

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

Lufthansa Group (LHG), headed by Deutsche Lufthansa AG is a leading European airline group with operations worldwide. It plays a leading role in its European home markets Germany, Austria, Belgium, Northern Italy and Switzerland. **It consists of the business segments Passenger Airlines, Logistics, MRO and Catering, as well as Additional Businesses and Group Functions.** In the financial year 2022, the LHG generated revenues of €32.8 bn, employed 109,509 employees (as of 31.12.2022) and operated 710 aircraft.

The **Passenger Airlines segment** comprises Lufthansa German Airlines, SWISS, Austrian Airlines and Brussels Airlines – which offer their customers a premium experience, with high-quality products and services – as well as Eurowings, which is positioned as a value carrier with an exclusive focus on point-to-point traffic. Lufthansa German Airlines also includes regional airlines Lufthansa CityLine and Air Dolomiti as well as Eurowings Discover. With their multi-hub strategy, the Passenger Airlines offer their passengers a premium, high-quality product and service, via their hubs in Frankfurt, Munich, Vienna, Zurich, Brussels and a comprehensive route network with an outstanding degree of travel flexibility. Eurowings including Eurowings Europe and the equity investment in SunExpress focuses on point-to-point connections via decentral bases.

Logistics: In addition to Lufthansa Cargo AG, the Logistics segment includes the airfreight container management specialist Jettainer group and the time:matters subsidiary, which specialises in particularly urgent consignments. The Heyworld subsidiary, which specialises in customised e-commerce solutions, and the investment in the airfreight company AeroLogic are also part of the segment.

MRO: Lufthansa Technik AG is the world's leading independent provider of maintenance, repair and overhaul services (MRO) for civilian commercial aircraft. Lufthansa Technik AG serves more than 800 customers worldwide, including OEMs, aircraft leasing companies and operators of VIP jets, as well as airlines.

Catering: The LSG Group offers a comprehensive range of products, concepts and services related to in-flight service as well as for other areas, such as retail and food producers. LSG Sky Chefs is a global food specialist with the highest hygiene and quality standards for airlines, the home delivery market and retail.

Additional Businesses and Group Functions include the Group's service and financial companies, above all AirPlus, Lufthansa Aviation Training and Lufthansa Systems as well as the Group functions for the LHG.

The business segments and the airlines are each under their own management. Overall coordination is by means of the Executive Board of the LHG and the Group Executive Committee, which consists of the members of the Executive Board of the LHG and the CEOs of the main companies. The Supervisory Board of Deutsche Lufthansa AG consists of 20 members - 10 shareholder representatives and 10 employee representatives.

The distribution of tasks undertaken by the **Executive Board of Deutsche Lufthansa AG** remained unchanged in the 2022 financial year. The Executive Board comprises six functions: The Chief Executive Officer of Deutsche Lufthansa AG, the Chief Officer Brand & Sustainability, the Chief Officer Global Markets & Network, the Chief Officer Fleet & Technology, the Chief Officer Human Resources & Infrastructure, and the Chief Financial Officer.

The LHG positions itself among the largest airlines in the world and assumes the role as the leading European airline group. In this role, the LHG aims to continue to play a part in actively shaping the global airline market. It strives to follow the mission statement: the LHG connects people, cultures and economies in a sustainable way. In doing so, it aspires to set standards in terms of sustainability and customer-friendliness. It 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 LHG. The safety of flight operations is and will always be the top priority.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data and indicate whether you will be providing emissions data for past reporting years.

Reporting year

Start date

January 1 2022

End date

December 31 2022

Indicate if you are providing emissions data for past reporting years

Yes

Select the number of past reporting years you will be providing Scope 1 emissions data for

2 years

Select the number of past reporting years you will be providing Scope 2 emissions data for

2 years

Select the number of past reporting years you will be providing Scope 3 emissions data for

2 years

C0.3

(C0.3) Select the countries/areas in which you operate.

Albania
Algeria
Angola
Argentina
Armenia
Austria
Azerbaijan
Bahrain
Barbados
Belarus
Belgium
Benin
Bosnia & Herzegovina
Brazil
Bulgaria
Burkina Faso
Burundi
Cabo Verde
Cameroon
Canada
Chile
China
Colombia
Costa Rica
Côte d'Ivoire
Croatia
Cuba
Cyprus
Czechia
Democratic Republic of the Congo
Denmark
Dominican Republic
Egypt
Estonia
Ethiopia
Finland
France
Gambia
Georgia
Germany
Ghana
Greece
Guam
Hong Kong SAR, China
Hungary
Iceland
India
Iraq
Ireland
Israel
Italy
Jamaica
Japan
Jordan
Kazakhstan

Kenya
Kuwait
Latvia
Lebanon
Liberia
Lithuania
Luxembourg
Maldives
Malta
Mauritius
Mexico
Micronesia (Federated States of)
Montenegro
Morocco
Myanmar
Namibia
Netherlands
New Zealand
Nigeria
North Macedonia
Norway
Panama
Philippines
Poland
Portugal
Puerto Rico
Republic of Korea
Republic of Moldova
Romania
Russian Federation
Rwanda
Saudi Arabia
Senegal
Serbia
Seychelles
Sierra Leone
Singapore
Slovakia
Slovenia
South Africa
Spain
Sri Lanka
Sweden
Switzerland
Thailand
Togo
Tunisia
Turkey
Uganda
Ukraine
United Arab Emirates
United Kingdom of Great Britain and Northern Ireland
United Republic of Tanzania
United States Minor Outlying Islands
United States of America
Uruguay
Venezuela (Bolivarian Republic of)
Viet Nam

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

EUR

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.

Financial control

C-TO0.7/C-TS0.7

(C-T00.7/C-TS0.7) For which transport modes will you be providing data?

Aviation

C0.8

(C0.8) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?

Indicate whether you are able to provide a unique identifier for your organization	Provide your unique identifier
Yes, an ISIN code	DE0008232125

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual or committee	Responsibilities for climate-related issues
Board-level committee	<p>Group Executive Board of Deutsche Lufthansa AG: In the reporting year 2022 the "Group Executive Board of Deutsche Lufthansa AG" has been responsible for reviewing the Group's climate related strategy, measures and target setting. The Executive Board also released a budget of USD \$250mn for securing Sustainable Aviation Fuels until 2024.</p> <p>Climate-related decisions within the last two years: 2021 The Board decided to confirm previous years targets - despite the COVID 19 crisis: <ul style="list-style-type: none"> • Reduce net CO₂ emissions by half in 2030 based on 2019 and to reach net zero CO₂ emissions in 2050. • 100% compensation of CO₂ emissions - starting in 2019 - for all business related flights of LHG employees • CO₂ neutral mobility on the ground by 2030 in Germany, Austria, Switzerland and Belgium • Carbon neutral electricity in 2021 for all LHG-buildings in Germany, Austria, Belgium and Switzerland. </p> <p>In November 2021, the Group Executive Board of Deutsche Lufthansa AG has decided to further specify its emission reduction targets, has made a commitment to science-based targets and submitted an application for validation of these reduction targets for 2030 in accordance with the Aviation Sector Guidance of the Science-based Targets Initiative (SBTi).</p> <p>2022 The Group Executive Board of Deutsche Lufthansa AG has decided to align LHG policies with SBTi criteria and committed to reducing its CO₂ intensity, i.e. its CO₂ emissions per transported tonne-kilometre (passenger and freight), by 30.6% from 2019 to 2030.</p> <p>The strategy and measures have been derived and prepared by the Head of Corporate Responsibility, direct report to the Executive Board member who is responsible for Brand & Sustainability in close cooperation with relevant management functions (e.g. the Head of "Corporate International Relations and Government Affairs" or the Head of „Corporate Strategy“).</p>
Chief Financial Officer (CFO)	<p>Since the implementation of the EU CSR Directive for the first time for the reporting year 2017 and also for this reporting year 2022 the Group's "Chief Financial Officer" had the final oversight of the annual report which includes the Non-financial declaration encompassing the climate / environmental strategy, climate-related risk assessment, organization, management, measures and targets. The Non-financial declaration is a part of the annual report and was subject to a voluntary audit with limited assurance in accordance with ISAE 3000 (revised) commissioned by the Audit Committee of the Supervisory Board. In 2021, the CSR content was updated to include mitigating instruments and measures. Furthermore, in 2021 LHG has reported according to the TCFD and SASB recommendations for the first time. These reports were also updated for the year 2022.</p>
Board-level committee	<p>Supervisory Board of Deutsche Lufthansa AG</p> <p>1. The "Supervisory Board" of the LHG reviews the entire LHG strategy of which climate /environmental issues are part of.</p> <p>2. Additionally, the "Audit Committee" of the LHG Supervisory Board reviews and audits the Non-Financial declaration in their scheduled meetings. Climate /environmental issues and climate risk assessment are part of the Non-Financial declaration.</p> <p>Decisions in 2021: The Lufthansa Supervisory Board has used emission reduction targets as an element of long-term variable remuneration for the Executive Board of Deutsche Lufthansa AG since 2011. Since the remuneration system was changed in 2019, the Supervisory Board has regularly defined an environmental target as one of the strategic and sustainability targets for the long-term variable remuneration (MVV), which accounts for 15% of target achievement for the MVV (see also the remarks in the remuneration report). As the economic situation remains tense, the Supervisory Board has suspended variable remuneration components for the Executive Board members for financial year 2021. In the spirit of good corporate governance, Executive Board members were nonetheless set specific targets for 2021 and the four-year period from 2021 to 2024. One focus of the long-term targets was again to reduce the fleet's specific CO₂ emissions per passenger-kilometre flown.</p> <p>At the meeting on 3 May 2021, the Supervisory Board approved the purchase of ten new, more fuel-efficient aircraft put into operation – including Airbus A220-300, A320neo and A321neo and Boeing 777F, all featuring modern engines.</p> <p>In 2021 the training event and the Supervisory Board meeting on 20 and 21 September 2021 were dedicated to the topics of sustainability and climate protection. An event devoted to environmentally relevant sustainability aspects took place in 2021, which was organised for the Supervisory Board together with the Executive Board of the LHG.</p> <p>Decision in 2022: In December 2022, the Supervisory Board decided to increase the share of the strategic and sustainability targets within long-term variable remuneration from 15% to 20% as of 2023 and to establish an ESG Committee with effect as of 1 January 2023. The purpose of this ESG Committee is to advise the Supervisory Board, its Committees and the Executive Board on issues of sustainable corporate governance and the Company's business activities in ESG areas.</p>
Chief Sustainability Officer (CSO)	<p>The Executive Board member in charge of Lufthansa Group's Brand & Sustainability function - the Chief Sustainability Officer (CSO) - is responsible for identifying and assessing the Company's climate-related risks and opportunities, strategy, metrics and target setting. Climate related issues are monitored at Executive Board meetings which take place mostly twice a month.</p> <p>Decision 2021: In Nov. 2021 the CSO signed the "SBTi Commitment Letter of Lufthansa Group" and confirmed that LHG committed to set science-based emissions reduction targets (near-term targets), in line with the SBTi Criteria and Recommendations, submit them to the SBTi for validation and publish our approved targets, all within a maximum of 24 months. The CSO has also decided to conduct a qualitative and quantitative climate scenario analysis for the LHG. The results were disclosed in LHG's TCFD report 2021 and 2022.</p>

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Scope of board-level oversight	Please explain
Scheduled – some meetings	<p>Reviewing and guiding annual budgets</p> <p>Overseeing major capital expenditures</p> <p>Overseeing acquisitions, mergers, and divestitures</p> <p>Overseeing and guiding employee incentives</p> <p>Reviewing and guiding strategy</p> <p>Overseeing and guiding the development of a transition plan</p> <p>Overseeing the setting of corporate targets</p> <p>Monitoring progress towards corporate targets</p> <p>Overseeing and guiding public policy engagement</p> <p>Reviewing and guiding the risk management process</p>	<Not Applicable>	<p>LHG Executive Board (EB) Meetings take place every two weeks. Climate-related issues were scheduled in 2022 at the agenda of the Group Executive Committee 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.</p> <p>The ESG strategy is reviewed annually and discussed with the Executive Board as part of the Strategic Roadmap Discussions. The focus during the reporting year was on the CO₂ mitigation pathway and supporting measures. The Group Executive Board meetings determined the focus and further development of sustainability-related activities within the Lufthansa Group. They are prepared in part by the Group Executive Committee (GEC), chaired by the Chairman of the Executive Board. The GEC 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 Group's Strategy and Communications departments.</p> <p>Furthermore the Chief Sustainability Officer of LHG was briefed on progress in relation to decisions taken by LHG on sustainability and climate change strategies by the Head of the Corporate Responsibility department on a monthly basis.</p> <p>Most relevant decision for climate related issues is the investment into new fuel efficient aircrafts. These decisions are taken by the Executive Board and approved by the Supervisory Board. In 2022, a total of 24 aircraft, including Airbus A320neos, A321neos, A350-900s, Boeing 787-9s and Boeing 777Fs, which are powered by modern engines went into service with the Lufthansa Group airlines. In turn, a total of 27 older aircraft were removed from the Group fleet. Another important decision of the EB was the clear commitment to the science-based targets of the LHG validated in 2022. The Executive Board receives regular reports on the degree of achievement of the target and the associated measures.</p> <p>The Group Policy Committee (GPC), chaired by the Chairman of the Executive Board, discusses politically significant issues, including those relevant to sustainability, and prepares decisions. Individual managers within the committees are responsible for implementing concrete activities and projects. The Sustainability Circle, headed by the Corporate Responsibility department, was established in 2021 and continued in 2022. Its objective is to promote a Group-wide dialogue on sustainability topics. The members of this committee are the Corporate Responsibility officers of the Group companies and relevant Group functions.</p>
Scheduled – some meetings	<p>Overseeing and guiding employee incentives</p> <p>Reviewing and guiding strategy</p> <p>Monitoring progress towards corporate targets</p>	<Not Applicable>	<p>"Supervisory Board "of the LHG:</p> <p>The environmental strategy as part of the corporate responsibility strategy is being reviewed annually by the Supervisory Board as part of the entire LHG Strategy. Strategy and environmental targets as well as major projects such as strategic plans concerning e.g. Fleet renewal and Sustainable Aviation Fuels are also being reviewed.</p> <p>In 2022, the Supervisory Board held two deep dive meetings on the ESG strategy. This was prepared and presented by the CSO. In addition, the Supervisory Board receives a quarterly update on ESG topics from the CSO.</p> <p>In December 2022, the Supervisory Board decided to increase the share of the strategic sustainability targets within long-term variable remuneration from 15% to 20% as of 2023.</p> <p>Effective 1st January 2023, the Supervisory Board established an ESG Committee to advise the Supervisory Board, its committees, and the Executive Board on environmental, social, and good governance issues that are essential to the sustainable economic development of the company. The ESG Committee will meet twice a year.</p>
Scheduled – some meetings	<p>Reviewing and guiding strategy</p> <p>Other, please specify (Recommends the acknowledgement of the non-financial report by the Supervisory Board)</p>	<Not Applicable>	<p>"Audit Committee" of the Supervisory Board and the " CFO" having reviewed and audited the Non-Financial declaration which encompasses also the climate / environmental strategy, risks, targets and measurement.</p>

C1.1d

(C1.1d) Does your organization have at least one board member with competence on climate-related issues?

	Board member(s) have competence on climate-related issues	Criteria used to assess competence of board member(s) on climate-related issues	Primary reason for no board-level competence on climate-related issues	Explain why your organization does not have at least one board member with competence on climate-related issues and any plans to address board-level competence in the future
Row 1	Yes	<p>Yes, within the Group Executive Board of Deutsche Lufthansa AG, the CEO and the Brand & Sustainability Board (CSO) have special competence on climate-related issues. The Head of Corporate Responsibility at LHG is a direct report to the CSO. Both the CEO and CSO regularly participate actively in climate-related events or panel discussions (e.g. Chief Sustainability Officer on a panel discussion on "Can the Sky Be Green? at the DLD Kongress 2022 in Munich (20.05.2022) and on World Aviation Festival in Amsterdam on the topic "How can we move aviation from being a process-centric industry to being more sustainable and customer centric?" (05.10.2022) or the CEO on a Roundtable on "The Transformation of the German Economy - Opportunities and Challenges" at the Federal Ministry for Economic Affairs and Climate Protection (15.02.2022) or at the F.A.Z. Kongress 2022 "Zwischen den Zeilen" (06.05.2022)</p> <p>Furthermore, within the Supervisory Board 3 out of 10 shareholder representatives have dedicated knowledge & experience in the field of climate and sustainability related issues. Criteria used to assess competence: Responsibility about climate issues within own company/organisation.</p> <p>Additionally, in 2021, a special training event of the Group Executive Board and the Supervisory Board on 20 and 21 September 2021 were dedicated to the topics of sustainability and climate protection.</p>	<Not Applicable>	<Not Applicable>

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Position or committee

Other committee, please specify (Executive Board)

Climate-related responsibilities of this position

Managing annual budgets for climate mitigation activities
Managing major capital and/or operational expenditures related to low-carbon products or services (including R&D)
Managing climate-related acquisitions, mergers, and divestitures
Providing climate-related employee incentives
Developing a climate transition plan
Integrating climate-related issues into the strategy
Setting climate-related corporate targets
Monitoring progress against climate-related corporate targets
Managing public policy engagement that may impact the climate
Managing climate-related risks and opportunities

Coverage of responsibilities

<Not Applicable>

Reporting line

Reports to the board directly

Frequency of reporting to the board on climate-related issues via this reporting line

More frequently than quarterly

Please explain

The ESG strategy is reviewed annually and discussed with the Executive Board as part of the Strategic Roadmap Discussions. The focus during the reporting year was on the CO₂ mitigation pathway and supporting measures. The Group Executive Board meetings determined the focus and further development of sustainability-related activities within the Lufthansa Group.

Position or committee

Other committee, please specify (Supervisory Board)

Climate-related responsibilities of this position

Providing climate-related employee incentives
Integrating climate-related issues into the strategy
Monitoring progress against climate-related corporate targets

Coverage of responsibilities

<Not Applicable>

Reporting line

Reports to the board directly

Frequency of reporting to the board on climate-related issues via this reporting line

Annually

Please explain

Supervisory Board of the LHG:
The environmental strategy as part of the corporate responsibility strategy is being reviewed annually by the Supervisory Board as part of the entire LHG Strategy. Strategy and environmental targets as well as major projects such as strategic plans concerning e.g. Fleet renewal, Sustainable Aviation Fuels are also being reviewed. In 2022, the Supervisory Board held two deep dive meetings on the ESG strategy. This was prepared and presented by the CSO. In addition, the Supervisory Board receives a monthly update on ESG topics from the CSO.

Position or committee

Other committee, please specify (Audit Committee)

Climate-related responsibilities of this position

Integrating climate-related issues into the strategy

Coverage of responsibilities

<Not Applicable>

Reporting line

Finance - CFO reporting line

Frequency of reporting to the board on climate-related issues via this reporting line

Half-yearly

Please explain

The Audit Committee of the Supervisory Board and the "CFO" have reviewed and audited the Non Financial declaration which encompasses also the climate / environmental strategy, risks, targets and measurement

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	Executive Board remuneration consists of fixed, performance-unrelated and performance-related variable components. The three main components are the base salary, the one-year variable remuneration (annual bonus) and the multi-year variable remuneration (long-term incentive, LTI). 15% of the target achievement of the annual bonus and the LTI is based on non-financial sustainability targets. The Supervisory Board specified the "Environment" parameter as a focus topic for the LTI targets. This provides a LTI for the target of reducing CO ₂ emissions and is based on the LHG's long-term strategy. Since 2022, the LHG's targets for reducing its CO ₂ emissions have been aligned with the "Science Based Targets" (SBT). The reduction target for the LTI 2022–2025 is based on the SBT target of a 30.6% reduction in specific CO ₂ emissions by 2030 by comparison with the 2019 base year. The LTI target is a 13 % point reduction by the end of the performance period on 31.12.2025.

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Entitled to incentive

Board/Executive board

Type of incentive

Monetary reward

Incentive(s)

Shares

Performance indicator(s)

Board approval of climate transition plan
Progress towards a climate-related target
Reduction in emissions intensity

Incentive plan(s) this incentive is linked to

Long-Term Incentive Plan

Further details of incentive(s)

Long-term variable remuneration:

To promote the long-term, sustainable development of the Company, the long-term variable remuneration, and therefore the majority of variable remuneration, depends on the achievement of long-term targets. Taking the absolute and relative share performance into account aligns the interests of Executive Board members closely with those of shareholders.

Long-term variable remuneration commitment 2022 (LTI 2022–2025)

Since financial year 2020, the long-term variable remuneration commitment for Executive Board members is share-based. At the beginning of the performance period, the Executive Board members receive a number of virtual shares corresponding to the value of the contractually granted target amount. The number of virtual shares is determined by reference to the average price of the Lufthansa share in the first 60 trading days after the four-year performance period begins. The average price for the LTI 2022–2025 is € 7.00.

The final number of virtual shares depends on the achievement of the financial performance targets Adjusted ROCE (42.5%) and relative total shareholder return (42.5%), as well as the non-financial strategic and sustainability targets (15%).

The Supervisory Board has specified the "Environment" parameter as a focus topic for the strategic and sustainability targets in the LTI 2022–2025. This provides a long-term incentive for the environmental target of reducing CO₂ emissions.

15% of the target achievement of the long-term incentive is based on the environmental target of reducing CO₂ emissions. The "Environment" sustainability target is based on the Lufthansa Group's long-term strategy. Since 2022, the Lufthansa Group's targets for reducing its CO₂ emissions have been aligned with the "Science Based Targets" (SBT). The reduction target for the LTI 2022–2025 is based on the long-term target of a 30.6% reduction in specific CO₂ emissions by 2030 by comparison with the 2019 base year. The target is a 13 percentage point reduction by the end of the performance period on 31 December 2025. The end points of the range are defined by a deviation of +/- 2 percentage points from the target. Interim figures are linearly interpolated.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan

The Supervisory Board has specified the "Environment" parameter as a focus topic for the strategic and sustainability targets in the LTI 2022–2025 for the executive board. This provides a long-term incentive for the environmental target of reducing CO₂ emissions. Linking the LTI to the verified SBT underpins the climate commitments and the climate transition plan of LHG.

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?

Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	0	1	The short-term time horizon for climate related risks is aligned with the financial time horizons.
Medium-term	1	3	The medium-term time horizon for climate related risks is aligned with the financial time horizons.
Long-term	3	10	The long-term time horizon for climate related risks is aligned with the financial time horizons . Furthermore, specific impacts of climate-related risks are discussed in special committees like for example the finance cockpit committee, which responsibility is to identify, assess, monitor and control major financial risks. In this committee the aspects of CORSIA and EU ETS and further regulations from the EU Green Deal / Fit for 55 such as ReFuel EU have been discussed for a 10 year time horizon. The mitigation path for realizing net zero CO ₂ emissions (SCOPE 1) in 2050 has been discussed with the Lufthansa Group Executive Board.

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

A **substantive financial or strategic impact** on our business is defined in our risk management process as follows: either the effect on EBIT/profit is more than €300 mn and the probability of occurrence is above 2%, or the effect on EBIT/profit is €150 mn and the probability of occurrence is above 30%. We consider any opportunity or risk to be of substantive strategic impact if it's materially affects Lufthansa Group's future business potential and, therefore, its valuation. This includes changes of future growth potential – e.g. due to changes of customer satisfaction, regulatory limitations, financing capabilities, etc. – as well as changes of future profitability (EBIT margin, ROCE) – e.g. due to changes of cost positions, capital efficiency, etc..

The methodological evaluation of risks having a substantive financial impact on LHG business within the **Enterprise Risk Management** at Lufthansa Group (LHG) distinguishes between qualitative and quantitative risks. Climate-related risks are updated and (re-)assessed on a quarterly basis. Financial impacts of climate-related risks are quantified if possible, otherwise they are described as qualitative risks.

Qualitative risks are long-term developments and challenges with potentially adverse consequences for the LHG. Qualitative risks are often identified in the form of weak signals. As specific information often is not available, these risks can either not be quantified precisely or not quantified at all. To evaluate them as systematically as possible, estimates are made about the probability of their occurrence and their significance. Significance describes the potential impact of the individual risk or development under consideration of the reputation, the business model or earnings of the LHG.

After evaluation, both the individual qualitative and quantitative risks are **divided into priority classes A, B, C and D to assess their materiality**. The thresholds for classifying the financial effects are defined centrally for the LHG according to standardized criteria.

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered

Direct operations
Upstream
Downstream

Risk management process

Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment

More than once a year

Time horizon(s) covered

Short-term
Medium-term
Long-term

Description of process

Risk management at LHG aims to fully identify material risks, to present and compare them transparently and to assess and manage them. Climate-related risks are integrated into LHG's multi-disciplinary company-wide risk management process. Risk owners are obliged to monitor and manage risks and opportunities proactively and to include relevant information in the planning, steering and control processes. The Group guidelines on risk management adopted by the Executive Board define all the binding methodological and organisational standards for dealing with risks.

Identification: The LHG has implemented a systematic Enterprise Risk Management (ERM) process at both Group level and at the level of larger Business Units within the LHG. The closed and continuous risk management process, which is supported by IT, begins with the identification of current and future, existing and potential risks from all material internal and external areas. The LHG defines opportunities and risks as the possible positive or negative deviations from a forecast figure or a defined objective. All identified risks are documented in the LHG's risk portfolio, which documents the systematic totality of all individual risks and constitutes the quality-assured result of the identification phase. As the risk landscape is dynamic and subject to change, the identification of risks is a continuous task for the risk owner.

Assessment:

The risks identified are assessed for plausibility and substantive financial or strategic impact (see C2.1b) by the companies' or LHG's risk owners with the support of the Risk Management coordinators. Therefore, all identified individual risks are measured according to uniform measurement principles. Risks are generally evaluated on a net basis i.e., taking implemented and effective management and monitoring instruments into account. A methodological distinction is made between qualitative and quantitative risks. Qualitative risks are mostly long-term developments with potentially adverse consequences for the LHG (e.g. chronic physical climate risks). Quantitative risks are those whose potential effect on earnings can be estimated. A distinction is made between different probabilities of occurrence. Regardless of the risk type, objective criteria or figures derived from past experience are used for the evaluation wherever possible. The individual qualitative and quantitative risks are divided into classes A, B, C, D and other risks to assess their materiality. All quantitative and qualitative A and B risks that are at least of a "substantial" significance and a "high" magnitude count as material risks for the LHG.

Risk owners are obliged at least once a quarter to verify that the risks for which they are responsible are complete and up to date. They also evaluate the extent to which circumstances involving risk have already been included in the forecast results and to what extent there are additional risks of achieving a better or worse result than the one forecasted. Identified climate related risks are assessed by the LHG ESG Team, in conjunction with the ERM team and the concerned department(s) (e.g. climate regulation risks with the regulatory affairs department) and by using calculated key indicators. The assessments should also include information on potential mitigation measures. Respective Group committees are being involved through consultation engagements and regular reporting.

Process for responding to climate related risks:

The Risk owners actively manage risks by means of risk mitigation instruments and measures. On this basis, the Executive Board (EB) is regularly informed about the current risk situation of the LHG and its business segments. The EB reports annually to the Audit Committee on the performance of the risk management system, the current risk situation of the LHG and on significant individual risks and their management. In the event of significant changes to previously or recently identified and assessed top risks, mandatory ad hoc reporting processes have been defined in addition to these standard reports.

Managers with budgetary and/or disciplinary responsibility are designated as risk owners. Their role is to implement risk management for their area. The identification, evaluation, monitoring and management of risks are therefore fundamental aspects of every management role.

The Supervisory Board's Audit Committee monitors the existence and the effectiveness of the LHG's risk management. The Risk Management Committee ensures, on behalf of the EB, that business risks are always identified at an early stage, evaluated and managed across all functions and processes. It is also responsible for improving the effectiveness and efficiency of risk management. Appointments to and the responsibilities of the committee are defined in internal regulations.

Case study - transition risks:

LHG has identified environmental regulation as a climate-related risk. Prominent examples include changes to existing regulations (e.g. EU ETS) and emerging regulations (e.g. ReFUEL EU Aviation) as risks, which are always included in our climate-related risk assessments. In order to better assess the effects of climate-related risks and opportunities on LHG's business, a targeted TCFD-aligned quantitative scenario analysis was finalized in 2022. The results of the analysis have been considered in strategic and financial decisions. Two selected climate scenarios developed by the International Energy Agency were chosen to assess the quantitative effects selected risks have on LHG's financial performance:

1. Well-below 2 degrees (~1.8°C),
2. Stated policies scenario (~2.7°C).

Further internal and external sources were used to analyze the effects on passenger and freight transport. The two hot spots that were subjected to quantitative analysis are:

1. Potential increase in operating costs due to rising CO₂ costs and increased use of SAF,
2. Potential change in market demand driven by higher ticket prices and subsidies for other modes of transport which could increase modal shift e.g., air transport to rail transport.

The analysis has shown that the dominant cost driver in both scenarios is the development of oil and SAF price, which exceed the costs for carbon emissions especially in the medium term. With regard to the quantitative impacts of changing transportation markets resulting from shifting demand patterns and subsidy structures, both climate scenarios show an increase in demand for passenger transportation. It has also shown that LHG'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 the quantitative scenario analysis confirm that LHG's strategic initiatives are suitable to minimize the respective risks and to create opportunities.

C2.2a

(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Air traffic within the EU is already part of the EU Emissions Trading Scheme EU-ETS, which has been associated with the Swiss Emissions Trading Scheme since the beginning of 2020 as well as the UK ETS regulation since the beginning of 2021. The periodic tightening of this regulation in conjunction with the price development of emissions allowances (from €9 per tonne CO ₂ in 2018 to around €100 per tonne CO ₂ in 2022) the relevance of this risk type is always included in LHG climate-related risk assessments. LHG publicly disclosed climate related regulatory risks in its 2022 Annual report (page 87). Besides the risk from increasing prices for carbon allowances, the ETS has two more concrete risks to LHG emission expenses: Reducing the emission cap and reducing the free allocation of allowances.
Emerging regulation	Relevant, always included	Because of the emerging climate regulations like the bundle of European Commission legislative initiatives to support the targets of the EU Green Deal initiative launched in 2020, which will potentially have a high financial cost impact on the LHG, the relevance of this risk type is always included in LHG climate-related risk assessments. The bundle is named "Fit for 55 package", i.e. a legislative proposal for a SAF mandate in Europe (2% in 2025, 6 % in 2030, 20% in 2035 and gradually to 70% in 2050), a legislative proposal to end the exemption of the energy tax for jet fuel and a reform of the EU ETS rules for aviation by gradually remove free emissions allowances for the aviation sector and to move to full auctioning of allowances by 2026.
Technology	Not relevant, included	In the frame of our defined time horizon for identifying and assessing climate-related risks (up to 10 years) we have not identified any technology related risks for the LHG. Technology risks will be industry-wide risks.
Legal	Relevant, always included	As a large company with global operations, potential legal issues are always in consideration in LHG's risk assessments, including climate-change related risk assessments. The potential for litigation could also affect LHG, by ways of adverse court decisions and the associated reputational damage. For example, in May 2022, the German Environmental Aid (DUH) is taking legal action against alleged misleading advertising promises claiming that products are "climate neutral". To this end, the environmental and consumer protection association has initiated legal proceedings against initially eight companies. Same happens in the Netherlands: Environmental groups took legal action in May 2022 against an airline that, according to the claimants, was misleading the public about the sustainability of flying. As climate-change focused litigation increases around the world, failure to monitor and prepare for potential legal risks could cause reputational and financial damage to the LHG.
Market	Relevant, always included	In the frame of our defined time horizon for identifying, and assessing climate-related risks (up to 10 years) we have identified the following market risks for the LHG.: - Market price risks for emission allowances - SAF prices and SAF sourcing (presently an oligopolistic market) - higher competition on market for voluntary carbon offsets - Competition impact due to emission regulations, especially on intercontinental competition.
Reputation	Relevant, always included	Any negative impact on brand perception has the potential to have impacts on the ability to hold customers or to attract new customers, to form partnerships and community relations and as well on institutional investors. This could result in a) reduction in passenger/customer preferences and therefore could have impacts on revenue and b) in a downgrading by rating agencies. Aviation has been identified as a "hard to decarbonize" industry with a growing carbon footprint. Public concern about climate change and negative perception about the aviation industry may lead to increased calls for operating restrictions or financial penalties and brand damage to airlines. To identify potential reputational environmental/climate risks, LHG is regularly conducting broad stakeholder surveys on sustainability topics such as materiality analysis. The responses of the stakeholders are combined with top management's assessments in a materiality matrix, which is also taken into account for material topics reported in the Non-financial statement and LHG sustainability factsheet. This matrix regularly serves LHG as the base from which to advance the strategic development of corporate responsibility management (including climate topics). The next broad stakeholder survey in the context of the materiality analysis is intended to be held in 2023 - postponed due to COVID-19 and major changes with upcoming EU CSRD and ESRS and their definition of materiality. Furthermore, LHG is monitoring relevant media reporting on climate and aviation related topics to identify potential reputational risks for the LHG and its subsidiaries.
Acute physical	Relevant, always included	Acute physical risks like isolated extreme weather events (e.g. cyclones, hurricanes, or floods) don't have the potential to jeopardize LHG business, because LHG focuses on diversifying its operations through a global network. Those effects will usually have a larger impact on ground operation but might also affect flight operation. Individual destinations and flight routes or regions could be affected. LHG is constantly improving its weather forecasting capabilities and works closely with meteorological organizations like the "Deutsche Wetterdienst" and research facilities around the world in order to improve climate and weather forecasts by more intensively using aircraft-based weather information. During the flight, LHG pilots are using the so called newly developed "Enroute Weather Display" which has the most accurate data e.g. for turbulence areas.
Chronic physical	Not relevant, included	In the frame of LHG's defined time horizon for identifying and assessing climate-related risks (up to 10 years) LHG has not identified chronic physical related risks for the LHG. Nevertheless, LHG has included chronic physical risks in its assessment, as these climate change risks include changes in average temperature, changes in average precipitation and sea level rise on a time horizon of more than 10 years, which may have an impact on LHG's flight operations, as well as changes in consumer preferences, which may affect demand for LHG's travel services. For example, a rise in the average temperature in the Mediterranean region may mean that traditional holiday destinations in this region, which are regularly served by the LHG, are no longer attractive destinations due to the high summer temperatures. Moreover sustained heat or stronger wind events (e.g. changes in jet stream) may increase LHG's operating costs (delays, fuel/emissions cost, cooling, maintenance). LHG can manage these risks by adjusting flight plans, better forecasting and appropriate preparation. Indirectly, engagement in research projects and initiatives as well as our CO ₂ reduction target and related measures also contribute to limiting the chronic physical risks of climate change.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Current regulation	Carbon pricing mechanisms
--------------------	---------------------------

Primary potential financial impact

Increased direct costs

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

Risk of cost increase incurring from tightening of rules and induces carbon price changes in the EU Emissions Trading Scheme (ETS) regulation as part of the Fit for 55 legislative package presented by the EU Commission in summer 2021. Out of a total of 13 legal initiatives of this package, three are particularly relevant for aviation: the reform of emissions trading (EU-ETS), the mixing quota for sustainable aircraft fuel (ReFuel EU Aviation) and the proposal to introduce a kerosene tax (energy tax

directive). Subject to formal adoption, the co-legislators European Parliament and European Council agreed in December 2022 to gradually reduce the total number of emissions certificates and abolish the previous partly "free" allocations completely from 2026. This will make feeder traffic by European airlines more expensive and entails the risk of an increasing displacement of long-haul connections to hubs outside Europe, which will further distort competition between EU airlines and their competitors from the Middle East. In 2022 LHG has emitted around 7.4 mn tonnes of CO₂ on flights within the European Economic Area (EEA), which corresponds to a share of around 32 % of total emissions of LHG in this year. The EU-Allowance's (EUA) price per tonne of CO₂ has increased from around €25 at the end of 2019 up to around €100 in 2022. It is expected that costs for EUA's will further increase in future due to an increased scarcity of available offsetting allowances. Increased emission costs negatively affecting LHG's result and can also cause a decline in demand and reduce revenue from European flights if the costs are passed through to customers.

Time horizon

Medium-term

Likelihood

Very likely

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

1175000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The above mentioned potential financial impact figure is estimated for the year 2030 (description below) and these costings are provided only as an illustration of how the financial impacts may be calculated. It should not be interpreted as a definitive projection of the LHG's financial risk or future financial performance. The approach to calculate the figure is based on the revision of the EU Emissions Trading System (EU ETS) rules on aviation in the EU, which will phasing out free allowances for the aviation sector by 2026. As a result, the LHG will have to purchase CO₂ emission allowances (EUA) for all flights covered by the EU ETS (intra EU/EEA) in 2030. We assume at this point that the Swiss ETS and the UK ETS will adopt these regulations. The calculated value is therefore dependent on the development of LHG's absolute CO₂ emissions within the EU and the EUA price per t CO₂ in 2030.

Formula for calculate the financial impact figure: $x \cdot y = z$:

Scenario for

x. Estimated EU ETS allowance relevant CO₂ emissions of the LHG in 2030.

y. Estimated cost of EU allowances (price per tonne of CO₂)

z. Financial impact figure

Scenario for x:

In this scenario we assume growth of the EU ETS relevant CO₂ emissions of the LHG by 3 % per anno between 2022 and 2030. The emissions of the LHG that fall under the EU ETS rules are thus 9,4 mn tonnes in 2030.

Scenario for y:

The prices for EUA in 2022 were in the meantime close to €100. In the calculation used here, a price of €125 /t CO₂ is used for the year 2030.

Calculation for z:

Estimated EUA's LHG in 2030 (x) * Estimated price per EUA in 2030(y) = Estimated financial impact of EU ETS for LHG in 2030 (z). This equals to 9,400,000 t CO₂ * €125 /t CO₂ = €1,175,000,000

Cost of response to risk

21284000000

Description of response and explanation of cost calculation

The cost calculation covers the period 2023 to 2030.

The above risk response costs are made up of the two levers that are by far the most cost-intensive and at the same time the most climate (cost)-effective: fleet renewal and the use of SAF.

Cost calculation formula is:

Costs fleet renewal up to 2030 (x) + costs SAF supply up to 2030 (y) = Cost for response to risk (z)

Scenario for x (Fleet renewal):

In 2022 24 new, more fuel-efficient aircraft put into operation which are up to 25% more fuel efficient than the predecessor models. In turn, a total of 27 older aircraft were removed from the Group fleet. At year-end 2022, there were 174 aircraft on the LHG's order list until 2030. Order commitments for aircraft and reserve engines amount to €15.8bn.

Scenario for y: SAF.

In order to safeguard the supply of SAF in the long term, LHG has developed a three-pronged strategy: 1. In the short term, up to €234mn has been released for the procurement of SAF. 2. In the medium term, options for long-term supply commitments are under consideration around the world. These offer significant production volumes and security of supply from around 2025 onwards. Letters of intent were signed with fuel suppliers in the reporting year to provide up to 2.5 mn tonnes of sustainable fuels for LHG between 2025 and 2030. The additional costs for SAF compared to fossil kerosene calculated with €2100 per ton in 2022. 3. In the long term, the LHG will provide support for innovative supply concepts with the goal of transforming today's start-ups and developers into tomorrow's suppliers. In developing SAF, LHG focuses on synthetic kerosene based on waste materials, ligneous biomass and renewable electrical energy (power-to-liquid – PtL) as well as on research into the direct use of sunlight for fuel synthesis. In the reporting year, SWISS has acquired a financial interest in Swiss-based technology company Synhelion in a further step to help bring solar fuels to market.

This adds up to: 234,000,000 + (2,500,000 * 2,100) = €5.484 bn .

In total (z): €15.8 bn + €5.484 bn = €21.284 bn

Comment

We also refer to this regulatory risks in our Annual Report 2022 (p. 80, 87f., 102f.)

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Opp1

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Resource efficiency

Primary climate-related opportunity driver

Use of more efficient modes of transport

Primary potential financial impact

Reduced direct costs

Company-specific description

The LHG is constantly working on improving its specific fuel consumption and CO₂ emissions.

Fleet renewal remains the key driver for reducing CO₂ in the medium and long term. Lufthansa Group continuously invests (approx. €2.0bn annually until 2030) in modern, fuel-efficient aircraft and engine technologies, which represent the most important element in reducing CO₂ emissions from flight operations. In 2022, the LHG took delivery of 24 new aircrafts which are up to 25% more fuel efficient than the predecessor model. In turn, a total of 27 older aircraft were removed from the Group fleet. At year-end 2022, there were 174 aircraft on the Lufthansa Group's order list until 2030. The continuous fleet renewal reduces LHG's climate impact and has also an impact on operating costs by reducing fuel cost and carbon compliance costs under the EU ETS and global CORSIA schemes, as captured in the risk calculations (see C2.3). In addition, competitive advantages can be gained as a fuel- and CO₂-efficient fleet not only reduces operating costs, but also brings reputational gains.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

612000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The above mentioned potential financial impact figure is estimated for the year 2030 (description below) and these savings are provided only as an illustration of how the financial impacts may be calculated. It should not be interpreted as a definitive projection of LHG's financial opportunity or future financial performance. The approach used for the calculation is based on the fuel and CO₂ efficiency improvements of new aircraft. The financial impact in 2030 was calculated.

The following assumptions were used as a basis for the calculation:

- Number of aircraft and transport performance of LHG in 2030 is identical to 2022.
- Costs per tonne of kerosene in 2030 are identical to 2022.
- Costs of emissions allowances (per tonne of CO₂) in 2030 are €125.
- 174 new aircraft in LHG fleet in 2030 (24.5% of total number of LHG aircraft).
- The new aircraft are up to 25% more fuel-efficient and thus CO₂-efficient than their predecessors.

This calculation does not take into account the financial impact of a gradual increase in the SAF blend ratio, which is intended to be introduced as part of the implementation of the EU Fit for 55 package. The financial impact of these opportunity will vary strongly, depending on factors like the fossil jet fuel price and also SAF market price in different regions, both of which are subject to significant variability, so this figure is for illustrative purposes only.

Calculation formula financial impact of opportunity in 2030:

Financial impact = (cost of jet fuel in 2022/2030 * share of new aircraft in LHG fleet in 2030 * improvement in fuel efficiency of new aircraft) + (CO₂ emissions in 2022 * cost per tonne of CO₂ allowances * share of new aircraft in LHG fleet in 2030 * improvement in CO₂ efficiency of new aircraft

(€7.1 bn * 0.245 * 0.25) + (23.1 mn * €125 * 0.245 * 0.25) = €435 mn + €177 mn = €612 mn

Cost to realize opportunity

15800000000

Strategy to realize opportunity and explanation of cost calculation

The cost calculation to realize the opportunity covers the period 2023 to 2030.

LHG has set ambitious climate protection targets to mitigate its climate change impact as well as to reduce the cost related to the climate change risks. It is striving to lower its net CO₂ emissions to half of 2019 levels by 2030 and is seeking to be carbon-neutral by 2050. Furthermore, LHG has aligned its carbon reduction pathway with the targets of the Paris Climate Agreement. These LHG target by 2030 was validated from SBTi in August 2022.

The cost calculation to realize the opportunity covers the period 2023 to 2030 and are made up of the lever which is by far the most invest-intensive and at the same time the most climate (cost)-effective: fleet renewal. Lufthansa Group continuously invests (approx. €2.0 bn annually until 2030) in modern, fuel-efficient aircraft and engine technologies, which represent the most important element in reducing CO₂ emissions from flight operations.

Cost calculation formula is:
Invest in fleet renewal up to 2030 (x) = z (Cost to realize opportunity).

Scenario for x:
At year-end 2022, there were 174 aircraft on the Lufthansa Group's order list until 2030. Order commitments for aircraft and reserve engines amount to €15.8bn (see also Annual report 2022, page 198).

Comment
We also refer to this opportunity in LHG Annual Report 2022, Sustainability Factsheet 2022 and TCFD Report 2022

C3. Business Strategy

C3.1

(C3.1) Does your organization's strategy include a climate transition plan that aligns with a 1.5°C world?

Row 1

Climate transition plan
Yes, we have a climate transition plan which aligns with a 1.5°C world

Publicly available climate transition plan
Yes

Mechanism by which feedback is collected from shareholders on your climate transition plan
We have a different feedback mechanism in place

Description of feedback mechanism
The LHG net zero target for 2050 is consistent with 1.5°C and the Paris Agreement. The carbon intensity target for 2030 is aligned with the "well below 2°C" target and verified by the SBTi. The LHG Executive Board and Supervisory Board approved these targets in 2021 and the corresponding LHG transition plan and are regularly informed about the current implementation status. In addition, LHG maintains an ongoing dialogue with its shareholders, politicians and other stakeholders to discuss the goals and measures taken. Where appropriate, updates on sustainability are included in the Group's quarterly results presentations and published on the Lufthansa Group's Web pages. In 2022, LHG was the first airline group in Europe whose reduction targets were verified by SBTi.

Frequency of feedback collection
More frequently than annually

Attach any relevant documents which detail your climate transition plan (optional)
<https://www.lufthansagroup.com/media/downloads/en/responsibility/LH-TCFD-Report-2022.pdf> , p. 14-21 +++++ https://investor-relations.lufthansagroup.com/fileadmin/downloads/en/presentations/2303_ESG_Investor_Presentation.pdf , p. 9-14

Explain why your organization does not have a climate transition plan that aligns with a 1.5°C world and any plans to develop one in the future
<Not Applicable>

Explain why climate-related risks and opportunities have not influenced your strategy
<Not Applicable>

C3.2

(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?

	Use of climate-related scenario analysis to inform strategy	Primary reason why your organization does not use climate-related scenario analysis to inform its strategy	Explain why your organization does not use climate-related scenario analysis to inform its strategy and any plans to use it in the future
Row 1	Yes, qualitative and quantitative	<Not Applicable>	<Not Applicable>

C3.2a

(C3.2a) Provide details of your organization’s use of climate-related scenario analysis.

Climate-related scenario		Scenario analysis coverage	Temperature alignment of scenario	Parameters, assumptions, analytical choices
Transition scenarios	IEA SDS	Company-wide	<Not Applicable>	<p>Lufthansa Group (LHG) has been signatory to the TCFD since 2021 and has followed the recommendations to conduct both a qualitative and quantitative scenario analysis. The qualitative scenario analysis preceded the quantitative one.</p> <p>LHG has considered two contrasting scenarios from the IEA ETP 2020, the - the Sustainable Development Scenario (SDS) - the Stated Policies Scenario (STEP).</p> <p>LHG has identified these scenarios to offer well described and plausible climate scenarios that provide two contrasting cases against which to test potential impacts on LHG business.</p> <p>The scenarios use concrete assumptions such as global GDP growth, population developments, the relative use of different energy sources (renewables vs fossil), CO₂ price development and the penetration of SAFs in air traffic to model energy systems and industries consistent with the respective underlying level of global warming.</p> <p>These scenarios were linked to hot spots defined by the LHG and corresponding parameters of a previously created qualitative scenario heatmap, which have identified transition risks currently as the most relevant risks for the LHG. The LHG’s climate goals adopted in 2021 (for 2030 and 2050, with 2019 as the base year) were defined as time frames. Several further internal and external sources were also used (e.g. fuel procurement quantities, the development of the average fuel consumption per tonne kilometre, operational cost structure, sales / revenue volume, assumptions on customer price sensitivity as well as fuel and carbon prices, internal climate/emissions risk assessments), to analyse the effects on passenger as well as on freight transport. The two hot spots that were subjected to quantitative analysis are: 1. A potential increase in operating costs due to rising CO₂ and increased use of sustainable aviation fuels (SAF) and 2. A potential change in market demand driven by higher ticket prices (from hot spot 1) and subsidies for other modes of transport which could increase modal shift e.g. to rail.</p> <p>Important parameters relevant for the quantitative results were e.g. CO₂ and oil price development. Basic macroeconomic factors affecting transport demand were also included in the analysis. Likewise, technological assumptions relevant to the quantitative results such as continuous fleet modernisation and increasing SAF quotas were considered. By calculating external costs, different impact categories can be compared, and their relative relevance can be assessed.</p>
Transition scenarios	IEA STEPS (previously IEA NPS)	Company-wide	<Not Applicable>	<p>Lufthansa Group (LHG) has been signatory to the TCFD since 2021 and has followed the recommendations to conduct both a qualitative and quantitative scenario analysis. The qualitative scenario analysis preceded the quantitative one.</p> <p>LHG has considered two contrasting scenarios from the IEA ETP 2020, the - the Sustainable Development Scenario (SDS) - the Stated Policies Scenario (STEP).</p> <p>LHG has identified these scenarios to offer well described and plausible climate scenarios that provide two contrasting cases against which to test potential impacts on LHG business.</p> <p>The scenarios use concrete assumptions such as global GDP growth, population developments, the relative use of different energy sources (renewables vs fossil), CO₂ price development and the penetration of SAFs in air traffic to model energy systems and industries consistent with the respective underlying level of global warming.</p> <p>These scenarios were linked to hot spots defined by the LHG and corresponding parameters of a previously created qualitative scenario heatmap, which have identified transition risks currently as most the relevant risks for the LHG. The LHG’s climate goals adopted in 2021 (for 2030 and 2050, with 2019 as the base year) were defined as time frames. Several further internal and external sources were also used (e.g. fuel procurement quantities, the development of the average fuel consumption per tkm, operational cost structure, sales / revenue volume, assumptions on customer price sensitivity as well as fuel and carbon prices , internal climate/emissions risk assessments), to analyse the effects on passenger as well as on freight transport. The two hot spots that were subjected to quantitative analysis are: 1. A potential increase in operating costs due to rising CO₂ and increased use of sustainable aviation fuels (SAF) and 2. A potential change in market demand driven by higher ticket prices (from hot spot 1) and subsidies for other modes of transport which could increase modal shift e.g. to rail.</p> <p>Important parameters relevant for the quantitative results were e.g. CO₂ and oil price development. Basic macroeconomic factors affecting transport demand were also included in the analysis. Likewise, technological assumptions relevant to the quantitative results such as continuous fleet modernisation and increasing SAF quotas were considered. By calculating external costs, different impact categories can be compared, and their relative relevance can be assessed.</p>

C3.2b

(C3.2b) Provide details of the focal questions your organization seeks to address by using climate-related scenario analysis, and summarize the results with respect to these questions.

Row 1

Focal questions

The focal questions to be addressed by the qualitative and quantitative climate scenario analysis were:

1. What are the most relevant climate risks and opportunities for the LHG and which impacts on LHG business could they potentially have?
2. Is the LHG sufficiently well positioned to identify potential risks and opportunities at an early stage and to counter them?

For this purpose, at the beginning of 2021, LHG has carried out - together with an independent, professional consulting agency – a qualitative climate-related scenario analysis based on the IEA SDS Scenario. This analysis resulted in a climate risk & opportunities heatmap which showed that the transition risks currently have the highest potential to influence Lufthansa's business. In the course of a subsequent quantitative scenario analysis, two hotspots were filtered out of this heatmap. These two hotspots were then subjected to a detailed examination on the basis of the two IEA scenarios mentioned in C3.2a (SDS and STEP) in order to a.) evaluate whether and how the scenarios can influence LHG's business and b.) analyse whether LHG's current climate strategy is able to recognise the identified risks and opportunities in time and to minimize the identified risk and/or maximize the opportunities. From LHG's point of view, the two selected IEA scenarios were particularly suitable because they offer well-described and plausible climate scenarios by using concrete assumptions such as global GDP growth, population developments, the relative use of different energy sources (renewables vs fossil), CO₂ price development and the penetration of SAFs in air traffic to model energy systems and industries consistent with the respective underlying level of global warming. This made it possible to present a spectrum of potential risks that was as broad as possible, but also as realistic as possible, on the basis of which possible effects on the LHG business could be estimated and were thus suitable for providing an answer to the two focus questions.

Results of the climate-related scenario analysis with respect to the focal questions

With respect to the focal question on relevant risks and potential impact, the analysis has shown, that transition risks are the most relevant risks for LHG. The dominant cost driver in both scenarios is the development of oil and SAF price, which exceed the costs for carbon emissions especially in the medium term.

In the SDS (1.8°C) scenario, which is based on an ambitious decarbonisation pathway, the costs associated with this decarbonisation increase significantly by 2050.

However, assuming no regulatory interference in market pricing, oil prices decrease because of lower general market demand in this scenario. SAF shares increase to almost 50% by 2050. In sum, these effects could lead to only a slight increase in OPEX in the medium-term for the passenger fleet of the LHG. The long-term effects on OPEX are remaining insignificant.

In the STEP (2.7°C) scenario, CO₂ prices rise more slowly. However, higher demand for crude oil in this scenario means that fuel costs increase potentially inducing a significant increase in OPEX both in the medium and long term.

In both scenarios, the global demand for passenger transportation volume increases with global population and economic growth (especially in economically developing regions). In this model a homogeneous implementation of CO₂ prices across regions and sectors was assumed. The risks related to regional differences in policy approaches and the related distortion of competition therefore exists and should be examined more closely in a further analysis.

With regard to the quantitative impacts of changing transportation markets resulting from shifting demand patterns and subsidy structures, both climate scenarios show an increase in demand for passenger transportation. In the 2.7°C scenario, less emphasis is put on the extension of regional rail networks and subsidy structures for alternatives to air transport compared to the 1.8°C scenario. Thus, higher demand increase can be expected in the 2.7°C scenario.

Both the qualitative and quantitative scenario analysis showed that LHG'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 focal question 2). Some of its key strategic initiatives are the following:

- Investing in fuel-efficient aircraft,
- Increasing the use of sustainable aviation fuel,
- Expansion of intermodal traffic,
- Strengthen innovation & research.

The results of the quantitative scenario analysis confirm that LHG's strategic initiatives (see above) are suitable to minimize the respective risks and to create opportunities. Nevertheless, to further improve the resilience of LHG's strategy, measures to strengthen and more closely integrate risk management and strategic planning were identified and discussed. In the next step, LHG will incorporate the most relevant aspects into the established risk management and financial planning structures.

C3.3

(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	<p>LHG recognizes a steadily growing stakeholder interest in reducing GHG emissions from aviation as a climate-related risk. In order to minimize this risk over the next 2 to 5 years and to develop potential opportunities (see C2.3a and C2.4a), LHG has firmly integrated sustainability and climate protection into its corporate strategy and has defined and initiated several measures / mitigation activities. Below are some key strategic decisions made in the last years focusing on product and service:</p> <p>In 2020: Launch of the "Corporate Value Fares" program: CO₂ emissions from intra-EU and domestic air travel by business customers are automatically offset.</p> <p>In 2021: - Integration of COMPENSAID into all booking platforms of the LHG network airlines. COMPENSAID is a carbon offset tool (launched by LHG in 2019) and the world's first opportunity for customers to purchase Sustainable Aviation Fuel (SAF) through LHG to directly reduce their carbon footprint, regardless of whether they fly with LHG airlines or with other airlines. They also have the option of purchasing a combination of SAF and CO₂ offset projects. - Logistics: Launch of "Sustainable Choice" product by Lufthansa Cargo. Customers now can offset individual shipments through a portfolio of climate protection projects or reduce CO₂ in combination with SAF. Additionally offer of a "Bulk Agreement" that allows large quantities of SAF to be used to reduce CO₂.</p> <p>In 2022: - All passenger airlines of LHG have established the option of CO₂ offsetting directly when booking flights. In addition, start of in-flight CO₂ offsetting offers. - Successful launch of a new, "green" fare in the Scandinavian market, which for the first time integrate carbon offset in the price by using SAF and offsetting CO₂ emissions. Board decision to extend this fare offer to other markets in 2023. - Intermodal transport (train/bus) offers to LHG hubs are being expanded. This enables a lower number of shorthaul flights and alternative ways for reaching hubs. In 2022 the cooperation with Schweizer Bundesbahnen (SBB) was expanded to include six destinations in Switzerland. - Deutsche Bahn joined the Star Alliance (SA), making it the world's first intermodal partner in an air transport alliance. This will enable more than 220 daily joint services between Frankfurt Airport and 24 short-haul destinations to also be used by SA partners.</p>
Supply chain and/or value chain	Yes	<p>With reference to the supply chain, the activities of LHG's suppliers could pose risks in terms of new climate-related regulations, which affect their costs in the next 1-5 years. It could also have impact on LHG's access to capital, if investors begin to allocate funds on the basis of which companies are reducing their scope 1-3 emissions. In order to minimise this risk and, where appropriate, to develop potential opportunities (see C2.3a and C2.4a), the LHG has firmly integrated sustainability and climate protection into its corporate strategy, defined and introduced several measures / mitigation activities. In doing so, the LHG increasingly considers the entire value chain of its business activities. The following are some important strategic decisions with focus on supply chain:</p> <ul style="list-style-type: none"> - 2019: Introduction of a "Supplier Code of conduct" with ESG focus. - 2021: Realization of a complete initial screening of 100% of suppliers for ESG risks. - 2022: 1.) LHG filtered out the suppliers with the potentially highest ESG risks and started to create an action plan to minimize and monitor these ESG supply chain risks. 2.) Start with the creation of a tool that can be used to calculate the Scope 3 emissions of the various purchased products and services of suppliers based on the purchase value. 3.) LHG's emissions reduction target for 2030 validated according to the strict requirements of SBTi. This validated target includes direct (Scope 1) CO₂ emissions from the combustion of kerosene, as well as emissions from the upstream kerosene supply chain (well-to-tank, Scope 3). The SBTi target is now part of the corporate strategy. All relevant investment decisions have since been reviewed to determine their impact on achieving the SBTi target. It was also integrated into variable remuneration of LHG Board, thus once again underlining the clear commitment to achieving this corporate goal. 4. Most relevant strategic decision for climate related issues within the supply chain is the investment into new fuel efficient aircrafts. In 2022, the LHG took delivery of 24 new aircrafts which are up to 25% more fuel efficient than its predecessor model. In turn, a total of 27 older aircraft were removed from the Group fleet. At year-end 2022, there were 174 aircraft on the Lufthansa Group's order list until 2030. There are also options to buy a further 58 aircraft.
Investment in R&D	Yes	<p>LHG recognises that innovation and R&D will be crucial to our decarbonisation efforts over a timeframe to 2050. Investments in R&D and the ability to use SAF and new technologies, will reduce the climate related risks (e.g. compliance cost under existing and emerging climate regulations) and increases the chance to reach competitive advantage. LHG has firmly integrated sustainability and climate protection into its corporate strategy. The following are some important strategic decisions with focus on investment in R&D and innovation:</p> <p>End of 2021, LHG launched the Clean-Tech Hub (CTH). Via the CTH, the latest technologies are being pooled and sustainable innovations developed in the field of climate protection. These relate to the following five core areas: Alternative Fuels and Emissions, Aircraft Hardware, Digital Solutions and Processes, Waste and Circular Economy, and Mobility of Tomorrow and Beyond.</p> <ul style="list-style-type: none"> - LHG is involved in various SAF projects and alliances and looks globally for sourcing opportunities. Some examples: <ul style="list-style-type: none"> o in 2019 LHG closed a Lol with Heide refinery to support the development of Power-to-liquid (PtL) technology for sustainable jet fuel. Heide refinery shall supply LHG with SAF from 2024 of 5% for LHG flights from Hamburg. o in 2021 the climate protection organization Atmosfair inaugurated the world's first production plant for PtL-jet fuel from water, CO₂ and renewable electricity. LHG will be the first customer of this completely CO₂-neutral kerosene. o in 2022 SWISS has invested in Synhelion company to helping accelerate the process of bringing solar fuels to market. - LHG is partnering with universities (e.g. KIT, RWTH Aachen) and research institutes (e.g. DLR) in climate research projects. For more than 20 years LHG aircrafts has been collecting data for research projects (e.g. IAGOS, CARIBIC) to better understand climate change. - Lufthansa Technik cooperates with BASF Coatings GmbH and Airbus to develop a film that resembles the structure of Sharks Skin as their microstructure reduces the frictional resistance which can save up to 3% of fuel. SWISS and Lufthansa Cargo will adopt the coating on its aircrafts as launching "customers" in 2023. - in 2022 Lufthansa Technik presented its Hydrogen Aviation Lab, Hamburg's new functional laboratory for the testing of maintenance and ground processes for future hydrogen-powered aircraft.
Operations	Yes	<p>Jet Fuel emissions represents 99 % of LHG Scope 1 & 2 emissions. Climate-related regulatory risks lead to increasing compliance costs (e.g. EU Allowance's price of CO₂ at EU ETS has increased from around €25 in 2019 to around €100/t at the end of 2022 - see also C2.3a). A further tightening of the EU ETS regulation is to be expected (e.g. decreasing of free allowances) and thus further increase of the operational costs for LHG. Besides this, the climate targets of LHG until 2030 and 2050 are based, among other things, on continuous efficiency improvements of the operation. Efficient flight operation e.g. by intelligent route planning, modern approach procedures, weight reduction or the operation of innovative technology, helps to reduce costs, to reach climate targets and therefore also offer the opportunity of a competitive advantage and thus influence LHG strategy. The following are some important strategic decisions within the LHG with focus on operations:</p> <p>In 2022, LHG implemented and monitored a total of 24 fuel-saving projects. This enabled another 33 thousand tonnes of CO₂ emissions permanently to be eliminated in 2022.</p> <p>End of 2022 LHG has launched the OPS Sustainability Program. It is a three-step approach to the sustainable reduction of CO₂ emissions in flight operation. It was launched by the experts from the Operations Efficiency department in cooperation with all flight operations of the LHG and will run until 2030. Measures to improve efficiency are being implemented in a number of areas of action along the operational production chain – from flight preparation to in-flight optimisation measures and handling services on the ground to the data-based evaluation of completed flights.</p> <p>The first of the three steps consists of 93 ideas for projects that will be implemented in stages through 2025. They will also involve targeted training and communication measures based on a comprehensive analysis of flight data. In the subsequent steps from 2025 onwards, the individual measures will be harmonised across the airlines of the Lufthansa Group. Projects that have not yet been fully identified and evaluated in the first step will be implemented thereafter. The reductions in CO₂ emissions achieved in the OPS Sustainability Program will be continuously tracked and reported, which makes them an essential building block for achieving the LHG's SBTi targets.</p>

C3.4

(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Direct costs Indirect costs Capital expenditures Capital allocation Access to capital Liabilities	<p>LHG financial planning has been influenced by climate-related regulatory risk as well as by climate-related opportunities by creating availability of sustainable energy source.</p> <p>The risk of (cost) increasing climate-related regulation like carbon pricing, energy efficiency standards as well as aviation (and fuel) taxes influenced the financial planning in the element CAPITAL EXPENDITURES for buying new, more fuel efficient aircrafts with lower operational costs than older (less efficient) aircraft. As a case study to reduce the risk of increasing (INDIRECT & DIRECT) COSTS from climate-related regulations looking at the impact of fleet renewal on reducing operational costs in terms of fuel consumption and emissions. Approximately 32% of LHG's CO₂ emissions occur from flights within the European Economic Area (EEA) (as of 2022). Flights within the EEA are subject to the EU ETS, and the price per tonne of CO₂ was around €100 at the end of 2022 (in 2019 at €25/tonne). In addition, the free allowances allocated in the EU ETS are gradually being reduced and expected to reduce to zero until 2030. Additional tightening is being sought through the EU 'Fitfor55' package. A new Airbus A320/A321neo, of which the LHG has integrated a total of 51 aircraft into its fleet between 2019 and 2022, consumes on average 20 % less fuel and thus also emits less CO₂ emissions than the aircraft it replaces. This also reduces the respective fuel costs and the costs that have to be paid for the purchase of emission certificates. In financial planning, the possible costs for emission certificates and fuel are usually calculated and taken into account for a period of 3 years.</p> <p>Fleet renewal is currently the key driver for reducing CO₂ emissions from flight operations. The Lufthansa Group continuously invests in modern, fuel-efficient aircraft and engine technologies, which represents the most important element in reducing CO₂ emissions from flight operations in this decade.</p> <p>Financial planning has also been influenced by LHG SAF strategy. On the one hand sustainable alternative fuels poses a climate-related regulatory risk ("Fitfor55 Package": mandatory SAF quota within the EU), because SAF might be more expensive than conventional fuels and this may lead to a potential competitive distortion of a SAF quota for intra EU flights. On the other hand a high engagement and commitment for SAF leads to climate-related opportunities by creating availability of sustainable energy source and possibly contributes to higher customer retention or acquisition and thus better REVENUES. For example, the Lufthansa Group airlines offer COMPENSAID, a platform developed in the Lufthansa Innovation Hub that enables passengers to offset their CO₂ emissions by means of high-quality climate action projects or reduce them by purchasing sustainable aviation fuel (SAF). Lufthansa Cargo customers have also been able to transport their freight in a carbon-neutral manner since September 2021.</p> <p>Further examples of financial planning which has been influenced by climate-related risks and opportunities:</p> <p>CAPITAL ALLOCATION</p> <ul style="list-style-type: none"> - Funds for voluntary CO₂ compensation: Financial funds have been provided to compensate CO₂ on a voluntary basis: All LHG employees duty flights are 100% compensated via our partner myclimate since 2019. - Funds for Green electricity: Financial funds have been provided to use 100% green electricity in Germany, Austria, Switzerland and Belgium - the opportunity to reduce fuel consumption and emissions has made aircraft investments comparably more attractive than other investments and alternative options to allocate capital. <p>ACCESS TO CAPITAL:</p> <p>The upcoming EU Taxonomy might influence the accessibility to capital. Until end of 2022 the economic activity "Passenger and Freight air transport" has not been included as a NACE Code. For fiscal year 2022 LHG has only to disclose according to EU Taxonomy its "Non core activities". So the magnitude of a possible impact is still not clear.</p> <p>LIABILITIES:</p> <p>Due to the COVID-19 pandemic, LHG has had to make use of state loans. Germany's government has therefore established the "Economic stabilisation Fund" (ESF) which requires that expenditures out of this loan need to support sustainable investments.</p>

C3.5

(C3.5) In your organization's financial accounting, do you identify spending/revenue that is aligned with your organization's climate transition?

	Identification of spending/revenue that is aligned with your organization's climate transition	Indicate the level at which you identify the alignment of your spending/revenue with a sustainable finance taxonomy
Row 1	No, but we plan to in the next two years	<Not Applicable>

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?

Intensity target

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number

Int 1

Is this a science-based target?

Yes, and this target has been approved by the Science Based Targets initiative

Target ambition

Well-below 2°C aligned

Year target was set

2021

Target coverage

Company-wide

Scope(s)

Scope 1

Scope 3

Scope 2 accounting method

<Not Applicable>

Scope 3 category(ies)

Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Intensity metric

Other, please specify (Grams CO2e per revenue tonne kilometer (g CO2e/RTK))

Base year

2019

Intensity figure in base year for Scope 1 (metric tons CO2e per unit of activity)

0.000826815

Intensity figure in base year for Scope 2 (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 3, Category 1: Purchased goods and services (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 3, Category 2: Capital goods (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e per unit of activity)

0.000210462

Intensity figure in base year for Scope 3, Category 4: Upstream transportation and distribution (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 3, Category 5: Waste generated in operations (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 3, Category 6: Business travel (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 3, Category 7: Employee commuting (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 3, Category 8: Upstream leased assets (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 3, Category 9: Downstream transportation and distribution (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 3, Category 10: Processing of sold products (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 3, Category 11: Use of sold products (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 3, Category 12: End-of-life treatment of sold products (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 3, Category 13: Downstream leased assets (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 3, Category 14: Franchises (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 3, Category 15: Investments (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 3, Other (upstream) (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for Scope 3, Other (downstream) (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in base year for total Scope 3 (metric tons CO2e per unit of activity)

0.000210462

Intensity figure in base year for all selected Scopes (metric tons CO2e per unit of activity)

0.001037277

% of total base year emissions in Scope 1 covered by this Scope 1 intensity figure

98.57

% of total base year emissions in Scope 2 covered by this Scope 2 intensity figure

<Not Applicable>

% of total base year emissions in Scope 3, Category 1: Purchased goods and services covered by this Scope 3, Category 1: Purchased goods and services intensity figure

<Not Applicable>

% of total base year emissions in Scope 3, Category 2: Capital goods covered by this Scope 3, Category 2: Capital goods intensity figure

<Not Applicable>

% of total base year emissions in Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) covered by this Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) intensity figure

99.01

% of total base year emissions in Scope 3, Category 4: Upstream transportation and distribution covered by this Scope 3, Category 4: Upstream transportation and distribution intensity figure

<Not Applicable>

% of total base year emissions in Scope 3, Category 5: Waste generated in operations covered by this Scope 3, Category 5: Waste generated in operations intensity figure

<Not Applicable>

% of total base year emissions in Scope 3, Category 6: Business travel covered by this Scope 3, Category 6: Business travel intensity figure

<Not Applicable>

% of total base year emissions in Scope 3, Category 7: Employee commuting covered by this Scope 3, Category 7: Employee commuting intensity figure

<Not Applicable>

% of total base year emissions in Scope 3, Category 8: Upstream leased assets covered by this Scope 3, Category 8: Upstream leased assets intensity figure

<Not Applicable>

% of total base year emissions in Scope 3, Category 9: Downstream transportation and distribution covered by this Scope 3, Category 9: Downstream transportation and distribution intensity figure

<Not Applicable>

% of total base year emissions in Scope 3, Category 10: Processing of sold products covered by this Scope 3, Category 10: Processing of sold products intensity figure

<Not Applicable>

% of total base year emissions in Scope 3, Category 11: Use of sold products covered by this Scope 3, Category 11: Use of sold products intensity figure

<Not Applicable>

% of total base year emissions in Scope 3, Category 12: End-of-life treatment of sold products covered by this Scope 3, Category 12: End-of-life treatment of sold products intensity figure

<Not Applicable>

% of total base year emissions in Scope 3, Category 13: Downstream leased assets covered by this Scope 3, Category 13: Downstream leased assets intensity figure

<Not Applicable>

% of total base year emissions in Scope 3, Category 14: Franchises covered by this Scope 3, Category 14: Franchises intensity figure

<Not Applicable>

% of total base year emissions in Scope 3, Category 15: Investments covered by this Scope 3, Category 15: Investments intensity figure

<Not Applicable>

% of total base year emissions in Scope 3, Other (upstream) covered by this Scope 3, Other (upstream) intensity figure

<Not Applicable>

% of total base year emissions in Scope 3, Other (downstream) covered by this Scope 3, Other (downstream) intensity figure

<Not Applicable>

% of total base year emissions in Scope 3 (in all Scope 3 categories) covered by this total Scope 3 intensity figure

58.74

% of total base year emissions in all selected Scopes covered by this intensity figure

88.23

Target year

2030

Targeted reduction from base year (%)

30.6

Intensity figure in target year for all selected Scopes (metric tons CO2e per unit of activity) [auto-calculated]

0.000719870238

% change anticipated in absolute Scope 1+2 emissions

-14.26

% change anticipated in absolute Scope 3 emissions

-8.46

Intensity figure in reporting year for Scope 1 (metric tons CO2e per unit of activity)

0.0008081197

Intensity figure in reporting year for Scope 2 (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 1: Purchased goods and services (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 2: Capital goods (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e per unit of activity)

0.0002057031

Intensity figure in reporting year for Scope 3, Category 4: Upstream transportation and distribution (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 5: Waste generated in operations (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 6: Business travel (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 7: Employee commuting (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 8: Upstream leased assets (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 9: Downstream transportation and distribution (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 10: Processing of sold products (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 11: Use of sold products (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 12: End-of-life treatment of sold products (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 13: Downstream leased assets (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 14: Franchises (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Category 15: Investments (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Other (upstream) (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for Scope 3, Other (downstream) (metric tons CO2e per unit of activity)

<Not Applicable>

Intensity figure in reporting year for total Scope 3 (metric tons CO2e per unit of activity)

0.0002057031

Intensity figure in reporting year for all selected Scopes (metric tons CO2e per unit of activity)

0.0010138229

Does this target cover any land-related emissions?

Yes, it covers land-related CO2 emissions/removals associated with bioenergy and non-land related emissions (e.g. non-FLAG SBT with bioenergy)

% of target achieved relative to base year [auto-calculated]

7.38928807068075

Target status in reporting year

Underway

Please explain target coverage and identify any exclusions

This target is company-wide and covers 88 % of both our Scope 1 and 3 emissions in 2019. Lufthansa Group commits to reduce its GHG emissions from the combustion of jet fuel (Scope 1 + Scope 3 Category 3 as per SBTi target template, WTW approach) by 30,60% per Revenue Tonne Kilometer (RTK) by 2030 from a 2019 base year. This intensity target relates to the combustion of jet fuel only (as per SBTi target template 1.037 g CO₂e/RTK, absolute 39.655.275 t CO₂e in 2019, Well-to-wheel (WTW) approach), other sources of emissions are not included (e.g. natural gas in stationary installations). The target boundary includes land-related emissions and removals from bioenergy feedstocks.

Note: The intensity figures are calculated energetic acc. to SBTi Aviation Tool (Tank-to-wheel (TTW) = WTW * 71,5 / 89,7).

This target is part of LHG long term net-zero target 2050.

Plan for achieving target, and progress made to the end of the reporting year

There are three big levers to achieve the target:

1. Fleet renewal: LHG invests continuously in modern, fuel-efficient aircraft and engine technologies, which represent the most important element in reducing CO₂ emissions from flight operations. 24 new aircraft went into service with LHG airlines in 2022. A total of 27 older aircraft were removed from the LHG fleet in exchange. Up to 174 new particularly fuel-efficient aircraft will be delivered by 2030.

Measures to technically modify the existing fleet are also constantly examined and implemented where appropriate. By mid 2020, a new surface coating developed jointly by Lufthansa Technik and BASF Coatings GmbH were tested. This functional film, known as AeroSHARK, optimizes the aerodynamics and saves 1% CO₂ per flight. 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.

2. Operational & air traffic management efficiency: LHG's operational measures for CO₂ reduction comprise the use of efficiently sized aircraft and the optimisation of load factors, as well as reviewing and introducing new flight procedures and navigation technologies, determining optimal routes and speeds, and monitoring the many activities to save fuel. In the year 2022, 24 fuel-saving projects were under way across LHG. They enabled another 33,000 tonnes of CO₂ emissions to be permanently eliminated in the reporting year.

3. Sustainable Aviation Fuel (SAF): SAF shows an up to 90% fossil CO₂ mitigation in comparison to fossil fuel. In the reporting year, LHG became a launching customer for synthetic kerosene from the world's first industrial production facility for PtL fuel in Werlte. Furthermore in the short term (2022-24), up to USD 250mn (€234 mn) has been released for the procurement of SAF on the spot market by decision of the Executive Board. The use of the SAF reduced the LHG's CO₂ emissions with an impact on the climate by a total of 43,900 tonnes in 2022.

Note: Due to the COVID-19 pandemic, the passenger load factor of LHG aircraft in 2020/21 was only just over 60% and thus far below the passenger load factor from 2019 (82.6%). After the re-start, the value stated in the "% of target achieved relative to base year" field is for the first time positive.

List the emissions reduction initiatives which contributed most to achieving this target

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?

Net-zero target(s)

C4.2c

(C4.2c) Provide details of your net-zero target(s).

Target reference number

NZ1

Target coverage

Company-wide

Absolute/intensity emission target(s) linked to this net-zero target

Int1

Target year for achieving net zero

2050

Is this a science-based target?

No, but we are reporting another target that is science-based

Please explain target coverage and identify any exclusions

LHG is committed to a net zero target by 2050 covering its scope 1 emissions. To achieve this target, LHG will rely on a mixture of reductions, CO₂ removals and/or CO₂ compensation. It is expected that SAF will become the most important mitigation option. Against this background, LHG fosters SAF innovation through a global network of partnerships with SAF developers and suppliers, e.g. solar fuels (Synhelion partnership) to increase the number of technologies and suppliers on the market. Electric/hydrogen aircraft may also play a role after 2035.

Do you intend to neutralize any unabated emissions with permanent carbon removals at the target year?

Yes

Planned milestones and/or near-term investments for neutralization at target year

In the wider context of the net zero target, the medium term targets for 2030 act as milestones. Lufthansa group will mitigate its net Scope 1 emissions in 2030 by 50 % vs. 2019. Also, a science based intensity target has been validated for 2030 that defines the minimum share of emission reductions embedded in the net emission target for 2030.

Some near- to mid-term investments for reaching the target:

Lufthansa Group develops retrofits to further reduce the emissions of the existing fleet (e.g. Aeroshark).

In 2022 twenty four new, more fuel-efficient aircraft put into operation. In return, a total of 27 older aircraft left the Group fleet. The CO₂ emissions of these new aircraft are up to 25% less than with the predecessor models.

Since the start of the coronavirus crisis, 110 aircraft have been retired until end of 2022. In the same period, i.e. since the end of 2019, 57 aircraft have been added.

At year-end 2022, there were 174 aircraft on the Lufthansa Group's order list until 2030. There are also options to buy a further 58 aircraft. Order commitments for aircraft and reserve engines amount to €15.8bn (previous year: €14.3bn).

Furthermore, in order to safeguard the supply of SAF in the long term, the LHG has developed a three-pronged strategy:

1. In the short term (until 2024), up to USD 250mn (€ 234mn) has been released for the procurement of SAF on the spot market by decision of the Executive Board.
2. In the medium term, options for long-term supply commitments are under consideration around the world. These offer significant production volumes and security of supply from around 2025 onwards.
3. In the long term, LHG will provide support for innovative supply concepts with the goal of transforming today's start-ups and developers into tomorrow's suppliers.

Planned actions to mitigate emissions beyond your value chain (optional)

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	538	
To be implemented*	36	24014.6
Implementation commenced*	7	19402.1
Implemented*	17	22276.2
Not to be implemented	373	

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
----------------	----------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

9550.9

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

2999000

Investment required (unit currency – as specified in C0.4)

1800000

Payback period

<1 year

Estimated lifetime of the initiative

Ongoing

Comment

OPSD Tail Optimizer - Optimize Tail assignments based on various data sources in Google Cloud Platform (Project @ SWISS)

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
----------------	----------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

6057.6

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

1202000

Investment required (unit currency – as specified in C0.4)

4000

Payback period

<1 year

Estimated lifetime of the initiative

Ongoing

Comment

SUNRISE - Extra Fuel - Tracking of deviations from minimum reserves to reduce extra fuel (Project @ Austrian Airlines)

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
----------------	----------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

1562.9

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

391000

Investment required (unit currency – as specified in C0.4)

7000

Payback period

<1 year

Estimated lifetime of the initiative

Ongoing

Comment

SUNRISE Alternate Fuel - Reduction of alternate fuel: Leverage characteristics of VIE Hub and eliminate necessity of alternate fuel (project @ Austrian Airlines)

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
----------------	----------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

899.8

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

295000

Investment required (unit currency – as specified in C0.4)

0

Payback period

No payback

Estimated lifetime of the initiative

Ongoing

Comment

Seat Configuration Update - New Seat Configuration (project @ Air Dolomiti)

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
----------------	----------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

821.7

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

260000

Investment required (unit currency – as specified in C0.4)

0

Payback period

No payback

Estimated lifetime of the initiative

Ongoing

Comment

Single Engine Taxi Out (SETO) A220 Go-Live - Introduction and implementation of SETO on A220 (project @ SWISS)

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
----------------	----------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

756

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

237000

Investment required (unit currency – as specified in C0.4)

0

Payback period

No payback

Estimated lifetime of the initiative

Ongoing

Comment

PIP Performance Improvement Package B777 - Tripfuel efficiency improvement through the optimization of aerodynamic points on the aircraft (only Tailsign DALFK; project @ LH Cargo)

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
----------------	----------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

583.9

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

195000

Investment required (unit currency – as specified in C0.4)

1200000

Payback period

4-10 years

Estimated lifetime of the initiative

Ongoing

Comment

Premium Eco Seat B767 - New lighter Premium Eco Seats on B767 fleet (project@Austrian Airlines)

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
----------------	----------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

516.2

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

170000

Investment required (unit currency – as specified in C0.4)

476810

Payback period

1-3 years

Estimated lifetime of the initiative

Ongoing

Comment

Scavenge Pump Modification B777 - Upgrade from the center fuel tank scavenge pump system (project @Austrian Airlines)

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
----------------	----------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

460.4

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

122000

Investment required (unit currency – as specified in C0.4)

0

Payback period

<1 year

Estimated lifetime of the initiative

Ongoing

Comment

Optimized OFP STAR Distance Planning based on FDM Data - EDDM - The AIP information for the expected STAR Arrival Distance is updated based on OMEGA Flight Data Monitoring Data and published by the ATM provider DFS. This leads to more accurate OFP and less Transport Fuel (project @ Lufthansa Airlines)

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
----------------	----------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

447.6

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

140000

Investment required (unit currency – as specified in C0.4)

0

Payback period

No payback

Estimated lifetime of the initiative

Ongoing

Comment

Light Weight B777 Tires - A new contract for Boeing 777 tires has been signed which includes lighter tires (project @ SWISS)

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
----------------	----------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

237.2

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

77000

Investment required (unit currency – as specified in C0.4)

500

Payback period

<1 year

Estimated lifetime of the initiative

Ongoing

Comment

SUNRISE - Single Engine Taxiing E-195 - Focus and acceleration of implementation at ERJ fleet (project @ Austrian Airlines)

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
----------------	----------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

117.6

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

27000

Investment required (unit currency – as specified in C0.4)

0

Payback period

No payback

Estimated lifetime of the initiative

Ongoing

Comment

SqAir Timber - Light weight loading support material - Light weight loading support material used for pallet stacks (project @ Lufthansa Airlines)

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
----------------	----------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

90.4

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

24000

Investment required (unit currency – as specified in C0.4)

0

Payback period

No payback

Estimated lifetime of the initiative

Ongoing

Comment

SqAir Timber - Lightweight loading support material - Lightweight loading support material used for pallet stacks (project @ Lufthansa Cargo)

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
----------------	----------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

69.6

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

21000

Investment required (unit currency – as specified in C0.4)

0

Payback period

No payback

Estimated lifetime of the initiative

Ongoing

Comment

Continuous descent approach via EMPAX in FRA (project @ Lufthansa Airlines)

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
----------------	----------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

47.5

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

15000

Investment required (unit currency – as specified in C0.4)

0

Payback period

No payback

Estimated lifetime of the initiative

Ongoing

Comment

Increased use of RNP-Y procedures - Project for increased use of the efficient and noise-optimized approach procedure RNP-Y. This method saves through continuous descent on the final approach and shorter routing (project @ Lufthansa Airlines)

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
----------------	----------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

31.3

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

10000

Investment required (unit currency – as specified in C0.4)

20895

Payback period

1-3 years

Estimated lifetime of the initiative

Ongoing

Comment

Increase in Light Weight Container Share 2022 - The share of Light Weight Containers has increased over the past year (project @ SWISS)

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
----------------	----------------------------------

Estimated annual CO2e savings (metric tonnes CO2e)

25.6

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

14000

Investment required (unit currency – as specified in C0.4)

0

Payback period

No payback

Estimated lifetime of the initiative

Ongoing

Comment

Fuel ballast procedure - Fuel ballast procedure for non-commercial flights (project @ Air Dolomiti)

C4.3c

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Financial optimization calculations	The LHG uses an internal carbon price (price range), which is mainly used by environmental-, strategy-, risk controlling-, sales-, fuel- and aircraft procurement-teams, this typically by taking into account the costs of current and (possible) future regulations (e.g. EU ETS, CORSIA). This means that the CO ₂ price risk is increasingly taken into account in investment- or project-decisions. The risk controlling department prepares monthly reports on the current and forecast development of the CO ₂ market price and calculates the potential cost impact on the LHG. The LHG is also active in the voluntary carbon market and purchases project-based carbon credits for its corporate and private customer carbon offsetting program. A calculated internal CO ₂ price is used for this voluntary offer. As part of its green electricity target LHG is also purchasing green energy certificates (scope 2). Therefore LHG calculate an 'implicit carbon price' for carbon free electricity supply.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products.

Level of aggregation

Product or service

Taxonomy used to classify product(s) or service(s) as low-carbon

No taxonomy used to classify product(s) or service(s) as low carbon

Type of product(s) or service(s)

Biofuels	Other, please specify (Sustainable Aviation Fuel (SAF))
----------	---

Description of product(s) or service(s)

LHG has already implemented a broad spectrum of products for low carbon flying - along the travel journey for the private customers, on bulk and on route for corporates product. These products includes both the opportunity to reduce emissions directly by purchasing sustainable aviation fuel (SAF), and to offset them via climate protection projects. LHG was the first airline to sell certified emission reductions for SAF. The amount of SAF purchased for this purpose must meet contractually agreed sustainability criteria. The scheme is based on the EU Renewable Energy Directive (2018/2001). Additional criteria have also been defined, for instance, that SAF is free of palm oil, and is purchased in addition to mandatory quotas and is not included in the EU ETS. Double counts are also ruled out. During the first half of 2022 the opportunity to buy this low-carbon service when booking a flight was implemented at all LHG passenger airlines. In addition, a new "green" fare by using SAF and carbon offsetting projects, was introduced in 08/2022 on a test basis in the Scandinavian market. The test was successful, so that the LHG Executive Board decided to extend the Green Fare to other markets in 2023. In the future, SAF will be made as well by using renewable energies (Power to liquid, PtL) and the power of the sun (Sun to liquid (StL)). The LHG airlines are the first customer for the world's first PtL jet fuel made on an industrial scale as well as for the first solar fuel (StL).

Have you estimated the avoided emissions of this low-carbon product(s) or service(s)

Yes

Methodology used to calculate avoided emissions

Other, please specify (SAF CO₂ savings vs. fossil fuel)

Life cycle stage(s) covered for the low-carbon product(s) or services(s)

Cradle-to-grave

Functional unit used

Using SAF in the LHG fleet vs. operating this fleet by fossil jet fuel only.

Reference product/service or baseline scenario used

up to minus 90 % carbon emissions compared to fossil fuel thanks to sustainable fuel of biogenic origins – including production and transport (Well-to-Wheel Accounting). The Emission Mitigation Certificate (EMC) for corporate customers guarantees min. 80% emission mitigation (compared to fossil reference, which is jet fuel in this case) and calculates with WTW emission factor (max. 17,46 g CO₂e/MJ).

Life cycle stage(s) covered for the reference product/service or baseline scenario

Cradle-to-grave

Estimated avoided emissions (metric tons CO₂e per functional unit) compared to reference product/service or baseline scenario

43900

Explain your calculation of avoided emissions, including any assumptions

The use of the Sustainable Aviation Fuel (SAF) reduced the Lufthansa Group's CO₂emissions with an impact on the climate by a total of 43,900 tonnes in 2022 (Well-to-Wheel Accounting). Every purchased SAF amount has an own Proof of Sustainability (PoS) certificate with individual emission factor. In aggregate, LHG calculates with this assumption: CO₂ emission of SAF is equal to 1/10 of fossil jet fuel (10% CO₂ emissions of SAF to take account of SAF production and transport acc. to cradle-to-grave approach), 90% CO₂ saving of SAF per unit.

Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year

0.07

C5. Emissions methodology

C5.1

(C5.1) Is this your first year of reporting emissions data to CDP?

No

C5.1a

(C5.1a) Has your organization undergone any structural changes in the reporting year, or are any previous structural changes being accounted for in this disclosure of emissions data?

Row 1

Has there been a structural change?

No

Name of organization(s) acquired, divested from, or merged with

<Not Applicable>

Details of structural change(s), including completion dates

<Not Applicable>

C5.1b

(C5.1b) Has your emissions accounting methodology, boundary, and/or reporting year definition changed in the reporting year?

	Change(s) in methodology, boundary, and/or reporting year definition?	Details of methodology, boundary, and/or reporting year definition change(s)
Row 1	No	<Not Applicable>

C5.2

(C5.2) Provide your base year and base year emissions.

Scope 1

Base year start

January 1 2019

Base year end

December 31 2019

Base year emissions (metric tons CO2e)

33349293

Comment

No additional comment

Scope 2 (location-based)

Base year start

January 1 2019

Base year end

December 31 2019

Base year emissions (metric tons CO2e)

259527

Comment

No additional comment

Scope 2 (market-based)

Base year start

January 1 2019

Base year end

December 31 2019

Base year emissions (metric tons CO2e)

199817

Comment

No additional comment

Scope 3 category 1: Purchased goods and services

Base year start

January 1 2019

Base year end

December 31 2019

Base year emissions (metric tons CO2e)

12100

Comment

No additional comment

Scope 3 category 2: Capital goods

Base year start

January 1 2019

Base year end

December 31 2019

Base year emissions (metric tons CO2e)

806400

Comment

No additional comment

Scope 3 category 3: Fuel-and-energy-related activities (not included in Scope 1 or 2)

Base year start

January 1 2019

Base year end

December 31 2019

Base year emissions (metric tons CO2e)

7892623

Comment

No additional comment

Scope 3 category 4: Upstream transportation and distribution

Base year start

January 1 2019

Base year end

December 31 2019

Base year emissions (metric tons CO2e)

1441305

Comment

No additional comment

Scope 3 category 5: Waste generated in operations

Base year start

January 1 2019

Base year end

December 31 2019

Base year emissions (metric tons CO2e)

270601

Comment

No additional comment

Scope 3 category 6: Business travel

Base year start

January 1 2019

Base year end

December 31 2019

Base year emissions (metric tons CO2e)

62959

Comment

No additional comment

Scope 3 category 7: Employee commuting

Base year start

January 1 2019

Base year end

December 31 2019

Base year emissions (metric tons CO2e)

37867

Comment

No additional comment

Scope 3 category 8: Upstream leased assets

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

not relevant in scope 3 base year 2019

Scope 3 category 9: Downstream transportation and distribution

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

not relevant in scope 3 base year 2019

Scope 3 category 10: Processing of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

not relevant in scope 3 base year 2019

Scope 3 category 11: Use of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

not relevant in scope 3 base year 2019

Scope 3 category 12: End of life treatment of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

not relevant in scope 3 base year 2019

Scope 3 category 13: Downstream leased assets

Base year start

January 1 2019

Base year end

December 31 2019

Base year emissions (metric tons CO2e)

64854

Comment

No additional comment

Scope 3 category 14: Franchises

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

not relevant in scope 3 base year 2019

Scope 3 category 15: Investments

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

not relevant in scope 3 base year 2019

Scope 3: Other (upstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

not relevant in scope 3 base year 2019

Scope 3: Other (downstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

not relevant in scope 3 base year 2019

C5.3

(C5.3) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.

European Union Emission Trading System (EU ETS): The Monitoring and Reporting Regulation (MMR) – General guidance for installations

European Union Emissions Trading System (EU ETS): The Monitoring and Reporting Regulation (MMR) – General guidance for aircraft operators

IPCC Guidelines for National Greenhouse Gas Inventories, 2006

ISO 14064-1

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

The Greenhouse Gas Protocol: Scope 2 Guidance

The Greenhouse Gas Protocol: Corporate Value Chain (Scope 3) Standard

Other, please specify (Airport Carbon Accreditation of the Airport Council International Europe, IEA emission factors 2021. DEFRA (Department for Environment, Food and Rural Affairs) and UBA (Umweltbundesamt – the German Environment Agency))

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)

23210476

Start date

January 1 2022

End date

December 31 2022

Comment

Scope 1 emissions data include direct GHG emissions from aviation passengers, freight, as well as ground operation and stationary installations.

Past year 1

Gross global Scope 1 emissions (metric tons CO2e)

13823320

Start date

January 1 2021

End date

December 31 2021

Comment

Scope 1 emissions data include direct GHG emissions from aviation passengers, freight, as well as ground operation and stationary installations.

Past year 2

Gross global Scope 1 emissions (metric tons CO2e)

11509756

Start date

January 1 2020

End date

December 31 2020

Comment

Scope 1 emissions data include direct GHG emissions from aviation passengers, freight, as well as ground operation and stationary installations.

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based

We are reporting a Scope 2, location-based figure

Scope 2, market-based

We are reporting a Scope 2, market-based figure

Comment

Scope 2 location-based figure is calculated with location-based factors (IEA EMISSION FACTORS 2021). Scope 2 market-based figure is calculated with market-based factors for electricity delivered by our energy suppliers where available. For all other sites, where market-based-factors were not available, we used location-based factors to complete the market-based figure.

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based
200314

Scope 2, market-based (if applicable)
125245

Start date
January 1 2022

End date
December 31 2022

Comment

Scope 2 location-based figure was calculated with location-based factors (IEA EMISSION FACTORS 2021). Scope 2 market-based figure is calculated with market-based factors for electricity delivered by our energy suppliers where available. For all other sites, where market-based-factors weren't available, we used location-based factors to complete the market-based figure. In the CDP-report, we calculated our Scope 2 location-based emissions as instructed in the CDP-guidance. Therefore, we used location-based factors also for sites, where 100 % green power was used.

Past year 1

Scope 2, location-based
205292

Scope 2, market-based (if applicable)
139496

Start date
January 1 2021

End date
December 31 2021

Comment

Scope 2 location-based figure was calculated with location-based factors (IEA EMISSION FACTORS 2021). Scope 2 market-based figure is calculated with market-based factors for electricity delivered by our energy suppliers where available. For all other sites, where market-based-factors weren't available, we used location-based factors to complete the market-based figure. In the CDP-report, we calculated our Scope 2 location-based emissions as instructed in the CDP-guidance. Therefore, we used location-based factors also for sites, where 100 % green power was used.

Past year 2

Scope 2, location-based
222309

Scope 2, market-based (if applicable)
135183

Start date
January 1 2020

End date
December 31 2020

Comment

Scope 2 location-based figure was calculated with location-based factors (IEA EMISSION FACTORS 2021). Scope 2 market-based figure is calculated with market-based factors for electricity delivered by our energy suppliers where available. For all other sites, where market-based-factors weren't available, we used location-based factors to complete the market-based figure. In the CDP-report, we calculated our Scope 2 location-based emissions as instructed in the CDP-guidance. Therefore, we used location-based factors also for sites, where 100 % green power was used.

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1, Scope 2 or Scope 3 emissions that are within your selected reporting boundary which are not included in your disclosure?

Yes

C6.4a

(C6.4a) Provide details of the sources of Scope 1, Scope 2, or Scope 3 emissions that are within your selected reporting boundary which are not included in your disclosure.

Source of excluded emissions

Non-owned offices in countries outside of Europe: Small offices that are used but not owned by LHG. Incomplete information for the period in question.

Scope(s) or Scope 3 category(ies)

Scope 1
Scope 2 (location-based)
Scope 2 (market-based)

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

Emissions are not relevant

Relevance of market-based Scope 2 emissions from this source

Emissions are not relevant

Relevance of Scope 3 emissions from this source

<Not Applicable>

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

1

Estimated percentage of total Scope 3 emissions this excluded source represents

<Not Applicable>

Explain why this source is excluded

Incomplete information for the period in question: emissions from some small non-owned-office buildings which usually have a very small energy consumption and where no energy consumption data is available.

Explain how you estimated the percentage of emissions this excluded source represents

The by far biggest share of the joint scope 1+2 emissions of the LHG are caused by flight fuel burned in aircraft engines (99,1 % of the combined scope 1 and 2 market based emissions) and further by the great number of the major group companies and their ground facilities that are included in the certified scope 1+2 data. Therefore the emissions from some small non-owned-office buildings which usually have a very small energy consumption and where no energy consumption data is available is well below 1 % of total scope 1+2 emission.

Source of excluded emissions

Ground vehicles: vehicles used for ground operation at smaller airports. Incomplete information for the period in question. Data gaps exist for certain group airlines, business units and in certain operating destinations.

Scope(s) or Scope 3 category(ies)

Scope 1
Scope 2 (location-based)
Scope 2 (market-based)

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

Emissions are not relevant

Relevance of market-based Scope 2 emissions from this source

Emissions are not relevant

Relevance of Scope 3 emissions from this source

<Not Applicable>

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

1

Estimated percentage of total Scope 3 emissions this excluded source represents

<Not Applicable>

Explain why this source is excluded

Incomplete information for the period in question. Data gaps in regards to ground vehicles exist for certain group airlines, business units and in certain operating destinations.

Explain how you estimated the percentage of emissions this excluded source represents

The by far biggest share of the joint scope 1+2 emissions of the LHG are caused by flight fuel burned in aircraft engines (99,1 % of the combined scope 1 and 2 market based emissions) and further by the great number of the major group companies and their ground facilities that are included in the certified scope 1+2 data. Therefore the emissions from some small non-owned-office buildings which usually have a very small energy consumption and where no energy consumption data is available is well below 1 % of total scope 1+2 emission.

(C6.5) Account for your organization's gross global Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

9196

Emissions calculation methodology

Other, please specify (Based on the assumption that GHG emissions from the production of aircraft and flight simulators are about the same, emissions were estimated in equivalence to the emissions from aircraft manufacturing.)

Percentage of emissions calculated using data obtained from suppliers or value chain partners

30

Please explain

This category includes GHG emissions from the production of flight simulators, which LHG bought in 2022. Based on the assumption that GHG emissions from the production of aircraft and flight simulators are about the same in the first order, emissions were estimated in equivalence to the emissions from aircraft manufacturing. In 2022 LHG has bought four new flight simulators (two small sized training aircraft models and two large sized aircraft models). Emissions from aircraft / engine manufacturing are relevant to LHG. According to the GHG Protocol these can be accounted either for "Purchased goods and services" or "Capital goods" (cp. "Guidance for Calculating Scope 3 Emissions" from the Greenhouse Gas Protocol, p.23). Hence, GHG emissions from aircraft and engine manufacturing were accounted to capital goods. This category includes GHG emissions from the production of flight simulators, which LHG bought in 2022.

Capital goods

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

240467

Emissions calculation methodology

Other, please specify (Aircraft / Engine manufacturing: GHG emissions which are emitted through the process of aircraft and engine manufacturing. Calculation on the data reported by manufactures)

Percentage of emissions calculated using data obtained from suppliers or value chain partners

70

Please explain

The emissions calculated reflect the LHG purchased aircraft deliveries in 2022. In 2022 the LHG has entered into service 16 new aircraft (14 medium sized and 2 large sized aircraft in LHG ownership). Leased aircraft were not accounted here due to its leased status. Aircraft / Engine manufacturing: A new, more accurate calculation method was used in the calculation for 2022. Compared to previous years, this method is based on a high proportion of primary data and uses scope 1, 2 and relevant aircraft related Scope 3 emissions published by the aircraft manufacturers as well as the aircraft-related sales and the respective aircraft empty operational weight for the calculation. Compared to previous years, in which the calculation of the emission factor was based on a research paper published in 2008 by the University of California (Berkeley), whose basic data (e.g. electricity grid, materials) was outdated, this year actual available manufacturer data was used.

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

5192640

Emissions calculation methodology

Average data method

Other, please specify (Upstream emissions of purchased fuels: CO2 emissions that are emitted in the supply chain of kerosene (Well-to-Tank-Process). The calculation is based on the burned kerosene by all aircraft and on the emission factor from the DIN EN Standard 16258)

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

According to Greenhouse Gas Protocol aggregated number from the following subcategories: A) Upstream emissions of purchased fuels: CO2 emissions which are emitted along the supply chain of kerosene (Well-to-Tank-Process). The calculation is based on the burned kerosene by all aircraft (those emissions are reported in Scope 1) and on the emission factor from the DIN EN Standard 16258. B) Upstream emissions of purchased electricity: The calculation is based on emission factors from the DEFRA 2021 (Government emission conversion factors for greenhouse gas company reporting). The calculation method is based on the average-data method according to the "Guidance for Calculating Scope 3 Emissions" from the Greenhouse Gas Protocol (p.32 and following). C) transmission and distribution losses: The calculation is based on electric power and district heating transmission and distribution loss rates for the respective country from IEA Emissions factors 2021 (Upstream T&D losses electricity) and DEFRA, 2021 (Government emission conversion factors for greenhouse gas company reporting). The calculation method is based on the average-data method according to the "Guidance for Calculating Scope 3 Emissions" from the Greenhouse Gas Protocol (p.34). Estimates for the subcategory "D) Generation of purchased electricity that is sold to end users" were not conducted since it is not applicable to Lufthansa.

Upstream transportation and distribution

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

1074818

Emissions calculation methodology

Distance-based method
Site-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

80

Please explain

Aggregated number from the following subcategories: - Flights for LHG services operated by third parties documented in our operational data-warehouse systems. These third parties are neither fully owned nor controlled by LHG. Distance based method used to calculate these emissions.

- The Road Feeder Service, which transports airfreight by trucks from its initial origin to the airport, respectively from the airport to its final destination. Trucks are neither owned nor controlled by LHG. The emissions factor used was derived from the CLECAT-study ("Calculating GHG Emissions for Freight Forwarding and Logistics Services" (2012)) using the distance based method.
- Airport operation: The GHG emissions which result from airport operation. Site-specific method used. The data was requested from the LHG's main hubs (Frankfurt, Munich, Zurich, Vienna), which also report their emissions according to the GHG Protocol. According to the GHG Protocol life cycle emissions associated with manufacturing vehicles, facilities or infrastructure can be included in this category optionally (cp. "Guidance for Calculating Scope 3 emissions" from the Greenhouse Gas Protocol, p.4). The main part of the emissions in this category are resulting from airport operation. Further in this category emissions from flights by third parties performing flights for the LHG and ground based transportation performed by third parties are included.

Waste generated in operations

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

40499

Emissions calculation methodology

Waste-type-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

60

Please explain

Waste data for 2022 was only available partly. Waste generated at home market locations (Germany, Austria, Switzerland and Belgium) is available for most of the LHG's companies. For LSG Sky Chefs, which is responsible for the major part of the waste generated, international data is included, originating from 2022. The major part (75%) of the waste is generated by LSG, Lufthansa Group's catering company. Since this company operates many countries outside Europe, with facilities in big cities, as well as developing countries, tracking down waste precisely can be difficult. Still, we are improving the data coverage every year. Growing numbers do not automatically indicate more waste, they can also be explained by growing data coverage.

Business travel

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

40902

Emissions calculation methodology

Supplier-specific method
Hybrid method
Distance-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

Business travel includes flights operated by other (then LHG) airlines (using the distance-based method), since flights operated by LHG airlines are already included in Scope 1.

Business travel also includes hotel overnight stays of LHG staff (including flight crew). A new, more accurate calculation method was used in the hotel overnight stay calculation for 2022. This method is based (compared to previous years) on a high proportion of primary data. The emissions for staff accommodation were calculated based on a supplier based method and where supplier data were not available by using the Hotel Carbon Management Initiative (HCMI) database. This category is classified as "not relevant, calculated" for the LHG as they amounted to less than 1% of the Scope 3 emissions in the past two years.

Employee commuting

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

42847

Emissions calculation methodology

Average data method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

25

Please explain

The emissions from employee commuting were calculated based on the "Mikrozensus 2020", a nationwide, governmental study that includes average commuting habits in Germany. Emissions factor actualized by using new data from Umweltbundesamt Germany. Since such data was not available for other countries the data was extrapolated to all LHG employees. Due to the pandemic-related increase of short-time work and the share of employees working from their home-offices, the emissions accounted for 2022 was reduced by 30%.

Upstream leased assets

Evaluation status

Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Emissions from operating leased assets within the Lufthansa Group are accounted for in Scope 1 and Scope 2.

Downstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

According to the GHG Protocol "this category includes emissions from transportation and distribution of products sold by the reporting company in the reporting year between the reporting company's operations and the end consumer in vehicles and facilities not owned or controlled by the reporting company" ("Guidance for Calculating Scope 3 Emissions" from the Greenhouse Gas Protocol, p.70). Within the LHG mainly transportation, maintenance and IT services are provided. These services are no physical products and hence cannot be sold or processed again. Products sold by LHG's catering service are transported in own vehicles and are therefore accounted for in Scope 1 emissions.

Processing of sold products

Evaluation status

Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Within the LHG mainly transportation, maintenance and IT services are provided. These services are no physical products and hence cannot be sold or processed again. Therefore, emissions from processing of sold intermediate products by third parties in this category are not relevant to LHG (cp. "Guidance for Calculating Scope 3 Emissions" from the Greenhouse Gas Protocol, p.72).

Use of sold products

Evaluation status

Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Within the LHG mainly transportation, maintenance and IT services are provided. These services are not physical products and hence cannot be sold or processed again. Therefore, emissions from the use of sold goods and services by the end user are not relevant to LHG (cp. "Guidance for Calculating Scope 3 Emissions" from the Greenhouse Gas Protocol, p.77).

End of life treatment of sold products

Evaluation status

Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Within the LHG mainly transportation, maintenance and IT services are provided. These services are not physical products and hence cannot be sold or processed again. Therefore, end-of-life emissions from sold products due to waste disposal and treatment are not relevant to LHG (cp. "Guidance for Calculating Scope 3 Emissions" from the Greenhouse Gas Protocol, p.88).

Downstream leased assets

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

526538

Emissions calculation methodology

Other, please specify (The calculation is based on the Lufthansa Group's respective aircraft's internal fuel consumption of the respective leased aircraft type as a representative figure and extrapolated to the respective number of aircraft and their time of lease-out.)

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

Emissions resulting from aircraft owned by the LHG and leased to other airlines outside the LHG. The calculation is based on the assumption that the leased aircraft have a similar capacity and fuel consumption as the respective aircraft types within the Lufthansa Group. Therefore, the calculation is based on the internal fuel consumption of the respective leased aircraft type as a representative figure and extrapolated to the respective number and time of lease.

Franchises

Evaluation status

Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

The Lufthansa Group does not operate franchises, therefore this category is not relevant.

Investments

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

1787198

Emissions calculation methodology

Asset-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

The calculation is based on a pro-rata crediting of the emissions of LHG's joint ventures (e.g. the 50/50% Aerologic joint venture with DHL). The emissions are accounted for on the basis of the joint venture shares and takes into account the relevant Scope 1 and 2 emissions from these Joint Ventures. The emissions of LHG's joint ventures were calculated for the first time in this year and included in this category.

Other (upstream)

Evaluation status

Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

There are no other Scope 3 upstream emissions which need to be accounted for. All relevant upstream emissions are covered by the upstream emission categories above.

Other (downstream)

Evaluation status

Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

There are no other Scope 3 downstream emissions which need to be accounted for. All relevant downstream emissions are covered by the downstream emission categories above.

C6.5a

(C6.5a) Disclose or restate your Scope 3 emissions data for previous years.

Past year 1

Start date

January 1 2021

End date

December 31 2021

Scope 3: Purchased goods and services (metric tons CO2e)

10910

Scope 3: Capital goods (metric tons CO2e)

245700

Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e)

3109427

Scope 3: Upstream transportation and distribution (metric tons CO2e)

766768

Scope 3: Waste generated in operations (metric tons CO2e)

82237

Scope 3: Business travel (metric tons CO2e)

21432

Scope 3: Employee commuting (metric tons CO2e)

29823

Scope 3: Upstream leased assets (metric tons CO2e)

Scope 3: Downstream transportation and distribution (metric tons CO2e)

Scope 3: Processing of sold products (metric tons CO2e)

Scope 3: Use of sold products (metric tons CO2e)

Scope 3: End of life treatment of sold products (metric tons CO2e)

Scope 3: Downstream leased assets (metric tons CO2e)

401252

Scope 3: Franchises (metric tons CO2e)

Scope 3: Investments (metric tons CO2e)

Scope 3: Other (upstream) (metric tons CO2e)

Scope 3: Other (downstream) (metric tons CO2e)

Comment

note: all categories left empty were verified as "not relevant" by the auditors in the respective past year.

Past year 2

Start date

January 1 2020

End date

December 31 2020

Scope 3: Purchased goods and services (metric tons CO2e)

0

Scope 3: Capital goods (metric tons CO2e)

473200

Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e)

2599885

Scope 3: Upstream transportation and distribution (metric tons CO2e)

158701

Scope 3: Waste generated in operations (metric tons CO2e)

187837

Scope 3: Business travel (metric tons CO2e)

17740

Scope 3: Employee commuting (metric tons CO2e)

20865

Scope 3: Upstream leased assets (metric tons CO2e)

Scope 3: Downstream transportation and distribution (metric tons CO2e)

Scope 3: Processing of sold products (metric tons CO2e)

Scope 3: Use of sold products (metric tons CO2e)

Scope 3: End of life treatment of sold products (metric tons CO2e)

Scope 3: Downstream leased assets (metric tons CO2e)

33593

Scope 3: Franchises (metric tons CO2e)

Scope 3: Investments (metric tons CO2e)

Scope 3: Other (upstream) (metric tons CO2e)

Scope 3: Other (downstream) (metric tons CO2e)

Comment

note: all categories left empty were verified as "not relevant" by the auditors in the respective past year.

C6.7

(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?

No

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure

0.000712

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)

23335721

Metric denominator

unit total revenue

Metric denominator: Unit total

3277000000

Scope 2 figure used

Market-based

% change from previous year

14.3

Direction of change

Decreased

Reason(s) for change

Other emissions reduction activities

Please explain

The relative increase of combined scope 1 and scope 2 emissions 2022 versus 2021 of the Lufthansa group was smaller than the relative increase of the total revenue of the group. This was due to a more energy efficient operation based on the LHG's annual revenue figure development in 2022 compared to 2021.

C-TS6.15

(C-TS6.15) What are your primary intensity (activity-based) metrics that are appropriate to your emissions from transport activities in Scope 1, 2, and 3?

Aviation

Scopes used for calculation of intensities

Report just Scope 1

Intensity figure

0.000846

Metric numerator: emissions in metric tons CO2e

23210476

Metric denominator: unit

t.km

Metric denominator: unit total

27427000000

% change from previous year

-4

Please explain any exclusions in your coverage of transport emissions in selected category, and reasons for change in emissions intensity.

No exclusion of any Scope 1 transport emissions. The intensity figure represents the LH Group's overall Scope 1 CO2-emissions divided by the overall revenue tonne kilometers transported by the LH Group's aircraft. Since 99,6 % of the overall Scope 1 emissions are resulting from aircraft fuel burnt in aircraft engines, the improvement of the emission intensity is owed to a better overall transport efficiency in 2022 compared to 2021.

ALL

Scopes used for calculation of intensities

Report Scope 1 + 2

Intensity figure

0.000851

Metric numerator: emissions in metric tons CO2e

23335721

Metric denominator: unit

t.km

Metric denominator: unit total

27427000000

% change from previous year

-4.5

Please explain any exclusions in your coverage of transport emissions in selected category, and reasons for change in emissions intensity.

No exclusion of any Scope 1 transport emissions or Scope 2 emissions. The intensity figure represents the LH Group's overall Scope 1 plus Scope 2 CO2-emissions divided by the overall revenue tonne kilometers transported by the LH Group's aircraft. Since 99,1 % of the overall Scope 1 plus Scope 2 emissions are resulting from aircraft fuel burnt in aircraft engines, the improvement of the emission intensity is owed to a better overall transport efficiency in 2022 compared to 2021.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?

No

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/area/region.

Country/area/region	Scope 1 emissions (metric tons CO2e)
Other, please specify (International Airspace)	23116103
Germany	35328
Other, please specify (Rest of world)	59045

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By activity

C7.3c

(C7.3c) Break down your total gross global Scope 1 emissions by business activity.

Activity	Scope 1 emissions (metric tons CO2e)
Catering	50615
Aircraft Maintenance, repair and overhaul (LHT)	34273
Aircraft & ground operations of passenger airlines	21712456
Cargo	1407709
Services (IT, Flight Training, additional customer services like miles&more)	5424

C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO2e.

	Gross Scope 1 emissions, metric tons CO2e	Net Scope 1 emissions, metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Electric utility activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (midstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	23113662	<Not Applicable>	For the LHG, transport service activities as a sector production activity only imply aircraft operations, not ground operations. Therefore, sector-specific Scope 1 emissions include the emissions from the aircraft fleet of LHG (verified with a high assurance).

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/area/region.

Country/area/region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Germany	104587	42285
Other, please specify (Rest of the world (without Germany))	95727	82959

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By activity

C7.6c

(C7.6c) Break down your total gross global Scope 2 emissions by business activity.

Activity	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Catering (kitchen, storing facilities etc.)	57302	57302
Aircraft Maintenance, repair and overhaul (LHT)	59169	23410
Airline Offices (Administration)	47004	27173
Cargo	20552	12084
Services (IT, Flight Training, additional customer services like miles&more)	16287	5276

C7.7

(C7.7) Is your organization able to break down your emissions data for any of the subsidiaries included in your CDP response?

Yes

C7.7a

(C7.7a) Break down your gross Scope 1 and Scope 2 emissions by subsidiary.

Subsidiary name

Air Dolomiti S.p.A. Linee Aeree Regionali Europee

Primary activity

Passenger airlines

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

243910

Scope 2, location-based emissions (metric tons CO2e)

133

Scope 2, market-based emissions (metric tons CO2e)

133

Comment

Subsidiary name

Lufthansa AirPlus Servicekarten GmbH

Primary activity

Travel services

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

774

Scope 2, location-based emissions (metric tons CO2e)

910

Scope 2, market-based emissions (metric tons CO2e)

97

Comment

Subsidiary name

Austrian Airlines AG

Primary activity

Passenger airlines

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

1850170

Scope 2, location-based emissions (metric tons CO2e)

3791

Scope 2, market-based emissions (metric tons CO2e)

1276

Comment

Subsidiary name

Lufthansa CityLine GmbH

Primary activity

Passenger airlines

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

593709

Scope 2, location-based emissions (metric tons CO2e)

2065

Scope 2, market-based emissions (metric tons CO2e)

1386

Comment

Subsidiary name

Deutsche Lufthansa AG

Primary activity

Passenger airlines

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

11279075

Scope 2, location-based emissions (metric tons CO2e)

35608

Scope 2, market-based emissions (metric tons CO2e)

20022

Comment

Subsidiary name

Edelweiss Air AG

Primary activity

Passenger airlines

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

728586

Scope 2, location-based emissions (metric tons CO2e)

40

Scope 2, market-based emissions (metric tons CO2e)

40

Comment

Subsidiary name

EFM Gesellschaft für Enteisen und Flugzeugschleppen am Flughafen München GmbH

Primary activity

Transportation support services

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

690

Scope 2, location-based emissions (metric tons CO2e)

370

Scope 2, market-based emissions (metric tons CO2e)

370

Comment

Subsidiary name

Eurowings Aviation GmbH

Primary activity

Passenger airlines

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

1679707

Scope 2, location-based emissions (metric tons CO2e)

825

Scope 2, market-based emissions (metric tons CO2e)

414

Comment

Subsidiary name

Eurowings Discover GmbH

Primary activity

Passenger airlines

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

863052

Scope 2, location-based emissions (metric tons CO2e)

416

Scope 2, market-based emissions (metric tons CO2e)

416

Comment

Subsidiary name

Lufthansa Global Business Services GmbH

Primary activity

Commercial services

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

0

Scope 2, location-based emissions (metric tons CO2e)

145

Scope 2, market-based emissions (metric tons CO2e)

61

Comment

Subsidiary name

Lufthansa Aviation Training GmbH

Primary activity

Transportation support services

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

3006

Scope 2, location-based emissions (metric tons CO2e)

10097

Scope 2, market-based emissions (metric tons CO2e)

2855

Comment

Subsidiary name

Lufthansa Cargo AG

Primary activity

Air freight

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

1407709

Scope 2, location-based emissions (metric tons CO2e)

20552

Scope 2, market-based emissions (metric tons CO2e)

12084

Comment

Subsidiary name

Lufthansa Industry Solutions GmbH & Co.KG

Primary activity

IT services

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

23

Scope 2, location-based emissions (metric tons CO2e)

686

Scope 2, market-based emissions (metric tons CO2e)

451

Comment

Subsidiary name

Lufthansa Process Management GmbH

Primary activity

IT services

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

9

Scope 2, location-based emissions (metric tons CO2e)

10

Scope 2, market-based emissions (metric tons CO2e)

10

Comment

Subsidiary name

Lufthansa Seeheim GmbH

Primary activity

Education services

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

719

Scope 2, location-based emissions (metric tons CO2e)

2029

Scope 2, market-based emissions (metric tons CO2e)

0

Comment

Subsidiary name

Lufthansa Systems GmbH & Co.KG

Primary activity

IT services

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

203

Scope 2, location-based emissions (metric tons CO2e)

1104

Scope 2, market-based emissions (metric tons CO2e)

720

Comment

Subsidiary name

Lufthansa Technik AG

Primary activity

Engineering services

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

34273

Scope 2, location-based emissions (metric tons CO2e)

59169

Scope 2, market-based emissions (metric tons CO2e)

23410

Comment

Subsidiary name

LSG Lufthansa Service Holding AG

Primary activity

Other food processing

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

50615

Scope 2, location-based emissions (metric tons CO2e)

57302

Scope 2, market-based emissions (metric tons CO2e)

57302

Comment

Subsidiary name

Miles & More GmbH

Primary activity

Transportation support services

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

0

Scope 2, location-based emissions (metric tons CO2e)

248

Scope 2, market-based emissions (metric tons CO2e)

216

Comment

Subsidiary name

Brussels Airlines SA/NV

Primary activity

Passenger airlines

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

1333503

Scope 2, location-based emissions (metric tons CO2e)

1303

Scope 2, market-based emissions (metric tons CO2e)

774

Comment

Subsidiary name

Swiss International Air Lines AG

Primary activity

Passenger airlines

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

3140744

Scope 2, location-based emissions (metric tons CO2e)

2822

Scope 2, market-based emissions (metric tons CO2e)

2710

Comment

Subsidiary name

Minor other business units

Primary activity

Transportation support services

Select the unique identifier(s) you are able to provide for this subsidiary

No unique identifier

ISIN code – bond

<Not Applicable>

ISIN code – equity

<Not Applicable>

CUSIP number

<Not Applicable>

Ticker symbol

<Not Applicable>

SEDOL code

<Not Applicable>

LEI number

<Not Applicable>

Other unique identifier

<Not Applicable>

Scope 1 emissions (metric tons CO2e)

1

Scope 2, location-based emissions (metric tons CO2e)

688

Scope 2, market-based emissions (metric tons CO2e)

498

Comment

C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7

(C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7) Break down your organization's total gross global Scope 2 emissions by sector production activity in metric tons CO2e.

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (midstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	67556	39256	For the LHG, sector production activities are transport services activities. Sector-specific location-based and market based Scope 2 emissions include the emissions from the LHG airlines Lufthansa German Airline, Lufthansa City Line, Brussels Airlines, Eurowings, Eurowings Discover, Germanwings, Air Dolomiti, SWISS, Austrian Airlines and Lufthansa Cargo verified with a limited assurance. Sector-specific market-based Scope 2 emissions of LHG airlines include sites in Germany, Austria, Belgium and Switzerland, which provided market-based factors and all other sites, where only location-based factors were available.

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Increased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change in emissions	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	17238	Decreased	0.17	By the utilization of Sustainable Alternate Fuels (SAF) 23,162 tons of CO ₂ were reduced in reporting year 2021. In reporting year 2022 this reduction was increased to 40,400 tons of CO ₂ . This increase of 17,238 tons of reduced CO ₂ represents an percentage change of 0.17% in relation to the LH Group's total scope 1+2 footprint in 2021. Calculation: 40,400 t CO ₂ - 23,162 t CO ₂ = 17,238 t CO ₂ ; 17,238 t CO ₂ / 13,962,816 t CO ₂ *100 = 0.17% decrease. Formula: X = ((Change in Scope 1+2 emissions attributed to the reason described in column 1)/Previous year Scope 1+2 emissions) * 100)
Other emissions reduction activities	22276	Decreased	0.16	By implementing 17 additional fuel saving projects in 2022 additional annual savings of 22,276 tons of CO ₂ could be realized in 2022 (see C4.3a). This represents a 0.16% saving in relation to the LH Group's total scope 1+2 footprint of 2021. Calculation: 22,276 t CO ₂ / 13,962,816 t CO ₂ * 100 = 0.16% savings. Formula: X = ((Change in Scope 1+2 emissions attributed to the reason described in column 1)/Previous year Scope 1+2 emissions) * 100)
Divestment		<Not Applicable >		
Acquisitions		<Not Applicable >		
Mergers		<Not Applicable >		
Change in output	9372908	Increased	67.1	Due to the COVID-19 Pandemic a significantly reduced air transport capacity was still offered by the Lufthansa Group's airlines in 2022. Parts of the fleets were still grounded and the still reduced demand compared to pre-pandemic years was mainly met by employing the most fuel efficient modern aircraft of the LHG fleet. Since air traffic demand nevertheless took up in 2022 compared to 2021, flight production was increased (t.km +75.0 %), leading to a higher kerosene consumption and accordingly to rising CO ₂ emissions (+67.1%). The rise in emissions was nevertheless 7.9 %P lower than the rise in production, so production was more CO ₂ -efficient in 2022 compared to 2021. Note: flight fuel emissions account with a share of 99.1% for the major part of the LHG's combined Scope 1+2 emissions. The change in emissions was calculated as follows: total Scope 1+2 2022 minus total Scope 1+2 2021: (23,210,476 t CO ₂ +125,245 t CO ₂)-(13,823,320 t CO ₂ +139,496 t CO ₂)=9,372,905 t CO ₂ . Calculation of percentage change CO ₂ 2022 versus 2021 in relation to the LH Group's total scope 1+2 footprint of 2021: +9,372,905 t CO ₂ / (13,823,320 t CO ₂ +139,496 t CO ₂)*100= +67.1%. The change in flight production (t.km) was calculated as follows: flight production in 2022 minus flight production in 2021: 27,427,000,000 t.km - 15,673,900,427 t.km=11,753,099,573 t.km. Calculation of percentage change: 11,753,099,573 t.km/15,673,900,427 tkm)*100= +75.0%. The efficiency increase of 7.9 %P was calculated as follows: 75.0%-67.1%=7.9 %P.. Formula: X = ((Change in Scope 1+2 emissions attributed to the reason described in column 1)/Previous year Scope 1+2 emissions) * 100)
Change in methodology		<Not Applicable >		
Change in boundary		<Not Applicable >		
Change in physical operating conditions		<Not Applicable >		
Unidentified		<Not Applicable >		
Other		<Not Applicable >		

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Market-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 20% but less than or equal to 25%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	Yes
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	Yes
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	157111	90156344	90313455
Consumption of purchased or acquired electricity	<Not Applicable>	37822	391791	429613
Consumption of purchased or acquired heat	<Not Applicable>	0	91138	91138
Consumption of purchased or acquired steam	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired cooling	<Not Applicable>	0	91138	91138
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	0	<Not Applicable>	0
Total energy consumption	<Not Applicable>	194933	90730411	90925343

C8.2b

(C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	Yes

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Sustainable biomass

Heating value

LHV

Total fuel MWh consumed by the organization

0

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Comment

Other biomass

Heating value

LHV

Total fuel MWh consumed by the organization

0

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Comment

Other renewable fuels (e.g. renewable hydrogen)

Heating value

LHV

Total fuel MWh consumed by the organization

157111

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Comment

Coal

Heating value

LHV

Total fuel MWh consumed by the organization

0

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Comment

Oil

Heating value

LHV

Total fuel MWh consumed by the organization

4076

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Comment

Gas

Heating value

LHV

Total fuel MWh consumed by the organization

267793

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

26476

Comment

Other non-renewable fuels (e.g. non-renewable hydrogen)

Heating value

LHV

Total fuel MWh consumed by the organization

89884475

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

0

Comment

Total fuel

Heating value

LHV

Total fuel MWh consumed by the organization

90313455

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

0

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration

26476

Comment

C8.2d

(C8.2d) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	10253.34	10253.34	0	0
Heat	10005.86	10005.86	0	0
Steam	0	0	0	0
Cooling	0	0	0	0

C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a zero or near-zero emission factor in the market-based Scope 2 figure reported in C6.3.

Country/area of low-carbon energy consumption

Austria

Sourcing method

Retail supply contract with an electricity supplier (retail green electricity)

Energy carrier

Electricity

Low-carbon technology type

Low-carbon energy mix, please specify (green electricity mix)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

20383

Tracking instrument used

Contract

Country/area of origin (generation) of the low-carbon energy or energy attribute

Austria

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2022

Comment

Since the green electricity sourced usually is a green energy mix from a multitude of different green sources and green energy generation facilities, that further may at least partly not be located in the country of consumption it is not possible to state one specific country of generation or one specific commissioning year in this case of mixed sourcing. Therefore as a default the country of origin is set equal to the country of consumption, since usually this is the predominant regional origin of a green energy mix consumed in one country and the commissioning year is set to match the reporting year alternatively.

Country/area of low-carbon energy consumption

Ireland

Sourcing method

Retail supply contract with an electricity supplier (retail green electricity)

Energy carrier

Electricity

Low-carbon technology type

Low-carbon energy mix, please specify (green electricity mix)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

6807

Tracking instrument used

Contract

Country/area of origin (generation) of the low-carbon energy or energy attribute

Ireland

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or re-powering)

2022

Comment

Since the green electricity sourced usually is a green energy mix from a multitude of different green sources and green energy generation facilities, that further may at least partly not be located in the country of consumption it is not possible to state one specific country of generation or one specific commissioning year in this case of mixed sourcing. Therefore as a default the country of origin is set equal to the country of consumption, since usually this is the predominant regional origin of a green energy mix consumed in one country and the commissioning year is set to match the reporting year alternatively.

Country/area of low-carbon energy consumption

Belgium

Sourcing method

Retail supply contract with an electricity supplier (retail green electricity)

Energy carrier

Electricity

Low-carbon technology type

Low-carbon energy mix, please specify (green electricity mix)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

3201

Tracking instrument used

Contract

Country/area of origin (generation) of the low-carbon energy or energy attribute

Belgium

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or re-powering)

2022

Comment

Since the green electricity sourced usually is a green energy mix from a multitude of different green sources and green energy generation facilities, that further may at least partly not be located in the country of consumption it is not possible to state one specific country of generation or one specific commissioning year in this case of mixed sourcing. Therefore as a default the country of origin is set equal to the country of consumption, since usually this is the predominant regional origin of a green energy mix consumed in one country and the commissioning year is set to match the reporting year alternatively.

Country/area of low-carbon energy consumption

United States of America

Sourcing method

Retail supply contract with an electricity supplier (retail green electricity)

Energy carrier

Electricity

Low-carbon technology type

Renewable energy mix, please specify (green electricity mix)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

2819

Tracking instrument used

Contract

Country/area of origin (generation) of the low-carbon energy or energy attribute

United States of America

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or re-powering)

2022

Comment

Since the green electricity sourced usually is a green energy mix from a multitude of different green sources and green energy generation facilities, that further may at least partly not be located in the country of consumption it is not possible to state one specific country of generation or one specific commissioning year in this case of mixed sourcing. Therefore as a default the country of origin is set equal to the country of consumption, since usually this is the predominant regional origin of a green energy mix consumed in one country and the commissioning year is set to match the reporting year alternatively.

Country/area of low-carbon energy consumption

Switzerland

Sourcing method

Retail supply contract with an electricity supplier (retail green electricity)

Energy carrier

Electricity

Low-carbon technology type

Low-carbon energy mix, please specify (green electricity mix)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

4897

Tracking instrument used

Contract

Country/area of origin (generation) of the low-carbon energy or energy attribute

Switzerland

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or re-powering)

2022

Comment

Since the green electricity sourced usually is a green energy mix from a multitude of different green sources and green energy generation facilities, that further may at least partly not be located in the country of consumption it is not possible to state one specific country of generation or one specific commissioning year in this case of mixed sourcing. Therefore as a default the country of origin is set equal to the country of consumption, since usually this is the predominant regional origin of a green energy mix consumed in one country and the commissioning year is set to match the reporting year alternatively.

Country/area of low-carbon energy consumption

Philippines

Sourcing method

Retail supply contract with an electricity supplier (retail green electricity)

Energy carrier

Electricity

Low-carbon technology type

Low-carbon energy mix, please specify (green electricity mix)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

1185

Tracking instrument used

Contract

Country/area of origin (generation) of the low-carbon energy or energy attribute

Philippines

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or re-powering)

2022

Comment

Since the green electricity sourced usually is a green energy mix from a multitude of different green sources and green energy generation facilities, that further may at least partly not be located in the country of consumption it is not possible to state one specific country of generation or one specific commissioning year in this case of mixed sourcing. Therefore as a default the country of origin is set equal to the country of consumption, since usually this is the predominant regional origin of a green energy mix consumed in one country and the commissioning year is set to match the reporting year alternatively.

Country/area of low-carbon energy consumption

Italy

Sourcing method

Retail supply contract with an electricity supplier (retail green electricity)

Energy carrier

Electricity

Low-carbon technology type

Low-carbon energy mix, please specify (green electricity mix)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

801

Tracking instrument used

Contract

Country/area of origin (generation) of the low-carbon energy or energy attribute

Italy

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2022

Comment

Since the green electricity sourced usually is a green energy mix from a multitude of different green sources and green energy generation facilities, that further may at least partly not be located in the country of consumption it is not possible to state one specific country of generation or one specific commissioning year in this case of mixed sourcing. Therefore as a default the country of origin is set equal to the country of consumption, since usually this is the predominant regional origin of a green energy mix consumed in one country and the commissioning year is set to match the reporting year alternatively.

Country/area of low-carbon energy consumption

Germany

Sourcing method

Retail supply contract with an electricity supplier (retail green electricity)

Energy carrier

Electricity

Low-carbon technology type

Renewable energy mix, please specify (green electricity mix)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

429

Tracking instrument used

Contract

Country/area of origin (generation) of the low-carbon energy or energy attribute

Germany

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2022

Comment

Since the green electricity sourced usually is a green energy mix from a multitude of different green sources and green energy generation facilities, that further may at least partly not be located in the country of consumption it is not possible to state one specific country of generation or one specific commissioning year in this case of mixed sourcing. Therefore as a default the country of origin is set equal to the country of consumption, since usually this is the predominant regional origin of a green energy mix consumed in one country and the commissioning year is set to match the reporting year alternatively.

Country/area of low-carbon energy consumption

United Kingdom of Great Britain and Northern Ireland

Sourcing method

Retail supply contract with an electricity supplier (retail green electricity)

Energy carrier

Electricity

Low-carbon technology type

Renewable energy mix, please specify (green electricity mix)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

111

Tracking instrument used

Contract

Country/area of origin (generation) of the low-carbon energy or energy attribute

United Kingdom of Great Britain and Northern Ireland

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2022

Comment

Since the green electricity sourced usually is a green energy mix from a multitude of different green sources and green energy generation facilities, that further may at least partly not be located in the country of consumption it is not possible to state one specific country of generation or one specific commissioning year in this case of mixed sourcing. Therefore as a default the country of origin is set equal to the country of consumption, since usually this is the predominant regional origin of a green energy mix consumed in one country and the commissioning year is set to match the reporting year alternatively.

Country/area of low-carbon energy consumption

Germany

Sourcing method

Retail supply contract with an electricity supplier (retail green electricity)

Energy carrier

Electricity

Low-carbon technology type

Small hydropower (<25 MW)

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)

187841

Tracking instrument used

Other, please specify (HKN Neu100 certificate of origin and approval of devaluation of certificates of origin issued by MAINOVA AG. Devaluation confirmed by German Umweltbundesamt (part of German Ministry of Environment) in their register of certificates of origin (HKNR))

Country/area of origin (generation) of the low-carbon energy or energy attribute

Norway

Are you able to report the commissioning or re-powering year of the energy generation facility?

Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)

2016

Comment

C8.2g

(C8.2g) Provide a breakdown by country/area of your non-fuel energy consumption in the reporting year.

Country/area

Angola

Consumption of purchased electricity (MWh)

2

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

2

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

4

Country/area

Argentina

Consumption of purchased electricity (MWh)

1680

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

1680

Country/area

Austria

Consumption of purchased electricity (MWh)

20388

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

7899

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

28287

Country/area

Azerbaijan

Consumption of purchased electricity (MWh)

3

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

3

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

6

Country/area

Bahrain

Consumption of purchased electricity (MWh)

2

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

3

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

5

Country/area

Belarus

Consumption of purchased electricity (MWh)

3

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

4

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

7

Country/area

Belgium

Consumption of purchased electricity (MWh)

3221

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

3562

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

6783

Country/area

Benin

Consumption of purchased electricity (MWh)

27

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

27

Country/area

Brazil

Consumption of purchased electricity (MWh)

9870

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

716

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

10586

Country/area

Bulgaria

Consumption of purchased electricity (MWh)

5020

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

28

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

5048

Country/area

Burkina Faso

Consumption of purchased electricity (MWh)

11

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

11

Country/area

Burundi

Consumption of purchased electricity (MWh)

9

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

9

Country/area

Cameroon

Consumption of purchased electricity (MWh)

72

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

72

Country/area

Canada

Consumption of purchased electricity (MWh)

6023

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

6023

Country/area

Chile

Consumption of purchased electricity (MWh)

1683

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

1683

Country/area

China

Consumption of purchased electricity (MWh)

6866

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

67

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

6933

Country/area

Democratic Republic of the Congo

Consumption of purchased electricity (MWh)

80

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

80

Country/area

Côte d'Ivoire

Consumption of purchased electricity (MWh)

73

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

73

Country/area

Croatia

Consumption of purchased electricity (MWh)

1

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

2

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

3

Country/area

Czechia

Consumption of purchased electricity (MWh)

19

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

25

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

44

Country/area

Denmark

Consumption of purchased electricity (MWh)

22

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

29

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

51

Country/area

Egypt

Consumption of purchased electricity (MWh)

5711

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

5711

Country/area

Estonia

Consumption of purchased electricity (MWh)

214

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

211

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

425

Country/area

Finland

Consumption of purchased electricity (MWh)

19

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

25

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

44

Country/area

France

Consumption of purchased electricity (MWh)

110

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

70

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

180

Country/area

Gambia

Consumption of purchased electricity (MWh)

18

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

18

Country/area

Germany

Consumption of purchased electricity (MWh)

188645

Consumption of self-generated electricity (MWh)

10253

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

141423

Consumption of self-generated heat, steam, and cooling (MWh)

10006

Total non-fuel energy consumption (MWh) [Auto-calculated]

350327

Country/area

Ghana

Consumption of purchased electricity (MWh)

18

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

18

Country/area

Greece

Consumption of purchased electricity (MWh)

11

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

14

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

25

Country/area

Guam

Consumption of purchased electricity (MWh)

1023

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

1023

Country/area

Hong Kong SAR, China

Consumption of purchased electricity (MWh)

9971

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

51

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

10022

Country/area

Hungary

Consumption of purchased electricity (MWh)

1977

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

2678

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

4655

Country/area

India

Consumption of purchased electricity (MWh)

3164

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

68

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

3232

Country/area

Ireland

Consumption of purchased electricity (MWh)

6841

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

44

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

6885

Country/area

Israel

Consumption of purchased electricity (MWh)

16

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

20

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

36

Country/area

Italy

Consumption of purchased electricity (MWh)

1383

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

143

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

1526

Country/area

Japan

Consumption of purchased electricity (MWh)

45

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

58

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

103

Country/area

Kazakhstan

Consumption of purchased electricity (MWh)

6

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

8

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

14

Country/area

Kenya

Consumption of purchased electricity (MWh)

867

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

31

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

898

Country/area

Republic of Korea

Consumption of purchased electricity (MWh)

6610

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

1472

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

8082

Country/area

Latvia

Consumption of purchased electricity (MWh)

506

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

154

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

660

Country/area

Luxembourg

Consumption of purchased electricity (MWh)

5

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

6

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

11

Country/area

Malta

Consumption of purchased electricity (MWh)

2551

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

5

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

2556

Country/area

Mexico

Consumption of purchased electricity (MWh)

285

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

285

Country/area

Netherlands

Consumption of purchased electricity (MWh)

84

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

97

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

181

Country/area

New Zealand

Consumption of purchased electricity (MWh)

6092

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

6092

Country/area

Nigeria

Consumption of purchased electricity (MWh)

823

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

823

Country/area

Norway

Consumption of purchased electricity (MWh)

25

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

32

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

57

Country/area

Panama

Consumption of purchased electricity (MWh)

2126

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

2126

Country/area

Philippines

Consumption of purchased electricity (MWh)

17014

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

17014

Country/area

Poland

Consumption of purchased electricity (MWh)

354

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

157

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

511

Country/area

Portugal

Consumption of purchased electricity (MWh)

8

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

10

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

18

Country/area

Puerto Rico

Consumption of purchased electricity (MWh)

2837

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

2837

Country/area

Romania

Consumption of purchased electricity (MWh)

7

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

9

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

16

Country/area

Russian Federation

Consumption of purchased electricity (MWh)

18040

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

991

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

19031

Country/area

Rwanda

Consumption of purchased electricity (MWh)

3

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

3

Country/area

Saudi Arabia

Consumption of purchased electricity (MWh)

7

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

9

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

16

Country/area

Senegal

Consumption of purchased electricity (MWh)

25

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

9

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

34

Country/area

Sierra Leone

Consumption of purchased electricity (MWh)

7

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

7

Country/area

Singapore

Consumption of purchased electricity (MWh)

95

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

86

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

181

Country/area

Slovenia

Consumption of purchased electricity (MWh)

3

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

4

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

7

Country/area

South Africa

Consumption of purchased electricity (MWh)

318

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

318

Country/area

Spain

Consumption of purchased electricity (MWh)

56

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

61

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

117

Country/area

Sweden

Consumption of purchased electricity (MWh)

62

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

77

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

139

Country/area

Switzerland

Consumption of purchased electricity (MWh)

12336

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

15393

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

27729

Country/area

United Republic of Tanzania

Consumption of purchased electricity (MWh)

1379

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

1379

Country/area

Thailand

Consumption of purchased electricity (MWh)

5232

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

5232

Country/area

Togo

Consumption of purchased electricity (MWh)

22

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

22

Country/area

Tunisia

Consumption of purchased electricity (MWh)

6

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

8

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

14

Country/area

Turkey

Consumption of purchased electricity (MWh)

24

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

32

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

56

Country/area

Uganda

Consumption of purchased electricity (MWh)

12

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

12

Country/area

United Arab Emirates

Consumption of purchased electricity (MWh)

214

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

5

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

219

Country/area

United Kingdom of Great Britain and Northern Ireland

Consumption of purchased electricity (MWh)

3369

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

63

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

3432

Country/area

United States of America

Consumption of purchased electricity (MWh)

72193

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

6390

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

78583

Country/area

United States Minor Outlying Islands

Consumption of purchased electricity (MWh)

701

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

701

Country/area

Venezuela (Bolivarian Republic of)

Consumption of purchased electricity (MWh)

1044

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

0

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

1044

Country/area

Viet Nam

Consumption of purchased electricity (MWh)

17

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)

22

Consumption of self-generated heat, steam, and cooling (MWh)

0

Total non-fuel energy consumption (MWh) [Auto-calculated]

39

C-TS8.5

(C-TS8.5) Provide any efficiency metrics that are appropriate for your organization's transport products and/or services.

Activity

Aviation

Metric figure

0.335

Metric numerator

Liters of fuel

Metric denominator

t.km

Metric numerator: Unit total

9175945057

Metric denominator: Unit total

27427000000

% change from last year

-3.8

Please explain

The main driver of this efficiency gain in aviation fuel consumption was the fact that the LH Group succeeded in transporting 75.0% more passenger- and freight-kilometers in 2022 compared to 2021 (expressed by an increase of the metric denominator t.km 2022 versus previous year) whilst burning over-proportionally less aviation fuel (just 68.4 % more versus previous year), leading to a decrease of specific aviation fuel consumption per tonne kilometer of -3.8%, a significant efficiency gain.

Activity

Please select

Metric figure

Metric numerator

Please select

Metric denominator

<Not Applicable>

Metric numerator: Unit total

Metric denominator: Unit total

% change from last year

Please explain

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

Description

Energy usage

Metric value

4.02

Metric numerator

MWh electricity in reporting year

Metric denominator (intensity metric only)

Average number of employees in reporting year

% change from previous year

7.8

Direction of change

Increased

Please explain

With the increasing return of employees from COVID-19 induced home-office work to on-site work and the uptake of production in the LH Group's operative facilities, the average consumption of electricity per employee - taking into account the total average number of group-wide employees in the reporting year - is expectedly increasing.

C-TO9.3/C-TS9.3

(C-TO9.3/C-TS9.3) Provide tracking metrics for the implementation of low-carbon transport technology over the reporting year.

Activity

Aviation

Metric

Fleet adoption

Technology

Other, please specify (Percentage point increase of the share of low carbon company cars in reporting year 2022 compared to year 2021)

Metric figure

17

Metric unit

Other, please specify (Percentage point increase of the share of low carbon company cars in reporting year 2021 compared to base year 2019)

Explanation

By incentivizing the use of low carbon company cars in Germany, the share of these cars in the LH Group's company car fleet in Germany was increased by 17 percentage points from 28% in 2021 to 45% in 2022. This represents an increase of the electric and hybrid company car fleet of 72% in 2022 compared to 2021.

C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6

(C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?

	Investment in low-carbon R&D	Comment
Row 1	Yes	

C-TO9.6a/C-TS9.6a

(C-TO9.6a/C-TS9.6a) Provide details of your organization's investments in low-carbon R&D for transport-related activities over the last three years.

Activity

Aviation

Technology area

Aerodynamics

Stage of development in the reporting year

Full/commercial-scale demonstration

Average % of total R&D investment over the last 3 years

4.2

R&D investment figure in the reporting year (unit currency as selected in C0.4) (optional)

Average % of total R&D investment planned over the next 5 years

Explain how your R&D investment in this technology area is aligned with your climate commitments and/or climate transition plan

The research, development and implementation of operational efficiency measures to reduce fuel consumption and related GHG emissions of LHG's aircraft fleet is a main pillar of LHG's climate transition plan. The AeroSHARK will already reduce the Lufthansa Group's carbon footprint by improve around one percent more fuel-efficient on aircraft with use this modification of a fuel-saving film. Therefor this R&D investment is fully aligned with LHG's climate transition plan.

In December 2019, Lufthansa Technik began first large-scale flight trials of a new surface technology jointly developed with BASF Coatings GmbH, in which a modified Boeing 747-400 demonstrated the technology's effectiveness in meanwhile more than 6,000 flight hours collected during regular long-haul operations for Lufthansa. This functional film called AeroSHARK, inspired by the skin of sharks and its microscopic ribs (so-called "riblets"), reduces the frictional resistance of any aircraft. The mentioned Boeing 747-400 was modified with approximately 500 square meters of these riblet films and already validated a drag reduction of up to 0.8 percent. This would equal annual savings of more than 300 metric tons of fuel and more than 900 metric tons of CO₂ emissions for this single aircraft alone.

The successful proof of concept on the Boeing 747-400 was succeeded by an even larger AeroSHARK modification developed for two subtypes of Boeing 777. For this development stage, Lufthansa Technik achieved EASA (and later FAA) supplemental type certification in December 2022, paving the way for the 777-fleet-wide roll-out of the AeroSHARK technology at the launch customers SWISS and Lufthansa Cargo. With up to 950 square meters of riblet film applied to the aircraft's fuselage and engine nacelles, this AeroSHARK modification is estimated to make both the 777F of Lufthansa Cargo and the 777-300ER of SWISS around one percent more fuel-efficient. As soon as the combined Boeing 777 fleets at Lufthansa Cargo and SWISS are fully modified, AeroSHARK will already reduce the Lufthansa Group's carbon footprint by more than 25,000 tons of CO₂ every year.

Moreover, plans persist to have the energy-saving riblet films certified for further aircraft types and additional aircraft surfaces, promoting it more widely across aircraft operators around the world. Therefore, Lufthansa Technik also plans to make the fuel-saving film available to airlines outside the Lufthansa Group.

Activity

Aviation

Technology area

Operations

Stage of development in the reporting year

Applied research and development

Average % of total R&D investment over the last 3 years

3

R&D investment figure in the reporting year (unit currency as selected in C0.4) (optional)

Average % of total R&D investment planned over the next 5 years

3

Explain how your R&D investment in this technology area is aligned with your climate commitments and/or climate transition plan

The research, development and implementation of operational efficiency measures to reduce fuel consumption and related GHG emissions of LHG's aircraft fleet is a main pillar of LHG's climate transition plan. The VOLAR project established an innovative algorithm which offers a synchronized route optimization for diverse criteria (kerosene, costs, time, climate effects). Therefor, this R&D investment is fully aligned with LHG's climate transition plan.

VOLAR is a development project for our Lufthansa Systems product LIDO Flight 4D. The project is ongoing and has the aim to reduce CO₂ through smart mathematics. Based on the flight planning software Lido Flight 4D, the expansion of the new Lido Optimizer VOLAR Algorithm followed and enables the optimization of routes to avoid non-CO₂ effects such as condensation trails through the usage of eco-efficient trajectories.

Activity

Aviation

Technology area

Operations

Stage of development in the reporting year

Small scale commercial deployment

Average % of total R&D investment over the last 3 years

0.16

R&D investment figure in the reporting year (unit currency as selected in C0.4) (optional)

Average % of total R&D investment planned over the next 5 years

0.05

Explain how your R&D investment in this technology area is aligned with your climate commitments and/or climate transition plan

The research, development and implementation of operational efficiency measures to reduce fuel consumption and related GHG emissions of LHG's aircraft fleet is a main pillar of LHG's climate transition plan. The STAM project is an approach to smooth sector workloads by reducing traffic peaks through short-term application of minor ground delays, appropriate flight level capping and rerouting to a limited number of flights. One effect of the approach is the reduction of fuel & GHG emissions. Therefor this R&D investment is fully aligned with LHG's climate transition plan.

STAM (Short Term ATFCM (Air Traffic Flow and Capacity Management) Measures.

STAM is a development project for our Lufthansa Systems product LIDO Flight 4D. The project will end December 2023.

With the STAM RRP procedure, FMPs can offer targeted flights to reroute out of their area of responsibility when there is a residual traffic peak during the tactical day. At the same time, it provides AOs with an option to avoid future delay. The entire procedure is supervised, consolidated and when it is needed, the requests are also coordinated and approved by the Network Manager.

Activity

Aviation

Technology area

Operations

Stage of development in the reporting year

Small scale commercial deployment

Average % of total R&D investment over the last 3 years

0.18

R&D investment figure in the reporting year (unit currency as selected in C0.4) (optional)

Average % of total R&D investment planned over the next 5 years

0.05

Explain how your R&D investment in this technology area is aligned with your climate commitments and/or climate transition plan

The eFPL project is a development project for our Lufthansa Systems product LIDO Flight 4D. The project has been completed in 2023.

The eFPL is the successor of the current standard ICAO2012 filing. eFPL is part of the FF ICE (Flight and Flow Information for a Collaborative Environment) concept driven by ICAO. This concept shall align information exchange along all flight phases (planning and inflight): more information on ICAO website. It will implement major changes in the way flight plans are filed, updated and cancelled. Expected benefits on the long term run are:

- o less rejects due to better understanding by NM of desired trajectory from aircraft operator
- o more precise Demand Capacity Balancing of ANSPs due to more precise trajectory information and better counting.

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement

2

Lufthansa Group CDP verification 2023.pdf

Lufthansa Group CDP verification statement 2023.pdf

Page/ section reference

Lufthansa Group CDP verification statement 2023.pdf (as attached) pages 1-5; Lufthansa Group CDP verification 2023.pdf (as attached) pages 1-2

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

C10.1b

(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.

Scope 2 approach

Scope 2 location-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

2

Lufthansa Group CDP verification 2023.pdf

Lufthansa Group CDP verification statement 2023.pdf

Page/ section reference

Lufthansa Group CDP verification statement 2023.pdf (as attached) pages 1-5; Lufthansa Group CDP verification 2023.pdf (as attached) pages 1-2

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 2 approach

Scope 2 market-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

2

Lufthansa Group CDP verification 2023.pdf

Lufthansa Group CDP verification statement 2023.pdf

Page/ section reference

Lufthansa Group CDP verification statement 2023.pdf (as attached) pages 1-5; Lufthansa Group CDP verification 2023.pdf (as attached) pages 1-2

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

C10.1c

(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope 3 category

Scope 3: Purchased goods and services

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

2

Lufthansa Group CDP verification 2023.pdf

Lufthansa Group CDP verification statement 2023.pdf

Page/section reference

Lufthansa Group CDP verification statement 2023.pdf (as attached) pages 1-5; Lufthansa Group CDP verification 2023.pdf (as attached) pages 1-2

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Capital goods

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

2

Lufthansa Group CDP verification 2023.pdf

Lufthansa Group CDP verification statement 2023.pdf

Page/section reference

Lufthansa Group CDP verification statement 2023.pdf (as attached) pages 1-5; Lufthansa Group CDP verification 2023.pdf (as attached) pages 1-2

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2)

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

2

Lufthansa Group CDP verification 2023.pdf

Lufthansa Group CDP verification statement 2023.pdf

Page/section reference

Lufthansa Group CDP verification statement 2023.pdf (as attached) pages 1-5; Lufthansa Group CDP verification 2023.pdf (as attached) pages 1-2

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Upstream transportation and distribution

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

2

Lufthansa Group CDP verification 2023.pdf

Lufthansa Group CDP verification statement 2023.pdf

Page/section reference

Lufthansa Group CDP verification statement 2023.pdf (as attached) pages 1-5; Lufthansa Group CDP verification 2023.pdf (as attached) pages 1-2

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Waste generated in operations

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

2

Lufthansa Group CDP verification 2023.pdf
Lufthansa Group CDP verification statement 2023.pdf

Page/section reference

Lufthansa Group CDP verification statement 2023.pdf (as attached) pages 1-5; Lufthansa Group CDP verification 2023.pdf (as attached) pages 1-2

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Business travel

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

2

Lufthansa Group CDP verification 2023.pdf
Lufthansa Group CDP verification statement 2023.pdf

Page/section reference

Lufthansa Group CDP verification statement 2023.pdf (as attached) pages 1-5; Lufthansa Group CDP verification 2023.pdf (as attached) pages 1-2

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Employee commuting

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

2

Lufthansa Group CDP verification 2023.pdf
Lufthansa Group CDP verification statement 2023.pdf

Page/section reference

Lufthansa Group CDP verification statement 2023.pdf (as attached) pages 1-5; Lufthansa Group CDP verification 2023.pdf (as attached) pages 1-2

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Downstream leased assets

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

2

Lufthansa Group CDP verification 2023.pdf
Lufthansa Group CDP verification statement 2023.pdf

Page/section reference

Lufthansa Group CDP verification statement 2023.pdf (as attached) pages 1-5; Lufthansa Group CDP verification 2023.pdf (as attached) pages 1-2

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

Scope 3 category

Scope 3: Investments

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

2

Lufthansa Group CDP verification 2023.pdf

Lufthansa Group CDP verification statement 2023.pdf

Page/section reference

Lufthansa Group CDP verification statement 2023.pdf (as attached) pages 1-5; Lufthansa Group CDP verification 2023.pdf (as attached) pages 1-2

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

C10.2**(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?**

Yes

C10.2a**(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?**

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C6. Emissions data	Other, please specify (Relative decrease of the sum of LHG's scope 1 and 2 emissions 2022 vs. 2021 related to LHG's total annual revenue; relative development 2022 vs. 2021 of primary intensity activity-based metrics in scope 1 & 2 appropriate to air-transport activities)	ISO14064-3	LHG has chosen to verify the selected data points with the mentioned standard in order to provide verified data to our interested stakeholders. All data mentioned in questions C6.10 and C-TS6.15 was verified by third party . The verification was carried out on a yearly basis via the entire LHG organization. Lufthansa Group CDP verification 2023.pdf Lufthansa Group CDP verification statement 2023.pdf
C7. Emissions breakdown	Other, please specify (All data, statements and breakdowns as detailed by the LH Group in chapter C7. Emissions breakdowns)	ISO14064-3	LHG has chosen to verify the selected data points with the mentioned standard in order to provide verified data to our interested stakeholders. All data mentioned in questions C7.2, C7.3c, C-TS7.4, C7.5, C7.6c, C7.7a, C-TS7.7 and C7.9a was verified by third party . The verification was carried out on a yearly basis via the entire LHG organization Lufthansa Group CDP verification 2023.pdf Lufthansa Group CDP verification statement 2023.pdf
C8. Energy	Energy consumption	ISO14064-3	LHG has chosen to verify the selected data points with the mentioned standard in order to provide verified data to our interested stakeholders. All data mentioned in questions C8.1, C8.2a, C8.2c , C8.2d, C8.2e and C8.2g was verified by third party . The verification was carried out on a yearly basis via the entire LHG organization. Lufthansa Group CDP verification 2023.pdf Lufthansa Group CDP verification statement 2023.pdf
C8. Energy	Other, please specify (Efficiency metric appropriate to organization's transport products and services)	ISO14064-3	LHG has chosen to verify the selected data points with the mentioned standard in order to provide verified data to our interested stakeholders. All data mentioned in question C-TS8.5 was verified by third party . The verification was carried out on a yearly basis via the entire LHG organization. Lufthansa Group CDP verification 2023.pdf Lufthansa Group CDP verification statement 2023.pdf

C11. Carbon pricing**C11.1****(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?**

Yes

C11.1a

(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.

EU ETS
Switzerland ETS
UK ETS
Other ETS, please specify (CORSA)

C11.1b

(C11.1b) Complete the following table for each of the emissions trading schemes you are regulated by.

EU ETS

% of Scope 1 emissions covered by the ETS

29

% of Scope 2 emissions covered by the ETS

0

Period start date

January 1 2022

Period end date

December 31 2022

Allowances allocated

3361878

Allowances purchased

2356500

Verified Scope 1 emissions in metric tons CO2e

6731101

Verified Scope 2 emissions in metric tons CO2e

0

Details of ownership

Facilities we own and operate

Comment

The ETS relevant numbers here are based on aircraft owned by, and flights operated by Lufthansa German Airlines, SWISS, Austrian Airlines, Brussels Airlines, Eurowings and Lufthansa Cargo . Lufthansa German Airlines also includes regional airlines Lufthansa CityLine and Air Dolomiti as well as Eurowings Discover.

Switzerland ETS

% of Scope 1 emissions covered by the ETS

2.2

% of Scope 2 emissions covered by the ETS

0

Period start date

January 1 2022

Period end date

December 31 2022

Allowances allocated

421113

Allowances purchased

45000

Verified Scope 1 emissions in metric tons CO2e

521311

Verified Scope 2 emissions in metric tons CO2e

0

Details of ownership

Facilities we own and operate

Comment

The ETS relevant numbers here are based on aircraft owned by, and flights operated by Lufthansa German Airlines, SWISS, Austrian Airlines, Brussels Airlines, Eurowings and Lufthansa Cargo . Lufthansa German Airlines also includes regional airlines Lufthansa CityLine and Air Dolomiti as well as Eurowings Discover.

UK ETS

% of Scope 1 emissions covered by the ETS

0.6

% of Scope 2 emissions covered by the ETS

0

Period start date

January 1 2022

Period end date

December 31 2022

Allowances allocated

292173

Allowances purchased

0

Verified Scope 1 emissions in metric tons CO2e

131442

Verified Scope 2 emissions in metric tons CO2e

0

Details of ownership

Facilities we own and operate

Comment

In 2022, emissions from flights falling under the UK ETS remained below the level of free allowances. The reason for this is that the measurement of the flight performance which is relevant for the amount of allocated allowances was made at a point in time when the DLH Group had a higher share of UK ETS relevant traffic. The ETS relevant numbers here are based on aircraft owned by, and flights operated by Lufthansa German Airlines, SWISS, Austrian Airlines, Brussels Airlines, Eurowings and Lufthansa Cargo . Lufthansa German Airlines also includes regional airlines Lufthansa CityLine and Air Dolomiti as well as Eurowings Discover.

Other ETS, please specify

% of Scope 1 emissions covered by the ETS

0

% of Scope 2 emissions covered by the ETS

0

Period start date

January 1 2022

Period end date

December 31 2022

Allowances allocated

0

Allowances purchased

0

Verified Scope 1 emissions in metric tons CO2e

0

Verified Scope 2 emissions in metric tons CO2e

0

Details of ownership

Facilities we own and operate

Comment

Instrument mentioned here: CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation). On June 30th 2020, ICAO Council passed a resolution to adjust the baseline for CORSIA. ICAO's Council agreed to omit 2020 from the carbon neutral growth baseline (new baseline: 2019 only) for CORSIA's first three years (2021-2023). Both LHG and the entire aviation sector covered by CORSIA did not exceed the 2019 emission levels in 2022. Therefore, LHG does not have to meet any requirements with regard to CO₂ under CORSIA in 2022 (besides the reporting requirements).

C11.1d

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

LHG's 4-pillar climate protection strategy define market-based measures (e.g. ETS) as an important instrument to reduce the carbon emissions in a cost-effective manner, as long as these measures treating airlines equally. LHG's strategy for complying with the existing / emerging systems is to ensure legal compliance through closely monitoring and reporting externally verified emissions and through a close cooperation with the respective (national) emission authority.

To be able to fulfill the obligation to surrender allowances to cover the emission debts, LHG purchases CO₂ allowances on a regular basis and takes thereby into account the planned emissions of not only the current year but also the two following business years. LHG has employ a hedging strategy for the ETS allowances - similar to fuel hedging - to protect against price volatility.

Overall strategy for compliance with EU ETS, Switzerland ETS and the CORSIA scheme is co-ordinated at Group level. Nevertheless, LHG also has dedicated person responsible for emissions compliance requirements in each business unit managing the detailed monitoring, reporting and verification aspects. In addition, LHG has engaged third party verifiers to check and review the compliance reporting prior to annual submission to respective regulators.

LHG strategy also foresees to use all opportunities to reduce fuel consumption and with this the CO₂ emissions (e.g. investment in fuel efficient aircraft, operational fuel efficiency or in SAF) in order to minimize LHG climate impact and exposure to compliance costs.

Various teams have been set up for this purpose (e.g. on emissions regulations, emissions management, fuel efficiency, SAF, ETS risks), which regularly exchange information on an interdisciplinary basis and also coordinate short- to long-term action strategies. Furthermore LHG uses an internal carbon price for some decision-making processes (see C11.3).

C11.2

(C11.2) Has your organization canceled any project-based carbon credits within the reporting year?

Yes

C11.2a

(C11.2a) Provide details of the project-based carbon credits canceled by your organization in the reporting year.

Project type

Solar

Type of mitigation activity

Emissions reduction

Project description

In order to reduce CO₂ and counter the rapid deforestation on Madagascar, the project supports the manufacture and distribution of efficient cookers and climate-friendly solar cookers. The sensibilisation of pupils about environmental protection and climate friendly cooking as well as the reforestation of two seedlings per cook stove sold are part of that project.

Credits canceled by your organization from this project in the reporting year (metric tons CO₂e)

6007

Purpose of cancellation

Voluntary offsetting

Are you able to report the vintage of the credits at cancellation?

Yes

Vintage of credits at cancellation

2021

Were these credits issued to or purchased by your organization?

Purchased

Credits issued by which carbon-crediting program

Gold Standard

Method(s) the program uses to assess additionality for this project

Barrier analysis

Approach(es) by which the selected program requires this project to address reversal risk

No risk of reversal

Potential sources of leakage the selected program requires this project to have assessed

Activity-shifting
Market leakage
Ecological leakage

Provide details of other issues the selected program requires projects to address

no other issues

Comment

According to GS meth requirements, following leakage risks have been assessed: Displaced technologies are used again outside of boundary, saved biomass is used by other non-project users, impact on other carbon/forestry projects, compensation of less space heating with other technology, substitution of lower-emission technologies.

C11.3

(C11.3) Does your organization use an internal price on carbon?

Yes

C11.3a

(C11.3a) Provide details of how your organization uses an internal price on carbon.

Type of internal carbon price

Shadow price

How the price is determined

Alignment with the price of allowances under an Emissions Trading Scheme
Price/cost of voluntary carbon offset credits

Objective(s) for implementing this internal carbon price

Drive energy efficiency
Drive low-carbon investment
Navigate GHG regulations
Stakeholder expectations

Scope(s) covered

Scope 1
Scope 2

Pricing approach used – spatial variance

Differentiated

Pricing approach used – temporal variance

Evolutionary

Indicate how you expect the price to change over time

Rising

Actual price(s) used – minimum (currency as specified in C0.4 per metric ton CO2e)

5

Actual price(s) used – maximum (currency as specified in C0.4 per metric ton CO2e)

125

Business decision-making processes this internal carbon price is applied to

Capital expenditure
Operations
Procurement
Product and R&D
Risk management
Opportunity management

Mandatory enforcement of this internal carbon price within these business decision-making processes

Yes, for some decision-making processes, please specify (For example in profitability calculations for aircraft procurement or network strategy and planning , LHG always use a CO2 surcharge in the assumptions on the future fuel price.)

Explain how this internal carbon price has contributed to the implementation of your organization's climate commitments and/or climate transition plan

The use of the internal CO2 price for existing and future regulations as a shadow price has helped to raise awareness of the major risks associated with kerosene (98% of the LHG's direct CO2 footprint). In addition it has helped to push the conversation on low-carbon investment that have the potential to reduce fuel/energy use and thus to limit carbon emissions. It has further contributed to push and support innovative, promising initiatives and technologies to reduce LHG's environmental and climate impact.

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, our suppliers
Yes, our customers/clients
Yes, other partners in the value chain

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement

Innovation & collaboration (changing markets)

Details of engagement

Collaborate with suppliers on innovative business models to source renewable energy
 Other, please specify (Joint product development with suppliers)

% of suppliers by number

3

% total procurement spend (direct and indirect)

% of supplier-related Scope 3 emissions as reported in C6.5

63

Rationale for the coverage of your engagement

Major parts of LHG CO₂ emissions are related to jet fuel consumption. Therefore a special focus lies on suppliers and business partners which are directly involved in flight operations to improve fuel efficiency and fuel related climate impact. Only 3 % of the total number of LHG suppliers are responsible für appr. 63 % of LHG’s scope 3 emissions in 2022 (jet fuel suppliers, aircraft and engine manufactures as well as airports and ATC/ATM providers):

- Jet Fuel Suppliers: LHG’s largest source of climate relevant emissions is related to the consumption, production and supplying of jet fuel. To support the development and production of SAF to replace fossil based jet fuel, LHG is engaged with jet fuel suppliers in producing more SAF and also optimizing sustainable logistics. Jet fuel represents 99 % of LHG’s scope 1 and 57 % of scope 3 emissions and is some of LHG’s largest suppliers by spend in 2022. LHG is engaged in more than ten SAF cooperations. With these multitude of cooperations LHG has committed to off-take agreements.
- Aircraft, aircraft equipment and engine manufacturers: LHG is highly involved and encourages suppliers when developing new aircraft models and/or retrofits or aircraft equipment, to support aircraft are getting more fuel efficient. LHG pilots and LHT are usually involved in the development and introduction of new aircraft technologies, which in the best case contributes to a reduction in climate impact both during the production and end-of-life phase (Scope3 emissions) and during the operational phase (LHG Scope 1 emissions). Aircraft and equipment is also some of LHG’s largest suppliers by spend in 2022.
- Airports and ATC/ATM providers are LHG most relevant suppliers to minimize the climate impacts of aviation during start and landing procedures as well as on ground operation at airport (Scope 1 to 3 impact). LHG has a close cooperation with it’s main airports and ground service providers to have the necessary infrastructure e.g. to power aircraft using electricity instead of fuel while parked at the gate. With ATC/ATM providers LHG has developed landing procedures to reduce noise and fuel consumption during descent and are working together in the SESAR program for many years with the clear expectation that measurable operational improvements in ATM are implemented. In 2022 LHG has spend more than € 3.7 bn for fees and charges.

Impact of engagement, including measures of success

There are several positive impacts of LHG’s supplier engagement with regard to a joint product development. An important indicator of the success of LHG’s engagement to SAF is the fact that an increasing number of fuel suppliers are investing in the construction of plants for the production of SAF, as LHG signs corresponding MoU’s to purchase the SAF as soon as available. The threshold at which LHG considers its impact to be successful, in terms of performance measurement, is the achievement of the SBTi target of minus 30.6% fossil CO₂ per RTK in 2030. The steady increase of the SAF share plays an essential role for this. In 2022 LHG airlines has saved 43,900 t fossil CO₂ through the use of SAF (well-to-wake balancing). Of this amount, 40,400 tonnes were accounted for by direct savings in the combustion of SAF (Scope 1) and 3,500 t by savings in the upstream supply chain (Scope 3). This means that compared to the previous year, the use of SAF increased the reduction of fossil CO₂ by 73.5 %. In 2022 LHG achieved in total a –2,2 % reduction of CO₂/RTK.

Furthermore, LHG has build up a very high level of expertise in the topics of SAF, options and measures of emission reductions in flight operations as well as at airport ground operations. Several suppliers and system partners such as aircraft manufacturers, airports or Air Navigation Service Providers increasingly appreciate this expertise and actively approach the LHG as partner for testing and implementing innovative technologies for emission reductions.

o The establishment of LHG Clean Tech Hub in 2021 and the high interest of (potential) suppliers in contributing their concepts and innovative ideas on clean technologies and possibly receiving a partnership or support from the LHG represents another milestone in the LHG’s supplier commitment.

Further measurable successes so far:

- o ATM /SESAR: Together with ANSPs, Airports and some other European airlines the LHG coordinates a total of 340 projects of which 259 projects already in operation in 2022 with calculated savings of 3.5 m tons of CO₂ until 2030.
- o Lufthansa Technik and BASF are bringing the innovative AeroSHARK surface technology to standard production; this will be in use on first LHG aircrafts from 2022 and will improve the aerodynamics of e.g. LCAJ s entire Boeing 777 fleet by 2026 - with annual CO₂ reduction of more than 10,000 tons.

Comment

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement & Details of engagement

Education/information sharing	Run an engagement campaign to education customers about your climate change performance and strategy
-------------------------------	--

% of customers by number

100

% of customer - related Scope 3 emissions as reported in C6.5

100

Please explain the rationale for selecting this group of customers and scope of engagement

To sensitize customers about GHG emissions of their flights with LHG aircraft and to show possibilities to mitigate this climate change impact, LHG Airlines offer programs to their customers to calculate the CO₂ emissions of their flight and offset or mitigate the unavoidable CO₂ emissions associated with their air travel through the purchase of carbon offsets or SAF. Since 2007 LHG was in a cooperation with myclimate, an experienced non-profit organization that operates high quality climate protection projects. In 2019 LHG has launched the online CO₂ offsetting platform COMPENSAID for customers who wish either to buy SAF for their flights or to compensate with CO₂ reducing climate projects or a combination of both. With this innovation LHG offers as first airline worldwide its customers to buy SAF directly. LHG ensures the purchase and logistics of the SAF for the customer. The customer has the possibility to choose the amount of SAF and will pay the additional cost incurred to close the gap between fossil fuel and SAF. In 2022 LHG has further expanding its CO₂ -neutral flight offers: For the first time LHG is offering a new fare that already includes full CO₂ compensation. 80 % of the offsetting is done through high-quality climate protection projects and 20 % through the use of SAF. In the pilot project the new "Green Fare" will initially be offered to all guests booking their flight from Denmark, Sweden and Norway. LHG was the first international aviation group to offer its customers a separate 'green fare' for CO₂ - neutral flying with SAF. Since end 2022, passengers have also been able to offset the emissions of their flight on board of LHG aircraft and use the service free of charge

via the internet on board on their mobile devices ("Compensation on the fly").

To offer the option across the entire travel chain, passenger can use the "mindfulflyer" function to remind them to regularly offset their flights. For their climate protection commitment, for example, LHG Miles & More participants receive digital awards, such as the "Climate Supporter," which distinguish them as environmentally conscious travelers. These awards can be shared via social media channels to inspire other travelers to offset their flights as well. By offer these option across the entire travel chain, we could reach 100% of our customers with our engagement measure.

Impact of engagement, including measures of success

The success of this commitment is measured by the volume of carbon credits purchased by customers (including SAF). The thresholds for measuring success for customers were, on the one hand, the expansion of the CO₂ compensation option along the travel route (book trip, take flight, after flight) and, on the other hand, at least a doubling of the CO₂ compensation volumes sold in the B2C area compared to the previous year. In addition, another focus was on communicating the differences between CO₂ offsetting by supporting climate protection projects and the possibility of immediately minimizing climate-impacting CO₂ emissions by purchasing SAF.

The success of this commitment is measured by the amount of carbon credits purchased by customers (including SAF). In 2022, the total amount of carbon credits sold (CO₂ offsetting + CO₂ SAF) in the B2C sector amounts to approximately 220,500 tons of CO₂ (+1,800% compared to 2021). Of this amount, around 5,350 tons are offset by a direct reduction of climate-impacting CO₂ emissions through the purchase of SAF (+300 % vs. 2021). This increase compared to 2021 is significant and can be considered a success.

Type of engagement & Details of engagement

Collaboration & innovation	Other, please specify (Innovative product development - Corporate Value Fares / Corporate Customer SAF Contracts)
----------------------------	---

% of customers by number

25

% of customer - related Scope 3 emissions as reported in C6.5

25

Please explain the rationale for selecting this group of customers and scope of engagement

As more and more companies are looking for ways to reduce the carbon footprint (CF) in their value chain (Scope 3) – and thus also in relation to business travel and/or goods transport. Accordingly, the demand for options to minimize the CF of business-related air travel grew continuously. With the input from the corporate customers LHG has set up in 2019 a corresponding program based on the option of voluntary CO₂ compensation that has already existed for individual travellers since 2007. Initially, selected corporate customers were offered the opportunity to completely offset the CO₂ emissions of their air travel on all intra-European flights with the LHG for a one-year test phase as part of the so-called "Corporate Value Fares" program. This offer was very well received and the demand for an extension was high so that LHG continued the program and extend it to a much larger corporate customer base.

In addition, LHG offers the possibility to its corporate customers reduce CO₂ emissions with the purchase of Sustainable Alternative Fuel (SAF). In April 2021, the offsetting platform "COMPENSAID," which was already launched in 2019 by the Lufthansa Innovation Hub, was expanded to include a special program for corporate customers.

Since then B2B customers have had the opportunity to offset the CO₂ emissions caused by their employees' flights en bloc and to use SAF for this in full or on a pro rata basis. LHG ensures the purchase and logistics of the sustainable aviation fuel for the customer. LHG has developed a proprietary process together with a neutral external auditor to certify the customer's SAF purchase, which can be used by the customer to reduce their respective Scope 3 carbon emissions.

Lufthansa Cargo has also launched a corresponding offer with SAF and carbon offsetting projects. LH Cargo customers can use an CO₂ -calculator integrated into the online booking tool to determine and offset and/or mitigate the CO₂ emissions for the transport of their goods during the booking process. The add-on service 'Sustainable Choice' is available on all routes with a freighter segment, for all product groups and all customers worldwide.

LHG is willing to further support the program's endeavor to make SAF more broadly available to the aviation in general and increasing demand and thereby promoting awareness, availability and profitability of alternative fuels.

Impact of engagement, including measures of success

The LHG's commitment to voluntary CO₂ offsetting is meeting with a high level of interest from an increasing number of corporate customers. The offer was very well received in 2022 and a total of 170,000 tons of CO₂ were offset by B2B customers through climate protection projects (+320% vs. 2021). In addition, 34,000 tons (+67% vs. 2021) of climate-impacting CO₂ were mitigated through SAF purchasing by B2B customers. Lufthansa Cargo customers in particular have greatly expanded this offer for freight transport. The success of this commitment at Lufthansa Cargo is also reflected in an SAF share in the fuel consumption of LH Cargo freighters of just under 1.8% in 2022 (2021 still approx. 1% share). For its commitment, the cargo customer receives a certificate issued by an independent third party for the corresponding reduction of its Scope 3 emissions.

The SAF for the program is not derived from palm oil or palm fatty acid distillates. The fuel manufacturer is certified according to EU-ISCC and complies with the requirements of the RED II and the certification system ISCC EU which is approved by the European Commission.

By replacing fossil jet fuel with SAF, aviation's carbon emissions can be significantly reduced by 80% to 90 %. As the prices for SAF are currently significantly higher than those of fossil kerosene, Lufthansa is willing to support the program's endeavor to make SAF more broadly available to the aviation in general. Therefore through the larger B2B SAF-volumes, LHG are increasing demand and thereby promoting awareness, availability and profitability of alternative fuels. Therefore LHG has committed to purchase SAF for a quarter of a billion US-Dollars (or €234 mn) between 2022 and 2024 in order to be able to meet the foreseeable increase in demand in the coming years. This is the largest pure sustainability investment in the history of the LHG to date.

C12.1d

(C12.1d) Give details of your climate-related engagement strategy with other partners in the value chain.

Engagement with German, Austrian and Swiss railways to expand intermodal transport:

LHG supports intermodal traffic so that passengers who travel via its hubs to make intermodal arrivals or departures to open up additional potential for reducing emissions. By offering appealing and convenient intermodal services, arriving and departing by long-distance train or bus should become just as natural as connecting flights. In cooperation with the national railway companies (Deutsche Bahn, Österreichische Bundesbahnen and Schweizerische Bundesbahnen) and some bus operators in the home markets, LHG offers around 450 alternative connections daily to and from LHG hubs. These intermodal options are integrated into the LHG's range of services via a flight number and are treated as largely equivalent to a flight in terms of the service package for the customer. The joint services on offer are continuously being expanded and optimised. Three national destinations in each country are linked to the hubs in Vienna and Zurich by rail.

Germany: Expanding the partnership with Deutsche Bahn (established in 2001) enabled seven additional destinations to be added to the express rail network in 2021. The network of Lufthansa Express Rail connections from/to Frankfurt Airport grows to 24 cities. Among other things, Lufthansa German Airlines passengers can now book an Express Rail connection to their flights on almost all domestic German destinations served from Frankfurt. More than 220 daily connections to and from Frankfurt have been offered in 2022. In 2021 a working group was set up with DB, Fraport and the LHG to optimise the customer experience in the joint services with a focus on transfer processes in Frankfurt. These developed joint proposals for improvement in the areas of routing and transfer acceleration with particular priority on pragmatic simplification and acceleration of the baggage process. In the course of these measures, the Airrail Terminal in Frankfurt was reopened in June 2021.

Furthermore, since August 2022, Deutsche Bahn (DB) is the world's first Intermodal Partner of Star Alliance. The new partnership between DB and Star Alliance, a grouping of 26 airlines, builds on the Lufthansa Express Rail program. With this, DB and the aviation industry are sending another strong signal for the environment-friendly evolution of the travel industry. Under the new cooperation, DB customers and passengers of Star Alliance member airlines will be able to start or end their long-distance journey comfortably on the climate-friendly train. Germany is the first market and DB is the world's first partner in the new Star Alliance initiative.

Switzerland: The SWISS, together with Swiss Federal Railways (SBB), is also expanding its intermodal services (from 2022 onward under the new name "SWISS Air Rail"). To further improve rail accessibility to the SWISS hub at Zurich Airport, SWISS has added Munich Central Station to its intermodal route network for the first time as an international SWISS Air Rail route in July 2022. Munich thus complements the Air Rail services from the Basel SBB, Lugano and Geneva stations to Zurich Airport, which have been gradually introduced over the past few years and were previously known as "Flugzug". In addition, the tourist destinations Lucerne and Interlaken were integrated in SWISS' route network in 2022.

Austrian: In cooperation with the ÖBB-Austrian cooperation "AIRail", the route from Vienna Airport to Linz was transferred to rail in December 2014. In 2017, the cooperation was extended to the Vienna Airport-Salzburg route, and the flight connection between Salzburg and Vienna was finally discontinued in 2020 and completely transferred to rail. In 2021, Austrian Airlines additionally extended the cooperation to the Vienna Airport - Graz route.

C12.2

(C12.2) Do your suppliers have to meet climate-related requirements as part of your organization's purchasing process?

Yes, climate-related requirements are included in our supplier contracts

C12.2a

(C12.2a) Provide details of the climate-related requirements that suppliers have to meet as part of your organization's purchasing process and the compliance mechanisms in place.

Climate-related requirement

Other, please specify (Complying with legal/regulatory requirements as well as expectation to adhere to the principles of the UN Global Compact)

Description of this climate related requirement

Within the LHG Supplier Code of Conduct, which will be handed out to every (potential) supplier, LHG considers legal compliance to be one of their primary duties. As part of LHG's corporate responsibility, the group also expects from their suppliers a similar behavior. Of course this includes that the supplier complies with the applicable climate-related laws and regulations of the country in which it offers, manufactures or supplies products or services.

The LHG's Supplier Code of Conduct also states that LHG is a member of the UN Global Compact and expects its suppliers to adhere to the principles of the UN Global Compact. This also includes the supplier duties:

- supports a precautionary approach to environmental challenges;
- supports initiatives to promote greater environmental responsibility;
- encourages the development and diffusion of environmentally friendly technologies;

LHG generally prefers to cooperate with such suppliers who make and demonstrate an active contribution to sustainability and environmental/ climate protection and constantly strives to improve the efficiency and sustainability of its operations.

In order to ensure and demonstrate compliance with this Code of Conduct, the supplier shall keep record of all respective documentation, and provide to Lufthansa Group supporting documentation upon request. To verify suppliers' compliance, LHG expects that the supplier supports the right to audit and inspect supplier's operations and facilities.

% suppliers by procurement spend that have to comply with this climate-related requirement

100

% suppliers by procurement spend in compliance with this climate-related requirement

100

Mechanisms for monitoring compliance with this climate-related requirement

Supplier self-assessment

Other, please specify (1. keep record of all respective documentation, 2. provide to LHG supporting documentation upon request, 3. To verify suppliers' compliance, LHG expects that the supplier support the right to audit and inspect supplier's operations and facilities.)

Response to supplier non-compliance with this climate-related requirement

Suspend and engage

C12.3

(C12.3) Does your organization engage in activities that could either directly or indirectly influence policy, law, or regulation that may impact the climate?

Row 1

External engagement activities that could directly or indirectly influence policy, law, or regulation that may impact the climate

Yes, we engage directly with policy makers

Yes, our membership of/engagement with trade associations could influence policy, law, or regulation that may impact the climate

Does your organization have a public commitment or position statement to conduct your engagement activities in line with the goals of the Paris Agreement?

Yes

Attach commitment or position statement(s)

- SBT-Commitment-Letter LHG 2021.pdf

- Screenshot SBT.org - LHG Commitment 2023-07-19.pdf

- LHG Website - Climate protection goals - 2023-07-19.pdf (see: <https://www.lufthansagroup.com/en/responsibility/climate-environment/climate-protection-goals.html>)

LHG Website - Climate protection goals - 2023-07-19.pdf

Screenshot SBT.org - LHG Commitment -2023-07-19.pdf

SBT-Commitment-Letter LHG 2021.pdf

Describe the process(es) your organization has in place to ensure that your external engagement activities are consistent with your climate commitments and/or climate transition plan

The processes at LHG to manage the multiple activities around climate change across business units (BU's) and geographies to ensure that LHG has a common approach that is consistent with LHG's strategy on climate change, is as follows:

At Lufthansa Group the Executive Board has ultimate oversight of climate-related issues and has been responsible for reviewing LHG's climate related risks and opportunities, strategy, measures and target setting. At the Executive Board level, the Chief Sustainability Officer (CSO) takes over the responsibility for the company's environmental, climate and social effects. The definition of priorities and the further development of sustainability-relevant activities within the Lufthansa Group took place during the reporting year in the context of the Group Executive Board's meetings, as well as in the Group Executive Committee (GEC). The GEC, which is chaired by the Chief Executive Officer, is a senior management level entity and consists of the Executive Board of Deutsche Lufthansa AG, the CEOs of the segment parent companies, the senior executives of the Network Airlines and the heads of the Group's Strategy, Controlling and Communications departments.

Primary reason for not engaging in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate

<Not Applicable>

Explain why your organization does not engage in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate

<Not Applicable>

C12.3a

(C12.3a) On what policy, law, or regulation that may impact the climate has your organization been engaging directly with policy makers in the reporting year?

Specify the policy, law, or regulation on which your organization is engaging with policy makers

EU ETS Revision (as part of the EU Fit for 55 regulation)

Category of policy, law, or regulation that may impact the climate

Carbon pricing, taxes, and subsidies

Focus area of policy, law, or regulation that may impact the climate

Emissions trading schemes

Policy, law, or regulation geographic coverage

Regional

Country/area/region the policy, law, or regulation applies to

Europe

Your organization's position on the policy, law, or regulation

Support with major exceptions

Description of engagement with policy makers

LHG has been engaging directly with national, EU and international policy makers to encourage the adoption of a global market based measure for reducing carbon emissions from aviation. Due to its restricted geographic scope, current legislation (EU ETS) and Switzerland ETS) is only limitedly effective and leads to competitive distortions to the detriment of participating airlines. A global offsetting mechanism would improve effectiveness and eliminate any competitive distortions. LHG has been promoting this opinion in previous years and also in 2022 through active participation in several national, European and international discussion meetings, congresses and debates with a climate change (CC) background. Furthermore, LHG has addressed the issue in its "Policy Brief", which is being sent to politicians and media contacts several times a year LHG is member and an active participant in the various trade associations such as BDL in Germany, A4E (Airlines for Europe) and IATA, where all the Policy issues are being discussed and position papers are being drafted.

Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation

LHG considers the adoption of market-based measures as an effective mean for reducing CO₂ emissions from aviation if they fulfill the following criteria:

1. ensure environmental integrity,
2. minimize administrative complexity, and
3. minimize competitive distortions.

In principle, the ETS is an effective climate protection instrument because it prices, limits, and reduces CO₂. However, under the current EU ETS regulations and the reform plans, it is a disadvantage for EU network airlines and airports in intercontinental transfer traffic. This is because feeder flights via EU hubs are subject to ETS, whereas transfer connections via non-EU hubs are not. Thus, the ETS reform should include an urgently needed correction of this distortion of competition, instead for a tightening by extending the ETS scope to all departures in the EU. This would mean that EU airlines would buy ETS allowances for the entire journey, i.e. for the short feeder flight within the EU and the long-haul. In contrast, airlines with a transfer flight via a non-EU hub save themselves the purchase of allowances for the long and particularly expensive part of the route.

Already without the extension of the scope, transfer traffic will be heavily shifted to non-EU hubs. Consequently, up to 260,000 jobs would be at risk, as an actual study shows (SEO Amsterdam Economics: Aviation "Fit for 55" – Ticket prices, demand and carbon leakage, 03/2022). With an extension to all departures in the EU, the effects would be further exacerbated.

For the revision of the EU ETS within Fit for 55 Package and for ensuring fair competition and avoiding carbon leakage, LHG's alternative approach foresees the following:

- Intercontinental transfer passengers travelling to or from the EU are subject to the ETS on feeder flights to European hubs. In contrast, a transfer at a non-EU hub implies that the feeder flight to this airport is not included. The EU policy should use the chance to correct this distortive element in competition.
- The CO₂ emissions of international flights departing EU/EEA airspace is already covered under the landmark CORSIA, while the EU ETS covers flights within the EU. A unilateral decision by the EU to expand the scope of ETS extra-territorially to non-EU destinations will threaten the prospects for major global decarbonization efforts and would weaken and potentially dismantle the existing agreement (CORSIA as single global market-based measure applied to international aviation).

Have you evaluated whether your organization's engagement on this policy, law, or regulation is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

Please explain whether this policy, law or regulation is central to the achievement of your climate transition plan and, if so, how?

This regulation is not central to the achievement of LHG's climate transition plan.

Specify the policy, law, or regulation on which your organization is engaging with policy makers

EU Taxonomy, Technical Screening Criteria (TSC) for "Passenger and Freight Air Transportation" and EU Taxonomy in general

In summer 2021 the first draft of the EU Taxonomy Technical Screening Criteria for aviation have been published.

Parts of Technical Screening Criteria are technical not feasible i.e. such as data collection of direct usage/ drop in of SAF in a specific aircraft (per tail-sign) and routing. Others are not clearly defined which makes it not understandable for the airline industry, so that we requested to get more information and explanation how the usage of the TSC is meant to be.

Category of policy, law, or regulation that may impact the climate

Climate change mitigation

Focus area of policy, law, or regulation that may impact the climate

Other, please specify (Mandatory climate-related reporting)

Policy, law, or regulation geographic coverage

Regional

Country/area/region the policy, law, or regulation applies to

Europe

Your organization's position on the policy, law, or regulation

Support with major exceptions

Description of engagement with policy makers

LHG took directly part in the official EU consultation on the TSC of the EU Taxonomy for aviation in September 2021. Additionally LHG got invited in November 2021 to a clarification call with other industry experts with DG Move, DG Fisma, T&E and other EU bodies to raise questions and to give technical input to the TSCs what is operational do-able and to better understand the draft TSC and how to use it and how to derive the KPIs. LHG also provides feedback and took part in the prior Steer Study workshop in autumn 2020, which has been commissioned by the EU. LHG is also engaged via the airline associations BDL, A4E and IATA and it's working groups in 2022 to deliver constructive consolidated feedback of the airline industry to the EU bodies.

Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation

The economic activity for "Passenger and Freight Air Transport" inclusive of the Technical Screening Criteria has not been finalized by the EU Commission in 2022, but some of our input such as: no information of SAF direct usage on a single aircraft operation which is technically not feasible has been taken into account. The actual draft prohibits a taxonomy-aligned growth even if best-in-class aircraft - as defined by the taxonomy- are purchased as per newly entered aircraft into the fleet another aircraft of

similar size as defined by the taxonomy has to leave the fleet within a short period of time. The industry sees this as a strong intervention into the individual business strategy especially for LHG as it's CO₂ mitigation path is aligned with SBTi until 2030 which even foresees growth.

Have you evaluated whether your organization's engagement on this policy, law, or regulation is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

Please explain whether this policy, law or regulation is central to the achievement of your climate transition plan and, if so, how?

This regulation is not central to the achievement of LHG's climate transition plan.

Specify the policy, law, or regulation on which your organization is engaging with policy makers

ICAO aircraft CO₂ certification standard

Category of policy, law, or regulation that may impact the climate

Climate change adaptation

Focus area of policy, law, or regulation that may impact the climate

Other, please specify (Verification and audits)

Policy, law, or regulation geographic coverage

Global

Country/area/region the policy, law, or regulation applies to

<Not Applicable>

Your organization's position on the policy, law, or regulation

Support with no exceptions

Description of engagement with policy makers

LHG has been promoting the new CO₂ standard at national and international policy making levels and via participation in the respective ICAO working groups in which also relevant members of national ministries have been taking part. Furthermore LHG has taken also position via BDL, A4E and IATA where these policies are being discussed and position papers are drafted.

LHG supports the implementation of an appropriate ICAO aircraft CO₂ certification standard in future policy making related to carbon management from aviation

Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation

<Not Applicable>

Have you evaluated whether your organization's engagement on this policy, law, or regulation is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

Please explain whether this policy, law or regulation is central to the achievement of your climate transition plan and, if so, how?

This standard is not central to the achievement of LHG's climate transition plan.

Specify the policy, law, or regulation on which your organization is engaging with policy makers

ReFuel EU as part of Fit For 55

Category of policy, law, or regulation that may impact the climate

Climate change mitigation

Focus area of policy, law, or regulation that may impact the climate

New fossil fuel energy generation capacity

Policy, law, or regulation geographic coverage

Regional

Country/area/region the policy, law, or regulation applies to

Europe

Your organization's position on the policy, law, or regulation

Support with major exceptions

Description of engagement with policy makers

LHG has developed a position paper which has been directly and indirectly via industry associations circulated with policy makers. Additionally the Fit for 55 package and the ReFuel EU Proposal has been part in nearly each of the environmental working groups of A4E to come up with consolidated positions which A4E then discusses with the respective EU bodies.

Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation

LHG in general supports efforts to increase the scalability of Sustainable Aviation Fuels (SAF). But the ReFuel EU draft does not adequately address prevailing problems of carbon leakage and distortion of competition in aviation. LHG advocates for a level playing field as the airline industry is a global industry. Any policies affecting only EU carriers will have a negative effect in comparison to Non EU carriers and might even lead to carbon leakage. The SAF blending mandate unilaterally disadvantages European aviation as it will unilaterally increase fuel costs due to the significantly more expensive green kerosene. As a result, the price of airline tickets in Europe will rise. Passengers can easily avoid the major part of this price increase by travelling via a non-EU hub since the SAF mandate only applies to flights departing the EU. As a result, significant levels of carbon leakage and distortion of competition occur. In its current design, the proposal does not provide any mechanism, which could compensate for these unwanted effects. With regard to the SAF mandate, a competition-neutral solution that prevents carbon leakage must be found. To ensure full compliance with the ETS and CORSIA, the future rules need to align with REDIII and ICAO rules on criteria for eligibility.

Furthermore LHG propose to install a book-and-claim system for the usage of SAF (Sustainable Aviation Fuel) in order to facilitate and to grow its usage.

Once the ReFuel EU legislation has been passed, it should not be allowed to have different mandates in single EU countries which would lead to an enormous complexity. Due to the still very limited availability of SAF and the raising quota proposal within ReFuel EU, a regular revision of the law will be necessary.

Have you evaluated whether your organization's engagement on this policy, law, or regulation is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

Please explain whether this policy, law or regulation is central to the achievement of your climate transition plan and, if so, how?

The Refuel-EU regulation is not central to the achievement of LHG climate transition plan because the regulation unilaterally disadvantages European aviation as it unilaterally increases fuel costs due to the significantly more expensive green kerosene. As a result, airline ticket prices in Europe will increase. Passengers can easily avoid most of this price increase by traveling through a hub outside the EU, as the SAF mandate only applies to flights originating in the EU. As a result, there is a significant carbon leakage and distortion of competition. In its current form, the proposal does not provide a mechanism to offset these undesirable effects. With respect to the SAF mandate, a competitively neutral solution that prevents carbon leakage must be found. To ensure full compliance with the ETS and CORSIA, future rules must be brought into compliance with REDIII and ICAO regulations on eligibility criteria.

Specify the policy, law, or regulation on which your organization is engaging with policy makers

Single European Sky (SES) - air traffic management modernization EU policy project to support also the net zero goal of aviation in 2050.

Category of policy, law, or regulation that may impact the climate

Climate change mitigation

Focus area of policy, law, or regulation that may impact the climate

Other, please specify (Energy Efficiency)

Policy, law, or regulation geographic coverage

Regional

Country/area/region the policy, law, or regulation applies to

Europe

Your organization's position on the policy, law, or regulation

Support with no exceptions

Description of engagement with policy makers

LHG is a member of the European program Single European Sky Air traffic (SESAR) which is the technological pillar of the Single European Sky (SES) providing a number of staff to the program. LHG promotes the inclusion of the SES into European legislation especially into the EU Green Deal, to realize the related environment and economic benefits. Throughout the various working group LHG has been engaged with EU policy makers in this area to improve the modernization and harmonization of European Air traffic management in order to reduce unnecessary longer routes and holding patterns.

Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation

<Not Applicable>

Have you evaluated whether your organization's engagement on this policy, law, or regulation is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

Please explain whether this policy, law or regulation is central to the achievement of your climate transition plan and, if so, how?

The LHG has long called for the implementation of the so-called Single European Sky (SES) and supports the EU Commission (EC) in its reform plans. A reform of the European airspace offers enormous opportunities. For many years, the EC has wanted to implement the SES, but has been blocked in its realization by numerous member states as they have concerns about national sovereignty. Until now, air traffic control has largely been a sovereign task in each country. Currently, more than 60 control centers with different IT systems are responsible for air traffic control throughout Europe. In the future, these are to be harmonized at European level in the SES.

The creation of a more efficient and uniformly structured airspace with optimized flight routes could reduce CO₂ emissions in EU airspace by up to 10 %. The long overdue implementation of the SES would be a real climate protection measure and plays an important role in achieving the Climate Transition Plan of the LHG.

The following key tasks are pending and supported by the LHG: Harmonize airspace and enable climate-optimized flight routes: Lufthansa and Germany's air navigation services are working consistently to guide aircraft to their destinations without detours. In the first quarter of 2021, for example, LHG was sometimes able to use shorter flight paths and an optimized approach procedure due to reduced flight volumes. The result: on the Hamburg-Frankfurt route, this saved 7 % of fuel, and on the Paris-Frankfurt route, as much as 16 %. To achieve comparable results on European, transnational routes, the airspace structures must be harmonized.

Introduce interoperable, modern and uniform air traffic control systems: Some of the technologies with which air traffic controllers in Europe work date back to the 1970s and are therefore outdated. An automated division of labor at the European level too often fails due to incompatible systems. Improvements are urgently needed here. The necessary processes and technologies are already available today.

Specify the policy, law, or regulation on which your organization is engaging with policy makers

PtL Roadmap of German government and PtL Quota in Germany

Category of policy, law, or regulation that may impact the climate

Climate change mitigation

Focus area of policy, law, or regulation that may impact the climate

Renewable energy generation

Policy, law, or regulation geographic coverage

National

Country/area/region the policy, law, or regulation applies to

Please select

Your organization's position on the policy, law, or regulation

Support with no exceptions

Description of engagement with policy makers

LHG via BDL supports the PtL Roadmap in Germany. The BDL has signed the PtL Roadmap which has been a project of the German government to scale up Power-to-Liquid fuels until 2030. The PtL quota for kerosene shall be 2% in 2030.

Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation

<Not Applicable>

Have you evaluated whether your organization's engagement on this policy, law, or regulation is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

Please explain whether this policy, law or regulation is central to the achievement of your climate transition plan and, if so, how?

Electricity-based, sustainably produced fuels (PtL) are one of the most important building blocks for making CO₂-neutral flying possible. They thus play an important role in achieving LHG's Climate Transition Plan. The production processes are technically proven, but so far the fuels are neither available in relevant quantities nor at market prices. There is a lack of industrial-scale production. The joint roadmap drawn up by the German federal and state governments, aviation, the petroleum industry, and plant manufacturers and operators shows how the market ramp-up of sustainable kerosene can succeed. It provides a basis for making at least 200,000 metric tons of sustainable kerosene available to German air traffic by 2030 - equivalent to one-third of the fuel requirements of domestic air traffic in Germany. The key measures and requirements relate to the technology, sustainability and market ramp-up for PtL fuel. This means in detail:

- Establishment of a platform for the development, testing and demonstration of different PtL fuel production processes by the German Federal Ministry of Transport (BMVI) and the construction of demonstration plants by the German Federal Ministry for the Environment (BMU) planned.

- Joint commitment to the creation of a uniform, binding and ecologically and socially reliable standard for PtL fuel at European and international level.

- In supporting the market ramp-up, it is crucial to define binding targets for the purchase and sale of PtL fuel, what regulatory framework conditions are required, and what state support, open to technology, is necessary for a self-sustaining market:

- Promotion of the development and production of PtL kerosene by the federal and state governments and definition of a binding minimum quota and an obligation to purchase on aviation fuels sold in Germany. This is intended to ensure that demand and investment security are created for market players despite the higher cost of the

fuels. Distortions of competition for the aviation industry are to be avoided through regulatory measures. On this basis, the airlines commit themselves to purchasing relevant quantities of PTL kerosene over the next few years.
The implementation of this roadmap can therefore make a significant contribution to achieving the LHG's Climate Transition Plan.

C12.3b

(C12.3b) Provide details of the trade associations your organization is a member of, or engages with, which are likely to take a position on any policy, law or regulation that may impact the climate.

Trade association

International Air Transport Association

Is your organization's position on climate change policy consistent with theirs?

Consistent

Has your organization attempted to influence their position in the reporting year?

Yes, we publicly promoted their current position

Describe how your organization's position is consistent with or differs from the trade association's position, and any actions taken to influence their position

At the 77th IATA Annual General Meeting in Boston, USA, on 4 October 2021, a resolution was passed by IATA member airlines committing them to achieving net-zero carbon emissions from their operations by 2050. This pledge brings air transport in line with the objectives of the Paris agreement to limit global warming to 1.5°C.

To succeed, it will require the coordinated efforts of the entire industry (airlines, airports, air navigation service providers, manufacturers) and significant government support. The net-zero objective will be met through a combination of maximum elimination of emissions at source and the use of approved offsetting and carbon capture technologies. The key elements of the emissions reduction strategy are:

- The use of Sustainable Aviation Fuel (SAF), sourced from feedstocks that do not degrade the environment or compete with food or water
- Investment in new aircraft technology, including radical new aerodynamic and alternative propulsion (electric or hydrogen) solutions
- Continued improvement in infrastructure and operational efficiency, with a particular focus on improved air traffic management
- The use of approved offsets including carbon capture and storage technology

IATA engages with different regulatory bodies i.e. ICAO to advocate the adoption of a global regulatory approach for mitigating carbon emissions from aviation, which does not distort competition among airlines. Furthermore, IATA proposes the implementation of its 4-pillar-strategy that includes 1) investing in technology, 2) improving operational efficiency, 3) building and using efficient infrastructure, and 4) using market-based measures to address climate change. In 2020 ATAG - in cooperation with IATA - has published the Waypoint 2050 Report which has been closely developed with the Airlines like LHG. "Waypoint 2050" describes via manifold assumptions possibilities to become net zero CO₂ emissions in 2050 respectively 2060, which will be very challenging and is only possible with the cooperation of the entire aviation industry and with governmental support and structures.

IATA together with ATAG is promoting the Long Term Aspirational Goal for aviation of net zero in 2050 to be included in ICAO strategy.

LHG has been for many years and also in 2022 a member within IATAs Sustainability Environment Advisory Council (SEAC) and is chairing IATA's Sustainable Finance Taskforce which has been established in 2022.

Funding figure your organization provided to this trade association in the reporting year (currency as selected in C0.4)

Describe the aim of your organization's funding

<Not Applicable>

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

Trade association

Other, please specify (Association of German Aviation Industry (BDL))

Is your organization's position on climate change policy consistent with theirs?

Consistent

Has your organization attempted to influence their position in the reporting year?

Yes, we publicly promoted their current position

Describe how your organization's position is consistent with or differs from the trade association's position, and any actions taken to influence their position

The German aviation industry supports the goals of the Paris Climate Agreement and is making an active and ambitious contribution to achieve these goals. With its 2020 "BDL Master plan - climate protection in aviation", the German aviation industry set itself the goal of making flying and airport operations carbon neutral. The master plan identifies the fields where the aviation industry is making progress on climate protection and where it also intends to take further steps together with policymakers:

- (1) Investments in the use of lower-emission aircraft will result in the modernization of aircraft fleets and a reduction in CO₂ emissions from German aircraft fleets (minus 43% since 1990).
- (2) Substituting fossil jet fuel with sustainable aviation fuels can lead to significant progress towards achieving carbon-neutral flight operations.
- (3) By investing in structural and energy modernization at airports and utilizing the corresponding funding programmes, companies will implement carbon neutral airport operations.
- (4) More efficient air traffic management in European airspace will enable air traffic control service providers to make a further contribution to reducing emissions.
- (5) Aviation industry companies are working together with the German Aerospace Center (DLR) on ways to reduce non-CO₂ effects of flying (e.g. due to contrails).
- (6) The aviation industry is working together with policymakers and rail transport companies to ensure that more traffic can be shifted to rail by expanding rail connections and enhancing rail links to airports.
- (7) The aviation industry supports the instruments of a competitive neutral carbon pricing system which can be used to limit carbon emissions (ETS, CORSIA).

These goals and instruments of the industry's master plan are in line with the agreements reached by an alliance of approximately 20 countries, including Germany, at the recent COP26 UN Climate Change Conference for increased internationally coordinated climate protection in aviation. In addition, the German aviation industry's master plan is aligned with the European aviation sector's sustainability initiative ("Destination 2050"), which was unveiled in February 2021.

Funding figure your organization provided to this trade association in the reporting year (currency as selected in C0.4)

Describe the aim of your organization's funding

<Not Applicable>

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

Trade association

Other, please specify (Airlines for Europe (A4E))

Is your organization's position on climate change policy consistent with theirs?

Consistent

Has your organization attempted to influence their position in the reporting year?

Yes, we publicly promoted their current position

Describe how your organization's position is consistent with or differs from the trade association's position, and any actions taken to influence their position

A4E airlines are determined to address the climate challenge that faces all of mankind. By minimizing our environmental impact we can contribute to a more sustainable European economy as envisioned in the European Green Deal.

Europe's airlines have committed to decarbonize air transport and accelerate their efforts to make Europe the world's first carbon neutral continent by 2050 through the reduction of CO₂ emissions in absolute terms, and through CO₂ mitigation. Acknowledging its responsibilities despite the COVID-19 crisis, in 2021 the EU aviation sector published its "Destination 2050 — A route to net zero European aviation" roadmap showing a clear pathway to reaching net zero CO₂ emissions for intra-European and departing flights by 2050. A4E promotes efforts to include carbon dioxide emissions from aviation in a robust global climate change framework. To be both environmentally effective and economically efficient and to minimize the risk of competitive distortions and carbon leakage, policy action must be taken at a global not national or regional level.

A4E initiated and published in 2021 the study "Destination 2050" - a route to net zero aviation done by NRL/SEO with the support and input of its member airlines, ASD (Aerospace and Defence Industries Association of Europe), era (European Regions Airline Association) and canso (Civil Air Navigation Services Organisation). The aim has been to analyse and identify a possible route to net zero for the European aviation industry to achieve the major climate objective to reach net zero CO₂ emissions by 2050 from all flights within and departing from the EU.

A4E with its members has taken also in 2022 an active part within the consultations of the various EU "Fit for 55" policies and directives (i.e. ReFuel EU, EU ETS) as well EASA's EcoLabel initiative. In 2022 A4E was also focusing on the EU Taxonomy directive and its implication for the aviation industry within the EU.

Besides taking part in the EU consultation processes with the involvement of the member airlines, A4E also publishes position papers on the various upcoming policies and directives with the engagement of its members.

Funding figure your organization provided to this trade association in the reporting year (currency as selected in C0.4)**Describe the aim of your organization's funding**

<Not Applicable>

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

C12.4

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication

In mainstream reports

Status

Complete

Attach the document

LH-AR-2022-e.pdf

Page/Section reference

Pages 32-33, 79-80, 87-88, 93-114

Content elements

Governance
 Strategy
 Risks & opportunities
 Emissions figures
 Emission targets
 Other metrics

Comment

No additional comment

Publication

In mainstream reports, incorporating the TCFD recommendations

Status

Complete

Attach the document

LH-TCFD-Report-2022.pdf

Page/Section reference

Whole report

Content elements

Governance
 Strategy
 Risks & opportunities

Emissions figures
Emission targets
Other metrics

Comment

No additional comment

Publication

Other, please specify (SASB Report)

Status

Complete

Attach the document

LH-SASB-Report-2022.pdf

Page/Section reference

Whole Report

Content elements

Strategy
Emissions figures
Emission targets

Comment

No additional comment

Publication

In voluntary sustainability report

Status

Complete

Attach the document

LH-Factsheet-Sustainability-2022.pdf

Page/Section reference

Pages 1-18

Content elements

Governance
Strategy
Emissions figures
Emission targets
Other metrics

Comment

Publication

In voluntary communications

Status

Complete

Attach the document

230420_CG_Roadshow_Presentation_final_fuer_Website_Ergaenzung_vor_AGM.pdf

Page/Section reference

Pages 17-19

Content elements

Governance
Strategy
Emission targets

Comment

No additional comment

C12.5

(C12.5) Indicate the collaborative frameworks, initiatives and/or commitments related to environmental issues for which you are a signatory/member.

	Environmental collaborative framework, initiative and/or commitment	Describe your organization's role within each framework, initiative and/or commitment
Row 1	Business Ambition for 1.5C Task Force on Climate-related Financial Disclosures (TCFD) UN Global Compact	Business Ambition for 1.5C - As SBTi validated company, LHG were automatically member of the Business Ambition for 1.5 degrees. Task Force on Climate-related Financial Disclosures (TCFD) - Annual publication of a TCFD report UN Global Compact - Signatory Member, yearly communication on progress

C15. Biodiversity

C15.1

(C15.1) Is there board-level oversight and/or executive management-level responsibility for biodiversity-related issues within your organization?

	Board-level oversight and/or executive management-level responsibility for biodiversity-related issues	Description of oversight and objectives relating to biodiversity	Scope of board-level oversight
Row 1	No, and we do not plan to have both within the next two years	<Not Applicable>	<Not Applicable>

C15.2

(C15.2) Has your organization made a public commitment and/or endorsed any initiatives related to biodiversity?

	Indicate whether your organization made a public commitment or endorsed any initiatives related to biodiversity	Biodiversity-related public commitments	Initiatives endorsed
Row 1	Yes, we have endorsed initiatives only	<Not Applicable>	SDG Other, please specify (The LHG has a long standing cooperation with NABU (Naturschutzbund Deutschland e.V.). As a partner of Kranichschutz Deutschland gGmbH, the Group will support the protection of the endangered bird species.)

C15.3

(C15.3) Does your organization assess the impacts and dependencies of its value chain on biodiversity?

Impacts on biodiversity

Indicate whether your organization undertakes this type of assessment

No, but we plan to within the next two years

Value chain stage(s) covered

<Not Applicable>

Portfolio activity

<Not Applicable>

Tools and methods to assess impacts and/or dependencies on biodiversity

<Not Applicable>

Please explain how the tools and methods are implemented and provide an indication of the associated outcome(s)

<Not Applicable>

Dependencies on biodiversity

Indicate whether your organization undertakes this type of assessment

No, but we plan to within the next two years

Value chain stage(s) covered

<Not Applicable>

Portfolio activity

<Not Applicable>

Tools and methods to assess impacts and/or dependencies on biodiversity

<Not Applicable>

Please explain how the tools and methods are implemented and provide an indication of the associated outcome(s)

<Not Applicable>

C15.4

(C15.4) Does your organization have activities located in or near to biodiversity- sensitive areas in the reporting year?

Not assessed

C15.5

(C15.5) What actions has your organization taken in the reporting year to progress your biodiversity-related commitments?

	Have you taken any actions in the reporting period to progress your biodiversity-related commitments?	Type of action taken to progress biodiversity- related commitments
Row 1	Yes, we are taking actions to progress our biodiversity-related commitments	Land/water protection Species management Education & awareness

C15.6

(C15.6) Does your organization use biodiversity indicators to monitor performance across its activities?

	Does your organization use indicators to monitor biodiversity performance?	Indicators used to monitor biodiversity performance
Row 1	No	Please select

C15.7

(C15.7) Have you published information about your organization's response to biodiversity-related issues for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Report type	Content elements	Attach the document and indicate where in the document the relevant biodiversity information is located
In mainstream financial reports	Content of biodiversity-related policies or commitments	Page 53 & 119 of our Annual Report. LHG cooperation with myclimate on projects promote measurable climate protection by reducing CO ₂ emissions and improving the quality of life and biodiversity at a local level. LH-AR-2022-e.pdf
In voluntary sustainability report or other voluntary communications	Other, please specify (Supported projects with focus on biodiversity and climate protection)	LHG Webpage with information on the portfolio of supported carbon offset projects, which focuses on climate protection and a contribution to more biodiversity: https://lufthansa.compensaid.com/projects/portfolio Weblinks supported projects climate protection & biodiversity 2022.docx

C16. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

C16.1

(C16.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Member of the Executive Board Brand & Sustainability	Board/Executive board

SC. Supply chain module

SC0.0

verified by

MÜLLER-BBM
 CERT GMBH



VERIFICATION STATEMENT

Müller-BBM Cert Umweltgutachter GmbH, accredited verifier DAkKS D-VS-18709-01-01, accredited and approved for air traffic confirms, that CO₂ emissions data and energy consumption in the submitted Climate Change Questionnaire 2023 chapter C5 until C8 in the reporting year 2022 of

LUFTHANSA GROUP

Deutsche Lufthansa AG and affiliates*

under the verification standards ISO 14064-3

are reviewed and verified with following uncertainties:

- Scope 1 23.170.076 t CO_{2eq} (fossil, reasonable assurance, 2% materiality)
- Scope 1** 40.400 t CO_{2eq} (biogenic (reasonable assurance, 2% materiality)
- Scope 2*** 200.314 t CO_{2eq} (limited assurance, 5 % materiality)
- Scope 2**** 125.245 t CO_{2eq} (limited assurance, 5 % materiality)
- Scope 3***** 8.955.103 t CO_{2eq} (limited assurance, 10 % materiality)

Kerpen, 08th of July 2023



Müller-BBM Cert Umweltgutachter GmbH
 Dr. Stefan Bräker

Müller-BBM Cert
 Umweltgutachter GmbH
 Heinrich-Hertz-Straße 13
 50170 Kerpen/Germany
 Phone +49 2273 59280-188
 Fax +49 2273 59280-11
 info@mbbm-cert.com

muellerbbm-cert.de



***Companies in the scope of application CDP-Questionnaire 2023:**

Deutsche Lufthansa AG, Lufthansa Cargo AG, Lufthansa Technik AG, Lufthansa CityLine GmbH, Swiss International Air Lines AG, Edelweiss Air AG, Brussels Airlines SA/NV, Austrian Airlines AG, Air Dolomiti S.p.A. Linee Aeree Regionali Europee, Germanwings GmbH, Eurowings Aviation GmbH, Eurowings Discover GmbH, Eurowings Europe GmbH, Eurowings Europe Limited, 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 Enteisung und Flugzeugschleppen am Flughafen München GmbH plus proportionally the Joint Ventures, AeroLogic GmbH, SunExpress (Günes Ekspres Havaçilik A.S.), N3 Engine Overhaul Services GmbH & Co. KG and EME Aero.

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

*** location based

**** market based

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