

# Master Plan Climate Protection in Aviation

Measures for carbon  
neutral air transport



## Master Plan – Climate Protection in Aviation

Aviation brings people together all over the world, it makes the urgent transportation of valuable goods possible, ensures development aid for many countries and enables people to experience other countries and cultures. All of this is essential in a free and globalised world. Air transport is responsible for 2.8 per cent of global CO<sub>2</sub> emissions and it accounts for about 3 to 5 per cent of global warming.

In the current Covid-19 crisis, air travel has practically come to a complete standstill around the world, and with that, related emissions. However, demand for air transport will increase again. Although this will only happen gradually over a longer period of time, our position is clear: climate protection continues to concern all of us and we must act in a sustainable and effective way.

While doing so, we must also keep in mind to what extent the economic impact of the pandemic will affect the biggest levers for climate protection in air transport given: investing in climate protection requires economically strong companies.

### → Our goal

We, the companies of the German aviation industry, are committed to the goal of carbon neutral airport and flight operations.

## → Our measures

Our goal of carbon neutral aviation can be achieved if the specific measures outlined below are pursued jointly by industry and governments:

- ▶ Renew fleets by deploying lower-emission aircraft



- ▶ Replace fossil kerosene with sustainable aviation fuels



- ▶ Implement carbon neutral airport operations



- ▶ More efficient air traffic management in European airspace



- ▶ Shift traffic to rail by enhancing intermodal transportation



- ▶ Reduce emissions with a competitively neutral carbon pricing system



- ▶ Reduce other climate impacts (non-CO<sub>2</sub> effects)



## 1. Renew fleets by deploying lower-emission aircraft



Each new generation of aircraft requires up to 25 per cent less fuel and emits a correspondingly lower amount of CO<sub>2</sub>. Thanks to increasingly energy-efficient aircraft and operational procedures, we have succeeded in reducing CO<sub>2</sub> emissions per passenger-kilometre by 43 per cent since 1990, and we intend to invest in green fleet replacement even further. In addition, new aircraft engines will contribute to lower carbon emissions per flight over the long term.

### Measures:

- ▶ With the collapse of air transport due to the Covid-19 pandemic, fleet renewal has largely come to a standstill. However, we will continue to renew our aircraft fleets and equip them with more energy-efficient and lower-emission aircraft. To achieve this, we intend to draw on the funds from the fleet renewal support programme that the German government is currently preparing.

Our goal is to reduce specific carbon emissions through these investments and by continuing to optimise our operational processes by an additional 1 to 1.5 per cent annually.

## 2. Replace fossil kerosene with sustainable aviation fuels



To achieve the goal of flying in a carbon-neutral manner, it is essential to replace fossil kerosene with sustainable aviation fuels. The best solution in the long term, and also from an ecological point of view, involves fuels produced from atmospheric CO<sub>2</sub> using renewable energies. To achieve progress in this regard and put this vision into practice, we are working together with politics and manufacturers. In this context, it is important for us to support measures that are competitively neutral for airlines engaged in international competition.

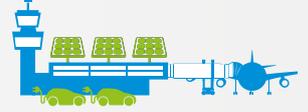
### Measures:

- ▶ Together with the federal and state governments, as well as plant manufacturers and the energy and mineral oil industries, we are drawing up a roadmap for the development of production capacities to make sustainable aviation fuels available at competitive prices.
- ▶ We are willing to participate in pilot projects to construct industrial plants producing sustainable aviation fuels, for example, in the form of purchase guarantees.
- ▶ For the market ramp-up, we propose that the government uses revenue from aviation taxes to support investments in a comprehensive system transition to sustainable aviation fuels. A blending obligation for synthetic fuels would also be a suitable way to get the market up and running. Implementing this kind of quota on a global level would be the preferable option since it would apply to all airlines in the same way.
- ▶ Any attempt to establish a mandatory blending obligation of this kind as a regional stand-alone solution (within Germany or Europe) in international aviation would lead to distortions of competition and carbon leakage. To prevent carbon leakage and distortion of competition to the disadvantage of German airlines and hubs in Germany in the event of a regional blending obligation (whether national or European), a corresponding regulation should not create any regional fuel price differences. It would have to be ensured that additional costs incurring as a result of a blending obligation are excluded on a reliable and long-term basis. In principle, this would be achievable by minimising the production costs and offsetting the remaining costs.

- ▶ We urge the European Union and its member states to take on a joint industrial policy initiative to establish conditions for an adequate supply of production facilities and fuel and to support the United Nations' International Civil Aviation Organisation (ICAO) in defining the necessary conditions to ensure sufficient demand for sustainable aviation fuels in global air transport. Blending obligations are only beneficial if they are feasible from a technical point of view and competitively neutral for airlines engaged in international competition.

We aim to have drawn up the roadmap, which we are developing together with both the federal and state governments as well as plant manufacturers and the energy and mineral oil industries, by early 2021. The roadmap can then be used as a basis to start expanding production capacities and gradually introduce the product to the market.

### 3. Implement carbon neutral airport operations



To reduce CO<sub>2</sub> emissions generated by our airports and their partners, we will implement specific climate protection measures in the field of facility management and airport operations.

#### Measures:

##### In the field of energy supply:

- ▶ Make full use of regional opportunities for climate-friendly energy supply
- ▶ Power generation and supply using renewable energies
- ▶ Use geothermal energy for cooling and heating requirements
- ▶ Generate electricity and heat from renewable raw materials

##### In the field of building technology:

- ▶ Optimise air conditioning in terminals
- ▶ Construct sustainable buildings with less energy consumption
- ▶ Optimise the energy efficiency of new construction projects, terminals and office buildings
- ▶ Implement temperature control systems based on the weather forecast
- ▶ Apply efficient lighting and innovative ventilation technology

##### In the field of specific airport facilities:

- ▶ Change runway lighting to LED technology
- ▶ Modify apron lighting
- ▶ Optimise passenger boarding bridges and baggage-handling systems

##### In the field of vehicle fleet/mobility:

- ▶ Switch to vehicles with alternative propulsion systems
- ▶ Expand and transition to electric mobility or alternative fuels, e.g. electrification of ground support vehicles

Retail and catering businesses at airports are also adopting measures to become carbon neutral.

By taking these measures, we will gradually reduce the CO<sub>2</sub> emissions generated by our airports to zero.

## 4. More efficient air traffic management in European airspace



The ongoing development of a “Single European Sky” can play a part in active climate protection: we have already succeeded in reducing detours and therefore fuel consumption by optimising flights within German airspace. At the European level, the introduction of free route airspace has saved more than 2.6 million tonnes of CO<sub>2</sub> since 2014, which is roughly equivalent to 0.5 per cent of the CO<sub>2</sub> emissions produced by air transport.

### Measures:

- ▶ Increase automation of air navigation services using standardised technologies
- ▶ Enhance flexibility in the use of air traffic controllers
- ▶ Set EU-wide standards for air traffic control technologies, procedures and licences to facilitate air traffic control operations
- ▶ Revision of the European regulatory framework with the aim of achieving effective economic regulation of air navigation services instead of the market regulation

According to SESAR Joint Undertaking, each flight could save 250 to 500 kg of fuel or 0.8 to 1.6 tonnes of CO<sub>2</sub> if the Single European Sky was put into practice:

- ▶ On the ground, e.g. through shorter taxiways and fewer stops: 38 to 75 kg of fuel per flight with the active involvement of airports and airlines
- ▶ Through optimised flight procedures such as continuous descent operations and fewer holding patterns: 163 to 325 kg of fuel per flight
- ▶ En route, e.g. through fewer detours due to restricted military areas: 50 to 100 kg of fuel per flight

A further reduction in carbon emissions produced by intra-European air traffic of approximately 5 to 10 per cent can be achieved by adopting these additional measures.

## 5. Shift traffic to rail by enhancing intermodal transportation



A great deal of domestic German traffic was already transferred to rail in the past, so that the operation of individual domestic flight routes could be discontinued. Transfers have always been successful when there was an attractive alternative transport option, the relevant infrastructure was in place and the journey time by rail was maximum three hours.

As a result, despite the growth in air transport, the number of domestic flight passengers in Germany has not risen for many years. Today, domestic air transport accounts for 0.3 per cent of total CO<sub>2</sub> emissions in Germany. Domestic flights now essentially operate only on longer routes, i.e. where travelling by rail does not enable passengers to attend an appointment in one day. On shorter routes, air transport is used almost exclusively by passengers transferring to international flights.

To encourage even more passengers to travel by rail, we would like to see greater cooperation between the different modes of transport and an improvement in the quality of rail travel.

### Measures:

- ▶ Further reduction in rail travel times
- ▶ Further strengthening of intermodal transportation by linking rail and air networks and connecting airports to the rail network
- ▶ Increasing the reliability of connections from rail to air
- ▶ Improving the transportation of luggage by rail

If all these measures were implemented, it would be possible to reduce domestic air travel by about 18 to 20 per cent from the current level of approximately 23 million passengers. This is equivalent to 4 million passengers. The contribution of domestic air travel to German CO<sub>2</sub> emissions could therefore be lowered by one-sixth.

## 6. Reduce emissions with a competitively neutral carbon pricing system



We support carbon pricing mechanisms if, firstly, they actually contribute to climate protection, and secondly, are designed to be competitively neutral and avoid carbon leakage.

Air transport is almost always international. Therefore, going it alone at the national level is not the right approach. In particular, climate policy regulations imposed via national taxes, surcharges or bans are counterproductive, both ecologically and economically. This is because measures like these do not actually lower carbon emissions, rather, they merely shift them to other regions (carbon leakage) where these charges are not levied, at the expense of the respective domestic industry. Air traffic is not reduced, it is only relocated. We oppose proposals for taxation on fuel because any carbon pricing system that is not introduced on a binding international basis would have the negative effect of distorting competition and causing carbon leakage. Air transport should be regulated at the international level, in which case it will also be effective in terms of climate policy. Where this is not possible internationally, unfair competition and carbon leakage must be avoided in other ways.

### Measures:

We consider emissions trading as a market-based instrument to limit and reduce CO<sub>2</sub> emissions and to set a price on CO<sub>2</sub> in air transport to be the most suitable solution. It was not possible to impose the inclusion of global air transport in emissions trading within the international community, which is why emissions trading has been confined regionally to the EU. However, to ensure that global air transport can also be included in carbon pricing, it is subject to the internationally coordinated carbon offsetting system CORSIA.

- ▶ We finance the pricing of CO<sub>2</sub> in air transport under the emissions trading system by purchasing the emission certificates required for this purpose. The inclusion of domestic and Europe-an air transport in the European Union Emissions Trading System, already implemented in 2012, ensures that the sum of CO<sub>2</sub> emissions of the economic sectors included (energy industry, manufacturing sector, aviation) will be reduced by 43 per cent of their 2005 levels by 2030. In the planned further development of the emissions trading system, existing distortions of competition, caused, for example, by the non-consideration of feeder flights to non-EU hubs, should be eliminated.

- ▶ The carbon offsetting system CORSIA will be used to balance growth-related emissions in global air transport. This means that international air transport will be growing in a carbon-neutral manner. Airlines also finance this system by purchasing corresponding certificates. We will provide transparent reporting on the type of certificates used.
- ▶ In addition to the carbon pricing instruments of emissions trading and CORSIA, passengers and companies can also individually make their flights climate-neutral. To this end, they can pay a surcharge based on their flight's impact on the climate, which will then go towards projects to reduce greenhouse gas emissions. Only very few passengers currently avail of this option. In order to raise awareness among passengers and companies of our offers to fly in a climate-neutral manner or to support sustainable environmental projects and to make it easier to do so, we intend to integrate these offers into the booking process. This method of voluntarily reducing one's own climate impact will be one part of the puzzle towards achieving the goal of carbon-neutral flights.

There is a need for action to make carbon pricing tools competitively neutral while simultaneously avoiding carbon leakage.

- ▶ To overcome the systemic distortions of competition inherent in the ETS, which is caused by limiting it to the EU, we propose:  
European airlines that have to operate intra-European feeder flights for long-haul connections will be allocated emission allowances for the share of emissions produced by feeder flights free of charge on a pro rata basis or their certificate costs will be offset elsewhere.
- ▶ To ensure that there is no double regulation by ETS and CORSIA, we propose:  
Intra-EU flights should continue to be included in emissions trading at 2020 emission levels. Any additional intra-European emissions and flights to third countries should be taken into account by CORSIA.

The inclusion of domestic and European air transport in the European Union Emissions Trading System will ensure that the overall CO<sub>2</sub> emissions of the economic sectors included (energy industry, manufacturing sector, aviation) will be reduced by 43 per cent on their 2005 levels by 2030. CORSIA will ensure that a carbon pricing and reduction system is also implemented for international air transport.

## 7. Reduce other climate impacts (non-CO<sub>2</sub> effects)



In addition to the CO<sub>2</sub> emissions it produces, the aviation sector is also responsible for other emissions resulting from the combustion of fuel at high altitudes. These emissions also have an impact on our climate, as they can contribute to the formation of clouds and other greenhouse gases. According to the Intergovernmental Panel on Climate Change (IPCC), the total impact of air transport on global warming, including CO<sub>2</sub>, is 3 to 5 percent and depends on a range of factors: the type and volume of emissions, weather conditions, the time of day and where the emissions are released, the time they remain in the atmosphere and their geographical dispersion. While the impact of carbon dioxide on the climate has been subject of extensive scientific research, further research is still needed, for example on the effects that contrails, cirrus clouds and nitrogen oxides have on the climate. However, there are a range of possible approaches that we are working on to reduce these effects:

- ▶ Greatly reduce nitrous oxide emissions by improving combustion processes in the engine
- ▶ Reduce particle emissions by using synthetic fuel, thereby reducing the formation of contrails
- ▶ Another possible approach, which can be derived from current studies, consists of climate-optimised flight paths, which would help to reduce the formation of contrails. However, further research is required before we can draw any conclusions about the impact on capacity in a heavily used airspace

Given that CO<sub>2</sub> has a particularly long life compared to other GHG emissions, the focus of our climate protection strategy is on cutting CO<sub>2</sub> emissions in particular – without neglecting other effects on the climate.



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