

**CORPORATE SOCIAL  
RESPONSIBILITY  
REPORT 2018**

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Carbon footprint

# **CARBON FOOTPRINT**

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**We aim to minimize our impact on the environment, and have set the target to further reduce CO<sub>2</sub> emissions by 20% by 2020. To achieve this ambition, we focus on fleet renewal, improving operational efficiency, promoting and using sustainable aviation fuels, and carbon offsetting.**

## OUR AMBITION 2020



**AIR FRANCE-KLM  
REDUCE CO<sub>2</sub> EMISSIONS BY 20%**

COMPARED TO 2011 INCLUDING  
MARKET-BASED MEASURES  
(G. CO<sub>2</sub> / PASSENGER / KM)

## OUR RESULTS 2018



**3.21 LITERS / PASSENGER / 100 KM**



**80 G. CO<sub>2</sub> / PASSENGER / KM**

## COMPARED TO 2011

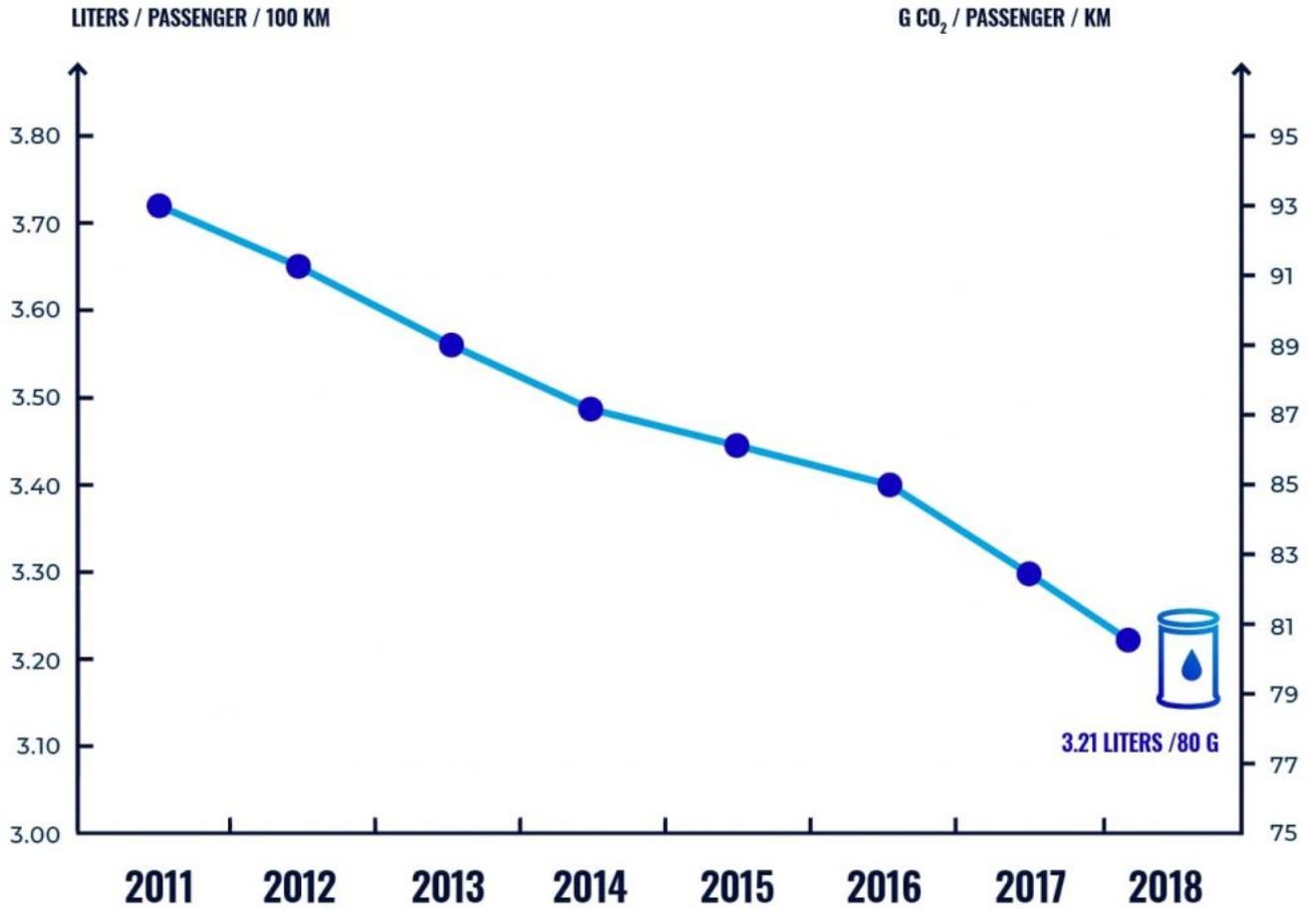


**13.5% REDUCTION  
(OPERATIONAL  
IMPROVEMENT)**

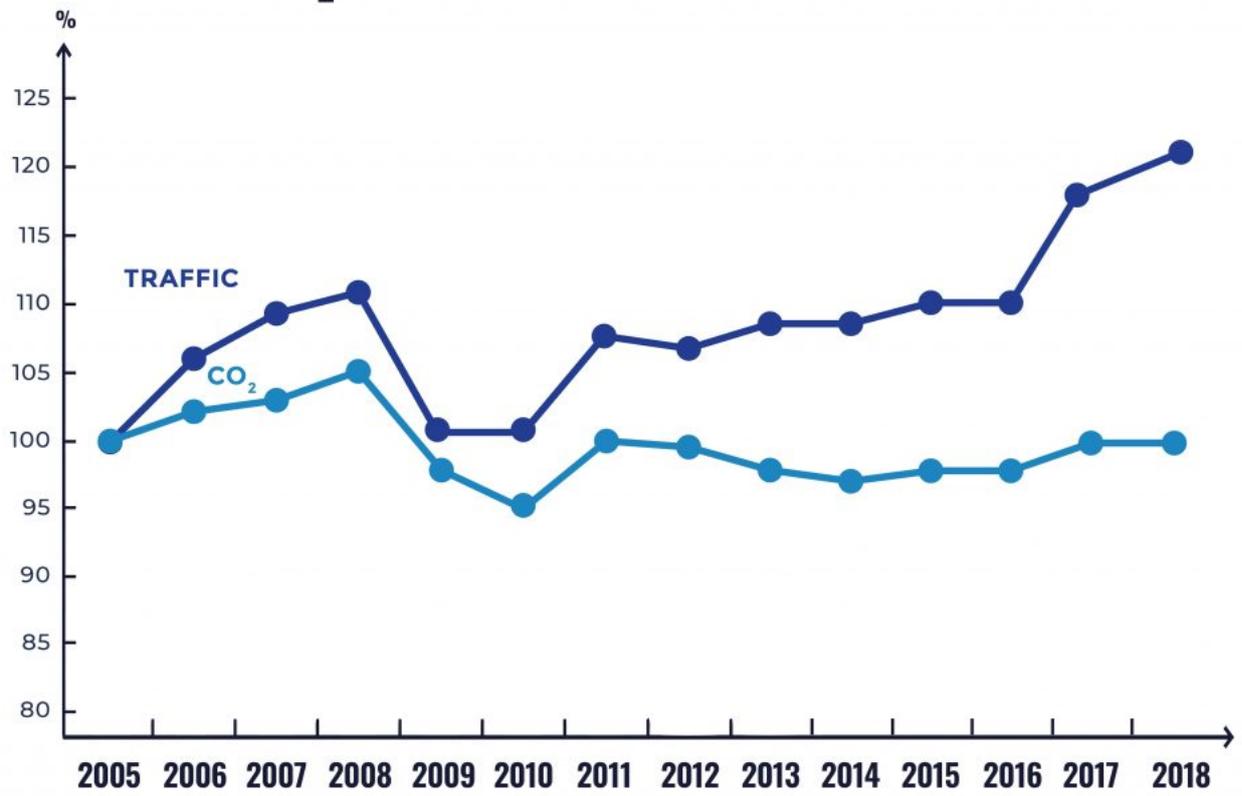


**21.6% REDUCTION  
(INCLUDING MARKET  
BASED MEASURES)**

# GROUP FUEL CONSUMPTION



# CO<sub>2</sub> EMISSIONS AND TRAFFIC



# BREAKDOWN OF CO<sub>2</sub> EMISSIONS FOR FLIGHT AND GROUND OPERATIONS



**0.2%**

Ground operations

**22.3%**

Short and medium haul

**77.5%**

Long haul

## GREENHOUSE GAS EMISSIONS: SCOPES 1, 2 AND 3

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### Scope 1

The most significant portion of greenhouse gas emissions (GHG) comes from our direct activities (scope 1), mainly from flight operations which account for 99.7% of the Group's total direct emissions. To minimize our environmental footprint, we have focused our actions on flight operations.

Reducing our CO<sub>2</sub> emissions goes hand in hand with fuel use reduction. Therefore, one of the focus points in our environmental policy is to reduce the use of fuel. Operating with more fuel-efficient aircraft, implementing weight reduction measures on board, optimizing flight routes and improving flight operations all contribute to the reduction of fuel use.

Secondly, we believe that the use of sustainable alternative fuels is an important factor in further reducing our CO<sub>2</sub> emissions. Consequently, both Air France and KLM have policies in place that stimulate the development and use of those. Currently, there is not enough supply to operate fully on sustainable alternative fuels. Therefore, carbon offsetting is a mid-way option to reduce our

environmental footprint.

## **Scope 2**

Ground operations, like the aircraft maintenance and tertiary activities, also generate indirect greenhouse gas emissions (scope 2) through electricity consumption in buildings (electricity, heating and air conditioning).

We implement actions to reduce ground energy consumption.

## **Scope 3**

The indirect scope 3 greenhouse gas emissions mostly come from the upstream phase (extraction, production, distribution, etc.) in aviation kerosene production and carbon emissions from vehicles and runway equipment.

Other scope 3 components are the purchasing of goods and services, passenger road travel to and from airports, and employee commuting. We are examining these components with a view to reducing emissions.

For air travel, scope 3 emissions account for around 16% of total emissions (scopes 1, 2 and 3).

## **Reporting**

Every year, we report 100% of our scope 1 and 2 CO<sub>2</sub> emissions, and the scope 3 emissions resulting from the upstream phase of kerosene production (according to the assessment made by the Group, these emissions represent approximately half of the total scope 3 emissions). These emissions are published in the form of indicators presented in the environmental indicator tables in the [Registration Document 2018](#).

# **FUEL USE REDUCTION**

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## **Fleet modernization**

Our fleet in 2018

Aircraft: 548

Average age: 11.3 years

	AIR FRANCE GROUP			KLM GROUP		
	AVERAGE AGE (YEARS)	AIRCRAFT TYPES	NUMBER OF AIRCRAFT	AVERAGE AGE (YEARS)	AIRCRAFT TYPES	NUMBER OF AIRCRAFT
	12.2		339	9.7		209
SHORT AND MEDIUM-HAUL	13.6	A318, A319 A320, A321	115	12.2	737-700/ -800/-900	50
LONG-HAUL	12.7	A380, A330-200 A340-300 777-200/-300 787-9	106	10.6	A330-200/-300 777-200/-300 747-400 787-9	66
CARGO	9.9	777F	2	18.7	747-400ERF/BCF	4
REGIONAL FLEET AIR FRANCE HOP KLM CITYHOPPER	12.3	ATR, Embraer, Bombardier	82	5.2	EMB 175/ EMB 190	49
REST OF THE FLEET TRANSAVIA FRANCE TRANSAVIA NL	6.1	737-800	34	9.8	737-700/-800	40

## AIR FRANCE-KLM FLEET ON DECEMBER 31, 2018



## SUSTAINABLE AVIATION FUEL

Sustainable aviation fuel constitutes one of the most promising approaches to reducing CO<sub>2</sub> emissions in aviation. They are key to achieving Air France-KLM's CO<sub>2</sub> emission reduction targets, as well as those of the aviation industry as a whole. Unlike other forms of transportation, commercial aviation industry has no alternative to fossil fuels and, moreover, no ground-breaking technologies are envisaged for commercial aviation in the coming decades.

In 2018:

- Over 1,300 tons of sustainable bio-kerosene were used by KLM, together with its corporate bio-fuel partners
- Air France engaged in a Green Deal signed with the French government and 4 industrial partners in order to promote the emergence of sustainable aviation bio-fuel industries, in economically viable conditions that fully integrate circular economy principles.

## CARBON OFFSETTING

### European trading system

Since 2012, the Group has been subject to the application of the European Emission Trading Scheme for greenhouse gas emission quotas (EU-ETS).

The EU-ETS scope is limited to intra-European flights until the end of 2023. The EU-ETS should be considered a first step towards a global system whose main principles were approved by ICAO in October 2016, and specified in the SARF (Standard and Recommended Practices) rulebook accepted by the ICAO council in 2018.

In 2018, Air France, KLM, Transavia, HOP! and KLM Cityhopper purchased emission allowances equivalent to 3,081,906 tons of CO<sub>2</sub>. We estimate that out of this just 2,496,488 tons will contribute to actually reducing emissions beyond the ETS threshold. Of the remainder, 15% was used in additional bidding as part of the EU's ETS system and 3% was allocated to a reserve.

If we take into account the economic measures above the ETS cap, in addition to the operational improvement measures of 13.5%, our total efficiency improved by 21.6% in 2018 (g.CO<sub>2</sub>/passenger/km) compared to 2011, surpassing our 20% target for 2020.

Seeing that not all emission allowances are used in a way to comply with the collective cap, the environmental integrity of EU ETS could be considered limited, as it does not lower our carbon footprint in the most cost-effective way.

### **CORSIA: Carbon Offsetting and Reduction Scheme for International Aviation**

CORSIA is a historic agreement that sets out a global system for capping net carbon emissions for the international aviation industry, making aviation the first economic sector to address climate change at a global level. This global market-based scheme aims to limit the CO<sub>2</sub> emissions from international aviation by targeting carbon-neutral growth relative to the 2020 reference. Air France, KLM and other airline members of IATA continue to work on defining the implementation conditions of this agreement.

For the implementation of CORSIA, the calculation of the CO<sub>2</sub> emission reference data began on January 1, 2019 (to determine the average of 2019 and 2020 emissions): all operators across all countries must henceforth declare the CO<sub>2</sub> emissions from their international flights.

The first phase of CORSIA offsetting will start from 2021 to 2026, with seventy-six volunteering countries (representing 76% of international aviation activity), having already declared their intention to participate. The following phase, set up from 2027 to 2035, will be mandatory, and will concern virtually all countries (with the exception of few countries, unless they volunteer).

This new system aims to supplement the basket of mitigation measures already deployed by the industry to reduce the CO<sub>2</sub> emissions from international aviation. This basket includes technical and operational improvements, together with progress made in producing and using sustainable alternative fuels for aviation.

The Group expects this system to ensure simplicity, environmental integrity and an acceptable cost-efficiency ratio, to establish fair competition between the airlines, and avoid having a patchwork of local or regional regulations. In this regard, the CORSIA provisions should be included in the EU-ETS regulation as of 2021 for the scope of international flights.

### **CO<sub>2</sub> offsetting service for our customers**

Air France and KLM also offer a CO<sub>2</sub> offsetting service for their customers on a voluntary basis. We provide CO<sub>2</sub> emission calculators on our websites that determine CO<sub>2</sub> emissions of a passenger, based on the distance flown and the fuel-efficiency data of our aircraft. These calculators are directly linked to an evaluation system, enabling passengers to balance the carbon emissions associated with their travel, should they so wish.

Air France partners the GoodPlanet Foundation's Solidarity Action Carbon Program for the financing of carbon offsetting projects aimed at promoting renewables to replace non-renewable energies in Peru, Bolivia and India, and at implementing waste recycling projects in Madagascar. In 2018, Air France launched a new partnership and the program Trip and Tree with the organization A Tree for You ([see Biodiversity page](#)).



KLM calculates the actual CO<sub>2</sub> emissions of a flight based on aircraft type, the distance flown, and the historical load. In 2018, around 88,000 passengers neutralized the CO<sub>2</sub> emissions from their journey by using KLM's CO2ZERO service. This is an increase of almost 50% compared to 2017.

The contribution paid by passengers through CO2ZERO is invested in Gold Standard-certified CO<sub>2</sub> reduction projects. All Gold Standard-certified projects must contribute to at least two UN Sustainable Development Goals. Therefore, they have a positive impact on the environment, but also contribute to the local communities.



In the past, these contributions were invested in the Clean Cookstoves projects in Mali, Kenya and Ghana. Since October 2017, revenues go to the “CO2OL Tropical Mix” project in Panama that focuses on planting new trees, maintaining existing forests and supporting the local community. In 2018, thanks to our passengers, the preservation and planting of 312 hectares of tropical forest was made possible.

On top of our operational improvements and mandatory offsetting, KLM reached almost 260,000 tons of total CO<sub>2</sub>-savings by voluntary offsetting, since the start of the program in 2008.

## **GROUND ENERGY CONSUMPTION**

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Electricity consumption in buildings dedicated to ground operations, like aircraft maintenance and tertiary activities, generates indirect greenhouse gas emissions (scope 2).

We are targeting a 20% improvement in ground operation energy efficiency by 2020 (relative to the 2011 level), by optimizing energy consumption and increasing the use of renewable energies.

Having reached the 2020 target in 2017, Air France has set a new target for the same date in 2020, that corresponds to a 26% reduction in electricity consumption (expressed in kWh/m<sup>2</sup>) compared to 2011 as the base year. This result was achieved notably through an improvement in equipment, such as lighting, and the integration of this objective in supplier contracts.

- Initiatives to reduce energy consumption are in place at all Air France sites. For example, at Valbonne in southern France where the bulk of the IT servers are located, 100% of the heating

need of the tertiary buildings comes from the recycling of heat generated by the air conditioning system.

- In the cargo warehouses, a new energy-efficient lighting system has replaced the traditional system, enabling an 80% savings (reduction in energy and maintenance costs) and avoidance of 285 tonnes of CO<sub>2</sub> emissions a year.

KLM has been introducing a range of energy saving measures in its buildings and processes. In 2016, KLM signed a fifth multi-year energy efficiency agreement with the Dutch Ministry of Economic Affairs, with the objective to reduce energy consumption by at least 2% per year until 2020.

- In 2018, KLM reduced its electricity and gas use by 3% and 5% respectively compared to the previous year. Between 2011 and 2018, KLM reduced the consumption of both electricity and gas by 19%.

In our buildings and hangars, we look for innovative solutions and turn to renewable energies. Our new facilities are designed to respect the principles of low environmental impact construction to ensure the comfort, health and safety of the people who use them, and to effectively manage energy use.

Architectural plans for all of our new buildings will be drawn up taking into account the possibility of implementing solar panels:

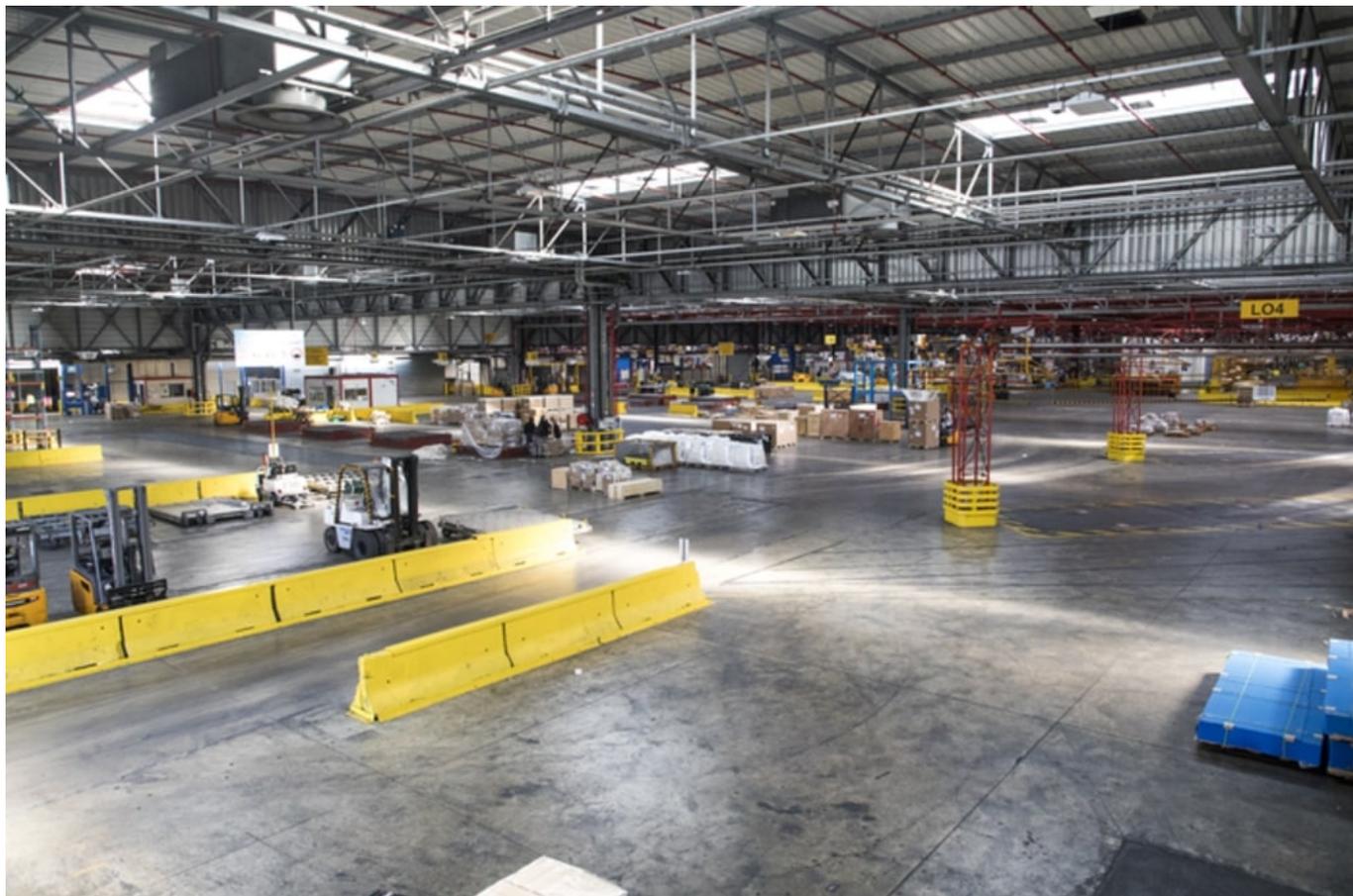
- Air France IT Center in Valbonne uses the solar energy provided by 6,000 m<sup>2</sup> of panels installed on the structure which also provides shade in the centre's car park. This plant covers 10% of the IT centre's annual electricity consumption, or the equivalent of 400 households' annual consumption.
- Air France Industries has implemented solar panels on maintenance hangar roofs wherever this was technically possible, as they require minimum roof surface and pitch.

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