.



Rank	Operator (group)	Country	2024
1	**Wizz Air**	Hungary	53.9
2	**Frontier Airlines**	USA	54.4
3	**Pegasus**	Turkiye	57.1
4	**Volaris**	Mexico	57.9
5	**IndiGo**	India	58.2
6	**Jetstar**	Australia	58.4
7	**Spirit Airlines**	USA	58.4
8	**Scoot**	Singapore	58.7
9	**SunExpress**	Turkiye	59.4
10	**Air India Express**	India	60.5

2024 - CO_2/ASK reduced by 0.9%

Total flights increased by 12%

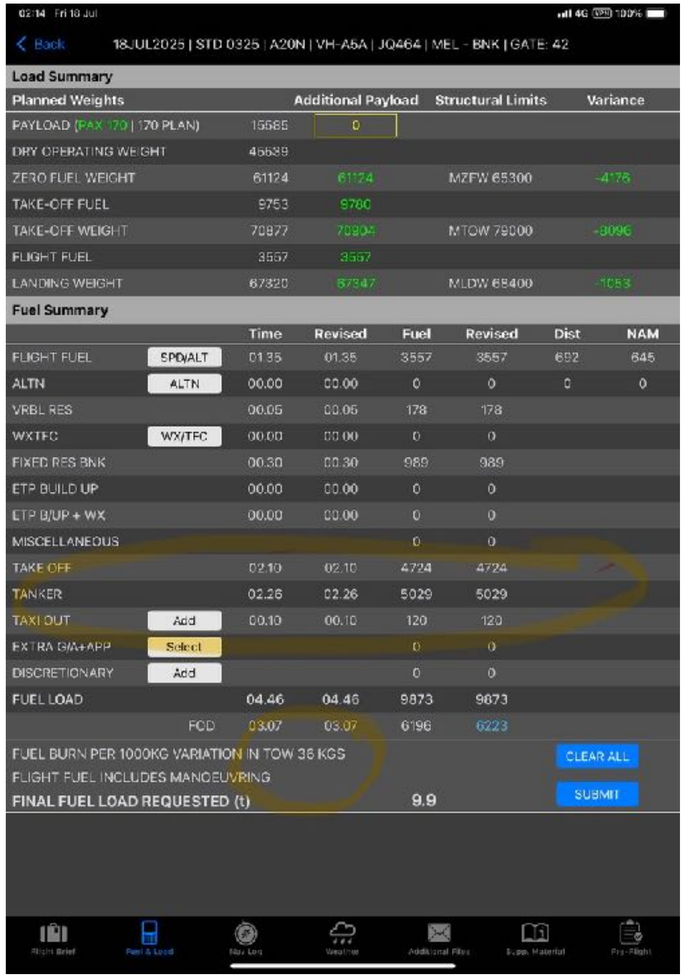
Qantas Group -

a case study in tokenism and double standards

- Jetstar “excess emissions” graphs
- Reduced landing flap selection
- Jetstar 2025-26 new routes (15 and counting)
- Jetstar fleet growth/long haul expansion
- QantasLink A319s

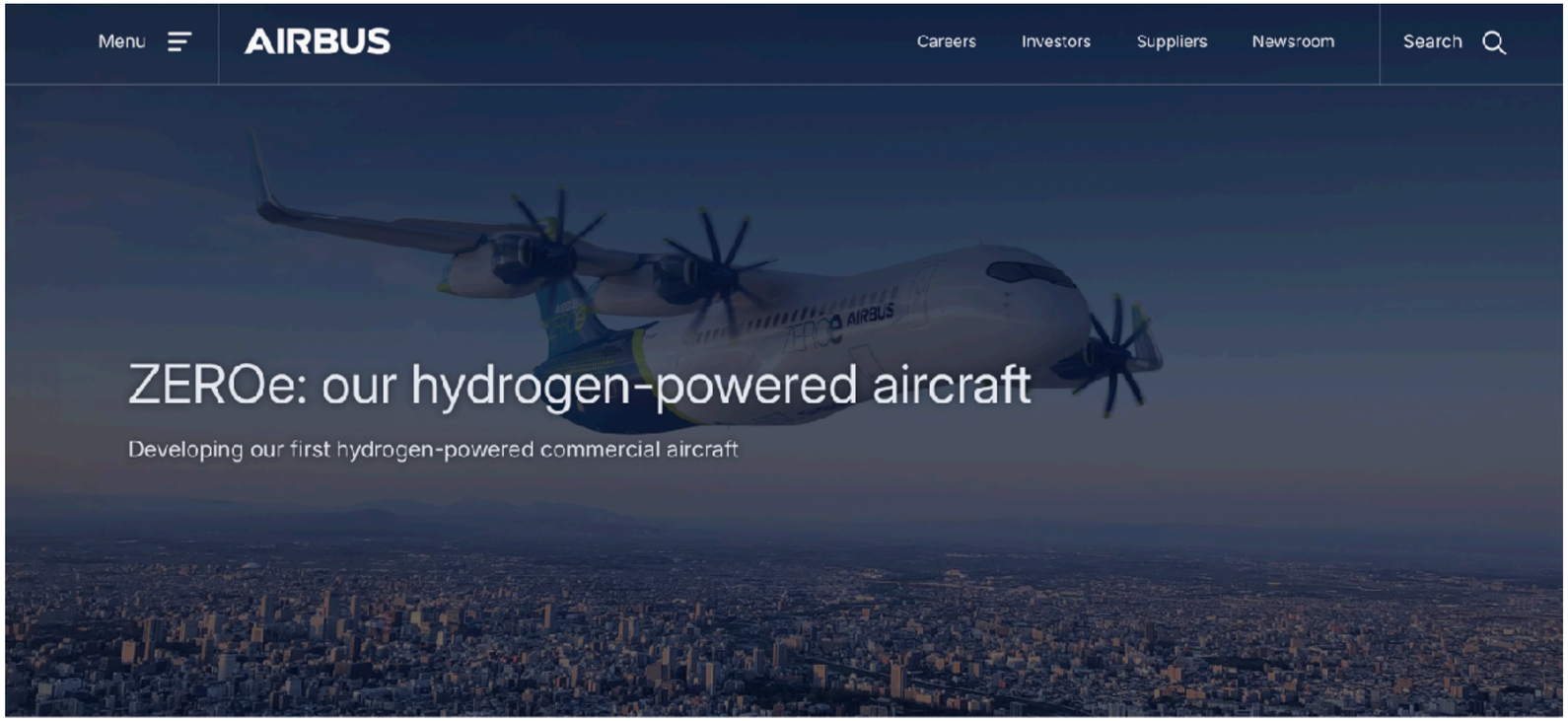
Qantas Group -
a case study in tokenism and double standards

- Fuel tankering
- Jetstar - >12 destinations
- Tankering banned in EU
- Climate Integrity/EDO greenwashing claim
- “Project Sunrise” inefficiency



Alternative fuels and propulsion

- Hydrogen - Airbus already delayed to at least 2045.
- Boeing?
- GA hydrogen fuel cell at least 10 years away
- Probably dead end



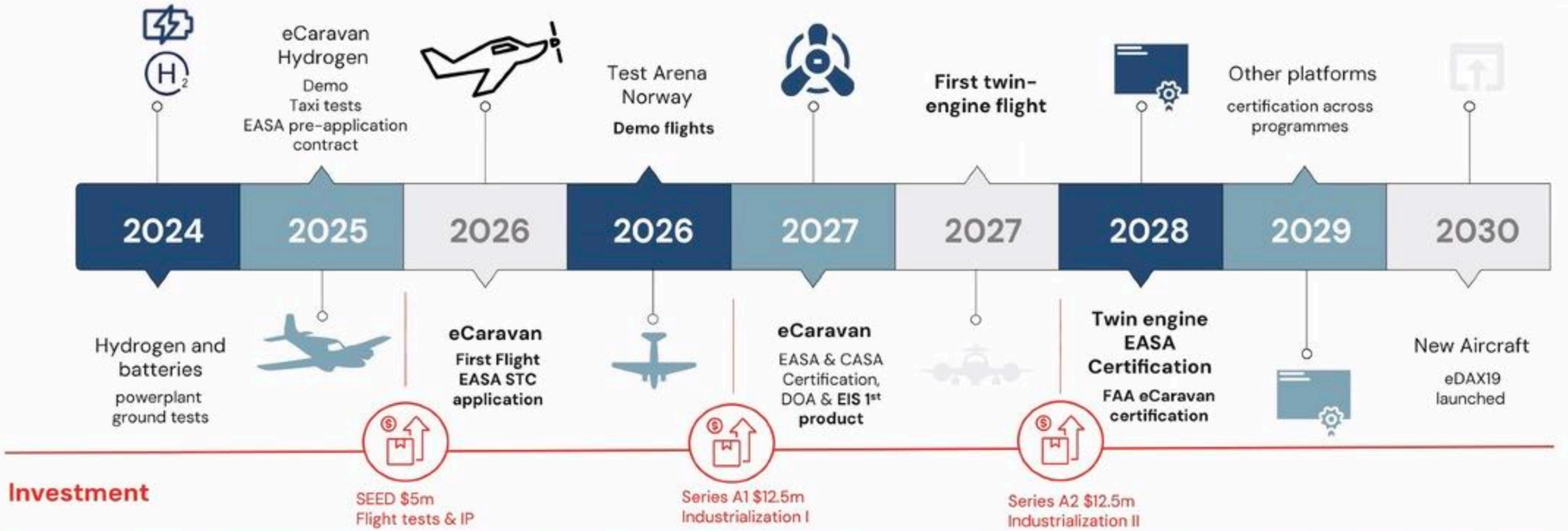
Alternative fuels and propulsion

- Electric aircraft
- So far the most promising
- Retrofit KingAir/Cessna 208
- Short range (800km)
- Smaller aircraft/“GA” sector
- First flight Q1 2026

Product development roadmap

The path to lead electric short distance flights

dovetail ELECTRIC AVIATION



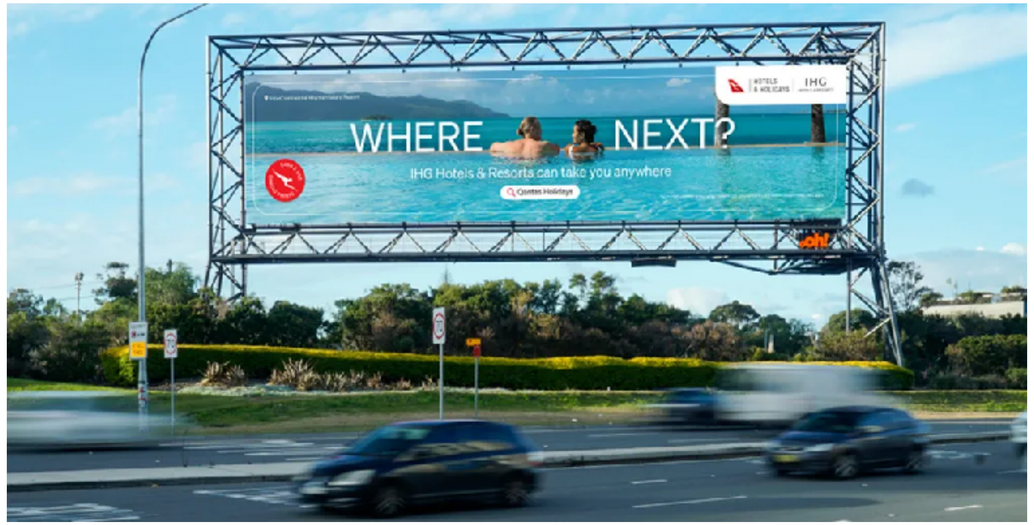
-INVESTORS DECK-

Who is flying?

- Globally only 20% of people have flown
- 1 in 4 Australians plan to travel overseas in the near future *(Morgan survey)*
- 6 in 10 Australians concerned about the impact of climate change *(Ipsos)*
- 20 countries responsible for surge in tourism emissions *(The Conversation)*
- Wealthy entitlement/global equity - changing norms (DPS/ZQN/winter break)
- 68% of Australian tourism sites at major risk with 2°C by 2050 *(The Guardian)*
- “Last chance” tourism

What to do? - Industry and goverment

- Frequent flyer levies - you fly more, you pay more
- Fuel tankering
- Stop airport expansion - WSI, MEL third runway
- Demand management to buy time
- Mode shift - neglect of rail network
- Banning unhealthy products advertising



What to do? - Individual actions

- Fly less - CO_2 of Premium Economy flight to Europe almost doubles footprint from 15t to 28t
- Australians 5th highest per capita CO_2 emissions from flying
- Look for alternatives to flying
- Push for alternatives to flying. Rail upgrades

Top 10 flight routes by available seats [edit]

Rank	Airport 1	Airport 2	Distance (km)	2024[1]
1	Jeju	Seoul–Gimpo	449	14,183,719
2	Sapporo–Chitose	Tokyo–Haneda	835	11,931,572
3	Fukuoka	Tokyo–Haneda	889	11,335,551
4	Hanoi	Ho Chi Minh City	1171	10,631,435
5	Sydney	Melbourne	705	9,217,377
6	Jeddah	Riyadh	857	8,700,415

The Seattle Times

Opinion ▾ Log In | Subscribe

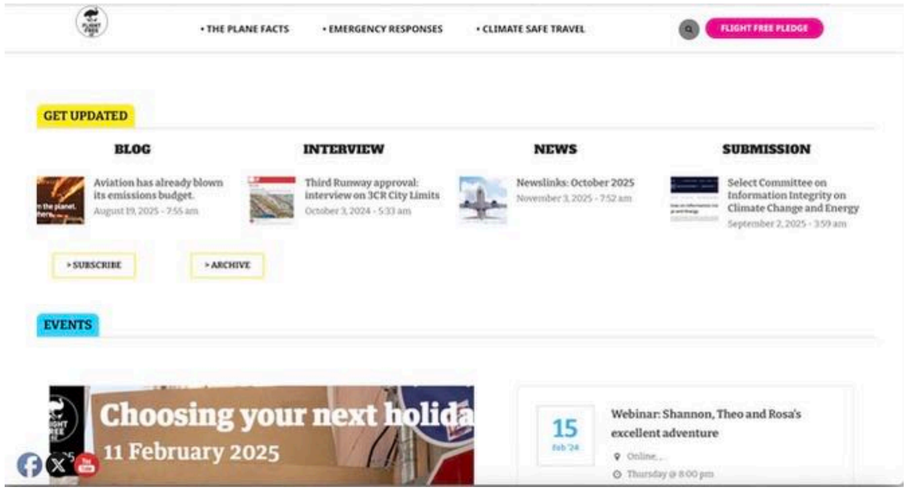
Sustainable aviation fuels aren't the answer; flying less is

July 12, 2023 at 3:56 pm

A refueler prepares to refuel a plane on the tarmac at... (Ellen M. Banner / The Seattle Times, 2021) More

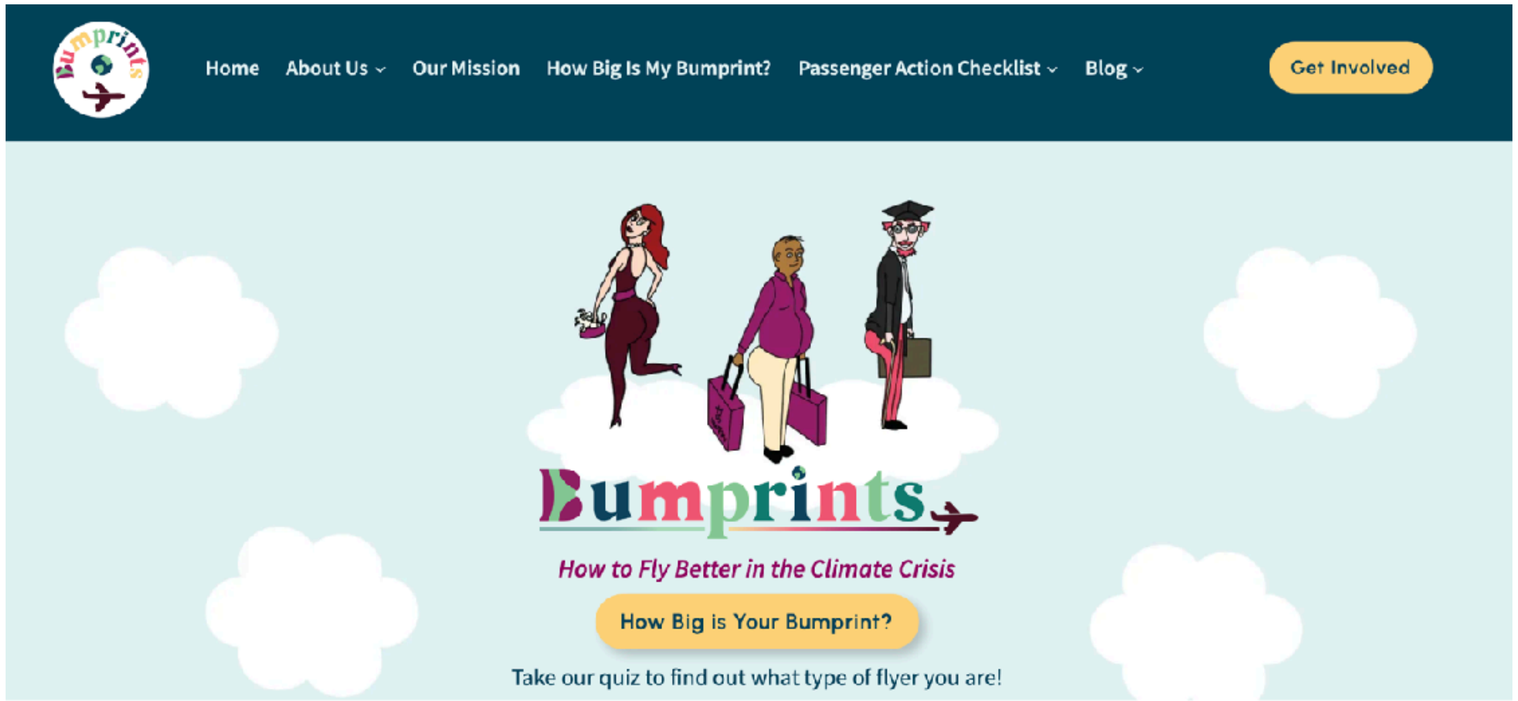
Support groups campaigning on aviation and climate change

- http://safe-landing.org
- https://www.callaviationtoaction.org/
- https://stay-grounded.org/
- https://flightfree.net.au/



What to do?

- bumprints.org
- Former commercial pilot
- Katie Thompson
- Consumer awareness
- Passenger tools



Passenger Action Checklist

In the cockpit, pilots use checklists for two reasons: to avoid emergencies or to deal with them. And when faced with an emergency situation, the flight crew are taught to engage the help of the whole team, including any responsible and capable passengers.

Attention passengers! We are declaring a climate emergency and need your help. Here is your checklist, refer to it whenever a travel opportunity arises. You have already taken the most important step: **deciding to reduce your carbon bumprint.**

BEFORE YOU TRAVEL

Personal Climate Emergency	DECLARE
Your Carbon Budget	MANAGE
Are You a Flight Pusher?	CONSIDER
Hard Conversations	INITIATE
Is Your Journey Necessary?	ASSESS
Non-Flying Options	EXPLORE
Multi-Purpose Travel	COMBINE
Distance of Travel	REDUCE

CHOOSING YOUR FLIGHT

Carbon Calculator	COMPARE FLIGHTS
Aircraft Type	MOST FUEL EFFICIENT
Airline Model	'NO FRILLS'
Seat	ECONOMY
Route	OPTIMISE
Time of Flight	DAYLIGHT HOURS
Private Jets	RESIST
Loyalty Programmes	DIVEST

ON THE DAY

Luggage	MINIMUM
Airport Shopping	LIMIT
In-Flight Meals	PRE-ORDER/OPT OUT
Carbon Offset	PURCHASE
Carbon Inset	BOOK & CLAIM
Sustainability Bingo	PLAY
Non-Essential Items	REFUSE

Airline Greenwashing Bingo

Our airline is committed to sustainability because...

We are buying new aircraft with lower emissions. Please don't ask us how many *more* we are buying than we are retiring...	**We don't use the words *'green'*, *'responsible'*, or *'sustainable'* in our advertising.** Only because we keep getting taken to court for misleading our customers.	**We only use recycled coffee cups on board.** Please ignore the mountains of other single use plastics on board.	**We will reward you for buying carbon offsets - with extra air miles.** Yay! Now you can fly even more!
We plant trees. But not the 100 billion mature trees, *(per year!)* necessary to offset aviation's emissions.	**Per passenger, our emissions are reducing.** But our *total* emissions are rising - the only number the planet actually cares about.	**We serve you water in paper boxes and our pretzels are carbon-neutral.** Please don't peek behind the first class curtain and see the gourmet meals being served.	**We are investing in a project to make fuel out of poop.** Just don't ask if the sh*t coming out of the back of the engine will be any cleaner.
We are flying on 'sustainable' aviation fuel. Please don't ask us how 'sustainable' this fuel actually is, or how much we use. (SAF production 2024 - 0.3%)	**We are electrifying all our ground vehicles.** Try and ignore the fact that we aren't actually on the ground right now.	**We have added a 'Green Tier' to our frequent flyer programme.** Your good environmental choices will be rewarded - with even more air miles.	**This airport is carbon neutral.** Spoiler alert, this is just the building, the flights are *not* included.
We are investing in research into hydrogen jet fuel. We have no idea if that will ever become a realistic solution, but it sounds cool.	**We have painted green leaves on our airplanes.** It hasn't made any difference to our fuel burn, but it sure looks pretty.	**We got rid of our inflight magazines to save fuel.** Please ignore the shopping trolley full of alcohol and perfumes as it goes past.	**We say we will be 'Net Zero by 2050'.** This sounds good doesn't it? Currently our carbon emissions are still rapidly increasing, but 2050 is ages away!

vanessa.hudson@qantas.com

stephanie.tully@jetstar.com

TOM GAULD NewScientist