KEY FINDINGS -

“CO2 emissions of private aviation in Europe”

March 2023

This is a Greenpeace publication based on an analysis by CE Delft that was conducted on behalf of Greenpeace Central and Eastern Europe
find the analysis by CE Delft here here

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Content

Overview of European Data

CE Delft analysed the number, development and climate impact of private jet flights in Europe (EU27, UK, Switzerland, Norway) in 2020, 2021, and 2022, as well as their geographical distribution, their distances and most-frequented airports.

The basis of the analysis is data provided by aviation analytics company Cirium. Flights are disaggregated by year, route and aircraft type. Certain small aircraft types with less than three seats have been excluded from the data, as they are mainly used for leisure rather than for business or private flights. Additionally flights to and from airports without an IATA code, and flights that arrive at the same airport as they have departed from, were excluded.

The CO_2 emissions of all flights were calculated using the Eurocontrol Small Emitters Tool.[1]

Number, development and climate impact of private jet flights in Europe

- The number of private jet flights is growing rapidly in Europe. Last year, private jet flights in Europe (EU27, UK, Norway and Switzerland) increased by a staggering 64% compared to the previous year: from 350,078 flights in 2021 to 572,806 in 2022.

- In 2022, private jet flights in Europe caused 3,385,538 tonnes of CO_2 emissions, which is equal to the average yearly CO_2 emissions of 555,000 EU residents[2], or to the annual emissions of the entire population of major European cities such as Lisbon, Manchester, Hanover, Genoa or The Hague.

- The emissions caused by private aviation in Europe last year alone, equals the average yearly CO_2 emissions of 3.3 million people living in Africa[3] – showing the blatant inequality of these luxury emissions.

- In the last three years combined (2020 - 2022), 1,041,640 private jet flights were conducted in Europe, causing 5,377,851 tonnes of CO_2 emissions, equal to the average yearly CO_2 emissions of 881,615 EU residents[4], or to the annual emissions of the entire population of major European cities such as Amsterdam, Marseille, Turin or Leeds.

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[1] Both the number of flights by private jets and, accordingly, their emissions have been calculated very conservatively. Many flights (such as round trips, certain small aircraft types or flights to and from airports without an IATA code) that make a significant contribution were deliberately not included. The present dimension therefore only shows the absolute peak of the iceberg of avoidable emissions from "classic" private jet flights.
[2] CO2 emissions (metric tons per capita) for the EU, 6,1T in 2019, Source: https://data.worldbank.org/indicator/EN.ATM.CO2E.PC?locations=EU
[3] CO2 emissions (metric tons per capita) for Africa, 1,04 T in 2021, Source: https://www.statista.com/statistics/1268403/co2-emissions-per-capita-in-africa-by-country/
[4] CO2 emissions (metric tons per capita) for the EU, 6,1T in 2019, Source: https://data.worldbank.org/indicator/EN.ATM.CO2E.PC?locations=EU

- The emissions produced by private aviation in Europe over the last three years equals the average yearly CO_2 emissions of 5.2 million people living in Africa.[5]

- If we look at the observed three-year period between 2020 and 2022, the increase-rate of private jet flights is even more extreme. From 2020 to 2022, the number of private jet flights in Europe has increased by a staggering 382%. This extreme increase is somewhat skewed as it includes 2020, the year the COVID pandemic peaked and the year associated with the most severe travel restrictions, even for the super-rich. However, industry data clearly shows that the industry bounced back from a short-term dip in 2020 with incredible speed. In 2021- a year with strong travel restrictions and lock-downs still in place for most of us - flight numbers already surpassed the pre-pandemic 2019 level.

Overview of private jet flights in Europe (2020, 2021, 2022)

Year	Private Flights in Europe	CO_2 Emissions (Tonnes)
2020	118,756	354,690
2021	350,078	1,637,623
2022	572,806	3,385,538

Dominance of (ultra) short-haul flights in European private aviation

- In 2022, 55% of all private jet flights were short and very short flights of less than 750 km. 15% of all private jet flights were less than 250 km, and 24% were between 250 and less than 500 km. Most of these distances could easily have been replaced by train travel or ferries.

- A similar distribution can be observed over the whole period from 2020 to 2022. The short distance of less than 750 km is clearly dominant with a share of 60% in 2021 and 73% in 2020. The decrease in the share of short-haul flights is mainly due to the increase in the share of long-haul flights of more than 3,000 km (from 3% in 2020, to 6% in 2021 to 9% in 2022). This is likely to reflect the increasingly relaxed COVID restrictions in global long-haul traffic. However, it remains clear that the private aviation market is a short-haul market. A large proportion of private jet flights in Europe could easily be replaced by train or ferry travel.

[5] CO_2 emissions (metric tons per capita) for Africa, 1,04 tonnes in 2021, Source: https://www.statista.com/statistics/1268403/co2-emissions-per-capita-in-africa-by-country/

Most used flight routes and most frequented destinations across Europe

- The 10 countries with the most private jet flights in Europe in 2022 were the UK, France, and Germany, followed by Italy, Spain, Switzerland, Austria, Greece, Netherlands and Belgium.

- The three most popular airports for private jets in Europe last year were in Nice Côte d'Azur, Paris and Geneva with 34,710, 33,496 and 28,630 flights respectively.

- In 2021, Paris was at the top of the list with most private jet flights arriving and departing, followed by Nice and Geneva.

- Other airports that have repeatedly appeared in the top 10 destinations with high private jet traffic over the last three years are the airports in London, Milan, Rome and Palma de Mallorca – many of which are known primarily as top tourist destinations rather than business hubs.

- The busiest private jet routes in Europe in 2022 were between London, Paris, Nice and Geneva, with Paris-London taking the lead. In 2021, the pattern is similar. However, Rome-Milan is also amongst the busiest routes, taking second place.

Train alternatives of frequently flown routes

A large share of the private flights spans a distance of 500 kilometres or less. These excessive and disproportionately climate-damaging short-haul flights could have easily been replaced by train or ferry trips. Europe has a highly developed and reliable rail system that provides an alternative, especially for short distances. Below we outline rail alternatives for some of the busiest private jet routes.

- Between Paris and Geneva – a route that is in the top 10 of frequently flown private aviation routes – there is a direct train connection that takes around 3 hours and 15 minutes one way. According to Lyria (TGV Lyria, 2023), there are around 8 return services per day on this route.

- Between Paris and London – a route that is in the top 10 of frequently flown private aviation routes each year as well – there is a direct train connection that takes around anywhere between 2 hours and 17 minutes to 2 hours and 37 minutes, which will take you from city centre to city centre. There are up to 10 trains each way per day (Eurostar, 2023).

- Between Paris and Nice, a route that is in the top 10 of frequently flown private aviation routes each year, the average train trip takes just over 7 hours. A solution could be the SNCF Intercités de Nuit, which is a night train that connects Paris and Nice. It rides

every night and takes around 12 hours to complete the voyage between Paris and Nice (Rail.cc, 2023).

- Between Rome and Milan, a route that is in the top 10 of frequently flown private aviation routes each year, there is a direct train connection of which the quickest trains take just over 3 hours. The frequency of the trains is very high, with sites saying anywhere between 48 to 72 trains each way per day (Italiarail, 2023) (Trainline, 2023).

- Between London and Amsterdam, a route that is within the top 10 of frequently flown private aviation routes in 2022, there is a direct train connection that takes around 4 hours. Approximately 8 trains ride this route per day each way (Eurostar, 2023).

- For the routes under 100 kilometres, train alternatives are even more plentiful. A few examples are the route between Maastricht and Liege, which is a 32 minutes train ride. The route between Brussels and Antwerp can be replaced by a 40 to 50 minutes train ride. The route between Nice and Cannes could be replaced by a train route of around 30 minutes. The train ride that could replace flights between Amsterdam and Rotterdam would take around 40 minutes. A direct train connection between Geneva and Chambery would take around 1 hour and 19 minutes. A train ride between Zurich and Basel would take around an hour.

European ranking	**EU ranking**	**Top countries**	**Private Flights in 2022**
1	-	United Kingdom	90,256
2	1	France	84,885
3	2	Germany	58,424
4	3	Italy	55,624
5	4	Spain	45,633
6	-	Switzerland	35,269
7	5	Austria	15,088
8	6	Greece	14,283
9	7	Netherlands	12,176
10	8	Belgium	10,618
11	9	Sweden	10,285
12	10	Poland	8,471

Overview of country data

CE Delft analysed the number, development and CO_2 emissions of private jet flights of the EU27 countries, the UK, Switzerland, and Norway in 2020, 2021, and 2022, as well as the geographical distribution, distances and most-frequented airports of private jet flights on national levels.

To establish the number of flights per country, researchers only counted those flights taking off from airports in the country to establish a reliable counting method that allows a pan European calculation by adding up the national data. The majority of business flights happen within Europe, which can make it confusing when counting both arriving and departing flights. For example, in a dataset of around 550,000 flights in 2022, adding all flights of separate countries together would result in a count of around 800,000 flights due to double counting. However, if we only count departing flights (considering that most flights are return-trips), it would provide more logical results. For instance, a flight departing from London and arriving in Paris would likely include a return flight from Paris to London. The data includes both domestic flights and international flights.

The CO_2 emissions of all flights per country were calculated using the Eurocontrol Small Emitters Tool.[6]

United Kingdom

- With 90,256 flights, the UK topped the list of European countries with the most private jet flights last year.
- Private jet flights in the UK last year caused 501,100 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 96,346 UK residents.[7]
- The number of private jet flights departing from the UK increased by 75% in 2022 compared to the year before, from 51,380 private flights in 2021 to 90,256 in 2022.
- Last year, CO_2 emissions from private jets taking off from UK airports caused 501,100 tonnes of CO_2 emissions. Compared to the year before this represents an increase of 145%.
- In the last three years (2020-2022) combined, private jets in the UK have caused 750,000 tonnes of CO_2 emissions

[6] Both the number of flights by private jets and, accordingly, their emissions have been calculated very conservatively. Many flights (such as round trips, certain small aircraft types or flights to and from airports without an IATA code) that make a significant contribution were deliberately not included. The present dimension therefore only shows the absolute peak of the iceberg of avoidable emissions from "classic" private jet flights.
[7] CO_2 emissions (metric tons per capita) for the UK, 5,2T in 2019, Source: https://data.worldbank.org/indicator/EN.ATM.CO2E.PC?locations=GB

- In 2022, the UK was responsible for 14,8% of Europe's private jet emissions. 15,7% of all private jet flights in Europe departed from the UK.

- Six of Europe's top ten most frequented private jet routes in 2022 involve the UK, including the top two pairings, Paris-London and Nice-London.

- The busiest airports for private jet flights in the UK in 2022 are London Luton Airport, Farnborough Airport near London and London Biggin Hill Airport.

Norway

- Last year, 6.705 private jet flights - excluding medical flights[8] - departing from Norway caused 26,400 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 17,600 conventional cars.[9]

- The number of private jet flights departing from Norway increased by 103% in 2022 compared to the year before, from 3.309 private flights in 2021 to 6.705 in 2022.

- Last year, CO_2 emissions from private jets taking off from Norwegian airports caused 26,400 tonnes of CO_2 emissions. Compared to the year before this represents an increase of 147%.

- In the last three years (2020-2022) combined, private jets departing in Norway have caused 40,900 tonnes of CO_2 emissions.[10]

- The shortest used route for private aviation with 10 flights or more per year in 2022 was the route between Stavanger and Haugesund (57.4 km). This route is served with public buses in two hours, leaving 12 times per day in both directions.

- The busiest airports for private jet flights in Norway in 2022 were Oslo Airport, Bergen Airport and Stavanger Airport.

[8] According to our data provider Cirium, a very large share of these flights are medical/special related (around 92% in 2020, around 79% in 2021 and around 65% in 2022). BE20 and C68A are mainly used as ambulance aircraft in Norway. We have chosen to calculate the most frequented airports, most frequented routes and shortest routes excluding BE20 and C68A for Norway, which might lead to an underestimation on these routes/airports. For country totals, the average percentage of medical/special flights have been taken into account as explained in the methodology.

[9] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO_2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO_2 per year. (We need to work with estimations, because there is no data for the average consumption of the full fleet available - you only find such data for the new cars of specific years - so 125 g/km is the average around 10 years ago - there is also no data on the relation of mileage and car age, but you can assume than newer cars are driven more than older ones (primary corporate use vs. secondary private use).

[10] ibid.

Switzerland

- With 35,269 private jet flights, Switzerland ranks sixth among the list of European countries with the most private jet flights last year. In 2022, Switzerland was responsible for almost 5% of Europe's private jet emissions – a considerable proportion compared to the size of the country.

- Private jet flights in Switzerland last year caused 166,000 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 37,727 Swiss residents.[11]

- The number of private jet flights departing from Switzerland increased by 63% in 2022 compared to the year before, from 21,665 private flights in 2021 to 35,269 in 2022.

- In the last three years (2020-20221) combined, private jets departing in Switzerland have caused 281,700 tonnes of CO_2 emissions

- Last year, CO_2 emissions from private jets taking off from Swiss airports caused 166,000 tonnes of CO_2 emissions. Compared to the year before this represents an increase of 83%

- The most frequently used route for private aviation for all years was the route between Geneva and Paris

- Three of Europe's ten most frequented private jet routes in 2022 involve Switzerland, including the top three pairing Paris-Geneva.

- The busiest airports for private jet flights in Switzerland in 2022 are Geneva Airport, Zurich Airport and Sion Airport.

- The shortest used route for private aviation with 10 flights or more per year in 2022 was the route between Altenrhein Airport (Thal) and Friedrichshafen in Germany, a route of just 22km.

[11] CO_2 emissions (metric tons per capita) for Switzerland, 4,4T in 2019, Source: https://data.worldbank.org/indicator/EN.ATM.CO2E.PC?locations=CH

Netherlands

- With 12,176 private jet flights the Netherlands ranks seventh among the list of EU countries with the most private jet flights in 2022.

- Private jet flights in the Netherlands last year caused 52,900 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 35,282 cars.[12]

- The number of private jet flights departing from the Netherlands increased by 87% in 2022 compared to the year before, from 6,521 private flights in 2021 to 12,176 in 2022.

- Last year, CO_2 emissions from private jets taking off from Dutch airports caused 52,900 tonnes of CO_2. Compared to the year before this represents an increase of 120%.

- The Airport with the highest private jet frequency in all three years has been Amsterdam Airport Schiphol, followed by Rotterdam and The Hague Airport.

- The most frequented route in all three years has been Amsterdam-London – a route that is also within the top 10 of frequently flown private aviation routes in 2022. These flights would be easily avoidable as there is a direct train connection that takes around 4 hours with approximately 8 trains riding this route per day each way.

- The shortest used route for private aviation with 10 flights or more per year in 2022 was the route between Maastricht and the Belgium town Liege. The two towns are connected with a direct train leaving every hour in both directions, the train trip takes 32 minutes.

NOTE: Greenpeace Netherlands released a report on private jet flights arriving and departing from Schiphol and Rotterdam The Hague Airport in October 2022. In order to make the results of these two studies comparable and to put them in relation to each other, it is important to note that the new report only looks at departing flights at the country level in order to enable an overall calculation of the flights operated at the European level. While the report from October 2022 analyses both departing and arriving flights at the analysed airports, only the departing destinations are included here. At the same time, additional airports were examined in the new report. Additionally, flights with aircraft with less than three seats have been excluded from the analysis, as well as flights to and from airports without an IATA code, and flights that arrive at the same airport as they have departed from. The reasons are that small aircraft are used for leisure rather than for business or private flights; that airports without an IATA code typically serve leisure aviation, parachute jumping flights, et cetera; and that round trips are often also for leisure or training purposes. Within the scope of this study, the number of flights by private jets and, accordingly, their emissions have thus been calculated very conservatively. The present dimension therefore only shows the absolute peak of the iceberg of avoidable emissions from "classic" private jet flights.

[12] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO_2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO_2 per year.

France

- With 84,885 flights, France topped the list of EU countries with the most private jet flights last year.

- Private jet flights in France last year caused 383,100 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 85,133 French residents.[13]

- The number of private jet flights departing from France increased by 55% in 2022 compared to the year before, from 54,742 private flights in 2021 to 84,885 in 2022.

- Last year, CO_2 emissions from private jets taking off from French airports caused 383,100 tonnes of CO_2. Compared to the year before this represents an increase of 93%.

- In 2022, France was responsible for 11% of Europe's private jet emissions. Almost 15% of all private jet flights in Europe departed from France.

- In the last three years (2020-2022) combined, private jets departing in France have caused 629,300 tonnes of CO_2 emissions.

- Five of Europe's ten most frequented private jet routes in 2022 involve France, including the top four pairings Paris-London, Nice-London, Paris-Geneva and Paris-Nice.

- The busiest airports for private jet flights in France in 2022 were Paris-Le Bourget Airport, Nice Côte d'Azur Airport and Cannes-Mandelieu.

- The shortest used route for private aviation with 10 flights or more per year in 2022 was the route between Le Havre and Beauville in Normandy. The two towns are connected with a direct bus leaving every hour in both directions, the trip takes 36 minutes.

Italy

- With 55,624 flights, Italy ranks third among the list of EU countries with the most private jet flights last year.

- Private jet flights departing in Italy caused 266,100 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 50,208 Italian residents.[14]

- The number of private jet flights departing in Italy increased by 61% in 2022 compared to the year before, from 34,500 private flights in 2021 to 55,624 in 2022.

[13] CO_2 emissions (metric tons per capita) for France, 4,5T in 2019, Source: https://data.worldbank.org/indicator/EN.ATM.CO2E.PC?locations=FR
[14] CO_2 emissions (metric tons per capita) for Italy, 5,3T in 2019, Source: https://data.worldbank.org/indicator/EN.ATM.CO2E.PC?locations=IT

- Last year, CO_2 emissions from private jets taking off from Italian airports caused 266,100 tonnes of CO_2. Compared to the year before this represents an increase of 100%.

- In the last three years (2020-2022) combined, private jets departing from Italy have caused 420,400 tonnes of CO_2 emissions

- In 2022, almost 10% of all private jet flights in Europe departed from Italy.

- Two of Europe's ten most frequented private jet airports in 2022 are in Italy (Milan and Rome).

- The highly frequented route between Milan and Rome is both one of the most frequented overall routes in 2022 and one of the most frequented short routes of less than 500 km. The Milan-Nice route is also one of the most popular short routes under 500 km.

- The busiest airports for private jet flights in Italy in 2022 were Milan Linate Airport, Rome Ciampino Airport and Olbia Costa Smeralda Airport.

- The shortest used route for private aviation with 10 flights or more per year in 2022 was the route between Verona and Brescia. The two towns are connected with a direct train leaving every 30 minutes in both directions, the train trip takes 35 minutes.

Germany

- With 58,424 private jet flights, Germany is the EU country with the second highest number of private jet flights in 2022, surpassed only by France. In 2022, over 10% of all private jet flights in Europe took off in Germany.

- Private jet flights in Germany last year caused 208,600 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 130,000 cars.[15]

- The number of private jet flights departing in Germany increased by 76% in 2022 compared to the year before, from 33,252 private flights in 2021 to 58,424 in 2022.

- Last year, private jets taking off from German airports caused 208,600 tonnes of CO_2. Compared to the year before this represents an increase of 91%.

- In the last three years (2020-2022) combined, private jets departing in Germany have caused 347,300 tonnes of CO_2 emissions.

- The most frequented flight route for private jets in Germany in 2022 was between Berlin and Cologne which has a direct train connection of 4 h 27 min every hour.

[15] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO_2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO2 per year.

- The busiest airports for private jet flights in Germany in 2022 were Berlin Brandenburg Intl., Munich International Airport and Hamburg Airport. Only in 2020, Düsseldorf airport was among the Top 3 in Germany.

- The shortest used route for private aviation with 10 flights or more per year in 2022 was the route between Stuttgart and Böblingen. The two towns are connected with trains leaving four times per hour in both directions, the train trip takes 21 to 25 minutes.

Spain

- With 45,633 private jet flights, Spain ranks fourth among the list of EU countries with the most private jet flights last year. In 2022 around 8% of all private jet flights in Europe departed in Spain.

- Private jet flights departing from Spain caused 243,900 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 162,567 cars.[16]

- The number of private jet flights departing in Spain increased by 74% in 2022 compared to the year before, from 26,239 private flights in 2021 to 45,633 in 2022.

- Last year, CO_2 emissions from private jets taking off from airports in Spain caused 243,900 tonnes of CO_2. Compared to the year before this represents an increase of 92%

- In the last three years (2020-2022) combined, private jets departing in Spain have caused 389,000 tonnes of CO_2 emissions.

- The well known holiday destination Palma de Mallorca is amongst the top frequented airports for private jets in Europe (Top 8). It has however to be noted that some of these flights might be attributed to medical purposes.[17]

- The busiest airports for private jet flights in Spain in 2022 were Palma de Mallorca Airport, Ibiza Airport and Madrid–Barajas Airport.

- The shortest used route for private aviation with 10 flights or more per year in 2022 was the route between Santiago de Compostela and La Coruna. The two towns are connected with a direct train leaving every 30 minutes in both directions, the train trip takes around 30 minutes.

[16] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO2 per year.
[17] The route between Palma de Mallorca and Ibiza is amongst the most used flight routes under 500km in 2022. However there are many BE20 flights accounted for on this route which, for the Balearic islands, often serve a medical purpose. It is however impossible to determine the purpose of these flights with certainty based on the available data.

Austria

- With 15,088 flights, Austria ranks fifth among EU countries with the most private jet flights in 2022.

- Private jet flights departing from Austria last year caused 54,400 tonnes of CO_2 – equal to the yearly average CO2 emissions of 36,251 cars.[18]

- The number of private jet flights departing from Austria increased by 89% in 2022 compared to the year before, from 7,971 private flights in 2021 to 15,088 in 2022.

- Last year, CO_2 emissions from private jets taking off from Austrian airports caused 54,400 tonnes of CO_2 emissions. Compared to the year before this represents an increase of 105%.

- In the last three years (2020-2022) combined, private jets departing in Austria have caused 88,800 tonnes of CO_2 emissions.[19]

- The most used routes for private aviation departing from Austria in 2022 were Vienna-Nice, Vienna-London and Vienna-Zurich.

- The shortest route for private aviation with 10 or more flights per year was between Vienna and Bratislava for all three years – a route with a daily, direct train connection of 1h06 in hourly intervals.

- The busiest airports for private jet flights in Austria in 2022 are Vienna International Airport, Salzburg Airport and Innsbruck Airport.

Belgium

- With 10,618 private jet flights, Belgium ranks eighth among the list of EU countries with the most private jet flights last year.

- Private jet flights in Belgium caused 41,000 tonnes of CO_2 in 2022 – equal to the yearly average CO_2 emissions of 27,310 cars.[20]

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[18] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO_2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO2 per year. (We need to work with estimations, because there is no data for the average consumption of the full fleet available - you only find such data for the new cars of specific years - so 125 g/km is the average around 10 years ago - there is also no data on the relation of mileage and car age, but you can assume than newer cars are driven more than older ones (primary corporate use vs. secondary private use).

[19] ibid.

[20] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO2 per year. (We need to work with estimations, because there is no data for the average consumption of the full fleet available - you only find such data for the new cars of specific years - so 125 g/km is the average around 10 years ago - there is also no data on the relation of mileage and car age, but you can assume than newer cars are driven more than older ones (primary corporate use vs. secondary private use).

- The number of private jet flights departing from Belgium increased by 52% in 2022 compared to the year before, from 6.963 private flights in 2021 to 10,618 in 2022.

- Last year, CO_2 emissions from private jets taking off from Belgian airports caused 41,000 tonnes of CO_2 emissions. Compared to the year before this represents an increase of 62%.

- In the last three years (2020-2022) combined, private jets departing from Belgium have caused 73,100 tonnes of CO_2 emissions.

- In 2022, the route between Brussels and London was the most frequently used route for private aviation, a route that can easily be travelled on the Eurostar train in just two hours.

- Belgium is also well represented among the most used flight routes under 100 kms in 2022. With the routes Lille-Kortrijk and Brussels-Antwerp taking third and fourth place respectively. Both are easily replaceable by a very short train ride of approximately half an hour to 45 minutes.

- The busiest airports for private jet flights in Belgium in 2022 are Brussels Airport, Antwerp International Airport and Brussels South Charleroi Airport.

Ireland

- Last year, 6,671 private jet flights departing from Ireland caused 67,900 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 45,267 cars.[21]

- The number of private jet flights departing from Ireland increased by 159% in 2022 compared to the year before, from 2,578 private flights in 2021 to 6,671 in 2022.

- Last year, CO_2 emissions from private jets taking off from Irish airports caused 67,900 tonnes CO_2 emissions. Compared to the year before this represents an increase of 246%.

- In the last three years (2020-2022) combined, private jets departing from Ireland have caused 90,600 tonnes of CO2 emissions.

- In all three years analysed, the route between Dublin and London was the most frequently used route for private aviation, a route that can be travelled in a bit more than seven hours by ferry and train.

- The busiest airports for private jet flights in Ireland in 2022 were Dublin and Shannon, together responsible for 82% of all Irish private jet flights analysed by the report.

[21] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO_2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO_2 per year. (We need to work with estimations, because there is no data for the average consumption of the full fleet available - you only find such data for the new cars of specific years - so 125 g/km is the average around 10 years ago - there is also no data on the relation of mileage and car age, but you can assume than newer cars are driven more than older ones (primary corporate use vs. secondary private use).

- The shortest route for private aviation with 10 or more flights per year was between Shannon and Kerry airport for all three years – a route which can be travelled by public buses in around three hours, depending on the exact place of departure and destination of the trip.

Slovenia

- Last year, 1,267 private jet flights departing from Slovenia caused 3,800 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 2,533 cars.[22]

- The number of private jet flights departing from Slovenia increased by 43% in 2022 compared to the year before, from 889 private flights in 2021 to 1,267 flights in 2022.

- Last year, CO_2 emissions from private jets taking off from Slovenian airports caused 3,800 tonnes of CO_2 . Compared to the year before this represents an increase of 46%.

- In the last three years (2020-2022) combined, private jets departing from Slovenia have caused 6,900 tonnes of CO_2 emissions.

- In 2021 and 2022, the route between Ljubljana and Belgrade (Serbia) was the most frequently used route for private aviation, followed by Maribor to Friedrichshafen (Germany) .

- The busiest airport for private jet flights in Slovenia in 2022 was Ljubljana, responsible for 76% of all Slovene private jet departures. All other remaining flights analysed left from Maribor and Portorož.

- The shortest route for private aviation with 10 or more flights per year was between Maribor and Graz (Austria) for all three years – a route which can be travelled by train in a bit more than one hour.

[22] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO_2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO_2 per year. (We need to work with estimations, because there is no data for the average consumption of the full fleet available - you only find such data for the new cars of specific years - so 125 g/km is the average around 10 years ago - there is also no data on the relation of mileage and car age, but you can assume than newer cars are driven more than older ones (primary corporate use vs. secondary private use).

Luxembourg

- Last year, 2,767 private jet flights departed from Luxembourg airport, the only relevant airport in the country, causing 9,100 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 6,066 cars.[23]

- The number of private jet flights departing from Luxembourg increased by 67% in 2022 compared to the year before, from 1,656 private flights in 2021 to 2,767 in 2022.

- Last year, CO_2 emissions from private jets taking off from Luxembourg caused 9,100 tonnes of CO_2. Compared to the year before, this represents an increase of 99 %.

- In the last three years (2020-2022) combined, private jets departing from Luxembourg have caused 15,200 tonnes of CO_2 emissions.

- In 2021 and 2022, the route between Luxembourg and Paris was the most frequently used route for private aviation. This is a route which can be travelled several times a day with a direct French TGV train in 2h22.

- The shortest route for private aviation with 10 or more flights per year was between Luxembourg and the Metz–Nancy–Lorraine Airport in France for all three years – Metz can be reached from Luxembourg with a direct train in 53 minutes, the direct train to Nancy takes 1h54.

Czech Republic

- Last year, 7,438 private jet flights departed from the Czech Republic causing 30,900 tonnes of CO2 – equal to the yearly average CO2 emissions of 20,600 cars.[24]

- The number of private jet flights departing from the Czech Republic increased by 59% in 2022 compared to the year before, from 4,684 private flights in 2021 to 7,438 in 2022.

- Last year, CO2 emissions from private jets taking off from the Czech airports caused 30,900 tonnes of CO_2 emissions. Compared to the year before this represents an increase of 118%.

[23] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO_2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO_2 per year. (We need to work with estimations, because there is no data for the average consumption of the full fleet available - you only find such data for the new cars of specific years - so 125 g/km is the average around 10 years ago - there is also no data on the relation of mileage and car age, but you can assume than newer cars are driven more than older ones (primary corporate use vs. secondary private use).

[24] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO_2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO_2 per year. (We need to work with estimations, because there is no data for the average consumption of the full fleet available - you only find such data for the new cars of specific years - so 125 g/km is the average around 10 years ago - there is also no data on the relation of mileage and car age, but you can assume than newer cars are driven more than older ones (primary corporate use vs. secondary private use).

- In the last three years (2020-2022) combined, private jets departing from the Czech Republic have caused 48,600 tonnes of CO2 emissions.

- In 2022, the route between Prague and the Slovak capital of Bratislava was the most frequently used route for private aviation, a route that can be frequently travelled by train in four and a half hours. In 2020 and 2021, the domestic flight between Prague and Ostrava was the most used private jet route.

- The busiest airport for private jet flights in the Czech Republic in 2022 was Prague, followed by Ostrava and Brno. These three airports are responsible for 91% of all Czech flights analysed.

- In 2022, the shortest route for private aviation with 10 or more flights per year was between Brno and Uherske Hradiste – a route which can be travelled by train in 1h43 with two options per hour.

Slovakia

- Last year, 2,528 private jet flights departed from Slovakia causing 10,000 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 6,666 cars.[25]

- The number of private jet flights departing from Slovakia increased by 127% in 2022 compared to the year before, from 1,114 private flights in 2021 to 2,528 in 2022.

- Last year, CO_2 emissions from private jets taking off from Slovakian airports caused 10,000 tonnes of CO_2 emissions. Compared to the year before this represents an increase of 223%.

- In the last three years (2020-2022) combined, private jets departing from Slovakia have caused 14,400 tonnes of CO_2 emissions.

- In 2021 and 2022, the route between Prague and Bratislava was the most frequently used route for private aviation, a route that can be frequently travelled by train in four and a half hours.

- The busiest airport for private jet flights in Slovakia in 2022 was Bratislava, followed by Kosice and Poprad-Tatry airport. These three airports are responsible for 95% of all Slovak flights analysed.

- In 2022, the shortest route for private aviation with 10 or more flights per year was between Bratislava and Vienna – a route which can be travelled twice per hour by train in one hour from city centre to city centre.

[25] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO_2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO_2 per year. (We need to work with estimations, because there is no data for the average consumption of the full fleet available - you only find such data for the new cars of specific years - so 125 g/km is the average around 10 years ago - there is also no data on the relation of mileage and car age, but you can assume than newer cars are driven more than older ones (primary corporate use vs. secondary private use).

Romania

- Last year, 4,453 private jet flights departed from Romania causing 19,000 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 12,667 cars.[26]

- The number of private jet flights departing from Romania increased by 120% in 2022 compared to the year before, from 2,027 private flights in 2021 to 4,453 in 2022.

- Last year, CO_2 emissions from private jets taking off from Romanian airports caused 1,900 tonnes CO_2 emissions. Compared to the year before this represents an increase of 120%.

- In the last three years (2020-2022) combined, private jets departing from Romania have caused 29,150 tonnes of CO_2 emissions.

- In 2022, the domestic route between Bucharest and Bacau was the most frequently used route for private aviation, a route that can be travelled by train in around four hours several times per day.

- The two busiest airports for private jet flights in Romania in 2022 were both in Bucharest (Otopeni and Baneasa). The third busiest airport was Cluj.

- In 2022, the shortest route for private aviation with 10 or more flights per year was between Timisoara and Belgrade (Serbia).

Croatia

- Last year, 5,642 private jet flights departed from Croatia causing 21,300 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 14,200 cars.[27]
- The number of private jet flights departing from Croatia increased by 40% in 2022 compared to the year before, from 4,020 private flights in 2021 to 5,642 in 2022.

- Last year, CO_2 emissions from private jets taking off from Croatian airports caused 21,300 tonnes CO_2 emissions. Compared to the year before this represents an increase of 56%.

[26] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO_2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO_2 per year. (We need to work with estimations, because there is no data for the average consumption of the full fleet available - you only find such data for the new cars of specific years - so 125 g/km is the average around 10 years ago - there is also no data on the relation of mileage and car age, but you can assume than newer cars are driven more than older ones (primary corporate use vs. secondary private use).

[27] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO_2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO_2 per year. (We need to work with estimations, because there is no data for the average consumption of the full fleet available - you only find such data for the new cars of specific years - so 125 g/km is the average around 10 years ago - there is also no data on the relation of mileage and car age, but you can assume than newer cars are driven more than older ones (primary corporate use vs. secondary private use).

- In the last three years (2020-2022) combined, private jets departing from Croatia have caused 38,000 tonnes of CO_2 emissions.

- In 2022, the route between Zagreb and Vienna was the most frequently used route for private aviation, a route that can be travelled by train in around seven hours, or by long-distance bus in around five hours.

- The three busiest airports for private jet flights in Croatia in 2022 were in Zagreb, Dubrovnik and Split.

- In 2021 and 2022, the shortest route for private aviation with 10 or more flights per year was between Dubrovnik and Tivat in Montenegro, which can be travelled by direct bus in 2h30.

Poland

- With 8,471 private jet flights, Poland ranks tenth among the EU countries with the most private flights in 2022.

- Last year, private flights departing from Poland caused 38,500 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 25,667 cars.[28]

- The number of private jet flights departing from Poland increased by 100% in 2022 compared to the year before, from 4,230 private flights in 2021 to 8,471 in 2022.

- Last year, CO_2 emissions from private jets departing from Polish airports caused 38,500 tonnes CO_2 emissions. Compared to the year before this represents an increase of 143%.

- In the last three years (2020-2022) combined, private jets departing from Poland have caused 58,000 tonnes of CO_2 emissions.

- In 2022, the route between Warsaw and Krakow was the most frequently used route for private aviation, a route that can be travelled by train in two and a half hours with almost hourly departures in both directions.

- The three busiest airports for private jet flights in Poland in 2022 were Warsaw-Chopin airport, Krakow and Rzeszów–Jasionka airport.

- In 2021 and 2022, the shortest route for private aviation with 10 or more flights per year was between Krakow and Katowice, which can be travelled by train in around one hour with frequent schedules.

[28] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO_2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO_2 per year. (We need to work with estimations, because there is no data for the average consumption of the full fleet available - you only find such data for the new cars of specific years - so 125 g/km is the average around 10 years ago - there is also no data on the relation of mileage and car age, but you can assume than newer cars are driven more than older ones (primary corporate use vs. secondary private use).

Bulgaria

- Last year, 2,164 private jet flights departed from Bulgaria causing 9,900 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 6,600 cars.[29]

- The number of private jet flights departing from Bulgaria increased by 46% in 2022 compared to the year before, from 1,485 private flights in 2021 to 2,164 in 2022.

- Last year, CO_2 emissions from private jets taking off from Bulgarian airports caused 9,900 tonnes of CO_2 emissions. Compared to the year before this represents an increase of 54%.

- In the last three years (2020-2022) combined, private jets departing from Bulgaria have caused 17,500 tonnes of CO_2 emissions.

- In all three years analysed, the route between Sofia and Athens was the most frequently used route for private aviation.

- The three busiest airports for private jet flights in Bulgaria in all three years were Sofia with 74% of all Bulgarian private jet flights in 2022 departing, followed by Varna and Burgas.

- In all years analysed, the shortest route for private aviation with 10 or more flights per year was between Varna and Burgas, which can be travelled by direct bus in around two hours.

Denmark

- Last year, 5,898 private jet flights departed from Denmark causing 24,900 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 16,600 cars.[30]

- The number of private jet flights departing from Denmark increased by 66% in 2022 compared to the year before, from 3,553 private flights in 2021 to 5,898 in 2022.

[29] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO_2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO_2 per year. (We need to work with estimations, because there is no data for the average consumption of the full fleet available - you only find such data for the new cars of specific years - so 125 g/km is the average around 10 years ago - there is also no data on the relation of mileage and car age, but you can assume than newer cars are driven more than older ones (primary corporate use vs. secondary private use).

[30] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO_2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO_2 per year. (We need to work with estimations, because there is no data for the average consumption of the full fleet available - you only find such data for the new cars of specific years - so 125 g/km is the average around 10 years ago - there is also no data on the relation of mileage and car age, but you can assume than newer cars are driven more than older ones (primary corporate use vs. secondary private use).

- Last year, CO_2 emissions from private jets taking off from Danish airports caused 24,900 tonnes of CO_2 emissions. Compared to the year before this represents an increase of 95%.

- In the last three years (2020-2022) combined, private jets departing from Denmark have caused 40,800 tonnes of CO_2 emissions.

- In 2022, the route between Copenhagen and London was the most frequently used route for private aviation.

- In 2021 and 2022, the three busiest airports for private jet flights in Denmark were Roskilde, near Copenhagen, Copenhagen and Billund.

- In 2022, the shortest route for private aviation with 10 or more flights per year was between Esbjerg and Billund, which can be frequently travelled by direct bus in around 90 minutes.

Sweden

- Last year, 10,285 private jet flights - excluding medical flights[31] - departed from Sweden causing 43,300 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 28,900 cars.[32]

- Sweden ranks ninth among the list of EU countries with the most private jet flights in 2022.

- The number of private jet flights departing from Sweden increased by 10% in 2022 compared to the year before, from 9,314 private flight ins 2021 to 10,285 in 2022 – this is the lowest increase of all countries analysed and could be explained with the more moderate COVID restrictions in Sweden and the high share of domestic private jet flights.

- Last year, CO_2 emissions from private jets taking off from Swedish airports caused 43,300 tonnes of CO_2 emissions. Compared to the year before this represents an increase of 42%.

- In the last three years (2020-2022) combined, private jets departing from Sweden have caused 80,400 tonnes of CO_2 emissions.

[31] Sweden is characterised by a relatively high amount ambulance flights (around 53% in 2020, around 32% in 2021 and around 36% in 2022), which are mainly performed by BE20 (2020 and 2021) or PC24 (2022) aircraft. We have chosen to calculate the most frequented airports, most frequented routes and shortest routes excluding BE20 and PC24 for Sweden, which might lead to an underestimation on these routes/airports. For country totals, the average percentage of medical/special flights have been taken into account as explained in the methodology.

[32] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO_2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO_2 per year. (We need to work with estimations, because there is no data for the average consumption of the full fleet available - you only find such data for the new cars of specific years - so 125 g/km is the average around 10 years ago - there is also no data on the relation of mileage and car age, but you can assume than newer cars are driven more than older ones (primary corporate use vs. secondary private use).

- In 2022, the route between Stockholm and London was the most frequently used route for private aviation, closely followed by Stockholm and Gothenburg. This route is frequently served with a direct train taking a bit more than three hours.

- In 2022, the three busiest airports for private jet flights in Sweden were in Stockholm (Bromma and Arlanda airports) and Ludvika Airport.

- In all three years analysed, the shortest route for private aviation with 10 or more flights per year was between Norrkoping and Linkoping, which can be travelled by direct train in 26 minutes leaving three to four times per hour in each direction.

Finland

- Last year, 6,104 private jet flights departed from Finland causing 19,500 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 13,000 cars.[33]

- The number of private jet flights departing from Finland increased by 31% in 2022 compared to the year before, from 4,669 private flights in 2021 to 6,104 in 2022.

- Last year, CO_2 emissions from private jets taking off from Finnish airports caused 19,500 tonnes of CO_2 emissions. Compared to the year before this represents an increase of 60%.

- In the last three years (2020-2022) combined, private jets departing from Finland have caused 32,200 tonnes of CO_2 emissions.

- In 2022, the route between Helsinki and Jyväskylä was the most frequently used route for private aviation. This route is served by train connection multiple times a day that takes about 3h - 3h30.

- In 2022, the three busiest airports for private jet flights in Finland were in Helsinki, Tampere and Rovaniemi.

- In 2022, the shortest route for private aviation with 10 or more flights per year was betweenTampere and Kuorevesi, which can be travelled by Bus in about 2h30..

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Portugal

- Last year, 7,994 private jet flights departed from Portugal causing 65,300 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 43,533 cars.[34]

- The number of private jet flights departing from Portugal increased by 81% in 2022 compared to the year before, from 4,406 private flights in 2021 to 7,994 in 2022.

- Last year, CO_2 emissions from private jets taking off from Portuguese airports caused 65,300 tonnes of CO_2 emissions. Compared to the year before this represents an increase of 98 %. compared to the year before.

- In the last three years (2020-2022) combined, private jets departing from Portugal have caused 103,400 tonnes of CO_2 emissions.

- In 2023, the route between Faro and London was the most frequently used route for private aviation.

- The three busiest airports for private jet flights in Portugal were Faro, Lisbon and Porto.

- In 2021 and 2022, the shortest route for private aviation with 10 or more flights per year was between Lisbon and Tires, which can be travelled by public transport in around one hour.

Greece

- With 14,283 private jet flights Greece ranks sixth among the list of EU countries with the most private jet flights in 2022.

[34] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO_2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO_2 per year. (We need to work with estimations, because there is no data for the average consumption of the full fleet available - you only find such data for the new cars of specific years - so 125 g/km is the average around 10 years ago - there is also no data on the relation of mileage and car age, but you can assume than newer cars are driven more than older ones (primary corporate use vs. secondary private use).

- Private jet flights in Greece last year caused 88,600 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 59,067 cars.[35]

- The number of private jet flights departing from Greece increased by 66% in 2022 compared to the year before, from 8,619 private flights in 2021 to 14,283 in 2022.

- Last year, CO_2 emissions from private jets taking off from Greek airports caused 88,600 tonnes of CO_2 emissions. Compared to the year before this represents an increase of 69%.

- In the last three years (2020-2022) combined, private jets departing from Greece have caused 146,700 tonnes of CO_2 emissions.

- In 2021 and 2022, the route between Athens and the touristic hotspot island of Mykonos was the most frequently used route for private aviation. The fastest ferry for this route takes only 2h35.

- In 2022, the busiest airport for private jet flights in Greece was Athens International airport, followed by the two island destinations of Mykonos and Corfu.

- In 2022, the shortest route for private aviation with 10 or more flights per year was between Mykonos and Syros Island. The fastest ferry for this route takes only 25 minutes.

Hungary

- Last year, 3,306 private jet flights departed from Hungarian airports causing 16,100 tonnes of CO_2 – equal to the yearly average CO_2 emissions of 10,733 cars.[36]

- The number of private jet flights departing from Hungary increased by 65% in 2022 compared to the year before, from 2,001 private flights in 2021 to 3,306 in 2022.

- Last year, CO_2 emissions from private jets departing from Hungary caused 16,100 tonnes of CO_2. Compared to the year before, this represents an increase of 64%.

- In the last three years (2020-2022) combined, private jets departing from Hungary have caused 27,200 tonnes of CO_2 emissions.

[35] According to ACEA, the average mileage of cars in the EU is around 12,000 kms per year. The average CO_2 emissions for cars can be estimated at 125 g/km. This makes 1.5 tonnes of CO_2 per year. (We need to work with estimations, because there is no data for the average consumption of the full fleet available - you only find such data for the new cars of specific years - so 125 g/km is the average around 10 years ago - there is also no data on the relation of mileage and car age, but you can assume than newer cars are driven more than older ones (primary corporate use vs. secondary private use).

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- In 2021 and 2022, the route between Budapest and London was the most frequently used route for private aviation.

- In 2022, the busiest airport for private jet flights in Hungary was Budapest International airport, with 93% of all Hungarian private jet flights analysed. Debrecen was the second busiest airport with less than 3% of all flights, followed by Heviz-Balaton airport..

- In 2022, the shortest route for private aviation with 10 or more flights per year was between Sarmellek airport, near Keszthely in the west of Lake Balaton, and Vienna. This distance can be travelled by train in around four hours.