Aviation Emissions Report
August 23

Emissions analysis for largest markets - August 23 vs prior years

25 largest markets by total emissions

Date Origin Country	August 2019 Total CO2 (Tonnes)	August 2022 Total CO2 (Tonnes)	August 2023 Total CO2 (Tonnes)
United States	16,475,668	13,755,394	15,225,063
China	8,392,106	6,312,562	8,188,829
United Kingdom, UK	3,205,756	2,422,270	2,868,560
India	1,748,596	1,633,533	1,975,895
Japan	2,419,195	1,368,433	1,963,505
Germany	2,253,321	1,721,292	1,859,878
United Arab Emirates	2,005,484	1,463,775	1,845,918
Spain and Canary Islands	1,978,959	1,695,901	1,844,168
France	1,861,609	1,498,837	1,673,307
Canada	1,863,385	1,427,184	1,627,611
Russian Federation	1,878,109	1,526,706	1,575,052
Turkey	1,399,953	1,419,593	1,570,737
Australia	1,682,548	1,090,827	1,477,868
Italy	1,360,419	1,045,043	1,242,177
Brazil	1,277,979	1,065,303	1,178,899
Mexico	1,030,744	1,000,846	1,034,069
Republic of Korea	1,236,734	639,213	1,002,571
Indonesia	1,112,495	763,517	968,890
Qatar	817,998	746,964	876,180
Singapore	972,786	601,822	838,825
Thailand	1,193,447	539,447	822,217
Saudi Arabia	811,075	705,752	791,563
Netherlands	887,029	690,139	745,141
Greece	565,093	629,919	637,215
Vietnam	590,436	513,312	619,852

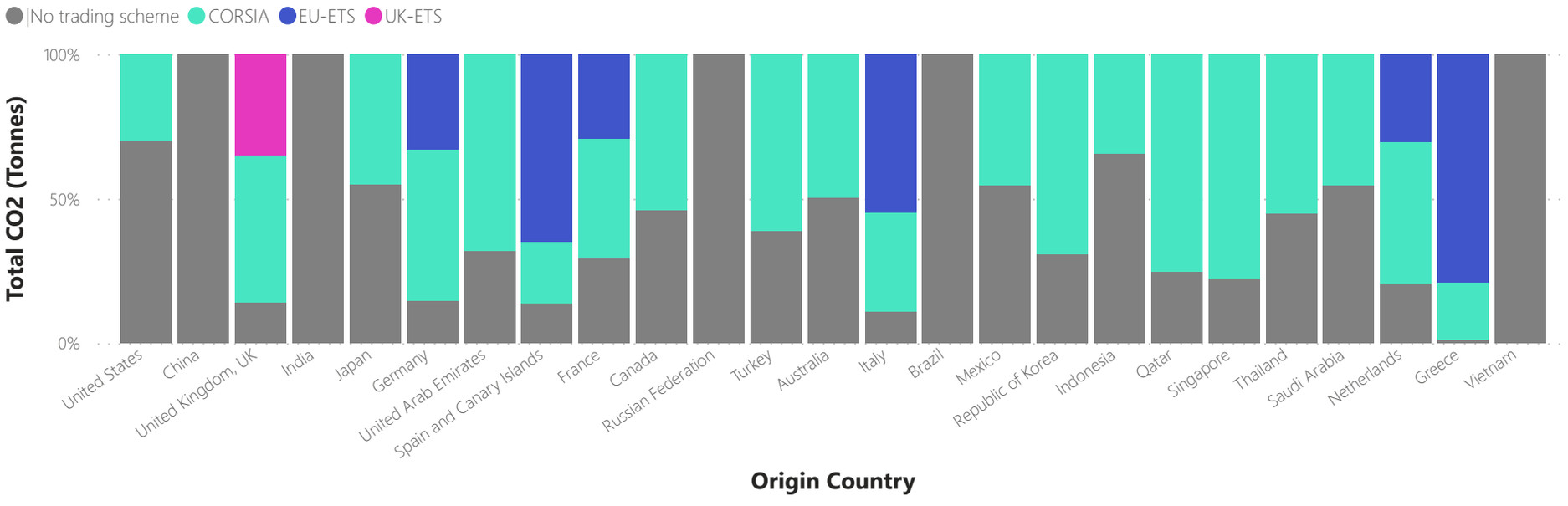
Change in Emissions - Current month vs prior years

This year vs last year	This year vs 2019
11%	-8%
30%	-2%
18%	-11%
21%	13%
43%	-19%
8%	-17%
26%	-8%
9%	-7%
12%	-10%
14%	-13%
3%	-16%
11%	12%
35%	-12%
19%	-9%
11%	-8%
3%	0%
57%	-19%
27%	-13%
17%	7%
39%	-14%
52%	-31%
12%	-2%
8%	-16%
1%	13%
21%	5%

Percent of Emissions covered by Compliance Programmes

August 2019 % covered	August 2022 % covered	August 2023 % covered
-	28.84%	29.92%
-	-	-
34.27%	89.53%	85.89%
-	-	-
-	35.35%	44.98%
33.03%	88.47%	85.45%
-	68.00%	68.07%
61.65%	88.75%	86.35%
27.71%	71.98%	70.67%
-	53.29%	53.96%
-	-	-
-	63.46%	61.25%
-	46.62%	49.59%
50.30%	93.12%	89.03%
-	-	-
-	45.01%	45.37%
-	67.56%	69.09%
-	27.49%	34.29%
-	75.94%	75.27%
-	84.28%	77.50%
-	57.23%	55.01%
-	41.06%	45.20%
26.53%	80.74%	79.21%
76.63%	99.18%	98.75%
-	-	-

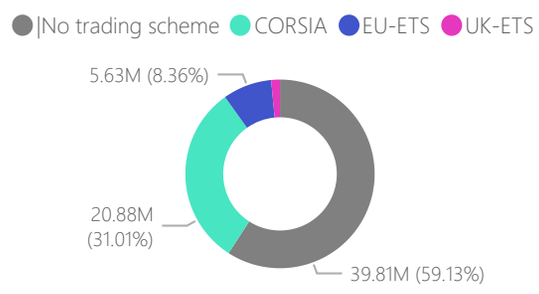
25 largest markets - emissions by Compliance Programme (current month)



Global emissions (tonnes)

67.33M

Emissions by compliance programme



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Emissions analysis for largest markets - YTD to Aug 23 vs prior years

25 largest markets by total emissions

YTD Period Origin Country	YTD 2019 Total CO2 (Tonnes)	YTD Last Year Total CO2 (Tonnes)	YTD This Year Total CO2 (Tonnes)
United States	122,255,482	100,243,512	111,673,852
China	62,023,541	42,071,537	56,735,120
United Kingdom, UK	22,678,349	15,422,565	19,612,567
India	14,073,019	12,261,292	15,458,755
Japan	18,134,467	8,834,083	13,867,013
United Arab Emirates	14,941,363	10,341,024	13,643,832
Germany	16,136,721	10,715,668	12,409,072
Spain and Canary Islands	13,212,015	10,886,988	12,325,878
France	13,041,327	9,508,118	11,183,529
Australia	13,457,000	7,299,688	10,983,345
Canada	12,649,887	8,479,575	10,800,213
Turkey	8,967,757	8,446,548	9,980,520
Russian Federation	12,600,901	9,396,208	9,615,091
Brazil	10,280,527	8,110,479	9,489,266
Mexico	8,032,968	7,590,558	8,178,580
Italy	8,843,873	6,093,059	7,659,566
Republic of Korea	9,241,237	3,604,686	7,147,150
Indonesia	8,713,308	5,523,450	7,116,452
Thailand	9,784,079	3,330,522	6,381,084
Qatar	6,241,699	5,421,202	6,314,045
Singapore	7,655,944	3,678,150	6,213,991
Saudi Arabia	5,784,029	4,588,223	5,894,328
Netherlands	6,333,217	4,664,014	5,256,407
Vietnam	4,580,023	3,284,691	4,574,135
Malaysia	5,377,255	2,161,128	3,905,557

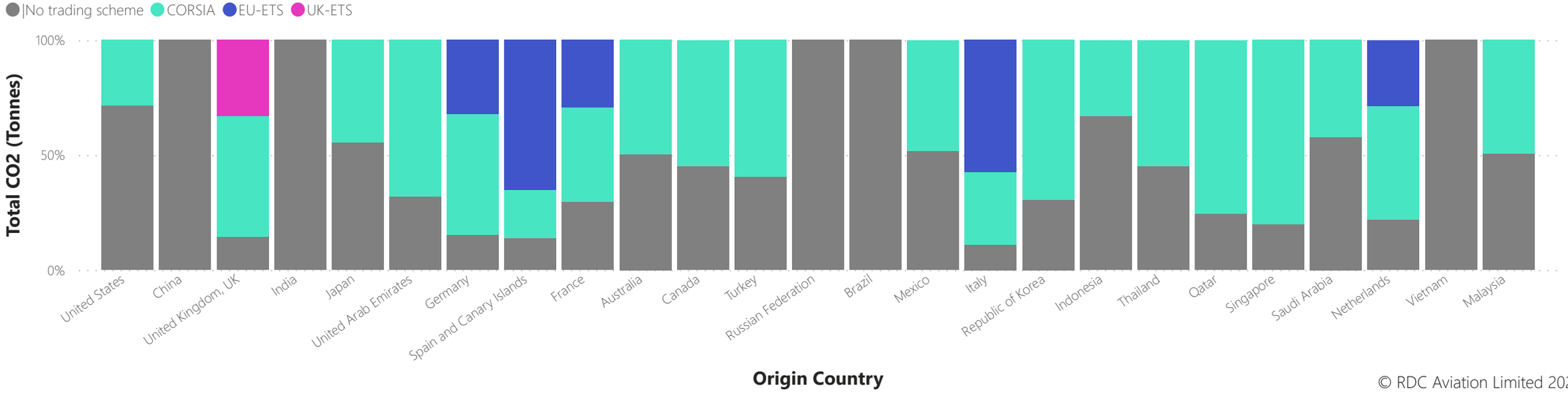
Change in Emissions - Current month vs prior years

This YTD vs Last YTD	This YTD vs YTD 2019
11%	-9%
35%	-9%
27%	-14%
26%	10%
57%	-24%
32%	-9%
16%	-23%
13%	-7%
18%	-14%
50%	-18%
27%	-15%
18%	11%
2%	-24%
17%	-8%
8%	2%
26%	-13%
98%	-23%
29%	-18%
92%	-35%
16%	1%
69%	-19%
28%	2%
13%	-17%
39%	-0%
81%	-27%

Percent of Emissions covered by Compliance Programmes

YTD 2019 Trading scheme %	YTD Last Year Trading scheme %	YTD This Year Trading scheme %
-	25.72%	28.45%
-	-	-
31.68%	88.65%	85.56%
-	-	-
-	32.77%	44.63%
-	67.40%	68.07%
33.41%	87.25%	84.57%
62.02%	87.73%	86.11%
27.67%	72.56%	70.22%
-	41.56%	49.74%
-	54.17%	54.79%
-	60.64%	59.58%
-	-	-
-	-	-
-	48.36%	48.11%
51.12%	94.34%	89.08%
-	65.26%	69.56%
-	17.36%	32.95%
-	54.04%	54.78%
-	74.10%	75.41%
-	84.06%	80.22%
-	32.57%	42.30%
25.09%	78.97%	78.09%
-	-	-
-	39.05%	49.42%

25 largest markets - emissions by Compliance Programme (current YTD)



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RDC CARE Index by carrier and home continent - August 23

Top 25 European Carriers

Carrier Name	CARE Index
Marabu Airlines	7.6
TUIfly Nordic	7.6
SmartLynx Airlines Estonia	7.5
PLAY	7.4
Novair	7.4
World2Fly	7.4
French Bee	7.3
Chalair Aviation	7.2
Iberojet	7.2
Wizz Air UK	7.1
Norse Atlantic Airways	7.1
Sunclass Airlines	7.1
Smartwings Poland	7.0
Wizz Air Malta	7.0
TUI Airways	6.9
Norse Atlantic Airways UK	6.8
Wizz Air	6.8
La Compagnie	6.8
SunExpress	6.8
Corendon Dutch Airlines	6.7
Freebird Airlines	6.7
TUIfly Deutschland	6.6
Abelo	6.6
Azores Airlines	6.6

Top 25 North American Carriers

Carrier Name	CARE Index
Canadian North	7.8
Lynx Air	7.1
Sunwing Airlines	6.9
Air Transat	6.9
Volaris	6.9
Flair Airlines	6.8
Frontier Airlines	6.8
Swoop	6.8
Canada Jetlines	6.3
Spirit Airlines	6.3
Allegiant Air	5.9
Omni Air International	5.9
WestJet	5.8
Sun Country	5.8
Aeromexico	5.7
Delta Air Lines	5.6
VivaAerobus	5.6
Alaska Airlines	5.6
Air Saint-Pierre	5.5
Airbahn	5.5
American Airlines	5.5
United Airlines	5.4
Air Canada	5.4
Avelo Air	5.3

Top 25 Asian Carriers

Carrier Name	CARE Index
Japan Air Commuter	7.1
Thai AirAsia X	6.7
AirAsia X	6.7
ZIPAIR Tokyo	6.7
Akasa Air	6.6
STARLUX Airlines	6.4
Thai Summer Airways	6.4
Trigana Air	6.3
Philippine Airlines	6.3
T'Way Air	6.3
Air Premia	6.3
Air India Express	6.2
airblue	6.2
Himalaya Airlines	6.2
Tigerair Taiwan	6.2
NordStar Airlines	6.2
Aero Nomad Airlines	6.1
Hong Kong Express	6.1
Ural Airlines	6.1
Greater Bay Airlines	6.1
Serene Air	6.1
Nordwind Airlines	6.0
Chongqing Airlines	6.0
Qingdao Airlines	6.0

Top 25 RoW Carriers

Carrier Name	CARE Index
SATENA	7.7
Wizz Air Abu Dhabi	6.9
Bonza Airline	6.7
Arajet	6.7
flydubai	6.6
Flynas	6.5
Bahamasair	6.5
Air Tahiti Nui	6.4
SalamAir	6.4
Syrian Air	6.2
El Al	6.1
LATAM Paraquay	6.1
FlyEgypt	6.1
TACV	6.0
Nouvelair Tunisie	6.0
Badr Airlines	5.9
Copa Airlines	5.9
Sudan Airways	5.9
Jazeera Airways	5.8
JetSmart Airlines S.A.	5.8
Flybondi	5.8
Nile Air	5.7
flyadeal	5.7
Nesma Airlines	5.7

The CARE Index is a measure of airline route sustainability, based around our emissions methodology and various other factors, that has been developed to give business and consumers the best information on which to make their purchasing decisions - particularly when it comes to making more environmentally friendly choices. Most 'efficiency measures' use CO2 per passenger, per seat or per available seat kilometre (ASK), which can be hard to understand for consumers. The CARE Index creates a score between 0 (worst) to 10 (best) for any air route, airline and aircraft combination, taking into account:

- fuel burn and **efficiency of the aircraft type**
- **efficiency of the airline** – using specific seat capacity, configuration and overall occupancy rates (load factor)
- use of **Sustainable Alternative Fuels (SAF)**
- if the route is part of a **compliance or regulatory emissions programme** such as EU ETS etc
- whether the **operator offsets any emissions over and above that which is legally required**

The CARE index has been designed to be a force for change, giving consumers better insight into the environmental impact of their chosen airline that will also help to shape airline sustainability strategies.

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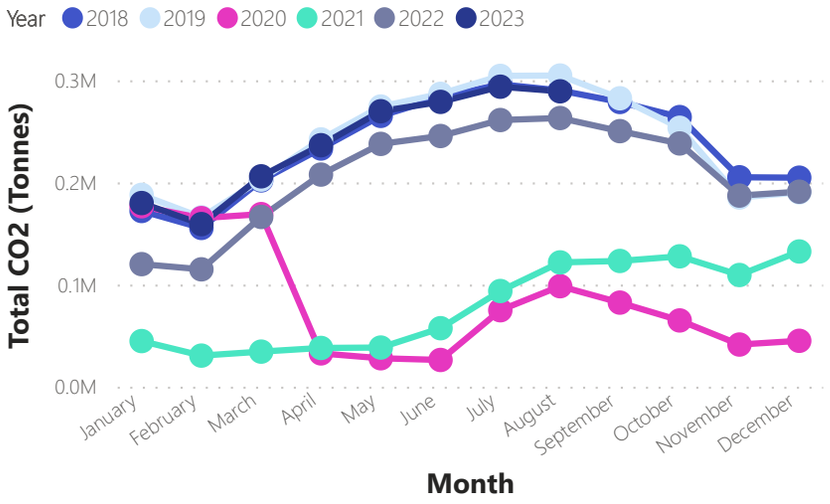
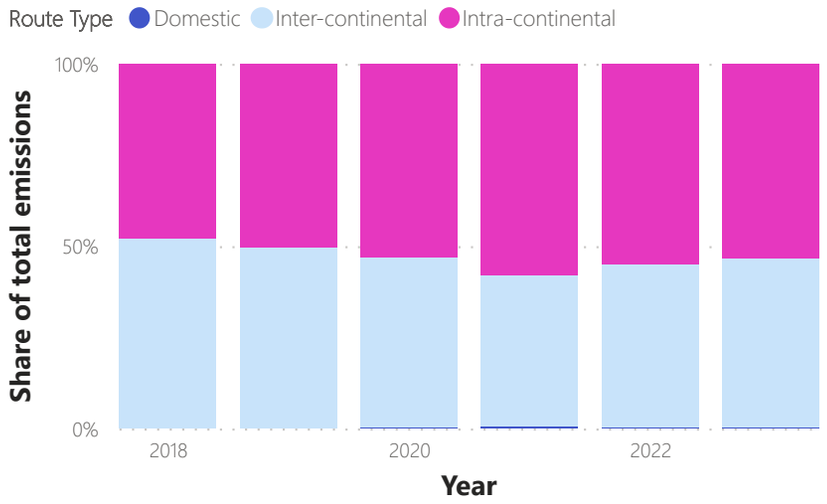
This month's focus country: Ireland

Total CO2 (Tonnes) by Month and Year



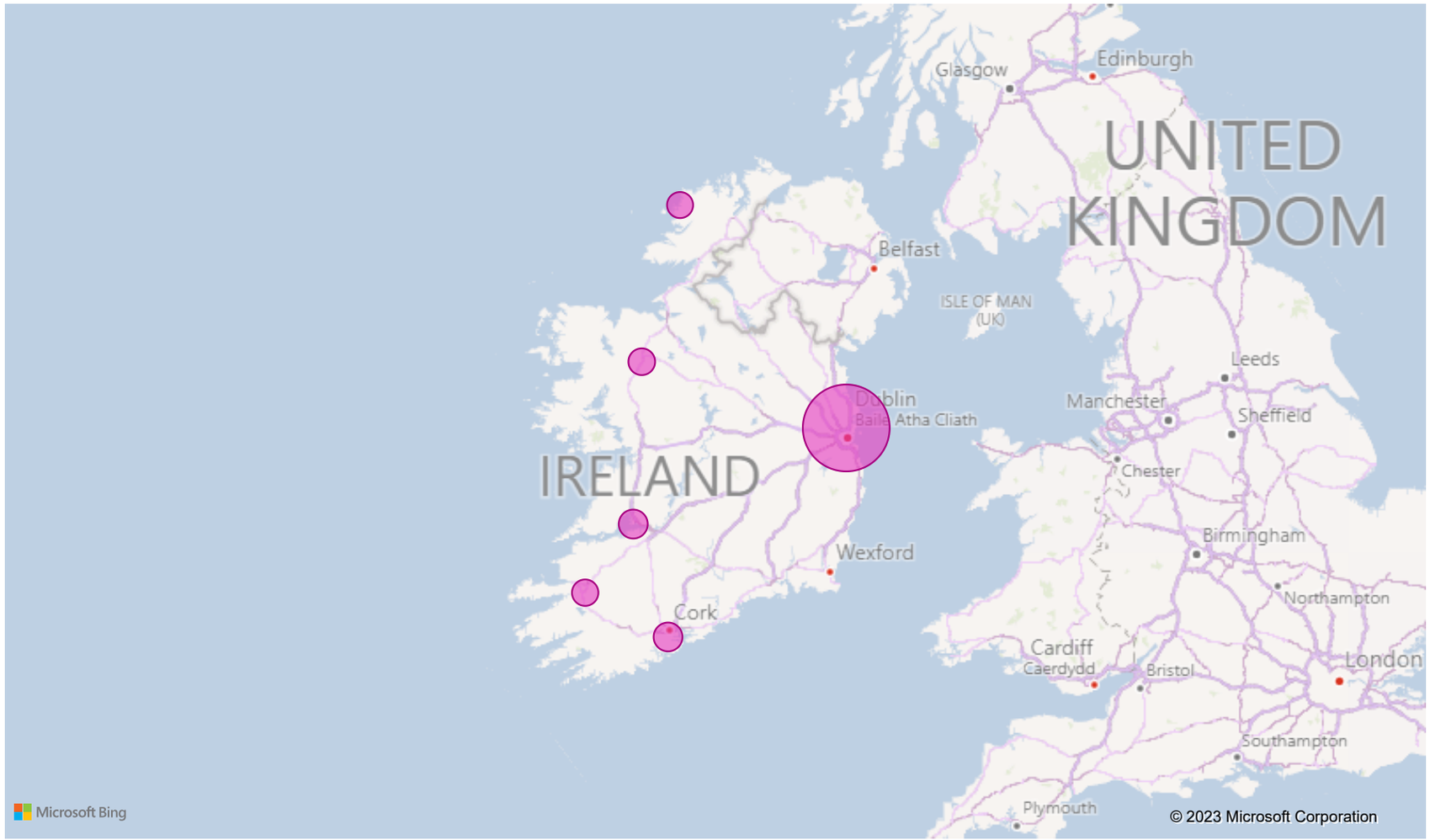
CO2 by Year and Route Type



10 largest markets by seat capacity ranked by lowest Emissions per ASK - last 12 months

Destination Country	Emissions per ASK (g)	Total CO2 (Tonnes)
Canada	56.29	122,897
Poland	57.94	57,808
Spain and Canary Islands	59.48	338,457
Italy	59.68	118,619
Portugal	62.01	95,836
Germany	64.78	98,986
United States	67.89	934,780
France	68.10	95,307
Netherlands	77.63	53,092
United Kingdom, UK	84.64	302,265

Largest origin airports by total emissions - last 12 months



10 largest carrier by emissions ranked by highest total emissions - last 12 months

Carrier Name	Emissions per ASK (g)	Total CO2 (Tonnes)
Aer Lingus	66.25	941,876
Ryanair	63.64	746,903
Ethiopian Airlines	60.32	115,989
United Airlines	82.84	113,929
Emirates	70.30	112,574
American Airlines	69.88	98,926
Delta Air Lines	68.77	97,496
Qatar Airways	64.24	59,605
Malta Air	58.60	46,288
Air Canada	59.76	43,935

10 most efficient routes according to RDC's CARE Index - current month

Carrier Name	Aircraft	Origin	Destination	CARE Index
Ryanair	B737 MAX 8	DUB	ACE	7.7
Ryanair	B737 MAX 8	DUB	ATH	7.7
Ryanair	B737 MAX 8	DUB	BJV	7.7
Ryanair	B737 MAX 8	DUB	CHQ	7.7
Ryanair	B737 MAX 8	DUB	DLM	7.7
Ryanair	B737 MAX 8	DUB	FUE	7.7
Ryanair	B737 MAX 8	DUB	JTR	7.7
Ryanair	B737 MAX 8	DUB	LPA	7.7
Malta Air	B737 MAX 8	SNN	MLA	7.7
Ryanair	B737 MAX 8	DUB	RHO	7.7

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For decades RDC have been monitoring and modelling the CO2 emissions arising from the growing aviation industry. We have the ability to calculate and report detailed airline operating expenses - including fuel burn, which in turn gives us the CO2 output from flying. For accuracy on CO2 emissions data, our accredited and independent methodology can't be beaten.

We passionately believe that business and consumers should be armed with the best information on which to make their purchasing decisions - particularly when it comes to making more environmentally friendly choices - this is why we developed our **CO2 calculator** and **CARE Index.**

To find out more about how RDC can deliver CO2 emissions data for your business services, get in touch with:

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