



## **Draft of a Net Zero Carbon roadmap for Munich Airport**

This draft of a Net Zero Carbon roadmap for Munich Airport (FMG) shows the steps Munich Airport has taken so far to achieve carbon neutrality by 2030 as well as our plans to achieve Net Zero Carbon by 2050 at the latest.

### **Development of Munich Airport's carbon strategy**

#### Carbon-neutral growth until 2020

Munich Airport adopted its first climate protection strategy in 2009, aimed at achieving carbon-neutral growth by 2020. This strategy focused on the emissions that are directly influenced by the airport and in addition on emissions of Munich Airport's customers without the landing and takeoff cycle, auxiliary power units and public transportation (Scopes 1, 2 and 3a).

Despite the growth in traffic and the opening of a new Terminal, FMG lowered its CO<sub>2</sub> emissions in Scope 1, 2 and 3a from around 162,000 tons in 2005 [reference year] to 107,959 tons in 2020 [147.788 tons in 2019 and a significant decrease in CO<sub>2</sub> emissions in 2020, due to the influence of the coronavirus pandemic].

#### Carbon-neutrality by 2030

Due to rapidly evolving global climate policies [such as the Paris Agreement], Munich Airport decided on a new carbon reduction goal in 2016: to achieve carbon-neutral operation in 2030. The focus of this new carbon strategy is on emissions that can directly be influenced by the airport [Scopes 1 and 2].

To achieve carbon neutrality by 2030 Munich Airport is going to reduce CO<sub>2</sub>-emissions that can be attributed directly to its operations by at least 60 percent using technical means. The remaining 40 percent of our emissions are to be compensated, preferably regional. FMG is investing 150 million euros to accomplish this by 2030.

#### Technical measures to achieve Carbon Neutrality by 2030

CO<sub>2</sub> emissions at Munich Airport have been reduced in 2020 by more than 50,000 tons yearly by about 300 individual measures since 2006.

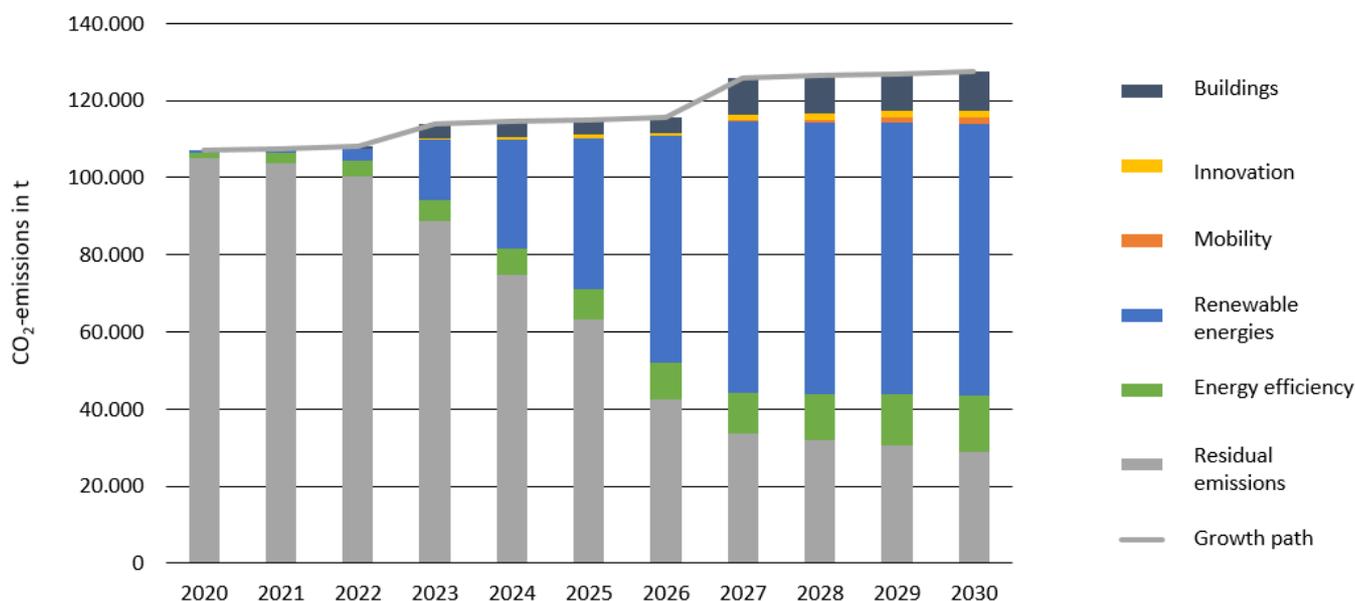
As a result - despite the growth in traffic - CO<sub>2</sub> emissions per passenger in Scopes 1 and 2 were reduced by more than 40 percent since 2006 [without the influence of Covid19].

As an example for 2020, the biggest carbon reductions were achieved by converting the main ventilation units in Munich Airport's Terminal 1. Two central rooftop systems now provide fresh air via a total of four supply air fans and four exhaust fans. These fans have been replaced step by step with the latest generation of fans. This saves up to 503 tons of CO<sub>2</sub> each year.



In addition to the implementation of energy efficiency measures and the increase in efficiency of drives and expansion of e-mobility, the shift to renewable energies is an important component of Munich Airport's carbon reduction plan. It is based on the use of bio methane, the use of photovoltaic systems on campus and off campus, purchased renewable energy as well as the use of environmental heat, such as geothermal energy.

The currently projected reduction path is shown below. It focusses on five fields of actions: buildings, innovation, mobility, renewable energy, energy efficiency.



### Offsetting of residual emissions

Some residual emissions that cannot be reduced by the airport itself remain.

To compensate these residual emissions, Munich Airport developed a regional project, the so called "Klimawald MUC" („Climate Forest MUC") - a regional CO<sub>2</sub>-compensation project. In this project existing forests are adapted to changing climate conditions and therefore additional growth is initiated, which can be used for carbon compensation. The project started in 2021 and will create a compensation capacity of around yearly 7000 t CO<sub>2</sub> in 2050. Since domestic offsetting in forests is not in line with German regulations, Munich Airport additionally purchases international CO<sub>2</sub>-certificates for every ton of CO<sub>2</sub> stored in "Klimawald MUC".

As a regional climate protection project "Klimawald MUC" has the following goals:

- Creation of a climate forest, that is resistant to climate change.



- Using trees with an average age of 75 years as CO<sub>2</sub> sink.
- Using the wood as e.g. building material for prolonged storage of CO<sub>2</sub>.
- Promotion of regional biodiversity.
- Preservation of the regional forests.
- Preservation of regional jobs in the forestry and timber sector.
- Creation of an attractive local recreation area.
- Creation of an educational trail on the subject of climate change, forests and climate protection.

### Certification

Munich Airport is certified by Airport Carbon Accreditation. Since 2010 Munich Airport is consistently on ACA Level 3.

### **Next step: Net Zero Carbon**

In 2019, Munich Airport committed to the «Net Zero Carbon Initiative» of ACI Europe: reducing the CO<sub>2</sub> emissions the airport can influence in its operations to reach Net Zero Carbon by the year 2050. The idea is to prevent emissions from arising in the first place and to remove residual emissions out of the atmosphere.

### Technical measures to achieve Net Zero Carbon

With regard to the Net Zero Carbon Initiative, the airport has identified key topic areas to adapt the existing CO<sub>2</sub> strategy.

Key components are

- increased and diversified generation of renewable energy
- storage of renewable energy
- establishment of a suitable electric infrastructure for e-mobility
- establishment of smart power management systems
- further increase of efficiency of all buildings and technical facilities

### Removal of residual emissions

“Klimawald MUC” is very likely to meet the regulations of removal projects. The actual requirements of removal projects are yet to be defined.

Since the projected capacity of “Klimawald MUC” in 2050 will be in the range of estimated residual emissions of Munich Airport under the conditions of Net Zero Carbon, it might be well capable of helping Munich Airport to fulfill its obligations to decrease its emissions to net zero. If Munich Airport’s demand of removal capacities in 2050 exceeds the projected removal capacity of “Klimawald MUC”, an upscale will be possible.



### Reduction of Scope 3 emissions

Although Munich Airport's carbon strategy focusses on the airport's Scope 1 and Scope 2 emissions, there are numerous examples of FMG's ambition to reduce its own Scope 3 emissions, as well as its effort to guide and influence its partners.

As an example, Munich Airport and its subsidiaries are offsetting all business-related air travel by Group employees by regional climate protection projects.

Another example are the pre-conditioned air (PCA) systems that are installed at 64 parking positions. They have been supplying aircrafts with pre-conditioned air since 2016. As a result, the aircrafts no longer need to run their auxiliary power units, which are responsible for high levels of noise, carbon emissions and other air pollutants.

Another element of FMG's ambition in Scope 3 is the provision of infrastructure for Sustainable Aviation Fuel (SAF). Since June 2021, "green kerosene" is available at Munich Airport.

Beyond that, FMG worked with airlines and Deutsche Flugsicherung (German Air Navigation Services) to establish the new Efficient Flight Profile (EFP) concept. This concept supports the continuous descent approach, which allows for lower fuel consumption and lower emissions when landing compared with standard approaches.

In addition, Munich Airport is constantly striving for the improvement of rail access to the airport and is negotiating with partners like the Deutsche Bahn.

### **Conclusion**

Munich Airport takes its environmental responsibility very seriously and is aware that an ambitious climate protection program makes the difference. The goal is to meet the requirements by politics and society but also to meet its own requirement: to pave the way for a sustainable restart as a green mobility hub. Consequently, the CO<sub>2</sub>-targets are reviewed annually and progress is evaluated. Munich Airport constantly strives for positive contributions to climate protection.