From CO_2-neutral operations to a Net Zero Airport

Net Zero Roadmap of Vienna Airport

June 2024

VIE Vienna Airport

Contents

I. Vienna Airport sets the course for an even more sustainable future

Vienna Airport (VIE) is a **central hub** for air traffic between **Eastern and Western Europe** as well as for **long-haul flights** to North America and the Middle and Far East. In 2019, before the outbreak of the COVID-19 pandemic, Vienna Airport achieved a record year with 31.7 million passengers. Passenger and traffic figures then came to a halt with the outbreak of the COVID-19 pandemic. However, as the pandemic has subsided, passenger numbers are rising again and around 30 million passengers are expected for 2024.

Vienna Airport proves that economic success, good operating performance and sustainable management are compatible goals; however, this can be achieved only in a balanced manner with a high level of management attention and comprehensive expertise. This starts with **thorough environmental and energy efficiency management**. A **proactive sustainability policy** is now firmly anchored **in the strategy of Flughafen Wien AG**. A major milestone was reached back in 2023: **CO_2-neutral operations at Vienna Airport.**

To limit global warming to an average of 1.5°C in line with the Paris Climate Agreement, the European Union and the European aviation industry have set the goal in their Green Deal of being climate neutral by 2050. The airport's next goal is therefore **to gradually progress from CO_2-neutral airport operations (since 2023)** to **"net zero" (by 2033).** This **roadmap** shows how this goal is to be achieved.

About Flughafen Wien AG

As the developer, constructor and full-service operator of the Vienna Airport, Flughafen Wien AG (FWAG) offers the entire range of related services. This includes airport operations, ground handling services, security services, infrastructure providers and commercial activities.

Benefiting from its geographic location in the centre of Europe, Vienna Airport has established itself as one of the most important hubs to the vibrant destinations of Central and Eastern Europe. In addition, more than 250 companies conduct business at VIE with over 23,000 employees.

Flughafen Wien AG is one of the few majority-private, listed airport operators in Europe and was privatised in 1992. The shareholders are:

- State of Lower Austria: 20.0%
- City of Vienna: 20.0%
- Employee-Participation Private Foundation: 10.0%
- Airports Group Europe S.à r.l. (IFM): 44.0%
- Free float: 6.0%

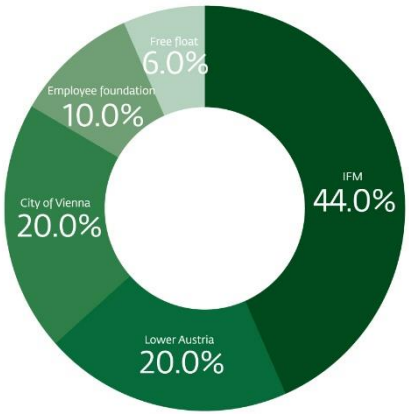
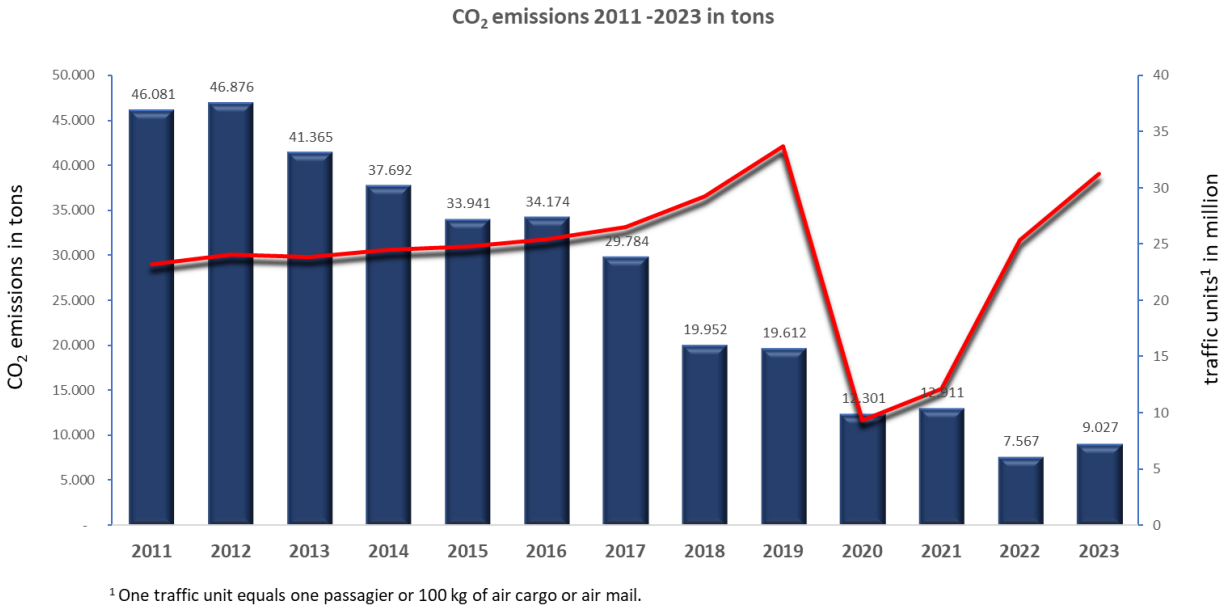


Figure 1: Shareholders of Flughafen Wien AG

II. Milestone CO_2-neutral airport operations

Vienna Airport has pursued a **proactive energy efficiency and sustainability policy with numerous sustainability measures** since 2011. Since 2014, a sustainability report has been prepared every three years to publicise the successes achieved and the planned environmental programme. Thanks to comprehensive environmental management and a wide range of measures, energy consumption and, accordingly, CO_2 emissions at Vienna Airport have been reduced significantly:



[1] One traffic unit equals one passagier or 100 kg of air cargo or air mail.

Figure 2: Development of CO_2 emissions at Vienna Airport from 2011 to 2023
(bars = annual CO_2 emissions in tons; red line = development of traffic units in millions)

CO_2-neutral power supply

A key component of Flughafen Wien AG's sustainability strategy is **its sustainable electricity production**: A total of **ten photovoltaic systems** have been installed on the premises of Vienna Airport to date. In particular**, this includes what is currently one of Austria's largest PV systems**, which was put into operation in 2022 directly south of Runway 11/29. The **existing PV systems have a capacity of around 45 MW peak** and produce around 45 million kilowatt hours per year, accounting for around **50% of the airport's total electricity requirements**. The remaining 50% of the electricity demand is certified to be hydropower.

Energy efficiency & sustainable building

In addition to the expansion **of sustainable energy production, heat** is obtained from district **heating from industrial waste heat from the OMV Schwechat refinery;** this qualifies as **CO_2 neutral**.

The ongoing **improvement in energy efficiency** using the (proprietary) **Smart Airport City software** and **the use of geothermal energy for building cooling** also makes Vienna Airport an international pioneer in sustainable airport operations. The use of **state-of-the-art building technology systems** (insulation, façade, etc.) and the **ongoing optimisation of building and plant technology** as well as **lighting at the site** (comprehensive conversion to LED, etc.) lead to a further significant reduction in energy consumption at the site.

Sustainable forms of mobility

Flughafen Wien AG already has **around 450 e-vehicles in use**. This primarily includes utility vehicles for handling, e.g.: e-forklifts, e-passenger stairs, and e-towing vehicles. The further **conversion of the vehicle fleet to CO_2-neutral drive types is being evaluated on an ongoing basis; depending on the practicability and feasibility of the respective drive types and energy sources (e-mobility, biogenic fuels, hydrogen, etc.), the vehicle fleet will gradually be converted to zero emissions** over the next few years.

Transparent compensation

For the remaining **approximately 9,000 t of CO_2 in the year 2023** which resulted from airport operations, *offsetting* was carried out via **Climate Austria[1] to compensate** for these CO_2 emissions. Climate Austria is supported in its activities at the national level by the Federal Ministry for Climate Protection. The use of the offsetting certificates is subject to strict criteria.

Thanks to these numerous sustainability measures, Vienna Airport has already reached the milestone of CO_2-neutral airport operations in 2023! [2]

[1] https://www.climateaustria.at/

[2] CO_2-neutral airport operations refer to directly influenceable emissions from Scope 1 and Scope 2a (see chapter IV).

Certifications

In the area of sustainability, Vienna Airport not only demonstrates transparency through its own sustainability reporting but also obtains regular **certification from external auditors**:

- Flughafen Wien AG complies with the requirements of the global **environmental management system ISO 14001** to further develop its strategic environmental management in the intended manner and obtain external certification. (see Annex 1)

- In addition, the much more extensive **EMAS certification** was obtained: the **"Eco-Management and Audit Scheme", the European Union's environmental management system with the highest requirements worldwide.** VIE was first entered in the EMAS register back in December 2015. (see Annex 2)

- In addition, Vienna Airport has been participating in the **Airport Carbon Accreditation Scheme** since 2013, a unique and global certification system that categorises and guides the CO_2 reduction of airports worldwide. Vienna Airport submitted the data for 2023 for **Level 3+ (*neutrality*)** certification in the first quarter of 2024 (confirmation pending or in progress). In addition, Joint-CEO Julian Jäger officially signed the Net Zero 2050 Commitment of ACI Europe on behalf of Flughafen Wien AG in 2019.

III. From CO_2-neutral airport operations to *net zero* in ten years

In the years 2022 and 2023, Flughafen Wien AG developed a new **corporate strategy**: **"Strategy 2030: So that we remain among the best in the future"**. A **proactive sustainability policy** is a central pillar in this regard, with the aim of **achieving the net zero target for CO_2 emissions by 2033**. In addition, Article 6 of FWAG's Articles of Association (*"Management and representation, reports to the Supervisory Board")* has been supplemented by the sustainability objective at the Annual General Meeting on June 5th, 2024: *"The Management Board shall [...] also take sustainability aspects into account in the development and implementation of the corporate strategy in order to ensure socially responsible action".*

Global environment

The ongoing climate change requires an ever-greater focus on climate-friendly, resource-conserving measures and technologies. In addition to CO_2-neutral airport operations, *Sustainable Aviation Fuels* (SAF) will play a particularly central role in decarbonising the industry for air traffic.

Alongside voluntary measures for the more efficient use of resources, binding emission reduction targets have also been adopted more frequently at the national, international and institutional levels in recent years. The following regulations are particularly noteworthy in this context:

- **UN**: "Sustainability" at various levels is included several times in the *Sustainable Development Goals* (SDGs)
- **EU Climate Law: climate-neutral** economy by 2050; specific regulatory requirements by 2030 as part of the Fit-for-55 Package (especially AFIR) and Clean Vehicles Directive (CVD)
- **Austria:** Achievement of climate neutrality already defined for 2040
- **IATA:** "*Fly Net Zero*" programme by 2050; applied to European aviation in the "*Destination 2050*" programme
- **ACI Europe:** Net Zero by 2050

Strategy 2030

Strategy 2030 of Flughafen Wien AG defines **five strategic directions** that are designed to ensure the **sustainable success of the company**:

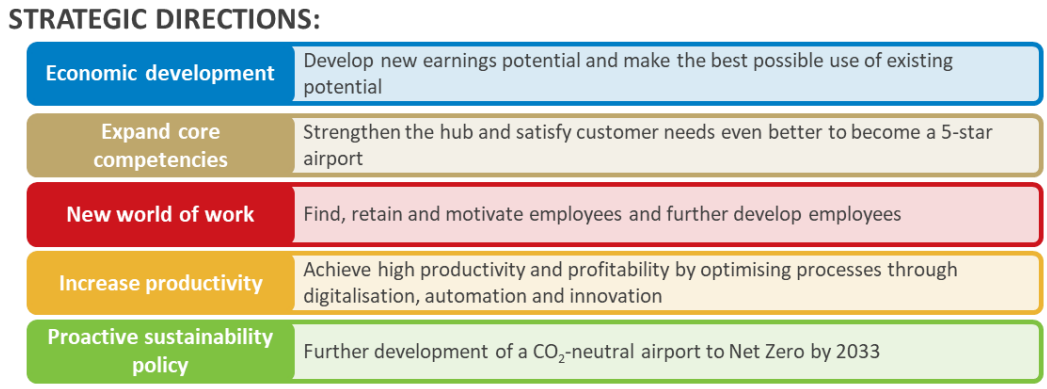


Figure 3: Strategic directions in Strategy 2030

These strategic directions are based on the **values of Flughafen Wien AG**, to which the **value of "sustainability"** has been added:

Figure 4: Values of Flughafen Wien AG

Proactive sustainability policy

The proactive sustainability policy as a strategic direction and sustainability as an important corporate value are essential to the creation of the net zero roadmap: Vienna Airport is committed to a sustainable approach to the environment and assumes responsibility for its surrounding area and the people who live nearby. With an intense sustainability policy—which is also clearly reflected in FWAG's investments—the airport will gradually **develop from a CO_2-neutral airport as of 2023 to "*net zero CO_2*" by 2033.**

In view of ESG requirements and transparency obligations, the rising expectations of stakeholders and, in particular, the positive economic effects, **sustainability activities have become a guiding management principle at FWAG**.

Cooperative dialogue with local residents and airport stakeholders is also of central importance. Thanks to decades of work in the **Dialogforum[3],** which has been founded on mutual trust, there is a high level of acceptance for the sustainable development of the airport. This close dialogue will be continued in the future.

International investments

According to FWAG's annual report, *"the Flughafen Wien Group (FWAG) [...] had investments in two international airports in 2023. FWAG held a stake of 48.44% in Malta Airport (fully consolidated subsidiary) as of December 31, 2023, [...] FWAG has an indirect stake of 66% in Košice Airport (at-equity investment)"[4].*

Both airports have defined their own *net zero* targets. Košice Airport will reduce its CO_2 emissions to "net zero" by 2040. Malta Airport aims to reach this goal by 2050.

[3] The "Dialogforum Flughafen Wien" is a non-profit association registered under the Austrian Associations Act and based in Schwechat. The Dialogforum was founded by Flughafen Wien AG, Austrian Airlines, Austro Control, the working group of residents' associations and citizens' initiatives around Vienna Airport ("ARGE gegen Fluglärm"), the provinces of Vienna, Lower Austria and Burgenland as well as the ten municipalities bordering Vienna Airport as a discussion and negotiation platform for the entire air traffic issue. See: www.dialogforum.at

[4] See annual report 2023: https://www.viennaairport.com/jart/prj3/va/uploads/data-uploads/IR/2024/Annual%20Report%202023%20EN.pdf

IV. VIE in CO_2-neutral operations

This chapter outlines the CO_2 emissions of Vienna Airport in 2023 (*mapping*). A key framework condition for the CO_2 emissions balance is the definition of the balance thresholds. The present balance threshold was selected so that all emission sources at the airport are covered and a comparison with emissions surveys at other airports can be made.

The survey area covers the entire airport site; the site boundaries also represent the balance threshold. This means that all emissions emitted directly at the airport and those resulting from energy consumption (supplied by third parties) are recorded. The balance does not include upstream and downstream emissions of a production chain (e.g., CO_2 emissions during the manufacturing of a vehicle).

An exception to the balance threshold applies to aircraft emissions: Here, the system threshold is based on the definition of the LTO cycle (*Landing and Take-Off Cycle*, see Figure 5) according to ICAO (International Civil Aviation Organization). Accordingly, emissions from take-offs and landings are calculated up to an altitude of 3,000 feet (equivalent to approximately 915 m).

For road traffic in the publicly accessible area (*landside*), the routes at the airport up to the public road network, i.e., up to the A4 or the B9 Hainburger Bundesstraße, were taken into account (see Figure 6). This calculation does not include arrival and departure traffic on the public road network.

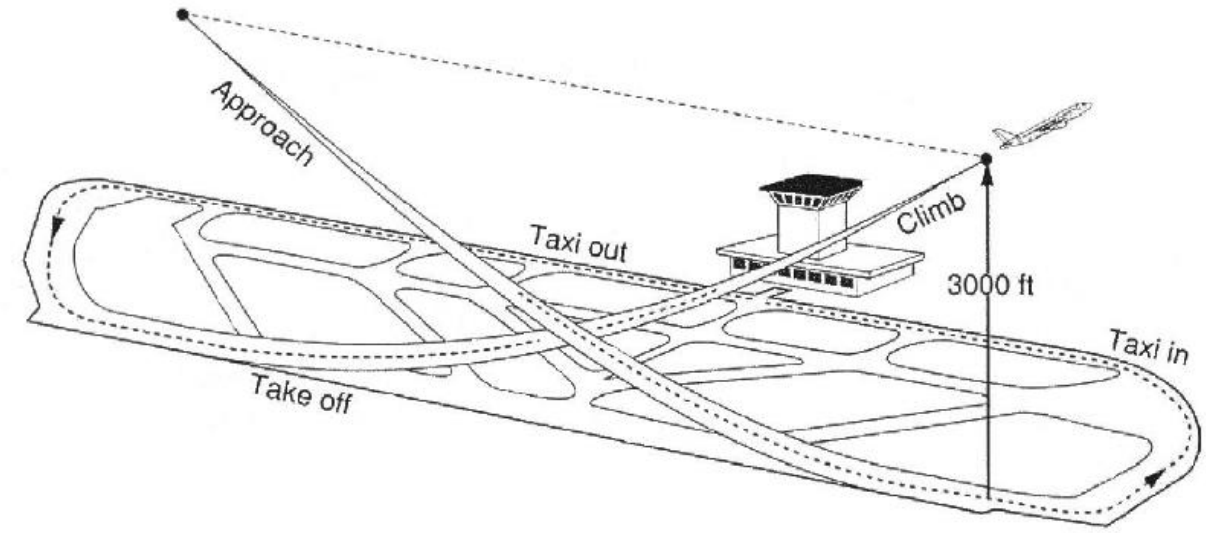


Figure 5: Graph of the Landing and Take-Off Cycle (LTO cycle)

Figure 6: Balance sheet threshold (survey area) for CO_2 emissions at Vienna Airport

As mentioned in Chapter II, both the CO_2-neutral operations and the *net zero* target refer to the **CO_2 emissions from *Scope 1 (a+b)* and *Scope 2 (a)* of FWAG that can be directly influenced**. The classification into *Scopes 1, 2* and *3* refers to the sources of emissions in the survey area and the extent to which these emissions can be influenced. The scopes are defined as follows:

Scope	Greenhouse gas emissions arise…
Scope 1	… in the course of the company's business activities from sources that the company itself owns and/or operates, e.g. vehicles, combustion plants
Scope 2	… as part of the generation by third parties of the energy consumed by the company, e.g. electricity, district heating and cooling
Scope 3	… in the supply chain or in the course of using the products or services sold by the company, arrival and departure of passengers and employees, transportation of goods, use of the airport by airlines

Table 1 Allocation of emissions by scopes

The airport operator can, at best, indirectly influence third-party emissions at the airport. For this reason, the emissions of the individual scopes are distinguished in each case between:

A) can be influenced directly; the airport operator can directly control the emissions behaviour

B) can be influenced indirectly; the decision on emissions behaviour remains with third parties

Figure 7: Definition of Scopes 1, 2 and 3 or allocation of emissions by scope

CO_2 emissions in 2023

Flughafen Wien AG **emitted 9,027 tons of CO_2 at the Vienna-Schwechat site in 2023**, which falls under *Scope 1* and *2a* and can be directly influenced. These emissions come from three different sources: **road traffic with FWAG vehicles** (6,743 t), **ground handling equipment** (2,239 t) and **emergency power generators** (45 t). The emissions here are attributable to fuel consumption (mainly diesel). In Scope 2 a, CO_2 emissions were already zero. The 9,027 t of CO_2 from *Scope 1* and the 135 t of CO_2 from *Scope 3* for business trips were offset using CO_2 certificates via Climate Austria. This enabled the achievement of **CO_2-neutral operations**. These offsetting measures are no longer fully permissible for the net zero target. The remaining 17,704 t in *Scope 2 b* cannot be directly influenced: these are CO_2 emissions from the electricity requirements of companies located at the site, most of which are tenants of FWAG.[5] Most emissions in *Scope 3* originate from the main and auxiliary engines of the aircraft (302,618 t from 319,300 t of the emissions in *Scope 3* that can be influenced indirectly) and from the fuel consumption of external companies.

These **data for 2023** were verified by an **external environmental auditor**, Ulrich Schmidt (IFU-CERT), as part of the **annual EMAS audit**. In addition, the submission for Level 3+ (*neutrality*) was carried out as part of the Airport Carbon Accreditation Scheme. This is being audited by WSP; confirmation is still pending.

V. Measures and pathways

Flughafen Wien AG launched a comprehensive programme to increase energy efficiency and reduce energy consumption in 2011. As a result, emissions from airport operations have fallen continuously and significantly. The year 2011 is therefore also used as the base year for calculating the path to the net zero target. Since then, measures for and investments in the sustainable operation of the airport have been implemented and made on an ongoing basis, and targets have been defined for the future.

Investments in sustainable operations

Vienna Airport is committed to a sustainable approach to the environment and assumes responsibility for its surrounding area and the people who live nearby. By means of an intense sustainability policy – which is also reflected in the investments that are made—FWAG is gradually developing from a CO_2-neutral airport (since 2023) to an organisation with "net zero" CO_2 emissions (by 2033). Therefore, in addition to economic objectives, **sustainability policy objectives** should also be taken into account when making investment decisions:

- **Sustainable procurement** in the sense of a circular economy
- **Further increase in energy efficiency** and in-house **CO_2-free electricity production** as well as reduction in ongoing resource consumption
- Measures to **minimise the CO_2 emissions generated (optimising public transport connections, etc.**)

[5] From 2024, the electricity demand of companies based at the site will be covered by FWAG's own sustainable electricity production or procured CO_2-free using hydropower certificates; Scope 2b will therefore also be set to zero from 2024.

Based on these principles, Flughafen Wien AG has identified a series of measures for the sustainable development of airport operations.

- **Upgrading the grid infrastructure to meet future requirements:** The expected increase in energy consumption at the site (primarily due to the expansion of e-mobility) may require an increase in the capacity of the grid connection to the upstream grid.
- **Further increase in efficiency and reduction of resource consumption** in the operational management of existing buildings through increased digitalisation, the accelerated use of BIM (*Building Information Modelling*) and improved technologies for machinery, heating and air conditioning.
- **Further expansion of photovoltaics:** The use of additional areas for PV systems is being evaluated on an ongoing basis and expansion is driven forward in line with demand.
- **Wind power:** The potential of electricity production through the use of wind power at the site is to be examined in order to develop a further sustainable source of electricity generation in addition to our own electricity production through photovoltaics – above all, as potential for a CO_2 sink.
- **Electricity storage:** In order to make optimum use of the electricity generated in the PV systems, it is necessary to supplement this with electricity storage; the acquisition of sufficient battery storage capacity is currently the preferred option.
- **Hydrogen production:** The utilisation of surplus energy for hydrogen production at the site is also being considered.
- **Conversion of the vehicle fleet (ground power units, buses, catering vehicles, etc.) to sustainable drive types:** The conversion of the vehicle fleet to CO_2-neutral methods of propulsion is being evaluated and driven forward on an ongoing basis. In accordance with the practicability and feasibility of the respective propulsion types (e-mobility, hydrogen, etc.), the vehicle fleet will gradually be made emission free over the next few years.
- Construction of a **high-power, fast e-charging station** at the site.
- **Further investments in increasing energy efficiency:** Vienna Airport is constantly striving to analyse energy consumption and make it more efficient. As a result, energy consumption has already been significantly reduced in recent years. Further potential for increasing efficiency is evaluated and realised on an ongoing basis.
- **Sustainable Aviation Fuel (SAF):** The aviation industry will make a significant contribution to achieving climate targets through the gradual introduction of SAFs. However, the provision of the necessary infrastructure should support the use of SAFs to the best of its ability.
- **CO_2 sinks: In order to bind any residual emissions,** the use of other CO_2 sinks should also be examined (e.g., reforestation or irrigation of moors).

Measures

Flughafen Wien AG publishes an **annual environmental statement** and a **regular sustainability report**, which are available on the FWAG website. This includes both the environmental measures applied to date since 2014 and the current and planned measures in the area of the environment and sustainability. FWAG's sustainability measures are comprehensively listed in the 2022 environmental statement (see Annex 1 of the 2022 environmental statement). The 2023 environmental statement will be available on the FWAG website[6] in July 2024.

As described in Chapter IV, the **largest directly controllable sources of emissions at Vienna Airport are vehicles and equipment** that are currently powered by diesel, gasoline or gas. These vehicles and equipment are to be gradually converted to sustainably operated alternatives.

As can already be seen from the environmental statements of recent years, the sustainable transformation of a multifaceted company such as Vienna Airport requires not only a **proactive energy efficiency and sustainability policy**, consistently pursued over many years, but also many **individual measures**. Achieving CO_2-neutral operations has already required "1,001 measures" and the same still applies to the net zero target. For this reason, "Strategy 2030" sets out a large number of specific measures to achieve the next major milestone in terms of sustainability. These affect all areas of the company and range from the conversion of the vehicle fleet to alternative drive technologies and fuels to consistent improvements in the area of energy and environmental efficiency (e.g., in buildings) and the further reduction of resource consumption at the site.

For the ***net zero CO_2*** **target**, it is crucial to reduce the **remaining CO_2 emissions** from *Scope 1* **as far as technically possible and economically viable**. This **concerns a) the vehicles and equipment of FWAG, b) the *ground power units* (GPUs) and c) the emergency power generators**. Conversions will take place gradually up to 2033 and in consideration of the legal framework (in particular, tenders) as well as technological developments and availability on the market. Flughafen Wien AG is constantly monitoring the market and evaluating possible applications.

Technological flexibility plays a **central role** for FWAG here, which is why **possible scenarios** are outlined below as to what the **pathway towards Net Zero** could look like. However, due to the **rapid pace of technological progress and (at least partially) unpredictable developments on the procurement market, it is difficult** to pinpoint a **specific scenario or technological solution**. In particular, it should be borne in mind that vehicles and equipment used at an airport are usually **special vehicles or equipment** that often undergo a different or delayed technological development.

[6] See: https://www.viennaairport.com/en/company/flughafen_wien_ag/environment__sustainability/sustainability_report

a) **Possible scenario for FWAG vehicles and equipment:** Although around 450 e-vehicles are already in use, the majority of **FWAG's vehicles and equipment** are currently still powered by **diesel, gasoline or natural gas**. The **largest share of fuel consumption** is **diesel**, which **is** the **fuel for many special vehicles on the apron, such as catering lift trucks** or passenger buses. The conversion of the vehicle fleet to CO_2-neutral drive types is being evaluated on an ongoing basis. Depending on the practicability and feasibility of the respective drive types, the vehicle fleet will gradually be made emission free over the next few years. In the future, the diesel-powered (special) vehicles could run on the **biogenic fuel HVO100**, which would **reduce CO_2 emissions by around 90%**. **Certain diesel-powered vehicle types**, for which electrification is progressing faster or at economically justifiable prices, could be **operated electrically**; this could include the passenger buses[7] used, for example. The **gasoline-powered vehicles** currently in use, most of which are **conventional passenger cars, could also be gradually replaced by electric vehicles**. The natural **gas-powered vehicles** could, in turn, run on **biogas**, which would reduce CO_2 emissions to zero.

b) **Possible scenario for ground power units (GPUs):** The stationary power supply for aircraft on the apron is currently provided by **diesel-powered GPUs**. This power supply must be provided by the year 2030 on **the basis of the "EU Regulation on the deployment of alternative fuels infrastructure (AFIR)"**, either by means of installed ground power from grid or sustainably operated GPUs. Vienna Airport therefore plans **to gradually expand ground power on the apron by 2030** (where it makes sense for structural reasons) and to use **sustainably operated GPUs**.[8] At present, it seems most likely that, in addition to ground power expansion, **electrically powered GPUs (eGPUs)** powered by sustainable electricity will be used, thereby reducing CO_2 emissions to zero. Similar to the vehicles and devices on the apron, other technologies may also be used in the future, such as hydrogen-powered GPUs or the replacement of diesel with HVO100 fuel.

c) **Possible scenario for emergency power generators:** The **diesel-powered emergency power generators**, which accounted for the smallest share of the remaining CO_2 emissions from *Scope 1* in 2023 at 45 tons, could also be **operated with HVO100** (reduction of 90% of CO_2 emissions).

[7] The use of electric passenger buses is already being tested at Vienna Airport.

[8] Test installations for ground power on the apron are already in operation at Vienna Airport and electrically powered GPUs (eGPUs) have already been tested.

Pathway to net zero

How the measures to reduce CO_2 are implemented are being defined by the *pathway*. Figure 8 first provides an overview of various scenarios that show the possible paths under theoretical assumptions:

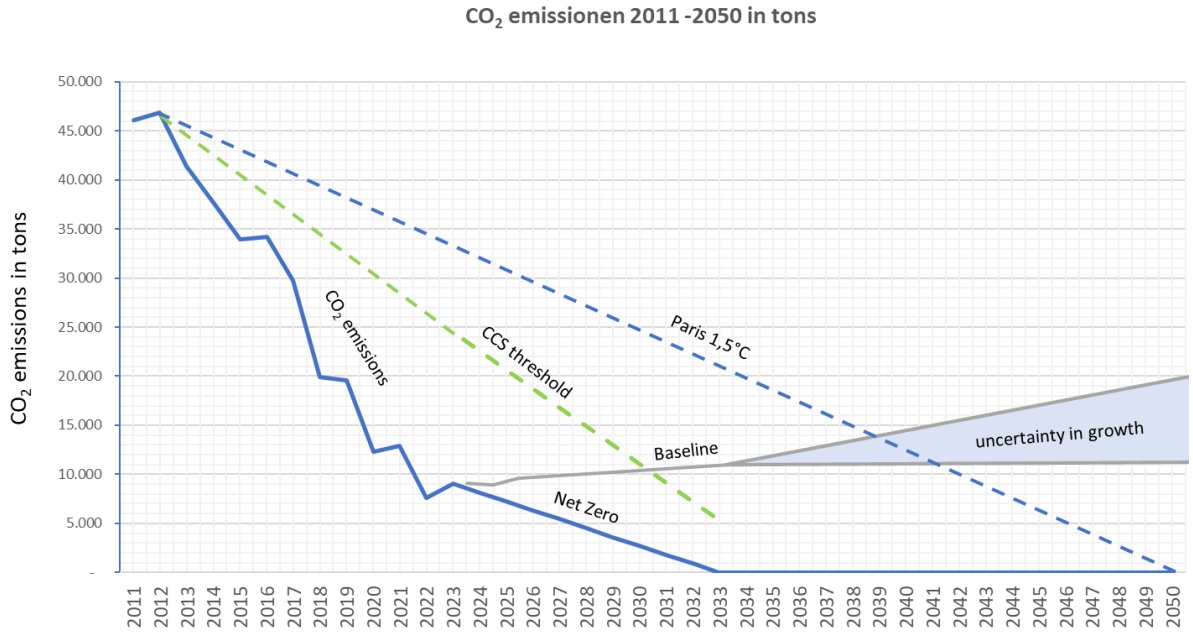


Figure 8: Scenarios for the reduction of CO_2 emissions by 2050

The dashed blue line shows the theoretical pathway to net zero by 2050 in accordance with the Paris Climate Agreement (1.5°C target). The dashed green line shows the path that, starting from the base year 2011, would reach the value by 2033 that is permitted for net zero (in combination with CCS or natural CO_2 sinks). This value is likely to be a maximum of 4,608.1 t CO_2 by 2033 (max. 10% compared to the base year). The solid blue line up to 2023 describes the reduction in CO_2 emissions at Vienna Airport achieved to date; the continuing blue line from 2023 to 2033 shows the theoretical pathway that would set the existing approx. 9,000 t of CO_2 to zero (*net zero pathway* without CCS). The grey line from 2023 onward describes the baseline scenario, i.e., this is how CO_2 emissions would develop if Vienna Airport did not implement any further reduction measures from 2023 (although there is some uncertainty as to how traffic at VIE will develop in the long term).

The actual pathway to net zero is shown in Figure 9. The primary goal is to reduce absolute CO_2 emissions as far as technically possible and economically feasible by 2033. The remaining CO_2 emissions can be removed by CCS or natural CO_2 sinks. The *pathway* of Flughafen Wien AG is as follows:

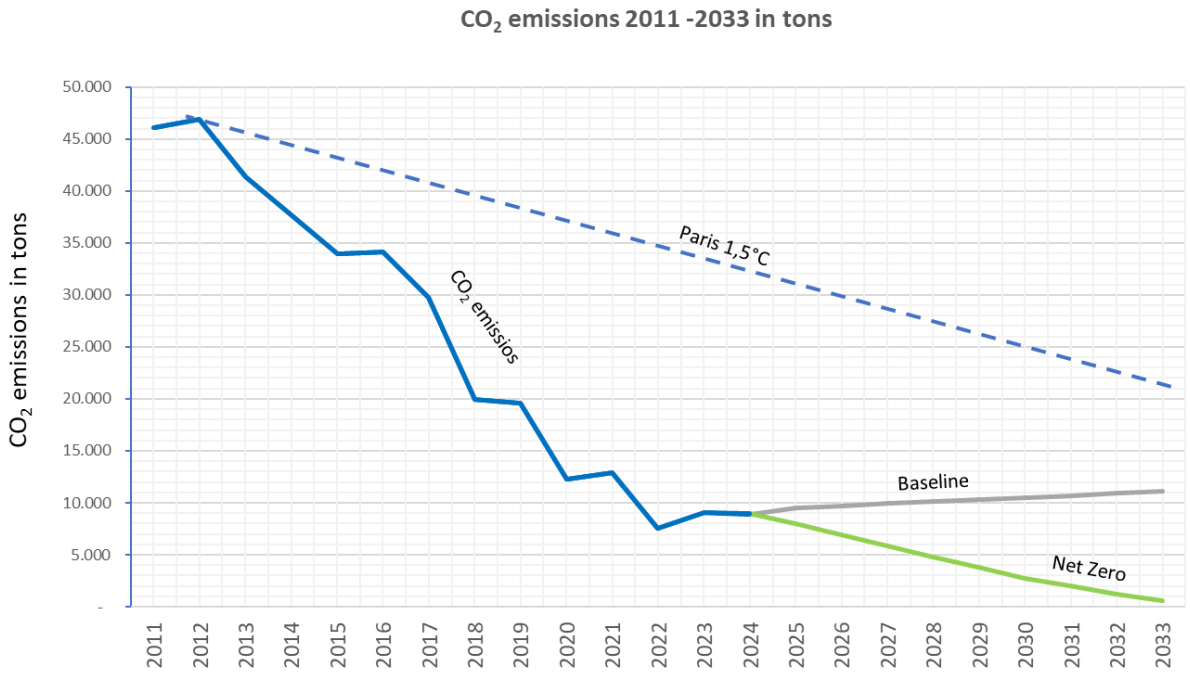


Figure 9: Pathway to achieving net zero CO_2 at Vienna Airport

The green line shows the path that could be taken at Vienna Airport by implementing the scenarios described above. The line ends in 2033 just above the zero line; around 600 t CO_2 emissions are expected in this year. These emissions are caused by special vehicles and equipment on the apron and are to be covered by CCS systems or natural CO_2 sinks. **As a result, Vienna Airport will achieve its *net zero CO_2* target for emissions from *Scope 1 (a+b)* and *Scope 2* (a) in 2033.**

Further emission reductions

Vienna Airport is also making efforts to further reduce CO_2 emissions in the other emission categories. ***Scope 2 (b)*** covers the **electricity consumption of customers at the site**. From the year 2024 onward, the electricity demand of companies based at the site will be covered by **FWAG's own sustainable electricity production** or **procured in a CO_2-free manner with a certificate of origin for hydropower**; *Scope 2 (b)* will therefore also be set to zero from 2024.

Scope 3 (a) includes the emissions resulting from **FWAG's business trips**. In 2023**, these were offset with CO_2 certificates via Climate Austria** and thus were made CO_2 neutral. In the future, these emissions are to be **reduced through the use of SAF** or **removed with the help of CCS or natural CO_2 sinks**.

The emissions in ***Scope 3 (b)*** primarily originate from the **operation of aircraft within the LTO cycle**. The increased **provision of ground power on the apron** by FWAG will lead to a reduction in the use of *Auxiliary Power Units* (APUs) in the aircraft and thus also ***Scope 3 (b) emissions***. The **full implementation of *Collaborative Decision Making* (CDM)** will result in a further emission reduction in aircraft operations at Vienna Airport, for example through shorter taxiways on the apron. Due to the **obligation to blend sustainable aviation fuels ("ReFuelEU Aviation")** and the use of new aircraft that are more energy efficient in operation, ***Scope 3 (b)*** **emissions at the site** will also be **significantly reduced**.

Another area in ***Scope 3 (b)*** concerns **landside traffic** due to travel to and from the airport. The **modal split** should therefore be further improved in favour of **public transport**. This includes, above all, the **expansion of the rail connection**: On the one hand, **capacity increases are planned on the main line toward Vienna** for the S-Bahn and the City Airport Train and, on the other hand, the **construction of a high-speed railroad towards Budapest and Bratislava via Vienna Airport** ("Airport Link"). In addition to the existing charging points, a **central electric fast-charging station** is currently under construction on the entrance road to Vienna Airport. Incentives will also be created to promote the use of **"green taxis".** Employees can **use the City Airport Train and the buses to the airport (Vienna Airport Lines) free of charge** as part of the company transportation system and thus travel by public transport. The airport also has a **rental bike system** (Nextbike) for trips around the site and e-scooters are also used.

VI. Implementation and further development of the net zero roadmap

The **net zero roadmap** shows how Vienna Airport will **reduce its CO_2 emissions from operations to "net zero" by 2033**. A **roadmap** is always **confronted with the uncertainties of future events**: external influences (e.g., international conflicts, pandemics), changing market conditions (e.g., technological developments, product availability or pricing) and the company's internal reactions to these can lead to adjustments to such roadmaps. The **net zero roadmap of Vienna Airport** is therefore to be understood as a **living document** that will be subject to ongoing adaptation in the future.

Net zero Roadmap

As shown in Chapter IV, around 9,000 tons of CO_2 were still emitted during operations at Vienna Airport at the end of 2023. The **most important measures for achieving the net zero target** therefore consist of **a) operating the previously mentioned vehicles and equipment with sustainable fuels or replacing them with sustainable alternatives, b) creating the necessary conditions for this** (sustainable energy production, expansion of grid and charging infrastructure, etc.), and **c) binding the unavoidable CO_2 emissions through storage or sinks**. In addition, Vienna Airport will not only become a net zero airport with a large **number of measures**—see Chapter V—but will also **ensure sustainable airport operations in the long term**. Flughafen Wien AG is thus contributing to achieving climate neutrality in Europe and is an international pioneer in the aviation sector.

The roadmap essentially consists of implementing the measures mentioned in Chapter V following the pathway to net zero shown in Figure 9. The primary focus **is therefore on CO_2 emissions from *Scope 1 (a+b)* and *Scope 2 (a)***. At the same time, Flughafen Wien AG is making continuous efforts to reduce emissions from *Scope 2 (b)* and *Scope 3 (a+b)*.

Implementation

The implementation of the roadmap is a priority for Vienna Airport: Not only are **sustainability aspects explicitly anchored in the company's statutes**, but the **net zero target** has also been anchored in the **new "Strategy 2030" as a strategic direction**. This focus on sustainability is **set and actively supported at the top management level**. The ongoing implementation of a large number of measures in the area of sustainability is **of central importance in all organisational units**. **Regular reporting at the highest management level** is ensured internally **via management team meetings and Supervisory Board meetings**. In addition, **annual reporting** is carried out in central environmental management and the roadmap will also form part of FWAG's **ESG reporting** in the future.

As already noted in the measures and paths (Chapter V), technological advances and market developments are expected in the coming years, to which management will have to respond. The **roadmap will therefore be updated regularly** to take account of these developments and ensure that the net zero target is achieved. To reach this target by 2033 (with regard to *Scope 1 (a+b)* and *Scope 2 (a)*), the focus will be on switching from fossil fuels to sustainable alternatives and converting to alternative drive technologies for FWAG vehicles and equipment. In addition, the use of CCS or natural CO_2 sinks will be necessary to bind the remaining residual emissions.

By implementing this roadmap, Vienna Airport will achieve the net zero target by 2033.

VII. Sources and links

ACI EUROPE: Net zero Webpage	https://aci-europe.org/netzero
Climate Austria	https://www.climateaustria.at/
Dialogforum Flughafen Wien	https://www.dialogforum.at/
Košice Airport	https://www.airportkosice.sk/
Malta Airport	https://www.maltairport.com/
Vienna Airport	https://www.viennaairport.com/
Annual reports of Flughafen Wien AG	https://www.viennaairport.com/en/company/investor_relations/publications_and_reports/annual_reports_1
Sustainability reports and environmental statements of Flughafen Wien AG	https://www.viennaairport.com/en/company/flughafen_wien_ag/environment__sustainability/sustainability_report

Annex 1: Certification according to ISO 14001: 2015

Bundesministerium
Klimaschutz, Umwelt,
Energie, Mobilität,
Innovation und Technologie

EMAS
Geprüftes Umweltmanagement

AT-000677

Registrierungsurkunde

Flughafen Wien Aktiengesellschaft

1300 Mannswörth

Das Unternehmen nimmt am Umweltmanagementsystem EMAS teil (Verordnung EG 1221/2009) und ist daher zur Verwendung des EMAS-Zeichens berechtigt. Das Unternehmen veröffentlicht regelmäßig eine Umwelterklärung und lässt ihr Umweltmanagementsystem von einem zugelassenen, unabhängigen Umweltgutachter überprüfen.

Gültig bis Juli 2025

Bundesministerin Leonore Gewessler, BA
Wien, im November 2022

Annex 2: EMAS certification

ZERTIFIKAT ◆ CERTIFICATE ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

TÜV SÜD Landesgesellschaft Österreich

ZERTIFIKAT

Die Zertifizierungsstelle
der TÜV SÜD Landesgesellschaft Österreich GmbH
bescheinigt, dass die Organisation

Vienna International Airport

Flughafen Wien Aktiengesellschaft
Postfach 1
A-1300 Wien-Flughafen

mit den Organisationen gemäß Anlage

für den Geltungsbereich

Betrieb eines Verkehrsflughafens
mit allen damit in Zusammenhang stehenden Einrichtungen

ein Managementsystem eingeführt hat und anwendet.
Durch ein Audit wurde der Nachweis erbracht, dass die Forderungen gemäß

ISO 14001 : 2015

erfüllt sind. Dieses Zertifikat ist gültig bis 30. Juni 2025
Zertifikat-Registrier-Nr. 01531224

Wien, 2022-06-[illegible]

Zertifizierungsstelle
der TÜV SÜD Landesgesellschaft Österreich GmbH
Franz-Grill-Straße 1 - Arsenal, Objekt 207, 1030 Vienna, Austria