PRB | Performance review body of the single european sky

Performance Review Body Monitoring Report

Romania - 2023

This report is automatically generated from: sesperformance.eu

Performance Review Body of the Single European Sky | Rue de la Fusée 96, Office 50.659, 1130 Brussels
Office Telephone: +32 (0)2 234 7824 | cathy.mannion@prb.eusinglesky.eu | prb-office@prb.eusinglesky.eu | eu-single-sky.transport.ec.europa.eu

TABLE OF CONTENTS

1 OVERVIEW 3
- *1.1 Contextual information* 3
- *1.2 Traffic (En route traffic zone)* 3
- *1.3 Safety (Main ANSP)* 4
- *1.4 Environment (Member State)* 4
- *1.5 Capacity (Member State)* 5
- *1.6 Cost-efficiency (En route/Terminal charging zone(s))* 6

2 SAFETY - ROMANIA 7
- *2.1 PRB monitoring* 7
- *2.2 Effectiveness of Safety Management (EoSM) (KPI#1)* 7
- *2.3 Occurrences - Rate of runway incursions (RIs) (PI#1) & Rate of separation minima infringements (SMIs) (PI#2)* 8

3 ENVIRONMENT - ROMANIA 8
- *3.1 PRB monitoring* 8
- *3.2 En route performance* 8
- *3.3 Terminal performance* 9
- *3.4 Civil-Military dimension* 11

4 CAPACITY - ROMANIA 12
- *4.1 PRB monitoring* 12
- *4.2 En route performance* 13
- *4.3 Terminal performance* 16

5 COST-EFFIENCY - ROMANIA 18
- *5.1 PRB monitoring* 18
- *5.2 En route charging zone* 18
- *5.3 Terminal charging zone* 21

1 OVERVIEW

1.1 Contextual information

National performance plan adopted following Commission Decision (EU) 2022/2424 of 5 December 2022

List of ACCs 1
Bucharest ACC

No of airports in the scope of the performance plan:
- **≥80'K** 1
- **<80'K** 1

Exchange rate (1 EUR=)
2017: 4.56629 RON
2023: 4.94375 RON

Share of Union-wide:
- **traffic (TSUs) 2023** 4.8%
- **en route costs 2023** 3.3%

Share en route / terminal costs 2023 91% / 9%

En route charging zone(s)
Romania

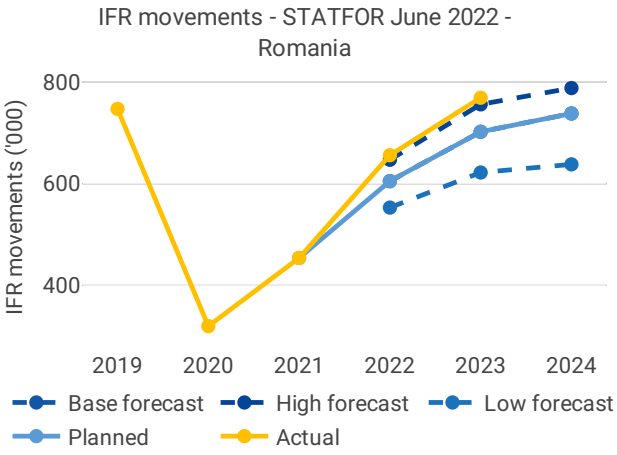
Terminal charging zone(s)
Romania

Main ANSP
- ROMATSA

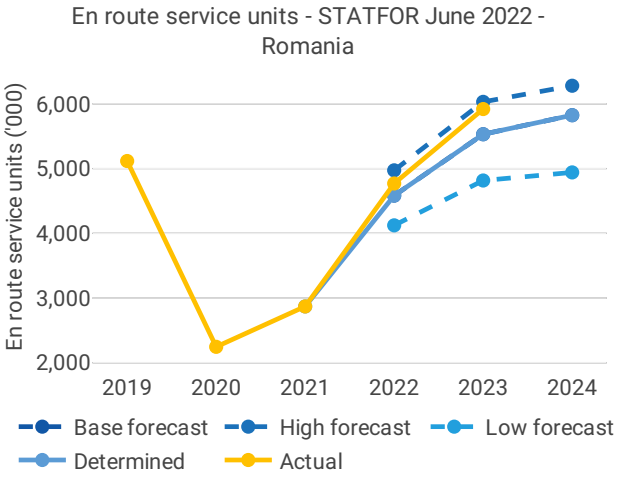
Other ANSPs
–

MET Providers
–

1.2 Traffic (En route traffic zone)

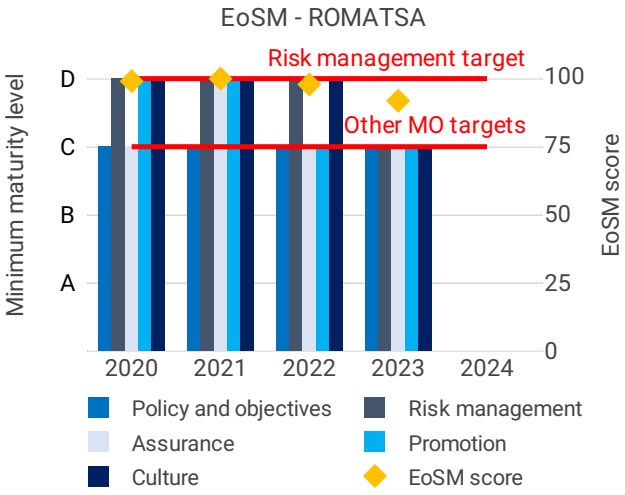


- Romania recorded 769K actual IFR movements in 2023, +17% compared to 2022 (656K).
- Actual 2023 IFR movements were +9.5% above the plan (702K).
- Actual 2023 IFR movements are +3% above the actual 2019 level (747K).



- Romania recorded 5,920K actual en route service units in 2023, +24% compared to 2022 (4,770K).
- Actual 2023 service units were +7% below the plan (5,531K).
- Actual 2023 service units are +16% above the actual 2019 level (5,117K).

1.3 Safety (Main ANSP)

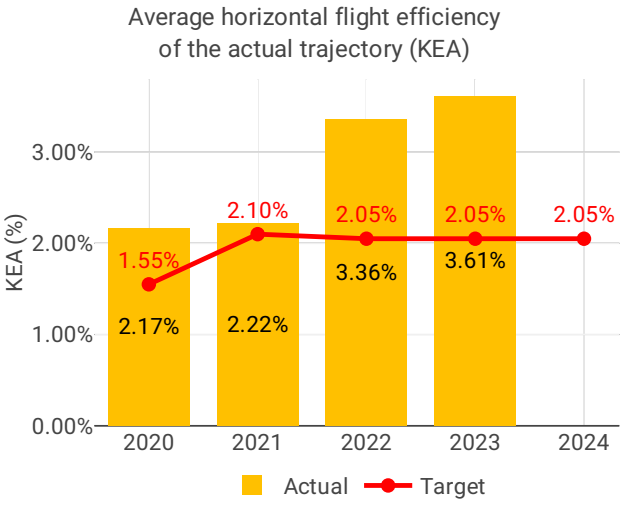


• ROMATSA reached the RP3 target maturity levels in 2021. Between 2022 and 2023, the achieved maturity level decreased in safety culture and safety risk management from level D to level C, but ROMATSA remain at the planned maturity levels defined in their Performance Plan for 2023. ROMATSA had in the Performance Plan planned reach RP3 target maturity levels only in 2024, improving safety risk management in 2024 to level D. ROMATSA, together with the NSA, developed a safety strategy including various measures to monitor the implementation and efficiency of safety actions to ensure high safety performance.

• Romania recorded stable performance with respect to safety occurrences, with no runway incursions and a decrease in the rate of separation minima infringements relative to 2022. The NSA regularly monitors the safety occurrences and perform specialized analysis on daily, quarterly, and yearly basis.

• ROMATSA do not use automated safety data recording systems.

1.4 Environment (Member State)



• Romania achieved a KEA performance of 3.61% compared to its target of 2.05% and did not contribute positively towards achieving the Union-wide target.

• The NSA states that reasons for deterioration include neighbouring airspace unavailability due to conflict zones, being upstream or downstream of ATM network inefficiencies, and airspace users' preferences.

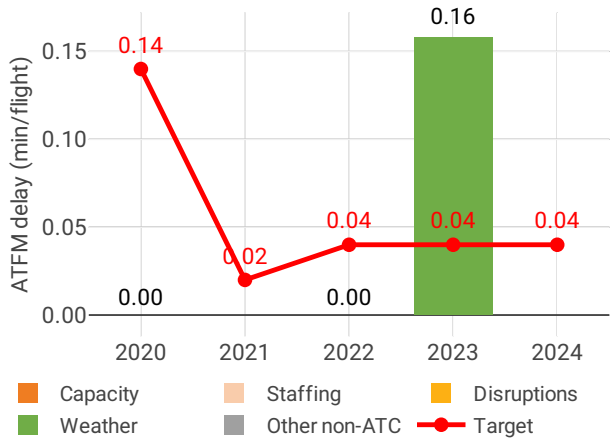
• KEP and SCR worsened compared to 2022.

• The share of CDO flights increased marginally from 40.63% to 40.70% in 2023.

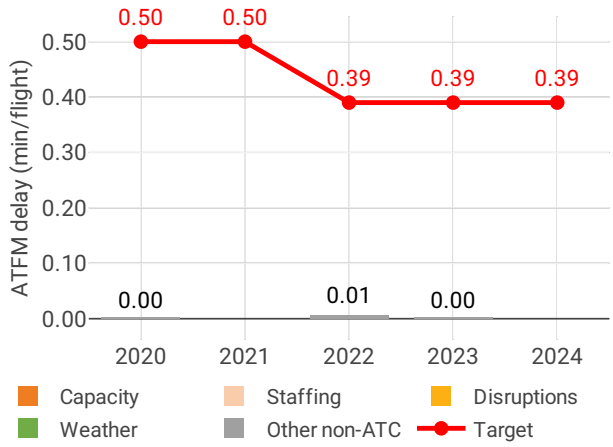
• During 2023, additional time in terminal airspace increased from 0.58 to 0.63 min/flight, while additional taxi out time increased from 2.08 to 2.17 min/flight.

1.5 Capacity (Member State)

Average en route ATFM delay per flight by delay groups



Average arrival ATFM delay per flight by delay groups



• Romania registered 0.20 minutes of average en route ATFM delay per flight during 2023 which has been adjusted to 0.16 during the post-ops adjustment process, thus not achieving the local target value of 0.04. Delays in Romania increased by 0.16 minutes per flight year-on-year.

• Delays accumulated between May and September, due to adverse weather conditions.

• The share of delayed flights with delays longer than 15 minutes in Romania increased by 43 p.p. compared to 2022 and was higher than 2019 values.

• The average number of IFR movements was 3% above 2019 levels in Romania in 2023.

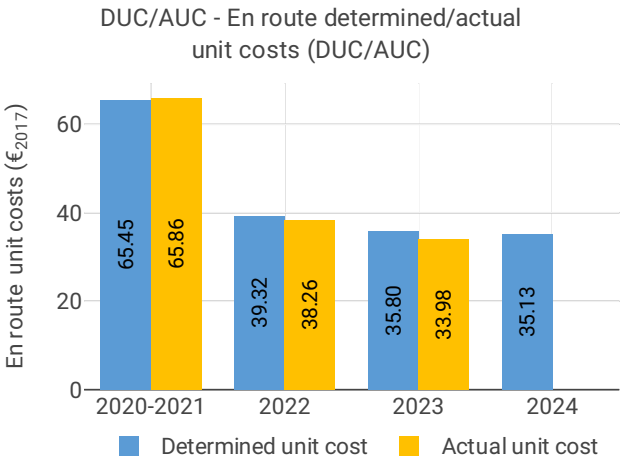
• The number of ATCOs in OPS is expected to increase by 12% by 2024, with the actual value being below the 2023 plan in Bucharest by 3 FTEs.

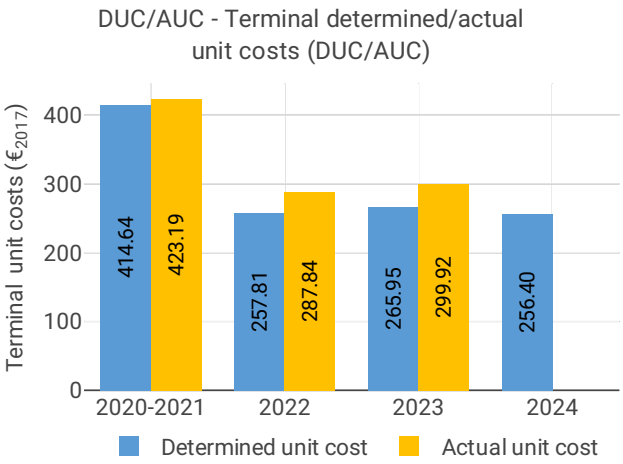
• The yearly total of sector opening hours in Bucharest ACC was 69,428, showing a 1.2% increase compared to 2022. Sector opening hours are 1.2% above 2019 levels.

• Bucharest ACC registered 10.94 IFR movements per one sector opening hour in 2023, being 2.0% above 2019 levels.

• Romania was badly affected by adverse weather in 2023, resulting in unusually high levels of en route ATFM delay. As the uncertainty of weather impact is likely to increase, Romania should work closely with the NM and all concerned stakeholders to mitigate weather impact as much as possible.

1.6 Cost-efficiency (En route/Terminal charging zone(s))





• The en route 2023 actual unit cost of Romania was 33.98 €2017, -5.1% lower than the determined unit cost (35.80 €2017). The terminal 2023 actual unit cost was 299.92 €2017, +13% higher than the determined unit cost (265.95 €2017).

• The en route 2023 actual service units (5.9M) were +7.0% higher than the determined service units (5.5M).

• The en route 2023 actual total costs were +3.2 M€2017 (+1.6%) higher than determined. The primary factor driving the difference in total costs was an overspend in staff costs (+7.8 M€2017, or +5.3%), largely due to wage compensations awarded for higher than planned traffic and achieving the capacity target. The gap in staff costs was partially mitigated by an underspend in other operating costs (-4.0 M€2017, or -13%). The difference in other operating costs was mainly attributed to lower energy expenses and delays in both the training program and the contracting processes with third-party service providers.

• ROMATSA spent 19 M€2017 in 2023 related to costs of investments for both en route and terminal charging zones, -3.1% less than determined (20 M€2017), mainly due to delays in new investment projects.

• The en route actual unit cost incurred by users in 2023 was 44.07€ (+5.9% above the 2023 DUC), while the terminal actual unit cost incurred by users was 351.53€ (+12% above the 2023 DUC).

2 SAFETY - ROMANIA

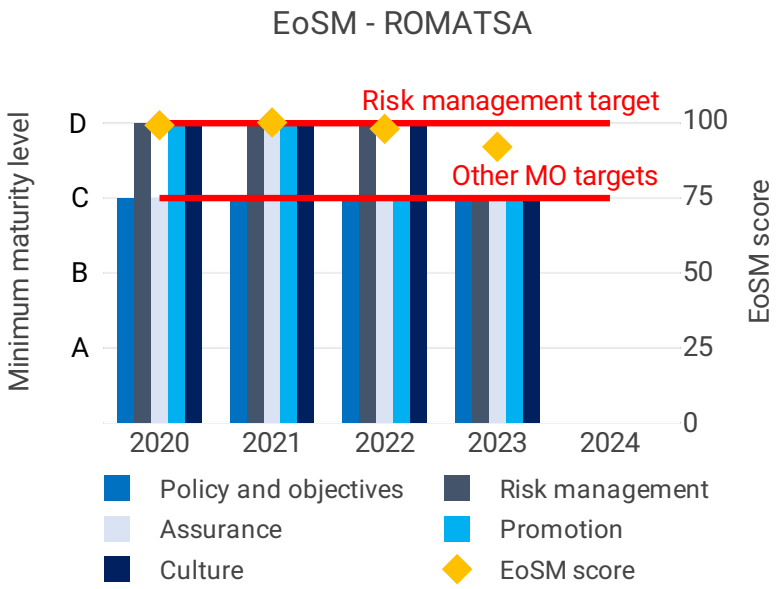
2.1 PRB monitoring

• ROMATSA reached the RP3 target maturity levels in 2021. Between 2022 and 2023, the achieved maturity level decreased in safety culture and safety risk management from level D to level C, but ROMATSA remain at the planned maturity levels defined in their Performance Plan for 2023. ROMATSA had in the Performance Plan planned reach RP3 target maturity levels only in 2024, improving safety risk management in 2024 to level D. ROMATSA, together with the NSA, developed a safety strategy including various measures to monitor the implementation and efficiency of safety actions to ensure high safety performance.

• Romania recorded stable performance with respect to safety occurrences, with no runway incursions and a decrease in the rate of separation minima infringements relative to 2022. The NSA regularly monitors the safety occurrences and perform specialized analysis on daily, quarterly, and yearly basis.

• ROMATSA do not use automated safety data recording systems.

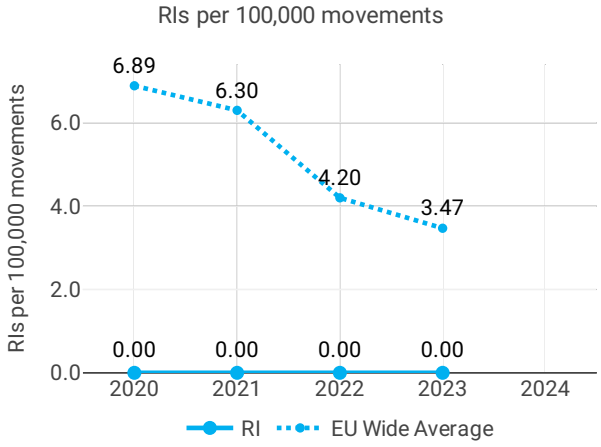
2.2 Effectiveness of Safety Management (EoSM) (KPI#1)

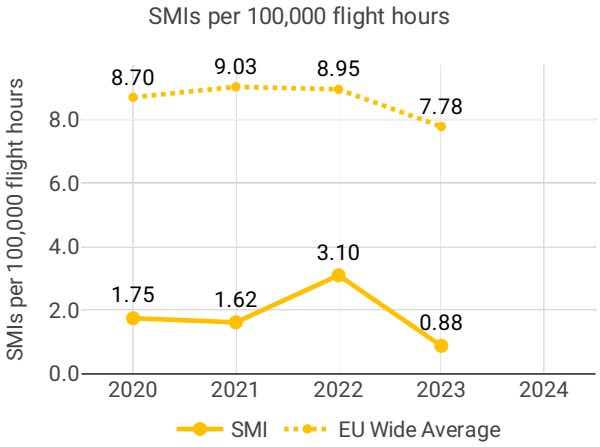


Focus on EoSM

Four out of five EoSM components of the ANSP meet the RP3 target level. Over 2023, the component "Safety Risk Management" was degraded and is below 2024 target level. Improvement for a single question in "Safety Risk Management" is expected during RP3 to achieve RP3 targets.

2.3 Occurrences - Rate of runway incursions (RIs) (PI#1) & Rate of separation minima infringements (SMIs) (PI#2)





3 ENVIRONMENT - ROMANIA

3.1 PRB monitoring

• Romania achieved a KEA performance of 3.61% compared to its target of 2.05% and did not contribute positively towards achieving the Union-wide target.

• The NSA states that reasons for deterioration include neighbouring airspace unavailability due to conflict zones, being upstream or downstream of ATM network inefficiencies, and airspace users' preferences.

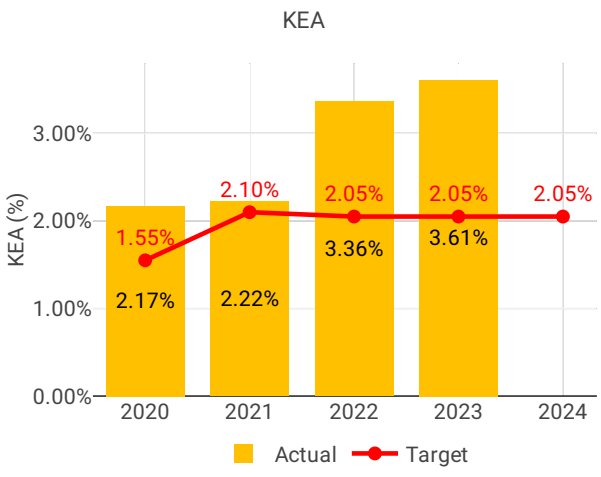
• KEP and SCR worsened compared to 2022.

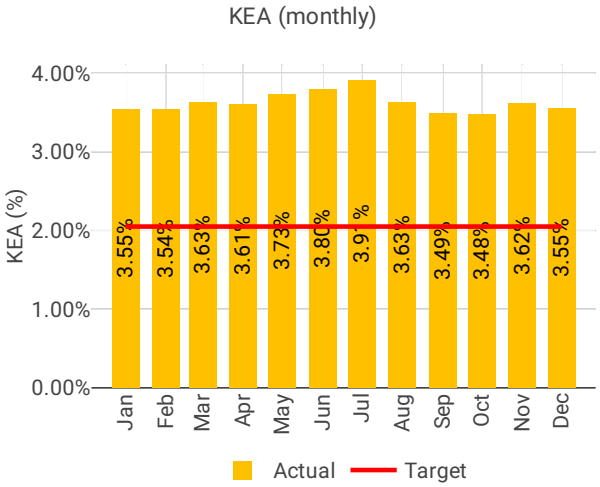
• The share of CDO flights increased marginally from 40.63% to 40.70% in 2023.

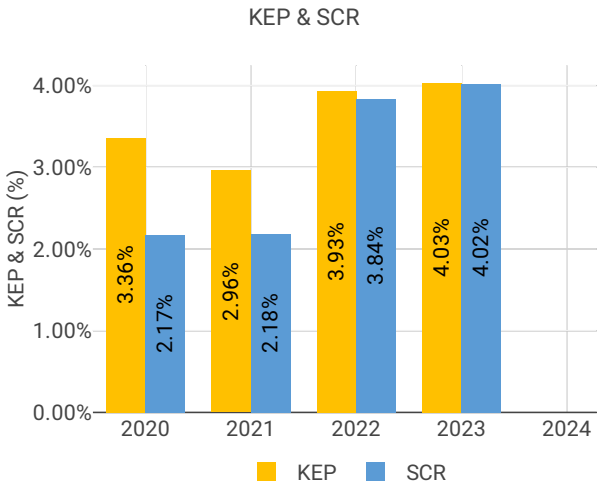
• During 2023, additional time in terminal airspace increased from 0.58 to 0.63 min/flight, while additional taxi out time increased from 2.08 to 2.17 min/flight.

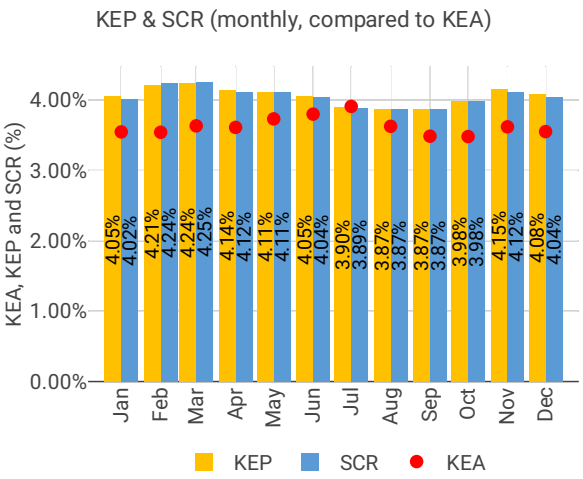
3.2 En route performance

3.2.1 Horizontal flight efficiency of the actual trajectory (KEA) (KPI#1), of the last filed flight plan (KEP) (PI#1) & shortest constrained route (SCR) (PI#2)



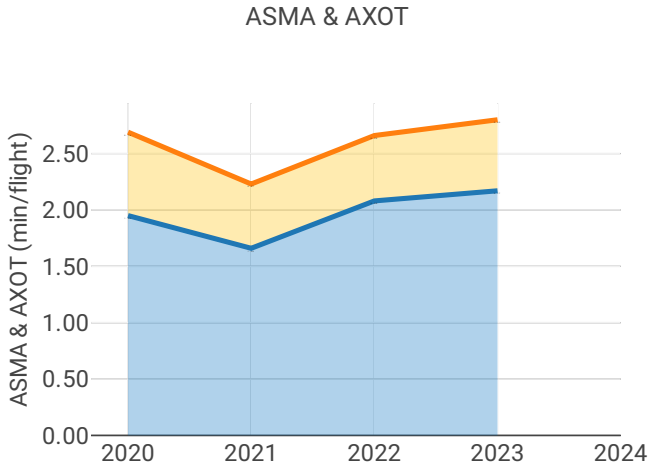


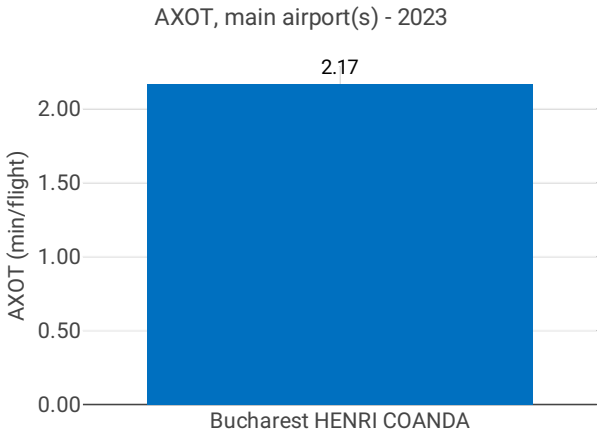


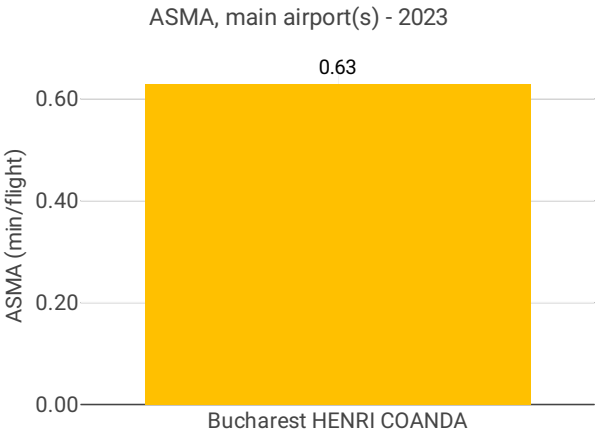


3.3 Terminal performance

3.3.1 Additional taxi-out time (AXOT) (PI#3) & Arrival Sequencing and Metering Area (ASMA) time (PI#4)







Focus on ASMA & AXOT

AXOT

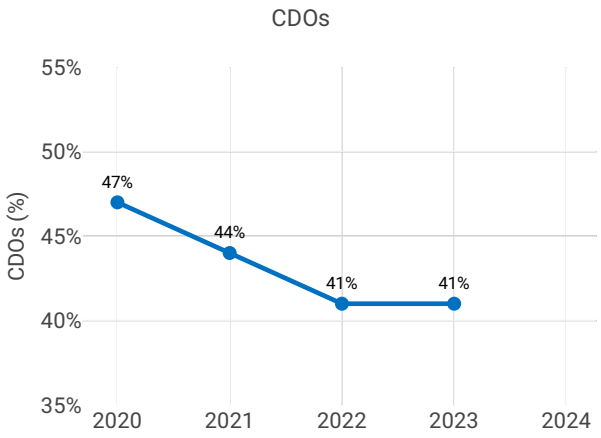
Additional taxi-out times at Bucharest/Otopeni (LROP; 2019: 2.67 min/dep.; 2020: 1.95 min/dep.; 2021: 1.66 min/dep.; 2022: 2.08 min/dep.; 2023: 2.17 min/dep.) increased in 2023, but was still below the SES average of 2.81 min/dep.
In the Romanian monitoring report, ROMATSA mentions the same measures or initiatives as the last two years, although no dates are provided:

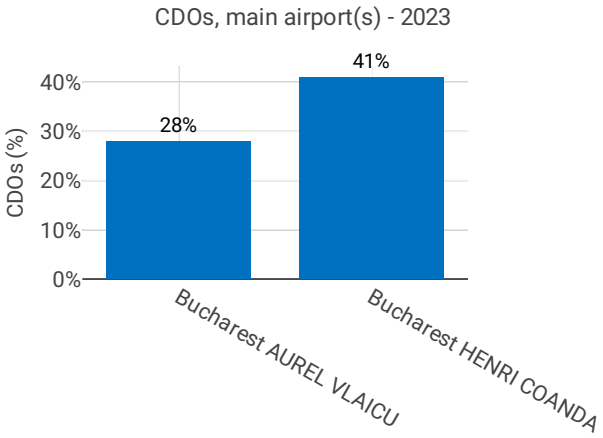
a) Implemented:
- clearance delivery position;
- ASMGCS at Otopeni TWR - advanced surface management ground control system;
- Common procedure between Bucharest Airports National Company and TWR Otopeni for repairing works periods on the manoeuvering area, ie pre-established alternative standard taxi routes;
- Common procedure regarding ATFM (according to EU Reg 255/2010) regarding the regulation of traffic in situations that may influence the airport's capacity.
b) Planned:
- Modernisation ASMGCS - Implementation of Advanced Tower Messaging - upgrading the local ATC system at Otopeni TWR to provide departure planning information (expected to be fully implemented in Q2 2024);
- AMAN at Bucuresti TMA - Arrival Manager (ongoing, contract signed with the ATM system provider for the implementation in the ATM 2015+ System of the Arrival Manager Module (AMAN) for Bucuresti TMA).
NSA: specific monitoring of data on EUROCONTROL portal and oversight activities

ASMA

Additional ASMA times at Bucharest/Otopeni (LROP; 2019: 0.75 min/arr.; 2020: 0.74 min/arr.; 2021: 0.57 min/arr.; 2022: 0.58 min/arr.; 2023: 0.63 min/arr.) increased in 2023, but was still well below the SES average of 1.16 min/dep.
In the Romanian monitoring report, ROMATSA mentiones the following measures or initiatives:
a) Implemented:
- SID / STAR RNAV 1;
- as current practice, vectorizations for shortening the trajectories when the traffic is of low complexity (DIRECT TO);
- Bucharest TMA resectorisation - implementation of new sector: DIRECTOR.
b) Planned:
- implementation of AMAN - Arrival Manager (ongoing, contract signed with the ATM system provider for the implementation in the ATM 2015+ System of the Arrival Manager Module (AMAN) for Bucuresti TMA);
- implementation of RNP (required navigation performance) approach procedures.
NSA: specific monitoring of data on EUROCONTROL portal and oversight activities

3.3.2 Share of arrivals applying continuous descent operations (CDOs) (PI#5)





Focus CDOs

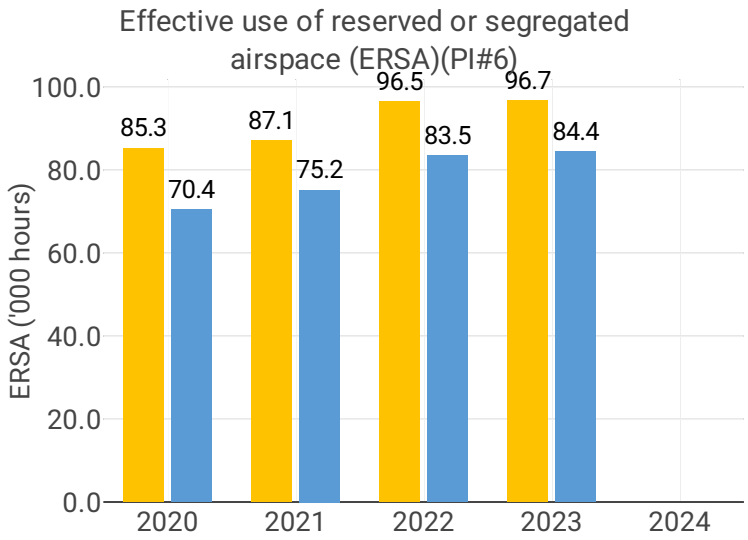
Bucharest/Otopeni (LROP), being the major airport in Romania, has the highest share of CDO flights: 41.1% which is well above the overall RP3 value in 2023 (28.8%).
The share of CDO flights at Bucharest AUREL VLAICU (LRBS) decreased to 27.7%, being slightly below the overall RP3 value in 2023 of 28.8%.
According to the Romanian monitoring report:*ROMATSA: Resumption of AIP Romania amendment process, chap. 2.21 Noise abatement procedures with the following specific provisions for aircraft operating

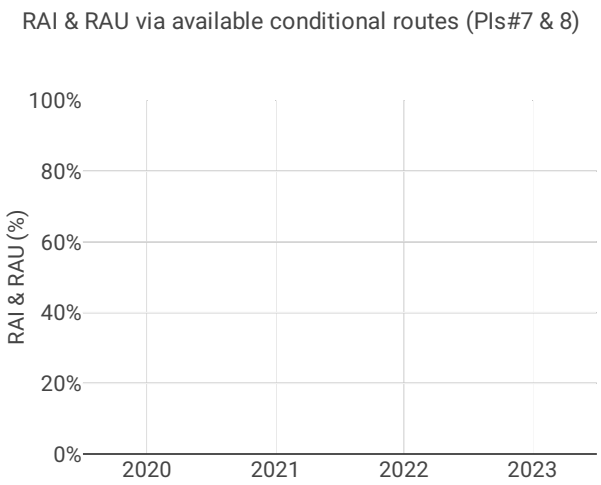
at Otopeni Airport:
”In order to reduce aircraft noise and emissions, ATC gives clearances allowing continuous descent (CD) traffic situation permitting. Continuous descent can be planned based on track distance information of the STAR or, when vectored, on estimated track distance provided by ATC. ”
NSA: NSA is monitoring this indicator through LSSIP

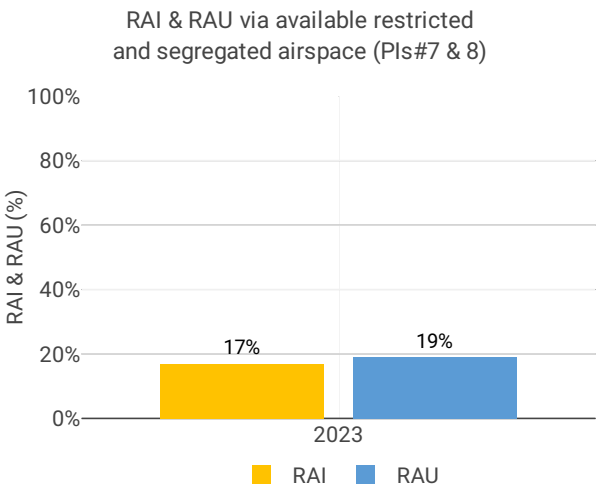
Airport level

	Additional taxi-out time (PI#3)					Additional ASMA time (PI#4)					Share of arrivals applying CDO (PI#5)				
Airport Name	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
Bucharest HENRI COANDA	1.95	1.66	2.08	2.17	NA	0.74	0.57	0.58	0.63	NA	48%	45%	41%	41%	NA
Bucharest AUREL VLAICU	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	31%	31%	29%	28%	NA

3.4 Civil-Military dimension







Focus on Civil-Military dimension

Update on Military dimension of the plan

Military - related measures implemented or planned to improve capacity

The FUA Concept is fully implemented in Romania at all specific levels, as follows: at Level 1 through National Air Space Management Council, at Level 2 through AMC, as civil-military body and at Level 3 through civil-military coordination offices colocated. At FAB level, an Air Space Policy Body is defined for strategic coordination between Romania and Bulgaria. Furthermore, Romanian operational procedures allow the crossing of most military training zones by civil aircraft with a prior coordination.

Initiatives implemented or planned to improve PI#6

ROMATSA: *The FUA Concept is fully implemented in Romania at all specific levels, as follows: at Level 1 through National Air Space Management Council, at Level 2 through AMC, as civil-military body and at Level 3 through civil-military coordination offices colocated. At FAB level, an Air Space Policy Body is defined for strategic coordonation between Romania and Bulgaria. Furthermore, Romanian operational procedures allow the crossing of most military training zones by civil aircraft with a prior coordination*
NSA: continuous oversight

Initiatives implemented or planned to improve PI#7

No data available.

Initiatives implemented or planned to improve PI#8

No data available.

4 CAPACITY - ROMANIA

4.1 PRB monitoring

• Romania registered 0.20 minutes of average en route ATFM delay per flight during 2023 which has been adjusted to 0.16 during the post-ops adjustment process, thus not achieving the local target value of 0.04. Delays in Romania increased by 0.16 minutes per flight year-on-year.

• Delays accumulated between May and September, due to adverse weather conditions.

• The share of delayed flights with delays longer than 15 minutes in Romania increased by 43 p.p. compared to 2022 and was higher than 2019 values.

• The average number of IFR movements was 3% above 2019 levels in Romania in 2023.

• The number of ATCOs in OPS is expected to increase by 12% by 2024, with the actual value being below the 2023 plan in Bucharest by 3 FTEs.

• The yearly total of sector opening hours in Bucharest ACC was 69,428, showing a 1.2% increase compared to 2022. Sector opening hours are 1.2% above 2019 levels.

• Bucharest ACC registered 10.94 IFR movements per one sector opening hour in 2023, being 2.0% above 2019 levels.

• Romania was badly affected by adverse weather in 2023, resulting in unusually high levels of en route ATFM delay. As the uncertainty of weather impact is likely to increase, Romania should work closely with the NM and all concerned stakeholders to mitigate weather impact as much as possible.

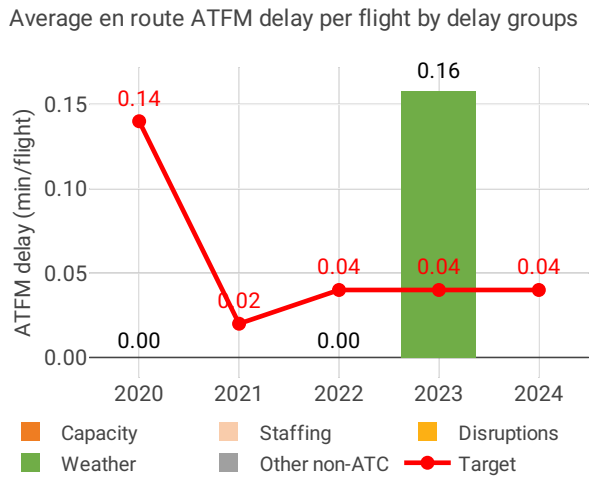
• Romania registered an average airport arrival ATFM delay of nearly zero minutes per flight in 2023, achieving the local target of 0.39 minutes.

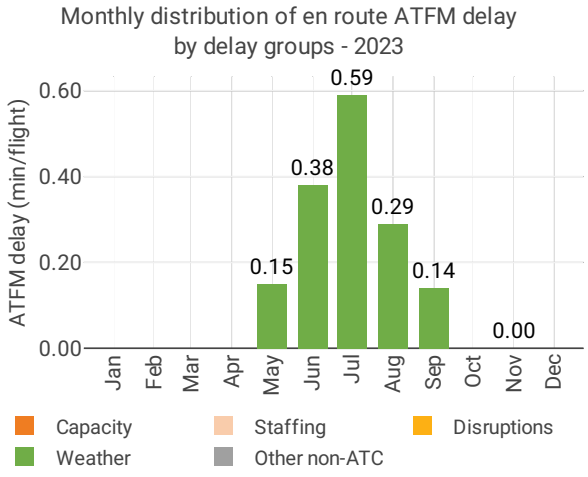
• Compared to 2022, average arrival ATFM delays in Romania were 83% lower in 2023, while the number of IFR arrivals increased by 9%.

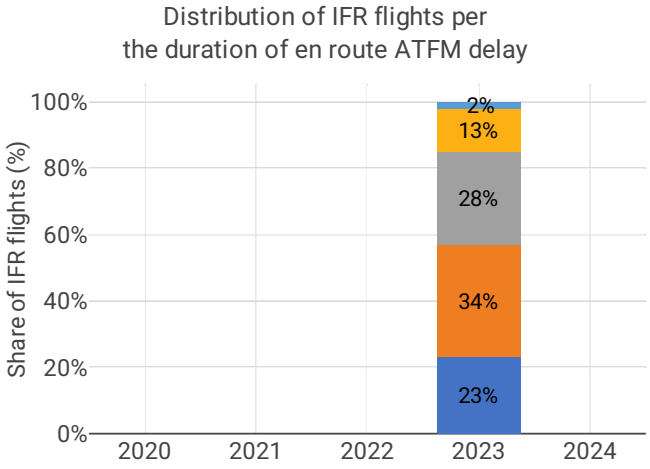
• The main reason for delays was other, non-ATC related causes, accounting for 100% of delays.

4.2 En route performance

4.2.1 En route ATFM delay (KPI#1)







Focus on en route ATFM delay

Summary of capacity performance

Romania experienced an increase in traffic from 656k flights in 2022, with zero en route ATFM delay, to 769k flights in 2023 with 131k minutes of en route ATFM delay. In 2019, Romania had 747k flights with 85k minutes of en route ATFM delay.
In 2023, all ATFM delays were attributed to adverse weather.
There was an additional 33k minutes of delay originating in Romania that were re-attributed to DFS via the NM post operations delay attribution process, according to the NMB agreement for eNM/S23 measures, to ameliorate capacity shortfalls in Karlsruhe UAC.

NSA's assessment of capacity performance

The year 2023 continues to be deeply impacted, both economically and operationally, by the war in Ukraine. The Russian invasion and the subsequent restrictions and sanctions imposed have determined traffic flows that were already circumnavigating the conflict area following the events in 2014 to be pushed further to Romania's south-western part. Furthermore, new traffic flows prefer to cross atypically the Romanian airspace in this geopolitical context. Average distance/flight has increased compared to 2019 and this is visible also in the service units evolution that has outpaced the IFR movements trend in comparison with 2019. These, combined with the increased military activity, including ad-hoc activity focused not only in the NE part of Romania, but in the entirety of the airspace, have generated an increase in complexity whilst also forcing operations into a narrower corridor to keep AUs away from conflict zones.
Despite the swift rebound of traffic in Romanian airspace, nearly reaching pre-pandemic levels with 97% of 2019 IFR movements and surpassing those levels with 104% in terms of service units, the complexity

has increased due to re-routings and heightened military activity from the war in Ukraine. Nevertheless, ROMATSA has managed to maintain zero (CRSTMP) delays attributable to ATC, with delays occurring only due to weather conditions.

Monitoring process for capacity performance

ROMATSA provided regularly inputs on capacity availability in the context of NOP Rolling Seasonal Plan implemented by the Network manager at European network level. The expected en-route performance was and is regularly evaluated by the NM for each ACC, including Bucuresti ACC, in terms of planned/maximum sector openings in relation with the estimated traffic demand.
The performance target has not been met solely due to weather related restrictions. From 121 301 ATFM delay minutes incurred in 2023, the total of 100% were generated due to weather reasons. The delay due to all other reasons, incl. ATC capacity and stafffing, were zero which confirms that there was no capacity gap in 2023.

Capacity planning

The capacity as previously planned and published within an annual NOP (Network Operatios Plan) has been adapted accordingly by adoption of capacity plans under a NOP Rolling Seasonal Plan format, including periods of 6 weeks, based on the expected traffic demand regularly provided by the Network Manager. These plans refer to:
- sector openings;
- maximum possible sector openings;
- availability of support of operational staff;
- special events and projects, etc.

Bucuresti ACC ensured a stable sector opening plan with no sector capacity reduction, with the possibility to increase the number of sectors when traffic increased.

Application of Corrective Measures for Capacity (if applicable)

The performance target has not been met solely due to weather related restrictions. From 121 301 ATFM delay minutes incurred in 2023, the total of 100% were generated due to weather reasons. The delay due to all other reasons, incl. ATC capacity and stafffing, were zero which confirms that there was no capacity gap in 2023.

Significant Risks Likely to Affect Capacity Performance in Reference Period

Traffic values have increased in the aftermath of the COVID-19 pandemic and due to the re-routings caused by the war in Ukraine and the restrictions imposed. Traffic flows that were already circumnavigating the conflict area following the events in 2014 have been pushed further to Romania's south-western part. Furthermore, new traffic flows prefer to cross atypically the Romanian airspace in this geopolitical context. Average distance/flight has increased compared to 2019 and this is visible also in the service units evolution. From April 2023, the number of daily IFR movements in Romanian airspace has surpassed 2019 levels. These, combined with the increased military activity have generated an increase in complexity.

Another risk is generated by ROMATSA's ageing ATCO personnel, especially in ACC Bucharest, where more than 1/3 of ATCOs are over 50 years old and will be over age 55 at the end of RP3. It takes between 3 to 5 years to fully train and authorize an ATCO for ACC, therefore a recruitment process was started in 2017 to guarantee proper staffing levels to ensure safety and capacity.

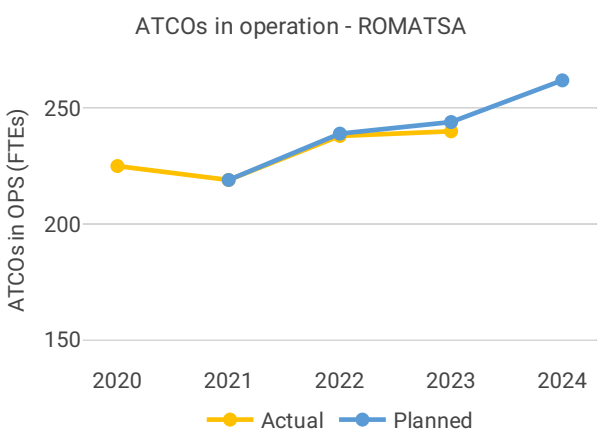
Additional Information Related to Russia's War of Aggression Against Ukraine Traffic flows that were already circumnavigating the conflict area following the events in 2014 have been pushed further to Romania's south-western part (Examples of traffic flows: Russian Federation – Turkey, Turkey - Sweden, Poland - Israel, Lithuania - Turkey, Romania - Poland, Turkey - Finland, Russian Federation - Egypt, Poland - Qatar, United Kingdom - Romania, Turkey - Norway).
Furthermore, new traffic flows prefer to cross atypically the Romanian airspace in this geopolitical context (Examples of the most affected flows : Russia-Turkey, United Kingdom – India, Republic of Korea – Germany, Australia - United Kingdom, Kazakhstan – Hungary, Qatar – Sweden, Pakistan - United Kingdom). These, combined with the increased military activity, scheduled or ad-hoc, focused not only in the NE part of Romania, but in the entirety of the airspace, have generated an increase in complexity.

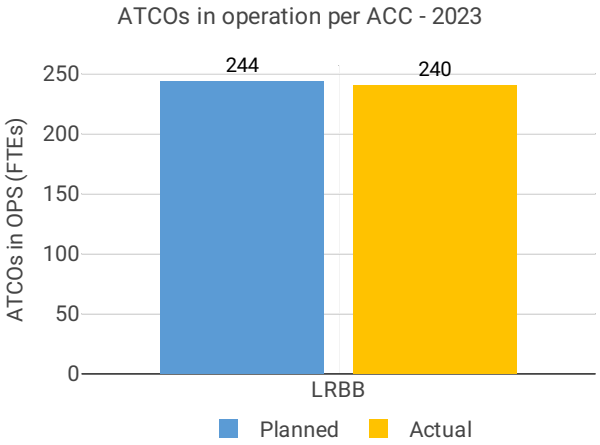
In 2023, ROMATSA managed to mantain a high-level of performance for en route capacity, despite a challenging summer season, with traffic values above the 2019 level, the reduction of available airspace due to military activity and significant weather disruptions.
Through application of FUA principles, civil-military coordination helped mitigate any possible impacts on en-route capacity performance.

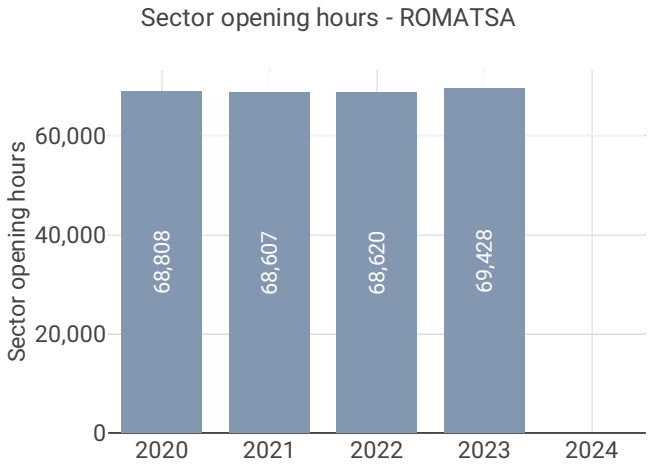
En route Capacity Incentive Scheme

The incentive scheme is under review by the European Commission

4.2.2 Other indicators





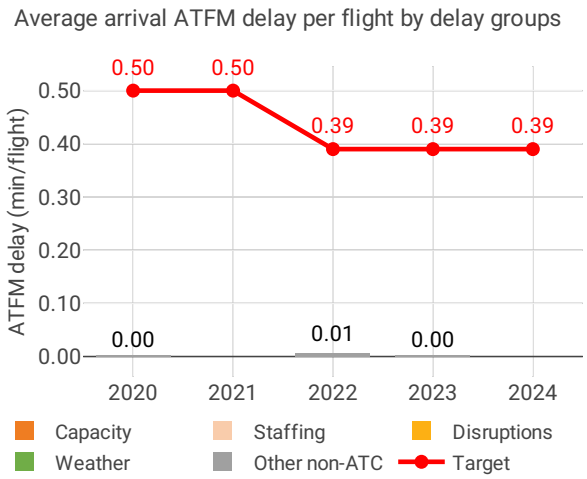


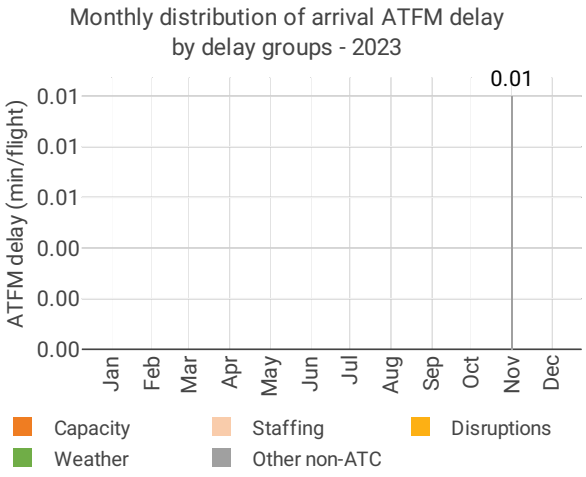
Focus on ATCOs in operations

ROMATSA has continued its training and recruitment process as planned to replace ageing ATCOs from ACC Bucharest. 21 ATCOs who had previously been counted at 0.5 FTE have further extended their competencies (new sectors licences) and thus 10.5 FTE have been added. In the same time 8 ATCOs have left the OPS room, out of which 7 retired and 1 lost his licence due to medical reasons.

4.3 Terminal performance

4.3.1 Arrival ATFM delay (KPI#2)





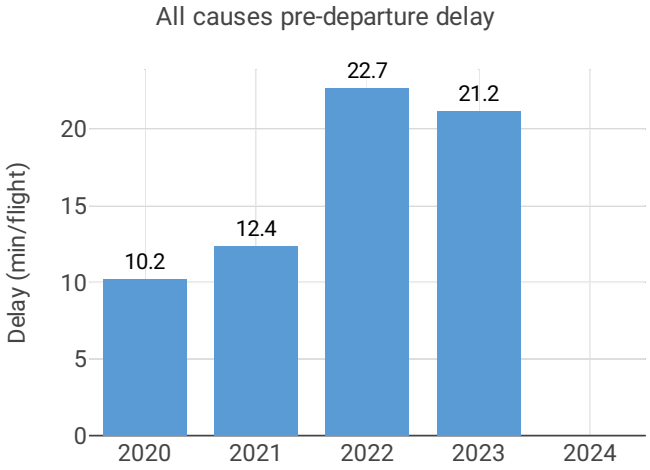
Focus on arrival ATFM delay

Romania includes 2 airports under RP3 monitoring. However, in accordance with IR (EU) 2019/317 and the traffic figures, only Bucharest/Otopeni (LROP) must be monitored for the pre-departure delay indicators. The Airport Operator Data Flow, necessary for the monitoring of these delays, is correctly implemented where required and the monitoring of all capacity indicators can be performed. The quality of the reporting from Bucharest improved in 2023, allowing for the calculation of the ATC pre-departure delay indicator.
Traffic at these 2 airports in 2023 was still 9% lower than in 2019, but showed a 9% increase with respect to 2022.
Average arrival ATFM delays in 2023 were zero at both Romanian airports. The national target was met.
ATFM slot adherence remained very hight (2023: 99.6%; 2022: 99.4%) .

Average arrival ATFM delays at both Romanian airports under monitoring in 2023 were zero min/arr, with only 54 minutes recorded in the entire year for Bucharest/Otopeni.According to the Romanian monitoring report: *ROMATSA and Bucharest Airports National Company continue to work together to ensure optimum capacity level at terminal level as this impacts the entire network. On one hand ROMATSA has implemented at Otopeni TWR a different ATM system with ASMGCS component, composed of a surveillance subsystem (operational for over three years) and an electronic flight strips subsystem (transferred into operations on April 8th 2019), interfaced via OLDI with the System covering the rest of the ATS units.*
There is in place also a common procedure between Bucharest Airports National Company and TWR Otopeni for repairing works periods on the manoeuvering area, i.e. pre-established alternative standard taxi routes.
According to EU Reg 255/2010, a common procedure regarding ATFM for the regulation of traffic in situations that may influence the airport's capacity is in place.
Implementation of AMAN at Bucharest TMA starts this year and will be finalised at the beginning of RP4, while the upgrade of ASMGCS to include Advanced Tower Messaging (implementation of DPI messages) is ongoing and will be finalised this year.

Romanian performance plan sets a national target on arrival ATFM delay for 2023 of 0.39 min/arr. This target was met, with no delays recorded at any of the Romanian airports under monitoring. The incentive scheme uses modulated pivot values limited to CRSTMP delay causes, with a pivot value for 2023 o 0.04 min/arr. The actual value for CRSTMP was 0 min/arr in 2023 (since also all delays regardless of the reason are zero).
The NSA calculates a bonus of RON 545 985.

4.3.2 Other terminal performance indicators (PI#1-3)



Airport level

	Avg arrival ATFM delay (KPI#2)				Slot adherence (PI#1)			
Airport name	2020	2021	2022	2023	2020	2021	2022	2023
Bucharest AUREL VLAICU	NA	NA	NA	NA	100.0%	100.0%	99.2%	99.5%
Bucharest HENRI COANDA	0.00	NA	0.01	0.00	96.6%	98.1%	99.4%	99.6%

	ATC pre departure delay (PI#2)				All causes pre departure delay (PI#3)			
Airport name	2020	2021	2022	2023	2020	2021	2022	2023
Bucharest AUREL VLAICU	NA	NA	NA	NA	NA	NA	NA	NA
Bucharest HENRI COANDA	0.10	0.21	0.16	0.34	10.2	12.4	22.7	21.2

Focus on performance indicators at airport level

ATFM slot adherence

The national average, driven by Bucharest/Otopeni, was an excellent 99.6%. With regard to the 0.4% of flights that did not adhere, 0.3% was early and 0.1% was late.
According to the Romanian monitoring report: *Performance improved compared to 2022. According to EU Reg 255/2010 a common procedure regarding ATFM for the regulation of traffic in situations that may influence the airport's capacity is in place between Bucharest Airports National Company and ROMATSA.*

ATC pre-departure delay

The calculation of the ATC pre-departure delay is based on the data provided by the airport operators through the Airport Operator Data Flow (APDF) which is properly implemented at Bucharest/Otopeni (the only Romanian airport subject to monitoring of this indicator).
The quality of the data provided improved in 2023, allowing for the calculation of this indicator for the first time in RP3. The annual average of the ATC pre-departure delay in 2023 at Budapest (LROP) was 0.37 min/dep.
According to the Romanian monitoring report:
In 2023 departure delays at LROP were mainly due to aerodrome capacity. ROMATSA and Bucharest Airports National Company continue to work together to ensure optimum capacity level at terminal level as this impacts the entire network. ROMATSA has implemented at Otopeni TWR a different ATM system with ASMGCS component, composed of a surveillance subsystem (operational for over three years) and an electronic flight strips subsystem (transferred into operations on April 8th 2019), interfaced via OLDI with the System covering the rest of the ATS units. An upgrade to the system will be finalised in 2024 to include Advanced Tower Messaging.
There is in place also a common procedure between Bucharest Airports National Company and TWR Otopeni for repairing/maintenance periods on the manoeuvering area, i.e. pre-established alternative standard taxi routes.

According to EU Reg 255/2010, a common procedure regarding ATFM for the regulation of traffic in situations that may influence the airport's capacity is in place.
Implementation of AMAN at Bucuresti TMA starts this year and will be finalised in the beginning of RP4.

All causes pre-departure delay

The total (all causes) delay in the actual off block time at Bucharest/Otopeni slightly decreased in 2023 (LROP: 2020: 10.22 min/dep.; 2021: 12.45 min/dep.; 2022: 22.67 min/dep.; 2023: 21.23 min/dep.)
The Romanian monitoring report mentions the same measures taken as for the ATC pre-departure delay (see above).

5 COST-EFFIENCY - ROMANIA

5.1 PRB monitoring

• The en route 2023 actual unit cost of Romania was 33.98 €2017, -5.1% lower than the determined unit cost (35.80 €2017). The terminal 2023 actual unit cost was 299.92 €2017, +13% higher than the determined unit cost (265.95 €2017).

• The en route 2023 actual service units (5.9M) were +7.0% higher than the determined service units (5.5M).

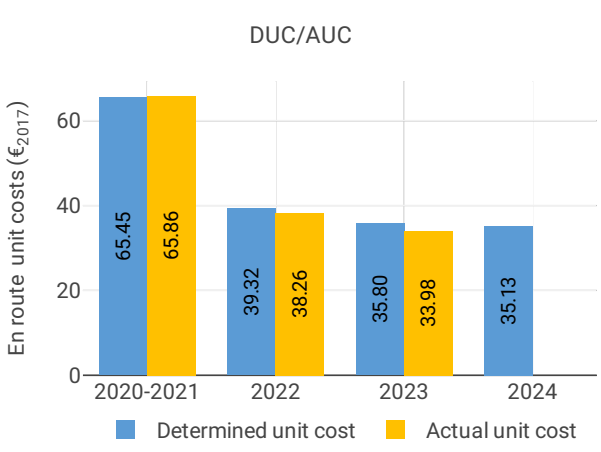
• The en route 2023 actual total costs were +3.2 M€2017 (+1.6%) higher than determined. The primary factor driving the difference in total costs was an overspend in staff costs (+7.8 M€2017, or +5.3%), largely due to wage compensations awarded for higher than planned traffic and achieving the capacity target. The gap in staff costs was partially mitigated by an underspend in other operating costs (-4.0 M€2017, or -13%). The difference in other operating costs was mainly attributed to lower energy expenses and delays in both the training program and the contracting processes with third-party service providers.

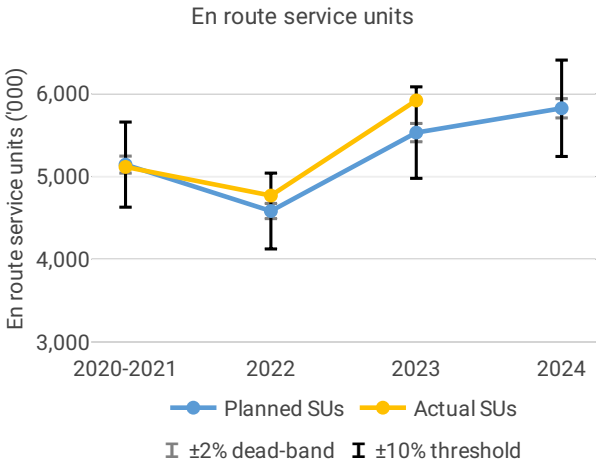
• ROMATSA spent 19 M€2017 in 2023 related to costs of investments for both en route and terminal charging zones, -3.1% less than determined (20 M€2017), mainly due to delays in new investment projects.

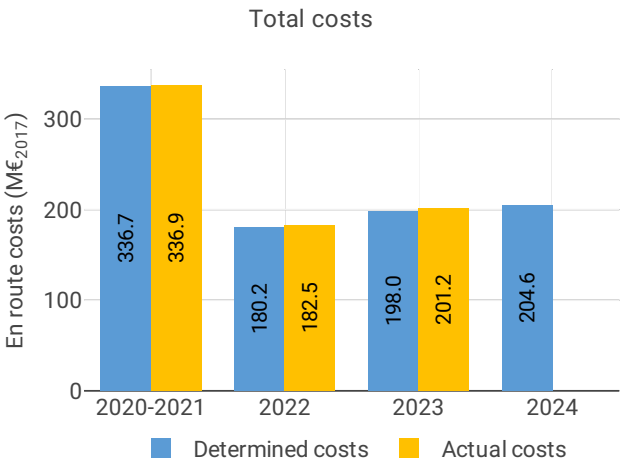
• The en route actual unit cost incurred by users in 2023 was 44.07€ (+5.9% above the 2023 DUC), while the terminal actual unit cost incurred by users was 351.53€ (+12% above the 2023 DUC).

5.2 En route charging zone

5.2.1 Unit cost (KPI#1)

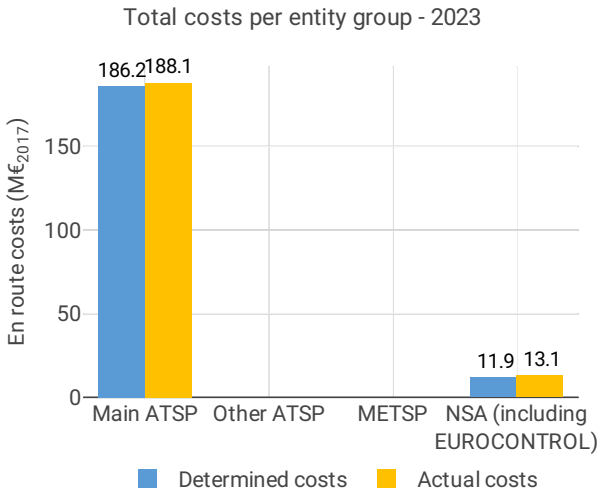


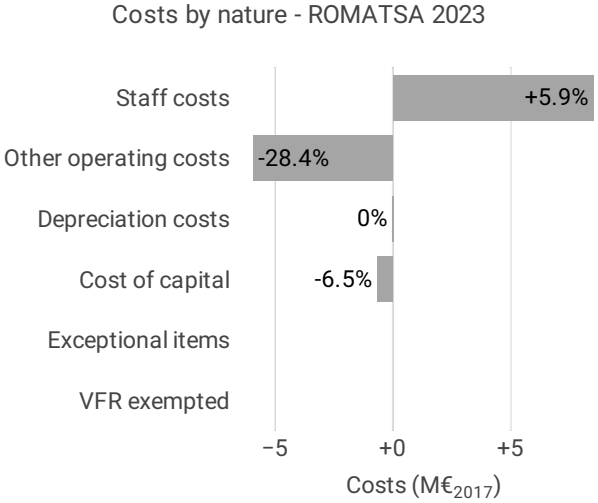




Actual and determined data

Total costs - nominal (M€)	2020-2021	2022	2023	2024
Actual costs	373	227	271	NA
Determined costs	370	219	249	265
Difference costs	2	8	22	NA
Inflation assumptions	**2020-2021**	**2022**	**2023**	**2024**
Determined inflation rate	NA	9.3%	4.0%	3.0%
Determined inflation index	NA	125.9	130.9	134.8
Actual inflation rate	NA	12.0%	9.7%	NA
Actual inflation index	NA	129	141.5	NA
Difference inflation index (p.p.)	NA	+3.1	+10.6	NA





Focus on unit cost

AUC vs. DUC

In 2023, the en route AUC was -5.1% (or -8.3 RON2017, -1.82 €2017) lower than the planned DUC. This results from the combination of significantly higher than planned TSUs (+7.0%) and higher than planned en route costs in real terms (+1.6%, or +14.5 MRON2017, +3.2 M€2017). It should be noted that the actual inflation index in 2023 was +10.6 p.p. higher than planned.

En route service units

The difference between 2023 actual and planned TSUs (+7.0%) falls outside the ±2% dead band, but does not exceed the ±10% threshold foreseen in the traffic risk sharing mechanism. The resulting gain of additional en route revenues is therefore shared between the ANSP and the airspace users .

En route costs by entity

The 2023 actual real en route costs are +1.6% (+3.2 M€2017) higher than planned. This is the result of higher than planned costs for the main ANSP, ROMATSA (+1.0%, or +1.9 M€2017) and the NSA/EUROCONTROL (+10.5%, or +1.3 M€2017).

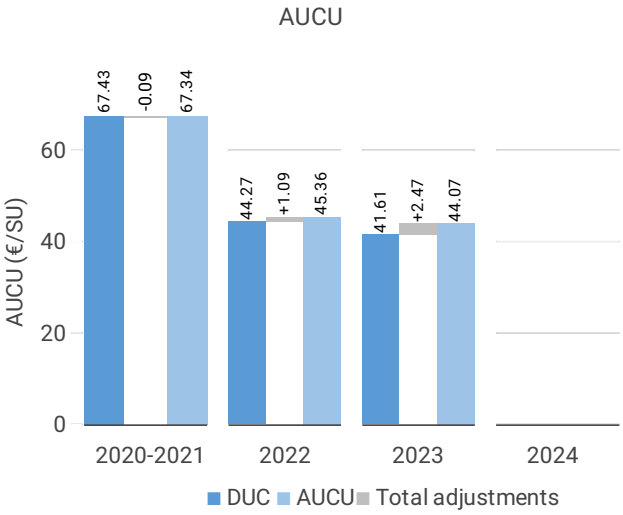
En route costs for the main ANSP at charging zone level

Higher than planned en route costs in real terms for ROMATSA in 2023 (+1.0%, or +1.9 M€2017) result from:

- Significantly higher than planned staff costs (+5.9%), reported to be mainly due to *"compensation for the increase in inflation, exceeding the traffic forecast and meeting the capacity target, and as a result of the increase in pension costs".*
- Significantly lower than planned other operating costs (-28.4%), reported to be mainly due to *"decrease*

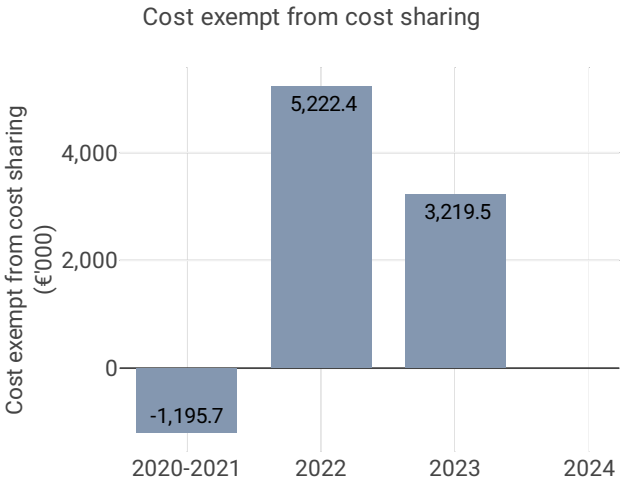
in electricity costs and delays in the training program and contracting with third parties",
- Depreciation costs in line with the performance plan (-0.005%),
- Significantly lower than planned cost of capital (-6.5%), reported to be mainly due to *"delays in contract signatures for new investments as well as impediments in deliveries impacting negatively the Investment Plan for 2023"*

5.2.2 Actual unit cost incurred by the users (AUCU) (PI#1)



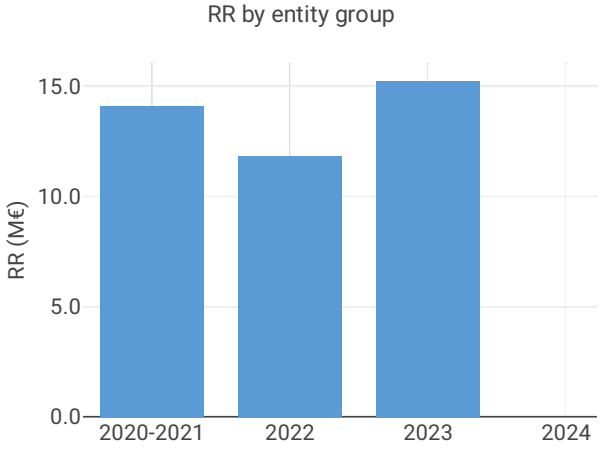
AUCU components (€/SU) – 2023

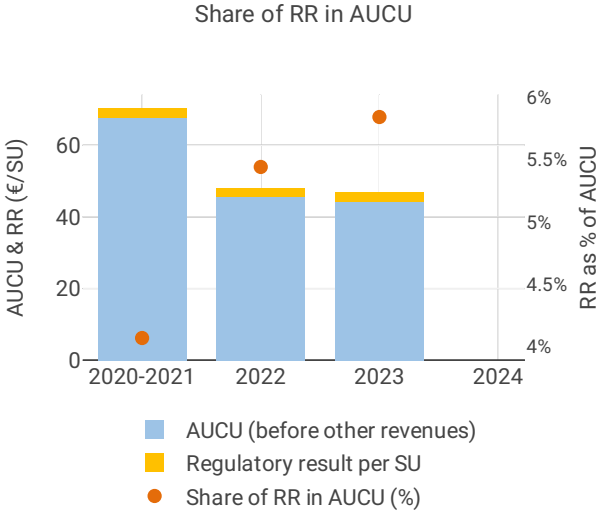
Components of the AUCU in 2023	€/SU
DUC	**41.61**
Inflation adjustment	2.74
Cost exempt from cost-sharing	0.54
Traffic risk sharing adjustment	-1.24
Traffic adj. (costs not TRS)	-0.26
Finantial incentives	0.74
Modulation of charges	0.00
Cross-financing	0.00
Other revenues	-0.06
Application of lower unit rate	0.00
Total adjustments	2.47
AUCU	**44.07**
AUCU vs. DUC	**+5.9%**

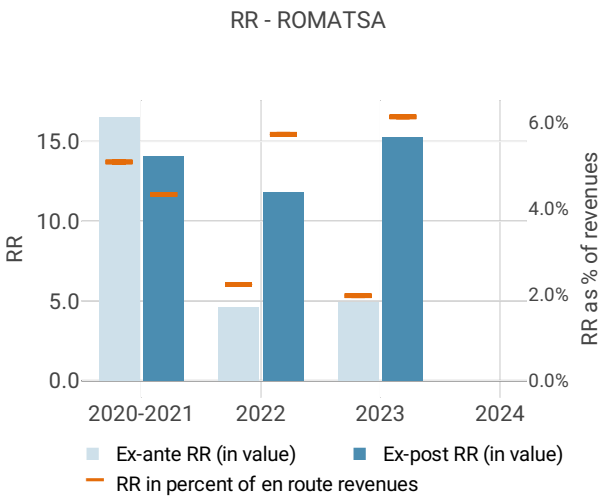


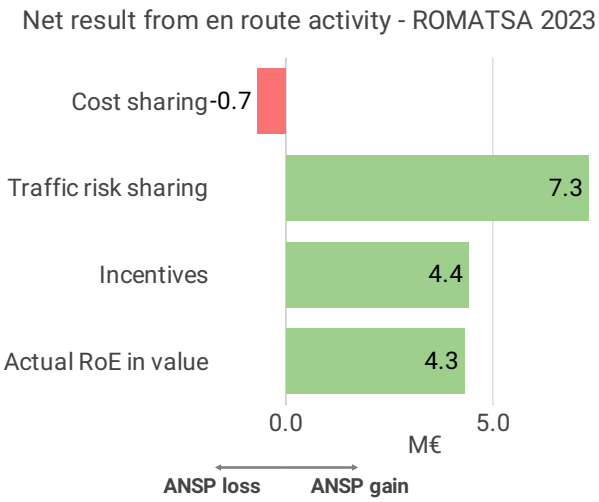
Cost exempt from cost sharing by item - 2023	€'000	€/SU
New and existing investments	-306.0	-0.05
Competent authorities and qualified entities costs	-611.2	-0.10
Eurocontrol costs	1,762.7	0.30
Pension costs	2,200.9	0.37
Interest on loans	173.2	0.03
Changes in law	0.0	0.00
Total cost exempt from cost risk sharing	**3,219.5**	**0.54**

5.2.3 Regulatory result (RR)









Focus on regulatory result

ROMATSA net gain on activity in the Romania en route charging zone in the year 2023

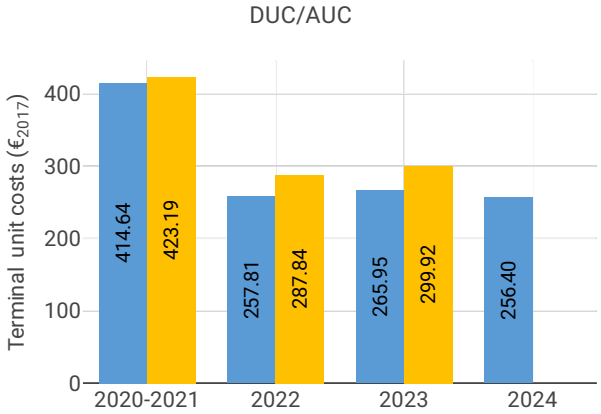
ROMATSA reported a net gain of +54.3 MRON, as a combination of a loss of -3.5 MRON arising from the cost sharing mechanism, with a gain of +36.1 MRON arising from the traffic risk sharing mechanism and a gain of +21.7 MRON relating to financial incentives.

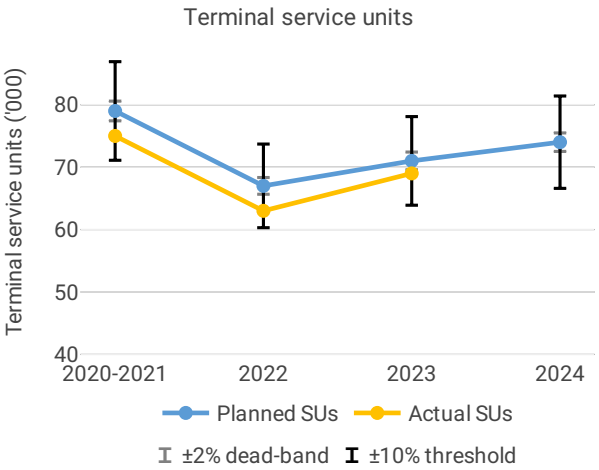
ROMATSA overall regulatory results (RR) for the en route activity

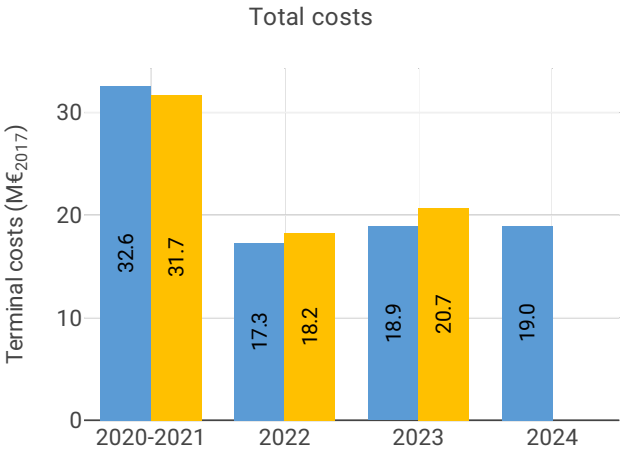
Ex-post, the overall RR taking into account the net gain from the en route activity mentioned above (+54.3 MRON) and the actual RoE (+21.1 MRON) amounts to +75.4 MRON (6.1% of the en route revenues). The resulting ex-post rate of return on equity is 27.8%, which is much higher than the 7.8% planned in the PP.

5.3 Terminal charging zone

5.3.1 Unit cost (KPI#1)

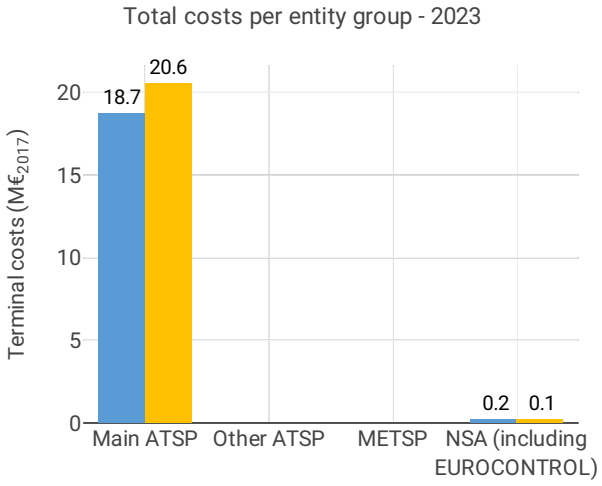


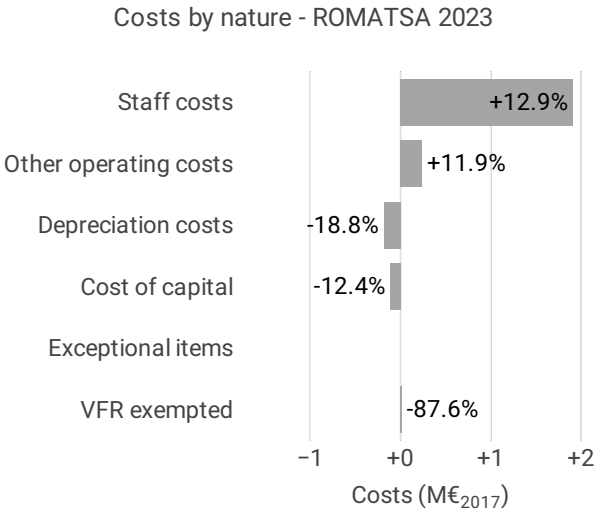




Actual and determined data

Total costs - nominal (M€)	2020-2021	2022	2023	2024
Actual costs	35	23	29	NA
Determined costs	36	21	24	25
Difference costs	-1	2	4	NA
Inflation assumptions	**2020-2021**	**2022**	**2023**	**2024**
Determined inflation rate	NA	9.3%	4.0%	3.0%
Determined inflation index	NA	125.9	130.9	134.8
Actual inflation rate	NA	12.0%	9.7%	NA
Actual inflation index	NA	129	141.5	NA
Difference inflation index (p.p.)	NA	+3.1	+10.6	NA





Focus on unit cost

AUC vs. DUC

2023, the terminal AUC was +12.8% (or +155.12 RON2017, +33.97 €2017) higher than the planned DUC. This results from the combination of significantly higher than planned terminal costs in real terms (+9.6%, or +8.3 MRON2017, +1.8 M€2017) and lower than planned TNSUs (-2.8%). It should be noted that actual inflation index in 2023 was +10.6 p.p. higher than planned.

Terminal service units

The difference between the 2023 actual and planned TNSUs (-2.8%) falls outside the ±2% dead band, but does not exceed the ±10% threshold foreseen in the traffic risk sharing mechanism. The resulting loss of terminal revenues is therefore shared between the ANSP and the airspace users .

Terminal costs by entity

The 2023 real actual terminal costs are +9.6% (+1.8 M€2017) higher than planned. This is the result of higher than planned costs for the main ANSP, ROMATSA (+9.9%, or +1.9 M€2017) and lower than planned costs for the NSA (-30.8%, or -0.1 M€2017).

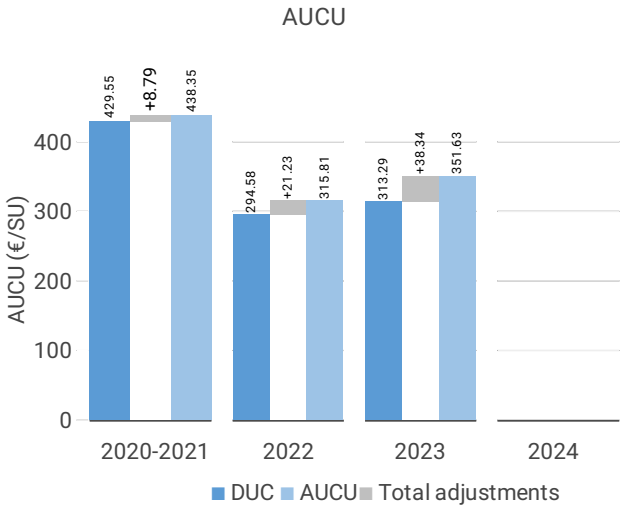
Terminal costs for the main ANSP at charging zone level

Significantly higher than planned terminal costs in real terms for ROMATSA in 2023 (+9.9%, or +1.9 M€2017) result from:

- Significantly higher than planned staff costs (+12.9%), reporetd to be mainly due to “an increase of pension costs and compensation of personnel with inflation”
- Significantly higher than planned other operating costs (+11.9%) reported to be mainly due to “a provision for unsettled clients as the recovery rate is progressing slowly”.,

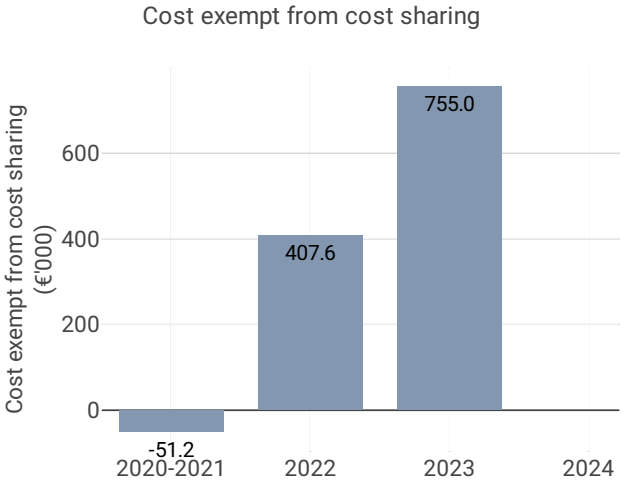
- Significantly lower than planned depreciation (-18.8%), reported to be mainly due "to the postponement of finalisation for the Modernization of A-SMGCS at DSNA Bucharest - Implementation of Advanced Tower Messaging".
- Significantly lower than planned cost of capital (-12.4%). reported to be mainly due to "the postponment of the A_SMGCS investment, partially offset by the increasing interest rate for the contracted loan"
- Significantly lower than planned deduction for VFR exempted flights (-87.6%).

5.3.2 Actual unit cost incurred by the users (AUCU) (PI#1)



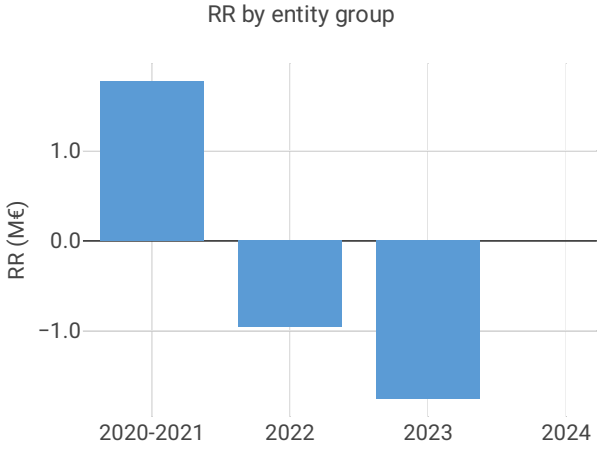
AUCU components (€/SU) – 2023

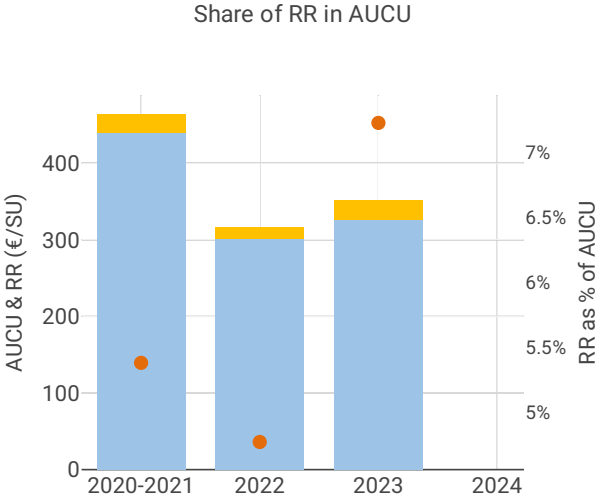
Components of the AUCU in 2023	€/SU
DUC	**313.29**
Inflation adjustment	23.91
Cost exempt from cost-sharing	10.94
Traffic risk sharing adjustment	1.78
Traffic adj. (costs not TRS)	0.55
Finantial incentives	1.60
Modulation of charges	0.00
Cross-financing	0.00
Other revenues	-0.45
Application of lower unit rate	0.00
Total adjustments	38.34
AUCU	**351.63**
AUCU vs. DUC	**+12.2%**

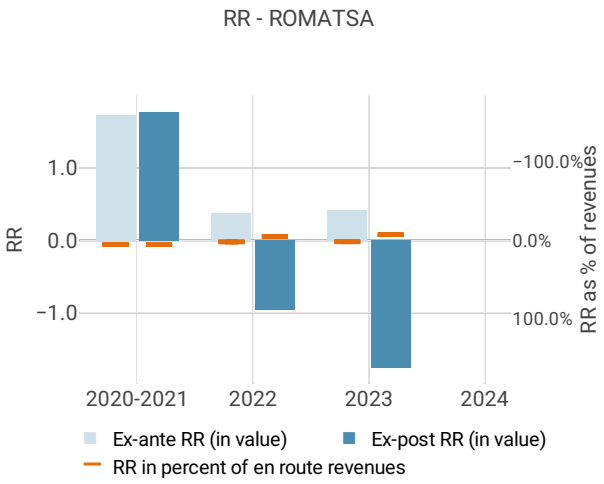


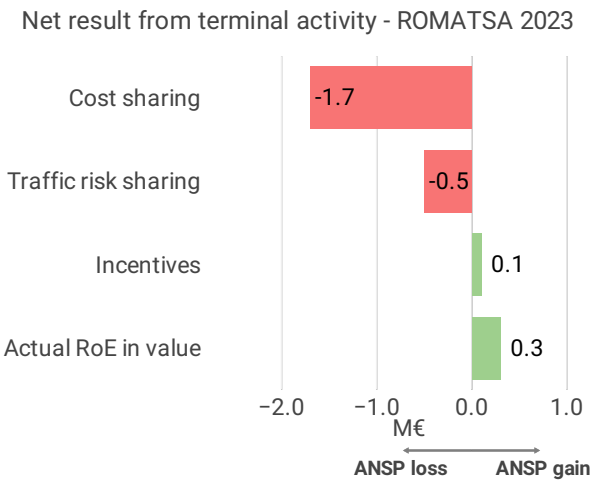
Cost exempt from cost sharing by item - 2023	€'000	€/SU
New and existing investments	-261.6	-3.79
Competent authorities and qualified entities costs	-47.8	-0.69
Eurocontrol costs	0.0	0.00
Pension costs	1,050.0	15.22
Interest on loans	14.5	0.21
Changes in law	0.0	0.00
Total cost exempt from cost risk sharing	**755.0**	**10.94**

5.3.3 Regulatory result (RR)









Focus on regulatory result

ROMATSA net gain on activity in the Romania terminal charging zone in the year 2023

ROMATSA reported a net loss of -10.4 MRON, as a combination of a loss of -8.6 MRON arising from the cost sharing mechanism, with a loss of -2.3 MRON arising from the traffic risk sharing mechanism and a gain of +0.5 MRON relating to financial incentives.

ROMATSA overall regulatory results (RR) for the terminal activity

Ex-post, the overall RR taking into account the net loss from the terminal activity mentioned above (-10.4 MRON) and the actual RoE (+1.7 MRON) amounts to -8.7 MRON (-7.3% of the terminal revenues). The resulting ex-post rate of return on equity is -39.5%.