Net Zero Carbon Roadmap

Foreword

The implementation of the roadmap is a priority for Cluj Avram Iancu International Airport since through our actions we emphasize the fact that we are anchored in the sustainability aspects and willing to reach the Net Zero target. This focus on environment has been supported at the top management level. The ongoing activities related to the area of sustainability is of central importance at Cluj Avram Iancu International Airport. By implementing this roadmap, Cluj Airport will achieve the Net Zero goal by 2050.

Europe Location - Gateway to Transylvania!

- One of the fastest growing regional airports in South-Central Europe
- Engine of economic growth in Romania and Transylvania region
- 3 hours flying time to most of Europe, North Africa and Middle East destinations

Airport Basic Information

Located in the center of Transylvania Region, 10 km East of Cluj-Napoca City, Romania

Modern airport infrastructure - new runway, new aprons, new passenger terminals

Over 50 routes

More than **20 countries in Europe and Middle East**

Charter flights to most popular holiday destinations

1st busiest regional airport of Romania, 2nd airport of the country after Bucharest Otopeni, by number of passengers

2.92 mil pax in 2019

0.9 mil pax in 2020

1.46 mil pax in 2021

2.64 mil pax in 2022

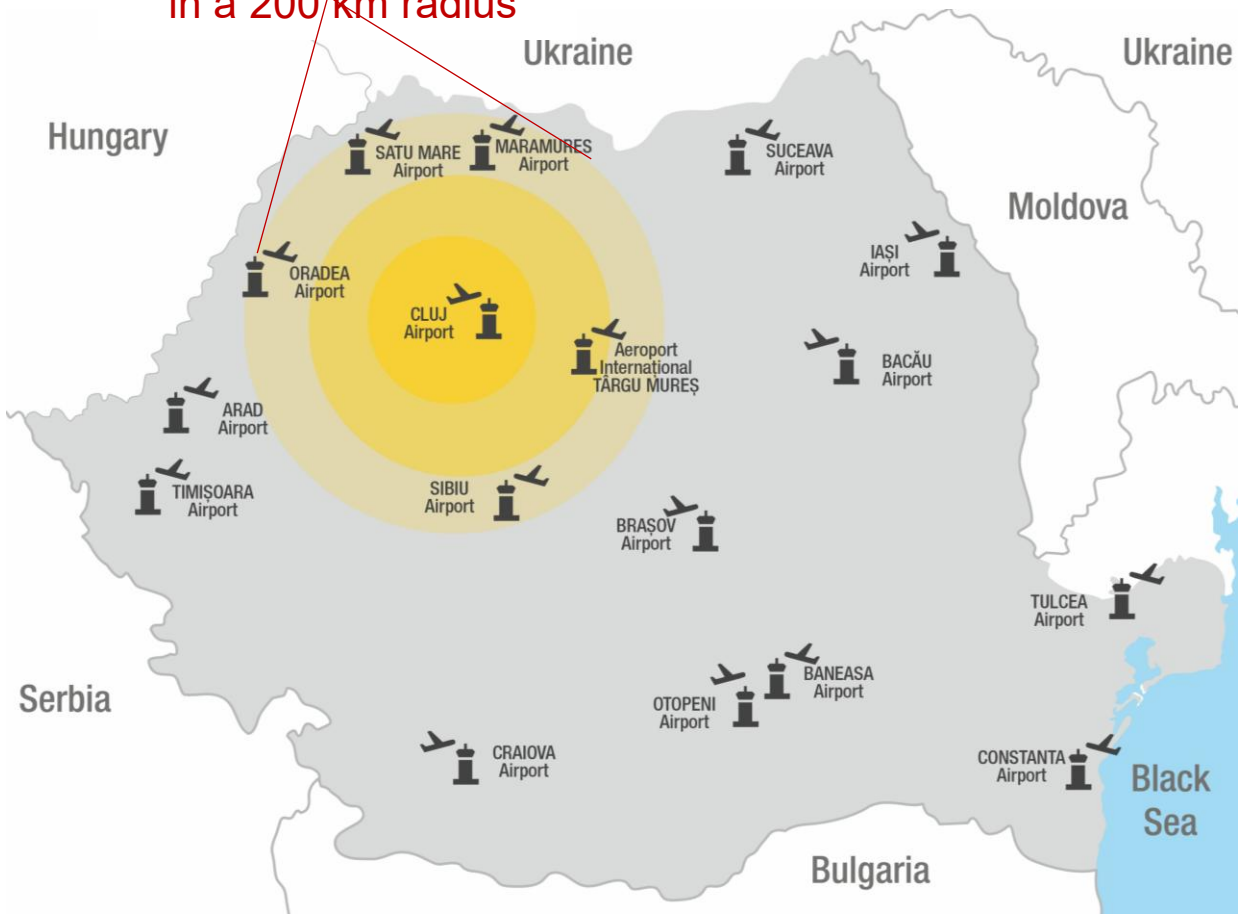
3.24 mil pax in 2023

Airport Catchment Area

- **17** Romanian airports - total number of passengers registered in 2023: **over 24,590,000**
- Expanded catchment area - more than **4 million people within 200 km** from the airport
- **1 million people** can reach the airport within **1 hour driving time** and **2.5 million people** can reach the airport **within 2 hours**
- The **main airport** in Transylvania

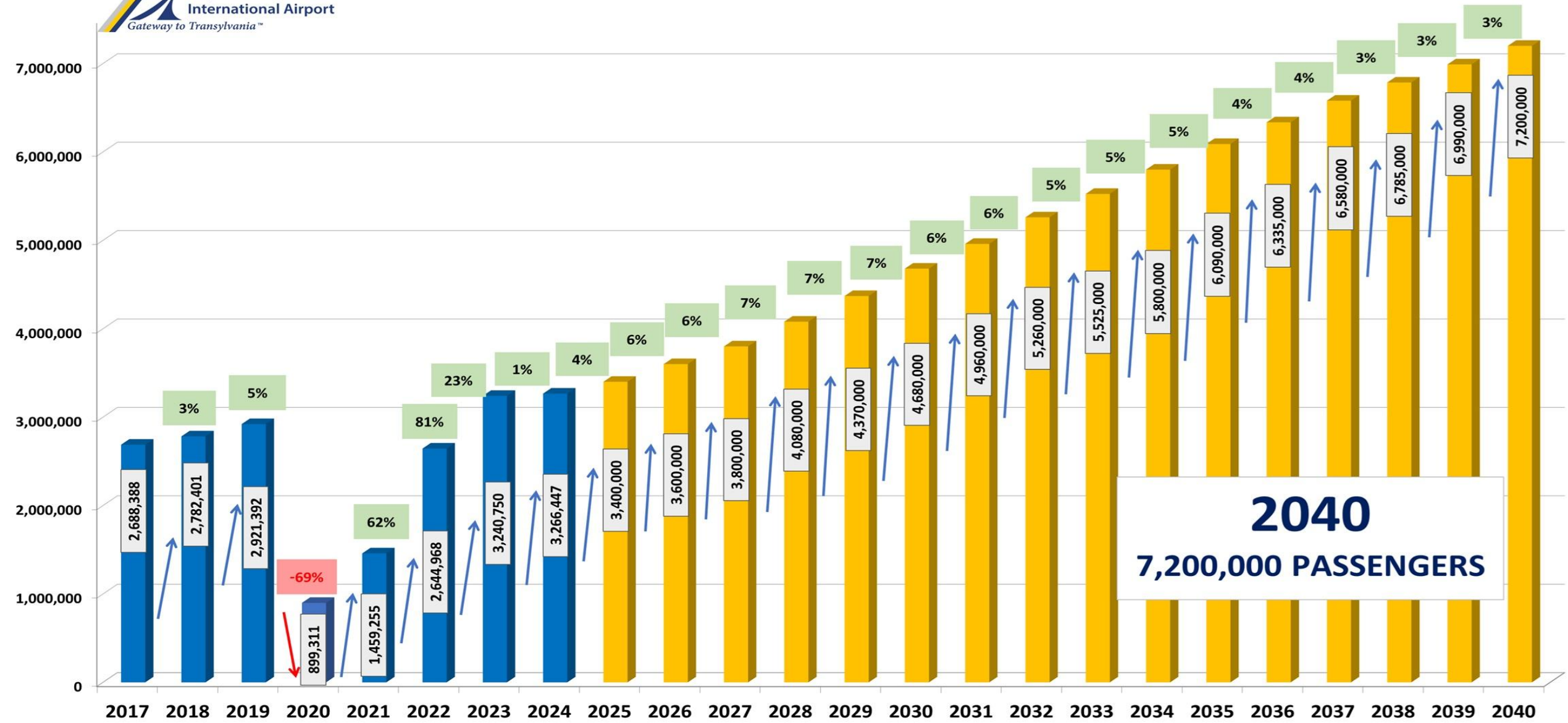
CLUJ CATCHMENT AREA

4 million inhabitants in a 200 km radius



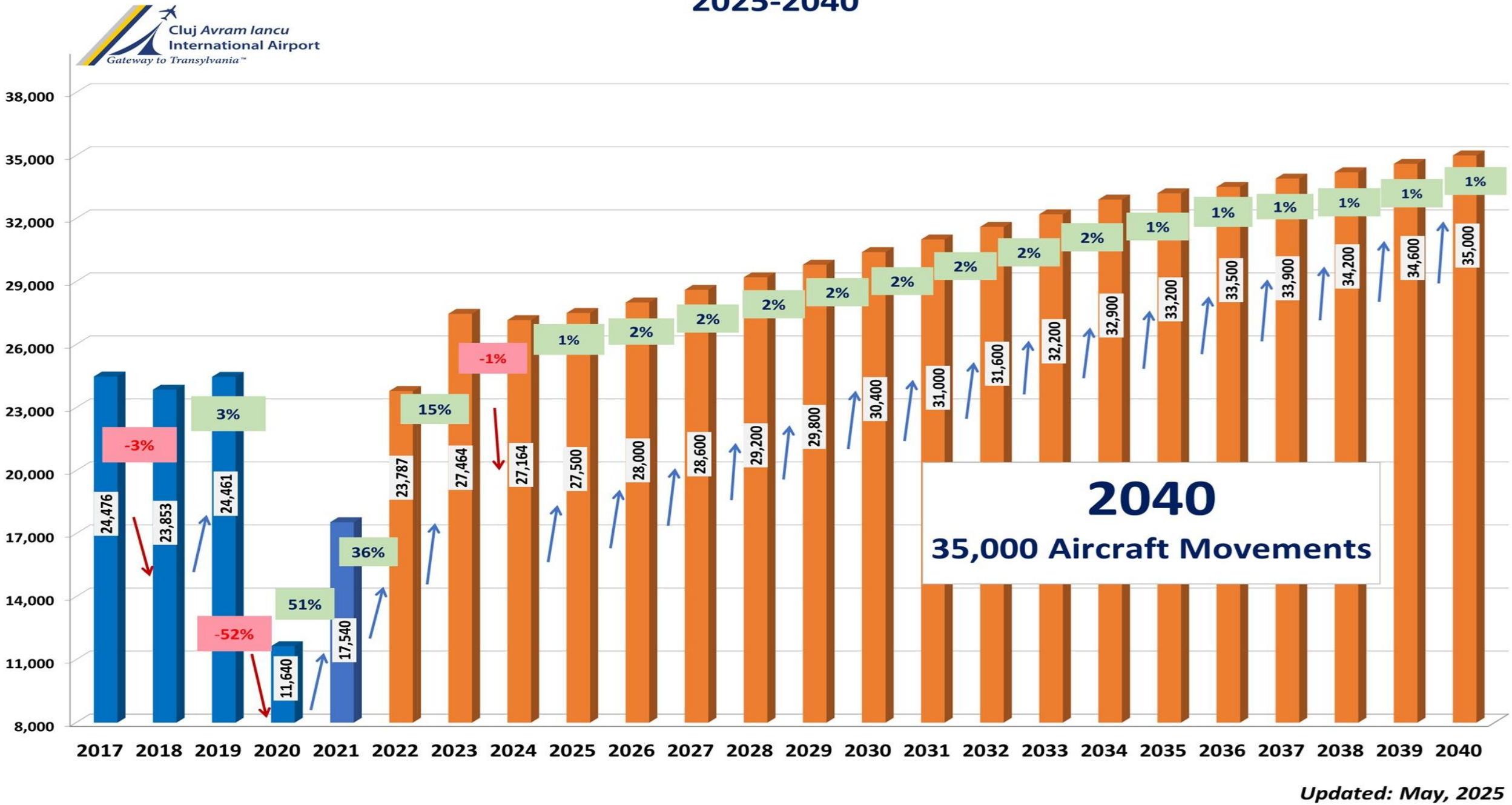
Passenger Traffic Forecast at Cluj International Airport: Base Scenario

2025-2040



Updated: May, 2025

Aircraft Movements Forecast at Cluj International Airport: Base Scenario
2025-2040



Updated: May, 2025

June 26, 2019
At the 29th Annual Congress of ACI Europe in Cyprus – Annual Meeting of European Airport Directors – Cluj Avram Iancu International Airport signed a commitment to reduce its carbon emissions by 2050.

2021
Cluj Avram Iancu International Airport obtained the Airport Carbon Accreditation certification, Level 1 - Mapping, from ACI EUROPE.

February 4, 2022
Cluj Avram Iancu International Airport signed an agreement in Brussels on February 4, 2022 - the "Toulouse Declaration" which marks a new chapter in Europe's journey towards aviation's Net Zero goal.

November 30, 2024
Cluj Avram Iancu International Airport obtained the Airport Carbon Accreditation (ACA) Level 2 recertification – CO2 reduction for carbon emissions!

December 1, 2023
Cluj Avram Iancu International Airport (CLJ) obtained the Airport Carbon Accreditation (ACA) Level 2 – CO2 Reduction certification for 2023-2024!

Cluj Airport – implemented steps

ISO 27001:2018 (2022)

ISO 14.001:2015 – Supervision 1 (2023)

ISO 9001:2015 Supervision II (2023)

ISO 9001:2015 (2023)

Cluj Airport – decarbonisation roadmap

❑ 2019
- The base year is set as the earliest possible one for which we possess data

❑ 2022
- Cluj Airport has set a Net Zero commitment until 2050.

❑ 2024
Detailed calculation of the carbon footprint for 2023 - 2019

❑ 2027
- Photovoltaic panels, including energy storage

❑ 2030
- Review all the major decarbonization measures and their forecasted impact.

❑ 2035
- Decarbonization of the car fleet - transition to vehicles without GHG emissions
- HVAC refurbishment for the main terminal

❑ 2040
- Evaluation of the HVAC refurbishment for the main terminal,
- Continuous monitoring and improvement of building operations (adjusting consumptions, building insulation)

❑ 2050
- Net zero

Cluj Avram Iancu International Airport
Gateway to Transylvania™

Implemented measures I

- C.A. Decision no. 93 of April 15, 2020, (updated by C.A. Decision no. 6.10 of 16.04.2025) regarding the approval of measures to reduce carbon emissions at Cluj Airport, which provides that starting with April 16 2020, the Handling Provider has the obligation to own handling equipment that is not older than 5 years and that must be electric.
- Replacement of the LED runway axial beacon system.
- Starting the technical documentation for the construction of a photovoltaic park that will generate energy independence.
- Using eco-friendly materials for the technical works.
- Ensuring lighting in the parking area with photovoltaic panels.
- Installation of photovoltaic panels on the roof of the Departures Terminal building, the Power Plant and the Handling Building.
- Partner in the OLGA Project (hOListic&Green Airports)
- Selective waste collection by providing containers for each type of waste.
- March 7, 2025 - Cluj International Airport uses Sustainable Aviation Fuel (SAF), supplied by OMV Petrom.

Implemented Measures II
Lighting with LED technology

1.In recent years, the airport has undertaken changes to its lighting to save electricity. Between 2017 and 2018, an extension of the departure terminal building area was carried out and LED lights were fitted. 164 LED ceiling lights were fitted.

2.The perimeter fence is illuminated with LED panels.

3.To ensure continuous guidance of aircraft at take-off, the unidirectional lights were replaced with bidirectional lights and the rest of the runway centerline lights were also replaced with new ones equipped with LED and individual control modules. The total number of RCL lights in recessed LED technology is 135.

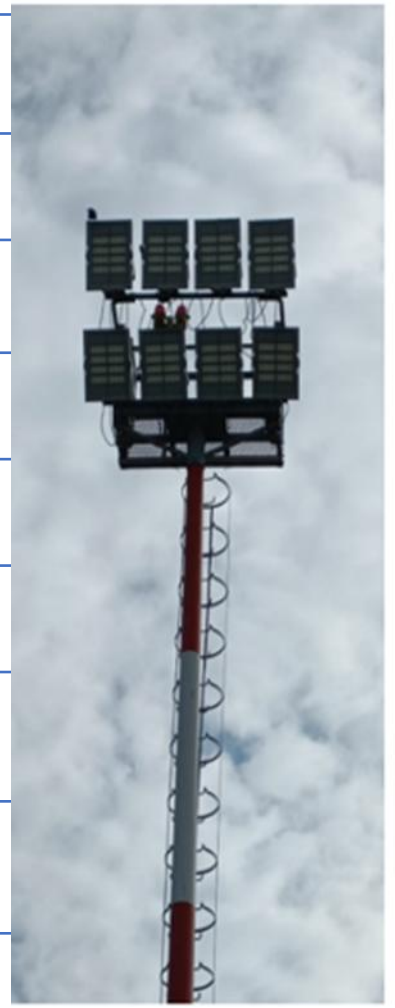
4. The terminal extension (ongoing) has all LED lighting both in the extended area and the rest of the terminal.

5.Between 2017-2018, LED lighting was implemented on the aircraft parking platform Apron 2. There are 5 poles on the Aprons with 8 LED lights each, hence a total of 40 LED lights have been replaced.

6. Replacement of the lighting in the Departures and Arrivals Terminals with LED lighting.

7. In 2022 the lighting system of the new taxiways was also changed and replaced with LED technology. This corresponds to the “Hotel” and “India” taxiways. We estimated a 55% less energy consumption for LED lights compared with halogen lights. At this time, 181 LED lights are in use on taxiway H and I.

8.Completion of the aircraft parking platform with 4 additional aircraft stationary places are now lightened with LEDs along with the LED taxiway lights.



Implemented measures III

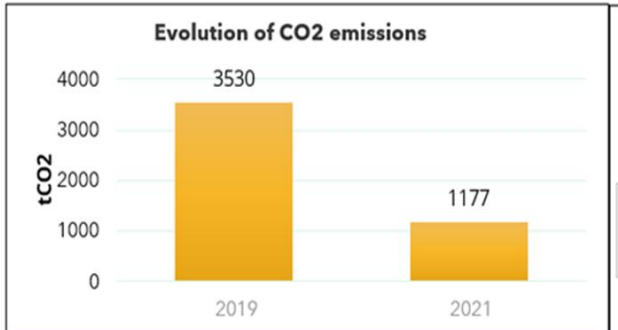
Implemented & ongoing projects

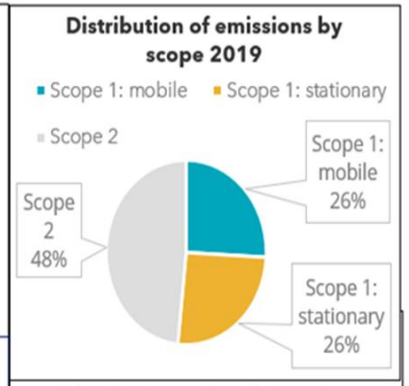
- Purchase of electric buses, aircraft de-icing equipment, electric cars, electric cars for perimeter patrol.
- Ongoing projects: Photovoltaic park, Biogas production through new EU research projects.
- Until 2050 we will change the entire ground fleet and we will introduce electric GPUs at all aircraft stationary stations.

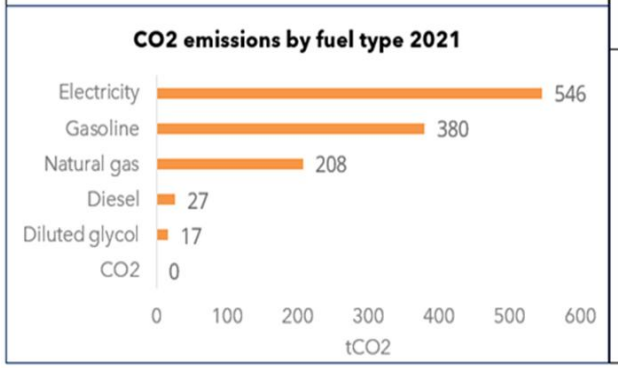
Historical carbon footprint (I)

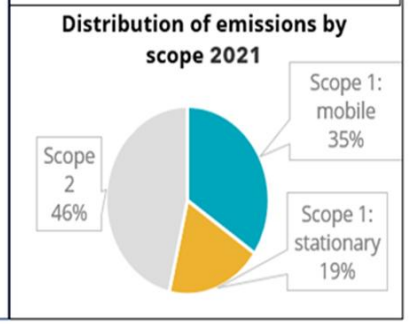
Environmental performance

The following graphs illustrate the evolution of Cluj Airport emissions by scopes, source types (mobile or stationary) or by detailed sources.









Emission reduction targets

This section provides information on the airport's carbon reduction target for Airport Carbon Accreditation level 2 and describes how these targets fit with the overall environmental policy.

Thanks to carbon reduction actions implemented before 2021 **(see section 5)**, according to the Location-Based approach, Cluj Airport was able to reduce in 2021 compared to 2019:

- 67% of the absolute scope 1 & 2 CO_2 emissions
- 33% of the scope 1 & 2 CO_2 emissions per passenger
- 52% of the scope 1 & 2 CO_2 emissions per movement
- 36% of the scope 1 & 2 CO_2 emissions per traffic unit

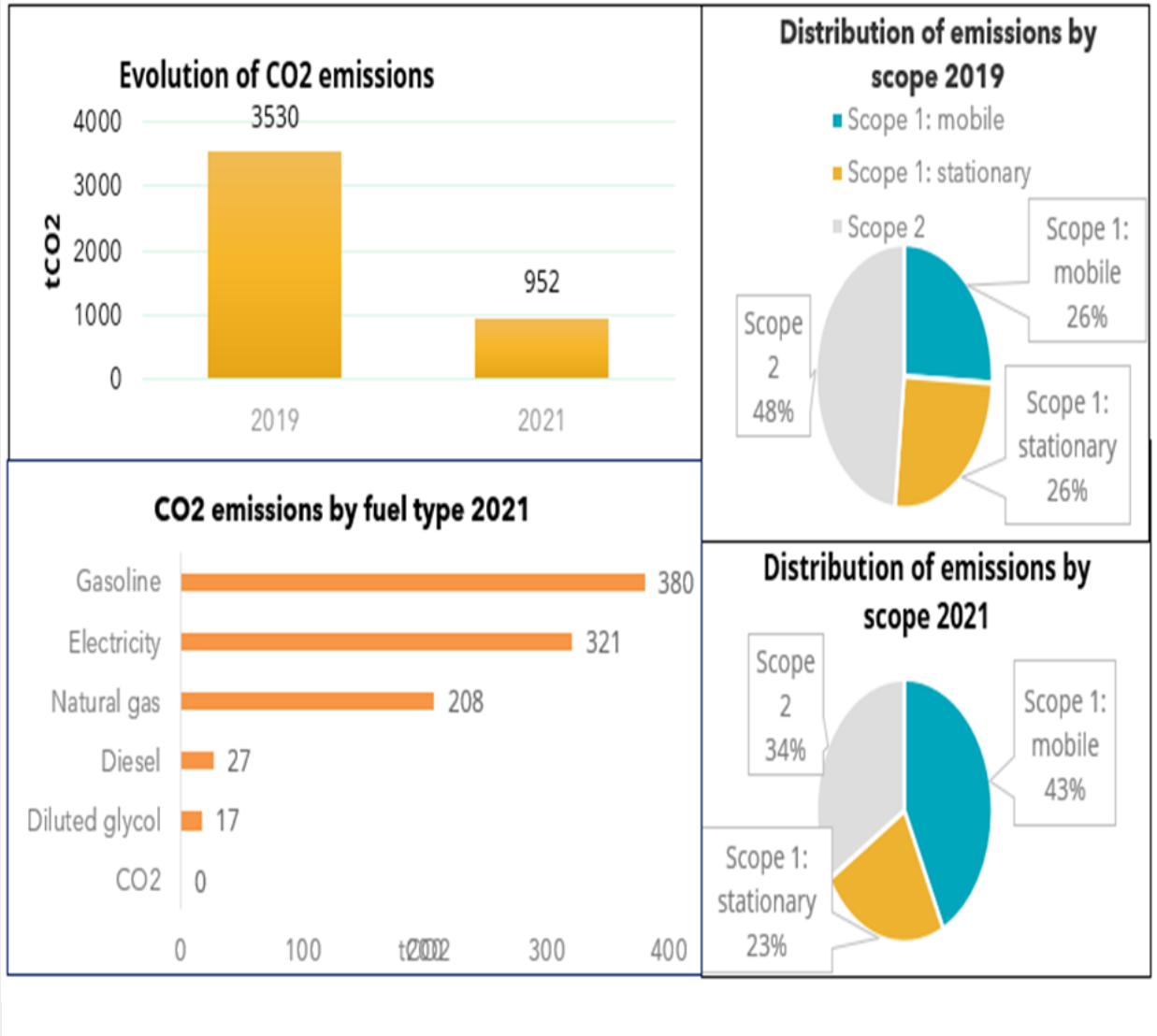
And according to the Market-Based approach, Cluj Airport was able to reduce in 2021 compared to 2019:

- 73% of the absolute scope 1 & 2 CO_2 emissions
- 46% of the scope 1 & 2 CO_2 emissions per passenger
- 61% of the scope 1 & 2 CO_2 emissions per movement
- 36% of the scope 1 & 2 CO_2 emissions per traffic unit

Historical carbon footprint (II)

Carbon reduction target: Cluj International Airport aims to reach net zero carbon by 2050 based on scope 1 & 2 emissions. This objective is prior to the ACA level 2 engagement in the airport environmental policy.

Cluj Airport intends to pursue in the ACA program and reach each level towards net zero carbon emissions by implementing a list of carbon reduction projects.



Cluj Airport, involved in the process of achieving ACA III

Implemented measures for ACA III @CLJ Airport	• CLJ obtained Airport Carbon Accreditation for Level I and II. • Awareness and behavioural change campaigns to increase the visibility of energy efficiency and low-carbon practices throughout the airport community. • Formal airport-wide schemes to encourage and facilitate the adoption of specific personal or operational practices or the choice of equipment or vehicles. • Working with key business partners to ensure they understand the airport's policy, goals and objectives and can support implementation. • Working with airport planners and third parties to ensure that an airport's infrastructure plans reflect and implement the airport's carbon emission reduction targets and can facilitate the reduction of emissions from major third parties. • Working with airlines to reduce the use of auxiliary power units (APUs) and taxi times would be a relevant example. • Setting minimum performance standards, for example: for the renovation of buildings/commercial units, operational practices and vehicle fleets. • Integrating carbon/energy considerations into existing contract/lease conditions with third parties and/or incorporating performance and implementation checks into airport audit processes. • Forming strategic partnerships with key airport operators, including airlines or contractors, to collaborate on projects and investment opportunities, for example in relation to sustainable aviation fuels (SAF).

Sustainable airport roadmap until 2050 – focus areas and measures

Focus areas	Measures
	PROJECTS AND ACTIVITIES THAT SUPPORT THIS PATHWAY
Zero emissions at Cluj Avram Iancu International Airport by 2050.	**1.Renewable Energies:** photovoltaic power plant.
	2.Clean transportation and infrastructure for low carbon transport - the airport imposes the obligation on the providers of handling services, to have electrical equipment, no more than 5 years old.
Cluj *Avram Iancu* International Airport has been among the first airports to embrace Net Zero 2050 resolution.	**3.Noise & emissions** – tracking data to diminish their impact & improve the quality of life around the airport.
	4.Optimise energy efficiency - replacing the old lightning system from the Departures Terminal with LEDs.
	5.Transport fueled with biomethane - connecting the airport with the city during nightime (the bus is fueled with biomethan resulted from fresh waste), "EU-funded research & innovation project".
Waste reduction of 15% (per pax) by 2050.	**6.Other initiatives** - making SAF available at the airport, starting with 2025.

Risks & Opportunities in reaching Net Zero by 2050

Risks

1. Human factor
2. Stakeholders
3. Less European projects
4. Government/Regulatory Authorities
5. Delay in certification and approval of new technologies/solutions
6. Technology limitations
7. Implementation challenges

Opportunities

1. Increase percentage of sustainable journeys to and from the airport
2. Minimise the environmental impact
3. Net Zero carbon operations at the airport
4. Implementing the Sustainable Aviation Fuel
5. Airport connectivity
6. Renewable Energy to make the airport self-sufficient
7. Energy efficient equipment

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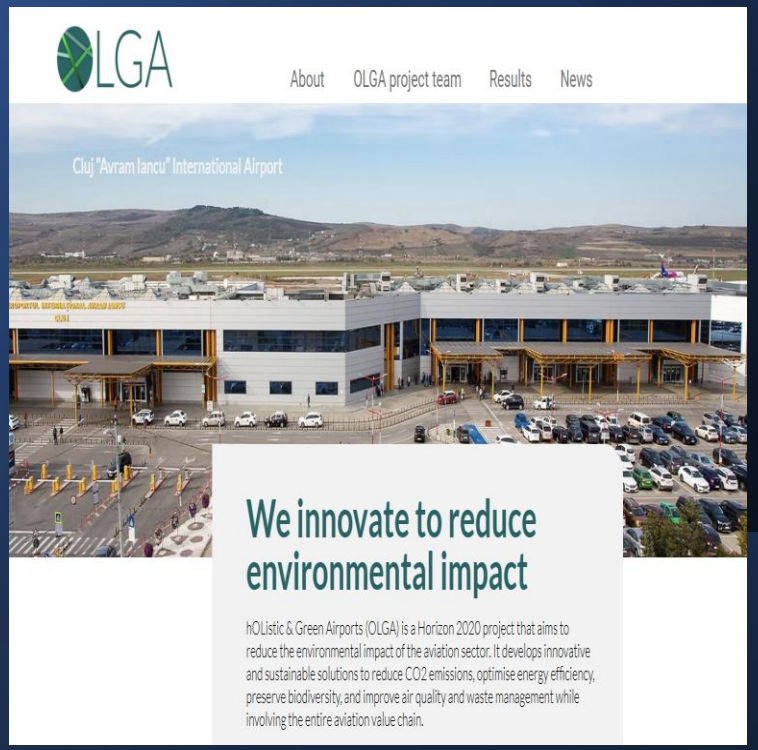


We innovate to reduce environmental impact

Horizon 2020

OLGA PROJECT - OBJECTIVES

1.Reduce the environmental impact of the aviation sector

2.Reduce CO2 emissions

3.Optimise energy efficiency

4.Improve air quality and waste management

OLGA PROJECT - KEY DEVELOPERS

Paris Charles de Gaulle (France) – lighthouse airport

Fellow airports:

- Cluj *Avram Iancu* International Airport (Romania),
- Milano Malpensa Airport (Italy),
- Zagreb Airport (Croatia).

OLGA PROJECT - MAIN GOAL

hOListic & Green Airports (OLGA) aims to reduce the environmental impact of the aviation sector. It develops innovative and sustainable solutions to reduce CO2 emissions, optimise energy efficiency, preserve biodiversity, and improve air quality and waste management.

This set of innovations is developed by Paris Charles de Gaulle in France as lighthouse airport and Milano Malpensa in Italy, Zagreb in Croatia and Cluj *Avram Iancu* International Airport in Romania as fellow airports. The participation of Air France, the French national airline, must also be noted, especially for the demonstration of the decarbonisation solutions.

CLUJ AIRPORT - INVOLVED IN :

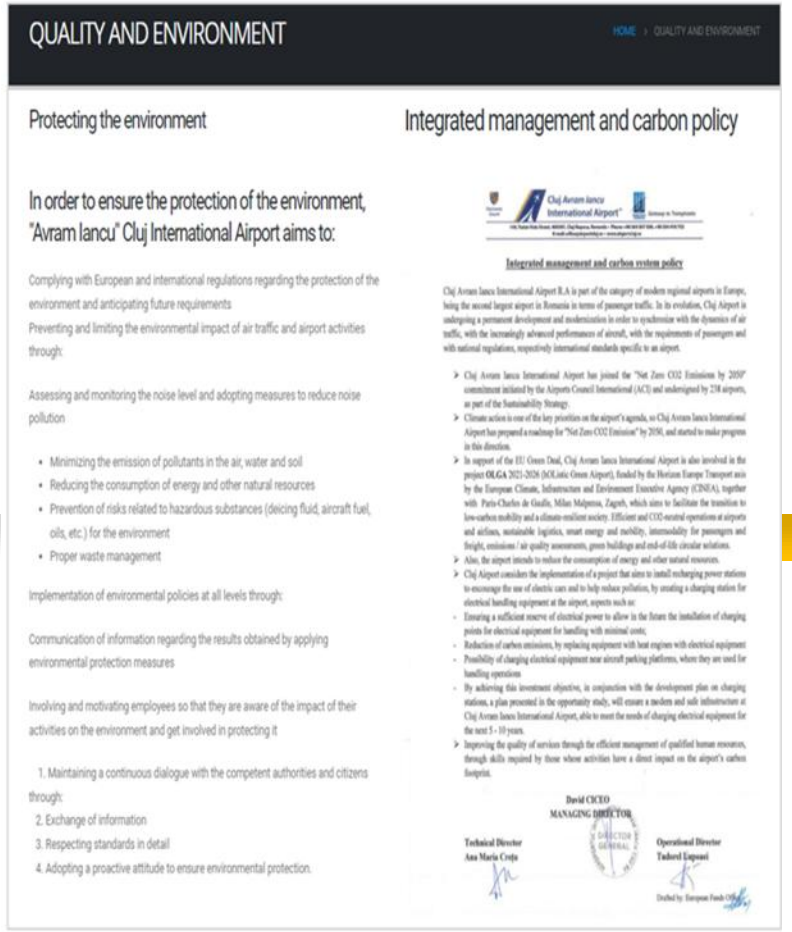
WP.5 Waste valorisation towards biofuels - Considering the nature of the available wastes at both the municipality and the airport, the generation of biomethane from wet wastes (anaerobic digestion process). Connecting the airport with the city during night time (the bus is fueled with biomethane resulted from fresh waste).

WP.4 Terminal Area - Replacing the old lighting system with LEDs, which will improve the energy efficiency and the travel experience of our passengers.

WP. 6 Cross-cutting aspects - Air quality and noise monitoring around the airport, to improve the quality of life for the people who live near the airport.

OUR COMMITMENT

- Cluj *Avram Iancu* International Airport - a regional airport - is committed **to scaling up existing innovation** and focus on **decarbonisation.**
- Engaging with EU partners in **low carbon innovation projects** is an ongoing activity.
- Participation in the Clean Aviation European Partnership.
- One important goal: to achieve **the ACI Zero carbon emissions until 2050;**
- Working together with the European partners & airports, involving knowledge transfer & identifying existing solutions to be tested and implemented.
- Obtaining ACA Level III in 2025.
- Gradually, obtaining the other ACA levels.


QUALITY AND ENVIRONMENT

Protecting the environment

Integrated management and carbon policy

In order to ensure the protection of the environment, "Avram Iancu" Cluj International Airport aims to:

Complying with European and international regulations regarding the protection of the environment and anticipating future requirements

Preventing and limiting the environmental impact of air traffic and airport activities through:

Assessing and monitoring the noise level and adopting measures to reduce noise pollution

- Minimizing the emission of pollutants in the air, water and soil
- Reducing the consumption of energy and other natural resources
- Prevention of risks related to hazardous substances (deicing fluid, aircraft fuel, oils, etc.) for the environment
- Proper waste management

Implementation of environmental policies at all levels through:

Communication of information regarding the results obtained by applying environmental protection measures

Involving and motivating employees so that they are aware of the impact of their activities on the environment and get involved in protecting it

1. Maintaining a continuous dialogue with the competent authorities and citizens through:
2. Exchange of information
3. Respecting standards in detail
4. Adopting a proactive attitude to ensure environmental protection.

Integrated management and carbon system policy

Policy commitment to emissions reduction on the CLJ airport website