

**Report of Deutsche Lufthansa AG to the Economic Stabilisation Fund on its activities to achieve the EU targets of 2 July 2021 (update 20 October 2021)**

Under the Framework Agreement on the granting of stabilisation measures between the Economic Stabilisation Fund and Deutsche Lufthansa Aktiengesellschaft (**DLH**) dated 29 June 2020, DLH has assumed a reporting obligation on the achievement of the EU targets and Member States' commitments regarding environmental and digital change, in particular the EU target of climate neutrality by 2050, and on the extent to which the funds received under the stabilisation support the Company in doing so:

A) Activities related to the EU targets of green transformation and climate neutrality by 2050**1. Emission reduction****1.1 Climate protection instruments**

As part of the implementation of the Green Deal with the goal of climate neutrality by 2050, the European Commission presented its proposals for the "Fitfor55" climate protection package in July 2021: With a total of 15 legislative proposals, the EU aims to achieve its goal of emitting at least 55 percent fewer greenhouse gases by 2030 than in 1990. Aviation is primarily affected by three legislative proposals: the introduction of a kerosene tax (ETD), the introduction of a blending quota for sustainable aviation fuels (RefuelEU Aviation) and the reform of emissions trading (EU ETS).

DLH supports the proposed significant emissions reduction of the Green Deal, which is in line with DLH's goal to fly CO₂ neutral by 2050. DLH closely follows the EU legislative proposals of the "Fitfor55" climate protection package and submits its own proposals to improve the effectiveness of regulation and prevent distortion of competition. At the same time, DLH's activities support the achievement in practice of the blending quotas intended by RefuelEU Aviation.

Lufthansa Group (**LHG**) participates itself and through its associations in the effective and targeted enactment of legislation at national, European and international level with the aim of decisively improving the CO₂ balance of air transport. This includes effective climate protection instruments. In designing these, it is particularly important for LHG that there is no unilateral distortion of competition, for example by placing European network airlines at a disadvantage compared to their global competitors. This would weaken both the economic efficiency urgently needed to achieve LHG's sustainability goals and climate protection.

Through the European Airline Association (A4E), the Lufthansa Group is part of the Aviation Roundtable (ART) and involved in the "Destination 2050" study, an initiative of five European air transport associations (A4E, ACI EUROPE, ASD, CANSO and ERA). The study examines emission reduction potentials from the fields of technology, operation and infrastructure, SAF (Sustainable Aviation Fuel) and market-based mechanisms with regard to their contribution to achieving emission targets for European aviation. The focus is on significant reductions by 2030 and achieving CO₂ neutrality in 2050; the aim is not to exceed the emissions level of 2019 in the future.

Politicians and industry are also working together towards the long-term goal of achieving CO₂ neutrality on flights to and from Europe by the middle of the century. In addition, significant reductions are also to be achieved by 2030.



In order to live up to its pioneering role, LHG has also defined its own reduction targets, some of which are more ambitious. For example, LHG's net carbon footprint is to be halved by 2030 compared with 2019 and to be neutral by 2050.

1.2 Fleet modernisation

LHG is sticking to the planned fleet modernisation in principle, but with an adjusted timetable. At present, there are still no plans to cancel aircraft orders (unless notified prior to the stabilisation measure). Investments in aircraft acquisition in the period 2021-2023 remain unchanged at up to 80 aircraft. An approximation to pre-crisis delivery schedules presupposes, among other things, that the subsidies announced in the economic stimulus package are made available.

In order to accelerate the modernisation of the LHG airlines' fleets, five additional Boeing 787-9 aircraft have been ordered for 2021 and are scheduled to enter service soon. In addition, the order for A350-900 aircraft was effectively supplemented by a further two aircraft, and a further four A350-900 were procured as part of a lease. All of the aforementioned aircraft types sustainably reduce specific CO₂ emissions – depending on the type by around 15-35% compared to their direct predecessor models. As part of the long-term fleet renewal, a total of 180 new aircraft will be delivered to the LHG airlines during this decade. The investments for this are in the billions. On average, the new aircraft will consume only about 2.5 litres of kerosene per passenger and 100 kilometres of flight. In the current year alone, on average DLH is taking delivery of one new, fuel-efficient Airbus aircraft from the A 320neo family for short- and medium-haul routes every month.

1.3 Operational efficiency measures

Operational measures taken by the Lufthansa Group to protect the climate include, in addition to the use of efficient aircraft sizes, the optimisation of flight capacity utilisation, measures to save fuel, the testing and introduction of new flight procedures, and the determination of optimal routes and speeds.

In April and May 2020, the German Air Navigation Services (Deutsche Flugsicherung – DFS), in cooperation with LHG, developed and implemented a concept for more efficient flight profiles for the approach to Frankfurt and Munich airports. The Efficient Flight Profile Concept (EFP) supports Continuous Descent Operations, which enable flight operations with lower fuel consumption and emissions compared to standard approaches. Evaluations show that LHG alone has been able to reduce CO₂ emissions by up to 2,000 tons per month since the introduction of the EFP concept.

In the 2020 financial year, 34 fuel-saving projects were pursued across the Group. These projects include measures in the areas of performance & procedures, weight reduction, flight route optimisation and technical developments. This enabled a further 52.6 thousand metric tons of CO₂ emissions to be sustainably avoided in 2020 – in addition to the reductions already achieved in previous years.

1.4 Intermodal transport

The cooperative working mode between LHG and Deutsche Bahn AG ("DB"), which was already established before the crisis, was intensified in the course of the Covid crisis, also in connection with sustainable travel. Substantial progress has already been made:



Optimisation of the network integration of Deutsche Bahn and LHG: Existing codesharing agreement ("Lufthansa Express Rail") extended to additional domestic German routes: Since July 2020, Lufthansa passengers have been able to use an additional four rail connections to Frankfurt Airport daily from Hannover and Leipzig Central Station, and three connections from Basel. The network of Lufthansa Express Rail connections from/to Frankfurt Airport is growing to 17 cities. This corresponds to more than 120 daily train/flight numbers. LHG has earmarked investments of around 200,000 euros for setting up the IT interface for improved cooperation with Deutsche Bahn.

LHG and Deutsche Bahn launched a new product offensive in March 2021, with which the two companies are significantly expanding their joint train-to-flight offering. By expanding their cooperation, Lufthansa Group and Deutsche Bahn are setting new standards in the environmentally friendly networking of modes of transport. For example, the Lufthansa Express Rail network will be expanded by five cities. For the first time, it will be possible to travel to Frankfurt Airport with Lufthansa Express Rail from Hamburg and Munich from July 2021, and from Berlin, Bremen and Münster from December 2021. It is also planned that new extra-fast Sprinter connections to Frankfurt Airport will make their debut from December 2021. From and to Munich and Nuremberg, there are direct connections to Frankfurt Airport twice a day in three and two hours, respectively, with no further stops in between, and precisely matching the departure and arrival times of the Lufthansa hub. In order to draw customers' attention to the joint offer, LHG has invested around EUR 300,000 in a marketing campaign.

1.5 Environmental research

The ongoing research project EffFlug (Efficiency Improvement in Flight Operations, funded by the Federal Ministry of Economics) is being continued despite the crisis. On 13 August 2020, DFS introduced the optimised MODRU departure route in Düsseldorf in close cooperation with Eurowings GmbH and Lufthansa Airlines. Eurowings GmbH, in particular, has since been using this new route for 60% of its departures to the southwest. This will enable LHG to achieve annual savings in fuel, noise and flight time (estimated: 2.7km, 40t of fuel, 130t CO₂). Further projects are included in the non-financial statement in the 2020 Annual Report of Deutsche Lufthansa AG.

As part of the CARIBIC ("Civil Aircraft for the Regular Investigation of the Atmosphere Based on an Instrument Container") atmospheric and climate research project, LHG, in cooperation with the Karlsruhe Institute of Technology (KIT), converted an Airbus A350-900 aircraft for the first time in March 2021 in order to be able to transport a 1.6-ton measuring container in the future, which still has to be certified. With the predecessor aircraft, around 500 measurement flights have been completed on international routes since 2004. In addition to KIT, more than ten international research institutions participate in CARIBIC with measuring instruments.

2. Renewable energies

2.1 Alternative fuels (SAF)

a) Research and development

From LHG's point of view, sustainable aircraft fuels are essential for reducing CO₂ emissions from air traffic. Over the past decade, LHG has already been intensively engaged in the research, testing and use of sustainable aviation fuels. The focus for LHG is on synthetic kerosene based on residual materials, woody biomass and renewable electrical energy (power-to-liquid - PtL). Key technologies for the production of sustainable aircraft fuels are driven forward through a steadily growing number



of targeted collaborations. Prominent examples include the support of the HySupply project of BDI and Acatech with the aim of setting up a supply chain for hydrogen from Australia, the cooperation with ETH Zurich, Climeworks (CO₂ air separation) and Synhelion (sunlight-based fuel syntheses) as well as the participation in a PtL project of the Masdar Institute in Abu Dhabi together with other partners such as Marubeni, Siemens Energy and Etihad. The range of technologies and raw materials that can be considered is wide.

However, it is crucial to accelerate the market ramp-up in a targeted manner in addition to research and development. Lufthansa Group is participating in the World Economic Forum's Clean Skies for Tomorrow Initiative, which aims to rapidly expand production capacity for SAF and is developing targeted policy recommendations to this end. The cross-sector Global Alliance Powerfuels, coordinated by the German Energy Agency (dena), focuses exclusively on PtL fuels. Its goal is to build an international alliance and drive a global PtL market. As a first, concrete step, LHG supports the world's first industrial PtL production plant in Werlte, which went into operation on 4 October 2021. It is operated by the climate protection organisation atmosfair and produces synthetic fuel for aircraft from water, CO₂ and renewable electricity (power-to-liquid = PtL). LHG is a partner in the pioneering project and is one of the first customers to purchase this sustainable, electricity-based kerosene. In this way, the company is making an important contribution to the establishment of PtL production in Germany and is promoting the market development of the first available CO₂-neutral synthetic kerosene. LHG will purchase at least 25,000 litres of PtL fuel annually over the next five years and make it available to customers. This is because stimulating demand is just as important as expanding production capacity. In the future, this will be shaped by two factors: Regulation and direct marketing to customers. Kühne+Nagel and Lufthansa Cargo have agreed on an exclusive partnership for the use of the first PtL volumes. The logistics service providers have committed themselves to the joint purchase of the fuel from Werlte.

b) Regulation

As part of its Green Deal, the EU is currently working on a special legal act ("RefuelEU Aviation") that exclusively governs sustainable aviation fuels and will bring them onto the market with the help of a progressively increasing blending quota. The draft EU regulation published in July 2021 provides, among other things, for a quota of 2% SAF from 1 January 2025 and a quota of 5% SAF and at the same time 0.7% PtL from 1 January 2030.

LHG is actively involved in the legislative process and has developed a proposal for the design of the SAF quota that avoids the shift of traffic and the associated fuel consumption out of the EEA. This strengthens the effectiveness of regulation by avoiding carbon leakage and is at the same time the prerequisite for a future increase in the blending target. At the same time, the activities and cooperations of LHG described under a) and c) contribute to the promotion of research, development and production of SAF – and in particular PtL – and to the fulfilment of the quota regulations. In addition, the PtL roadmap for air transport was published. Under the leadership of the German Air Transport Association and the Federal Ministry of Transport, this joint concept was developed by the federal government, the federal states, the aviation and fuel industries, and plant manufacturers with the aim of ensuring the market ramp-up of future PtL production for German air traffic.

The central concern of LHG is the harmonisation of European regulation with regard to quotas and subsidy mechanisms in order to avoid modal shifts (and the resulting carbon leakage) and to ensure fair competitive conditions – both within Europe and in intercontinental competition.

c) Direct marketing

LHG has developed an externally audited process to pass on emission reductions associated with SAF use to SAF customers in a targeted and verifiable manner. These can claim the reductions in



their carbon accounting in accordance with the GHG Protocol. This has significantly increased the attractiveness of the offer and the demand.

In the past year, demand for SAF on the part of corporate customers has increased sharply. Already in 2020, Lufthansa Cargo made its first cargo flight for a customer whose fuel requirements were completely substituted by SAF, using a balance approach. The successful first flight will now be followed by a series of weekly connections from Frankfurt to Shanghai. As a result of this cooperation, LHG is expected to be the largest SAF user in Europe in 2021 – with a throughput of up to 11,000 t.

LHG is currently further developing its SAF procurement strategy in order to be able to meet a further increase in demand also in the coming years. Specific talks are being held with suppliers all over the world.

2.2 Compensation: Voluntary CO₂ compensation with myclimate and Compensaid

In addition to the mandatory economic climate protection instruments (EU ETS, CORSIA), there is also the possibility of voluntary compensation. For more than 10 years, the Lufthansa Group has been in partnership with the compensation provider myclimate. Through the "Corporate Value Fares" programme, which LHG's Network Airlines offer its corporate customers, the emissions of intra-European air travel are automatically compensated via myclimate. In the first half of 2021, the offering to corporate customers was expanded to include the "Compensaid for Corporates" programme. Here, corporate customers have the opportunity to offset their emissions from flights via the Compensaid platform. LHG itself has been offsetting the CO₂ emissions of all business flights of its employees worldwide since 2019.

In addition, private customers and employees of LHG have the opportunity to compensate for or reduce their emissions on a voluntary basis.

With the "Compensaid" online platform developed and operated since by the Lufthansa Innovation Hub, travellers can reduce the CO₂ emissions of a flight by purchasing SAF or offset them with the compensation projects of long-standing LHG partner myclimate, regardless of the airline they choose. Since the first half of 2021, compensation has been made easier for the customer, as the Compensaid platform can be reached directly from the online booking platforms of all Lufthansa Group airlines via a link. LHG only purchases compensation certificates of the highest quality standards CDM Gold Standard and Plan Vivo.

With the "mindfulflyer" application, the respective CO₂ emissions of their flight have been automatically displayed for Miles & More customers in the Miles & More app since November 2020. They can compensate for this with just a few clicks directly in the app. For this, Miles & More integrates access to Compensaid. CO₂ compensation is possible both for a fee and through the use of Miles & More award miles collected by customers on their flights. The new offer is available not only for all LHG flights, but also for travel with Star Alliance and joint venture partners for which the customer has received or used Miles & More award miles.

2.3 Purchase of green electricity

Since 2019, LHG has been sourcing almost 100% green electricity in its home markets of Germany, Austria and Switzerland. This will also be the case in 2021. LHG will probably have to bear additional costs of approx. 200,000 euros for the purchase of green electricity compared to conventionally generated electricity in 2021.



B) Activities related to the EU digital transformation goals

A total of approximately EUR 16.4 million has been budgeted for the projects listed below for the current year 2021.

1. Corona testing and health certificates for cross-border travel

Many countries already require proof of certain entry documents in their entry regulations as part of the pandemic response. This includes, for example, a valid negative Covid-19 test, provision of proof of vaccination, a Digital Entry Registration for Germany or a Passenger Locator Form.

These documents have to be checked for validity by the airlines before departure, which involves an enormous organisational and time effort for passengers and airlines if they are checked manually. A digital document check, on the other hand, can speed up these checks and alert customers to any incorrect or incomplete documents, which can be corrected or completed by the passenger before they travel.

In the future, several systems will be established for the digitisation and standardisation of document control. LHG is working with IATA and Amadeus to digitise and standardise these document checks. The aim is to give all passengers the opportunity to electronically check and prove that they have the necessary documents before boarding their flight.

2. Project One_ID

The One_ID project promotes the goal of reaching LHG customers promptly, effectively and individually, providing them with up-to-date and travel-relevant information (e.g. travel restrictions, Covid warnings) in compliance with data protection regulations and making them tailor-made offers. The One_ID project lays the foundation by providing a standardised and uniform customer ID and authorisation for all LHG airlines and the subsidiary Miles & More GmbH, as well as integration at the most important digital touchpoints and the most important analysis systems. In addition, an Agile Release Train is to be established starting in 2022 to continuously deliver customer-user relevant business results.

3. KUSCO platform

The KUSCO platform also serves the goal of an improved customer approach mentioned under point 2 (One_ID project). KUSCO is a data and event streaming platform for LHG, which went live for the first time in October 2020 and is continuously being developed. With KUSCO it is possible to connect, consume and process real-time data easily and quickly, even at high volumes and workloads and with all the necessary security and quality standards that LHG strives for. This will make it possible to provide customers with personalised information and offers based on real-time data and, where necessary, to notify them more quickly of travel-related changes in the future.

4. Star Alliance Biometrics



The Biometric Hub project initiated by the STAR Alliance aims to enable passengers to use the airport area with as little contact as possible from the moment they arrive until they board the aircraft. For this purpose, it is necessary to be able to uniquely identify the passenger, who has agreed to this in advance, on the basis of his/her biometric data (via facial recognition software). LHG supports the Star Alliance initiative from a technical and legal point of view and has started pilot tests together with Frankfurt and Munich airports. Customers of the frequent flyer loyalty programme "Miles & More" who agree to participate in Biometrics will be able to pass through the security checkpoints and boarding gates without contact, making an important contribution to health protection in times of the COVID 19 pandemic.

5. The digital identity ecosystem – ID Wallet

A project launched jointly with the German government and partner companies from the business sector is to develop "digital evidence" that will make it possible to archive personal evidence of any kind quickly, easily and, above all, in a self-determined manner, and to create, manage and share evidence of them. The basis is the Self-Sovereign-Identity technology (SSI). The development will initially be driven forward in Germany and later throughout Europe. Naturally, the evidence stored in digital wallet are subject to special data security requirements. To ensure this, blockchain technology will be used to generate tamper-proof digital keys. This ensures that unauthorised persons (e.g. hackers) cannot access and steal millions of personal data or even entire identities from a single source. Users of the digital wallet should know at all times what information they are sharing with whom and thus retain sovereignty over their personal data. As a partner of the German government, Deutsche Lufthansa AG is one of the first companies to participate in the first use case "Hotel Checkin" for employees.

6. AVIATAR platform

AVIATAR is a platform that helps airline customers of DLH subsidiary Lufthansa Technik AG ("LHT") to manage their complex fleet conditions in real time and to forecast failure probabilities of individual components. The platform is openly programmed and enables the exchange of information across interfaces and aggregates and consolidates information in one central location. The platform applies analytical models to deliver new insights, recommendations and notifications that enable LHT customers to make faster and better decisions about necessary maintenance and service intervals. With the support of AVIATAR, users can optimise their aircraft's operating hours, minimise consequential costs, and ensure safer and more reliable fleet operations in the service of passenger safety around the world.

7. LHG One Data Platform

The importance of data and information is considerable for Lufthansa's business model to remain successful in the future. Virtually all business units will sooner or later base their decisions on data. The quality and consistency of data therefore make a significant contribution to the success of a company in today's world. LHG intends to create a One Data Platform (ODP) to pave the way to becoming a "data driven company".

The ODP is located in the cloud. This has two advantages: On the one hand, only the infrastructure that is actually used is paid for (pay-as-you-go model). On the other hand, new services such as a virtual machine can be connected within a few minutes – and not within weeks as in the past in a



local data centre. This means that new market requirements can be implemented in a very short time.

8. Project Adc.Evolution

Currently, each hub airline of LHG (including e.g. Swiss, Austrian Airlines and Brussels Airlines) develops and operates its own desktop solution and mobile apps for its customers, for example for ticket bookings, check-ins and other services. The goal of the Adc.Evolution project is to create a common and modernised platform for all .coms and mobile apps of the hub airlines of LHG. A uniform user interface is to be developed that all LHG customers can use for their mobile bookings. This modernised platform is also intended to technologically enable the development of innovative services, such as booking via voice assistant.
