

# TRAVEL REPORT

2016-11-01 - 2017-10-31

Stockholm Business Region

Issued by

**TRICORONA**  
TRICORONA CLIMATE PARTNER

2017-12-04

In collaboration with

**HRG**

# Climate Impact Report

## Stockholm Business Region's Air Travel 161101-171031

### Introduction

Tricorona has calculated the climate impact from Stockholm Business Region's air travel during 2016-11-01 - 2017-10-31, based on data supplied by HRG.

Each flight has been calculated separately, using great circle distances between the specific airports, to take full account of take-off and landing cycles.

The calculations are based on NTM's calculation method and take account of all climate impact from the flight, including non-carbon emissions. To achieve this result, the carbon emissions at high altitude are multiplied by a factor of 2.7 to achieve a total figure expressed in terms of carbon dioxide equivalent (CO<sub>2</sub>e).

For full details of the calculation methodology please see:  
<http://www.tricorona.se/tricorona-calculation-methodology-2015/>

### Summary Results

The total emissions from Stockholm Business Region's flights during the stated period are shown below. pkm means person kilometers, which is the total transported distance for all individuals. For carbon offsets the total emissions are rounded up to nearest whole number, giving 213 tons of carbon dioxide equivalents.

Category	Value	Unit
Total emissions	212,4	tonne CO <sub>2</sub> e
Emissions/flight	464	kg CO <sub>2</sub> e/flight
Emission/pkm	0,28	kg CO <sub>2</sub> e/pkm
No. Flights	458	-
Total distance	754 477	pkm

### Carbon offsetting

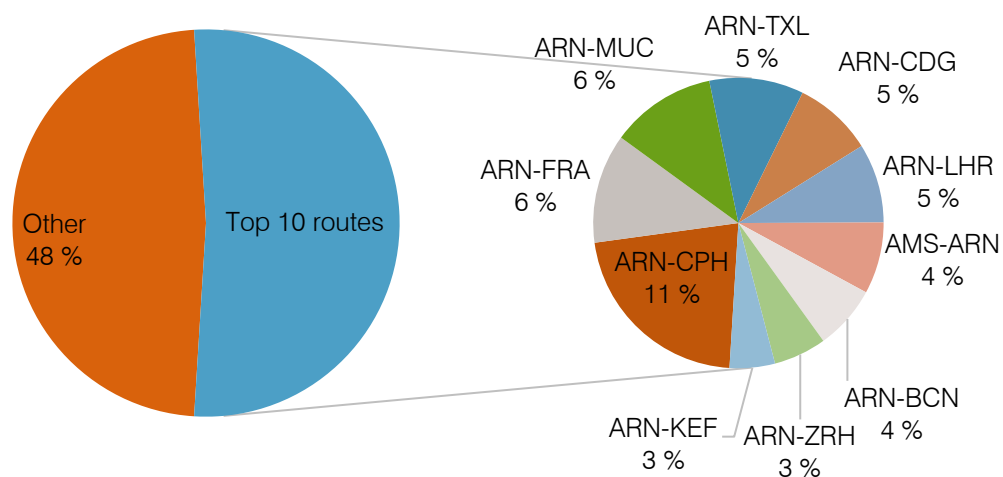
To carbon offset the total climate impact of the above travel, please contact your travel agency or Tricorona for further information.

## Most commonly flown routes

Table: Top 10 routes by no. flights

Route	No. flights	% of all flights	Emissions/flight (kg)	Total emissions (kg)	% of all emissions	Total distance (pkm)	% of all distance	Emissions /pkm (kg/pkm)
ARN-CPH	52	11 %	167	8 658	4 %	28 576	4 %	0,30
ARN-FRA	29	6 %	338	9 811	5 %	35 527	5 %	0,28
ARN-MUC	28	6 %	369	10 326	5 %	37 656	5 %	0,27
ARN-TXL	25	5 %	240	6 009	3 %	21 000	3 %	0,29
ARN-CDG	21	5 %	469	9 856	5 %	32 371	4 %	0,30
ARN-LHR	21	5 %	399	8 375	4 %	30 721	4 %	0,27
AMS-ARN	19	4 %	320	6 081	3 %	21 913	3 %	0,28
ARN-BCN	17	4 %	683	11 612	5 %	39 351	5 %	0,30
ARN-ZRH	14	3 %	405	5 673	3 %	20 834	3 %	0,27
ARN-KEF	12	3 %	636	7 627	4 %	25 717	3 %	0,30
Other	220	48 %	583	128 335	60 %	460 813	61 %	0,28
<b>Total</b>	<b>458</b>	<b>100 %</b>	<b>464</b>	<b>212 364</b>	<b>100 %</b>	<b>754 477</b>	<b>100 %</b>	<b>0,28</b>

Share of total trips, sorted by most often flown routes

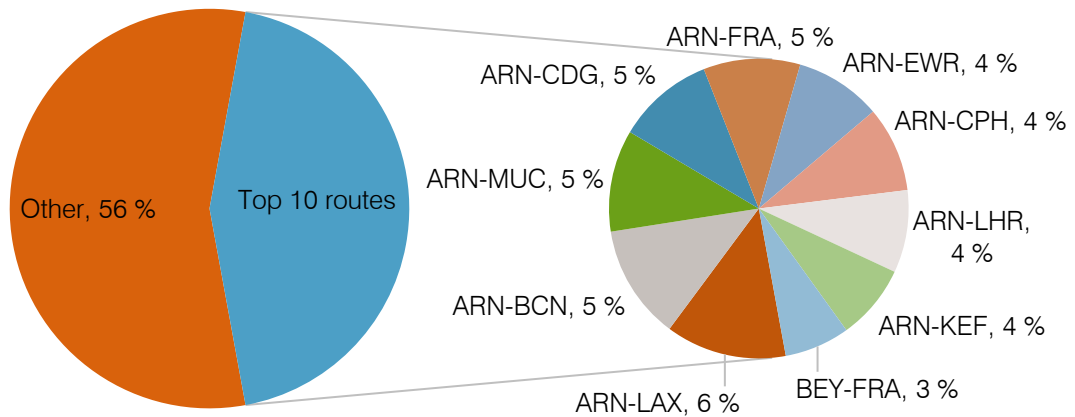


## Highest contribution to total emissions

Table: Top 10 routes by emissions

Route	No. flights	% of all flights	Emissions/flight (kg)	Total emissions (kg)	% of all emissions	Total distance (pkm)	% of all distance	Emissions /pkm (kg/pkm)
ARN-LAX	5	1 %	2 452	12 260	6 %	44 322	6 %	0,28
ARN-BCN	17	4 %	683	11 612	5 %	39 351	5 %	0,30
ARN-MUC	28	6 %	369	10 326	5 %	37 656	5 %	0,27
ARN-CDG	21	5 %	469	9 856	5 %	32 371	4 %	0,30
ARN-FRA	29	6 %	338	9 811	5 %	35 527	5 %	0,28
ARN-EWR	5	1 %	1 754	8 769	4 %	31 544	4 %	0,28
ARN-CPH	52	11 %	167	8 658	4 %	28 576	4 %	0,30
ARN-LHR	21	5 %	399	8 375	4 %	30 721	4 %	0,27
ARN-KEF	12	3 %	636	7 627	4 %	25 717	3 %	0,30
BEY-FRA	8	2 %	828	6 623	3 %	22 710	3 %	0,29
Other	260	57 %	456	118 447	56 %	425 984	56 %	0,28
<b>Total</b>	<b>458</b>	<b>100 %</b>	<b>464</b>	<b>212 364</b>	<b>100 %</b>	<b>754 477</b>	<b>100 %</b>	<b>0,28</b>

Share of emissions, sorted by total emissions per route

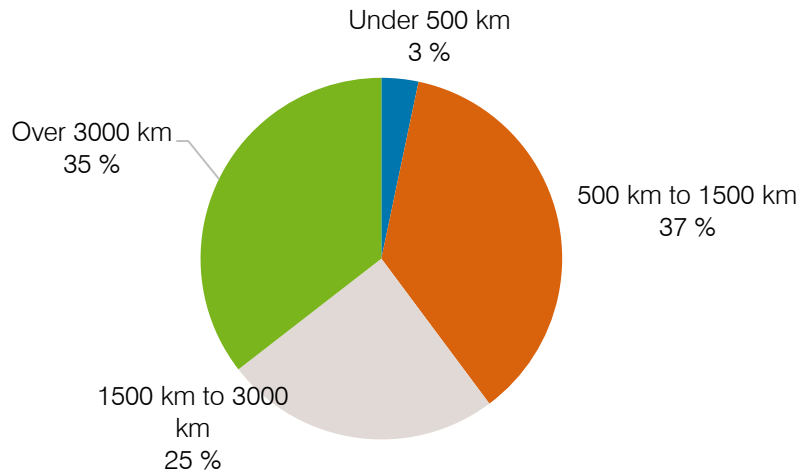


## Distance category

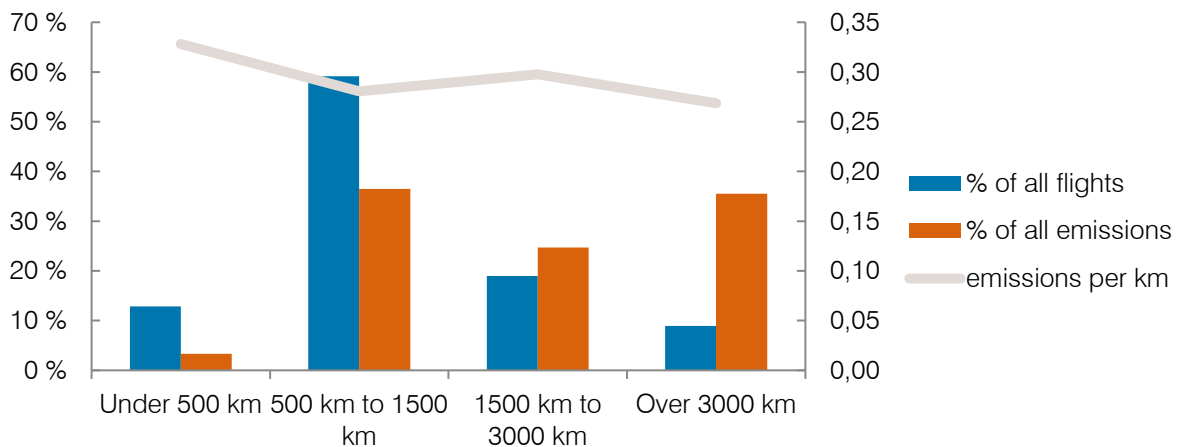
Table: Breakdown by distance category

Category	No. flights	% of all flights	Emissions/flight (kg)	Total emissions (kg)	% of all emissions	Total distance (pkm)	% of all distance	Emissions /pkm (kg/pkm)
Under 500 km	59	13 %	119	7 015	3 %	21 379	3 %	0,33
500 km to 1500 km	271	59 %	286	77 528	37 %	276 338	37 %	0,28
1500 km to 3000 km	87	19 %	603	52 448	25 %	176 136	23 %	0,30
Over 3000 km	41	9 %	1 838	75 373	35 %	280 624	37 %	0,27
<b>Total</b>	<b>458</b>	<b>100 %</b>	<b>464</b>	<b>212 364</b>	<b>100 %</b>	<b>754 477</b>	<b>100 %</b>	<b>0,28</b>

Share of emissions by distance category



Share of flights and emissions, emissions per pkm, by distance category



## Methodology

The climate impact calculations have been performed using the methodology developed for Tricorona, based primarily on data and methods developed by NTM, the Scandinavian Network for Transport and the Environment.

The NTM model calculates climate impact from direct carbon emissions only, and Tricorona has therefore corrected the resulting figures to account for climate impact arising due to high altitude. This is achieved by multiplying the calculated figures for carbon emissions by a factor of 2.7. The factor 2.7 is based on Tricorona's interpretation of IPCC research reports.

The per-passenger emissions are derived from the total flight emissions and assumptions about the seating configuration (passenger capacity) and cabin factor (load factor).

Full details of the calculation methodology are presented at <http://www.tricorona.se/tricorona-calculation-methodology-2015/>

Where the customer / travel agency data does not specify the aircraft used, Tricorona calculates based on the aircraft specified in the table below. Assumptions for cabin factor are also specified below.

*Table: Aircraft and cabin factor assumptions*

Category	Distance	Aircraft	capacity	Cabin factor
Local	Under 1500 km	A320	160	70%
Regional	1500 km to 3000 km	B737-600	115	70%
Continental	3000 km to 6000 km	B737-800	173	70%
Intercontinental	Over 6000 km	B747-400-Belly	440	90%

## Carbon offsetting

All projects offered by Tricorona for carbon offsetting are renewable energy or energy efficiency projects in developing countries. Tricorona offers two different categories of projects:

- CDM projects: these projects are projects certified by the UN under the Kyoto Protocol.
- Gold Standard CDM projects: these projects are, in addition to UN certification, also certified by the Gold Standard Foundation, an independent body backed by over 60 NGO's including WWF International and Greenpeace International.