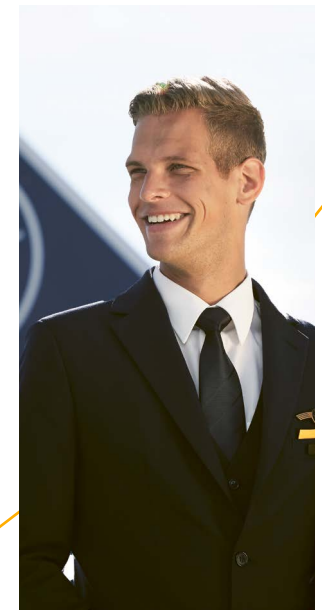
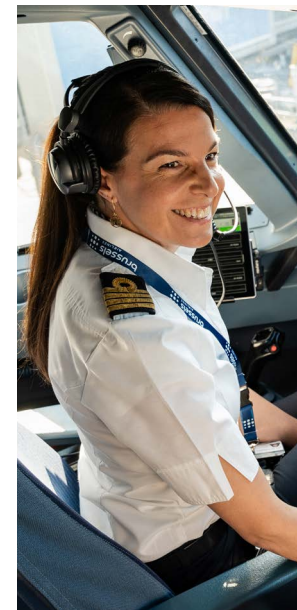
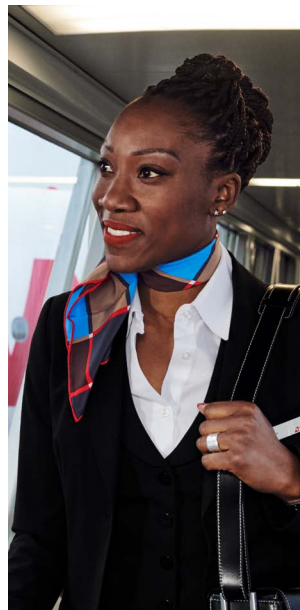




## Report 2023

# TCFD



Lufthansa Group is determined in its commitment to addressing the challenges posed by climate change. We firmly believe that governments, companies and investors share a collective responsibility to mitigate the impacts of a changing climate and foster a transition to a resilient, sustainable economy.

To operationalize this commitment, Lufthansa Group has pledged to align with the recommendations set forth by the Taskforce on Climate-related Financial Disclosures (TCFD). This strategic alignment enables us to gain a comprehensive understanding of the implications of climate change on our business model. The TCFD framework serves as a vital tool, enhancing the disclosure of consistent, reliable, and transparent climate-related financial information. By adhering to these recommendations, we empower investors to make well-informed capital allocation decisions that actively support the transition to a low-carbon economy.

Our 2023 TCFD disclosure represents a continued effort, building upon the groundwork laid in previous years, which is comprehensively detailed in our corresponding sustainability and non-financial reports. This disclosure underscores Lufthansa Group's pivotal role as a globally operating air transport company, particularly as a market leader in European markets.

For the fiscal year 2023, we present a concise table summarizing how Lufthansa Group aligns with the TCFD recommendations. This proactive stance reflects our unwavering belief in the shared responsibility of governments, companies, and investors to mitigate the impacts of climate change and facilitate a transition to a climate-resilient economy.

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### GOVERNANCE

#### A.

#### Describe the board's oversight of climate-related risks and opportunities

#### Supervisory Board

The highest supervisory body around sustainable management is the Supervisory Board, which also approves important climate-related decisions, including the proposed fleet order, considering the fuel and CO<sub>2</sub> efficiency of the decision to be made. In the 2023 financial year, the Supervisory Board formed five committees whose activities were each reported on at the beginning of the following Supervisory Board meeting. The Supervisory Board elected the members and the Chairman of the Committees.

Effective from the 1st of January 2023, the Supervisory Board established an ESG Committee to advise the Supervisory Board, its committees and the Executive Board on environmental, social and governance issues that are essential to the sustainable economic development of Lufthansa Group. The ESG Committee met twice in 2023. Focus topics in the reporting year were the steps taken by flight operations to reduce emissions, the current situation and outlook with regard to sustainable aviation fuel (SAF) (e.g. regulation, demand and supply, strategy) and the changing requirements for sustainability reporting. In addition, the Supervisory Board receives a quarterly update on ESG topics from the Chief Sustainability Officer (CSO) as member of the Executive Board.

The Supervisory Board's Audit Committee monitors the existence and effectiveness of the Lufthansa Group's risk management, which also includes climate related risks. It met five times in 2023 and is informed at least once a year about the risk management.

**Lufthansa Group Annual Report 2023**, Report of the Supervisory Board (p.9-13, p.125/126)

**Annual Report 2023 (Combined non-financial declaration)**, - Organizational foundations and responsibilities (p.76-81)

**CDP Report 2023**  
C1.1 - C1.1b

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The Supervisory Board also oversees and guides employee incentives. Emission reduction targets are an element of long-term variable remuneration for the Executive Board of Deutsche Lufthansa AG further described in METRICS AND TARGETS C.

### **Executive Board and Group Executive Committee**

Lufthansa Group Executive Board meetings take place every two weeks. Climate-related issues were scheduled in 2023 at the agenda of the Group Executive Committee (GEC) at some meetings with relevance on strategy or political decisions, risk management or major capital expenditures like investments in aircraft or Sustainable Aviation Fuel. Therefore, climate related considerations were integrated in board decisions on strategy, business plans or major capital expenditures.

The Group Executive Board meetings determined the focus and further development of sustainability-related activities within the Lufthansa Group in the reporting year. These meetings are prepared in part by the Group Executive Committee, which is chaired by the Chairman of the Executive Board. The Group Executive Committee is a committee at senior management level and consists of the Executive Board of Deutsche Lufthansa AG, the CEOs of the segment parent companies and the main Passenger Airlines and the heads of the Lufthansa Group's strategy and communications departments.

Furthermore, the ESG strategy is reviewed annually and discussed with the Executive Board as part of the Strategic Roadmap Discussions (SRD). The SRD is an established format in which relevant strategic topics are

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discussed on a yearly basis with the Executive Board of Lufthansa Group. In the reporting year, the focus was on the Lufthansa Group's carbon transition pathway and supporting measures, such as its Sustainable Aviation Fuel strategy and in-flight, as well as ground-based, efficiency measures.

In addition, the Executive Board has final oversight of the combined non-financial declaration that includes the climate / environmental strategy, organization, management, measures and targets. The Supervisory Board commissioned a limited audit review of the combined non-financial declaration.

### **Executive Board member Brand & Sustainability**

The Executive Board member in charge of the Lufthansa Group's Brand & Sustainability function - the Chief Sustainability Officer (CSO) - is responsible for the Company's environmental, climate and social impact at Executive Board level.

### **Group Policy Committee**

The Group Policy Committee (GPC), chaired by the Chairman of the Executive Board, discusses politically significant issues, including those relevant to sustainability, and prepares Lufthansa Group's strategy for mitigating policy risk. Individual managers within the committees are responsible for implementing planned activities and projects.

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GOVERNANCE

**B.**

**Describe management's role in assessing and managing climate-related risks and opportunities**

The Executive Board has the overall responsibility for:

- managing annual budgets for climate mitigation activities or capital and/or operational expenditures related to low-carbon products or services (including Research and Development)
- the integration of climate-related issues into the strategy and the setting of climate-related corporate targets
- monitoring progress against climate-related corporate targets and
- managing climate-related risks and opportunities

The Head of the Corporate Responsibility department – who reports directly to the Chief Sustainability Officer (Executive Board member) – is primarily responsible for identifying and assessing climate-related risks and opportunities as well as overseeing the climate protection strategy. The Corporate Responsibility department is developing appropriate measures, while working closely with the various departments and business units of the Lufthansa Group.

To better assess the potential materiality of the identified climate risks and opportunities, the Lufthansa Group undertook a more detailed climate scenario analysis in 2023. This qualitative scenario analysis identified both transitory and physical climate risks and opportunities and assessed their relevance to the Lufthansa Group. Relevant specialist departments were involved in the preparation process under the coordination of the Corporate Responsibility department. The analysis was completed at the beginning of 2024 (see STRATEGY and RISK MANAGEMENT). The results of this analysis were discussed with the departments and business units involved

**Annual Report 2023 (Combined non-financial declaration),**  
Environmental Concerns (p.76ff.)

**CDP Report 2023,**  
C1.2, C1.2a

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and will be brought to the attention of management through established governance processes.

Each identified climate risk has a risk owner within Lufthansa Group. Each owner is responsible for ensuring that the given risk is continuously monitored and assessed, and that measures are introduced in good time to help mitigate this risk. For example, the Head of Corporate International Relations and Government Affairs has been delegated climate-related risks resulting from regulatory aspects, and the risk owner of identified flight related physical climate risks and opportunities is the central flight operations department. Climate-related risks are identified, assessed, and monitored within Lufthansa Group's Risk Management System which is coordinated by the Risk Management department as described in RISK MANAGEMENT B. The risk assessment is conducted quarterly. The top risks are reported to the Executive Board on a quarterly basis and discussed annually in the Audit Committee of the Supervisory Board.

To tackle the increasing significance of carbon accounting and environmental legislation, the Corporate Responsibility and Group Controlling departments have formed the Emissions Management Committee to deliver regulatory information and interpretations to relevant departments and employees. This committee regularly discusses current developments in national and supranational emissions legislation and estimates their financial impacts.

Furthermore, the Sustainability Circle, led by the Corporate Responsibility department, promotes a Group-wide dialogue on sustainability topics. The members of this circle are the Corporate Responsibility Officers of the

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		<p>Group companies and relevant Group functions. The Sustainability Circle holds monthly meetings with an objective to promote a Group-wide exchange on sustainability topics, this also includes climate-related strategies, risks, and opportunities.</p> <p>In 2023, the Corporate Responsibility department proactively initiated the formation of the SAF Circle – an interdisciplinary, cross-company committee. This committee convenes bi-weekly, serving as a round table for bringing together all relevant stakeholders in the SAF domain. Its primary objective is to comprehensively tackle a diverse array of SAF-related matters, ranging from sourcing, sales, and certification of emissions reduction to policy. By adopting a holistic approach that extends beyond CO<sub>2</sub> emissions, the SAF Circle aims to address the broader climate impact of aviation.</p>	
STRATEGY	<p><b>A.</b></p> <p><b>Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term</b></p>	<p>Climate change can influence Lufthansa Group’s business strategy in two distinct ways. First, by causing climate-related business risks, whether physical, political, market or reputational. Second, by creating business opportunities that could arise from the transition to a low-carbon future.</p> <p>It is therefore imperative to identify climate-related risks and opportunities and take them into account when defining the strategic direction and monitoring and assessing them in the Group-wide risk management system. Since 2020, the Lufthansa Group has been acting on the recommendations of the TCFD and is continuously developing its reporting on the management of climate-related risks and opportunities, incorporating climate scenario analysis.</p>	<p><b>Lufthansa Group Annual Report 2023, - Opportunities and risk report (p.125-139)</b></p> <p><b>Annual Report 2023 (Combined non-financial declaration), - (p.74-77)</b></p> <p><b>CDP Report 2023, C2.1 – C3.1f</b></p>



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Within the Lufthansa Group risks are reviewed quarterly and developed as part of the corporate risk management framework, which ensures a unified and collaborative risk management approach and best practice across the Lufthansa Group. In the reporting year Lufthansa Group defines the time horizons for climate risks and opportunities as follows:

**Short-term:**

0-1 years

(aligned with the financial time horizons)

**Medium-term:**

1-3 years

(aligned with the financial time horizons)

**Long-term:**

3-10 years

(aligned with corporate strategy and our SBTi climate target 2030 - as well as specific impacts of climate-related risks are discussed in special committees like for example the finance committee, that is responsible for identify, assess, monitor, and control major financial risks. In this committee the aspects of CORSIA, EU ETS and further regulations from the EU Green Deal / Fit for 55 such as ReFuel EU have been discussed for a 10 years' time horizon)

The transition to a low-carbon future poses fundamental strategic challenges for the aviation sector. This transition could affect Lufthansa Group's financial outlook, whether directly e.g., through changes in taxation and regulation, or indirectly through changes in customer behavior. Physical risks due to climate change can have a potential impact on direct

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and indirect flight operations and Lufthansa Technik's maintenance operations.

In alignment to the TCFD categories, the following risks and opportunities have been identified over the short-, medium- and long-term time horizons:

### Transition Risks

The Lufthansa Group is exposed to a number of transitional climate risks in the periods under review. Relevant climate-related transition risks to the company could be policy and legal, market and technology as well as reputation related.

#### Policy and Legal

A high policy and legal risk impact may come from increased carbon pricing by mandatory cap and trade schemes, from carbon/fuel taxes, SAF blending quotas and upcoming “non-CO<sub>2</sub>”-regulations. The associated cost risks could increase significantly with heterogeneous carbon prices and increasing sustainability regulations in the individual countries and regions. Furthermore, there is the potential of a significant distortion of competition to the network airlines in intercontinental traffic, especially if costs are not fully passed on to passengers, because most of the regulations have only an impact on intra-EU flights, so airlines from outside the European Union with transfer stops near the European Union have a competitive advantage.

Lufthansa Group’s Risk Management System ranks “Regulatory risks in connection with climate change” as a top risk for Lufthansa Group. It is

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classified as a qualitative risk currently with a substantial significance and extreme magnitude.

### Market and Technology

While Lufthansa Group still predominantly uses regular jet fuel in its operations, potential price fluctuations of conventional fuel due to stricter climate regulations, taxes and market trends supporting a low carbon economy could potentially impact the company's operational expenditures and procurement costs especially in the medium to long term.

The availability and prices of sustainable aviation fuel (SAF) also represent a potential risk. Due to the difficulty in sourcing, SAF is still very difficult to procure. Lufthansa Group acknowledges the use of SAF as one of the technologies for the transformation into a sustainable aviation sector, so it might be affected by SAF supply shortages and high procurement costs (negatively affect OpEx).

### Reputational

The Lufthansa Group and the aviation industry may face reputational risks due to failure in meeting stakeholders' expectations on climate change performance - leading to pressure from external stakeholders such as customers and investors. Despite Lufthansa Group's current climate efforts (e.g., validated SBTs, investments in SAF and other technology research), the company could potentially face this risk which might lead to reduced revenues, decreased capital availability and difficulties in attracting new talent.

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### Physical Risks

In 2023/2024 Lufthansa Group has conducted a qualitative climate scenario analysis (more details see STRATEGY C), which has assessed and identified both potential chronic and acute physical risks. In this analysis, heatwaves were identified as the most potentially relevant physical climate risk that could have a material impact on the Lufthansa Group's business under the high emission scenario SSP5-8.5 scenario (details see STRATEGY C) over the long-term horizon (1-10 years). All other physical climate risks examined in this scenario analysis were classified as insignificant in the period under review (1-10 years), as they have no estimated material impact. Only ahead of 2050, which was considered in the course of the climate scenario analysis, and under high emission scenario (SSP5-8.5), further physical effects of climate change appear as potentially significant. Namely, cyclone, hurricanes and significant changes in the jet stream.

Regarding the increase in heatwaves, potential impacts have been identified in the Lufthansa Group's value chain. These effects can affect both the upstream value chain and own operations. For example, the disruption of supplier operations due to heatwaves may delay the delivery of essential (replacement-) parts or products, which in turn may lead to increased OpEx associated with sourcing alternative supplier routes and amending flight/maintenance schedules.

Heatwaves can also result in loss of revenue due to disruptions to airport operations resulting in flight delays, cancellations and/or diversions due to

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		<p>reduced runway performance (thermal expansion), air traffic congestion and malfunction of heat-sensitive equipment. This can affect all passenger airlines as well as cargo/freight carriers and lead to higher OpEx costs for passenger compensation. In addition, prolonged high temperatures can affect aircraft performance, reduce engine efficiency and lift capacity. This may result in increased fuel consumption, longer take-off distances and weight restrictions.</p> <p><b>Opportunities</b></p> <p>From an opportunity perspective, Lufthansa Group could potentially benefit from its own Research and Development of new sustainable aircraft technologies (like AeroShark technology) – especially in the medium and long term. Intelligent routing and smart technologies could reduce energy intensity and operational expenses and support climate-optimized flying.</p> <p>Driven by the current climate change discussions, further opportunities may also arise from accelerated railway infrastructure projects at hub airports, having the potential to increasingly replace cost- and CO<sub>2</sub> intensive short-haul feeder flights with train services.</p>	
STRATEGY	<p><b>B.</b></p> <p><b>Describe the impact of climate-related risks and opportunities on the organization's</b></p>	<p>The Lufthansa Group takes into account the climate-related risks and opportunities defined as material both when drawing up or revising its corporate strategy, and in its regular financial planning. Important corporate decisions are always made in consideration of the effects on the Lufthansa Group's emissions balance sheet and potential climate risks &amp; opportunities. This includes the fleet strategy in relation to the purchase of</p>	<p><b>Annual Report 2023 (Combined non-financial declaration)</b>, - (p.81-87, p.288/289)</p> <p><b>CDP Report 2023</b>, C1.1a – C4.2f.</p>

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### businesses, strategy, and financial planning

new (next generation) aircraft or the retirement of older aircraft, as well as the strategic corporate decision on partnerships in relation to the production and purchase of SAF. There is also a strong focus on the continuous improvement of fuel efficiency in flight operations.

The following examples illustrate how the Lufthansa Group pursues its own climate goals and measures to reduce the potential effects of climate-related risks and to take advantage of opportunities.

### **The Lufthansa Group's strategy include a CO<sub>2</sub> mitigation path which is aligned with SBTi validated CO<sub>2</sub> reduction target**

With its SBTi validation in 2022, Lufthansa Group was the first airline group in Europe and the second worldwide with a scientifically based CO<sub>2</sub> reduction target in line with the goals of the Paris Climate Agreement of 2015. Specifically, Lufthansa Group has aligned its policies with SBTi criteria (well below 2°C) and committed to reducing its CO<sub>2</sub> intensity, i.e., its CO<sub>2</sub> emissions per transported tonne-kilometer (passenger and freight), by 30.6% from 2019 to 2030. This goal may only be achieved by reducing fuel consumption or by substituting fossil fuels with SAF.

Beyond this reduction required by the SBTi targets, the Group will achieve its self-imposed target of cutting net CO<sub>2</sub> emissions in half by 2030 compared to 2019 by also including voluntary offsets. In the long term, Lufthansa Group aims to be carbon-neutral by 2050.

From Lufthansa Group's perspective, the science-based reduction targets represent the framework for a clearly defined roadmap to future-proof

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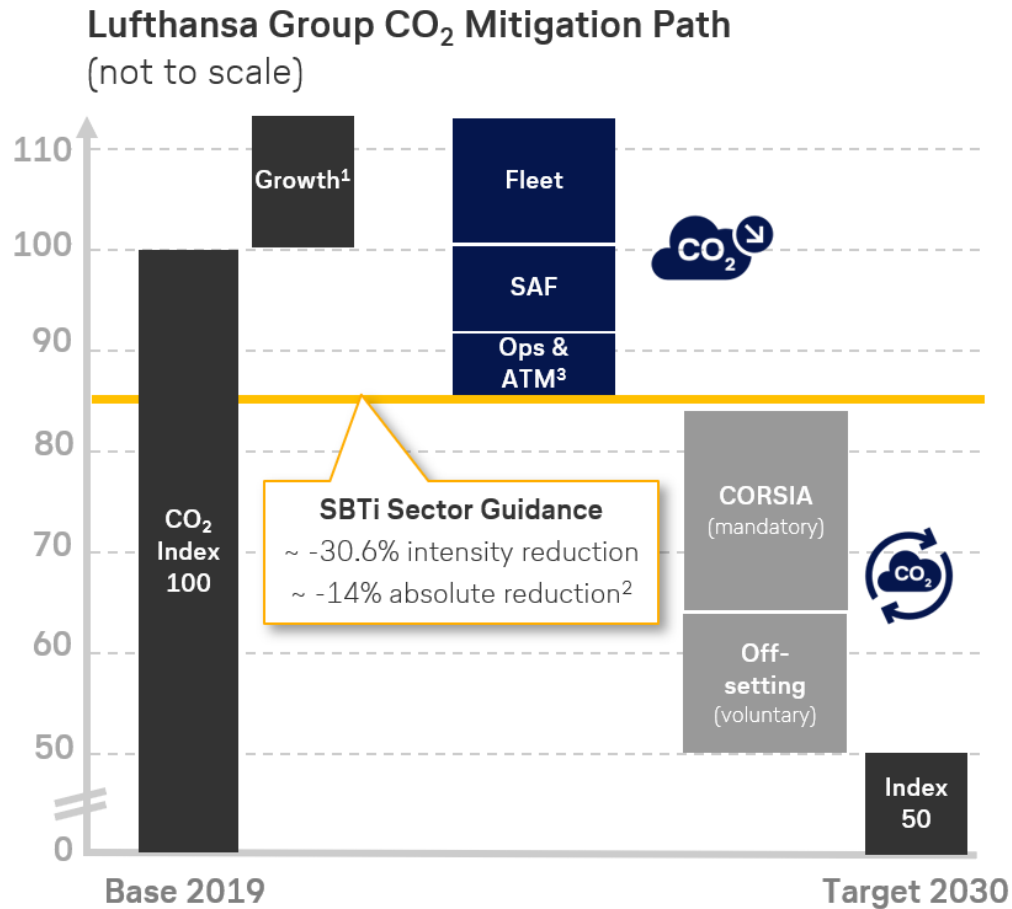
sustainable growth. Lufthansa Group's mitigation path explains the plan to achieve this and how the business will develop accordingly. This path defines the main levers – fleet, operations, and Sustainable Aviation Fuels– based on which Lufthansa Group intends to decarbonize airline operations and to achieve its targets. It is flanked by numerous investments and partnerships to drive emissions reduction in the short to medium term and support the development of technology that is required in the long term.

The strategy and the outline of the ambition is governed by the Corporate Responsibility department in close cooperation with relevant business units and functional departments. The Executive Board has the final oversight of the climate / environmental strategy, organization, management, and execution. Details regarding governance and oversight are presented in GOVERNANCE A.

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1) Based on current growth scenarios; 2) Based on CAGR forecast 3) Air Traffic Management



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### Fleet renewal is continuously driven forward

Fleet renewal remains the key driver for reducing CO<sub>2</sub> in the short and medium term. The Lufthansa Group continuously invests in modern, fuel-efficient aircraft and engine technologies, which represent the most important element in reducing CO<sub>2</sub> emissions from flight operations. In 2023, a total of 29 aircraft went into service with the Lufthansa Group airlines, including Airbus A320neos, A321neos, A350-900s and Boeing 787-9s, which are powered by modern engines. In turn, a total of 18 older aircraft were removed from the Group fleet.

The new aircraft have up to 30% lower fuel consumption and carbon emissions compared with their direct predecessor models. This results also in a corresponding positive financial impact.

At year-end 2023, there were 253 aircraft on the Lufthansa Group's order list. There are also options to buy a further 161 aircraft.

### Technical measures for the existing fleet

Measures to technically modify the existing fleet are also constantly examined and implemented in cooperation with partners from research and industry where appropriate. The AeroSHARK surface coating developed by Lufthansa Technik and BASF Coatings GmbH, reduces the air resistance of every aircraft. At the end of 2023, the Lufthansa Group had a total of 15 Boeing 777s fitted with AeroSHARK in service, including 11 Boeing 777-300ERs at SWISS and 4 Boeing 777Fs at Lufthansa Cargo. Following the

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modification of all Lufthansa Group aircraft of these two specific types, it is expected that cumulative savings of more than 8,000 tonnes of fuel and more than 25,000 tonnes of CO<sub>2</sub> per year will be possible in future.

### **Increasing the use of Sustainable Aviation Fuel**

Sustainable Aviation Fuel, especially on medium- and long-haul flights, is the key to achieving 2050 climate targets. Lufthansa Group recognizes that the global SAF production capacity, and therefore availability, has so far been very limited. Regarding the 2023 SAF production capacity of approximately 0.5 million tonnes it would only be sufficient for around 0.2% of worldwide aviation fuel consumption (Source: IATA, Dec. 2023).

In order to continually safeguard the supply of SAF, the Lufthansa Group follows a three-part strategy:

1. Enable the continuous procurement of SAF on the spot market, up to 250m EUR has been released for the period up to 2026 by decision of the Executive Board.
2. In addition, options for long-term supply commitments around the world are under consideration. These are expected to offer considerable production volumes and security of supply from around 2025 onwards. In the reporting year, two further letters of intent were signed to secure a permanent supply of Sustainable Aviation Fuels for the Lufthansa Group.

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3. In the long term, the Lufthansa Group will provide support for innovative supply concepts with the goal of transforming today's start-ups and developers into tomorrow's suppliers. In this regard, the Lufthansa Group focuses on synthetic kerosene based on residual materials, ligneous biomass and renewable electrical energy (Power-to-Liquid) as well as on research into the direct use of sunlight for fuel synthesis. To accelerate the market introduction of particularly forward-looking Sustainable Aviation Fuels, next year the Lufthansa Group intends to establish an SAF Buyers Alliance. This is intended to pool demand on the part of multiple corporate customers, to enable the construction of pilot systems for fuel generation.

### **More sustainable flight offerings for customers are being expanded**

The Lufthansa Group is continuously expanding its services and offerings for more sustainable flight options. Its Green Fares are worth highlighting in particular regarding the reporting year. In mid-February 2023, these Green Fares made the Lufthansa Group the first airline group in the world to offer a separate fare which includes compensation of flight-related carbon emissions. In addition, new technologies for long-term binding of CO<sub>2</sub> were added to the Group's portfolio of offset projects in 2023.

### **Operational measures**

The OPS Sustainability Program is a three-step approach to the sustainable reduction of carbon emissions. It was launched by the Operations Efficiency Department in cooperation with all flight operations of the Lufthansa Group and will run until 2030. Measures to improve efficiency are being implemented in several areas along the operational production

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		<p>chain – from flight preparation to in-flight optimization measures and handling services on the ground, to the data-based evaluation of completed flights.</p> <p>The reductions in carbon emissions achieved in the OPS Sustainability Program are continuously measured and tracked via the Framework and Certification work package, which makes them an important building block for achieving the Lufthansa Group’s SBTi targets.</p>	
<p>STRATEGY</p>	<p><b>C.</b></p> <p><b>Describe the resilience of the organization’s strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario</b></p>	<p>The Lufthansa Group's strategic and operational measures to reduce climate-relevant emissions listed under STRATEGY B contribute to increasing the company's resilience regarding climate change-related risks. The results of the climate scenario analysis carried out serve to evaluate the effectiveness of the corporate strategy in this respect and to adjust it if necessary.</p> <p>In 2023/2024 a climate scenario analysis (CSA) is used by Lufthansa Group to identify and assess climate related risks and opportunities and helps to understand the potential business implications of climate change (physical risk) and climate policy, regulation and technology (transition risk). Furthermore, a CSA supports Lufthansa Group in making strategic and risk management decisions under complex and uncertain conditions. In the reporting year, the Lufthansa Group, together with an internationally active sustainability consultancy, carried out a new qualitative climate scenario analysis of transition and physical risks and opportunities.<sup>1</sup> In addition, the Lufthansa Group has formed a project set-up consisting of the</p>	<p><b>Annual Report 2023 (Combined non-financial declaration), - (p.74)</b></p> <p><b>CDP Report 2023, C2.2a – C3.2b</b></p>

<sup>1</sup> In 2021/2022 Lufthansa Group has already carried out a qualitative and quantitative climate scenario analysis of the transition risks (see TCFD Report 2022).

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sustainability department, strategy department, risk management and experts from flight operations and aircraft maintenance.

For the first time, physical effects of climate change were also considered in this climate scenario analysis. The results of this scenario analysis were then used to assess the materiality of the identified climate-related risks & opportunities (CRROs) using Lufthansa Group's risk matrix within the materiality assessment.

### Transition Methodology

Transition considers the risks or opportunities arising from a shift to a low-carbon economy (including market, policy, technological and regulatory changes). A relevance assessment has been performed to identify the most material climate related transition risks and opportunities for Lufthansa Group. Based on this, different future climate scenarios (i.e. IEA Stated Policy Scenario - Business as usual - and IEA Net Zero Scenario - 1.5°C scenario and NGFS Current Policies and Net Zero) and multiple time horizons (baseline, 2030, 2040, 2050) were used in the climate scenario analysis to consider potential changes in risks and opportunities trends over time. The transition assessment has been done across the whole value chain of Lufthansa Group, understanding the potential exposure of passenger airlines, cargo/freight and Lufthansa Technik operations.

### Physical Methodology

The risks arising from physical climate change are considered here (this includes both acute events such as floods and storms, but also chronic changes, longer-term shifts in climate patterns, such as changes in average

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temperatures). An exposure screening of the 28 climate hazards of the EU Taxonomy of the Delegated Act on Climate Change was carried out and then the hazards classified as potentially most relevant from the project group's perspective were examined for their potential impact on the Lufthansa Group's business activities. Data from a low emissions pathway (SSP1-2.6) and a high emissions pathway (SSP5-8.5) to assess potential changes in physical risks over time (Baseline, 2030, 2050). A total of 25 locations were identified for the scenario analysis, 20 physical point locations, including airports, hubs, suppliers, and maintenance facilities and 5 regions which included major routes. These covered all aspects of Lufthansa Group's value chain.

The main identified physical CRRO were assessed against the scenarios and time horizons, combining global scenario data for assets with Lufthansa-specific data.

### **Resilience assessment and next steps**

The scenario analysis has shown that transition climate risks and especially the carbon and SAF/fuel price development are the dominant cost driver in short to long-term.<sup>2</sup> It has also shown that Lufthansa Group's current strategy already reflects many of these findings with climate-related issues affecting its products and services, its value chain, investments in R&D, and its operations. The results of these scenario analysis confirm that

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<sup>2</sup> Please note: the time horizons used in the climate scenario analysis (short, medium, long term) differ from the definition used by the Lufthansa Group for the description of the risk and opportunity assessment.

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		<p>Lufthansa Group's strategic initiatives are suitable to potentially minimize the respective transition risks and to pursue climate opportunities.</p> <p>Regarding the physical climate risks, it has been shown that for the most part these can only have a material impact on the Lufthansa Group's business selectively and, above all, in the long term (2040/2050). To assess and, above all, quantify the identified potential effects of physical climate change (but also transitional effects) even more precisely and to increase the Lufthansa Group's resilience to long-term climate risks, it is planned to supplement the qualitative scenario analysis with a quantitative assessment of the identified material climate risks.</p> <p>In addition, Lufthansa Group is currently preparing for the future legal requirements of the Corporate Sustainability Reporting Directive (CSRD). As this directive will have a fundamental impact on the interaction of risk management, financial planning and climate impact, the findings from the scenario analysis will be incorporated there.</p>	
RISK MANAGEMENT	<p><b>A.</b>  <b>Describe the organization's processes for identifying and assessing climate-related risks</b></p>	<p>The Lufthansa Group has implemented a systematic Enterprise Risk Management (ERM) process at both Group level and at the level of larger business units within the Group. It aims to fully identify material risks, to present and compare them transparently and to assess and manage them. Climate-related risks are evaluated against the internal qualitative matrix and integrated into Lufthansa Group's multi-disciplinary company-wide risk management process. Risk owners are obliged to monitor and manage risks proactively and to include relevant information in the planning, steering and control processes. The Group guidelines on risk management</p>	<p><b>Lufthansa Group Annual Report 2023</b>, Opportunities and risk report (p.125ff.)</p> <p><b>CDP Report 2023</b>, C2.1 - C2.2a</p>

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adopted by the Executive Board define all the binding methodological and organizational standards for dealing with risks.

The continuous risk management process, facilitated by IT, starts by identifying current and potential risks from all key internal and external sources. These identified risks are vetted for plausibility by the companies' risk coordinators and compiled in the Group's risk portfolio. Given the dynamic nature of the risk environment, this identification is an ongoing task for the risk owners. They must ensure, at least quarterly, that the risks they manage are comprehensive and current, actively managing them through various risk mitigation tools and strategies.

Once risks are identified, they are assessed on a net basis, considering the effects of active management and monitoring tools. Risks are categorized as either qualitative or quantitative, with continuous monitoring to detect changes and make timely adjustments to risk management. Qualitative risks often represent long-term trends with potential negative impacts, and without concrete information, cannot always be quantified. Quantitative risks, however, can be evaluated based on their potential financial effects and likelihood. Loss magnitudes are quantified by potential financial impact on projected Adjusted EBIT.

The process for identifying and checking corresponding risks is briefly described below using selected risk categories as examples:

### Regulatory Risks

Lufthansa Group's Corporate Responsibility department and the Corporate International Relations and Government Affairs department play a pivotal



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		<p>role. These departments monitor environmental policies and regulatory shifts by engaging in ongoing dialogues with pertinent authorities and policymakers. This allows them to gauge the potential impacts of these developments on both the Group and its subsidiaries.</p> <p><u>Physical Risks</u></p> <p>Lufthansa Group has designated experts who maintain constant communication with climate scientists and notable research institutions like the German Aerospace Centre. Since 1994, Lufthansa Group has been an active participant in research initiatives that explore climate and atmospheric changes and their potential effects on air traffic.</p> <p><u>Reputational Risks</u></p> <p>Lufthansa Group conducts extensive stakeholder surveys focused on sustainability. The insights gathered from these surveys are integrated with management's evaluations into an annually updated materiality matrix. Additionally, Lufthansa Group monitors climate and aviation-related media coverage to detect and manage potential reputational risks.</p>	
<p>RISK MANAGEMENT</p>	<p><b>B.</b> <b>Describe the organization's processes for managing climate-related risks</b></p>	<p>The organization's approach to managing climate-related risks is integrated into the risk management framework (Enterprise Risk Management), emphasizing a systematic and continuous process. Lufthansa Group manages climate-related risks through a well-structured and collaborative process involving multiple teams and departments. The process begins with the Corporate Sustainability department, which works in conjunction</p>	<p><b>Lufthansa Group Annual Report 2023</b>, - Opportunities and risk report, (p.125ff.)</p>

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		<p>with the Group Enterprise Risk Management (ERM) department to identify and assess sustainability risks, including those related to climate.</p> <p>On this basis, the Executive Board is regularly informed about the current risk situation of the Lufthansa Group and its operating segments. The Executive Board reports annually to the Audit Committee on the performance of the risk management system, the current risk situation of the Lufthansa Group and on significant individual risks and their management. In addition, plans to mitigate identified risks are developed. This responsibility is distributed among relevant risk owners who are specialists in specific areas of the business. This iterative and consultative approach ensures that the organization not only plans effectively for long-term climate-related challenges but also remains agile enough to handle short-term risks effectively.</p>	<p><b>Annual Report 2023 (Combined non-financial declaration)</b>, - (p.75ff.)</p> <p><b>CDP Report 2023</b>, C2.2a</p>
<p>RISK MANAGEMENT</p>	<p><b>C. Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization’s overall risk management</b></p>	<p>The systematic Enterprise Risk Management of Lufthansa Group considers all relevant risks, i.e., also risks related to climate change – including physical and transitional risks. The results of the quantitative scenario analysis mentioned in STRATEGY A contribute, amongst other factors, to a better assessment of the previously identified climate-related risks. Furthermore, the quantitative scenario analysis highlights that climate-related risks must be analyzed regarding their short-, medium- and long-term effects.</p>	<p><b>Lufthansa Group Annual Report 2023</b>, Opportunities and risk report, (p.125ff.)</p> <p><b>CDP Report 2023</b>, C2.2</p>

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### METRICS AND TARGETS

**A.**  
**Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process**

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 CO<sub>2</sub> reduction path. Lufthansa Group's target to achieve a 30.6 % reduction in CO<sub>2</sub> intensity in 2030 compared to 2019 was successfully validated in 2022 by SBTi.

The absolute CO<sub>2</sub> emissions resulting from the combustion of aviation fuel from Lufthansa Group aircraft in 2023 increased by 16.0% to 26.6 million tonnes (previous year: 22.9 million tonnes) due to the rise in demand and the expanded flight offers.

CO<sub>2</sub> emissions per tonne- kilometre transported declined by 0.3% to 834 g/tkm (previous year: 837 g/tkm).

Specific CO<sub>2</sub> emissions per passenger kilometre were 1.8% lower than in the previous year at 8.84 kg/100 pkm (previous year: 9.0 kg/100 pkm).

**Annual Report 2023 (Combined non-financial declaration)**, - (p.181)

**Lufthansa Group Annual Report 2023**, - Goals and Strategies (p.21ff.)

**Sustainability Fact Sheet 2023**, (p.3, p.8)

**CDP Report 2023**, C4.2c, C9.1, C-TO9.3/C-TS9.3

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ENVIRONMENTAL DATA <sup>1,2,3</sup>		2023	2022	Change
<b>Resource consumption</b>				
Fuel consumption	tonnes	8,451,407	7,284,584	+16.0%
Fuel consumption, specific, all types of transport	g/tkm	265	266	-0.3%
Fuel consumption, specific, passenger transportation	l/100 pkm	3.52	3.59	-1.7%
Fuel consumption, specific, freight transportation	g/tkm	218	214	+1.8%
<b>Emissions</b>				
Carbon dioxide emissions	tonnes	26,621,932	22,946,441	+16.0%
Carbon dioxide emissions, specific, all types of transport	g/tkm	834	837	-0.3%
Carbon dioxide emissions, specific, passenger transportation	kg/100 pkm	8.84	9.00	-1.8%

<sup>1</sup> The following companies are included for the 2023 reporting year: Lufthansa (including Lufthansa CityLine, Discover Airlines and Air Dolomiti), SWISS (including Edelweiss Air), Austrian Airlines, Eurowings, Brussels Airlines, and Lufthansa Cargo. Other flights and services performed by third parties are not included, as their performance is beyond Lufthansa Group's control <sup>2</sup> Types of flight service considered: all scheduled and charter flights (excluding ground vehicles). <sup>3</sup> 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.

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Lufthansa Group also monitors the split of CO<sub>2</sub> emissions by passenger and freight.

### CO<sub>2</sub> EMISSIONS<sup>1</sup> 2023

in tonnes

	<u>Passengers</u>	<u>±PY</u>	<u>Cargo<sup>2</sup></u>	<u>±PY</u>	<u>Total</u>	<u>±PY</u>
CO <sub>2</sub>	21,646,482	+19.2%	4,975,451	+3.8%	26,621,932	+16.0%

<sup>1</sup> The following companies are included for the 2023 reporting year: Lufthansa (including Lufthansa CityLine, Discover Airlines and Air Dolomiti), SWISS (including Edelweiss Air), Austrian Airlines, Eurowings, Brussels Airlines, and Lufthansa Cargo. Other flights and services performed by third parties are not included, as their performance is beyond Lufthansa Group's control. 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. <sup>2</sup> Based on freight tonne-kilometers transported in both cargo and passenger aircraft.

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**B.  
Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks**

Lufthansa Group determines its CO<sub>2</sub> emissions based on the Greenhouse Gas Protocol (GHG Protocol), which divides emissions into three main categories (Scopes).

The largest proportion of Lufthansa Group's CO<sub>2</sub> emissions are direct emissions (Scope 1) from its own operations. However, greenhouse gas emissions are also generated in other parts of the value chain. Lufthansa Group accordingly discloses Scope 1-3 emissions.

Lufthansa Group ensures that GHG Protocol values are externally audited on a yearly basis.

**Sustainability Fact Sheet 2023**, (p.21)

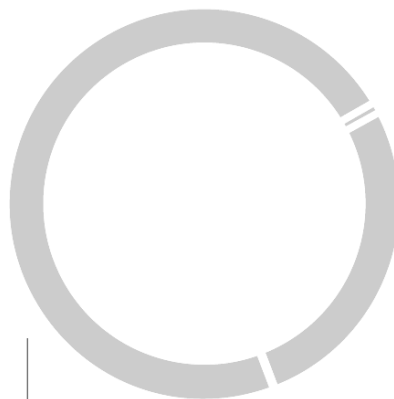
**CDP Report 2023**, C6.1, C6.3, C6.5, 10.1

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### DIRECT AND INDIRECT CO<sub>2</sub> EMISSIONS OF THE LUFTHANSA GROUP 2023



#### SCOPE 1

**72.5%**

26,822,114 tonnes CO<sub>2</sub>-eq

Direct carbon emissions from the Lufthansa Group's air traffic and ground vehicles as well as its own power generation facilities

#### SCOPE 2

**0.3%**

90,673 tonnes CO<sub>2</sub>-eq

Indirect carbon emissions from electricity/energy purchased for ground operations, including catering and maintenance

#### SCOPE 3

**27.2%**

10,062,778 tonnes CO<sub>2</sub>-eq

Other indirect carbon emissions from the supply chain and from purchased services – here primarily included emissions from the kerosene supply chain and from the manufacture of aircraft and engines

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### METRICS AND TARGETS

**C.**  
**Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets**

The Lufthansa Group supports IATA's emission reduction targets aimed at reducing net carbon emissions to zero by 2050 (net zero target). Lufthansa Group has set several targets combined with specific measures to reduce its climate related impact and to manage climate related risks and opportunities:

#### **Science Based Targets initiative (SBTi) validation**

The Lufthansa Group's carbon emissions reduction target was successfully validated by the SBTi in 2022. The Lufthansa Group has achieved SBTi validation, making it the first airline group in Europe to set a CO<sub>2</sub> reduction target that is scientifically robust and aligned with the objectives of the 2015 Paris Agreement. It ranks among the first three airlines globally to receive this endorsement for their reduction targets from the SBTi. Under the guidelines provided by the SBTi, Lufthansa has pledged to cut its carbon intensity—measured in carbon emissions per tonne-kilometre transported (covering both passengers and cargo)—by 30.6% from 2019 to 2030.

Over and above the reduction required by the SBTi targets, Lufthansa Group aims to achieve its self-imposed target of cutting net carbon emissions in half by 2030 compared to 2019 by means of voluntary offsets. The Lufthansa Group aims to be carbon-neutral by 2050.

**Lufthansa Group Annual Report 2023**, - Remuneration Report (p.278ff.)

**Annual Report 2023 (Combined non-financial declaration)**, - (p.81)

**CDP Report 2023**, C1.1a, C3.1, C12.1a, C12.3b



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### **Emission reduction targets are part of Executive Board remuneration**

Emission reduction targets are an element of long-term variable remuneration for the Executive Board of Deutsche Lufthansa AG. The Supervisory Board regularly defines an environmental target as focus of the strategic and sustainability targets.

For the 2023 financial year, the reduction of specific carbon emissions was incorporated into the long-term incentive (LTI) plan, aligned with the company's strategy. These reduction targets are calculated based on CO<sub>2</sub> emissions per tonne-kilometre, consistent with validated SBTi targets, and contribute 20% to the overall assessment of target achievement for LTI 2023.

### **Achieving carbon-neutral mobility on the ground**

Lufthansa Group aims to meet the milestone of switching to carbon-neutral mobility on the ground in its home markets by 2030 with electromobility or the use of other emission-free vehicles. The existing fleet of apron vehicles and company cars will be used more efficiently, and the targeted replacement of these vehicles with electric or other alternative drive systems.

In 2023, the Lufthansa Group expanded its vehicle purchasing and transition to carbon-neutral drive systems to include smaller locations in Berlin, Dusseldorf, Cologne, and Stuttgart, alongside the Group's major sites for its operational fleet.

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**The Lufthansa Group voluntarily compensates the carbon emissions from its own duty trips**

Since 2019, the Lufthansa Group has been offsetting the carbon emissions from all of its employees' duty flights globally. In 2023, 74,545 tonnes of CO<sub>2</sub> were compensated.

## **About this report:**

This report primarily contains information that have already been disclosed by Lufthansa Group (e.g., within its Annual Report 2023, the Fact Sheet Sustainability 2023 or as part of its CDP Climate reporting 2023). Under “Lufthansa Group Approach”, the Group has primarily taken information from these existing disclosures and supplemented them selectively with additional information to provide a more accurate picture of the current state of its efforts. Potential climate risks and opportunities have been further analyzed by conducting a qualitative and quantitative scenario analysis. Under “Further Disclosure”, Lufthansa Group references the key sources where the interested reader can find information relating to the specific TCFD recommendations within the Group’s disclosures.



## Editorial information

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[www.lufthansagroup.com/en/responsibility](http://www.lufthansagroup.com/en/responsibility)

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