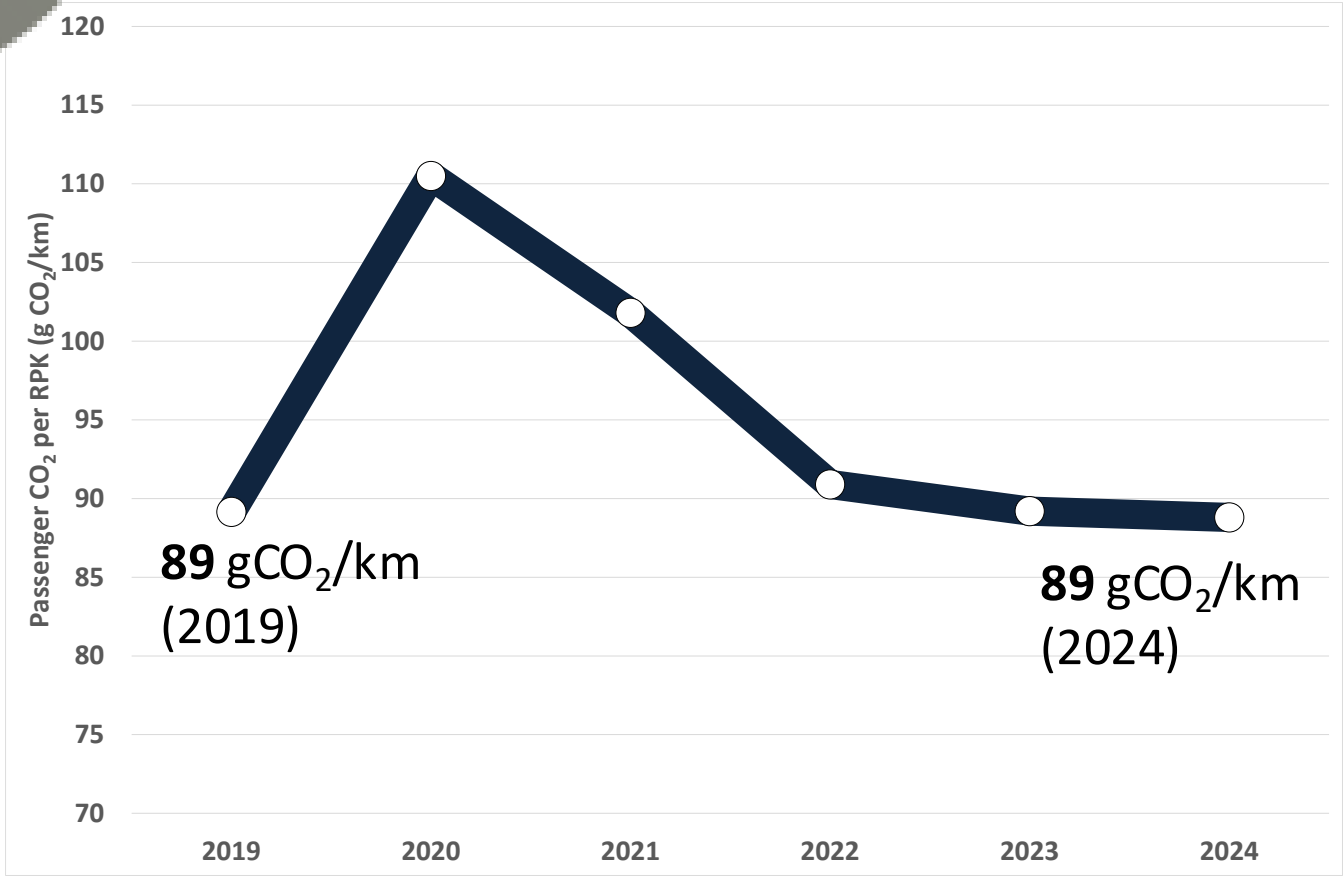
Aviation Sustainability Facts

February 2025

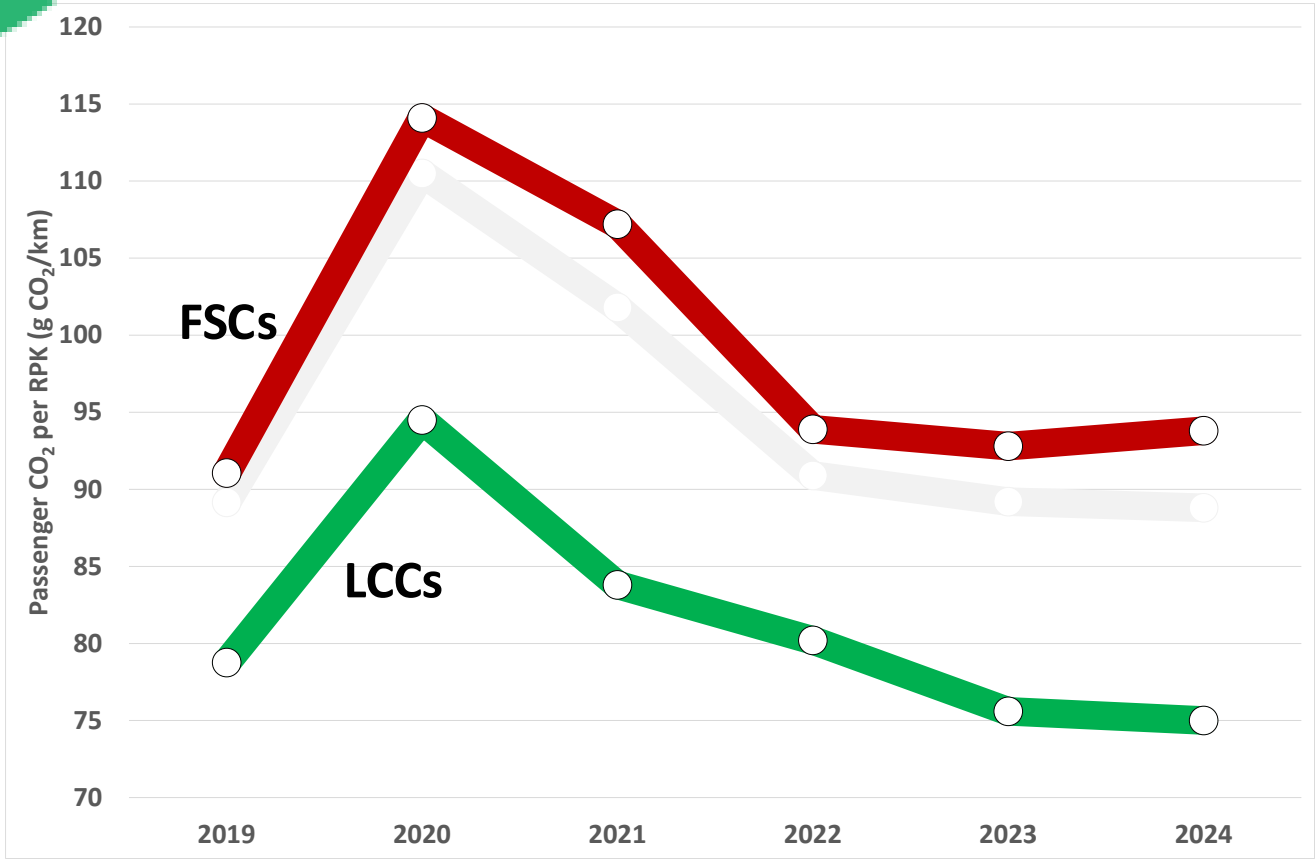
Photo by Peter Scherbatykh on Unsplash

0 % Reduction in Emission Intensity since 2019



No evidence of improved carbon-efficiency between 2019 and present. CO_2/RPK remained steady at approx. 89 g CO_2/km

20 % Increased Carbon Efficiency of LCCs over Other Airlines



LCCs have increased their collective carbon efficiency, reducing their average CO_2/RPK by 5% since 2019, from 79 gCO_2/km in 2019 to 76 g CO_2/km in 2023/24.

FSCs increased CO_2/RPK by 2% during the same period

LCC efficiencies and efficiency gains outperformed FSCs in all regions except North America

LCCs now operate at almost 80% the emission intensity of FSCs.

2024 data based on approximately 50% of airlines

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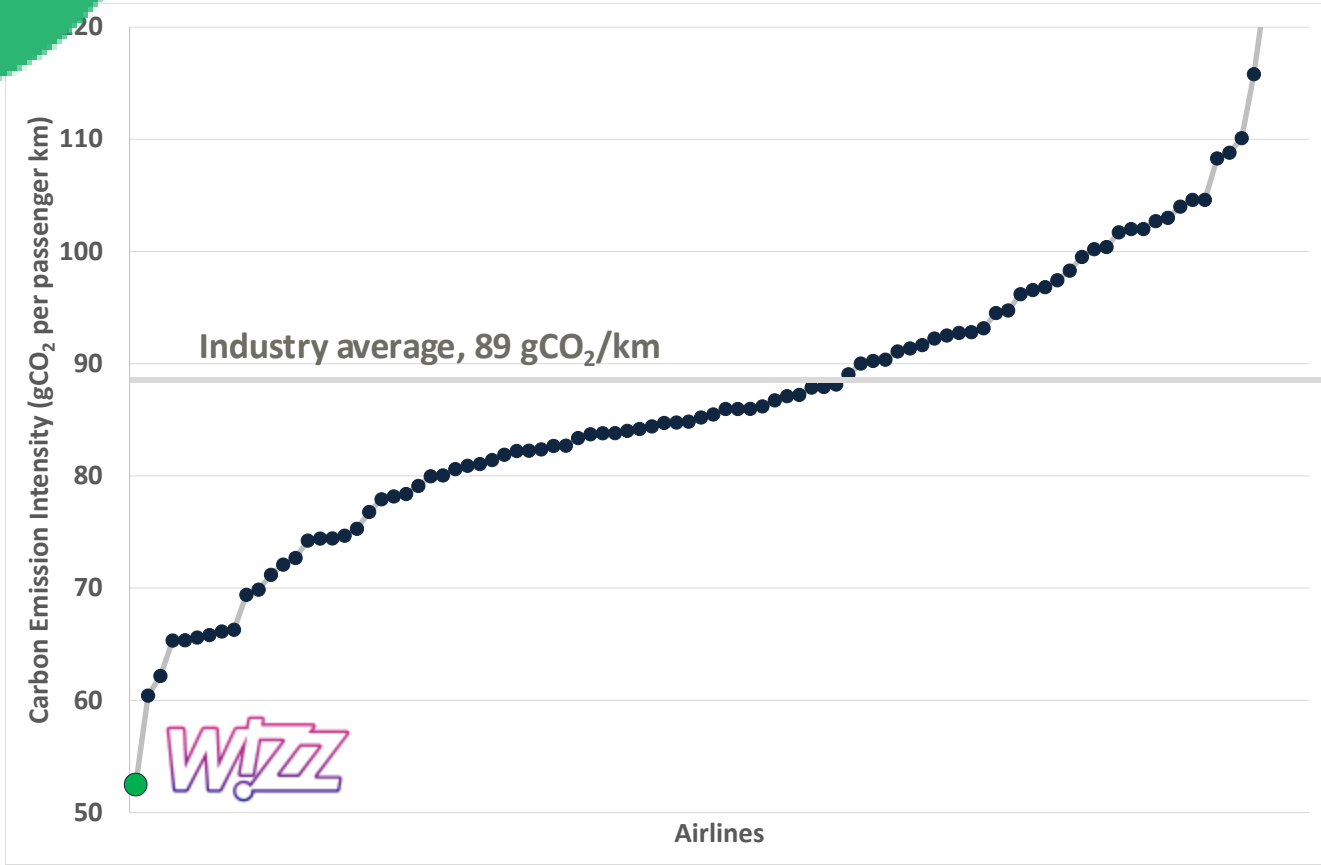
gCO_2 per km for Most Carbon Efficient Airline – Wizz Air



Wizz Air has a passenger carbon emission intensity of 52.5 gCO_2/RPK compared to the industry average of 89 gCO_2/km.

40% emission reduction compared to industry average

Pegasus, Volaris, Ryanair and Scoot are also in the top 10 most carbon efficient airlines

0.15 % of Total Industry Fuel Used in 2023/24 was SAF

KLM and British Airlines first two passenger airlines to exceed 1% of SAF in total fuel use

IAG SAF use in 2024 was 162,000T almost 2% of total fuel consumed by IAG airlines

70 % of SAF Use by European Airlines

70% of all SAF was consumed by European airlines.

Less than 10% was used in Asia, Middle East, South America and Africa combined

Most significant users of SAF

- British Airways
- KLM Royal Dutch Airlines
- Air France
- United Airlines
- Lufthansa
- Southwest Airlines
- Delta Air Lines
- American Airlines

97 % of SAF is Used by FSCs

95% of commercially available SAF is consumed by FSC airlines that are privately owned (inc with minority state ownership)

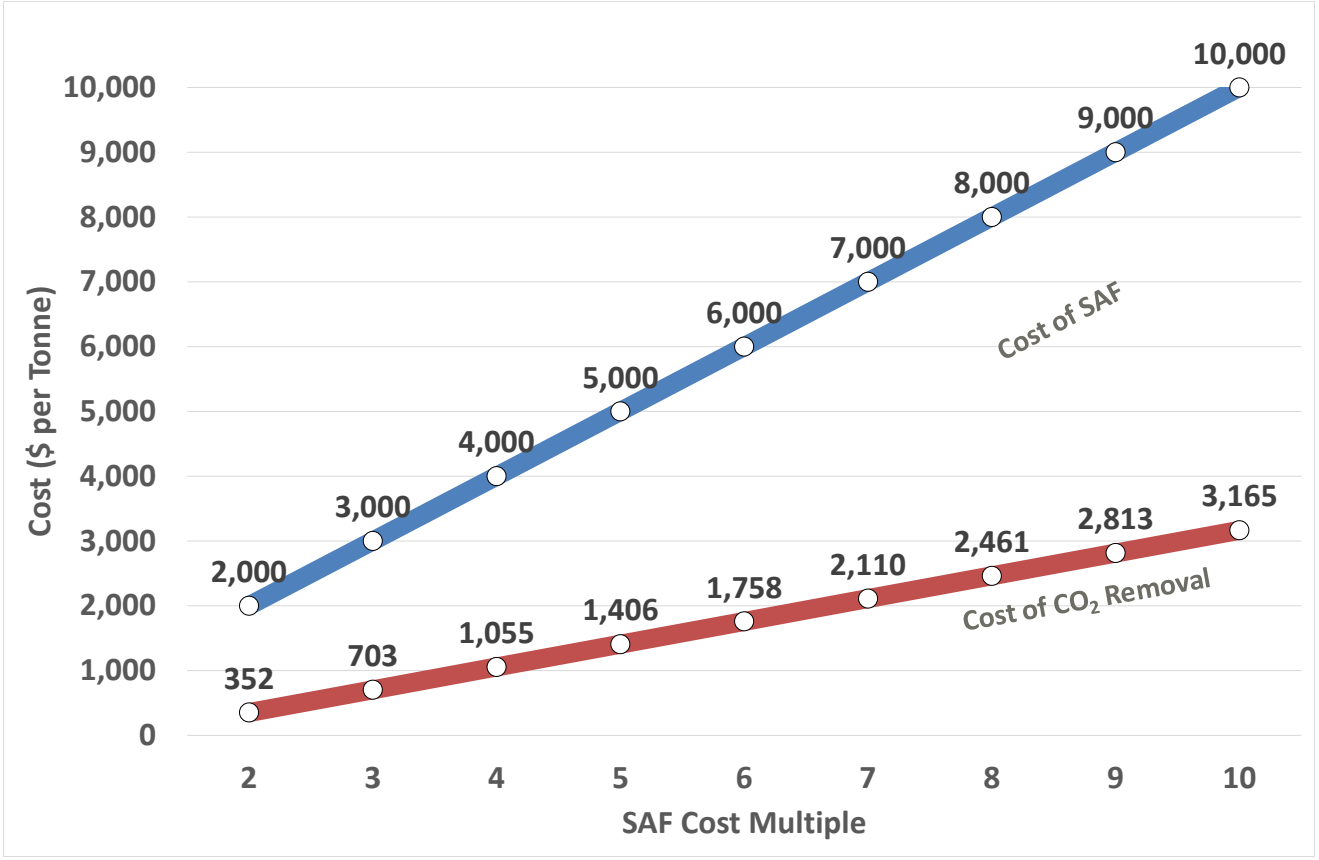
LCCs and State-Owned airlines each use less than 3% of the total available SAF supply

	LCC	FSC	Total
Private	3%	95%	**97%**
State	0%	3%	**3%**
Total	**3%**	**97%**	**100%**

700 $ per Tonne of CO_2 Removed using SAF

Assumptions

- SAF cost 3x jet fuel price
- Jet fuel costs $1,000 per tonne
- 90% CO_2 reduction using SAF
- 3.16 tonnes of CO_2 emitted per tonne of fuel consumed



3.8 x SAF Cost Multiple that Erodes 100% Operating Profit

Impact on industry operating profitability (10% SAF scenario)

- **3x** Industry operating profit reduced by 70%
- **4x** reduced by 110%

20% SAF scenario, the SAF breakeven cost multiple is 2.4x

Current industry operating profitability approximately 7.7%

SAF Cost Multiple	Industry Profit Margin (%)
2x	5.0%
3x	2.3%
4x	-0.4%
5x	-3.2%
7x	-8.6%

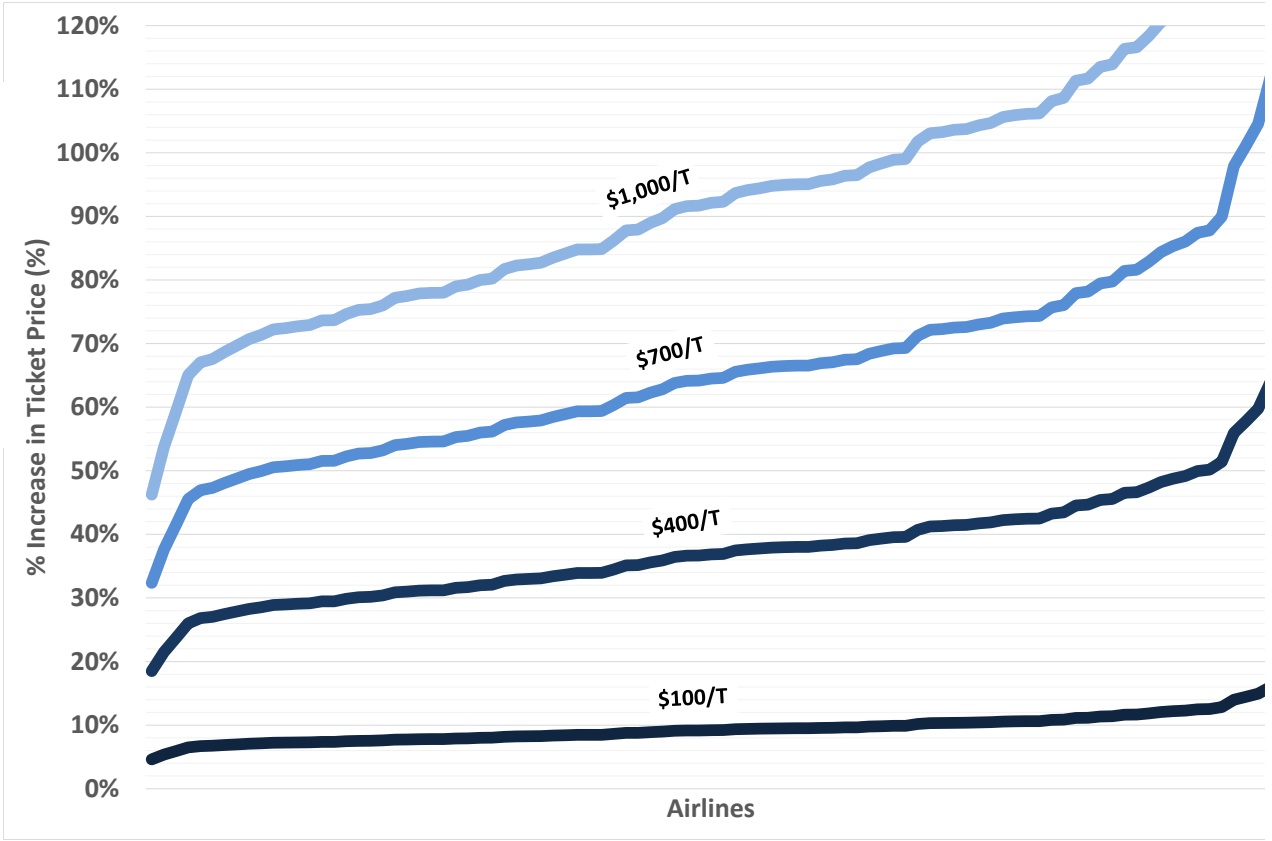
60 % Average Increase in Ticket Prices to Achieve Net-Zero

60% average increase in ticket prices based on a future carbon price of **$700/T**

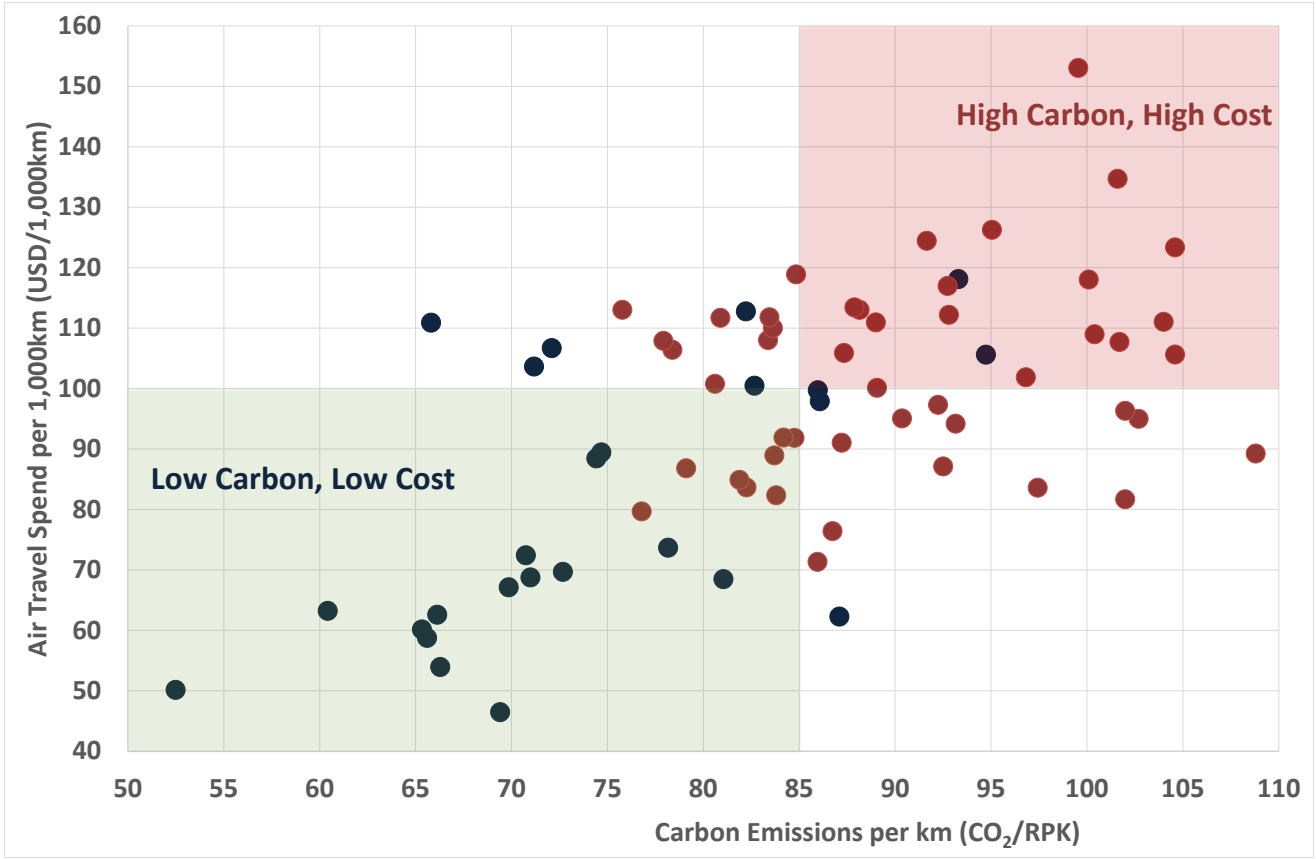
Price impact on individual airlines could range from 30% to 110% increase in this scenario

Future cost of carbon is critical to potential future price increases

Cost of Carbon	Industry avg. Increase (%)	Min-Max Increase Range (%)
$100/T	10%	5-20%
$400/T	35%	20-70%
$700/T	60%	30-120%
$1,000/T	90%	50-170%



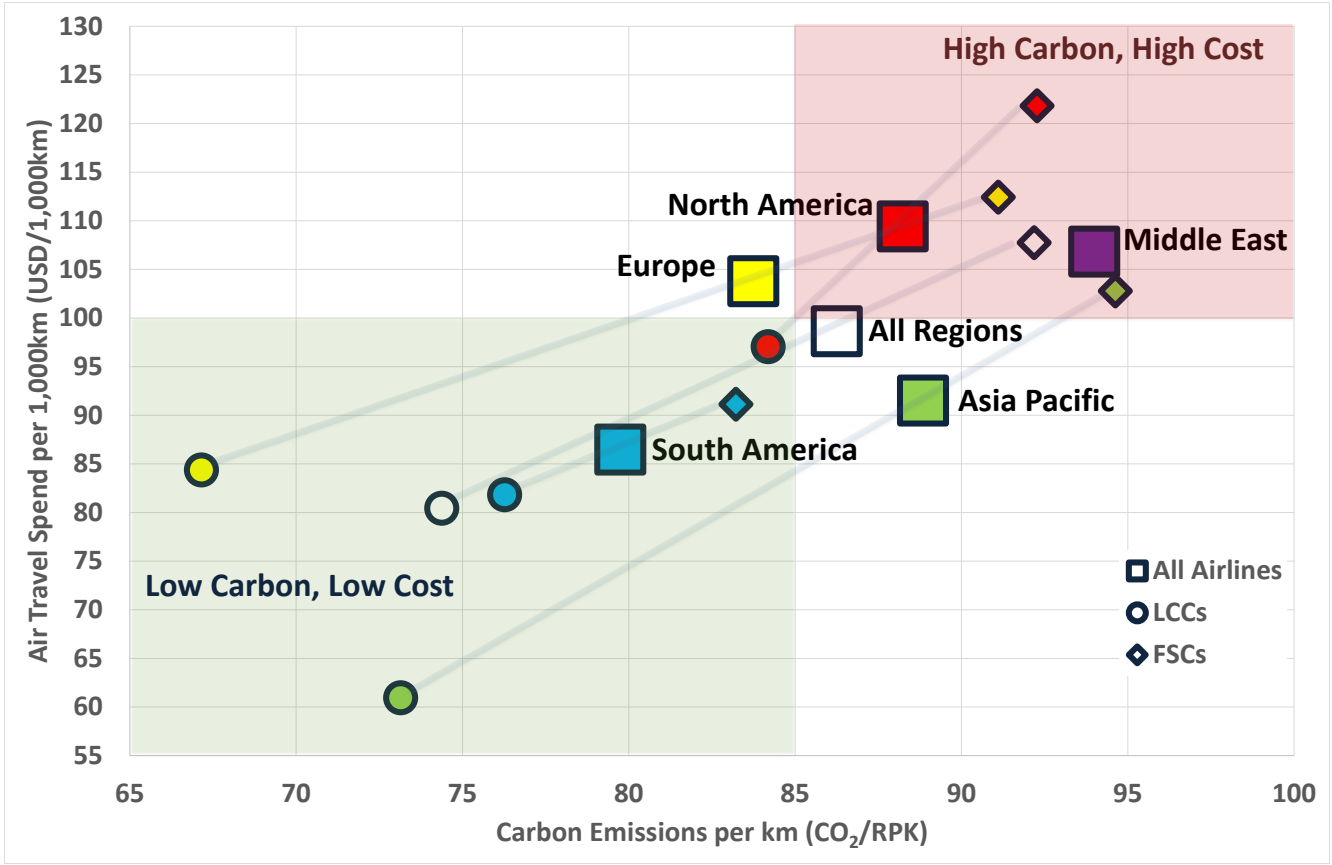
Airlines that Minimize both Cost and CO_2 per Travel km



LCCs are on average 20% more carbon-efficient and 25% more cost-effective when compared to FSCs on a per km basis

The most carbon-efficient FSC exhausts more CO_2 per RPK than the average LCC

South American Airlines Leading on Cost and Carbon Efficiency



Middle East and North American airlines dominantly in high-cost high-carbon quadrant

Low-carbon low-cost options absent in both these regions

13 % of Airlines Report on Carbon Offsets Purchased

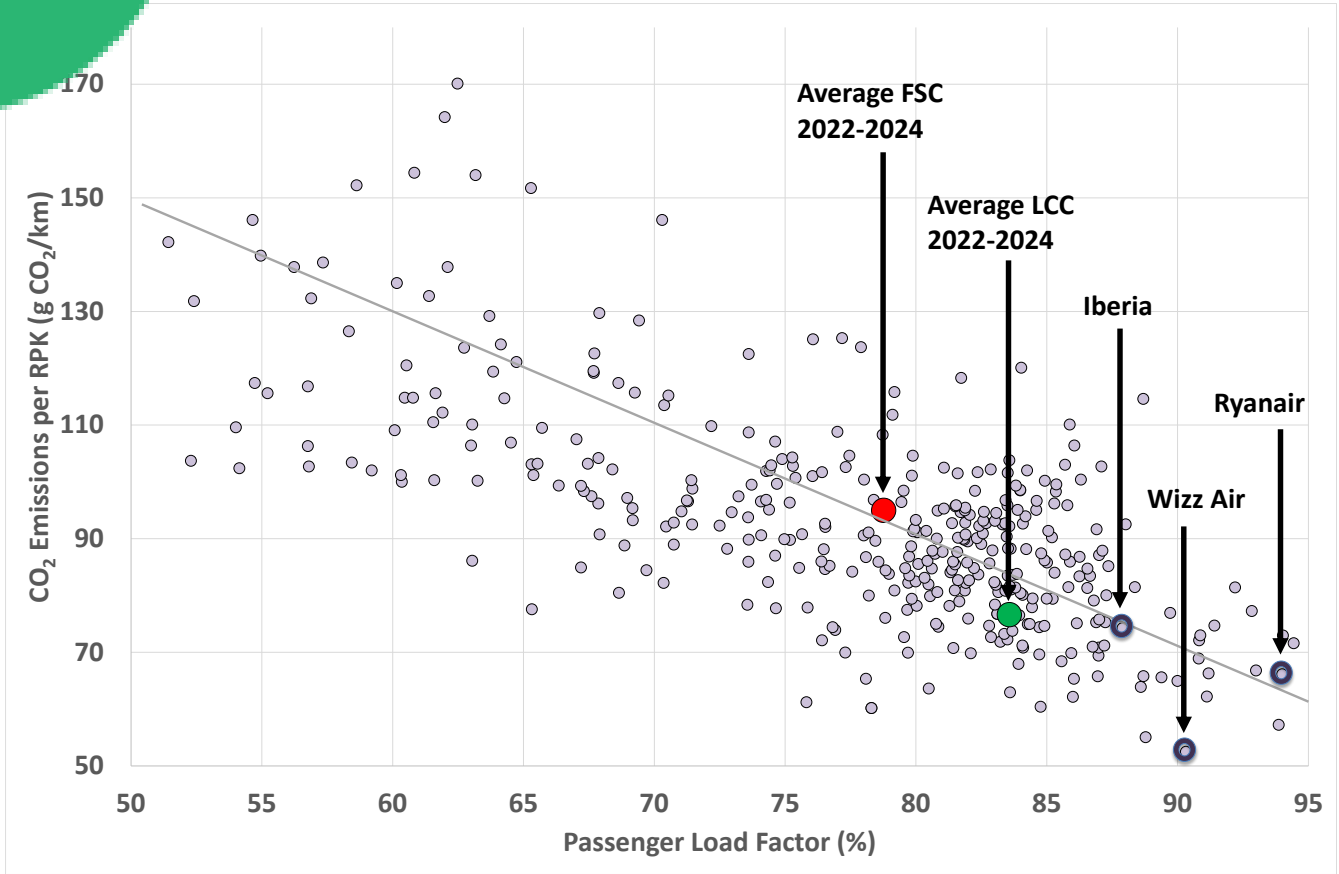
Most airlines describe the presence of offset programs but only 13% provide data on the quantity of offsets purchased

50% of airlines who reported offsets in 2020 no longer disclose details of offset program performance in their annual or sustainability reports

60% of airlines currently reporting on offsets are European carriers

Air New Zealand has the highest reports level of passenger voluntary purchase of carbon offsets at approx. 2.5% of total emissions

Load Factor matters

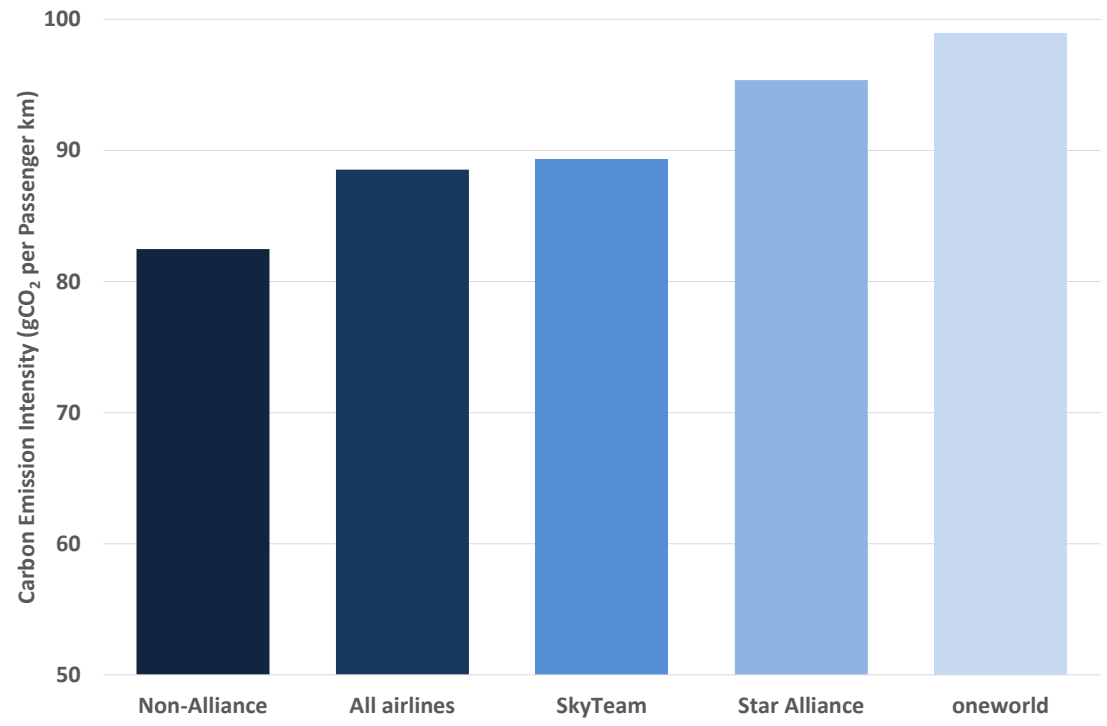


The most carbon-efficient airlines also have the highest passenger load factors

LCCs have an average load factor of 86%, almost 6% higher than FSCs

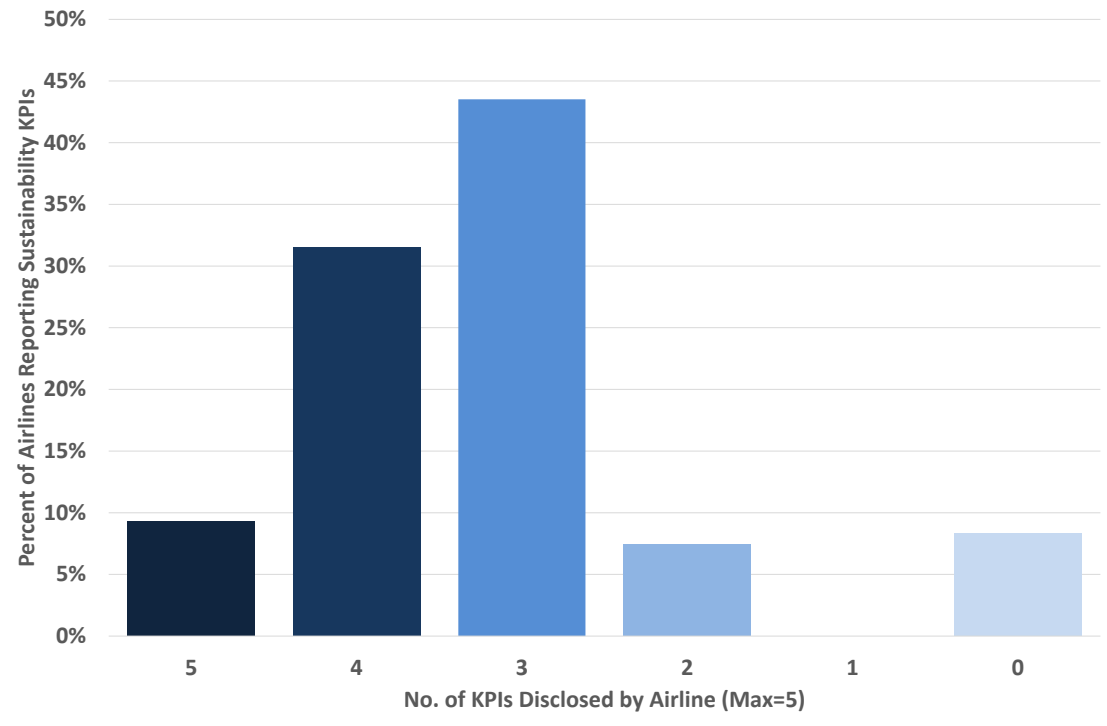
Data presented from 2020 to 2024

14 % Higher Emission Intensity of Alliances



The combined emission intensity of the three main alliances is over 14% higher than non-alliance airlines

85 % of Airlines Disclose Fuel Use and CO_2 Emission Data



The number of airlines that disclosure sustainability performance data has increased 30% since 2019

9% of airlines disclose both SAF Use and Offsets Purchased

KPI	Airlines Disclosing KPI (%)
Fuel Use	91%
Fuel Costs	91%
Scope 1 CO_2 Emissions	82%
SAF Use	36%
Offsets Purchased	13%

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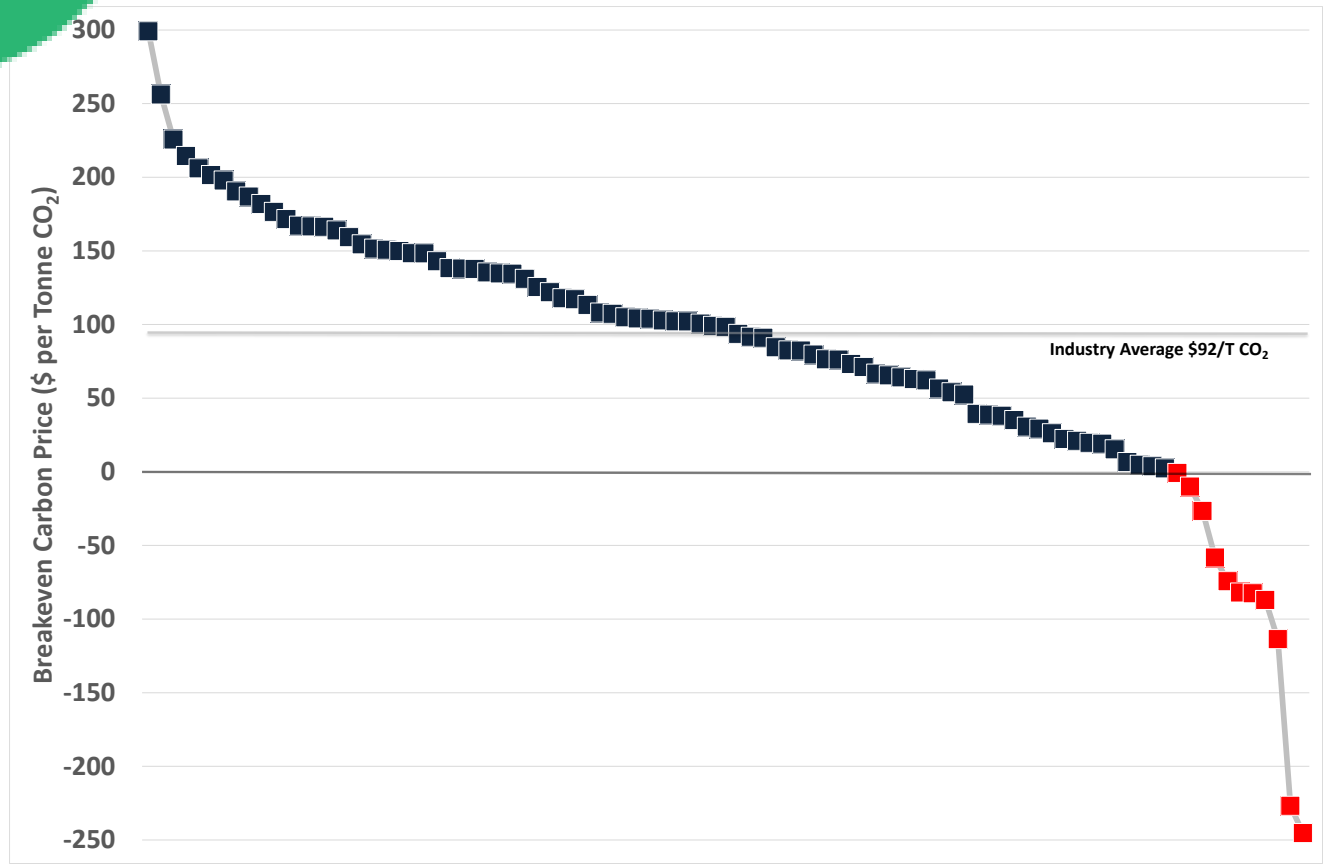
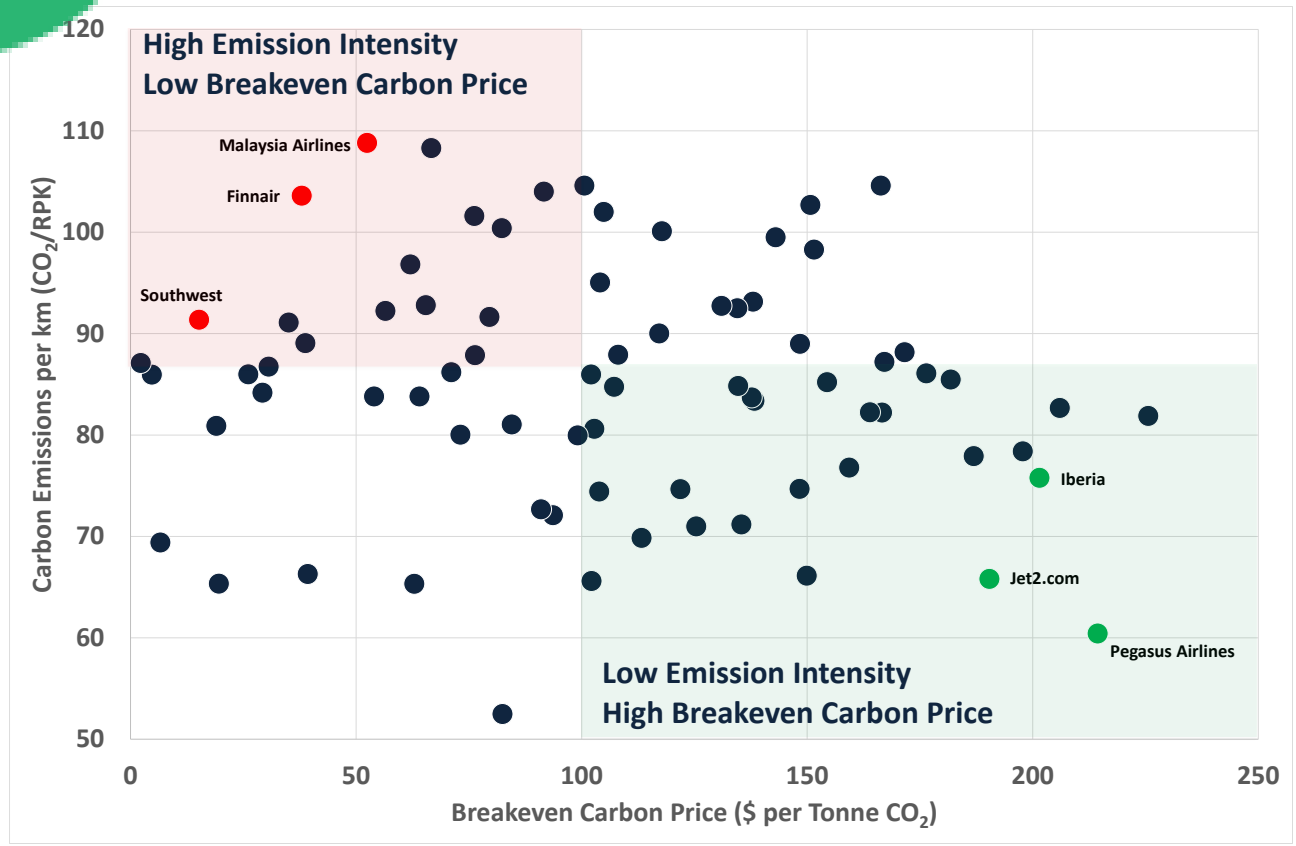
$ per Tonne CO_2 Emission "Breakeven Carbon Price"



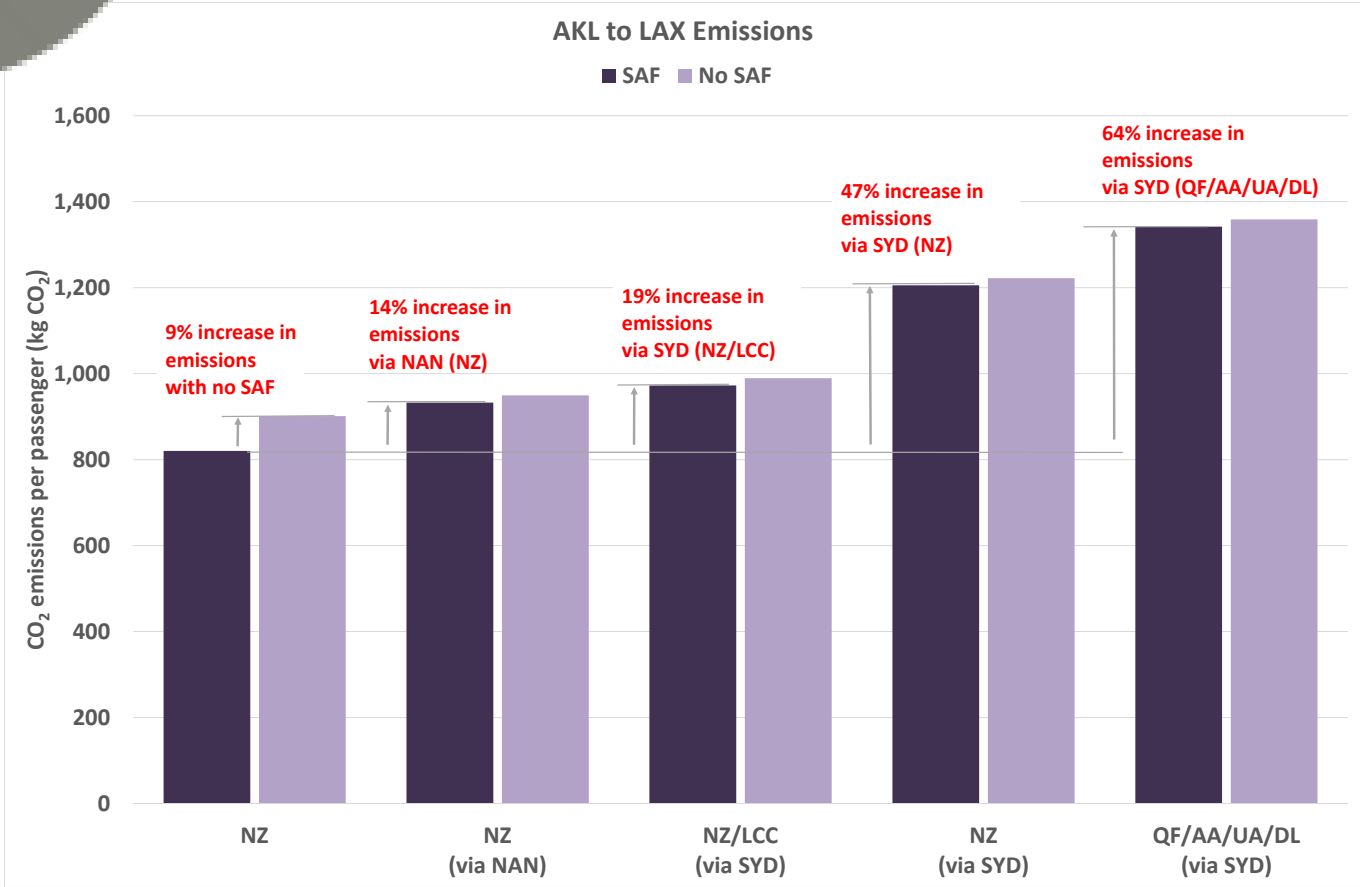
$92/T CO2 is the carbon price that would consume 100% of the collective industry operating profit if levied on all carbon emissions ("Breakeven Carbon Price")

Carbon Risk Matrix



Airlines with low CO_2 emission intensity and high Breakeven Carbon Price are likely to be the most resilient to pursue a path to net-zero

64 % More Emissions AKL-LAX via SYD to Avoid SAF Mandate



Assumptions

10% SAF mandate for all flights originating in New Zealand

90% CO_2 emission reduction using SAF

No SAF mandate for flights departing SYD or NAN

Performance of a “Platinum” airline

PEGASUS

Airline or Group		Group
Region		Europe
Alliance		
Start Date		01-Jan-23
End Date		31-Dec-23
Average fleet age	**Years**	**4.6**
Revenue	USD	3,119,844,748
Operating Profit	USD	639,186,927
Fuel Costs	USD	973,723,324
Fuel Use	Tonnes	943,656
ASK	km	58,217,000,000
RPK	km	49,353,232,000
Passenger Load Factors	**%**	**84.8%**
RFTK	Tonne km	0
Passenger as % of Total (Pax and Freight) Load	%	100.0%

CO_2e Emissions Reported	Tonnes	3,023,538
CO_2e Emissions Calculated from Fuel Use	Tonnes	2,981,953
CO_2e Emissions used in analysis	Tonnes	2,981,953
CO_2e/RPK	**Tonnes/km**	**60.4**
CO_2e/ASK	Tonnes/km	51.2
CO_2e/RTK	Tonnes/km	380
Carbon Offsets (airline purchased)	Tonnes	
Carbon Offsets (passenger purchased)	Tonnes	
Carbon Offsets (total)	Tonnes	
SAF Usage (Tonnes)	**Tonnes**	**217**
SAF as % of Fuel Use	%	0.023%
Weighted Average Carbon Index (WACI)	Tonnes/USD	956
Breakeven Carbon Price	**USD/Tonnes**	**214.4**
Disclosure	**Disclosure Score**	**100%**
Index	Index Score	37.3
Rating	**Rating**	**Platinum**

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