PRB | Performance review body of the single european sky

Performance Review Body Monitoring Report

Hungary - 2023

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1 OVERVIEW

1.1 Contextual information

National performance plan adopted following Commission Decision (EU) 2022/775 of 13 April 2022

List of ACCs 1
Budapest ACC

No of airports in the scope of the performance plan:
- **≥80'K** 1
- **<80'K** 0

Exchange rate (1 EUR=)
2017: 308.993 HUF
2023: 381.193 HUF

Share of Union-wide:
- **traffic (TSUs) 2023** 3.0%
- **en route costs 2023** 1.6%

Share en route / terminal costs 2023 84% / 16%

En route charging zone(s)
Hungary

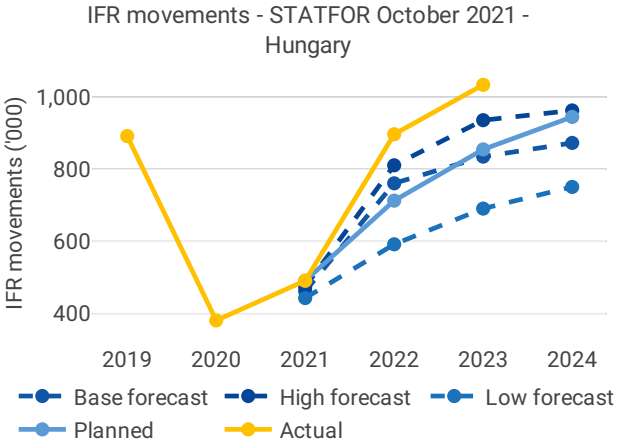
Terminal charging zone(s)
Hungary

Main ANSP
- HungaroControl (EC)

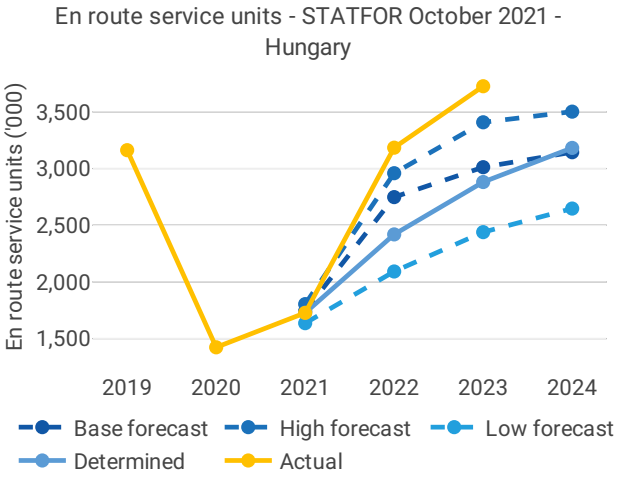
Other ANSPs
–

MET Providers
- Hungarian Meteorological Service (Országos Meteorológiai Szolgálat)

1.2 Traffic (En route traffic zone)

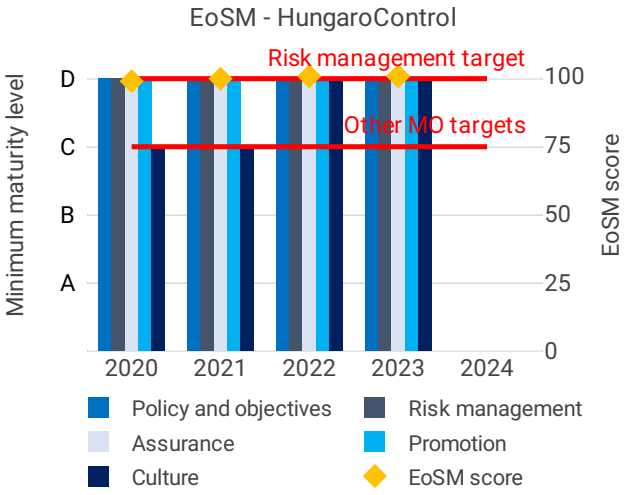


- Hungary recorded 1,034K actual IFR movements in 2023, +15% compared to 2022 (897K).
- Actual 2023 IFR movements were +21% above the plan (855K).
- Actual 2023 IFR movements are +16% above the actual 2019 level (892K).



- Hungary recorded 3,726K actual en route service units in 2023, +17% compared to 2022 (3,184K).
- Actual 2023 service units were +29% above the plan (2,881K).
- Actual 2023 service units are +18% above the actual 2019 level (3,162K).

1.3 Safety (Main ANSP)

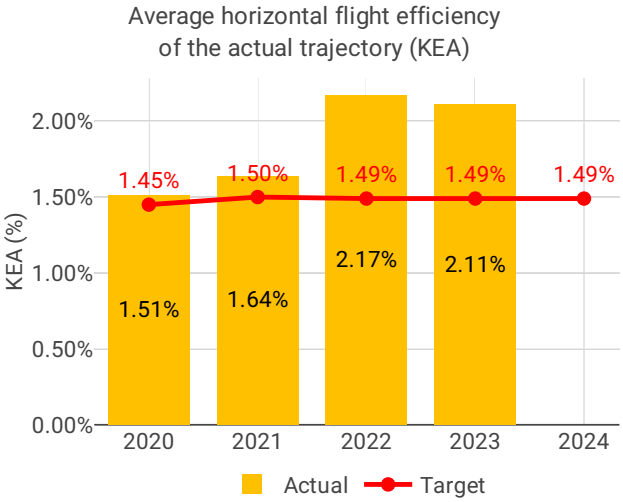


• HungaroControl had already achieved the RP3 EoSM targets in 2020 and has continued to further improve its performance. In 2023 HungaroControl maintained D in all five management objectives, exceeding all its planned maturity levels.

• Hungary recorded a stable number of safety occurrences with no runway incursions and similar rate of separation minima infringements compared with 2022.

• HungaroControl use STCA data for monitoring of SMIs, but do not use automated safety data recording systems for monitoring runway incursions.

1.4 Environment (Member State)



• Hungary achieved a KEA performance of 2.11% compared to its target of 1.49% and did not contribute positively towards achieving the Union-wide target.

• The NSA states that the performance deteriorated due to the extra distance flown as a result of Russia's war of aggression against Ukraine.

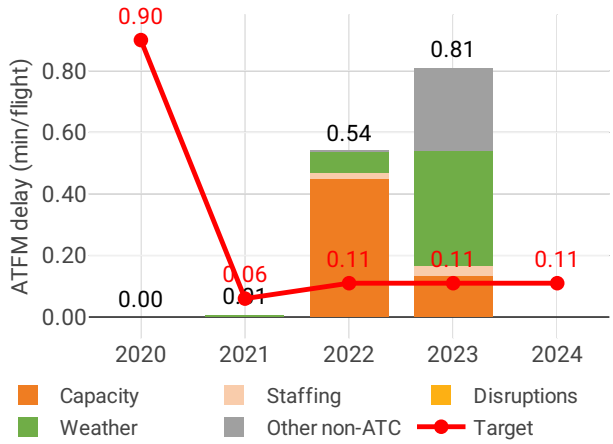
• Both KEP and SCR improved in comparison with 2022. The value of these two indicators was similar, meaning airspace users planned close to the shortest route available. Despite the KEA target being missed, the improvement in SCR shows that Hungary has improved the environmental efficiency of its airspace when accounting for impacts outside of its control.

• The share of CDO flights increased from 26.14% to 27.25% in 2023.

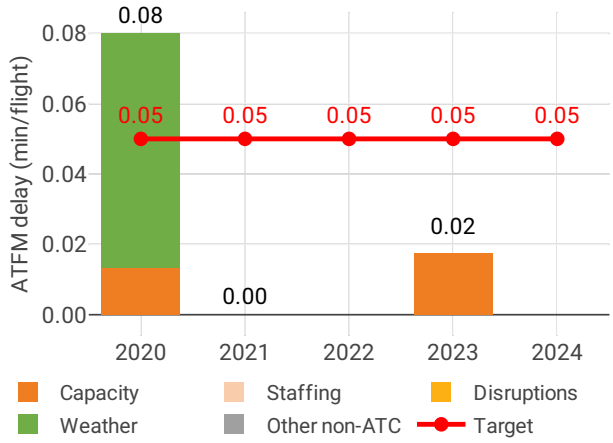
• During 2023, additional time in terminal airspace increased from 0.34 to 0.58 min/flight, while additional taxi out time decreased from 1.40 to 1.09 min/flight.

1.5 Capacity (Member State)

Average en route ATFM delay per flight by delay groups



Average arrival ATFM delay per flight by delay groups



• Hungary registered 0.99 minutes of average en route ATFM delay per flight during 2023 which has been adjusted to 0.81 during the post-ops adjustment process, thus not achieving the local target value of 0.11. Delays in Hungary increased by 0.27 minutes per flight year-on-year.

• Most of the delays were accumulated between May and December, driven by adverse weather conditions and the additional complexity due to the Ukrainian crisis.

• The share of delayed flights with delays longer than 15 minutes in Hungary decreased by 1 percentage point compared to 2022 and was higher than 2019 values.

• The average number of IFR movements was 16% above 2019 levels in Hungary in 2023.

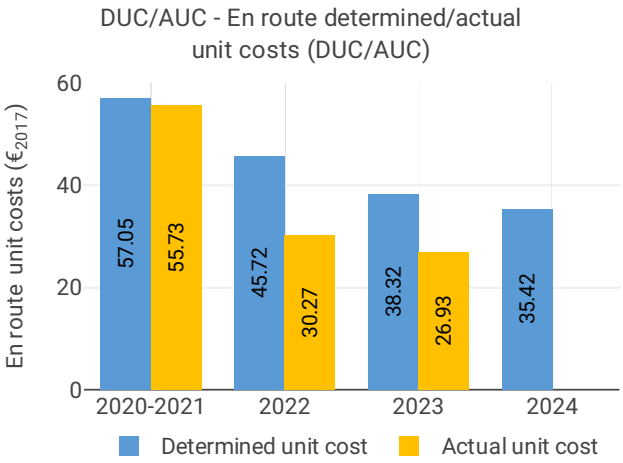
• The number of ATCOs in OPS is expected to increase by 12% by 2024, with the actual value being below the 2023 plan in Budapest by 3 FTEs.

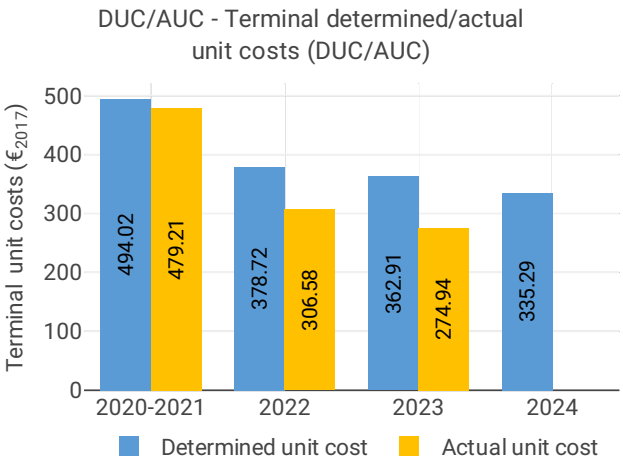
• The yearly total of sector opening hours in Budapest ACC was 35,265, showing a 4.5% decrease compared to 2022. Sector opening hours are 3.2% above 2019 levels.

• Budapest ACC registered 28.3 IFR movements per one sector opening hour in 2023, being 13.3% above 2019 levels.

• Year-on-year traffic growth in Hungary was 15% with IFR movements being 23% above the STATFOR 2021 October Base forecast, with the growth affecting already saturated sectors. The ongoing war in Ukraine increased traffic complexity in the Eastern part of the Hungarian airspace. These factors, combined with a lack of ATCOs, resulted in a significant capacity gap. Unless ATCO recruitment and training issues are resolved, the capacity gap will increase even further during the coming years.

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





• The en route 2023 actual unit cost of Hungary was 26.93 €2017, -30% lower than the determined unit cost (38.32 €2017). The terminal 2023 actual unit cost was 274.94 €2017, -24% lower than the determined unit cost (362.91 €2017).

• The en route 2023 actual service units (3.7M) were +29% higher than the determined service units (2.9M).

• In 2023, the en route actual total costs were -10 M€2017 lower (-9.1%) compared to determined. The underspend in actual costs was mainly attributable to staff costs (-7.4 M€2017, or -15%), which resulted from lower-than-expected headcount. Additionally, the underspend of other operating costs (-3.9 M€2017, or -11%) was mainly due to savings arising from various rising expenses, such as energy prices and external service charges, that increased at a rate below inflation. The cost of capital was the only cost category to register an increase (+2.6 M€2017, or +35%), mainly due to a significant growth in net current assets (+38 M€2017, or +168%). The NSA attributed the higher-than-planned net current assets to the inclusion of pension-related obligations, a situation that was also reported in 2022.

• Hungary presented a deviation from the criteria to achieve capacity targets, which was considered justified. As was the case in 2022, costs have stayed significantly below the determined, while the capacity targets have not been met.

• HungaroControl spent 29 M€2017 in 2023 related to costs of investments for both en route and terminal charging zones, -21% less than determined (36 M€2017), mainly due to some investments being scheduled later than determined.

• The en route actual unit cost incurred by users in 2023 was 32.94€ (-7.8% below the 2023 DUC), while the terminal actual unit cost incurred by users was 335.29€ (+0.4% above the 2023 DUC).

• The en route regulatory result for HungaroControl amounted to +21 M€, or 19% of the 2023 revenue. This may indicate that the airspace users are charged for costs which have not materialised in 2023.

• The PRB will take into consideration the implementation of the RP3 performance plans when assessing the RP4 cost-efficiency targets and recommends that the NSA of Hungary submits a detailed report of the capacity-related measures implemented during 2024. Should the RP3 planned measures not be implemented by the end of RP3, the PRB recommends Hungary to consider the reimbursement to airspace users of excess funds received by ANSPs for measures not implemented.

2 SAFETY - HUNGARY

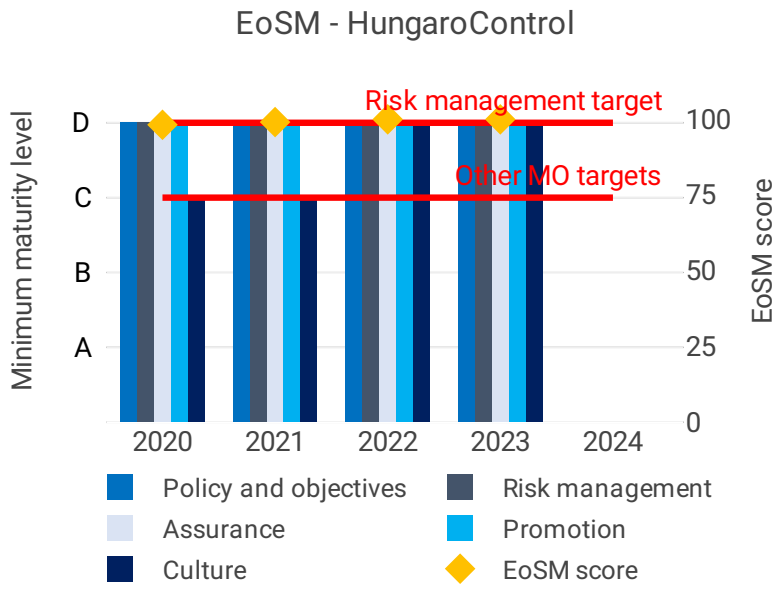
2.1 PRB monitoring

• HungaroControl had already achieved the RP3 EoSM targets in 2020 and has continued to further improve its performance. In 2023 HungaroControl maintained D in all five management objectives, exceeding all its planned maturity levels.

• Hungary recorded a stable number of safety occurrences with no runway incursions and similar rate of separation minima infringements compared with 2022.

• HungaroControl use STCA data for monitoring of SMIs, but do not use automated safety data recording systems for monitoring runway incursions.

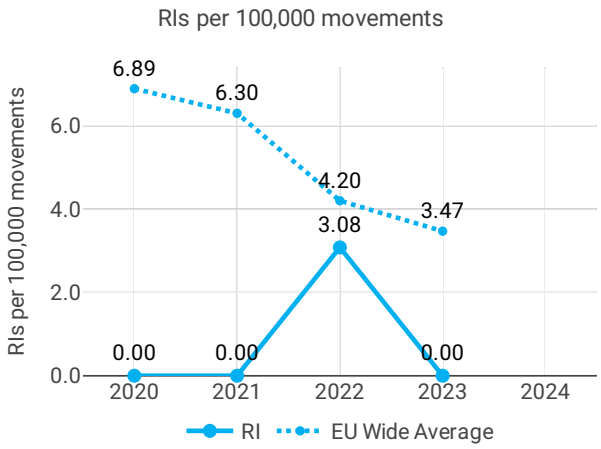
2.2 Effectiveness of Safety Management (EoSM) (KPI#1)

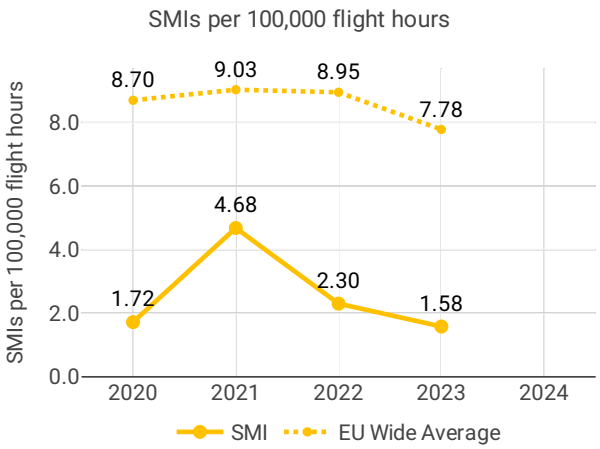


Focus on EoSM

All five EoSM components of the ANSP meet, or exceed, the RP3 target level. The ANSP has maintained the maximum level for all components.

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





3 ENVIRONMENT - HUNGARY

3.1 PRB monitoring

• Hungary achieved a KEA performance of 2.11% compared to its target of 1.49% and did not contribute positively towards achieving the Union-wide target.

• The NSA states that the performance deteriorated due to the extra distance flown as a result of Russia's war of aggression against Ukraine.

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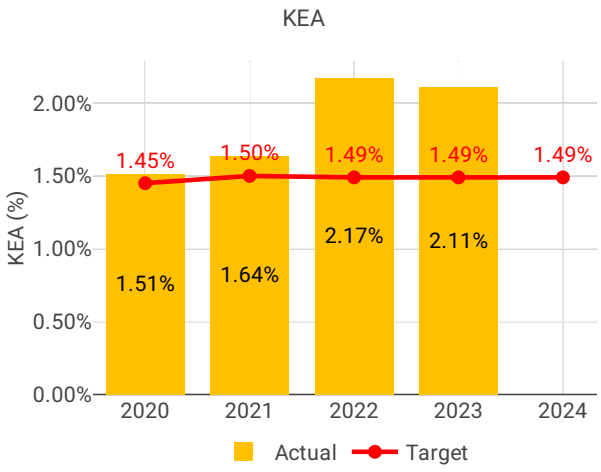
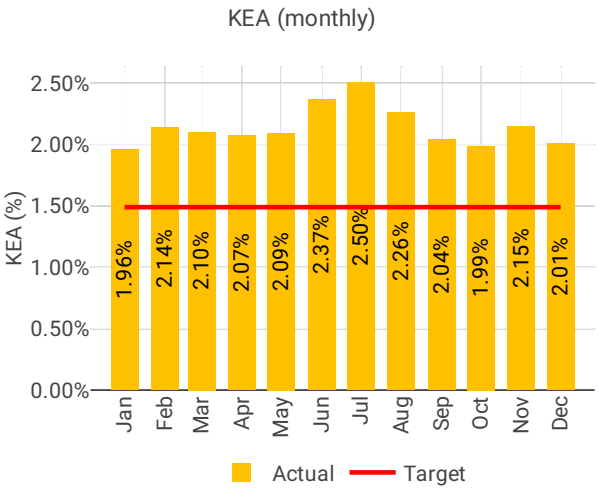
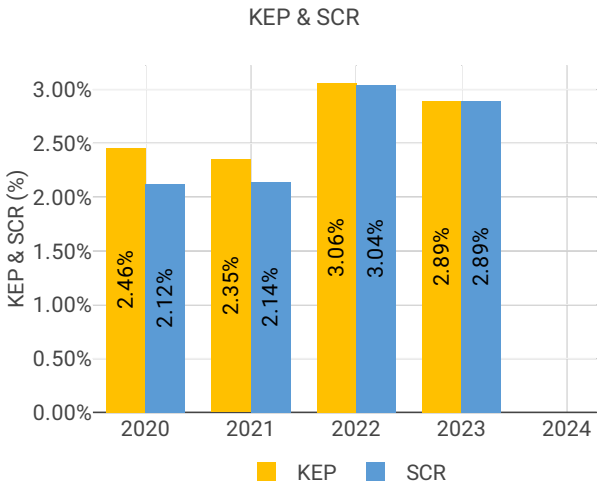
• During 2023, additional time in terminal airspace increased from 0.34 to 0.58 min/flight, while additional taxi out time decreased from 1.40 to 1.09 min/flight.

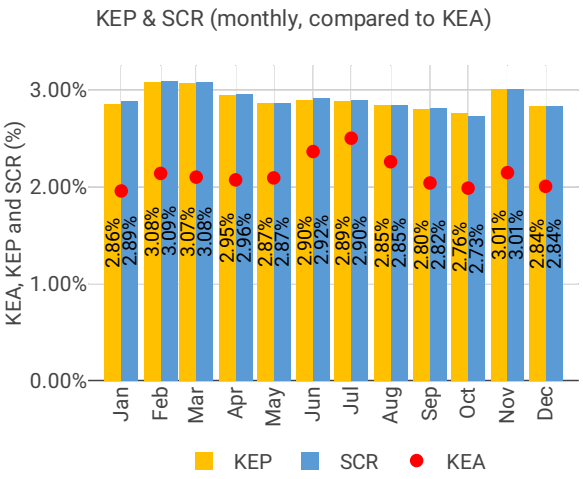
3.2 En route performance

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)



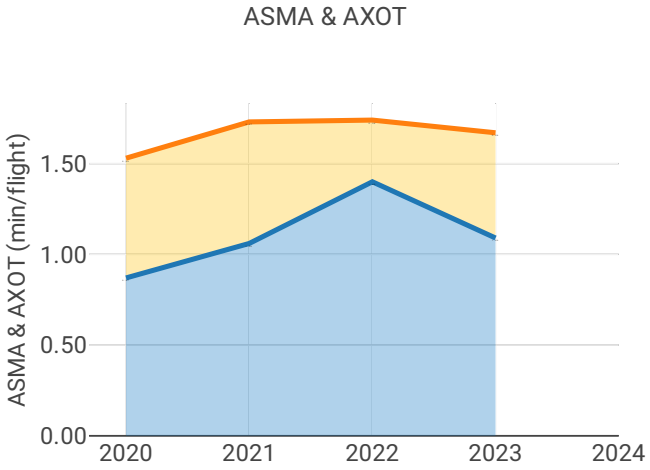


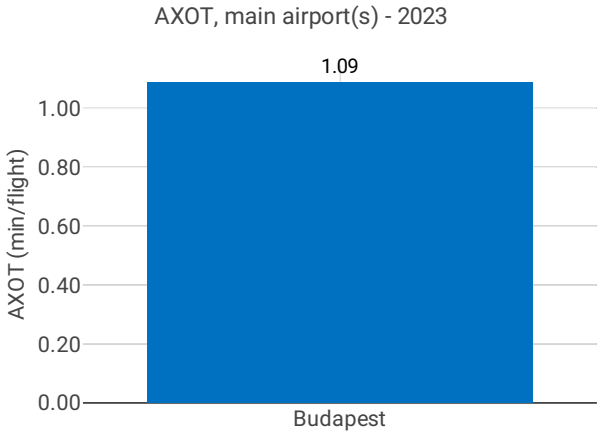


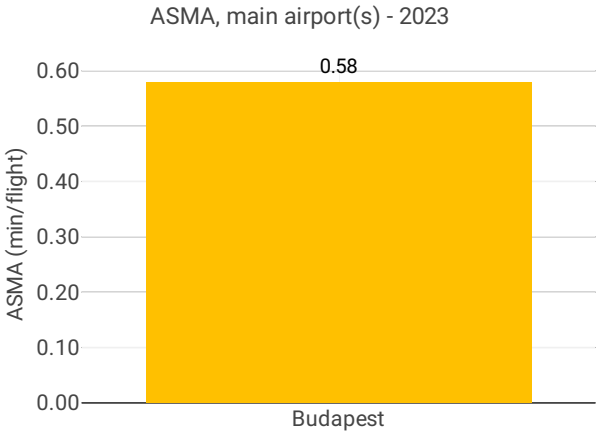


3.3 Terminal performance

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







Focus on ASMA & AXOT

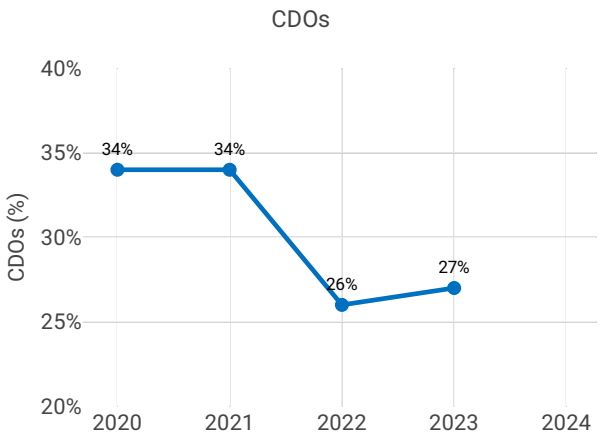
AXOT

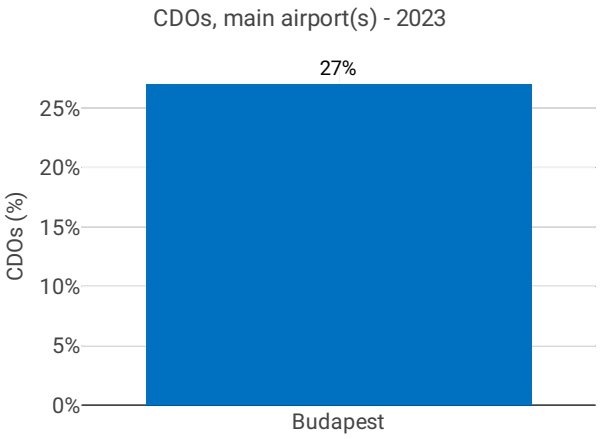
Additional taxi-out times at Budapest (LHBP; 2019: 1.63 min/dep.; 2020: 0.87 min/dep.; 2021: 1.06 min/dep.; 2022: 1.4 min/dep.; 2023: 1.09 min/dep.) decreased in 2023 and are considerably lower than the SES average of 2.81 min/dep.
According to the Hungarian monitoring report:*Since the value of this Performance Indicator shows improvement in 2023, no additional initiatives are needed.*

ASMA

The additional times in the terminal airspace at Budapest increased in 2023 (LHBP; 2019: 0.85 min/arr.; 2020: 0.66 min/arr.; 2021: 0.67 min/arr.; 2022: 0.34 min/arr.; 2023: 0.58 min/arr.) but remained one of the lowest additional ASMA times amongst the SES monitored airports.
According to the Hungarian monitoring report: *Since the actual value of this PI is still acceptable, no additional initiatives are needed.*

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





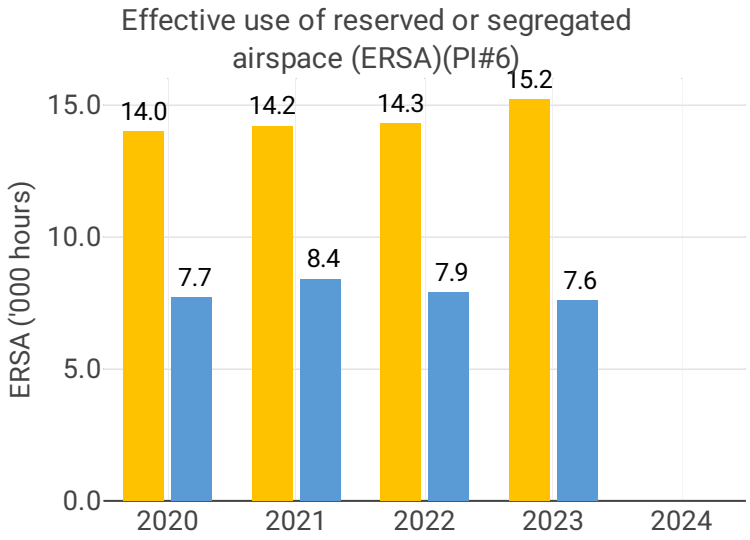
Focus CDOs

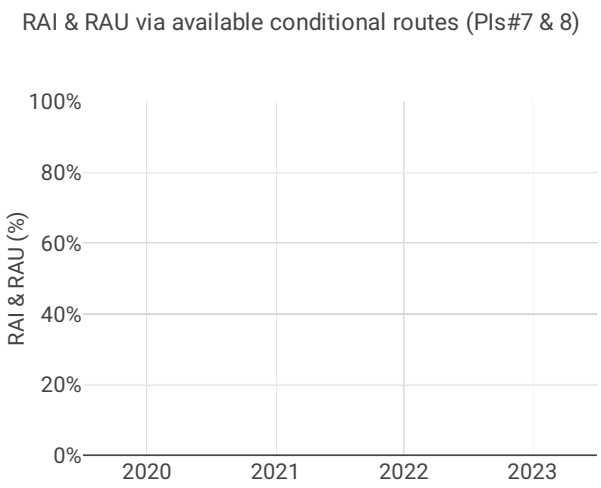
The share of CDO flights for Budapest (LHBP) has increased from 25.8% in 2022 to 26.8% in 2023. This value is below the overall RP3 value in 2023 (28.8%).
From May to October, the monthly values were below 26%.
According to the Hungarian monitoring report: *As the value of this performance indicator in 2023 is practically the same as in the previous year, no further initiatives are identified.*

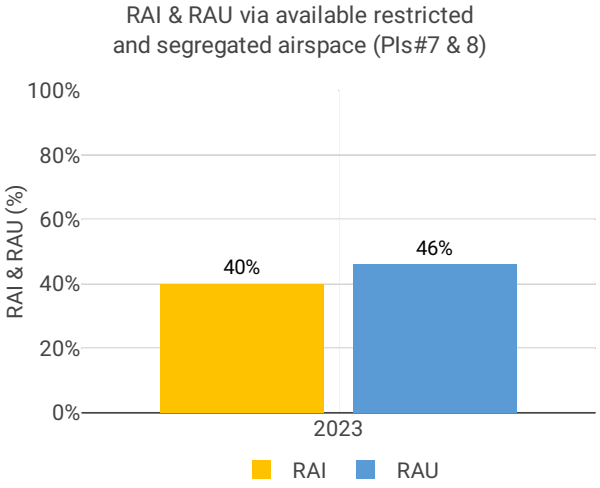
Airport level

	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
Budapest	0.87	1.06	1.40	1.09	NA	0.66	0.67	0.34	0.58	NA	33%	34%	26%	27%	NA

3.4 Civil-Military dimension







Focus on Civil-Military dimension

Update on Military dimension of the plan

The impact of military operations on civil traffic was very high in 2023. The war in Ukraine forced the Hungarian air defence and air force to create special training areas which were activated on an ad-hoc basis. Apart from those special air corridors were also established in order to allow the crossing of the allied forces UAVs.

Military - related measures implemented or planned to improve capacity

During the implementation of the new ad-hoc activation areas, HungaroControl representatives tried to negotiate the vertical dimension of these areas in a way that makes fewer problems for overflight traffic. Thanks to the good cooperation between the military and civil sides, these areas were active only when they were really needed and only for so long time which these special tasks in such a war environment required.

Initiatives implemented or planned to improve PI#6

The ongoing war in neighbouring Ukraine continues to have a very negative impact on the effectiveness of the use of military airspace, as special military airspaces, created to better respond to threats, have been activated on an ad-hoc basis.

Initiatives implemented or planned to improve PI#7

With the implementation of free route airspace in Hungary in 2015 all the ATS routes have been eliminated. Since that the entire CDR route concept has no meaning anymore in Hungary.

Initiatives implemented or planned to improve PI#8

With the implementation of free route airspace in Hungary in 2015 all the ATS routes have been eliminated. Since that the entire CDR route concept has no meaning anymore in Hungary.

4 CAPACITY - HUNGARY

4.1 PRB monitoring

• Hungary registered 0.99 minutes of average en route ATFM delay per flight during 2023 which has been adjusted to 0.81 during the post-ops adjustment process, thus not achieving the local target value of 0.11. Delays in Hungary increased by 0.27 minutes per flight year-on-year.

• Most of the delays were accumulated between May and December, driven by adverse weather conditions and the additional complexity due to the Ukrainian crisis.

• The share of delayed flights with delays longer than 15 minutes in Hungary decreased by 1 percentage point compared to 2022 and was higher than 2019 values.

• The average number of IFR movements was 16% above 2019 levels in Hungary 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 Budapest by 3 FTEs.

• The yearly total of sector opening hours in Budapest ACC was 35,265, showing a 4.5% decrease compared to 2022. Sector opening hours are 3.2% above 2019 levels.

• Budapest ACC registered 28.3 IFR movements per one sector opening hour in 2023, being 13.3% above 2019 levels.

• Year-on-year traffic growth in Hungary was 15% with IFR movements being 23% above the STATFOR 2021 October Base forecast, with the growth affecting already saturated sectors. The ongoing war in Ukraine increased traffic complexity in the Eastern part of the Hungarian airspace. These factors, combined with a lack of ATCOs, resulted in a significant capacity gap. Unless ATCO recruitment and training issues are resolved, the capacity gap will increase even further during the coming years.

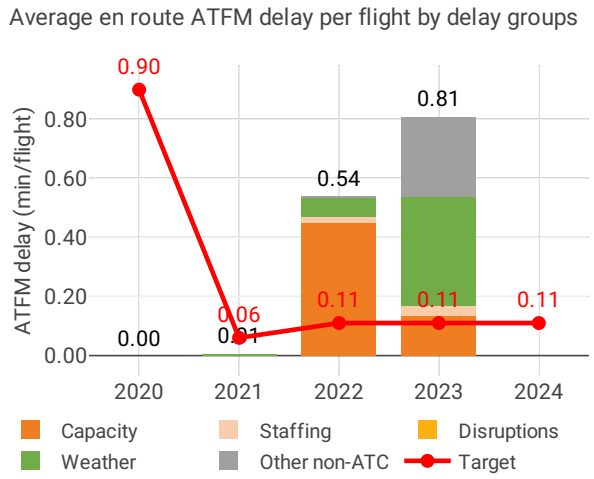
• Hungary registered an average airport arrival ATFM delay of 0.02 minutes per flight in 2023, achieving the local target of 0.05 minutes.

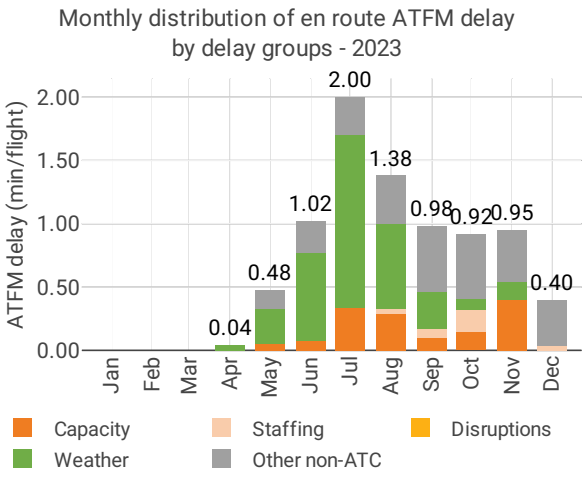
• Compared to 2022, the number of IFR arrivals in Hungary increased by 10%, while the average airport arrival ATFM delay increased from zero minutes to 0.02 minutes.

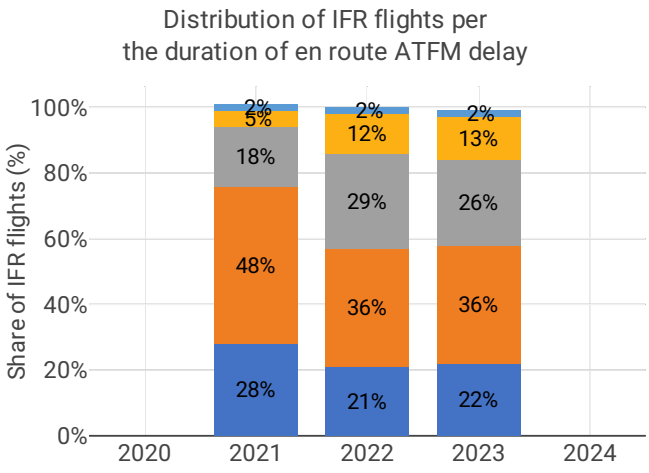
• The main reason for delays was ATC capacity, accounting for 100% of delays.

4.2 En route performance

4.2.1 En route ATFM delay (KPI#1)







Focus on en route ATFM delay

Summary of capacity performance

Hungary experienced an increase in traffic from 897k flights in 2022 to 1034k flights in 2023; during the same period en route ATFM delays increased from 481k minutes to 832k minutes. For reference in 2019, HungaroControl handled 892k flights with 1.4 million minutes of en route ATFM delay.)
There was an additional 187k minutes of ATFM delay originating in the Budapest ACC that were re-attributed to the DFS via the NM post operations delay attribution process, according to the NMB agreement for eNM/S23 measures, to ameliorate the capacity shortfall in Karlsruhe UAC.

NSA's assessment of capacity performance

The Ukrainian war has had a significant impact, in both operational and economic context of the service provision of ANS in Hungary. Operational: due to the closure of the Ukrainian airspace and the war-related sanctions, there have been reroutings in the Hungarian airspace, having a net positive and ever growing impact on the number of overflights. Traffic to and from Russia and Ukraine is missing, on the other hand, reroutings to and from North Europe, and the Far East (and other parts of Asia), as well as new routes between Russia and non-EU states have brought a significatnt amount of additional traffic. The size of this impact has further increased in 2023, as the traffic between Europe and Asia (mainly China) started to gain momentum. The Hungarian ANSP experienced a very strong recovery (with overflights passing the 2019-level by +17% on avg in 2023), and this was only in part a consequence of the reroutings, there was also a very strong increase of the organic traffic on the South-East axis. Especially in the summer, when leisure traffic from Western Europe to Greece and Türkiye created an unexpected high demand on our flow.
In addition to the already high demand, ANS provision was impacted by the war in one more way: there were military airspaces to decrease capacity and to increase complexity in the Hungarian airspace.
The war has caused a significant increase in traffic in Budapest ACC, resulting in traffic reaching +17% on avg vs2019 levels in 2023. Budapest ACC was able to manage the unexpected traffic growth but with significant delays. Although, Hungary was one of the delay hotspots in 2023, it should be noted that air traffic on the Eastern border of the Network was operated without any particular problems.
Our view is that a very significant part of the excess delay BUDAPEST ACC struggeled with in 2023 was due to the war.
We flagged this issue to the PRB and EC and also to the Network Management Board in 2023, before the Annual Monitoring Report of 2022. We understand that in 317/2019 the definition of "exceptional event" does not by word apply to our situation, we still belive that by the legislative intent a regular war in the neighbouring country, causing significant disruptions does qualify as an "exceptional event". With that said, throughout 2023 we reported our delay minutes associated with the war (based on some method agreed with the NM) under the "O" other delay category. We hope that in the 2023 Annual Monitoring Report a certain distinction would be made based on this categorization.
The continuous war in the neighbouring country has caused a significant increase in traffic in Budapest ACC, resulting in traffic well above the pre-COVID 2019 levels (+17%). Budapest ACC was able to manage the extreme traffic growth with 30% fewer delays than in 2019, which was not enough to meet the target, but allowed air traffic on the Eastern border of the Network to operate without any particular problems.

Monitoring process for capacity performance

NSA has monitored the roster planning for the summer season and also the evaluation of ATCO utilisation during the daily shift rostering.
Delay trend was also monitored but no need for intervention was identified.

Capacity planning

The capacity planning for 2023 with NM was completed in January and it was already anticipated that capacity problems can occur during the summer.
The main reason for the capacity problem was that there were not enough ACC ATCOs available.
The working schedule for the summer period has been designed to allow 7 sectors to open during the busiest periods of the day.
In addition, all office staff with valid ACC licences have been assigned to work as much as possible in the ACC sectors in Budapest.

As there are no indications that the war in Ukraine will end in the near future and the demand for overflight traffic in the Budapest ACC remains very high, further adjustments are needed in terms of sector capacity and in the availability (rostering) of ATCOs.
Despite the fact that the first wave of newly recruited ATCO students will complete their training in autumn 2024, the NSA proposes to launch additional ACC training courses with a large number of new recruits, considering the expected retirement rate and the recommencement of the Hungarian ATCOs employment abroad.
The NSA is aware of the unfortunate trend of ATCOs leaving HungaroControl for other ANSPs in Europe.

Application of Corrective Measures for Capacity (if applicable)

In 2023, ATCO training was ramped up (number of trainees was increased to maximum training capacity) to react to the explosion of traffic demand. However, the first ATCOs from this course will start work only in 2025. Therefore in the short run (i.e. through 2023-2024) capacity problems will deteriorate. Even the increased number of trainees will not be enough to serve this traffic we are currently serving. Hungaro-Control has started to explore further options to provide the necessary number of ATCOs, as the originally planned number of ATCOs is not (and will not be) enough to manage the traffic without disruptions (regulations, delays and re-routings of the re-routings).
Three main measures have been enacted to improve capacity performance:
1. Increase in sector capacity values - ACC en-route sector capacity values were reviewed and modified - ongoing and due by Q2/2024;
2. Fine tuning of ATCO roster - with fine-tuning of ATCO rostering, more ATCOs will be available for peaks - ongoing and due by Q2/2024;
3. Implementation (test operations) of Complexity tool - with the implementation of Complexity tool, more balanced workload is expected in the ACC sectors - ongoing and due by Q2/2024

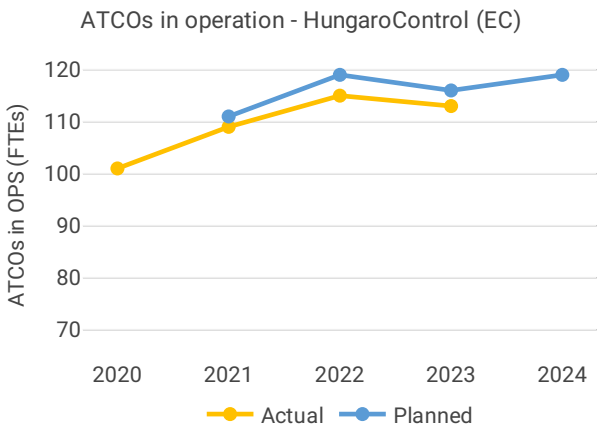
In response to measures introduced in previous calendar years the NSA also monitors the implementation of the training plan as part of the annual monitoring process.

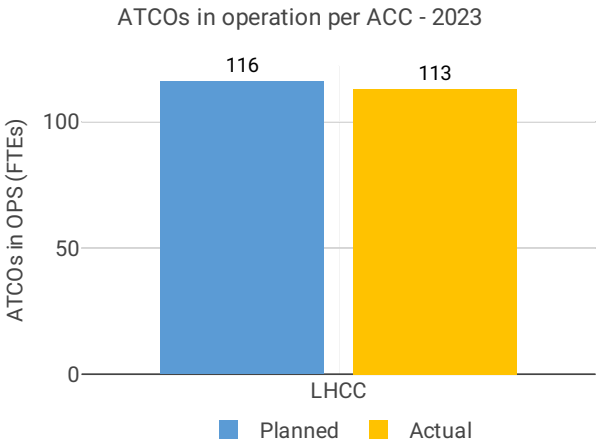
Additional Information Related to Russia's War of Aggression Against Ukraine The Ukraine war has continued a significant impact in traffic in Budapest ACC, resulting in traffic well above pre-COVID 2019 levels already in 2022.
Our view is that had the war not broken out, Budapest ACC would have been able to handle the 2023 traffic within its capacity target.
We believe that a very significant part of the excess delay was due to the war.
Due to the significant increase in traffic caused by the war, we made an adjustments to the capacity of HIGH/TOP sectors, and also made some fine tuning of ATCO rostering. In addition to that a Complexity tool will be implemented during Q2 2024

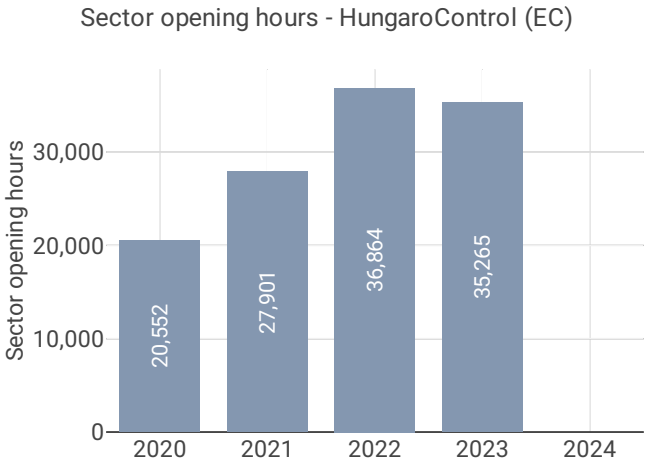
En route Capacity Incentive Scheme

HungaroControl: According to incentive scheme defined in monitoring report a penalty of 196;195;160 HUF is due.In accordance with Article 3(3)(a) of Implementing Regulation (EU) 2020/1627: The incentive scheme shall cover only the calendar years 2022 to 2024.

4.2.2 Other indicators



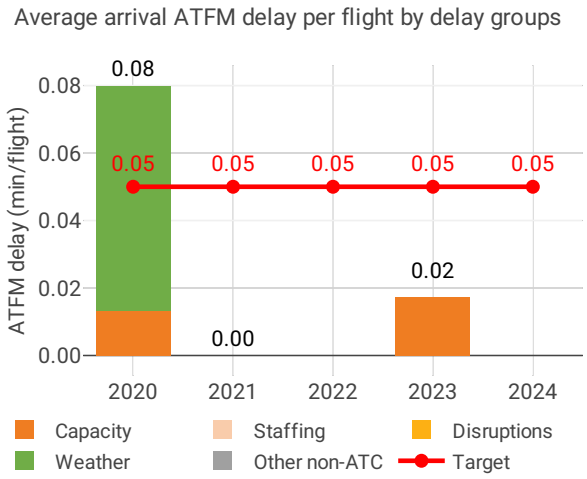


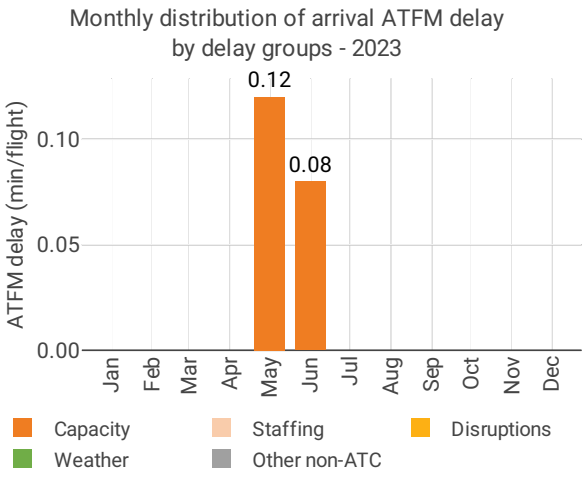


Focus on ATCOs in operations

4.3 Terminal performance

4.3.1 Arrival ATFM delay (KPI#2)





Focus on arrival ATFM delay

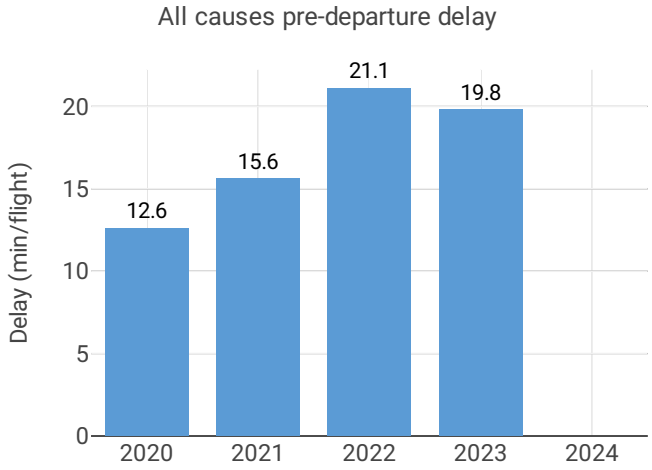
Hungary identified only its main airport Budapest as subject to RP3 monitoring. The Airport Operator Data Flow is correctly established and all capacity indicators can be monitored.
Traffic at Budapest airport in 2023 was still 12% lower compared to 2019 but 10% higher than in 2022.

Low arrival ATFM delays were observed in 2023 at Budapest (0.02 min/arr) while ATFM slot adherence has slightly deteriorated (2023: 96.2%; 2022: 95.4%).

Arrival ATFM delays at Budapest (LHBP: 2019: 0.03 min/arr.; 2020: 0.08 min/arr.; 2021: 0 min/arr.; 2022: 0 min/arr.; 2023: 0.02 min/arr.) increased slightly in 2023 but remain very low. All these regulations were attributed to ATC capacity.The Hungarian monitoring report mentions: *The traffic demand at Budapest Ferihegy airport was around 90% of the 2019's traffic.*
Since the Russian's war of aggression has continued against Ukraine all flights to/and from Russia and Ukraine were cancelled also in 2023 which represented less than 10% of LHBP traffic.
There was no war related delay at LHBP in 2023.
There was no need for any remedial action as a consequence of the Russian's war of aggression against Ukraine.

The Hungarian performance plan sets a national target on arrival ATFM delay for 2023 of 0.05 min/arr. This target was met with an actual performance of 0.02 min/arr.
According to the Hungarian monitoring report, this performance corresponds to the maximum bonus (0.50%), computed by the NSA as HUF 43 923 353

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
Budapest	0.08	0.00	NA	0.02	96.2%	96.0%	95.4%	96.2%

	ATC pre departure delay (PI#2)				All causes pre departure delay (PI#3)			
Airport name	2020	2021	2022	2023	2020	2021	2022	2023
Budapest	0.14	0.14	0.10	0.05	12.6	15.6	21.1	19.8

Focus on performance indicators at airport level

ATFM slot adherence

Budapest's ATFM slot compliance was 96.2%, a slight improvement with respect to 2022 (95.4%). With regard to the 3.8% of flights that did not adhere, 1.7% was early and 2.1% was late
The Hungarian monitoring report remarks that *ATFM compliance has been at roughly the same level and in line with expectations for years.*

ATC pre-departure delay

The performance in terms of ATC pre-departure delay at Budapest has further improved with respect to the previous years (LHBP; 2019: 0.30 min/dep.; 2020: 0.16 min/dep.; 2021: 0.14 min/dep.; 2022: 0.10 min/dep.; 2023: 0.05 min/dep.)
According to the Hungarian monitoring report: *The actual performance in the field of pre-departures delay shows continuous improvement since 2020, and this is in line with the expectation.*

All causes pre-departure delay

The total (all causes) delay in the actual off block time at Budapest in 2023 decreased but remained high and slightly above the SES average of 19.15 min/dep (LHBP: 2020: 12.58 min/dep.; 2021: 15.61 min/dep.; 2022: 21.12 min/dep.; 2023: 19.76 min/dep.).
According to the Hungarian monitoring report: *The actual performance in this respect was a bit better than in the previous year, which could be explained with the improvement of the overall staffing issues at the LHBP.*

5 COST-EFFIENCY - HUNGARY

5.1 PRB monitoring

• The en route 2023 actual unit cost of Hungary was 26.93 €2017, -30% lower than the determined unit cost (38.32 €2017). The terminal 2023 actual unit cost was 274.94 €2017, -24% lower than the determined unit cost (362.91 €2017).

• The en route 2023 actual service units (3.7M) were +29% higher than the determined service units (2.9M).

• In 2023, the en route actual total costs were -10 M€2017 lower (-9.1%) compared to determined. The underspend in actual costs was mainly attributable to staff costs (-7.4 M€2017, or -15%), which resulted from lower-than-expected headcount. Additionally, the underspend of other operating costs (-3.9 M€2017, or -11%) was mainly due to savings arising from various rising expenses, such as energy prices and external service charges, that increased at a rate below inflation. The cost of capital was the only cost category to register an increase (+2.6 M€2017, or +35%), mainly due to a significant growth in net current assets (+38 M€2017, or +168%). The NSA attributed the higher-than-planned net current assets to the inclusion of pension-related obligations, a situation that was also reported in 2022.

• Hungary presented a deviation from the criteria to achieve capacity targets, which was considered justified. As was the case in 2022, costs have stayed significantly below the determined, while the capacity targets have not been met.

• HungaroControl spent 29 M€2017 in 2023 related to costs of investments for both en route and terminal charging zones, -21% less than determined (36 M€2017), mainly due to some investments being scheduled later than determined.

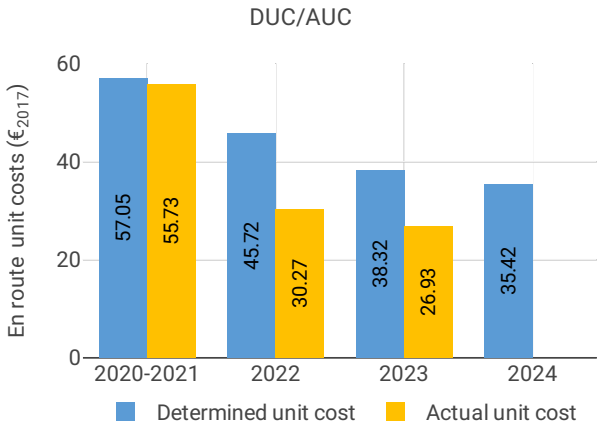
• The en route actual unit cost incurred by users in 2023 was 32.94€ (-7.8% below the 2023 DUC), while the terminal actual unit cost incurred by users was 335.29€ (+0.4% above the 2023 DUC).

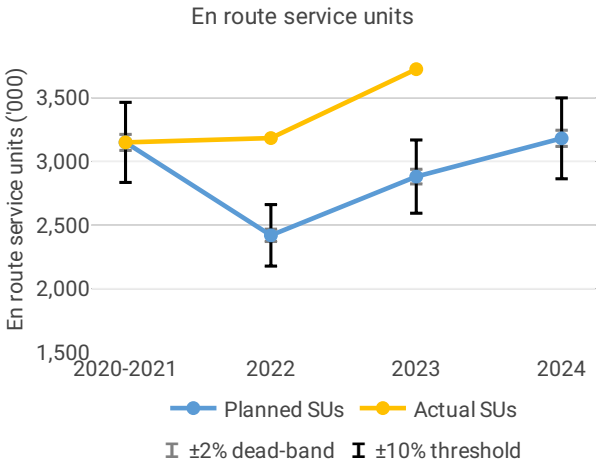
• The en route regulatory result for HungaroControl amounted to +21 M€, or 19% of the 2023 revenue. This may indicate that the airspace users are charged for costs which have not materialised in 2023.

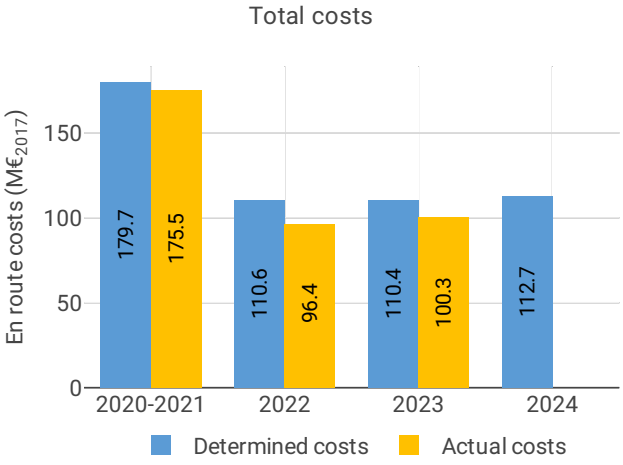
• The PRB will take into consideration the implementation of the RP3 performance plans when assessing the RP4 cost-efficiency targets and recommends that the NSA of Hungary submits a detailed report of the capacity-related measures implemented during 2024. Should the RP3 planned measures not be implemented by the end of RP3, the PRB recommends Hungary to consider the reimbursement to airspace users of excess funds received by ANSPs for measures not implemented.

5.2 En route charging zone

5.2.1 Unit cost (KPI#1)

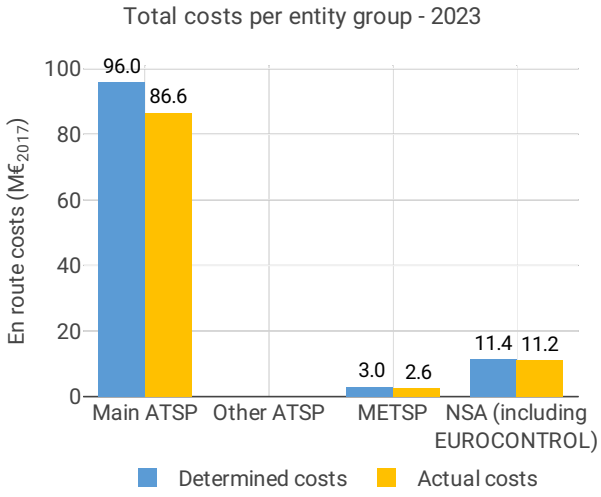


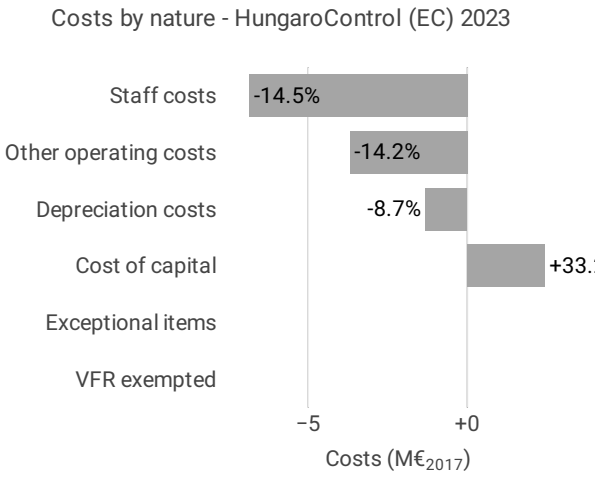




Actual and determined data

Total costs - nominal (M€)	2020-2021	2022	2023	2024
Actual costs	191	117	137	NA
Determined costs	195	124	127	132
Difference costs	-4	-7	10	NA
Inflation assumptions	**2020-2021**	**2022**	**2023**	**2024**
Determined inflation rate	NA	3.5%	3.3%	3.0%
Determined inflation index	NA	118	121.9	125.5
Actual inflation rate	NA	15.3%	17.0%	NA
Actual inflation index	NA	133.4	156.1	NA
Difference inflation index (p.p.)	NA	+15.4	+34.3	NA





Focus on unit cost

AUC vs. DUC

In 2023, the en route AUC was -29.7% (or -3 520.25 HUF2017, -11.39 €2017) lower than the planned DUC. This results from the combination of significantly higher than planned TSUs (+29.3%) and significantly lower than planned en route costs in real terms (-9.1%, or -3 115.7 MHUF2017, -10.1 M€2017). It should be noted that actual inflation index in 2023 was +34.3 p.p. higher than planned.

En route service units

The difference between actual and planned TSUs (+29.3%) falls outside 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

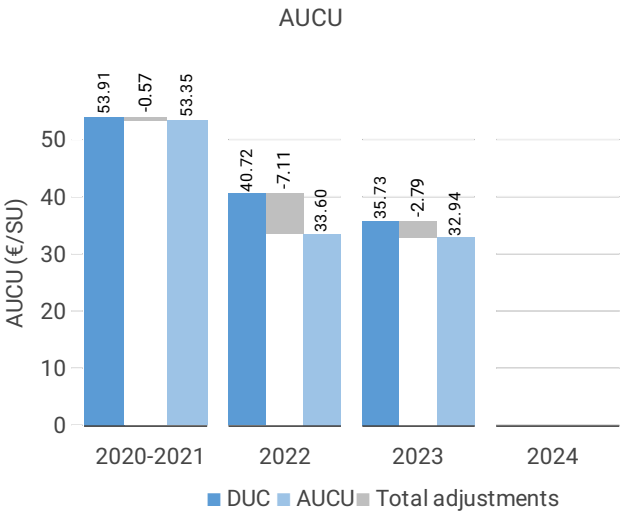
Actual real en route costs are -9.1% (-10.1 M€2017) lower than planned. This is the result of lower costs for the main ANSP, HungaroControl (-9.8%, or -9.4 M€2017), the MET service provider (-14.8%, or -0.5 M€2017) and the NSA/EUROCONTROL (-1.8%, or -0.2 M€2017).

En route costs for the main ANSP at charging zone level

Significantly lower than planned en route costs in real terms for HungaroControl in 2023 (-9.8%, or -9.4 M€2017) result from:

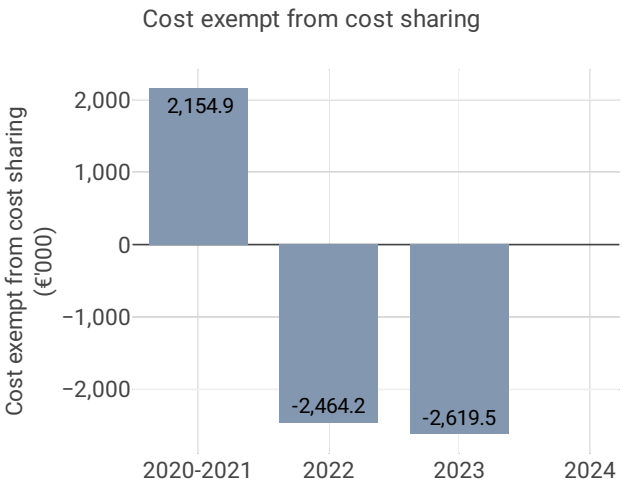
- Significantly lower staff costs in real terms (-14.5%), but higher in nominal terms (+9.6%), due to a higher than expected inflation which led to an increase in ATCO and non-ATCO salaries above the performance plan, albeit partially offset by lower-than-expected headcount;
- Significantly lower other operating costs in real terms (-14.2%), but higher in nominal terms (+10.0%), due to higher energy prices, external service charges, local business taxes and liability insurance premiums;
- Significantly lower depreciation (-8.7%), due to the postponement or delay in the implementation of investments;
- Significantly higher cost of capital (+33.2%), mainly due to the recognition of the pension related obligations towards the ATCO's in the employed capital.

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



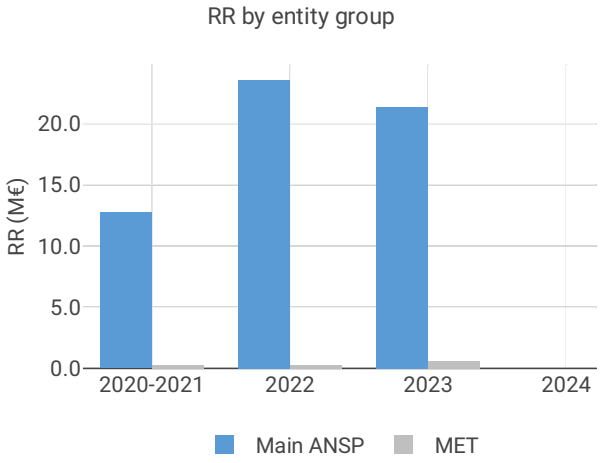
AUCU components (€/SU) – 2023

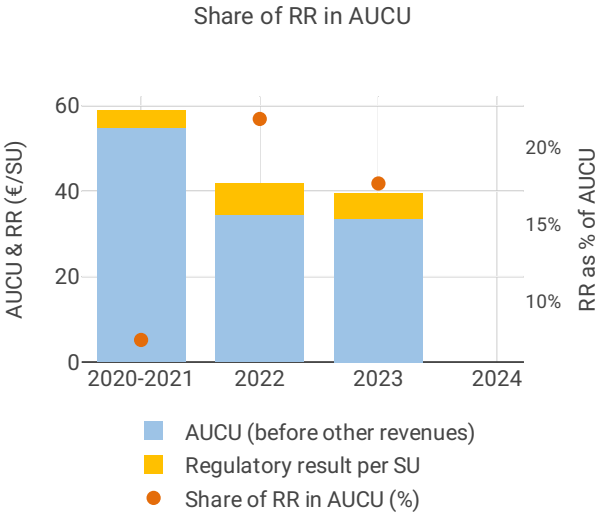
Components of the AUCU in 2023	€/SU
DUC	**35.73**
Inflation adjustment	5.65
Cost exempt from cost-sharing	-0.70
Traffic risk sharing adjustment	-6.07
Traffic adj. (costs not TRS)	-0.95
Finantial incentives	-0.14
Modulation of charges	0.00
Cross-financing	0.00
Other revenues	-0.57
Application of lower unit rate	0.00
Total adjustments	-2.79
AUCU	**32.94**
AUCU vs. DUC	**-7.8%**

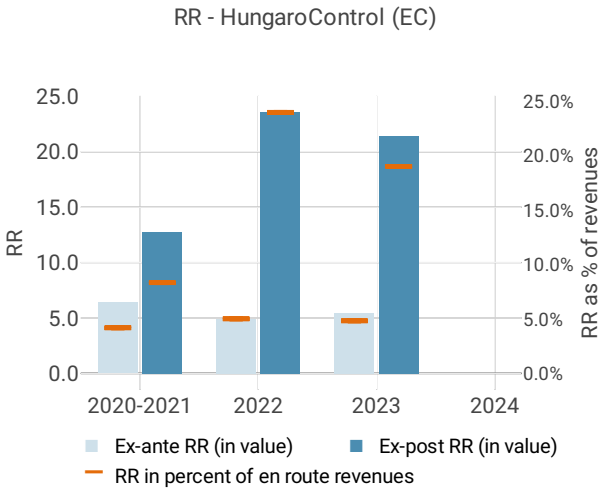


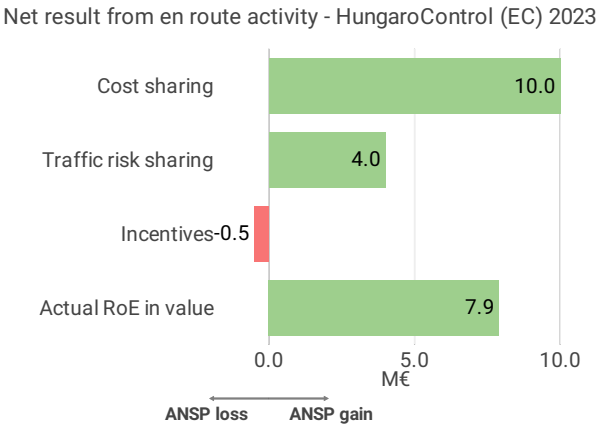
Cost exempt from cost sharing by item - 2023	€'000	€/SU
New and existing investments	-2,455.5	-0.66
Competent authorities and qualified entities costs	-466.0	-0.13
Eurocontrol costs	301.9	0.08
Pension costs	0.0	0.00
Interest on loans	0.0	0.00
Changes in law	0.0	0.00
Total cost exempt from cost risk sharing	**-2,619.5**	**-0.70**

5.2.3 Regulatory result (RR)









Focus on regulatory result

HungaroControl net gain on activity in the Hungary en route charging zone in the year 2023

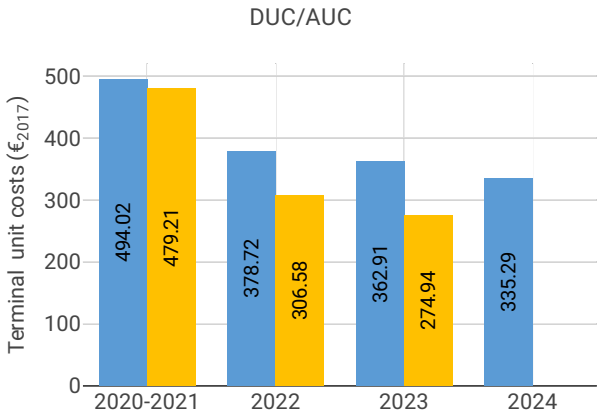
HungaroControl reported a net gain of +5 136.4 MHUF, as a combination of a gain of +3 809.3 MHUF arising from the cost sharing mechanism, with a gain of +1 523.3 MHUF arising from the traffic risk sharing mechanism and a loss of -196.2 MHUF relating to financial incentives.

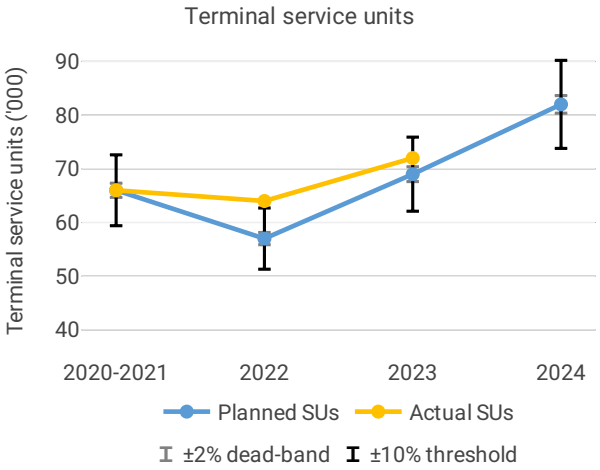
HungaroControl overall regulatory results (RR) for the en route activity

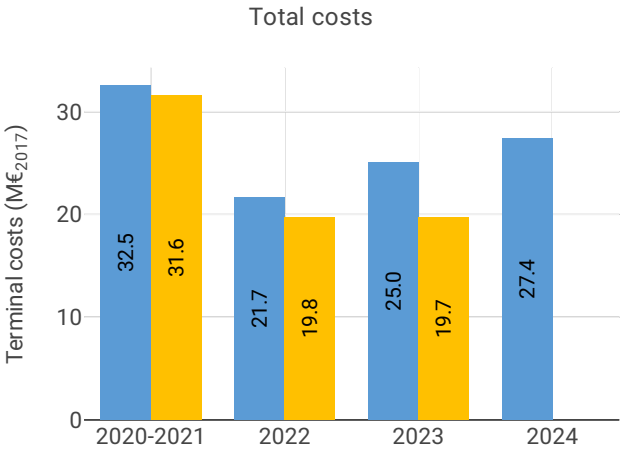
Ex-post, the overall RR taking into account the net gain from the en route activity mentioned above (+5 136.4 MHUF) and the actual RoE (+3 016.7 MHUF) amounts to +8 153.1 MHUF (19.0% of the en route revenues). The resulting ex-post rate of return on equity is 19.3%, which is higher than the 8.0% planned in the PP.

5.3 Terminal charging zone

5.3.1 Unit cost (KPI#1)

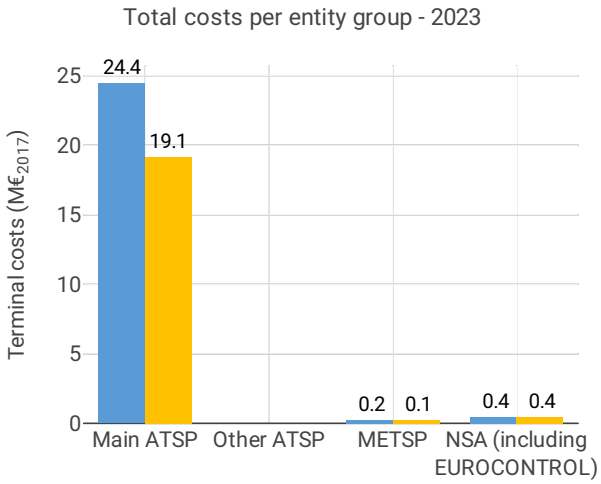


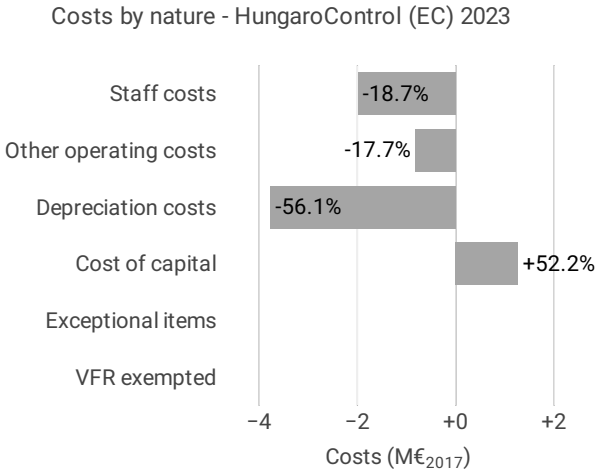




Actual and determined data

Total costs - nominal (M€)	2020-2021	2022	2023	2024
Actual costs	35	24	27	NA
Determined costs	36	25	28	31
Difference costs	-1	0	-2	NA
Inflation assumptions	**2020-2021**	**2022**	**2023**	**2024**
Determined inflation rate	NA	3.5%	3.3%	3.0%
Determined inflation index	NA	118	121.9	125.5
Actual inflation rate	NA	15.3%	17.0%	NA
Actual inflation index	NA	133.4	156.1	NA
Difference inflation index (p.p.)	NA	+15.4	+34.3	NA





Focus on unit cost

AUC vs. DUC

In 2023, the terminal AUC was -24.2% (or -27 181.05 HUF2017, -87.97 €2017) lower than the planned DUC. This results from the combination of significantly lower than planned terminal costs in real terms (-21.3%, or -1 650.5 MHUF2017, -5.3 M€2017) and higher than planned TNSUs (+3.9%). It should be noted that actual inflation index in 2023 was +34.3 p.p. higher than planned.

Terminal service units

The difference between actual and planned TNSUs (+3.9%) 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 terminal revenues is therefore shared between the ANSP and the airspace users.

Terminal costs by entity

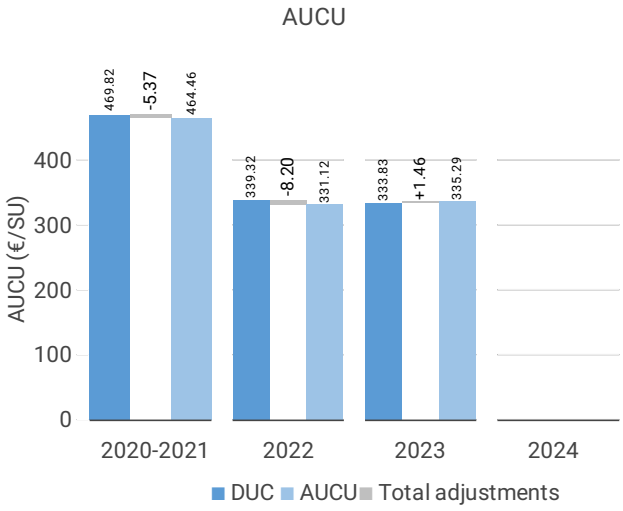
Actual real terminal costs are -21.3% (-5.3 M€2017) lower than planned. This is the result of lower costs for the main ANSP, HungaroControl (-21.7%, or -5.3 M€2017) and the MET service provider (-22.4%, or 0.04 M€2017) and higher costs for the NSA (+0.5%, or +0.002 M€2017).

Terminal costs for the main ANSP at charging zone level

Significantly lower than planned terminal costs in real terms for HungaroControl in 2023 (-21.7%, or -5.3 M€2017) result from:

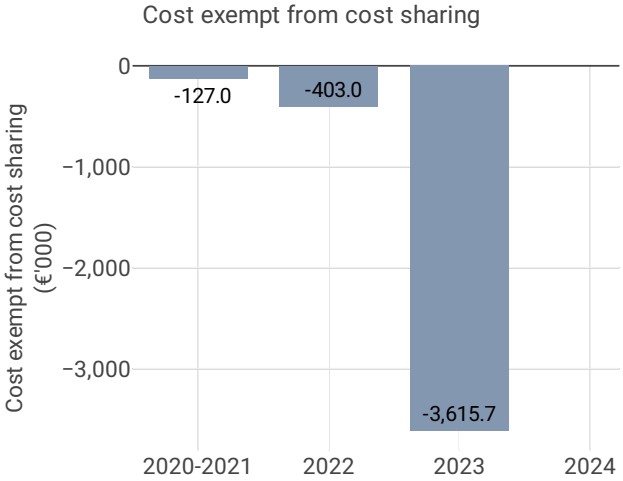
- Significantly lower staff costs in real terms (-18.7%), but higher in nominal terms (+4.2%), due to a higher than expected inflation which led to an increase in ATCO and non-ATCO salaries above the plan, albeit partially offset by lower-than-expected headcount;
- Significantly lower other operating costs in real terms (-17.7%), but higher in nominal terms (+5.4%), due to higher energy prices, external service charges, local business taxes and liability insurance premiums;
- Significantly lower depreciation costs (-56.1%), due to the postponement or late implementation of investments such as the mirTWR project;
- Significantly higher cost of capital (+52.2%) mainly due to the recognition of the pension related obligations towards the ATCO's in the employed capital.

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



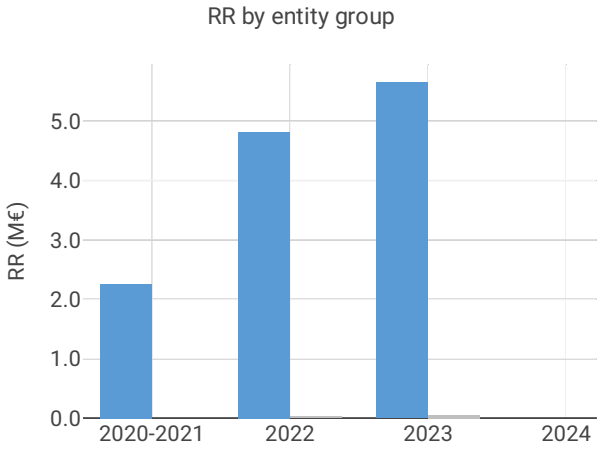
AUCU components (€/SU) – 2023

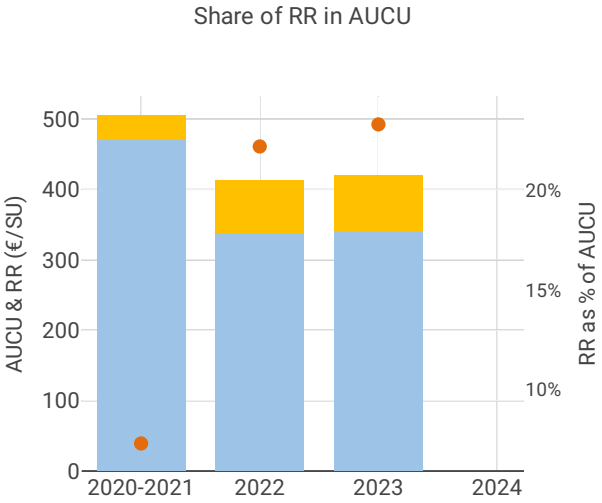
Components of the AUCU in 2023	€/SU
DUC	**333.83**
Inflation adjustment	59.88
Cost exempt from cost-sharing	-50.43
Traffic risk sharing adjustment	-4.07
Traffic adj. (costs not TRS)	-0.28
Finantial incentives	1.61
Modulation of charges	0.00
Cross-financing	0.00
Other revenues	-5.24
Application of lower unit rate	0.00
Total adjustments	1.46
AUCU	**335.29**
AUCU vs. DUC	**+0.4%**

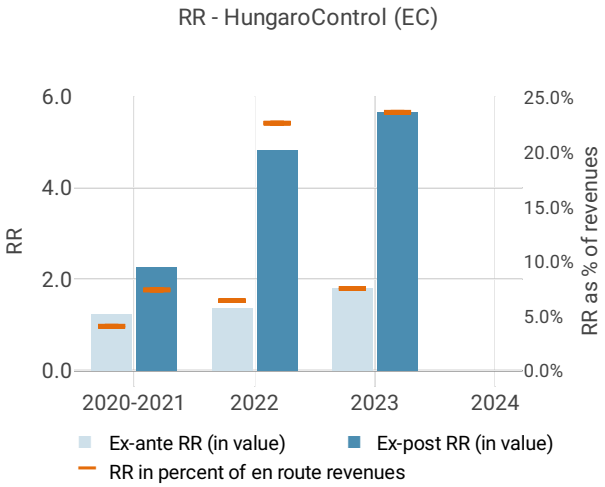


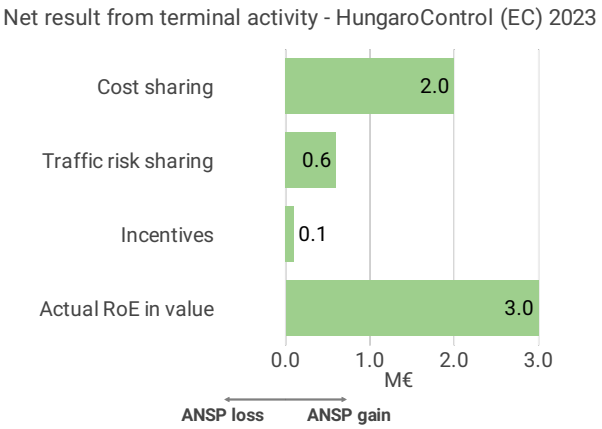
Cost exempt from cost sharing by item - 2023	€'000	€/SU
New and existing investments	-3,617.6	-50.46
Competent authorities and qualified entities costs	1.8	0.03
Eurocontrol costs	0.0	0.00
Pension costs	0.0	0.00
Interest on loans	0.0	0.00
Changes in law	0.0	0.00
Total cost exempt from cost risk sharing	**-3,615.7**	**-50.43**

5.3.3 Regulatory result (RR)









Focus on regulatory result

HungaroControl net gain on activity in the Hungary terminal charging zone in the year 2023

HungaroControl reported a net gain of +1 012.6 MHUF, as a combination of a gain of +749.3 MHUF arising from the cost sharing mechanism, with a gain of +219.4 MHUF arising from the traffic risk sharing mechanism and a gain of +43.9 MHUF relating to financial incentives.

HungaroControl overall regulatory results (RR) for the terminal activity

Ex-post, the overall RR taking into account the net gain from the terminal activity mentioned above (+1 012.6 MHUF) and the actual RoE (+1 142.2 MHUF) amounts to +2 154.8 MHUF (23.7% of the terminal revenues). The resulting ex-post rate of return on equity is 13.5%, which is higher than the 8.0% planned in the PP.