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Air France-KLM S.A.

Reasonable assurance report by one of the statutory auditors, appointed as independent third party, on the CO_2 emissions and fuel consumption calculator

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This report contains 4 pages and one appendix

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To the General Management,

In our capacity as Statutory Auditors of your company, designated as Independent Third Party Organization or ITO, we have performed work to enable us to express reasonable assurance on the Air France-KLM S.A. CO_2 emissions and fuel consumption calculator presented at the date of this report on both the KLM and Air France websites (hereafter the "Calculator").

The conclusion below is limited to the online Calculator and does not cover the entire website.

Responsibility of the company

The management of Air France-KLM S.A. is responsible for:

- the Calculator,
- the calculation methodology used in the Calculator to determine the CO_2 emissions and fuel data presented in the appendix “KLM CO2 Calculator Methodology 2022” (hereinafter the “Calculation Methodology”),
- designing, implementing and maintaining internal control relevant to the design and the functional of the Calculator to provide results in accordance with the Calculation Methodology that are free from material misstatement, whether due to fraud or error.

The quantification of these emissions has an inherent uncertainty due to the incomplete scientific knowledge used to determine the emission factors.
In the absence of a normative reference for the calculation of aircraft fuel consumption and CO_2 emissions, Air France-KLM S.A. has developed its own methodology in accordance with IATA guidelines.

Independence and quality control

Our independence is defined by the requirements of article L.822-11-3 of the French Commercial Code and the French Code of Ethics (*Code de déontologie*) of our profession. In addition, we have implemented a system of quality control including documented policies and procedures regarding compliance with applicable legal and regulatory requirements, the ethical requirements and French professional guidance.

Responsibility of the independent third party

Our responsibility is to express a conclusion of reasonable assurance that the CO_2 emissions and fuel consumption data are calculated, using the Calculator, in accordance with the methodology described in the Calculation Methodology.

Nature and scope of our work

We performed the procedures below in accordance with the professional doctrine of the Compagnie Nationale des Commissaires aux Comptes applicable to this type of engagement and the International Standard on Auditing (ISAE)[1]. This standard requires that we comply with ethical requirements, including independence requirements, and that we plan and perform our procedures to obtain reasonable assurance that the CO_2 emissions and fuel consumption are calculated, through the Calculator, in all material respects, in accordance with the Calculation Methodology. We performed the following activities:

- We assessed the suitability of the criteria of the Calculation Methodology with respect to their relevance, completeness, reliability, neutrality and understandability,
- We reviewed the system and processes in place and, in particular, the Calculation Methodology used for the Calculator,
- We interviewed the persons responsible for the Calculator to gain understanding of the calculation process and system in place,
- We performed detailed tests on a sample of flights in order to verify that the calculation process had been implemented correctly in accordance with the Calculation Methodology. For these flights, we performed arithmetic tests on the CO_2 and fuel calculation process, comparing results with the Calculator results.

During our work, we have been assisted by the experts in Environment and Sustainable Development from the Sustainability Services department of KPMG.

We believe that the sampling methods and sample sizes used, based on our professional judgement, were sufficient to enable us to provide reasonable assurance.

[1] ISAE 3000 (revised) - *Assurance engagements other than audits or reviews of historical financial information*.

Conclusion

On the basis of the procedures we have performed, as described in the "Nature and scope of our work" section, and the data we have collected, CO_2 emissions and fuel consumption are calculated, using the Calculator, in all material respects, in accordance with the Calculation Methodology.

Paris-La Défense, March 2nd 2022

KPMG S.A.

Fanny Houlliot
Partner
Sustainability Services

Eric Dupré
Partner

Appendix: KLM CO2 Calculator Methodology

The purpose of KLM's CO_2 and fuel calculator is to calculate the amount of CO_2 emissions and fuel consumption of passengers and cargo loads during a specific flight. The calculation is performed for each departure and arrival airport, which makes it possible to indicate the CO2 impact for each passenger or 100 kg cargo. This helps to define how much CO_2 should be compensated for in our CO_2 compensation service, or how much Sustainable Aviation Fuel (SAF) is needed to reduce the impact of a trip.

The CO_2 Calculator includes flights operated by KLM. For KLM's integrated network with Air France (AF) and Delta Airlines[1] (DL) aligned data based on their own CO_2 emission calculations are used. The calculator also includes all data of flights operated by Transavia (HV). Only scheduled flights are taken into account. That means that for wet leases and code share partners the average emissions are assumed to be equal to the overall efficiency of the KLM operations for short-, medium- and longhaul flights.

To be as close to the actual impact per passenger or 100 kg cargo there are three important elements in the calculations. I) The data that is used, II) The principles of the calculation and III) The implementation. This document explains all elements and their subsequent steps. To reassure a correct approach and execution of the calculations KPMG France performed a consistency review for both KLM and Air France.

I. OBTAINING THE DATA

For all KLM Group flights, the necessary data are based on actual flight data gathered at each flight by the aircraft onboard systems. All these data are automatically transferred to the KLM data warehouse for use in calculations and analysis. The fuel consumption data per aircraft type that is used in the calculations consist of: The fuel use per 100 kg payload per 100 km "bird eye distance", the passenger-kilometers traveled (PKT) and the ton-kilometers travelled (TKT). All this is abstracted over the previous calendar year and translated into fuel-efficiency data for the fleet.

Justification of data collection
The principles of IPCC 2006[2], TIER 3A are being used in collecting and calculating data on fuel burn and actual load per O&D-segment[3] and aircraft type. Air France used the same principles and has also been part of the KPMG engagement.

[1] Delta Airlines and Air France data have not been part of the KPMG engagement.

2 2006 IPCC Guidelines for National Greenhouse Gas Inventories; Chapter 3.6 Civil Aviation
3 O&D stands for origin and destination

II. PRINCIPLES OF CALCULATION

The methodology is based on the average fuel consumption per passenger and per ton of cargo for each flight of the network of KLM.

a) KLM methodology to split up fuel burnt between passengers and cargo
The allocation of fuel between passengers and cargo is proportional to the respective overall masses of passengers and cargo. The **overall mass** is constituted by the mass of the payload (passengers including luggage or cargo) to which the mass of the specific equipment necessary to the transportation of this kind of payload, named the equipped mass, is added.

The two equipped masses were estimated for each type of operation (short-, medium haul and long haul). These masses are used to get the average fuel efficiency per passenger and the average fuel efficiency per ton of cargo for each type of aircraft. KLM is using average factors for the equipment weights per passenger and amount of cargo load as derived from ICAO calculator principles[4].

b) How to evaluate flight distances
The "bird eye distance" between the departure airport and the arrival airport is not the same as the actual "**flying distance**", the distance effectively flown by the aircraft. This distance is determined in each flight plan, and this is the information that is used for the calculation. The flight plan takes into account operational constraints like military air zones and waiting loops above airports. KLM uses the flying distance to express amounts of CO_2 per km.

c) Calculation of the CO_2 emissions per Origin and Destination
First, we determine the expected fuel efficiency per passenger (or 100 kg cargo) on a specified O&D. This is done by taking the weighted average of the fuel efficiency of all aircraft types that will be used on this O&D. The weighting is according to the frequencies of the aircraft types on this O&D in the next scheduled plan period of one year from the moment the calculator is updated. The weighted average fuel efficiency per kilometer is then multiplied by the distance of the O&D.

Finally, the amount of CO_2 emissions of a flight is calculated by multiplying the average amount of fuel burn per passenger (or cargo) on the O&D by the emission factor. The current emission factor is based on ICAO CORSIA[5] and equals 3.16 per kg kerosene. That means that one ton of fuel produces 3.16 tons of CO_2.

4 ICAO Carbon Emissions Calculator, April 2008
5 Carbon Offsetting and Reduction Scheme for International Aviation

d) Calculation of the CO_2 emissions per Cabin Class

From 2022 onwards, a cabin class split is included in the CO_2 Calculations. This is because a business class or premium economy class passenger takes up more space in the aircraft. Space that otherwise could have been filled by more passengers, which would reduce the footprint of each passenger. To compensate for that, ratios are defined to re-divide the emissions. The re-division is based on the amount of extra economy class seats that could have been in the same space, opposed to the current configuration. Both Air France and KLM did this analysis on the short-, medium- and longhaul fleet and use the same ratios that are multiplied with the CO_2 emissions per passenger on an O&D.

Ratios Cabin class

Haul type	**Economy Class**	**Premium Economy**	**Business Class**	***% Economy versus Baseline****
Short- and medium haul	1	-	1.5	*98%*
Long haul	1	1.5	3	*80%*

*Baseline is the situation without any differentiation between the cabins. To ensure that the total amount stays the same, the Economy Class emissions versus Baseline are lowered.

The **origin and destination entry file** for the calculator comprises for each segment[6] the IATA code of the departure airport and of the arrival airport, the average fuel consumption in liters and the average amount of CO_2 in kilograms per passenger per cabin class and per ton of cargo and the "flying distance". This file contains all the segments of the KLM Group network, but it does not contain all the lines of this network, since a line can consist of two or more segments in case of stopovers. Consequently, this file has been manually completed to include all the lines KLM and KLC operate. For example, the value for AMS-CGK (Amsterdam to Jakarta) corresponds to the sum of the values for AMS-KUL (Amsterdam to Kuala Lumpur) and KUL-CGK (Kuala Lumpur to Jakarta).

[6] A segment is a direct flight –without any stopover- between a departure airport and an arrival airport. For example, AMS-JFK counts as one segment

III. Implementation for KLM Group

The method described in section II is integrally applied to calculate the emissions of KLM Group flights run by KLM, KLC or Transavia aircraft. The output of this calculation is connected to the booking tools and other web-based information to show customers and other stakeholders what emissions and fuel consumptions are related to their trips and travels.

The networks of AF and DL and code share partners are also connected to our calculation interface. The segment-based database of DL has not been part of the KLM and AF validation process and the CO2 is calculated by the airline itself. The code share flights have been estimated with the average emission of short-, medium- and longhaul performances of the AF and KLM-fleet. We consider that KLM efficiency is benchmarked as 'best in class' and hence this estimation might be undervalued, however no other objective and actual data are currently available.