



LUFTHANSA GROUP

Sustainability 2022

FACT SHEET





Dear Readers,

2022 was a very successful financial year for the Lufthansa Group, at least from an economic point of view. After the challenging years of the coronavirus pandemic, we were pleased to welcome more than 100 million passengers on board our aircraft again.

In keeping with our mission statement of connecting people, cultures and economies in a sustainable way, we aim to continue to play a leading role in our industry while limiting the environmental impact of flying. Our climate protection targets are just as ambitious: We strive to be carbon neutral by 2050, and by 2030, we already intend to halve our net CO₂ emissions compared with 2019 through reduction and offsetting measures. In summer 2022, the Science Based Targets initiative validated our target to reduce carbon intensity by 30.6% compared with 2019 by 2030 in line with the goals of the 2015 Paris Climate Agreement. We were the first airline group in Europe to achieve this.

We are investing more than ever in the modernisation of our Group fleet in order to make future mobility as environmentally sustainable as possible. On average, we will put a new, significantly more fuel-efficient aircraft into service every ten days until 2030. At the same time, we are driving the development

and use of sustainable aviation fuels and working with partners on innovative technologies to reduce CO₂. One example is the fuel-saving surface film AeroSHARK, which is modelled on the fine structure of shark skin. As an industry forerunner, we have already equipped more than 20 long-haul aircraft with this new technology. We are also continuously expanding our range of offers and services for more sustainable travel.

Our understanding of a premium product includes sustainability on board. Since we want to continue to improve significantly in this area, we have adopted specific waste reduction targets for all Passenger Airlines. We have also launched a product and quality offensive that will serve as a benchmark in our sector.

Since 2002, all of our activities have been closely aligned with the ten principles of the UN Global Compact, and we have documented our contribution to the achievement of the United Nations' global sustainable development goals (SDGs).

The expertise of our more than 109,000 employees from 177 nations is the key to our long-term business success. An integral part of our human resources strategy is the promotion of our employees' diverse talents and the provision of conditions

that ensure a healthy work-life balance. Corporate citizenship is also very important to us. Many of our employees volunteer their time in one of the 55 projects that our "help alliance" aid organisation runs worldwide. Last year, these projects provided support to around 38,000 disadvantaged people around the world.

Our commitment to sustainability is rated positively by independent rating organisations and is above the industry average. This reinforces our belief that we are on the right track with our programmes for more sustainable aviation and with our understanding of corporate responsibility.

This publication informs you in the usual way about the most important topics and key sustainability figures in the Lufthansa Group for 2022.

Carsten Spohr

Chairman of the Executive Board and CEO of Deutsche Lufthansa AG

At a glance

PERSONNEL DATA		2022	2021	Change
Average number of employees during the year		106,886	107,643	-1.0%
Employees (as of 31 Dec)		109,509	105,290	+4.0%
of which in Germany		59,295	60,517	-2.0%
of which abroad		50,214	44,773	+12.2%
Staff costs	in € million	8,108	6,328	+28.1%
Revenue/employees	€	306,580	156,174 ⁸	+96.3%
Staff costs/revenue	percent	24.7	37.6	-12.9 PP
Average age	Years	42.9	43.2	-0.3
Absolute part-time ratio ¹	percent	30.2	32.3	-2.1 PP
Part-time ratio men	percent	17.1	16.9	+0.2 PP
Part-time ratio women	percent	46.1	51.3	-5.2 PP
Proportion of women in management	percent	20.4	18.7	+1.7 PP

TRAFFIC DATA		Fact Sheet ^{2,3}			Annual Report ⁶		
2022		2022	2021	Diff. PY	2022	2021	Diff. PY
Flights ⁴		780,047	456,169	+71.0%	826,379	460,029	+79.6%
Passengers ⁵	thousands	95,946	46,126	+108.0%	101,774	46,949	+116.8%
Seat kilometres offered, SKO	million	250,552	144,873	+72.9%	259,381	145,139	+78.7%
Freight tonne kilometres offered, TKO	million	12,587	9,942	+26.6%	14,194	11,867	+19.6%
Passenger kilometres transported, PKT ⁵	million	201,665	89,530	+125.2%	207,035	89,397	+131.6%
Freight tonne kilometres transported (including third-party performance), FTKT	million	7,138	6,673	+7.0%	8,562	8,477	+1.0%
Passenger tonne-kilometres ⁵	million	20,289	9,001	+125.4%	-	-	-
Tonne-kilometres, TKT	million	27,427	15,674	+75.0%	-	-	-

¹ Scope = Group of consolidated companies without restriction. ² The following companies are included for the 2022 reporting year: Lufthansa (including Lufthansa CityLine, Eurowings Discover and Air Dolomiti), SWISS (including Edelweiss Air), Austrian Airlines, Eurowings (including Germanwings), Brussels Airlines and Lufthansa Cargo. Not included are other flights (see footnote 4, p. 11) and services performed by third parties, as their

performance is beyond our control (see table "Third-party interests", p. 11) ³ Types of flight service considered: all scheduled and charter flights (excluding ground vehicles). ⁴ Legs (operational perspective); Annual Report: routes (customer perspective). A route may comprise several legs, e.g. stopovers. ⁵ Based on all passengers on board. ⁶ Companies included as in 2, but including third-party services, as these contribute to the Group's result. ⁷ Actual

fuel consumption/carbon dioxide emissions in tonnes from flight operations based on all flight events under the respective operating flight number. Consumption/carbon dioxide emissions are recorded from gate to gate, i.e. including taxiing on the ground and holding patterns as well as flight detours. ⁸ Changed calculation basis compared to the Sustainability fact sheet in 2021.

ENVIRONMENTAL DATA ^{2,3}		2022	2021	Change
Resource consumption				
Fuel consumption ⁷	Tonnes	7,284,584	4,324,746	+68.4%
Fuel consumption, specific, all types of transport	g/tkm	266	276	-3.7%
Fuel consumption, specific, passenger transportation	l/100 pkm	3.59	4.05	-11.5%
Fuel consumption, specific, freight transportation	g/tkm	214	216	-0.9%
Emissions				
Carbon dioxide emissions ⁷	Tonnes	22,946,441	13,622,950	+68.4%
Carbon dioxide emissions, specific, all types of transport	g/tkm	837	869	-3.7%
Carbon dioxide emissions, specific, passenger transportation	kg/100 pkm	9.00	10.16	-11.4%
Nitrogen oxide emissions	Tonnes	106,896	65,001	+64.5%
Nitrogen oxide emissions, specific, passenger transportation	g/100 pkm	40.7	46.5	-12.6%
Carbon monoxide emissions	Tonnes	19,346	11,031	+75.37%
Carbon monoxide emissions, specific, passenger transportation	g/100 pkm	8.0	8.8	-9.3%
Unburned hydrocarbons	Tonnes	2,233.7	1,006.6	+121.9%
Unburned hydrocarbons, specific, passenger transportation	g/100 pkm	0.97	0.80	+21.1%

The Lufthansa Group is committed to providing transparent and comprehensive sustainability reporting.

MATERIAL SUSTAINABILITY ASPECTS IN THE LUFTHANSA GROUP

- Customer satisfaction
- Financial stability and resilience
- Business ethics and compliance
- Sustainable supply chains
- Emissions with an impact on the climate
- Energy and fuel efficiency
- Local pollution (including noise)
- Waste management
- Attractiveness as an employer
- Transformation capability
- Health and safety at work
- Diversity and equal opportunity
- Corporate citizenship¹

Sustainable and responsible corporate conduct is an integral part of the Lufthansa Group’s corporate strategy. The Lufthansa Group is convinced that it has an obligation to create added value for customers, employees and investors, and to meet its responsibility towards the environment, people and society.

Thus the Lufthansa Group considers it important to provide transparent and comprehensive reporting on its sustainability activities. To do so, the Lufthansa Group regularly identifies key sustainability aspects by conducting a **materiality analysis** in which it incorporates the demands and interests of its stakeholders. In addition to publishing the **Sustainability Fact Sheet**, the Lufthansa Group reports in detail on its commitment to sustainability in its non-**financial declaration** in the Annual Report, with reference to GRI standards. This also includes a statement on the applicability of the EU Taxonomy. The Lufthansa Group has been a signatory of the Task Force on Climate-related Finance Disclosures (**TCFD**) since 2020 and

reports accordingly. The Lufthansa Group also reports according to the Sustainable Accounting Standards Board (**SASB Standard**).

All reports are published under
[➤ lufthansagroup.com/en/responsibility/reports](https://lufthansagroup.com/en/responsibility/reports)

There, the company also provides a detailed description of its carbon footprint in the context of its **CDP rating**, and, in its annual **Communication on Progress**, reports on its sustainable corporate governance in accordance with the ten principles of the **UN Global Compact**.

STAKEHOLDERS OF THE LUFTHANSA GROUP



Customers
Consumers



Investors
Shareholders
Analysts
Rating agencies



Government
Legislation
Politics
Authorities



Residents
General public
Social networks



NGOs
Industry associations
Associations



Science
Research and education



Employees
Employee representation



Suppliers
Contracting parties











¹ Voluntary materiality of the Lufthansa Group.

Values and guidelines

The Lufthansa Group is committed to the **ten principles of the UN Global Compact** for sustainable and responsible corporate governance. In addition, it supports the 17 global Sustainable Development Goals (SDGs) of **Agenda 2030**, as adopted by the UN member states in 2015. In order to contribute towards

achieving these goals, the Lufthansa Group concentrates on the SDGs where it can reduce its negative impact and increase its positive effect based on its business model. An overview of its contributions is published in the Annual Report.

SUSTAINABLE DEVELOPMENT GOALS (SDG) OF THE LUFTHANSA GROUP

	SDG 3: Good Health and Well-Being		SDG 10: Reduced Inequalities
	SDG 4: Quality Education		SDG 12: Responsible Consumption and Production
	SDG 7: Affordable and Clean Energy		SDG 13: Climate Action
	SDG 8: Decent Work and Economic Growth		SDG 16: Peace and Justice
	SDG 9: Industry, Innovation and Infrastructure		SDG 17: Partnerships for the Goals

Code of Conduct

In its **Code of Conduct**, which is binding for all bodies, senior executives and employees, the Lufthansa Group documents its values, principles and standards of behaviour. This provides a framework for acting with integrity and behaving in accordance with internationally recognised values and standards. The key principles of the Code of Conduct include compliance with the rules of fair competition, fighting corruption and bribery, respect for human rights and compliance with labour and social standards.

Building on this document, the Lufthansa Group also has a **Supplier Code of Conduct**, which specifically lays out the Group's position: it expects its business partners and suppliers to abide by the principles outlined in the code as a key aspect of their business relationship. The principles laid down in the Supplier Code of Conduct not only act as the basis for responsible conduct and fair competition, but are also intended to help identify legal and reputational risks at an early stage and avoid them.

Ten principles of the UN Global Compact

1. Businesses should support and respect the protection of internationally proclaimed human rights.
2. Businesses should make sure that they are not complicit in human rights abuses.
3. Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining.
4. Businesses should uphold the elimination of all forms of forced and compulsory labour.
5. Businesses should uphold the effective abolition of child labour.
6. Businesses should uphold the elimination of discrimination in respect of employment and occupation.
7. Businesses should support a precautionary approach to environmental challenges.
8. Businesses should undertake initiatives to promote greater environmental responsibility.
9. Businesses should encourage the development and diffusion of environmentally friendly technologies.
10. Businesses should work against corruption in all its forms, including extortion and bribery.

Source: UN Global Compact

Strategy

Positioning as leading European airline group

The Lufthansa Group is one of the largest airlines worldwide and the leading European airline group. In this role, the Lufthansa Group aims to continue to play a part in actively shaping the global airline market. It strives to follow its mission statement: to connect people, cultures and economies in a sustainable way. In doing so, it aspires to set standards in terms of customer-friendliness and sustainability. The Lufthansa Group uses the potential of innovation and digitalisation to develop customer-focused

products and increase efficiency. Corporate responsibility and identity are put into practice locally and supported by overarching functional processes that enable synergies and economies of scale. A strict focus on costs, operational stability and reliability in all areas are firmly established in the DNA of the Lufthansa Group. The safety of flight operations is and always will be the top priority.

GUIDING PRINCIPLES OF THE LUFTHANSA GROUP



Lufthansa Group to focus increasingly on sustainability and social responsibility

Responsibility forms the foundation of business activities in the Lufthansa Group. The Lufthansa Group aspires to lead the airline industry with high standards in this area as well. It therefore builds continuously on its environmental commitment, is dedicated to many social issues, and treats its employees and partners in the value chain responsibly and fairly.



826,379 Flights¹



> 400 Targets



102 million Passengers¹



710 Aircraft



5 Hubs



109,509 Employees
as of 31 December 2022



319 Companies
(fully consolidated)

¹ Data basis annual report 2022.

External ratings

Indicators for future viability

Capital market investors are increasingly taking the social and environmental responsibility and good corporate governance of a company into account when making their decisions. These aspects are an increasingly important indicator of a company's future viability.

One of the tools investors use to make their decisions is independent company assessments. These assessments are conducted on the one hand by banks, but primarily by so-called ESG rating agencies. (Environment, Social, Governance/ESG). The ESG performance of a company is assessed on the basis of numerous criteria, which provide information on factors such as a company's values, risk management, non-financial goals and the measures it adopts.

Achieving a good rating helps companies to improve relationships with investors and clients, increases investment opportunities and improves access to lower-cost capital, and makes it easier to plan more effectively for the future. The sustainability performance of a company also plays a significant role on the labour market because it impacts the attractiveness of the company as an employer.

Highly respected rating agencies include MSCI ESG, Sustainalytics, ISS ESG and CDP.

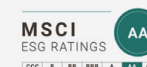
Prerequisites for a good rating

Materiality: Consideration of the material ESG factors for the Company's business and sector that may affect the Company's financial performance and sustainability over the long term.

Data quality: Accurate and reliable ESG data that is collected and managed via robust procedures and forms the basis for reporting.

Transparency: Disclosure of relevant information on ESG performance.

Benchmarking: Comparison of Company performance with competitors and standards in the sector.



AA

ecovadis



C+



44
Score
on 100



A-



27,8
Medium
Risk



FTSE4Good



The Lufthansa Group's sustainability performance is rated positively and is above the industry average, in parts leading the sector

How can a company in an industry that is difficult to decarbonise receive a good ESG rating?

The aim is to provide a holistic assessment of a company's ESG performance, taking into account its strengths as well as its weaknesses. This is why companies that use fossil fuels, for example, can still receive a good rating if they demonstrate strong and effective commitment and progress in reducing their environmental impact.

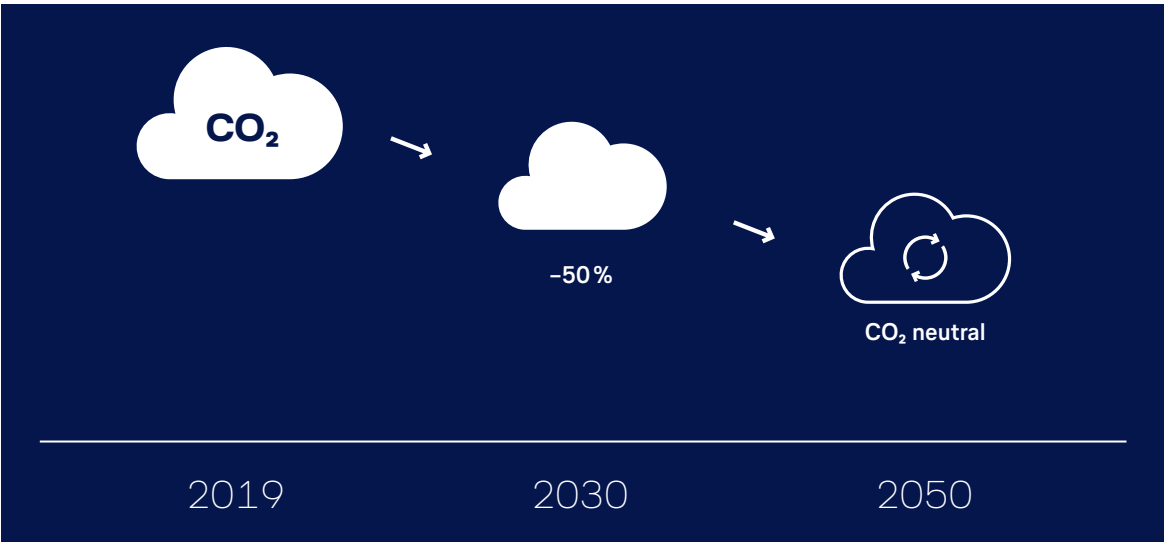
Climate action goals

Ambitious Lufthansa Group climate action goals

The Lufthansa Group has set ambitious climate protection goals. It aims to cut its net carbon emissions from flight operations in half by 2030 compared to 2019, and to achieve carbon neutrality by 2050.

As an additional goal, the Lufthansa Group aims to become carbon-neutral within their mobility on ground in its home markets by 2030.

The Lufthansa Group has joined the Science Based Target initiative (SBTi) and is following a clearly defined CO₂ reduction path. Lufthansa Group's target to achieve a 30,6 % reduction in CO₂ intensity in 2030 compared to 2019 was successfully validated in 2022 by SBTi.



THE LUFTHANSA GROUP'S TOOLS FOR ACHIEVEMENT OF ITS CLIMATE GOALS



Fleet modernisation

More modern and efficient aircraft provide the greatest leverage for reducing CO₂ emissions in this decade.



Efficiency in flight operations

Tools used every day to reduce carbon emissions include intelligent route planning, modern approach procedures and the latest technologies.



Offsetting

High-quality, certified offset projects that promote climate change mitigation worldwide are complemented by CORSIA, the international offset instrument for carbon-neutral growth in air transport.



Sustainable fuels

The key to making flying more climate-friendly is to increase the use of sustainable fuels.



Alternative transport to hubs

The expansion and interconnection of air, rail and bus services makes it possible to reduce the number of short-haul flights and offer alternative modes of travel to flights.



Update on levers for achieving climate goals – 2022 highlights



Fleet modernisation

- **24 new entry aircraft** including modern and more efficient aircraft models Airbus A320neo, A321neo, A350-900, Boeing 787-9 and Boeing 777F
- **27 Disposals** – older, relatively less efficient aircraft

LUFTHANSA GROUP FLEET ORDERS

	Firm orders ¹	Deliveries	Options
Long-haul fleet			
Airbus A350	28	2023 to 2029	
Boeing 787	30	2022 to 2026	20
Boeing 777	20	2023 to 2027	24
Boeing 777F	9	2024	
Short-haul fleet			
Airbus A220			14
Airbus A320	57	2023 to 2026	
Airbus A321	30	2023 to 2027	
Total aircraft	174	2023 to 2029	58



Sustainable Aviation Fuels

43,900 t fossil CO₂ saved through the use of sustainable aviation fuel (2022)

- Diversified supplier portfolio means that aircraft can now be refuelled with SAF in Lyon and Bordeaux as well as in Frankfurt and Vienna
- Financial investment by SWISS in Synhelion, a manufacturer of solar fuels. SWISS will be the first airline in the world to use solar aviation fuel.



Intermodal Transport

Around 450 alternative connections were offered daily to and from Lufthansa Group hubs



Efficiency in flight operations

33,000 t of CO₂ reduction and **approximately 10,500 t** kerosene reduction through **24 projects** across the Group

This is equivalent to approximately 127 return flights between Munich and New York with an Airbus A350-900 aircraft.



Offsetting

380,000 t by customers²
50,000 t by the Lufthansa Group for business trips^{2,3}

¹ Excluding contracted leases. ² CO₂ volumes offset via projects (2022). ³ excluding SWISS due to downstream capture.



Science-based Targets

The Science-based Targets (SBT)

The **Science-based Targets initiative (SBTi)** is an alliance of the United Nations Global Compact (UNGC), CDP, World Wide Fund for Nature (WWF) and World Resource Institute (WRI) that sets science-based emission reduction targets for companies (**SBT**). These targets are focused on the amount of emissions that must be reduced in order to meet the **Paris Agreement** targets.

The **SBTi Standard**¹ requires companies to set a target with a duration of between 5 and 15 years. Against the backdrop of a globally available residual carbon budget for achievement of the Paris Agreement target, an **emissions scenario** exists which defines when and by how much emissions are being reduced. **Emissions budgets** are also allocated to individual sectors and the companies in those sectors. Some industries are being required to reduce their emissions quickly and drastically. However, the airline industry is projected to continue to produce CO₂ in 2050, despite significant reductions. Defined **criteria and recommendations** from companies must also be fulfilled in order for the SBTi to verify the company's objectives as "**science based**". For example, payments for CO₂ offsets are not taken into account.²



The Paris Agreement

On 12 December 2015, 196 countries and the EU adopted the first legally binding international agreement to slow climate change and mitigate its impacts under the United Nations Framework Convention on Climate Change (UNFCCC) in Paris. The goal of the agreement is to limit global warming to 1.5°C if possible, but to limit it in any case to well below 2°C compared to the pre-industrial level of 1850.



-30.6%

CO₂/RTK by 2030 compared to base year 2019 is the Lufthansa Group's target

The Lufthansa Group follows a clearly defined carbon reduction path. The target of -30,6% CO₂/RTK in 2030 in comparison with the base year 2019 has been validated by the SBTi in 2022. This made it the second airline group worldwide and the first in Europe to have its CO₂ intensity reduction targets validated by the SBTi. In 2022 the Lufthansa Group achieved a -2,2% reduction of CO₂/RTK

¹ The SBTi is guided by the publications of the Intergovernmental Panel on Climate Change (IPCC) and accordingly reserves the right to change the carbon budget and other key figures. ² Source: myclimate, GUTcert

Absolute fuel consumption

FUEL CONSUMPTION^{1,2}

in tonnes

7,284,584

2022	
2021	4,324,746
2020	3,507,461
2019	10,435,324
2018	10,254,365

FUEL CONSUMPTION¹ 2022

in tonnes

	Passengers	Cargo	Total	Stake
Regular flights²				
Lufthansa	3,447,563	1,089,358	4,536,921	58.8%
SWISS	896,577	324,421	1,220,998	15.8%
Austrian Airlines	527,582	57,029	584,610	7.6%
Eurowings	527,253	1,464	528,718	6.9%
Brussels Airlines	364,856	48,482	413,338	5.4%
			7,284,584	94.4%
Other flights ⁴			25,226	0.3%
Reg. + other flights⁵			7,309,810	94.8%
Third parties ^{6,7}	221,309	182,048	403,357	5.2%
All flights			7,713,167	100.0%

Although the first half of the year in particular was still occasionally marked by significant travel restrictions and uncertainties in the air travel market, demand in the full 2022 year saw a significant increase in demand compared to the previous year.

The very strong positive development of demand compared to the previous year of 2021 combined with a significant increase in capacity in the 2022 reporting year resulted in correspondingly higher fuel consumption. The number of flights increased by 71%; transport volume increased by 75% and kerosene consumption by 68%.

FUEL DUMPS² 2022

	2022	Change compared to 2021
Total events	37	+32
of which medical reasons	18	+16
technical reasons	17	+15
other reasons	2	+1
Tonnage³	1,101.8t	+624.9%

THIRD PARTY SHARE ^{6,7} 2022

Number of flights	6.5%
Passengers	5.3%
Tonne-kilometres transported, TKT (tkm)	6.7%
Fuel consumption (tonnes)	5.2%
Carbon dioxide emissions (tonnes)	5.2%

¹ Actual fuel consumption in tonnes from flight operations based on all flight events under the respective operating flight number. Consumption/carbon dioxide emissions are recorded from gate to gate, i.e. including taxiing on the ground and holding patterns as well as flying detours. ² The following companies are included for the 2022 reporting year: Lufthansa (including Lufthansa CityLine, Eurowings Discover and Air Dolomiti), SWISS (including Edelweiss Air), Austrian Airlines, Eurowings (including Germanwings), Brussels

Airlines and Lufthansa Cargo. Not included are other flights (see footnote 4) and services performed by third parties, as their performance is beyond our control (see table "Third-party interests"). ³ Partly projections. ⁴ Ferry flights, special flights, test flights, training flights, aborted flights. ⁵ The carbon emissions resulting from this fuel consumption (times 3.15) differ slightly from the value of 23.1 million tonnes reported in the 2022 non-financial declaration. This is due to adjustments made to the system at Brussels Airlines, the inclusion



of further data systems for calculating specific data in the Fact Sheet, and related rounding differences. ⁶ Airlines that lie outside the scope of this Fact Sheet but that provide services for Lufthansa, e.g. in the event of capacity bottlenecks. ⁷ Excluding road feeder service and partial capacity chartered by Lufthansa Cargo, as no fuel consumption and emissions values are available for these services.

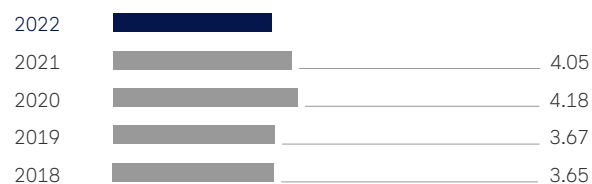
Specific fuel consumption



SPECIFIC FUEL CONSUMPTION PASSENGER TRANSPORTATION^{1,2} LUFTHANSA GROUP

in litres/100 passenger-kilometres (l/100 pkm)

3.59



The reduction in specific emissions in the Group fleet compared with the previous period was mainly due to an increase in the passenger load factor, changes to the route network, and the resulting increase in average flight length. Longer routes typically generate lower specific emissions since emissions are higher during take-offs and landings and carry less weight in the calculation as the flight distance increases.

SPECIFIC FUEL CONSUMPTION PASSENGER TRANSPORT IN COMPARISON^{1,2}

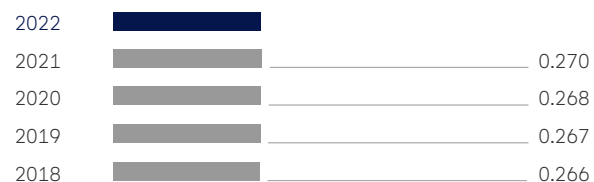
in litres/100 pkm

	2022	2021	Change in %
Group fleet	3.59	4.05	-11.5%
Lufthansa	3.63	3.97	-8.6%
SWISS	3.27	4.14	-20.9%
Austrian Airlines	3.79	4.57	-17.0%
Eurowings	3.71	4.10	-9.5%
Brussels Airlines	3.61	3.87	-6.8%

SPECIFIC FUEL CONSUMPTION CARGO TRANSPORT^{1,2,3}

in litres/tonne-kilometre (l/tkm)

0.268



¹ Actual fuel consumption in litres from flight operations based on all flight events under the respective operating flight number. Consumption is recorded from gate to gate, i.e. including taxiing on the ground and holding patterns as well as flying detours.

² The following companies are included for the 2022 reporting year: Lufthansa (including

Lufthansa CityLine, Eurowings Discover and Air Dolomiti), SWISS (including Edelweiss Air), Austrian Airlines, Eurowings (including Germanwings), Brussels Airlines and Lufthansa Cargo. Not included are other flights and services provided by third parties, as



their performance is beyond our control (see tables "Fuel consumption" and "Third-party interests", p. 11). ³ Based on cargo tonne-kilometres transported in both cargo and passenger aircraft.

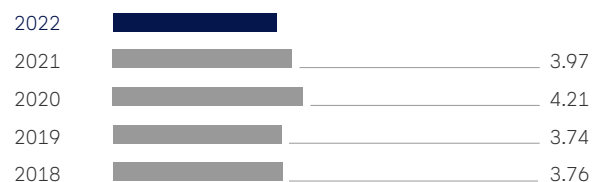
Specific fuel consumption of the passenger airlines



SPECIFIC FUEL CONSUMPTION PASSENGER TRANSPORTATION^{1,2} LUFTHANSA AIRLINES

in litres/100 passenger-kilometres (l/100 pkm)

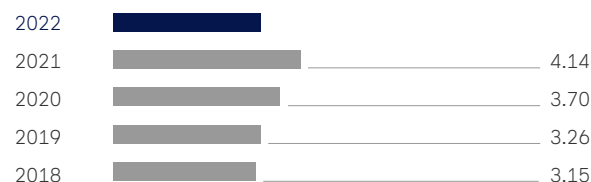
3.63



SPECIFIC FUEL CONSUMPTION PASSENGER TRANSPORTATION^{1,2} SWISS

in litres/100 passenger-kilometres (l/100 pkm)

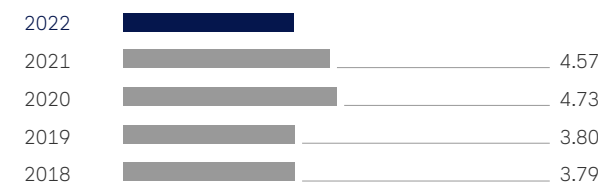
3.27



SPECIFIC FUEL CONSUMPTION PASSENGER TRANSPORTATION^{1,2} AUSTRIAN AIRLINES

in litres/100 passenger-kilometres (l/100 pkm)

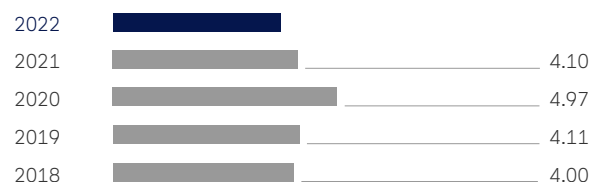
3.79



SPECIFIC FUEL CONSUMPTION PASSENGER TRANSPORTATION^{1,2} EUROWINGS

in litres/100 passenger-kilometres (l/100 pkm)

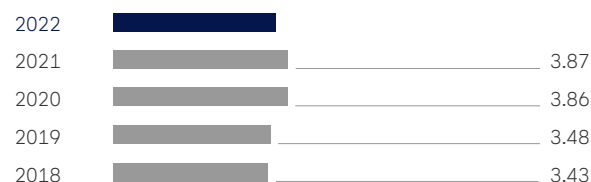
3.71



SPECIFIC FUEL CONSUMPTION PASSENGER TRANSPORTATION^{1,2} BRUSSELS AIRLINES

in litres/100 passenger-kilometres (l/100 pkm)

3.61



¹ Actual fuel consumption in litres from flight operations based on all flight events under the respective operating flight number. Consumption is recorded from gate to gate, i.e. including taxiing on the ground and holding patterns as well as flying detours.

² The following companies are included for the 2022 reporting year: Lufthansa (including Lufthansa CityLine, Eurowings Discover and Air Dolomiti), SWISS (including Edelweiss Air), Austrian Airlines, Eurowings (including Germanwings), Brussels Airlines and Luft-

hansa Cargo. Not included are other flights and services provided by third parties, as their performance is beyond our control (see tables "Fuel consumption" and "Third-party share", p. 11).

Decoupling of fuel and transport

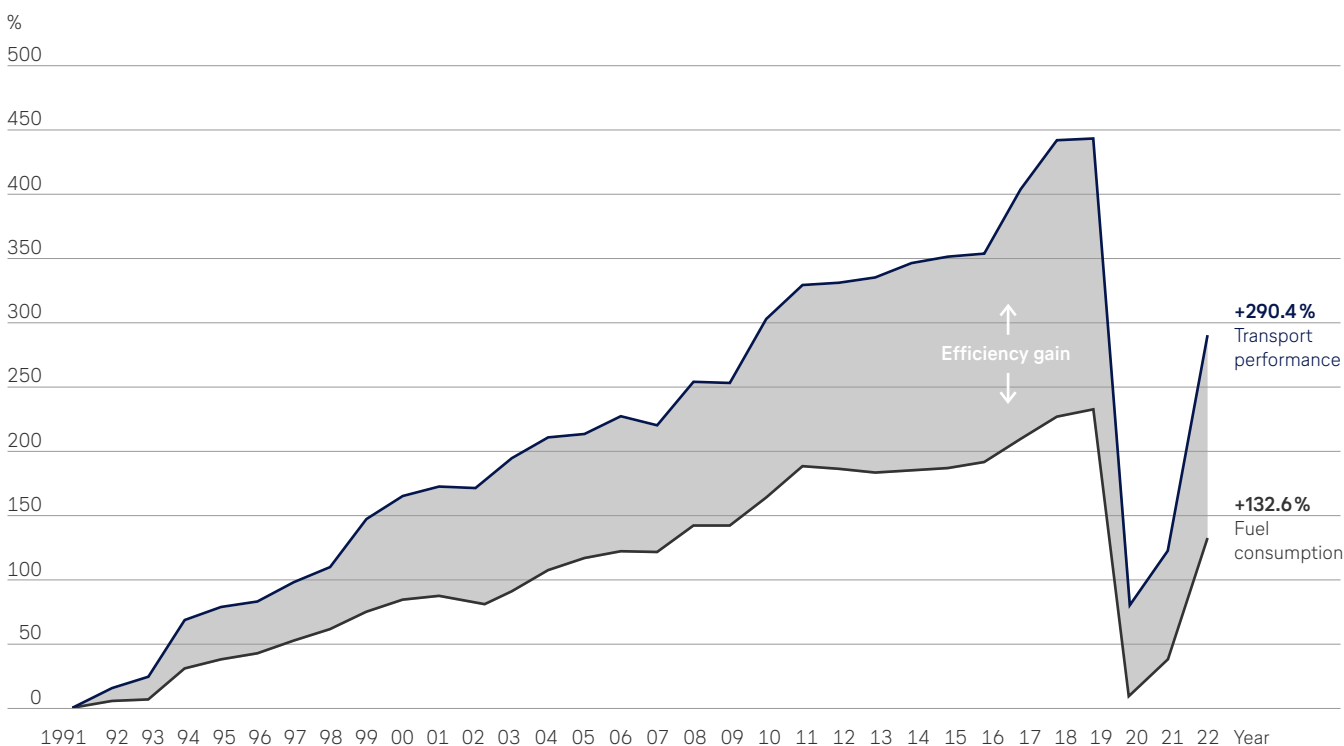
Improving efficiency by decoupling transport performance and fuel consumption

Despite increasing its transport performance, the Lufthansa Group has implemented numerous measures over many decades to significantly reduce its fuel consumption on a relative basis.

The result of these efforts is reflected in the decoupling chart. While transport performance increased by 290 % between 1991 and 2022, fuel consumption increased by only 133 %. Specific fuel consumption in 1991 was still 446 g/tkm (grammes of fuel per tonne-kilometre transported); in the pre-crisis year 2019 this figure was already only 276 g/tkm, and in the 2022 reporting year it was just 266 g/tkm. This corresponds to an efficiency increase of over 40 % compared to base year 1991.

In particular, the continuous modernization of the fleet with the use of more fuel-efficient aircraft is contributing to this. Examples are the modern A350-900 and Boeing 787-9 aircraft as well as the A320 and A321 neo family, which consume up to 30 % less fuel than their predecessors. A total of 20 of these models went into service with Lufthansa in 2022, in addition to other new aircraft. In 2022, 27 older aircraft were removed from the Group fleet. Up to 180 new particularly fuel-efficient aircraft will be delivered by 2030.

DECOUPLING OF TRANSPORT PERFORMANCE AND FUEL CONSUMPTION^{1,2,3,4} SINCE 1991



¹ The following are included for the 2022 reporting year: all scheduled and charter flights operated by Lufthansa (including Lufthansa CityLine, Eurowings Discover and Air Dolomiti), SWISS (including Edelweiss Air), Austrian Airlines, Eurowings (including

Germanwings), Brussels Airlines and Lufthansa Cargo. Not included are services provided by third parties, as their performance is beyond our control (see table "Third-party interests"). ² Transport performance in TKT. ³ Transport performance corrected in 2020

because of adjustments to the system. ⁴ Depiction of the development of transport performance and fuel consumption in % in two graphs, based on the 1991 starting value. The grey area between them represents the efficiency gain.



Hydrogen – future energy source for aviation?



A320 Hydrogen Aviation Lab

– a research project of Lufthansa Technik, the German Aerospace Center (DLR), the ZAL Center of Applied Aeronautics Research, and Hamburg Airport – supported by the Hamburg Ministry of Economic Affairs and Innovation and the Hamburg Investment and Development Bank

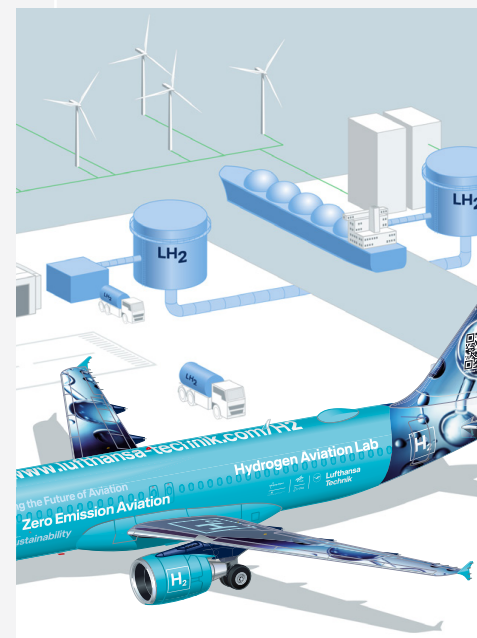
The aviation sector needs alternative energy sources that will enable it to significantly reduce its environmental footprint. In addition to sustainable aviation fuel (SAF), another focus of research is hydrogen, which can also be used for combustion in a turbine engine, to name one application. This has the advantage that the engine architecture would require comparatively moderate modification. There would be no more CO₂ emissions such as those from the combustion of fossil fuels.

Aircraft manufacturer Airbus has forecast that the first market-ready commercial aircraft fuelled by liquid hydrogen will be ready in the middle of the next decade. Yet in light of the long development and product life cycles in aviation, this topic is already relevant today. The introduction of such a new system is predicated on two conditions:

- **new or adapted infrastructures and ground processes** while maintaining the high level of safety in aviation
- **economic acceptance** on the part of users such as airlines, airport operators and maintenance companies, in order to achieve sufficiently large market penetration



In the **A320 Hydrogen Aviation Lab** in Hamburg, extensive maintenance and ground processes connected to hydrogen technology are being designed and tested with the stakeholders. These processes are not only developed and tested in a physical field laboratory – a decommissioned A320 of the Lufthansa Group – but also digitally using a “digital twin”. At all levels, the field laboratory is also designed to provide developers of future generations of aircraft with valuable inspiration. In this context, Lufthansa Technik will contribute its expertise in commercial aircraft maintenance, including the implementation and development of maintenance concepts and repair solutions for potential future hydrogen jets. Lufthansa Technik is also carrying out the retrofitting of different hydrogen components into the A320, such as an internal “deep-freeze tank” (where hydrogen is kept in a liquid state in cryotanks at -253 degrees Celsius).



Practical example

With the current state of the art, merely refuelling a long-haul flight with hydrogen could take several hours. This would hardly be practical, and no airline would want to use such an aircraft. Here too, the practical research being carried out by the **A320 Hydrogen Aviation Lab** is expected to provide valuable new insights and approaches.

Emissions

Absolute emissions¹

EMISSIONS² 2022

in tonnes

	Passengers	±PY	Cargo ³	±PY	Total	±PY
CO ₂	18,152,426	+99.5%	4,794,014	+6.0%	22,946,441	+68.4%
NO _x	81,998	+96.8%	24,898	+6.7%	106,896	+64.5%
CO	16,117	+104.4%	3,229	+2.6%	19,346	+75.4%
UHC	1,961	+172.7%	272	-5.2%	2,234	+121.9%

REDUCED FOSSIL CO₂ VOLUME THROUGH THE USE OF SUSTAINABLE AVIATION FUEL

in the Lufthansa Group, in tonnes

43,900



¹The following companies are included for the 2022 reporting year: Lufthansa (including Lufthansa CityLine, Eurowings Discover and Air Dolomiti), SWISS (including Edelweiss Air), Austrian Airlines, Eurowings (including Germanwings), Brussels Airlines and Lufthansa Cargo. Not included are other flights and services provided by third parties, as

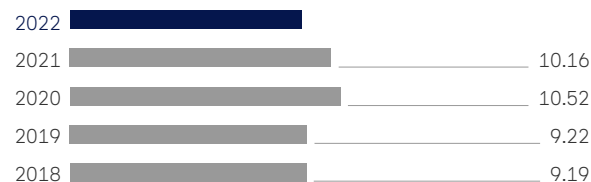
Specific CO₂ emissions¹

PASSENGER TRANSPORTATION 2022

CO₂ Emissions

in kilogrammes/100 passenger-kilometres (kg/100 pkm)

9.00



The use of Sustainable Aviation Fuel (SAF) reduced the Lufthansa Group's emissions with an impact on the climate by a total of 43,900 tonnes in 2022. Of this amount, 40,400 tonnes were accounted for by direct savings in the combustion of SAF (Scope 1) and 3,500 tonnes by savings in the upstream supply chain (production and transport, Scope 3). Both figures refer to the comparison with the use of fossil kerosene. This means that compared to the previous year, the use of SAF increased the reduction of CO₂ with an impact on the climate by 73.5%.

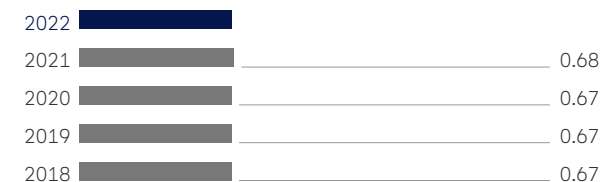
their performance is beyond our control (see tables "Fuel consumption" and "Third-party interests", p. 11). ² Absolute emissions in tonnes from flight operations (all scheduled and charter flights). Emissions are recorded from gate to gate, i.e. including taxiing on the ground and holding patterns as well as flight detours. ³ Based on cargo tonne-kilometres

CARGO TRANSPORT³ 2022

CO₂ emissions

in kilogrammes/cargo tonne-kilometre (kg/tkm)

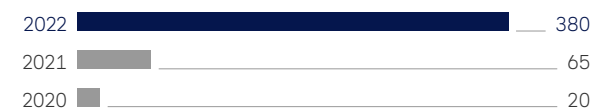
0.67



CO₂ VOLUME OFFSET THROUGH HIGH-VALUE OFFSET PROJECTS

in thousand tonnes

By customers



by the Lufthansa Group for business trips



transported in both cargo and passenger aircraft. ⁴ Excluding SWISS due to downstream capture. ⁵ Deviations from the figures in the 2021 Fact Sheet due to a subsequent correction in the calculation base.

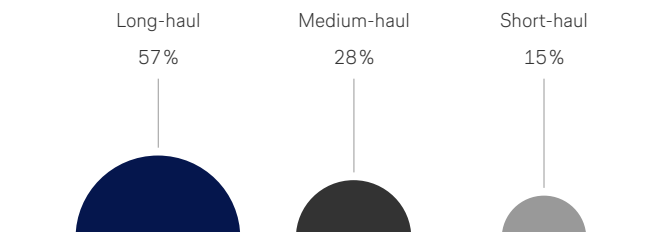
Specific fuel consumption and CO₂ emissions

SPECIFIC FUEL CONSUMPTION AND SPECIFIC CO₂ EMISSIONS IN THE LUFTHANSA GROUP¹ 2022

- Specific fuel consumption in litres/100 passenger-kilometres (l/100 pkm)
- Specific CO₂ emissions in kilogrammes/100 passenger-kilometres (kg/100 pkm)

	Total	Long-haul	Medium-haul	Short-haul
Specific fuel consumption	3.59	3.32	3.43	5.89
Specific CO ₂ emissions	9.00	8.32	8.62	14.83

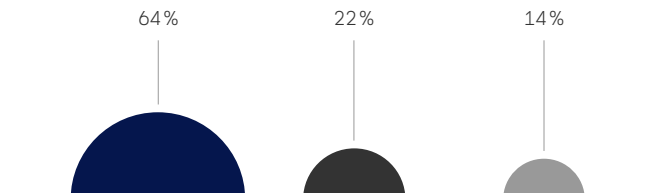
SHARE OF FUEL CONSUMPTION BY TRAFFIC AREAS¹ 2022



Environment

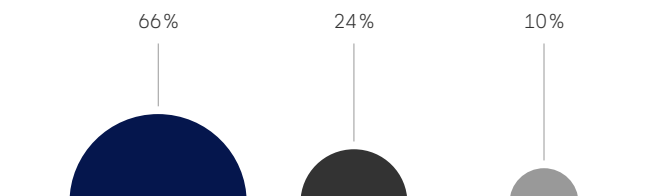
LUFTHANSA AIRLINES

	Total	Long-haul	Medium-haul	Short-haul
Specific fuel consumption	3.63	3.42	3.33	6.10
Specific CO ₂ emissions	9.10	8.59	8.37	15.35



SWISS

	Total	Long-haul	Medium-haul	Short-haul
Specific fuel consumption	3.27	3.09	3.38	4.75
Specific CO ₂ emissions	8.20	7.74	8.48	11.93



¹ Definition of haul length: long-haul routes: over 3,000 km; medium-haul routes: 800 to 3,000 km; short-haul routes: under 800 km.



Specific fuel consumption and CO₂ emissions



SPECIFIC FUEL CONSUMPTION AND SPECIFIC CO₂ EMISSIONS ¹ 2022

- Specific fuel consumption in litres/100 passenger-kilometres (l/100 pkm)
- Specific CO₂ emissions in kilogrammes/100 passenger-kilometres (kg/100 pkm)



	Total	Long-haul	Medium-haul	Short-haul
Specific fuel consumption	3.79	3.27	3.65	5.48
Specific CO ₂ emissions	9.48	8.17	9.15	13.76

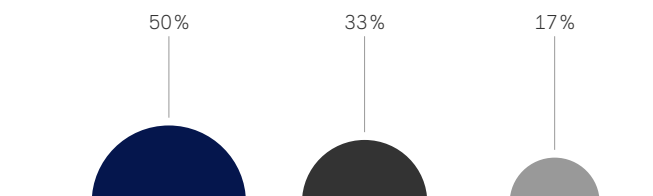
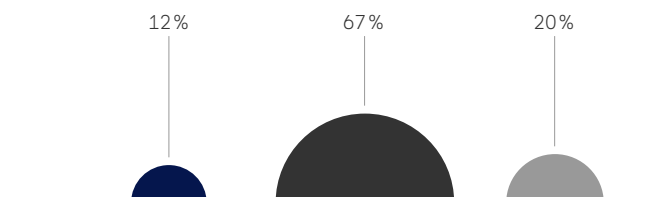
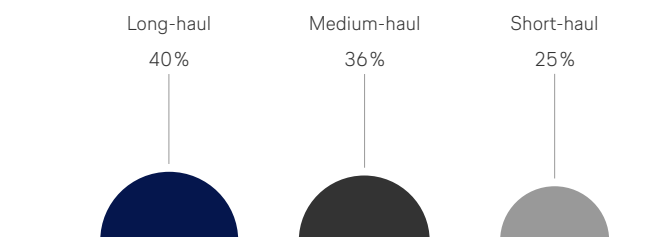


	Total	Long-haul	Medium-haul	Short-haul
Specific fuel consumption	3.71	2.85	3.44	6.69
Specific CO ₂ emissions	9.37	7.20	8.67	16.89



	Total	Long-haul	Medium-haul	Short-haul
Specific fuel consumption	3.61	3.15	3.70	5.90
Specific CO ₂ emissions	9.07	7.89	9.31	14.86

SHARE OF FUEL CONSUMPTION BY TRAFFIC AREAS 2022



¹ Definition of haul length: long-haul routes: over 3,000 km; medium-haul routes: 800 to 3,000 km; short-haul routes: under 800 km.



Political engagement

New competitive reality in international aviation

During the summer of 2021, the EU Commission presented the “Fit for 55” legislative package, which is designed to help achieve Europe’s climate protection goals. The following are particularly relevant for aviation: the reform of emissions trading (EU-ETS), the blending mandate for sustainable aviation fuel (ReFuelEU Aviation) and the proposal to introduce a kerosene tax (Energy Tax Directive, ETD). All three initiatives result in a significant distortion of competition to the detriment of European network airlines.

→ Emissions Trading Scheme puts strain on EU feeder traffic

Under the Emissions Trading Scheme (ETS) for aviation, the total number of CO₂ certificates will be reduced to a greater extent than before, and the previously no-cost (“free”) allocations will be completely phased out by 2026. This will lead to a considerable increase in the price of flights within Europe, while flights outside Europe will remain exempt for the time being.

→ SAF quota puts European airlines at a one-sided disadvantage

The EU is discussing a blending quota for sustainable aviation fuels (SAF). This is expected to increase steadily: as it stands, from 2% in 2025 up to 5–6% in 2030 and to at least 63% in 2050. SAF is currently 3–6 times more expensive than fossil kerosene. The regulation will apply to all refuelling operations in the EU. For a flight via Frankfurt to Singapore, SAF will have to be added for the entire route, whereas for a flight with a change in Istanbul or Doha, the use of SAF will only be required for the comparatively short first leg of the journey. The result: traffic is diverted, and CO₂ emissions are merely shifted.

→ Kerosene tax ecologically ineffective

In contrast to the ETS and SAF quota measures, which are basically effective, imposing taxes on aviation fuels – including sustainable ones – will not lead to a reduction in CO₂. This is a purely financial tax that unilaterally weakens the investment capacity of European airlines and will lead to significant competitive distortions.

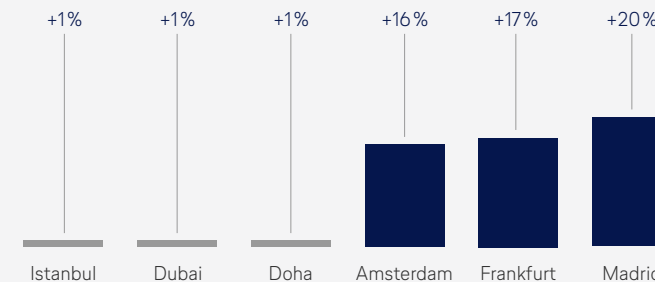


Shaping fair international competition

The Lufthansa Group is committed to fair and equal competition. For this reason, we are campaigning in our home markets and with the EU for an amendment to the “Fit for 55” legislation in order to maintain the competitiveness of EU airlines and avoid carbon leakage. The EU’s “Green Deal” regulatory initiatives must be structured in such a way that EU and non-EU airlines are treated equally.

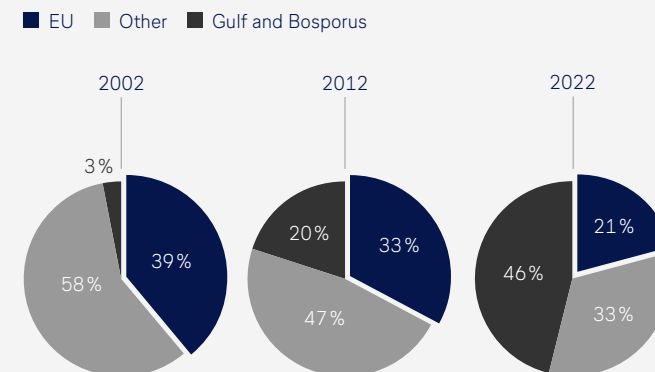
“Fit for 55” puts massive strain on European hubs

DEVELOPMENT OF AIR TICKET PRICES ACROSS INDIVIDUAL HUBS¹



MARKET SHARE DEVELOPMENT²

Air travellers from Europe to Asia, by region and percent



¹ Source: SEO Amsterdam Economics, 2022; Scenario 2030.

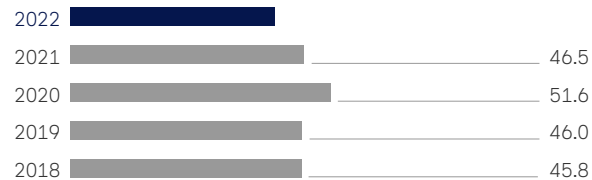
² Source: Own calculations, data in 2022 only January to November.

Specific further emissions broken down by passenger and cargo traffic

NO_x emissions

in grammes/100 passenger-kilometres (g/100 pkm)

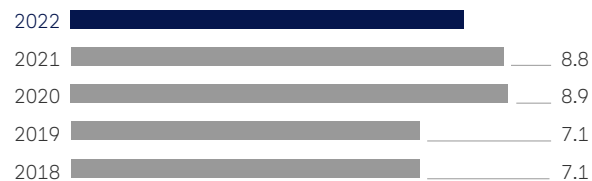
40.7



CO emissions

in grammes/100 passenger-kilometres (g/100 pkm)

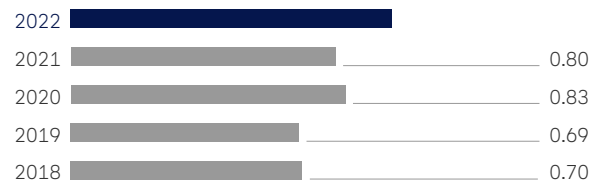
8.0



UHC emissions

in grammes/100 passenger-kilometres (g/100 pkm)

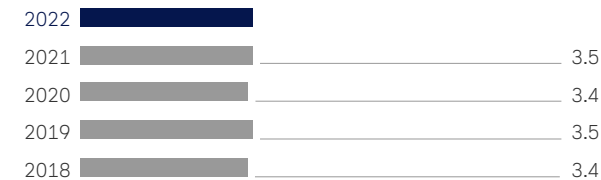
0.97



NO_x emissions

in grammes/cargo tonne-kilometre (g/tkm)

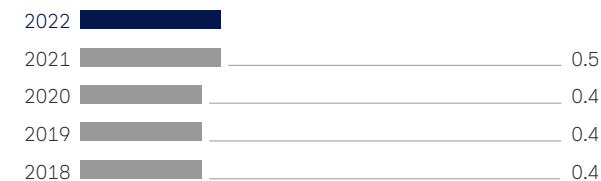
3.5



CO emissions

in grammes/cargo tonne-kilometre (g/tkm)

0.5



UHC emissions

in grammes/cargo tonne-kilometre (g/tkm)

0.04



Carbon footprint

DIRECT AND INDIRECT CO₂ EMISSIONS OF THE LUFTHANSA GROUP IN COMPARISON¹

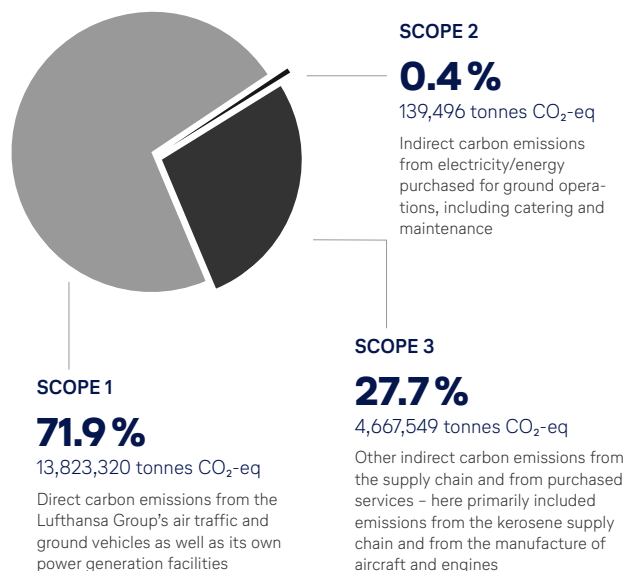
in tonnes CO₂-eq

	2022	2021	2020
Scope 1	23,210,476 71.9%	13,823,320 74.2%	11,509,756 76.0%
Scope 2	125,245 0.4%	139,496 0.7%	135,183 0.9%
Scope 3	8,955,103 27.7% ²	4,667,549 25.1%	3,491,821 23.1%



¹ Scope 1 for 2022 reporting year audited with high assurance. Scope 2 and 3 audited with limited assurance (see page 22). ² The share of Scope 3 emissions in the Lufthansa Group's total carbon footprint increased compared with the previous year due to the expansion and improvement of data collection for Scope 3 emissions. ³ Of this amount, 40,400

DIRECT AND INDIRECT CO₂ EMISSIONS OF THE LUFTHANSA GROUP 2022



The greenhouse gas footprint indicates the total greenhouse gas emissions (Scope 1–3) of the Lufthansa Group (see certificate on p. 22). The use of Sustainable Aviation Fuel (SAF) reduced the Lufthansa Group's emissions with an impact on the climate by a total of 43,900³ t in 2022 (well-to-wheel balancing⁴)

tonnes were accounted for by direct savings in the combustion of SAF (Scope 1) and 3,500 tonnes by savings in the upstream supply chain (production and transport, Scope 3). Both figures refer to the comparison with the use of fossil kerosene. ⁴ Well-to-wheel balancing



Carbon footprint – Scope 3 emissions

The term “Scope 3” originates from the Greenhouse Gas Protocol, a widely used tool for measuring greenhouse gas emissions. Scope 3 includes emissions that are produced indirectly through activities in the upstream and downstream supply chain of a company rather than directly by the company itself. These emissions typically represent a significant portion of a company's total emissions – up to 80 % in some sectors. This makes it increasingly important for companies that want to reduce their environmental impact to address these emissions. Scope 3 emissions represent about 30–35 % of the Lufthansa Group's total carbon footprint. The vast majority of this (around 60 %) is caused by emissions from the kerosene supply chain – emissions caused by the production and transport of kerosene to the aircraft. Therefore each less tonne of kerosene consumed reduces the corresponding Scope 3 footprint in the kerosene supply chain. The measures taken by the Lufthansa Group, such as modernisation of the fleet towards fuel-efficient aircraft, are also consistently reducing its Scope 3 emissions. Greenhouse gas emissions in the supply chain can also be reduced through the use of sustainable alternative fuel (SAF) since its production and delivery generally produces fewer emissions.

Methodology for calculating absolute and specific consumption and emissions

Kerosene in absolute terms

Kerosene consumption is calculated on the basis of actual flight operations (i.e. using actual load factors and flight routings) according to the gate-to-gate principle. This covers all phases of a flight, from taxiing on the ground to flying detours and holding patterns in the air.

Emissions in absolute terms

The emissions from flight operations are calculated on the basis of actual transport performance and hence on actual load factors and the actual absolute quantity of kerosene consumed in the reporting year. Transport performance is measured in tonne-kilometres. For passengers and their luggage, an average of 100 kilograms is the standard estimate; for freight, it is its scale weight.

Carbon dioxide (CO₂) emissions do not require special calculation methods, as they are generated in a fixed ratio to the quantity of kerosene burned. The combustion of one tonne of kerosene generates 3.15 tonnes of CO₂.

Specific consumption and emission values

Calculating specific consumption and emissions entails expressing absolute values in relation to transport performance. For example, the ratio litres per 100 passenger-kilometres (l/100 pkm) is calculated on the basis of actual load factors along with the quantity of kerosene actually consumed. The distances used in the calculations are great-circle distances. In combination flights (freight and passenger transport in one aircraft), fuel consumption is attributed on the basis of its share of the total payload to calculate the passenger- and freight-specific figures. Since 2013, the DIN EN 16258 standard has provided a framework for standardized calculation of greenhouse gas emissions for transport processes. The Lufthansa Group adheres to this guideline with respect to payload allocation. The Lufthansa Group would welcome a standardized, internationally harmonized and accepted method.

Verification statement Scope 1–3

VERIFICATION STATEMENT



verified by
MÜLLER-BBM
CERT GMBH

Müller-BBM Cert Umweltgutachter GmbH, accredited verification body DAKKS D-VS-18709-01-01, confirms that greenhouse gas balance according to the GHG Protocol of the

LUFTHANSA GROUP

Deutschen Lufthansa AG and affiliates*

audited according to the requirements of ISO 14064-3 and the information in the figure "Direct and indirect CO₂ emissions of the Lufthansa Group 2022" on page 21 of the Factsheet Sustainability 2022 was verified with the following uncertainties:

Scope 1 fossil (reasonable assurance, 2% materiality)	23.170.076 t CO _{2eq}
Scope 1 biogenic*** (reasonable assurance, 2% materiality)	40.400 t CO _{2eq}
Scope 2** (limited assurance, 5% materiality)	125.245 t CO _{2eq}
Scope 3**** (limited assurance, 10% materiality)	8.955.103 t CO _{2eq}

Kerpen, April 14th, 2023



Müller-BBM Cert Umweltgutachter GmbH

* Companies in the scope:
Deutsche Lufthansa AG, Lufthansa Cargo AG, Lufthansa Technik AG, Lufthansa CityLine GmbH, Swiss International Air Lines AG, Edelweiss Air AG, Brussels Airlines S.A.N.V., Austrian Airlines AG, Air Dolomiti S.p.A., Linee Aeree Regionali Europee, Germanwings GmbH, Eurowings Aviation GmbH, Eurowings Europe Limited, Eurowings Discover GmbH, Eurowings Europe GmbH, LSG Lufthansa Service Holding AG, Lufthansa AirPlus Servicekarten GmbH, Lufthansa Global Business Services GmbH, Lufthansa Seeheim GmbH, Miles & More GmbH, Lufthansa Process Management GmbH, Lufthansa Systems GmbH & Co.KG, Lufthansa Industry Solutions GmbH & Co.KG, Lufthansa Aviation Training GmbH, LZ-Catering GmbH, Lufthansa Global Tele Sales GmbH, EFM Gesellschaft für Entessen und Flugzeugkitchen am Flughafen München GmbH, AeroLogic GmbH, SunExpress (Güneş Ekspres Havacılık A.Ş.), N3 Engine Overhaul Services GmbH & Co. KG und EME Aero.

** market based

*** Note: These biogenic CO₂ emissions reflect reduced fossil CO₂ emissions in Scope 1 from use of certified biogenic sustainable aviation fuel. These reductions were realized for defined customers of LHG (incl. customers on codeshare flights of associated LHG partners) and exclusively allocated to them. They shall therefore not be claimed regularly and in principle by all LHG customers.

**** Includes changes of emissions from purchased fuels due to switch from fossil fuel to sustainable aviation fuel.

A MEMBER OF

MBBM

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Waste management



Measures along the waste hierarchy

The basis for action for increasingly circular waste management is the EU waste hierarchy “Reduce – Reuse – Recycle – Recover – Replace”.

The Lufthansa Group has already applied a wide range of measures along this hierarchy.

Reduction of waste on board and promotion of the circular economy

Globalised supply chains, the limited availability of resources and the political framework require responsible resource management. The Lufthansa Group focuses on sustainable and efficient waste management.

The existing framework for the responsible management of in-flight waste was expanded to cover all Passenger Airlines in 2022. All Lufthansa Group Passenger Airlines have the goal of completely eliminating single-use plastic and single-use aluminium items on board by 2025, and to reduce food waste on short-haul flights Group-wide by 50% compared to 2019. Lufthansa Cargo has set a target of increasing the share of waste returned for recycling at the hub in Frankfurt to 40% by 2025.

 46 %

of the food waste at Lufthansa Group Passenger Airlines was reduced on short-haul flights compared with 2019

 99 %

of Lufthansa Cargo's waste at the hubs is used to generate energy or is recycled



Examples from 2022

Reduce

Reduction of single-use plastic by removing items such as single-use plastic packaging, stirring sticks and straws at Lufthansa German Airlines, SWISS and Edelweiss

Reuse

Switch from disposable to reusable tableware in the “Edelweiss Box” at Edelweiss

Recycle

Extension of the product life cycle – cosmetic products at SWISS are collected, cleaned and refilled

Recover

Extraction of raw materials – Austrian Airlines' disposable plastic cups are converted into synthetic crude oil

Replace

Replacement of conventional materials with bio-degradable materials – switch from single-use plastic to compostable cellulose film for the packaging of selected products at Eurowings and Edelweiss

Customer satisfaction

The Net Promoter Score (NPS) is based on customers' willingness to recommend the company and is the leading indicator of customer satisfaction among the Lufthansa Group's Passenger Airlines. The NPS for Lufthansa German Airlines, SWISS, Austrian Airlines and Brussels Airlines was below the target of 55 in 2022. At Eurowings the NPS was below the target of 50. This is due in particular to the restrictions in services required by the

pandemic, as well as the operational difficulties during the summer months. For customers, this meant that flights were cancelled or had to be rebooked at short notice. Strikes at airports and the Lufthansa Group Passenger Airlines in autumn, and weather-related flight irregularities in December also had an adverse effect.



Set of measures were established to increase product quality

A total of EUR 2.5bn will be invested in products and services by 2025 in order to further improve the customer experience at every point of the journey. The top priority is to get back to fulfilling our promise as a premium provider. Several measures have already been implemented, including:



New cabin design in all flight classes

- **Premium Economy Class** introduced at SWISS
- **More than 30,000 new seats** in all classes on long-haul routes from 2023 onwards

Digital solutions in customer dialogue

- **New self-service offerings** that simplify and expedite customer service and dialogue
- **New "Travel ID"** – access to all Lufthansa Group Airlines platforms with a single log-in

Food and beverage service and lounges

- **Food quality and selection upgraded** on short-haul routes at Lufthansa German Airlines, SWISS and Austrian Airlines
- **Free aperitif service** and passenger **selection of the first meal** resumed in Economy Class on long-haul Lufthansa German Airlines flights



- **Passengers can order fresh dishes prior to travelling** in First, Business, and Economy Class at SWISS, and in Economy Class at Austrian Airlines
- **New bistro lounge** opened in Frankfurt
- **Improved food and beverage selection**, refurbished lounges in Newark, Düsseldorf, Washington and Hamburg

Voluntary carbon offset options and intermodal sustainable forms of travel

- **Purchase of sustainable aviation fuels and compensation** – directly when booking a flight or on board with Lufthansa German Airlines, SWISS and Eurowings Discover.
- **"Green" tariff** phased in, which directly includes full carbon offsetting
- **Approximately 450 intermodal connections** daily to and from Lufthansa Group hubs by bus or rail

¹ Excluding Eurowings.

Customer satisfaction



Operational stability – a complex system

Prior to a flight, many steps are required to ensure reliable flight operations. For example, the appropriate aircraft type and crew must be scheduled and available according to the route and booking situation. Preparations for the next flight begin once the aircraft has arrived, all passengers have disembarked and baggage has been unloaded. These tasks include cleaning the aircraft cabin, loading food and beverages, refuelling the aircraft and loading baggage. Finally, new passengers board the aircraft after checking in and passing through security and passport controls, or upon transferring from other flights. After receiving clearance from air traffic control in the tower, the flight can take off.

What makes daily flight operations so challenging?

Reliable planning and close coordination between airlines, airport operators (with their extensive aircraft and ground handling processes) and air traffic control are indispensable to ensure smooth operations. Even minor disruptions in individual processes can interfere with the normal flow of operations and lead to delays. For example, adverse weather events, including at other airports, can affect the entire flight operation when passengers miss their connecting flights and aircraft and crews are no longer available at the planned locations. An airline must react quickly in these cases: it may have to deploy replacement aircraft and crews, comply with prescribed crew rest periods, and



consider available capacity at both the airports (security checks, baggage handling) and in the airspace (time slots for take-offs and landings). The airline may also have to rebook passengers on other flights or even organise accommodation.

After the restrictions imposed during the Corona pandemic, in 2022 in particular a significant increase in demand as well as staff shortages at various points of the process chain, led to considerable disruptions in global flight operations for some time.

 66 %

Departure punctuality

Annual average departure punctuality was 15.3 percentage points lower than in the previous year. Results were negatively affected by a significant increase in passenger numbers (+119 %) and reduced resources in all areas of the air traffic system.

Set of measures were established to increase operational stability

The Lufthansa Group has adopted a number of measures to ensure stable flight operations in the face of the upcoming challenges in 2023 and to achieve its own goal of operating 85 % of all flights on time¹. These include:



- **Recruitment and training of personnel** to meet the increased demand
- **Optimisation of flight planning** in line with available resources
- **Investing in IT-supported systems** to facilitate rapid and accurate decision-making in the event of flight irregularities
- **Introduction of digital service offerings** for customers to improve communication and the processing of enquiries

¹ As is common internationally, all flights taxiing to the runway no later than 15 minutes after the planned departure time are defined as punctual.



Active noise abatement

A strong region

Airlines create connections to other cities, other countries and the world. The international hubs in particular provide the infrastructure for these connections. Companies like to settle in these regions because of their good connections. Yet suppliers and service providers in the region also benefit, which generates economic benefits and creates jobs and training opportunities. Air traffic can also be a burden, however, primarily because of noise pollution caused by planes taking off and landing in the region.

The Lufthansa Group's purpose is to connect people, cultures and economies in a sustainable way.

The Lufthansa Group engages in active dialogue with stakeholders and interested parties to ensure that local interests are taken into account, and participates in comprehensive research projects on active noise abatement. The primary goal is to sustainably reduce aircraft noise at its source and to develop optimised flight procedures. In so doing, the Company pursues measures using five levers:

Levers for active noise abatement



Investments in quieter aircraft



Noise-reducing technologies for the existing fleet



Participation in noise research



Development of optimised flight procedures and flight routes



Dialogue with residents near airports and other interest groups

99.4 %

Aircraft in the operational Group fleet meet the strict minus 10 decibel criterion of the ICAO¹ Chapter 4 Standard

The ICAO's high noise standard¹ is a benchmark for the Lufthansa Group

The Lufthansa Group uses the 10 decibel criterion of the ICAO Chapter 4 Standard to evaluate the effects of modernizing the Group's operational fleet. This criterion stipulates that all civil aircraft newly licensed from 2006 until the end of 2017 must cumulatively fulfil the older ICAO Chapter 3 Standard by a margin of 10 decibels or more.



Highlights 2022

- **Additions to the fleet** with state-of-the-art aircraft such as the Airbus A321neo and Boeing 787-9 – older and louder aircraft have left the fleet
- **New research project** in co-operation with the German Aerospace Center on noise reduction and take-off optimisation
- **37 precision approaches** carried out – with modified approach criteria, successful insights into noise reduction were generated
- **An innovative and low-noise approach procedure** was developed with the participation of Austrian Airlines and implemented in Vienna with a view to further evaluation
- **Expanded dialogue** – continuous, active participation in regional committees and working groups, as well as in various dialogue forums in Frankfurt, Vienna, and most recently in Hamburg

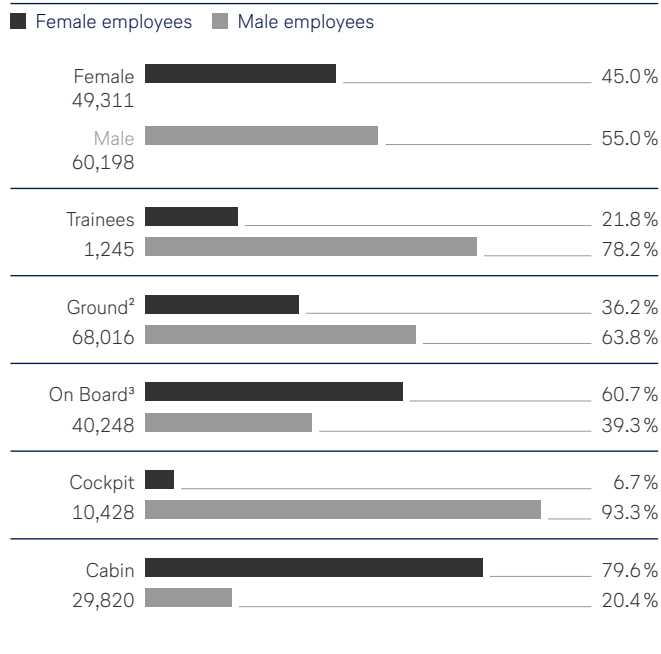
¹ International Civil Aviation Organization

Employee numbers

With their know-how and wide-ranging talents, the employees of the Lufthansa Group are a key factor in its commercial success. They embody the aspiration of Lufthansa Group Airlines to be a premium brand for passengers, shaping passenger experience. Moreover, they ensure reliable and productive flight operations and efficient administrative processes. For this reason, the Lufthansa Group attaches great importance to the development and well-being of its employees.

HEADCOUNT BY PROFESSIONAL GROUP AND GENDER¹

Lufthansa Group, employees as of 31 Dec 2022

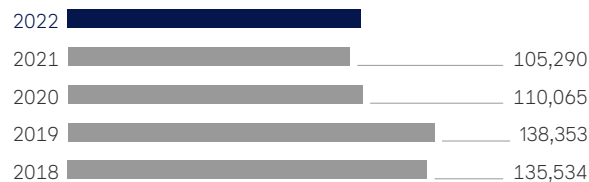


¹ Group of consolidated companies. ² Excluding trainees. ³ Consists of cockpit and cabin crew.

TOTAL HEADCOUNT¹

Lufthansa Group, employees as of 31 Dec

109,509



DISTRIBUTION OF EMPLOYEES¹

Lufthansa Group, employees as of 31 Dec

	2022	2021
Group employees	109,509	105,290
of which Passenger Airlines	56,762	56,858
of which Logistics	4,085	4,162
of which MRO	20,411	20,569
of which Catering	20,218	15,626
of which Additional Businesses and Group Functions	8,033	8,075



Recruiting campaign

Good prospects for new employees

The pool of skilled labour will decline by up to 30% in the coming decades. In addition, the Lufthansa Group had to downsize during the pandemic, which had an impact on its image as an employer. With a large-scale recruiting campaign, the Lufthansa Group is now highlighting its aspiration to establish itself as an industry leader in the long term. The Lufthansa Group has already recruited several thousand people through this campaign, and Group companies plan to hire about 20,000 new employees in total. The focus is on operational areas such as check-in, MRO, cockpit and cabin crew, though there will also be many new hires in administrative functions such as IT. A recruiting task force from different Group companies is coordinating this recruiting push across the entire Lufthansa Group.

Planned new hires by the end of 2023

IT 2.300

Technicians 1.600

Trainees 1.000

by the end of 2025

Cockpit 2.000

Cabin 10.000

Employer attractiveness

A satisfying work-life balance, a holistic approach regarding equal opportunity and all dimensions of diversity, and intensive talent management are key action areas for realising the Lufthansa Group's aim of a fair partnership with its employees so that it remains an attractive employer.

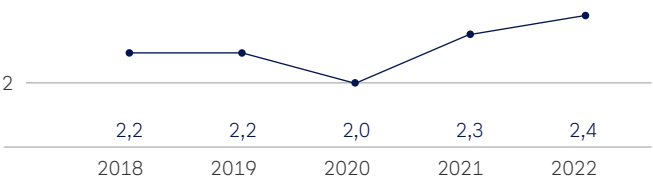
“involve me!”

The Lufthansa Group uses the annual voluntary employee survey “involve me!” to determine the **Engagement Index**. Among other things, this provides information about the Company's attractive-

ness as an employer. It measures the extent to which employees identify with the Company, as well as their commitment and willingness to recommend the Company to others. The results are measured on a scale from 1 (best) to 5 (worst). Reasons for the decline in 2022 vary widely between different groups of employees. On the one hand were the cost-cutting measures that were required to maintain the competitiveness of the Lufthansa Group. Other reasons were the general environment and the sometimes excessive employee workload caused by the steep rise in demand in the 2022 holiday season.

ENGAGEMENT-INDEX⁴

Lufthansa Group, in percent **2022**



Staff covered by collective agreements

78% in Germany¹

89% in Switzerland²

98% in Austria³

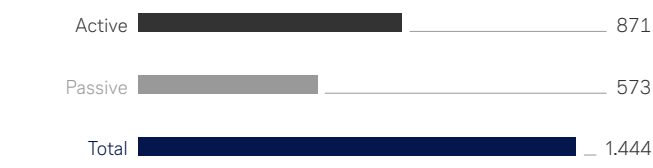
New collective agreements

In 2022, the Lufthansa Group, represented by the relevant industry associations or subsidiaries, concluded a large number of new collective agreements with its collective bargaining partners. In some cases, these replaced previously applicable crisis agreements which had been concluded due to the impacts of the coronavirus pandemic. This meant that, at the end of the year, collective bargaining agreements had been concluded and were in force for the entire Deutsche Lufthansa AG workforce that is covered by these agreements, and for the vast majority of employees in the Lufthansa Group's key flight operations, such as SWISS, Austrian Airlines and Eurowings.

PARTIAL RETIREMENT ACTIVE/PASSIVE

Deutsche Lufthansa AG, employees **as of 31 Dec 2022**

Employees Deutsche Lufthansa AG ground, total: 11,876



TRANSITIONAL PENSION FLIGHT STAFF³

Deutsche Lufthansa AG and Lufthansa Cargo AG, employees **as of 31 Dec 2022**



¹ The remaining percentage is largely made up of senior executives and management employees in senior positions. ² Only Deutsche Lufthansa AG. ³ Deutsche Lufthansa AG and Lufthansa Cargo AG. ⁴ Companies participating in the “involve me!” survey represent

80.54% of all employees in the Lufthansa Group. ⁵ Austrian Airlines in Europe ⁶ SWISS International Airlines



Employer value proposition

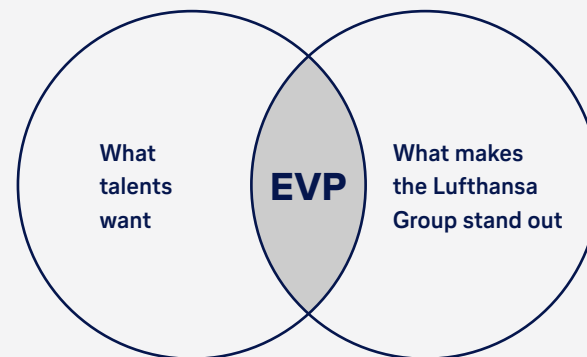


New value proposition for the employees of tomorrow

Digitalisation and demographic change are changing the labour markets: skilled workers are in short supply and their willingness to switch employers is much higher than at the beginning of the millennium. The Lufthansa Group needs the best people if it is to lead from the top of the aviation sector. For this reason, recruiting these talents while simultaneously inspiring those who already work for the company is a strategic focus of the Lufthansa Group.



The Lufthansa Group uses targeted campaigns to present its positioning, attitude and associated benefits on the external labour market. The large-scale “Lufthansa Group is back” campaign was launched in November 2022.



The **Employer Value Proposition (EVP)** – the value proposition of an employer to its potential employees – results from the intersection of what the target group wants and what makes that company unique.

Need for identity, meaning and flexibility in the work environment

With a revamped employer brand and a distinctive value proposition, the Lufthansa Group aims to return to the top tier of attractive employers. At the beginning of the process, a comprehensive analysis was conducted at the Lufthansa Group. The results of the annual employee survey and surveys of employees who departed the Company, market research data, and external qualitative employer evaluations were evaluated. A comprehensive global study also shed light on the factors that employees consider to be particularly important when choosing an employer.

Lufthansa Group employer value proposition

Of the ten most important of these decision-making criteria, the Lufthansa Group identified three focus topics for its positioning as an employer:

“**Good relationships**” that strengthen the unique Lufthansa Group community as well as “**development opportunities**” and “**diversity**” are at the core of the future value proposition. The Lufthansa Group will now take concrete measures to support its commitment to providing its employees with unique development opportunities as a sophisticated global company. Examples include the promotion of modern mosaic careers (combining experience from a wide variety of perspectives, such as management, expert and project careers involving both administrative and operational activities) and the facilitation of mobility between countries, Group companies and departments.

Employer attractiveness

EMPLOYEES ON PARENTAL LEAVE (OUTSIDE GERMANY)¹

Lufthansa Group, employees as of 31 Dec

Female employees



Male employees



EMPLOYEES ON PARENTAL LEAVE (GERMANY)²

Lufthansa Group, employees as of 31 Dec

Female employees



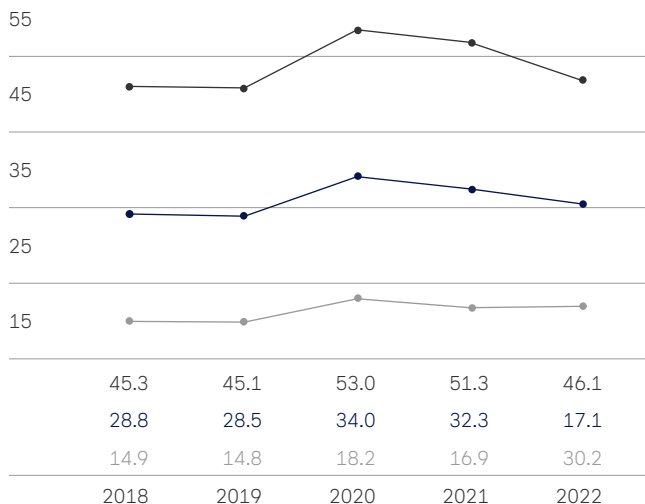
Male employees



PART-TIME EMPLOYMENT^{1,3}

Lufthansa Group, in percent as of 31 Dec

■ Female employees ■ Total ■ Male employees



Making work more flexible – “cross-border work”:

Increased flexibility for employees improves the work-life balance. Flexibility is particularly important for parents or employees who have family members in need of long-term care. In the Lufthansa Group, flexibility takes a wide variety of forms. Alongside various part-time models, Lufthansa Group offers mobile work for certain employees in large part of the Group. Since 2022, a certain employees and senior managers have the option – which is very attractive – of working from other EU countries on a limited basis. Employees can use up to 30 working days per year for so-called cross-border work. This form of work, which has also become known as “workation” in the last two years, is very popular. Employees can combine mobile work abroad with private trips, either immediately before or after a holiday or free time. This offers employees the flexibility to spend longer periods of time abroad and to optimally combine work and leisure.

¹ Scope: group of consolidated companies excluding Germany, excluding LSG Sky Chefs Spain, S.A.; LSG Sky Chefs Supply Chain Solutions, Inc.; Constance Food Group, Inc.; Sky Chefs, Inc.; Western Aire Chef, Inc.; SCIS Air Security Corporation ² Group of consolidated companies Germany. ³ Part-time including partial retirement (also leisure phase).

Diversity and equal opportunity

Share of women in leadership to be increased

The success of the Lufthansa Group depends to a great extent on the varying skills, perspectives and experiences of its employees. The most efficient and innovative workforce is one that is diverse and knows how to use this diversity competently and constructively. The company implements specific measures to promote this culture. The initial focus is on increasing the share of female senior executives. The Lufthansa Group is aiming for a share of

at least 25% women across all management levels by 2025 and has established corresponding target quotas in the Lufthansa Group companies. The company has adopted targeted measures to achieve these goals. For example, the “GoAhead Programme” for female junior executives has been expanded from 16 to 110 participants. Moreover, the new “Next UP” platform encourages talented women under 35 to pursue leadership careers.

 40%

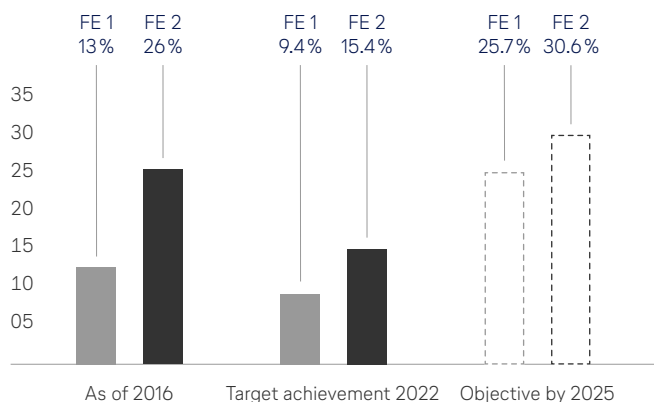
women on Supervisory Board²

 16.7%

women on Executive Board²

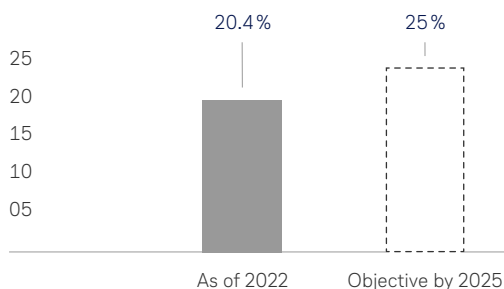
SHARE OF WOMEN AT MANAGEMENT LEVEL³ 1 AND 2

(statutory requirements) Deutsche Lufthansa AG, in percent



SHARE OF WOMEN IN MANAGEMENT⁴

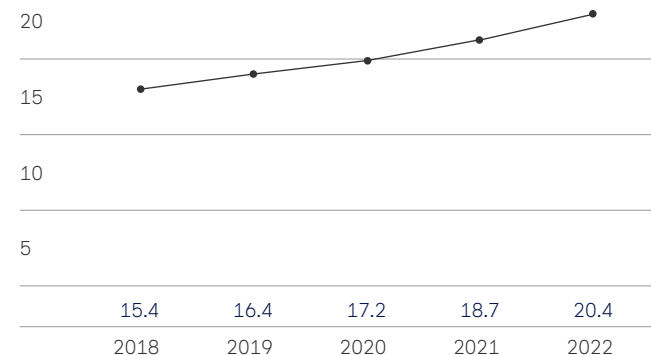
(voluntary) Lufthansa Group, in percent



In addition to Deutsche Lufthansa AG's statutory targets for management levels 1 and 2, the Lufthansa Group has set another target on a voluntary basis. Based on this, the Lufthansa Group aims to increase the share of women among its senior executives at the management level.

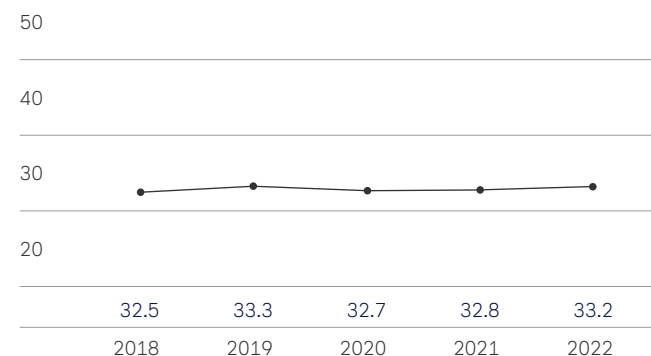
SHARE OF WOMEN IN MANAGEMENT⁴

Lufthansa Group, in percent as of 31 Dec



SHARE OF WOMEN WITH STAFF RESPONSIBILITY¹

Lufthansa Group, in percent as of 31 Dec



¹ Scope: Group consolidated companies. ² Deutsche Lufthansa AG. ³ Management level is the reporting level below the Executive Board. ⁴ Management includes all senior managers.

Diversity and equal opportunity



 4.3 %

Inclusion rate³

 177

Employees in the Lufthansa Group have various nationalities²

Development programmes encourage and inspire talent

Development opportunities and career options are key factors that talented people use to assess the attractiveness of an employer. The Lufthansa Group offers all employees a variety of continuing education and development opportunities. The company also uses a talent management system to identify top performers and high-potential employees from all over the world and offers them a range of attractive development opportunities. In addition to promoting employee retention and internationalisation, this allows the Company to pursue the goal of identifying the emerging needs of the Group companies early on so that it can provide them with qualified support at the right time. Special emphasis is on areas where demand is particularly high, such as engineering, finance and IT.

The classification of employees as talents and the access to the Lufthansa Group's programmes is data and evidence-based to

ensure fairness and equal opportunity. All talent programmes are based on the principles of "learn, connect and contribute". These elements strengthen the participants' self-initiative, and at the same time provide opportunities for them to develop personally and build new skills.

With the "Leadership Next Level" programme, the Lufthansa Group has reformulated its standards for leadership and cooperation in the areas of "ambition," "responsibility" and "empathy". Like all of the Group's human resources instruments from the selection process to the exit interview, talent programmes are aligned with this standard.

¹ Scope: group of consolidated companies excluding Germany, excluding LSG Sky Chefs Spain, S.A.; LSG Sky Chefs Supply Chain Solutions, Inc.; Constance Food Group, Inc.; Sky Chefs, Inc.; Western Aire Chef, Inc.; SCIS Air Security Corporation. ² Group of consolidated

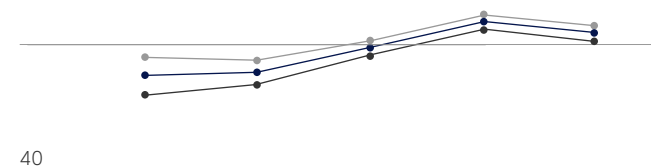
companies. ³ Reportable companies of the Lufthansa Group in Germany in the group of consolidated companies plus equity investments of the Lufthansa Group > 50%.

AVERAGE AGE¹

Lufthansa Group, in years as of 31 Dec

■ Male employees ■ Total ■ Female employees

45

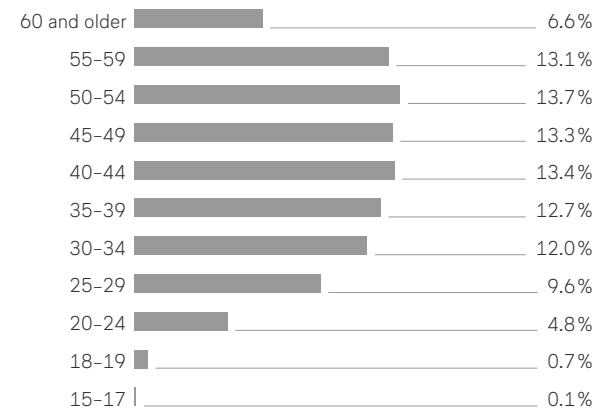


40

	42.1	42.0	42.6	43.4	43.1
	41.5	41.6	42.4	43.2	42.9
	40.8	41.2	42.1	43.0	42.6
	2018	2019	2020	2021	2022

AGE STRUCTURE¹

Lufthansa Group, in percent as of 31 December 2021





“Transformation capability”



Challenges for employees and companies

The Lufthansa Group is faced with the challenges of adapting to continuously changing conditions such as digitalisation, a shortage of skilled workers, demographic developments and fundamental structural change. Employees must have a continual willingness to learn and an ability to acquire new skills, to deal positively with change, and to strive for continued development. In this context, the objective of **“Sustainable Employability”** is to use appropriate measures to assure the employability of employees and the future viability of the Lufthansa Group. Accordingly, the ability of employees to transform is taking on a central role in the Lufthansa Group’s personnel strategy.

Employee programmes with a focus on sustainability

Sustainability is one of the major issues affecting the aviation industry. The Lufthansa Group is also faced with the challenge of making every aspect of the company responsible and more sustainable. For this approach to succeed, the Group needs employees who think in terms of integrated solutions and can overcome different challenges, but who also integrate sustainability as a basic premise for decision-making and action in their daily work. The Lufthansa Group aims to equip employees with these very skills in a series of programmes.



Green Explorers – a talent programme with a clear focus on the Lufthansa Group’s sustainability strategy. The 150 participants will explore the complex world of sustainability on learning platforms and in excursions. They will also learn how to identify relevant fields of action and to develop solutions.

Green Mobility Trainee – a cross-company trainee programme in the mobility and logistics sector with a focus on sustainability. Between five and ten trainees per year work on four projects each over a two-year period in various companies ranging from Lufthansa Cargo, Lufthansa Innovation Hub and time:matters to Daimler Truck, DB Schenker and onomotion. Lufthansa Airlines will also participate starting in 2023, thereby extending the programme to the passenger sector.

SustainABILITY – this programme, aimed at all employees, was first implemented in 2022 and includes lectures from experts and guest speakers from other large companies as well as interactive formats for use in everyday work. A total of 125 participants, made up of employees and managers from 22 Group companies, continue to network via a platform for continued expert exchange and collaborative learning.

Health and safety at work



Other highlights 2022

- **Recertification in accordance with ISO 9001:2015**
The entire Medical Services department, including Psychosocial Counselling and Passenger Medical Care, is certified according to the DIN ISO 9001:2015 quality management system. This certificate was renewed on the basis of an external audit in summer 2022.
- **Established intranet formats** such as newsletters, podcasts and articles were used to provide comprehensive and up-to-date information and communication on prevention measures, including on psychosocial topics.
- **Coronavirus vaccination campaigns** involving more than 7,000 additional individual vaccinations to boost personal immunity and protect against severe coronavirus illness were carried out alongside the annual flu vaccine campaign.
- **Medical care for employees abroad** – particularly for cockpit and cabin crew – has been revised to be future-oriented and digitally secured. This ensures improved standards of comprehensive medical care for employees, including a more extensive choice of doctors abroad.



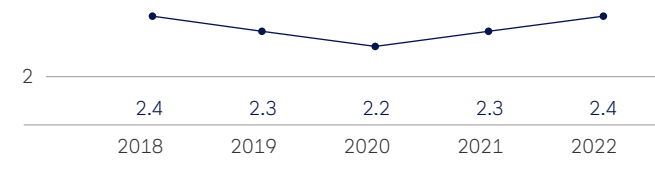
 6.6

work-related injuries per one million hours worked²

All events that resulted in downtime of at least one calendar day are included in the calculation of this indicator. In 2022, the figures included relevant companies that are insured in Germany by the largest employers' liability insurance association (BG-Verkehr) and that employ a total of 50 % of the Lufthansa Group's employees worldwide and 93 % of its employees in Germany. The scope of reporting was expanded compared with 2021 and coverage of additional companies will gradually be extended.

HEALTH INDEX¹

Lufthansa Group, in percent 2022



As part of the “involve me!” employee survey, the Health Index is measured annually as a key performance indicator for employee health. The results are measured on a scale from 1 (best) to 5 (worst). This value declined to 2.4 in 2022.

In addition to the Health Index evaluation, work factors that are closely related to the Health Index are analysed. All senior executives and the health managers of the individual Group companies receive a report on the results, which contains a selection of specific recommendations and supporting measures.

¹ Companies participating in the “involve me!” survey represent 80.54 % of all employees in the Lufthansa Group. ² Provisional for 2022/Data will be reconciled with the employers' liability insurance association after publication of this report.



“help alliance” project work

Engagement of the Lufthansa Group

help alliance gGmbH is the aid organisation of the Lufthansa Group, created and maintained through the commitment of Lufthansa Group employees. The focus is on social aid projects with an emphasis on education and income. In 2022, the Lufthansa Group covered all costs for administration, fundraising and communication. This ensures that 100 % of all other donations are used to fund project work.

Which projects are supported?

Lufthansa Group employees submit their own projects to help alliance and volunteer to be main contacts during the course of the project. Submissions undergo a selection process and are reviewed against set key criteria.

If the project is approved, the funding period is determined and the funding amount is paid out. help alliance is responsible for communication and impact measurement. Further information is available at [➤ help alliance](#)

Key criteria in the selection process

- Participants are children and young people
- Implementation of the projects with the help of officially registered partner organisations
- Project continuity after funding has ended

Example project 1 – Protected learning, Dehradun, India

Together with a local partner organisation, in 2022 help alliance opened a new refuge for 200 girls who have been rejected by their parents. The new building offers a safe environment for learning and personal development, and encourages self-sufficiency. The girls and other street children also receive remedial education for integration into public schools.



Highlights 2022

55

supported projects

> 1,900

young people were given access to education and training

~ 38.000

Participants

12.000

Children were given access to (pre-)school education

> 150

volunteer employees in the Lufthansa Group

> 1,300

young people were successfully integrated into the labour market



Example project 2 – Intercultural tandems

help alliance is involved in two outreach projects for refugees: the **job-buddy programme** helps refugees integrate into society and enter the labour market, for example by providing practice with job interviews. The **Volunteer Rockets programme** addresses both local residents and refugees who actively shape integration through their own outreach projects, for example by developing and implementing sports or cooking events.

Glossary

CO₂ equivalent (CO₂-eq)

Unit of measurement used to assess the impact of greenhouse gas emissions on climate change. There are several types of greenhouse gases, including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and hydrofluorocarbons (HFCs). Each of these gases has a different impact on the climate. CO₂ is the best known and most commonly emitted greenhouse gas, but other gases can have even stronger impacts. The CO₂ equivalent concept is an attempt to standardise the different effects of these gases in order to compare them better. The unit of measurement is defined in grammes or tonnes of CO₂ equivalent and indicates how much CO₂ would have to be emitted to have the same climate impact as the greenhouse gas in question.

Decibel (dB)

Measuring unit for the intensity and pressure of sound. The difference in intensity between the softest sound the human ear can perceive and the pain threshold is 1:10 trillion. To depict this enormous range objectively, acoustics uses the logarithmic decibel scale. On this scale, the value 0 dB is assigned to the perception threshold for a sound of 1,000 Hz) and the pain threshold at the value 130 dB. An increase of 10 dB corresponds to a tenfold increase in sound intensity. For the perceived volume, a difference of 10 dB corresponds to half or double the volume. However, the human ear is not equally sensitive across the entire range of frequencies. Low and high sounds are not perceived as being equally loud even at the same intensity. In measurement, this effect is compensated for by internationally defined rating curves. The best known is the so-called A value, indicated by the index dB(A). To measure aircraft noise, the EPNdB (Effective Perceived Noise Decibel) unit is used internationally.

Freight tonne-kilometres (FTKO/FTKT)

Airlines distinguish between freight performance offered (FTKO, freight tonne-kilometres offered) and its sold freight performance (FTKT, freight tonne-kilometers transported). See also “Tonne-kilometers”.

Fuel dump

Dumping of fuel in flight due to emergency situations to reduce a long-haul aircraft's weight to the maximum allowed landing weight before unscheduled landings (e. g. in the event of technical problems or serious passenger illness). Special air space is assigned to the aircraft, if possible above uninhabited or thinly populated areas. Fuel is usually dumped at altitudes of four to eight kilometres. A minimum altitude of 1,800 metres and a minimum speed of 500 km/h are required. The aircraft may not fly a fully closed circle. The dumped kerosene is released from outlet valves behind the aircraft and forms a fine mist. So far, no contamination has been detected in plant or soil samples after fuel dumps.

Great-circle distance

The shortest distance between two points on the Earth's surface, measured in kilometres (great-circle kilometres) or nautical miles. The centre of a great circle is the centre of the Earth. Synonym: Great Circle Distance.

Chapter 4 and Chapter 14 aircraft

The ICAO distinguishes between different noise standards, which are defined in related chapters of Annex 16 to the Convention on International Civil Aviation. The Environmental Committee (CAEP) of the ICAO agreed on the Chapter 4 noise standard in September 2001, according to which all aircraft newly certified since 2006 must remain cumulatively below the Chapter 3 noise levels by 10 decibels or more. In 2014, the ICAO agreed on the new Chapter 14 noise standard, which requires that aircraft must cumulatively remain 17 decibels below the Chapter 3 noise levels. This standard is applicable to

new aircraft with a maximum take-off weight of more than 55 tonnes that were certified after 31 December 2017. For aircraft below this weight, the new certification values are applicable from 31 December 2020.

Carbon dioxide (CO₂)

Gas resulting in nature from the burning or decomposition of organic substances (e.g. plant material). The greenhouse gas CO₂ remains in the atmosphere for about 100 years. Scientists attribute the increase in atmospheric CO₂ over the last 100 years to the burning of fossil fuels (e.g. coal, oil, natural gas) by humans. Per tonne of fuel, 3.15 tonnes of CO₂ result from the combustion process.. Currently, 2.8 percent of the CO₂ emissions due to human activities are caused by global air traffic. (Source: International Energy Agency (IEA) 2019 values).

Carbon monoxide (CO)

Chemical compound consisting of one carbon and one oxygen atom, formed in the incomplete combustion process of substances containing carbon. For aircraft engines, the level of CO emissions depends greatly on the thrust level: the emissions per kilogram of fuel burned are higher at idle settings, while taxiing, and on approach than during the climbing and cruising phases.

Passenger-kilometres (PKO/PKT)

Measure for transport performance in passenger carriage (number of passengers multiplied by distance flown). A distinction is made between available transport performance (PKO, passenger-kilometres offered, or, synonymously, SKO, seat-kilometres offered) and actual transport performance (PKT, passenger-kilometres transported).

Glossary

Passenger tonne-kilometres (PTKT)

Measure for transport performance in passenger traffic (number of passengers multiplied by passenger weight and distance flown). A distinction is made between passenger tonne-kilometres offered (PTKO) and passenger tonne-kilometres transported (PTKT). The calculation takes into account passengers by means of a statistical average weight. The payload weight per passenger is 100 kg for continental routes and 101 kg for intercontinental routes.

Revenue tonne-kilometre (RTK)

cf. tonne-kilometres (TKT) Measure of transport performance (payload multiplied by distance). In deviation from the average passenger weight used in the TKT definition, 100 kg is used for the definition of the SBTi target (CO_2/RTK) for each passenger for both continental and intercontinental routes.

Seat kilometre (SKO)

Measure of the transport capacity available (SKO, seat-kilometres offered).

Nitrogen oxides (NO_x)

Chemical compounds consisting of one nitrogen and several oxygen atoms. NO_x is defined as the sum of NO and NO_2 compounds. Natural sources include lightning and microbes in the soil. Nitrogen oxides are also generated in combustion processes under high pressures and temperatures. However, future combustion chambers of an advanced design could help reduce NO_x emissions by 85 percent. Air traffic contributes two to three percent of man-made NO_x emissions. Climate models show that nitrogen oxides have increased the concentration of ozone at cruising altitudes by a few percentage points.

Tonne-kilometres (TKT)

Measure of transport performance (payload multiplied by distance). In calculating payloads, passengers are taken into account by means of a statistical average weight. The payload weight per passenger is 100 kg for continental routes and 101 kg for intercontinental routes.

Unburned hydrocarbons (UHC)

Organic mixture of carbon and hydrogen that results from the incomplete combustion of fuel containing hydrocarbons or from the evaporation of fuel.



Credits

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Additional information on “Sustainability in the Lufthansa Group” can be found at:

➤ lufthansagroup.com/en/responsibility

The 2022 Annual Report, including the non-financial declaration, can be found at:

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