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atmosfair Airline Index 2011



How is the Airline Index used?

1. Avoidance

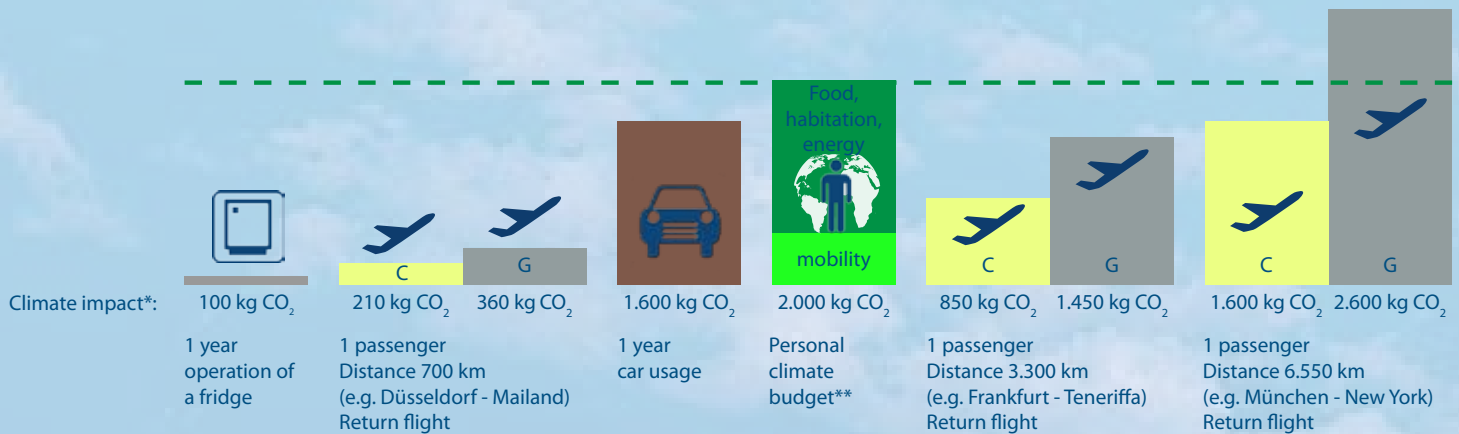
- Even efficient flights can quickly exceed a single person's climate appropriate CO₂ budget (see graphic). Is my flight necessary?
- Have I chosen the most direct flight? (Rule of thumb: a direct flight in Efficiency Class E is better for the climate than a transfer flight in Class C)

2. Optimization

- The airline index shows you the efficiency points of an airline broken down by short, medium and long distance flights. First, ascertain your flight distance and then, in the appropriate distance class, the most efficient airline.
- The airline with the most efficiency points will generally also be the most efficient on your specific flight from point A to point B. Deviations are possible, but generally do not exceed one efficiency class.

3. Compensation

- atmosfair can offset the CO₂ quantity that you generate with your flight by building up and expanding the generation of renewable energies. Make your contribution to fighting global warming online with the multiple test winner www.atmosfair.de



* Aircraft exhaust gases contain additional pollutants besides CO₂. Those other pollutants are converted to CO₂ equivalent omissions using the absolute global warming potential (AGWP) approach, with medium values and a 100 year time horizon. The AGWPs do not enter into the ranking of the airlines, since they are the same for all airlines.

** That is the amount of CO₂ that one human being can generate annually if global warming is to stay below the 2°C mark, provided the resulting world CO₂ budget were equally distributed among all humans. Transport accounts for about one quarter of current global CO₂ emissions.

References

Prof. Dr. Hartmut Graßl:

"With the airline index, atmosfair has built a bridge from science to practical climate protection in the important area of air transport."

Associate Prof. Paul Peeters, NHTV Breda University, aircraft engineer:

"The AAI calculation method is precise and sets the standard for the environmental evaluation of aircraft and airlines."

Prof. Dr. Stefan Gössling, Lund University:

"The challenge of comparing airlines from a climate policy viewpoint has been convincingly scientifically solved by atmosfair."

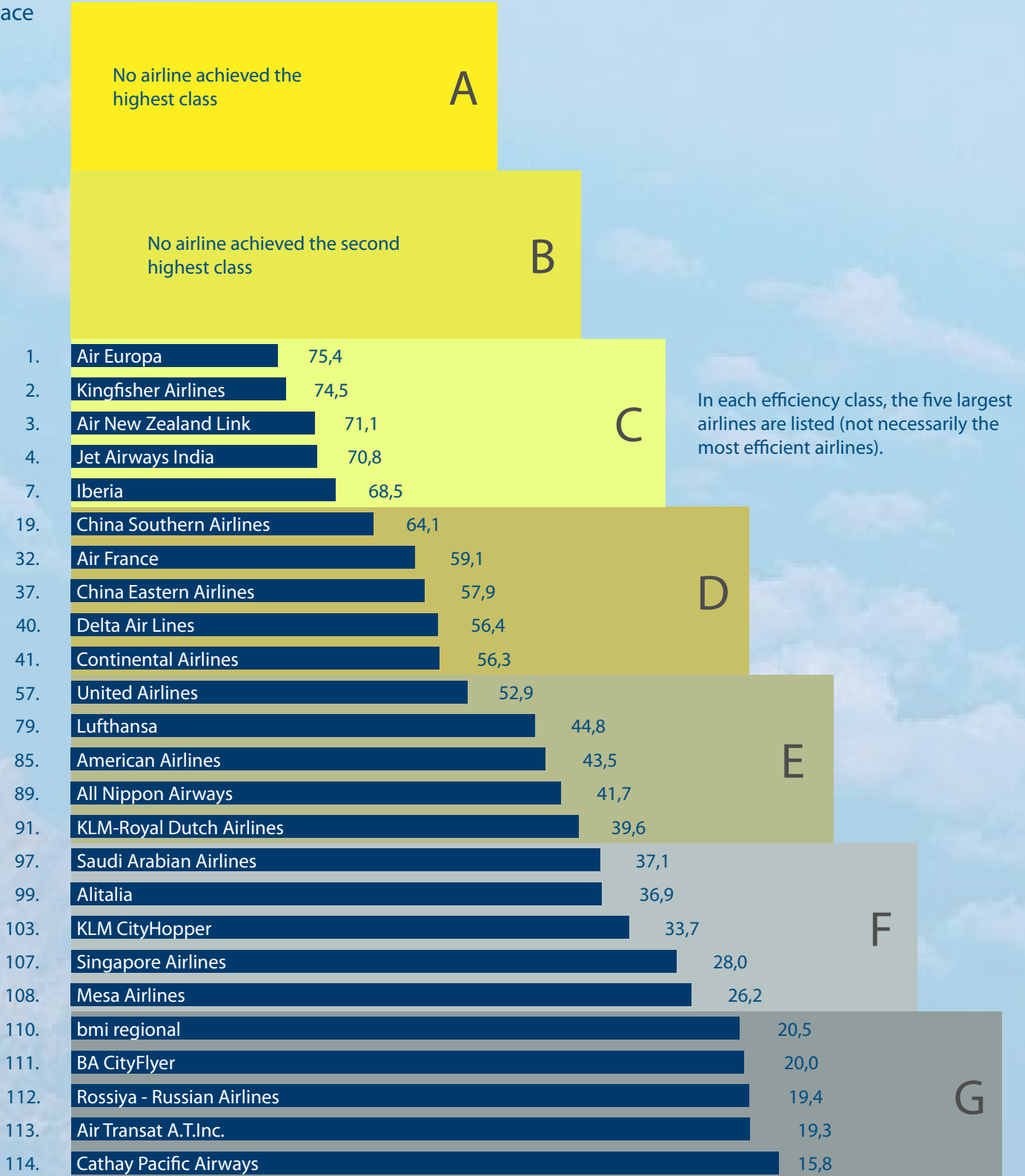
For corporates

The atmosfair airline ranking is available in detail even for single selected air routes. Because tight seating often reduces fuel consumption, we can recommend airlines on the routes that are important to you, with which you can save both money and CO₂.

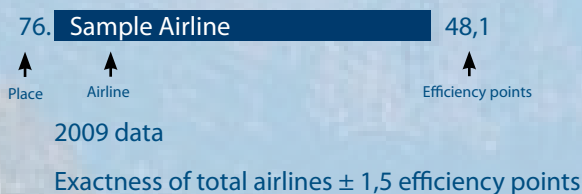
Ask us; we'll be happy to help you: airlineindex@atmosfair.de

AAI 2011 Evaluation of short haul flights (up to 800 km)

Place



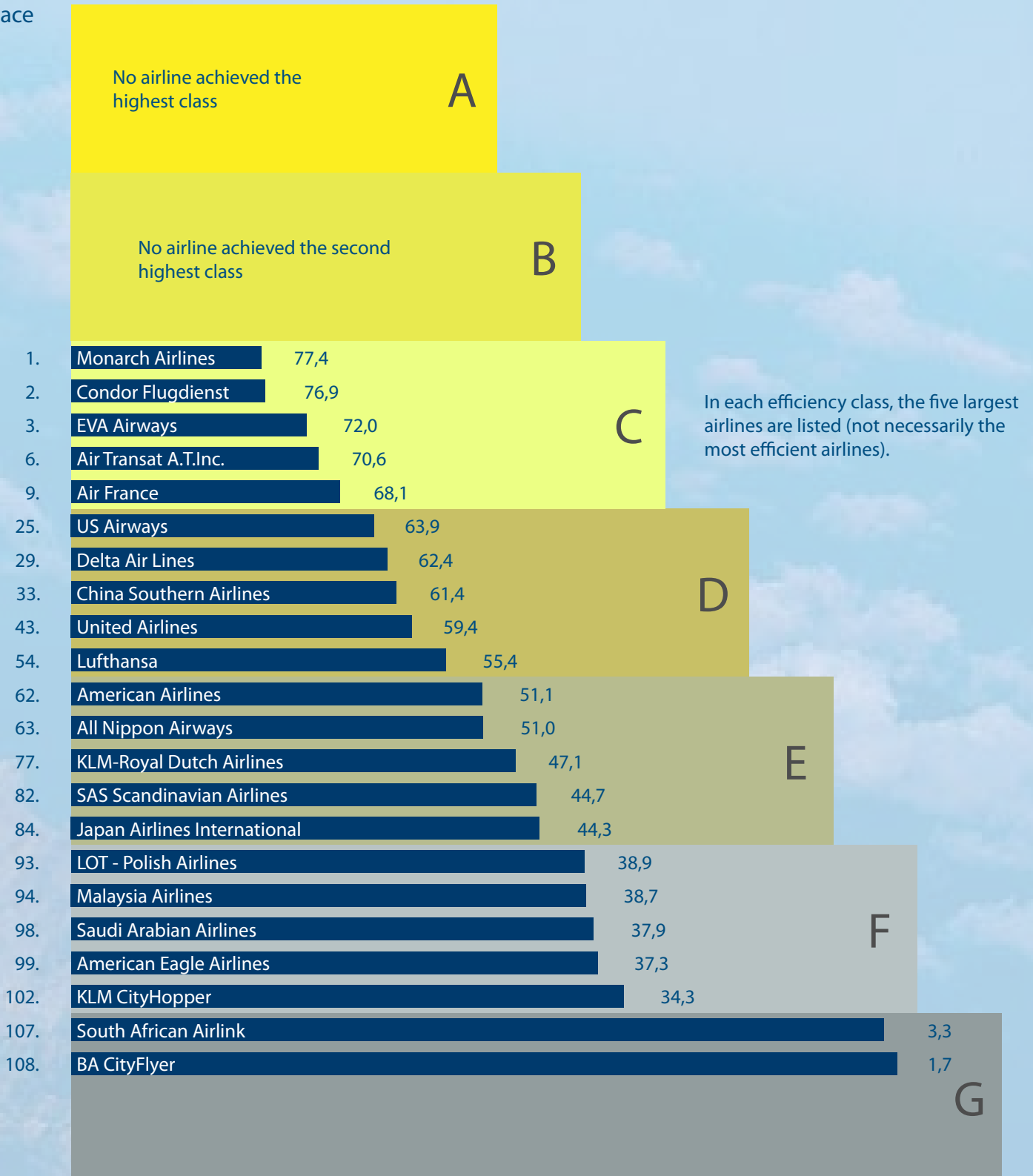
Legend



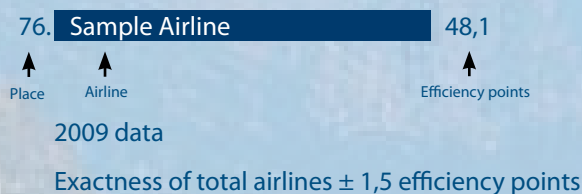
Efficiency class	Efficiency points
A	100 - 90
B	89 - 79
C	78 - 67
D	66 - 54
E	53 - 39
F	38 - 21
G	20 - 0

AAI 2011 Evaluation of medium haul flights (from 800 km up to 3.800 km)

Place



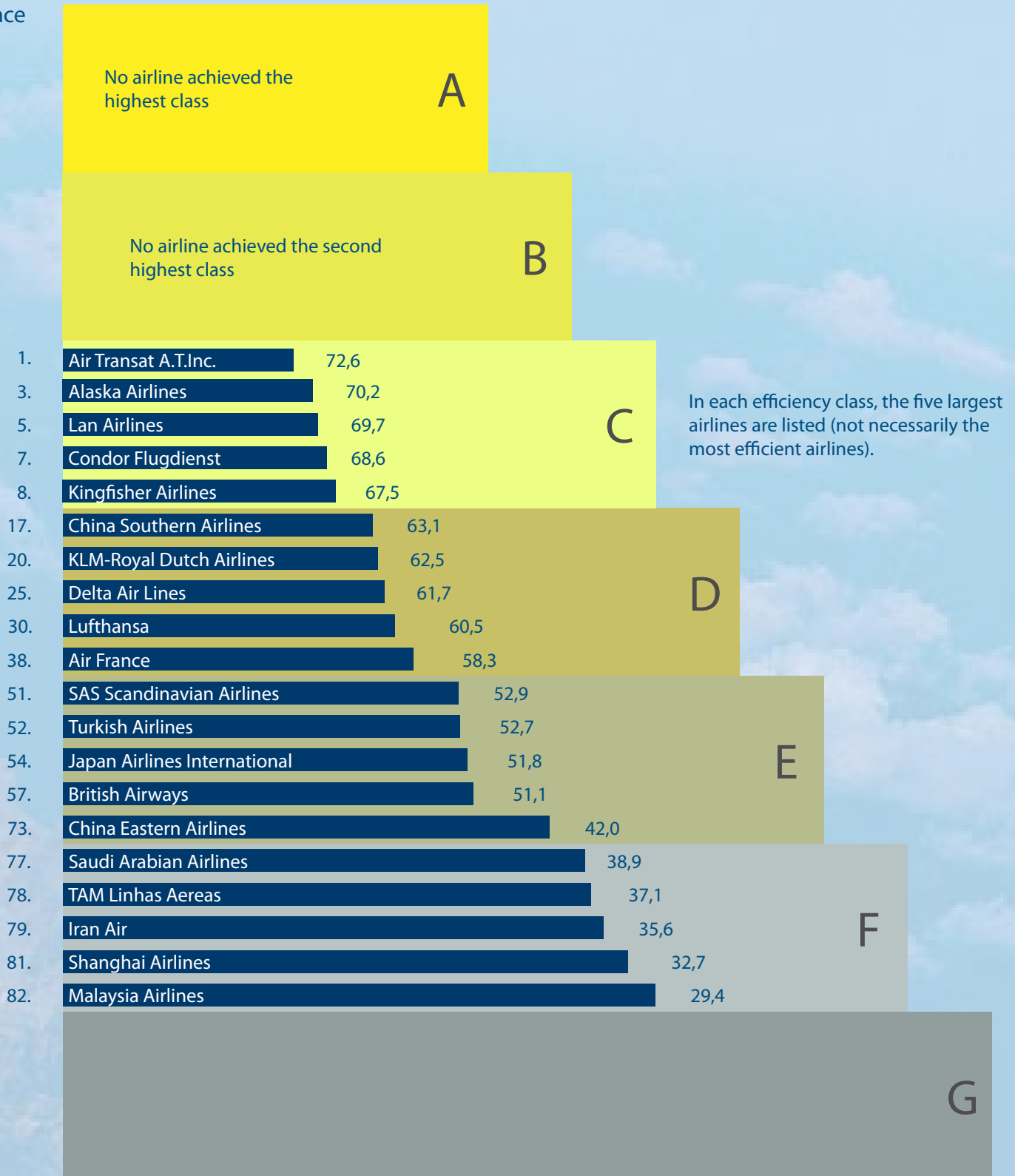
Legend



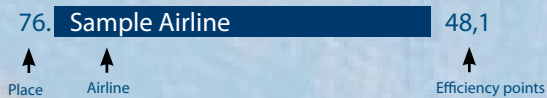
Efficiency class	Efficiency points
A	100 - 90
B	89 - 79
C	78 - 67
D	66 - 54
E	53 - 39
F	38 - 21
G	20 - 0

AAI 2011 Evaluation of long haul flights (more than 3.800 km)

Place



Legend



2009 data

Exactness of total airlines $\pm 1,5$ efficiency points

Efficiency class	Efficiency points
A	100 - 90
B	89 - 79
C	78 - 67
D	66 - 54
E	53 - 39
F	38 - 21
G	20 - 0

Detailed ranking (1)

Overall ranking

Place	Airline	EP*	EC*	Type*	Pax (in Mio.)*
1	Monarch Airlines	77,4	C	Charter	6,1
2	Condor Flugdienst	73,5	C	Charter	5,6
3	Air Transat A.T.Inc.	71,8	C	NetCarrier	3,2
4	Air New Zealand Link	71,1	C	Regional	4,0
5	Kingfisher Airlines	70,3	C	NetCarrier	11,0
6	EVA Airways	70,0	C	NetCarrier	6,0
7	Air Europa	69,6	C	NetCarrier	9,0
8	Srilankan Airlines	68,7	C	NetCarrier	2,6
9	TAM Regional ¹	68,6	C	Regional	1,1
10	Edelweiss Air	68,0	C	Charter	0,59
11	QantasLink	67,3	C	Regional	4,1
12	Hawaiian Airlines	66,4	D	NetCarrier	8,3
13	Shenzhen Airlines	66,1	D	NetCarrier	15,1
14	Jet Airways India	65,7	D	NetCarrier	12,0
15	Virgin America	65,4	D	NetCarrier	3,7
16	Sichuan Airlines	64,9	D	NetCarrier	9,2
17	Martinair Holland	64,4	D	NetCarrier	0,1
17	China Airlines	64,4	D	NetCarrier	10,0
19	Lan Airlines	64,2	D	NetCarrier	15,4
20	Korean Air	63,8	D	NetCarrier	20,7
21	Icelandair	63,7	D	NetCarrier	1,3
21	Hainan Airlines	63,7	D	NetCarrier	17,4
23	Dragonair	63,4	D	NetCarrier	6,0
24	Alaska Airlines	63,3	D	NetCarrier	15,6
25	Iberia	63,2	D	NetCarrier	20,5
26	Avianca	63,1	D	NetCarrier	9,3
27	Shandong Airlines	63,0	D	NetCarrier	6,6
28	Air India Express	62,6	D	Regional	2,5
29	US Airways	62,5	D	NetCarrier	51,0
30	Emirates	61,9	D	NetCarrier	27,5
30	China Southern Airlines	61,9	D	NetCarrier	66,3
32	Swiss/Crossair	61,8	D	NetCarrier	14,0
33	Delta Air Lines	61,7	D	NetCarrier	161,0
34	S7 Airlines	61,5	D	NetCarrier	4,6
35	Thomas Cook Airlines	60,8	D	Charter	8,2
36	Philippine Airlines	60,6	D	NetCarrier	9,4
37	Air France	60,5	D	NetCarrier	48,0
38	Continental Airlines	60,3	D	NetCarrier	45,6
39	El Al Israel Airlines	60,1	D	NetCarrier	3,8
40	Air China	60,0	D	NetCarrier	39,8
41	Qantas Airways	59,9	D	NetCarrier	38,4
42	Singapore Airlines	59,5	D	NetCarrier	16,5
43	Austrian Airlines AG	59,4	D	NetCarrier	9,9
44	All Nippon Airways Regional ²	59,3	D	Regional	1,6
45	Cathay Pacific Airways	59,1	D	NetCarrier	24,6
46	Turkish Airlines	58,8	D	NetCarrier	25,1
47	Air Canada	58,5	D	NetCarrier	30,9
48	United Airlines	58,1	D	NetCarrier	56,1
49	Asiana Airlines	58,0	D	NetCarrier	13,4
50	KLM-Royal Dutch Airlines	57,9	D	NetCarrier	22,3
51	Qatar Airways	57,6	D	NetCarrier	10,2
52	Lufthansa German Airlines	56,6	D	NetCarrier	55,6
53	Ethiopian Airlines	56,5	D	NetCarrier	2,9
53	China Eastern Airlines	56,5	D	NetCarrier	44,0
55	Malaysia Airlines Swings	55,7	D	Regional	1,0
56	Finnair	55,5	D	NetCarrier	7,4
57	TAP Air Portugal	55,1	D	NetCarrier	8,4
58	Transaero	54,5	D	NetCarrier	5,0
59	Iberia Regional Air Nostrum	54,2	D	Regional	0,5
60	Thai Airways International	54,0	D	NetCarrier	13,4

Distance-based ranking

<800 km			800-3800 km			>3800 km		
EP*	EC*	Place	EP*	EC*	Place	EP*	EC*	Place
			77,4	C	1			
64,9	D	17	76,9	C	2	68,6	C	7
19,3	G	113	70,6	C	6	72,6	C	1
71,1	C	3						
74,5	C	2	67,7	C	11	67,5	C	8
66,8	D	13	72,0	C	3	69,1	C	6
75,4	C	1	71,3	C	5	64,8	D	12
63,2	D	21	66,6	D	17	71,7	C	2
69,1	C	6	58,6	D	47			
66,5	D	14	71,9	C	4	62,5	D	19
67,5	C	11	60,7	D	38			
69,5	C	5				65,6	D	10
67,9	C	10	65,8	D	18	56,7	D	46
70,8	C	4	66,6	D	16	61,2	D	26
58,1	D	36	67,8	C	10	65,8	D	9
62,3	D	26	65,4	D	19			
						64,4	D	13
62,8	D	23	68,3	C	8	61,9	D	24
53,4	E	53	62,3	D	31	69,7	C	5
58,4	D	33	66,7	D	14	63,5	D	15
64,8	D	18	64,0	D	24	63,3	D	16
68,0	C	9	64,4	D	21	51,6	E	55
62,7	D	24	63,6	D	26	62,7	D	18
45,7	E	74	63,4	D	27	70,2	C	3
68,5	C	7	70,4	C	7	56,1	D	48
55,3	D	44	64,1	D	23	70,2	C	4
63,3	D	20	62,8	D	28			
68,4	C	8	62,3	D	30			
55,3	D	43	63,9	D	25	61,0	D	27
53,2	E	56	60,8	D	37	62,4	D	22
64,1	D	19	61,4	D	33	63,1	D	17
65,6	D	15	67,0	C	12	57,9	D	39
56,4	D	40	62,4	D	29	61,7	D	25
59,7	D	30	61,2	D	34	65,4	D	11
61,3	D	27	61,1	D	35	60,2	D	32
65,6	D	16	62,0	D	32	56,7	D	44
59,1	D	32	68,1	C	9	58,3	D	38
56,3	D	41	60,2	D	39	60,7	D	29
67,2	C	12	60,8	D	36	59,3	D	36
60,1	D	29	59,7	D	41	60,9	D	28
50,7	E	61	65,0	D	20	57,4	D	40
28,0	F	107	66,7	D	13	58,6	D	37
58,3	D	34	59,0	D	44	60,2	D	31
59,3	D	31						
15,8	G	114	64,3	D	22	56,8	D	42
63,0	D	22	59,7	D	40	52,7	E	52
54,8	D	46	56,3	D	50	62,4	D	21
52,9	E	57	59,4	D	43	57,1	D	41
50,0	E	63	55,2	D	56	63,7	D	14
39,6	E	91	47,1	E	77	62,5	D	20
58,3	D	35	59,6	D	42	56,7	D	45
44,8	E	79	55,4	D	54	60,5	D	30
62,3	D	25	55,1	D	57	56,7	D	43
57,9	D	37	58,0	D	48	42,0	E	73
55,7	D	42						
43,8	E	84	58,7	D	46	55,2	D	49
52,5	E	58	57,2	D	49	52,3	E	53
53,6	E	51	50,4	E	67	59,3	D	34
57,2	D	39	48,0	E	74			
60,1	D	28	58,9	D	45	50,7	E	59

* EP: Efficiency points; EC: Efficiency class;

* Pax: passenger figures are from Air Transport Intelligence, a service of ICAO.data.com, IATA WATS and other sources

* Type: the breakdown of airlines into categories was carried out via Air Transport Intelligence and other sources

¹ There is no airline called TAM Regional. This is the fictitious blanket designation used by the AAI for the four airlines which fly the regional routes for TAM Linhas Aéreas: these are NHT Linhas Aéreas, Passaredo Linhas Aéreas, TRIP Linhas Aéreas and Pantanal Linhas Aéreas.

² There is no airline called Nippon Airways Regional. This is the fictitious blanket designation used by the AAI for the three airlines which fly the regional routes for All Nippon Airways: these are Air Nippon, Air Next und Air Nippon Network.

Detailed Ranking (2)

Overall ranking

Place	Airline	EP*	EC*	Type*	Pax (in Mio.)*
61	Spanair	52,6	E	NetCarrier	7,6
61	British Airways	52,6	E	NetCarrier	31,8
63	American Airlines	52,5	E	NetCarrier	85,7
64	Transavia.com	52,3	E	Charter	5,2
65	Garuda Indonesia	52,2	E	NetCarrier	11,2
66	Xiamen Airlines Company	52,0	E	NetCarrier	11,1
67	All Nippon Airways	51,5	E	NetCarrier	44,6
67	Air New Zealand	51,5	E	NetCarrier	12,4
69	Shanghai Airlines	51,0	E	NetCarrier	10,7
70	Vietnam Airlines	50,9	E	NetCarrier	9,2
71	Ethiad Airways	50,7	E	NetCarrier	6,3
72	Gulf Air	50,3	E	NetCarrier	5,7
73	TAM Linhas Aereas	50,2	E	NetCarrier	30,4
73	Blue Panorama Airlines	50,2	E	NetCarrier	12,1
75	Royal Air Maroc	49,5	E	NetCarrier	5,9
76	Egyptair	48,1	E	NetCarrier	7,2
76	Aeromexico	48,1	E	NetCarrier	6,1
78	bmi british midland	48,0	E	NetCarrier	4,5
79	Pakistan International Airlines	47,7	E	NetCarrier	5,5
80	Japan Airlines International	46,9	E	NetCarrier	41,4
81	Mexicana de Aviacion	46,8	E	NetCarrier	6,5
82	Czech Airlines	46,6	E	NetCarrier	5,5
83	Aeroflot Russian Airlines	46,5	E	NetCarrier	8,8
84	South African Airways	46,2	E	NetCarrier	6,7
85	Alitalia	45,8	E	NetCarrier	21,2
86	SAS Scandinavian Airlines	45,7	E	NetCarrier	21,4
87	Air One CityLiner	45,3	E	Regional	0,03
88	Aerolineas Argentinas	44,9	E	NetCarrier	2,4
89	Royal Jordanian	44,7	E	NetCarrier	2,7
90	Air India	43,3	E	NetCarrier	3,2
91	LOT - Polish Airlines	42,9	E	NetCarrier	4,1
91	Mexicana Click	42,9	E	Regional	2,0
93	Rossiya - Russian Airlines	42,8	E	NetCarrier	3,0
94	US Airways Express	42,5	E	Regional	7,9
95	Lufthansa Regional	42,4	E	Regional	13,3
95	Continental Connection	42,4	E	Regional	19,4
95	Iran Air	42,4	E	NetCarrier	8,5
98	Brussels Airlines	42,3	E	NetCarrier	4,7
99	Virgin Atlantic Airways	42,0	E	NetCarrier	5,4
100	Aeromexico Connect	40,4	E	Regional	3,9
101	American Eagle Airlines	39,3	E	Regional	16,0
102	MALEV Hungarian Airlines	39,0	E	NetCarrier	3,2
103	Saudi Arabian Airlines	38,0	F	NetCarrier	18,3
104	South African Express	37,3	F	Regional	1,0
105	Kuwait Airways	37,2	F	NetCarrier	2,6
106	Air France Regional	36,3	F	Regional	3,9
107	Malaysia Airlines	35,2	F	NetCarrier	11,9
108	Delta Connection	34,8	F	Regional	20,0
109	KLM CityHopper	33,9	F	Regional	5,0
109	United Express	33,9	F	Regional	28,0
111	Alitalia Express	30,6	F	Regional	1,0
112	PGA Portugalia Airlines	29,7	F	Regional	1,2
113	Mesa Airlines	26,2	F	NetCarrier	11,0
114	bmi regional	20,7	G	Regional	0,5
115	BA CityFlyer	15,9	G	Regional	0,7
116	South African Airlin	13,8	G	Regional	1,5

Distance-based ranking

<800 km			800-3800 km			>3800 km		
EP*	EC*	Place	EP*	EC*	Place	EP*	EC*	Place
46,4	E	73	55,4	D	55			
54,1	D	47	55,8	D	51	51,1	E	57
43,5	E	85	51,1	E	62	56,3	D	47
55,0	D	45	52,1	E	60			
53,8	E	49	52,3	E	59	50,5	E	60
53,4	E	52	51,3	E	61			
41,7	E	89	51,0	E	63	61,9	D	23
52,4	E	59	50,4	E	66	50,9	E	58
53,3	E	54	50,9	E	64	32,7	F	81
49,2	E	67	46,0	E	80	59,3	D	35
49,5	E	66	55,6	D	53	48,9	E	62
50,0	E	62	54,3	D	58	46,5	E	66
51,3	E	60	55,6	D	52	37,1	F	78
49,7	E	65	66,6	D	15			
53,8	E	50	49,3	E	70	47,9	E	63
44,4	E	82	49,5	E	69	46,8	E	65
49,9	E	64	48,6	E	72	46,3	E	68
45,5	E	75	50,5	E	65	45,6	E	71
53,3	E	55	43,4	E	86	51,2	E	56
45,2	E	78	44,3	E	84	51,8	E	54
54,0	D	48	49,6	E	68	29,1	F	83
47,4	E	71	46,3	E	78	47,2	E	64
37,0	F	98	47,2	E	76	46,0	E	70
48,2	E	68	46,2	E	79	46,0	E	69
36,9	F	99	48,8	E	71	48,9	E	61
42,9	E	86	44,7	E	82	52,9	E	51
45,3	E	77						
47,7	E	69	43,9	E	85	46,5	E	67
35,5	F	100	48,2	E	73	40,0	E	75
39,0	E	93	44,9	E	81	42,8	E	72
33,8	F	102	38,9	F	93	59,4	D	33
42,0	E	88	44,5	E	83			
19,4	G	112	47,8	E	75	54,9	D	50
43,9	E	83	40,3	E	90			
44,4	E	80	38,7	F	95			
47,6	E	70	39,9	E	91			
47,4	E	72	41,6	E	88	35,6	F	79
44,4	E	81	42,6	E	87	39,5	E	76
57,4	D	38				41,8	E	74
42,7	E	87	38,3	F	96			
41,6	E	90	37,3	F	99			
39,0	E	94	39,0	E	92			
37,1	F	97	37,9	F	98	38,9	F	77
37,3	F	96	37,3	F	100			
45,5	E	76	37,9	F	97	35,6	F	80
34,7	F	101	40,9	E	89			
39,3	E	92	38,7	F	94	29,4	F	82
33,6	F	104	35,6	F	101			
33,7	F	103	34,3	F	102			
38,5	F	95	31,5	F	103			
31,0	F	106	29,2	F	105			
31,5	F	105	29,4	F	104			
26,2	F	108						
20,5	G	110	21,5	F	106			
20,0	G	111	1,7	G	108			
22,6	F	109	3,3	G	107			

* EP: Efficiency points; EC: Efficiency class;

* Pax: passenger figures are from Air Transport Intelligence, a service of ICAO.data.com, IATA WATS and other sources

* Type: the breakdown of airlines into categories was carried out via Air Transport Intelligence and other sources

The following airlines have not been evaluated due to a lack of data: TUIfly, Jet4you, JetairFly, SunExpress, ArkeFly, Lion Air, Onur Air, Corsair, Kenya Airlines

Where do particular airlines win or lose efficiency points?

The following brief characterization addresses important factors which help determine the results for an airline. We will limit ourselves here to the factors aircraft type, seating capacity and load factor. The last two together yield the number of passengers carried. These factors and their weighting in the evaluation are not stipulated by the AAI, but is calculated from the actual values for these factors which actually occur for each airline.

The best results are achieved by those airlines which used modern equipment well suited to the routes they fly and the numbers of passengers they carry, which have high seating density, and high rates of passenger occupancy and load utilization. That means for one thing that those airlines with high rates of occupancy carry passengers most efficiently if they have maximum seat density, and hence the least leg-room. Airlines have differing priorities in optimizing their service to their customers. Atmosfair does not evaluate these priorities, but it does evaluate the CO₂ emissions associated with them.

Monarch Airlines	Flies with efficient aircraft, including A320s and B757s. Compared with its competitors, it has the highest seating density, and thus achieves the highest point count with high occupancy.
Condor	Flies with efficient aircraft, including A320s and B757s. Achieves a high point count due to dense seating and the fact that it is the leader in terms of occupancy.
Iberia	Flies the efficient A320 family on its short and medium distance routes. Average seating density on short and medium distance routes. Overall above average occupancy; only average on short routes. Iberia loses points on long-distance routes with its wide-body A340, in which Iberia does not exhaust the seating efficiency potential.
Emirates	Fleet of modern jets, including B777s, A330s, A340s and A380s. These wide-body jets have average seating density, but are hence less efficient than narrow-body jets with average seating density. Overall above average occupancy.
Delta	Predominantly efficient aircraft – B737-800s, B767s and B777s. Gains points on medium distance routes in spite of only average seating densities, thanks to high occupancy. Loses points on short and medium distance routes due to frequent use of less efficient MD-80/90.
Air France	Predominantly efficient aircraft, except the B747-400. Generally high occupancy, short and medium distance fleet with average seating density. On short distance routes, Air France loses points due to low occupancy, on long distance routes, due to its wide-body jets, such as the A330, the A340 and the B777, with largely average seating density – in spite of high occupancy.
Lufthansa	Achieves a low point score due to overall below average occupancy and the lowest density of seating of any of the competitors listed here. On its short distance routes, Lufthansa uses less efficient aircraft models as the B737-300 and the B737-500 for approximately half its flights, and such modern wide-body jets as the A340 and the A330 on its long-distance routes. Here, Lufthansa fails to exhaust its efficiency potential in spite of high occupancy, due to low seating density and the frequent use of the B747-400.
British Airways	Approximately half the BA fleet consists of efficient aircraft such as the B777, the B767 and the A320 family; the other half is less efficient, including the B737-300 and -500, and the B747-400. Low average seating density and generally below average occupancy, except for long-distance routes, where occupancy is above average. However, loses points on long-distance routes due to the predominant use of B747-400s with low seating density.

¹ The selection made here does not constitute any value judgment.

CO₂ calculation and Low Cost Airlines

The Low Cost or so-called budget airlines have purposely not been included in this airline index. They have to be considered separately, since they raise methodological problems in CO₂ calculation and representation which atmosfair has not yet solved. As soon as atmosfair arrives at a methodological solution, the budget airlines could be incorporated into future rankings.

These problems include:

1. Subsidies:

Many, though not all, budget airlines receive subsidies, and hence generate flights which they could not otherwise have offered at such low prices. These subsidies cause the emission of CO₂, which must also be assigned to the climate account of the subsidized airlines.

2. Detours:

Many budget airlines fly to and from regional airports. However, the ground travel required to get to these airports is generally longer than in the case of hub to hub flights. These longer ground transport distances cause additional CO₂, which must be incorporated into the ranking.

3. Darstellung für den Kunden:

Budget flights operate under a business model which stimulates flights, and hence CO₂ which would not have been generated without those low prices. That is not the fault of the airlines themselves; after all they are only doing business. However, the airline index is directed at passengers. Many of them would not have flown at all had there been no budget airline. When global warming relevance is at issue, the passengers should first of all endeavor to avoid the CO₂ generated by these flights. Since from an environmental point of view, avoidance has priority over optimization, it is difficult to include both categories of air transport suppliers in the airline index at the same level without distorting the picture.

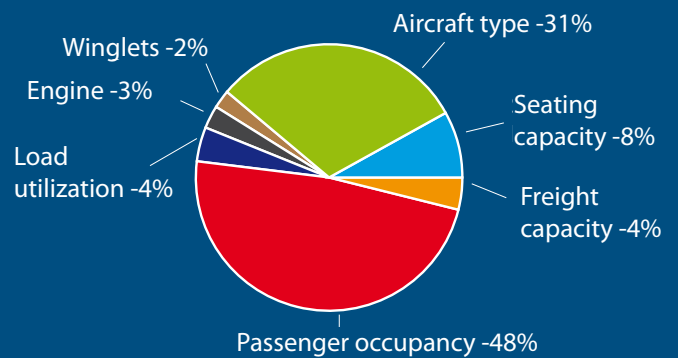
Note: not all budget airlines are alike. atmosfair has assumed the definition and categorization of airlines as "Low Cost airlines" from the ATI, the service provider for the international civil air transport organization ICAO. The definition is given in the complete documentation of the methodology, which can be downloaded from the atmosfair website.

The atmosfair Airline Index method

1. Calculation of the CO₂ per net load kilometer for each flight.
2. Comparison of the CO₂ per net load kilometer with the best case flight (according to the ICAO calculation method).
3. Determination of the city pair efficiency points of an airline (best case: 100 points; others relative to that).
4. Compilation of the city pair points of each airline to generate its mean global efficiency points.
5. Ranking of the airlines by global efficiency points.

The AAI is based on the CO₂ calculation method of the ICAO. Exactness: +1.5 efficiency points (confidence interval: 95%).

Efficiency optimization: What has the greatest effect?



In order to increase CO₂ efficiency, airlines can optimize various factors. The graphic shows which factors have the greatest effect on reducing CO₂ emissions.

Highlights of the atmosfair Airline Index

- 22 million flights
- 130 airlines worldwide
- 13,000 city pairs worldwide
- 92% of global air traffic
- 107 aircraft types (covering 97% of the market)
- 308 engines (covering 95% of the market)
- Respected independent data sources: ICAO, IATA, OAG, JP, etc.
- 2009 data

About atmosfair



Klaus Töpfer,
patron
atmosfair

atmosfair is a nonprofit organization for combating climate change, founded in 2004 from a research project of the German federal Ministry for the environment. We reduce CO₂ emissions of the source, e.g. via incentive programs for video conferences instead of business trips and companies. We compensate the remaining CO₂ emissions for our clients in CDM Gold standard projects with direct utility for local people and for the climate. Our reference customers include DHL and Greenpeace.

atmosfair is test winner of international comparative studies since 2005.



(sample)