

# **Performance Review Board**

## **Monitoring Report**

### **Hungary - 2024**



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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:**

- $\geq 80^{\circ}\text{K}$  1
- $< 80^{\circ}\text{K}$  0

**Exchange rate (1 EUR=)**  
2017: 308.993 HUF  
2024: 395.113 HUF

**Share of Union-wide:**

- traffic (TSUs) 2024 3.0%
- en route costs 2024 1.9%

**Share en route / terminal costs 2024** 82% / 18%

**En route charging zone(s)**  
Hungary

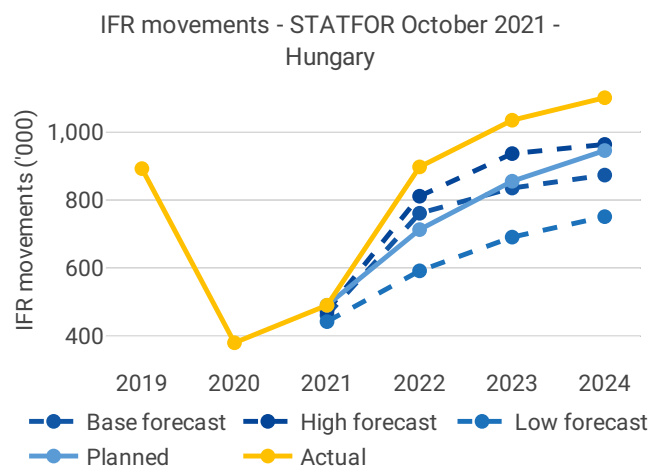
**Terminal charging zone(s)**  
Hungary

**Main ANSP**  
• HungaroControl (EC)

**Other ANSPs**  
-

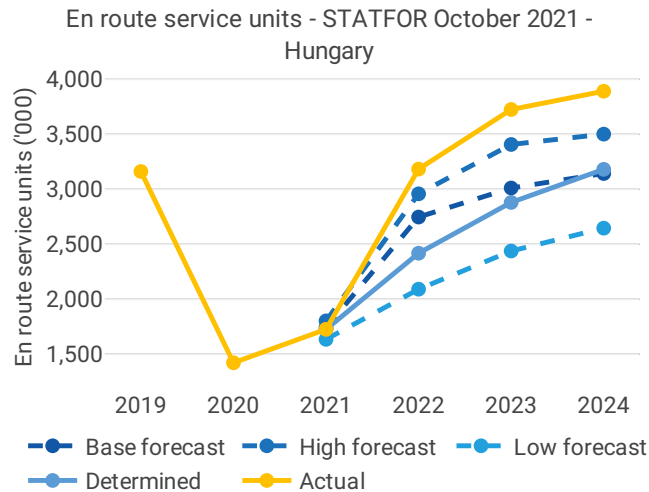
**MET Providers**  
• Hungarian Meteorological Service (Országos Meteorológiai Szolgálat)

### 1.2 Traffic (En route traffic zone)



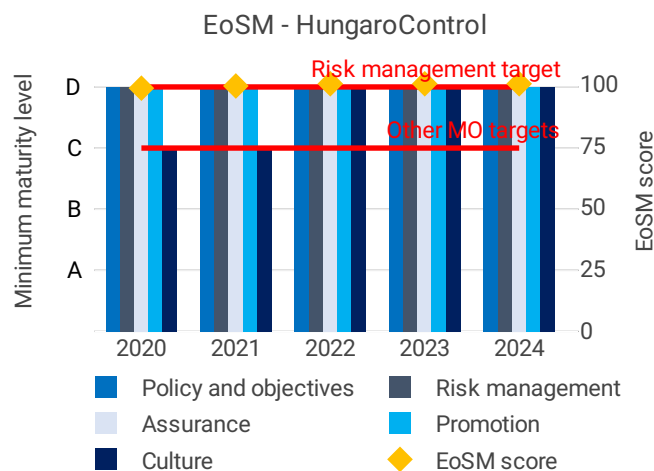
- Hungary recorded 1,100K actual IFR movements in 2024, +6.4% compared to 2023 (1,034K).
- Actual 2024 IFR movements were +16.4% above the plan (945K).
- Actual 2024 IFR movements are +23.3% above the actual 2019 level (892K).





- Hungary recorded 3,892K actual service units in 2024, +4.5% compared to 2023 (3,726K).
- Actual 2024 service units were +22.3% above the plan (3,182K).
- Actual 2024 service units are +23.1% above the actual 2019 level (3,162K).

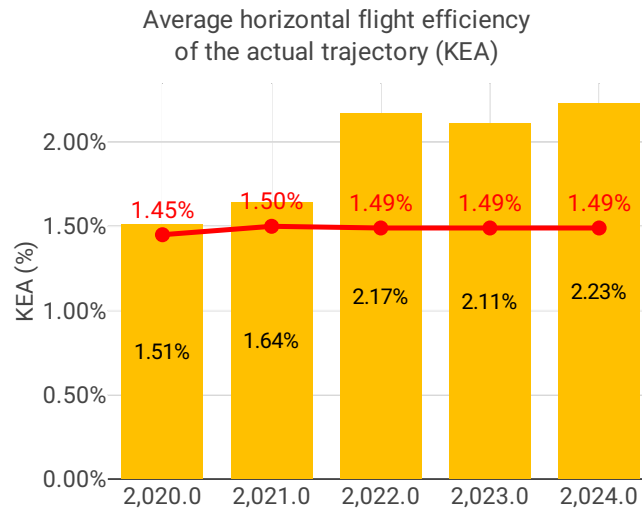
### 1.3 Safety (Main ANSP)



- HungaroControl achieved the RP3 EoS M targets in 2020 and continued to improve its performance. In 2024 HungaroControl maintained Level D for all five management objectives.
- Hungary recorded no runway incursions (RIs) in 2024, and a similar rate of separation minima infringements (SMIs) compared with 2023.

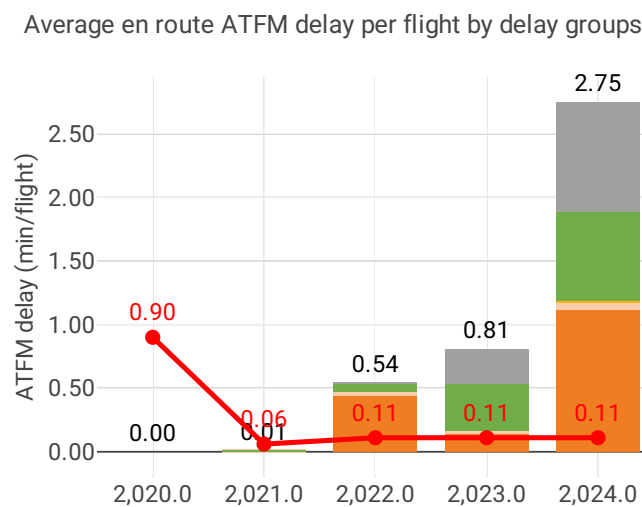


## 1.4 Environment (Member State)



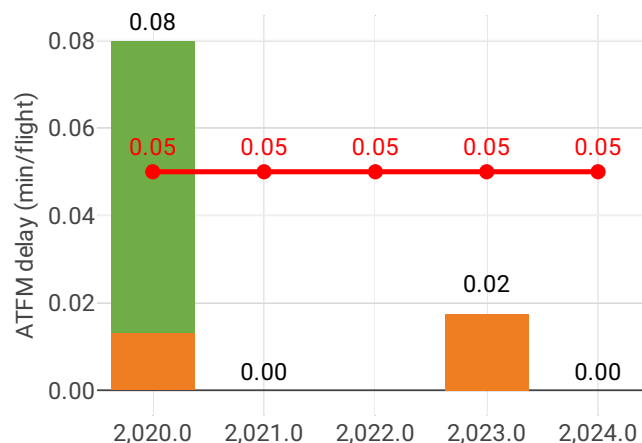
- Hungary achieved a KEA performance of 2.23% compared to its target of 1.49% and did not contribute positively towards achieving the Union-wide target.
- The NSA states the deterioration in performance resulted from the extra distance flown caused by Russia's war of aggression against Ukraine.
- Both KEP and SCR improved in comparison with 2023. 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 decreased from 27.26% to 26.14% in 2024.
- Additional taxi out time increased from 1.09 to 1.31 min/flight, while additional time in terminal airspace increased from 0.58 to 0.77 min/flight in 2024 compared to 2023.

## 1.5 Capacity (Member State)



- Hungary registered 2.64 minutes of average en route ATFM delay per flight during 2024, which has been adjusted to 2.75 during the post-ops adjustment process, thus not achieving the local target value of 0.11. Delays in Hungary increased by 1.94 minutes per flight year-on-year.
- Delays were highest between May and September, mostly related to the lack of ATC Capacity, 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 increased by 2 percentage points compared to 2023 and was higher than 2019 values.
- The average number of IFR movements was 23% above 2019 levels in Hungary in 2024.
- The number of ATCOs in OPS is 114, being below the 2024 plan in Budapest by 5 FTEs.
- The yearly total of sector opening hours in Budapest ACC was 34,903, showing a 1.0% decrease compared to 2023. Sector opening hours are 3.0% above 2019 levels.
- Budapest ACC registered 30.36 IFR movements per one sector opening hour in 2024, being 21.6% above 2019 levels.
- Delays in Hungary increased dramatically in 2024 compared to 2023, due to the efforts to mitigate the additional complexity and traffic growth resulting from the impact of Russia's war of aggression against Ukraine not being sufficient. Hungary should continue to work closely with the Network Manager and all stakeholders to mitigate the impact of Russia's war of aggression against Ukraine and ensure that all measures within the remit of the ANSP are implemented as planned. Actual 2025 values up to August show an improvement.

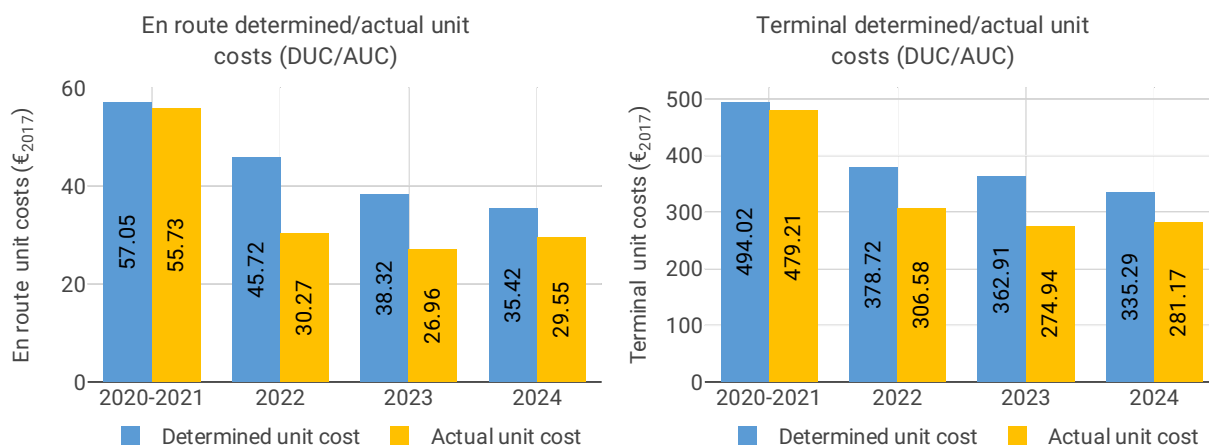
Average arrival ATFM delay per flight by delay groups



- Hungary registered zero minutes of average airport arrival ATFM delay per flight in 2024, thus achieving its local target of 0.05 minutes.
- Compared to 2023, the number of IFR arrivals in Hungary increased by 17%, while the average airport arrival ATFM delay decreased from 0.02 to zero minutes.



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



- The en route 2024 actual unit cost of Hungary was 29.55€<sub>2017</sub>, -17% lower than the determined unit cost (35.42€<sub>2017</sub>). The terminal 2024 actual unit cost was 281.17€<sub>2017</sub>, -16% lower than the determined unit cost (335.29€<sub>2017</sub>).
- The en route 2024 actual service units (3.9M) were +22% higher than the determined service units (3.2M).
- The en route 2024 actual total costs were 2.3M€<sub>2017</sub> (+2.0%) higher than determined. The largest difference was a higher than determined staff costs for HungaroControl (+3.5M €<sub>2017</sub>, or +7.2%), due to salary increases for both ATCO and non-ATCO positions resulting from high inflation, partly offset by lower than planned staff numbers. This difference is partially compensated by lower other operating costs in real terms (-3.1M€<sub>2017</sub>, or -12%), due to the effect of inflation.
- HungaroControl costs of investments were 32M€<sub>2017</sub> in 2024 for both en route and terminal charging zones, -21% less than determined (40M€<sub>2017</sub>). The difference is mainly due to underspend of -23% (-5.8M €<sub>2017</sub>) in depreciation. The NSA explained that the lower than planned depreciation is due to delays in the implementation of the investment plan accumulated during RP3.
- The en route actual unit cost incurred by users in 2024 was 32.04€ (-1.5% below the 2024 DUC), while the terminal actual unit cost incurred by users was 288.25€ (-4.2% below the 2024 DUC).
- Hungary's RP3 performance plan included justifications for a deviation to achieve the RP3 capacity targets. The main measures included the recruitment and training of new ATCOs and a number of investments to increase capacity. Hungary has not submitted a detailed report of the capacity-related measures implemented. However, the number of ATCOs in operation at the end of RP3 is below the plan, and costs for new major investments are significantly lower than determined. Hungary should reimburse to airspace users the excess funds received by the ANSP for measures not implemented.

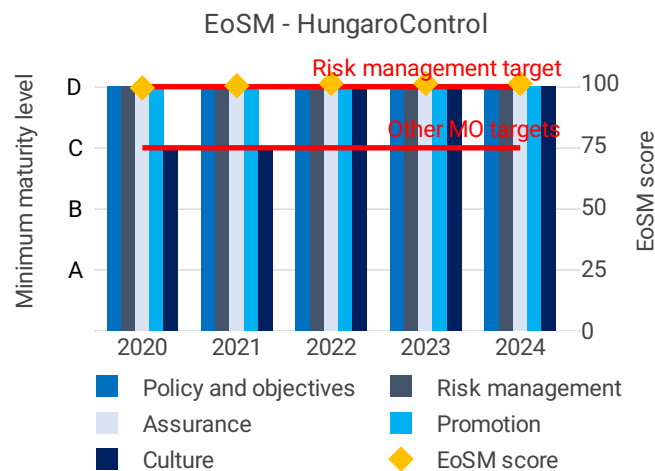


## 2 SAFETY - HUNGARY

### 2.1 PRB monitoring

- HungaroControl achieved the RP3 EoSM targets in 2020 and continued to improve its performance. In 2024 HungaroControl maintained Level D for all five management objectives.
- Hungary recorded no runway incursions (RIs) in 2024, and a similar rate of separation minima infringements (SMIs) compared with 2023.

### 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.

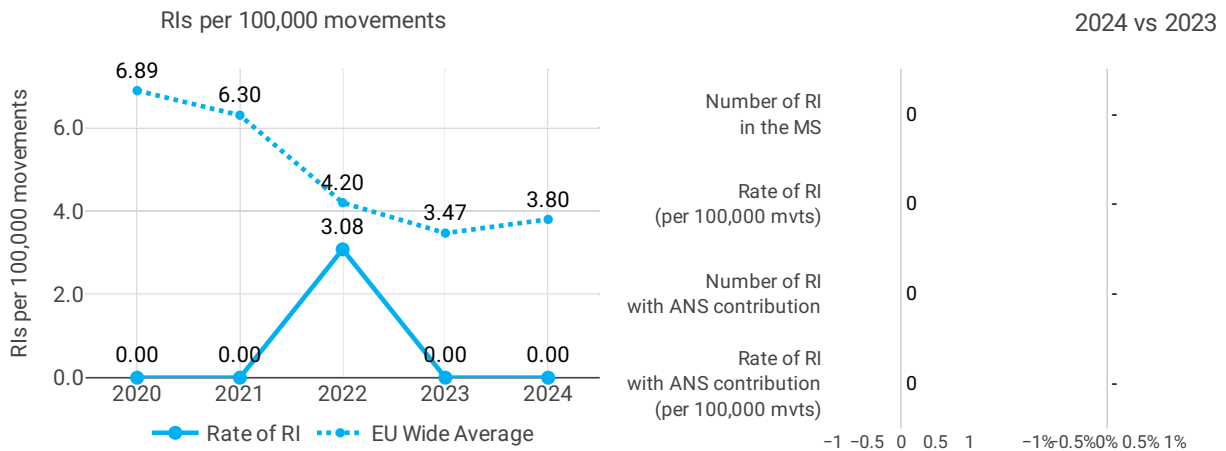
HungaroControl achieved the RP3 targets in 2020 and continued to improve its SMS reaching maturity level D in all Management Objectives in 2022.

HungaroControl operates a five-year safety development plan, with activities designed to support compliance with Level D effectiveness requirements.



## 2.3 Safety occurrences

### 2.3.1 Rate of runway incursions (RIs) (PI#1)



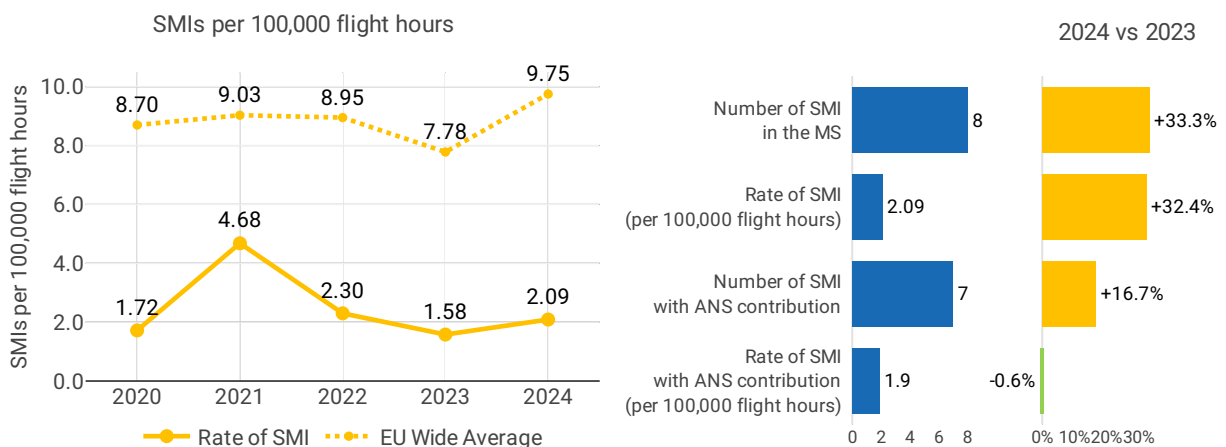
#### Rate of RIs per 100,000 airport movements - Hungary

| # | Airport name        | APT movements | Number of RI | Rate RI per 100,000 |
|---|---------------------|---------------|--------------|---------------------|
| 1 | Budapest - Ferihegy | 125,414       | 0            | 0.00                |

### Focus on runway incursions

Aside from 2022, Hungary has recorded no runway incursions during RP3 at Member State level. Similar results have been recorded for RIs with ANS contribution. The rate remained well below the Union-wide average throughout RP3.

### 2.3.2 Rate of separation minima infringements (SMIs) (PI#2)



#### Rate of SMI with ANS contribution per 100,000 flight hours

| # | ANSP           | Flight hours |         |         |         |         | Number of SMIs |      |      |      |      |
|---|----------------|--------------|---------|---------|---------|---------|----------------|------|------|------|------|
|   |                | 2020         | 2021    | 2022    | 2023    | 2024    | 2020           | 2021 | 2022 | 2023 | 2024 |
| 1 | HungaroControl | 116,008      | 149,648 | 259,939 | 313,567 | 368,164 | 2              | 7    | 6    | 6    | 7    |



| # | ANSP          | Rate of SMI per 100,000 flight hours |      |      |      |      | % variation in rate of SMIs |       |      |      |      |
|---|---------------|--------------------------------------|------|------|------|------|-----------------------------|-------|------|------|------|
|   |               | 2020                                 | 2021 | 2022 | 2023 | 2024 | 2020                        | 2021  | 2022 | 2023 | 2024 |
| 1 | HungaroContro | 2                                    | 5    | 2    | 2    | 2    |                             | +171% | -51% | -17% | -1%  |

### Focus on separation minima

After an increase in the rate of SMIs in 2021, Hungary remained at a stable level of occurrences throughout the remaining years of RP3, with only a marginal increasing rate in 2024. Throughout RP3, the rate remained well below the Union-wide average. The rate of SMIs with ANS contribution has remained stable since 2021, including the absolute number of occurrences.

#### 2.3.3 Quality of occurrences reporting

The number of occurrences reported at Member State level seems consistent with the occurrences reported at the ANSP level, both for SMIs and RIs.

#### 2.4 Use of automated safety data recording system (ASDRS) (PI#3)

| Use of automated safety data recording system - 2024 |          |
|--|----------|
| For RIs  | For SMIs |
| X  | ✓        |



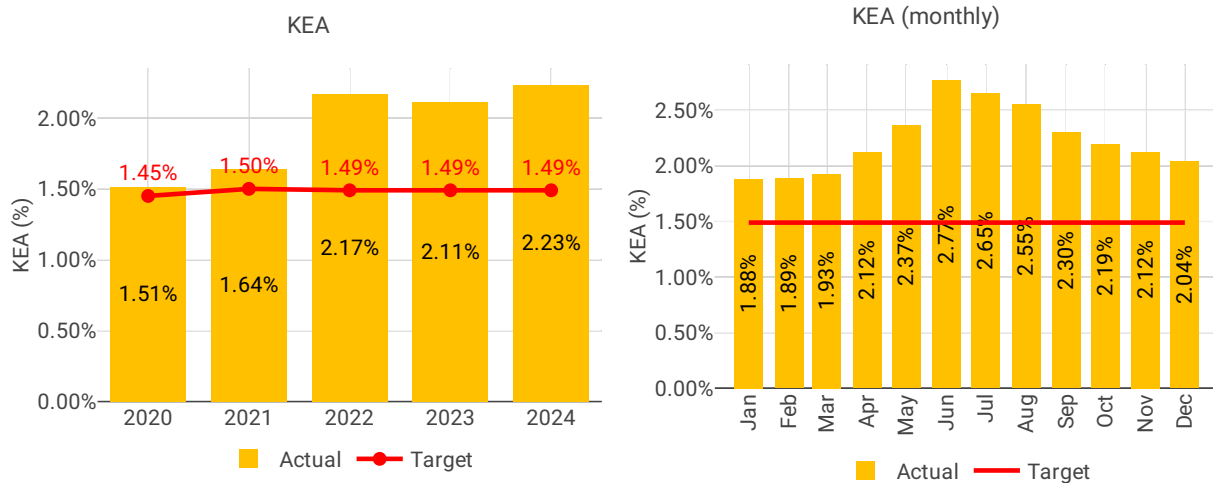
### 3 ENVIRONMENT - HUNGARY

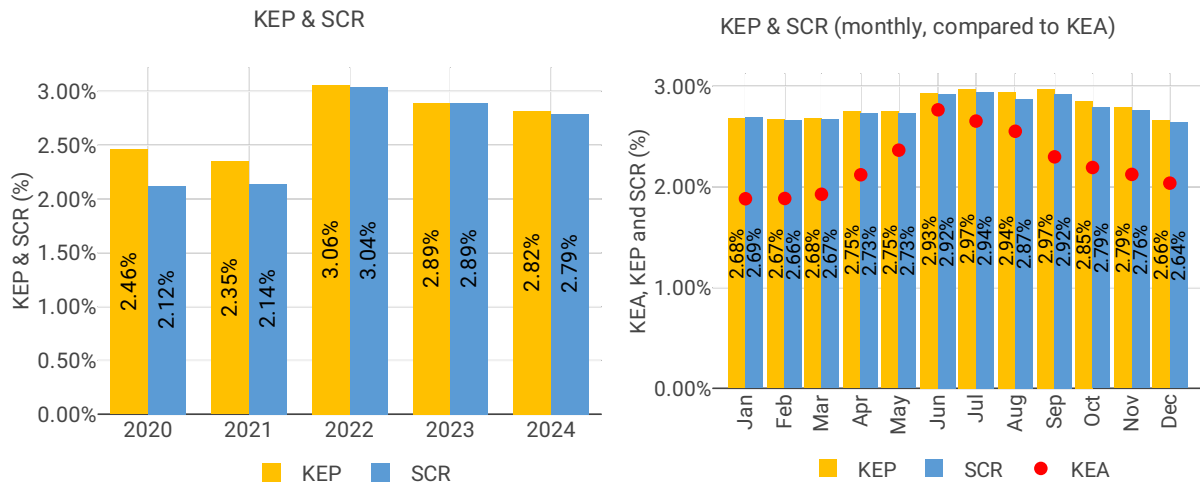
#### 3.1 PRB monitoring

- Hungary achieved a KEA performance of 2.23% compared to its target of 1.49% and did not contribute positively towards achieving the Union-wide target.
- The NSA states the deterioration in performance resulted from the extra distance flown caused by Russia's war of aggression against Ukraine.
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#### 3.2 En route performance

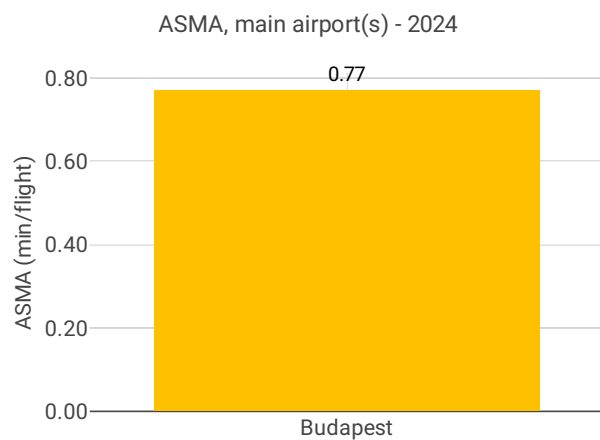
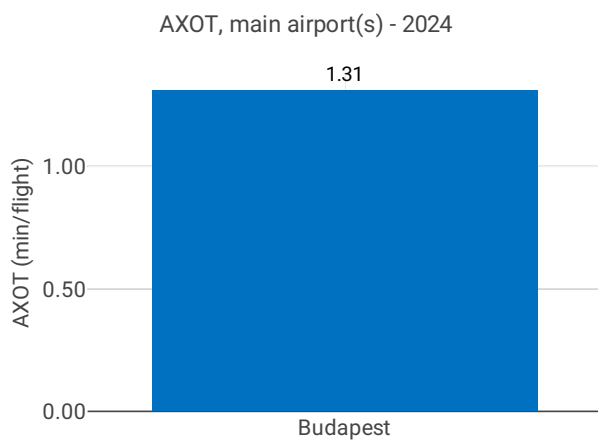
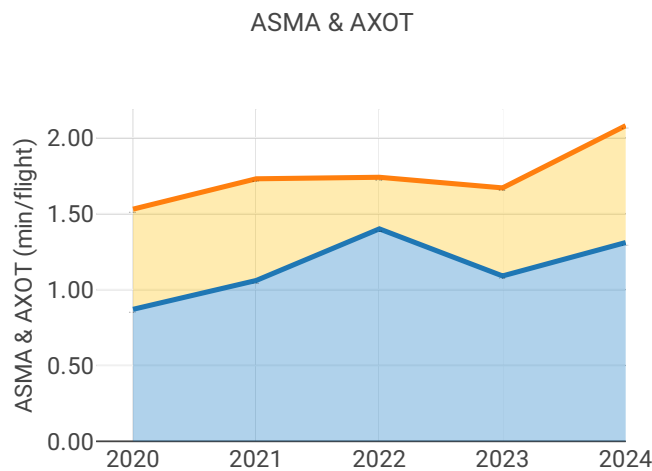
##### 3.2.1 Horizontal flight efficiency of the actual trajectory (KEA) (KPI#1), of the last filed flight plan (KEP) (PI#1) & shortest constrained route (SCR) (PI#2)





### 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 increased by 20% in 2024 (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.; 2024: 1.31 min/dep.) but remained considerably lower than the SES average of 2.91 min/dep.

According to the Hungarian monitoring report: *The en-route capacity problems have also had a significant impact on LHBP traffic and therefore PI has deteriorated somewhat compared to the previous year.*

\*\*

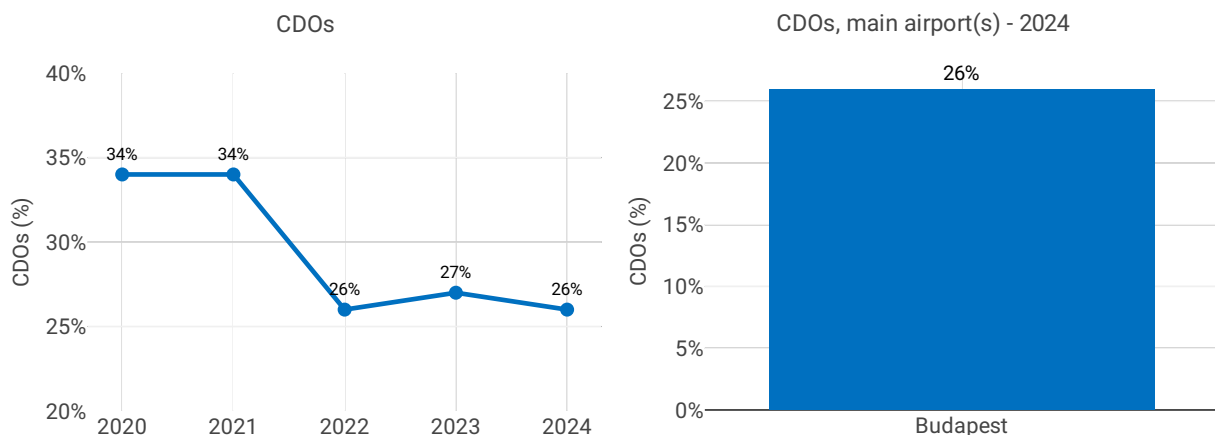
*Plans for 2025 include a significant reduction in en-route delays, especially for LHBP first rotation, which will also have an impact on all-day delays.*

### ASMA

The additional times in the terminal airspace at Budapest increased by 33% in 2024 (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.; 2024: 0.77 min/arr.) but remained well below the SES average for 2024 of 1.28 min/arr.

According to the Hungarian monitoring report: *Budapest APP handles the bulk of LHBP arriving traffic according to CDO principles, so the slight deterioration in this indicator is the result of increased traffic. 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

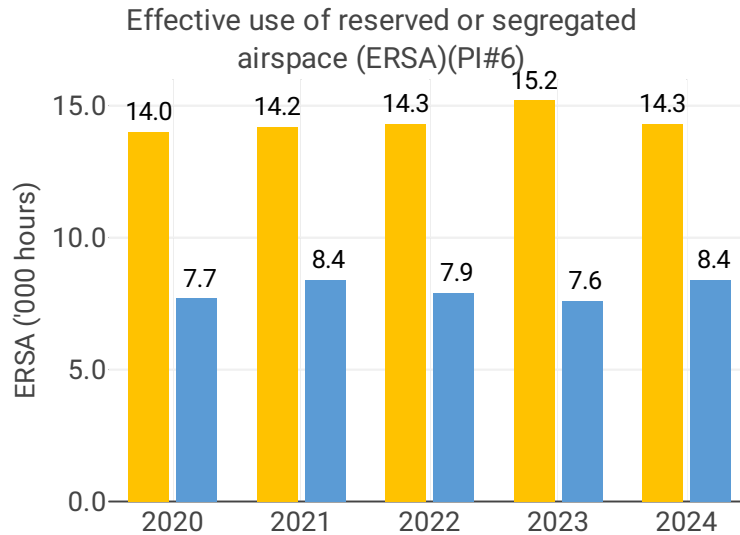
The share of CDO flights for Budapest (LHBP) has decreased from 26.8% in 2023 to 25.7% in 2024. This value is below the overall RP3 value in 2024 (29.3%). From May to October, the monthly values were below 26%.

According to the Hungarian monitoring report: *Despite the fact that traffic at LHBP has been increased in 2024 the value of this performance indicator in 2024 is practically the same as in the previous year, therefore no further initiatives are identified.*

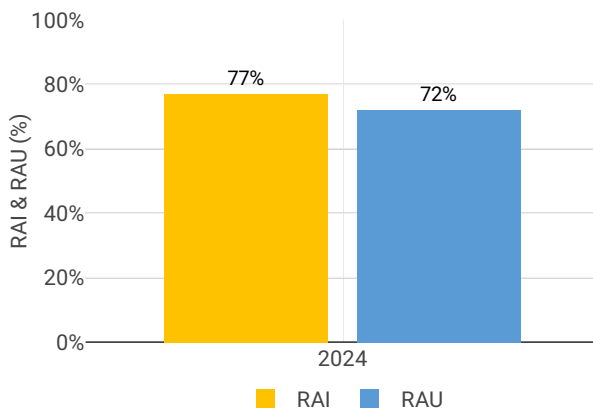


| Airport level |                                 |      |      |      |      |                             |      |      |      |      |                                       |      |      |      |      |
|---------------|---------------------------------|------|------|------|------|-----------------------------|------|------|------|------|---------------------------------------|------|------|------|------|
| Airport       | Additional taxi-out time (PI#3) |      |      |      |      | Additional ASMA time (PI#4) |      |      |      |      | Share of arrivals applying CDO (PI#5) |      |      |      |      |
|               | 2020                            | 2021 | 2022 | 2023 | 2024 | 2020                        | 2021 | 2022 | 2023 | 2024 | 2020                                  | 2021 | 2022 | 2023 | 2024 |
| Budapest      | 0.87                            | 1.06 | 1.40 | 1.09 | 1.31 | 0.66                        | 0.67 | 0.34 | 0.58 | 0.77 | 33%                                   | 34%  | 26%  | 27%  | 26%  |

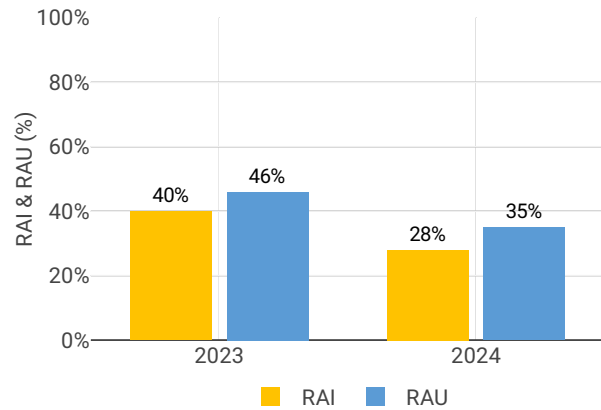
### 3.4 Civil-Military dimension



RAI & RAU via available conditional routes (PIs#7 & 8)



RAI & RAU via available restricted and segregated airspace (PIs#7 & 8)



## Focus on Civil-Military dimension

### Update on Military dimension of the plan

The impact of military operations on civil traffic continued to be very high in 2024. The war in Ukraine forced the Hungarian air defence and air force to use special training areas which were activated on an ad-hoc basis. Apart from those, special air corridors were also established and used in order to allow the crossing of the allied forces UAVs.

Due to the ongoing war in the neighbouring country, the Hungarian Air Force has raised its readiness level. In parallel, pilots have been required to undergo training for a new form of aerial combat. As part of these efforts, extensive so-called BVR (Beyond Visual Range) airspaces have been established.



**Military - related measures implemented or planned to improve capacity**

To mitigate these negative impacts, improvements were made in civil-military cooperation, resulting in a reduction in the total reservation time of AMC-manageable TRAs.

**Initiatives implemented or planned to improve PI#6**

Compared to the previous year, there were about 1000 hours less airspace bookings overall, but the actual utilisation of the TRAs increased by about 700 hours, resulting in an efficiency improvement of almost 10%. Unfortunately due to the ongoing war in neighbouring Ukraine the special military airspaces, created to better respond to threats are still in use and continued to be 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

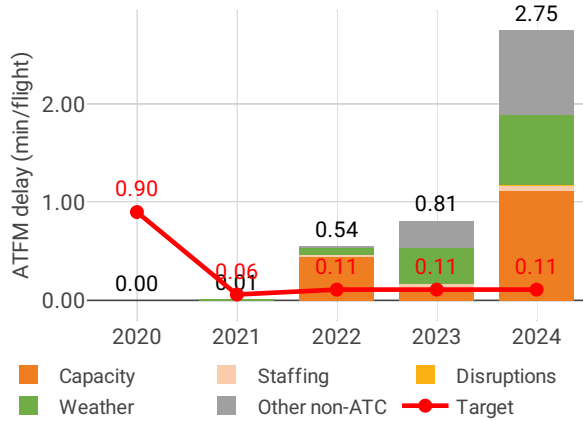
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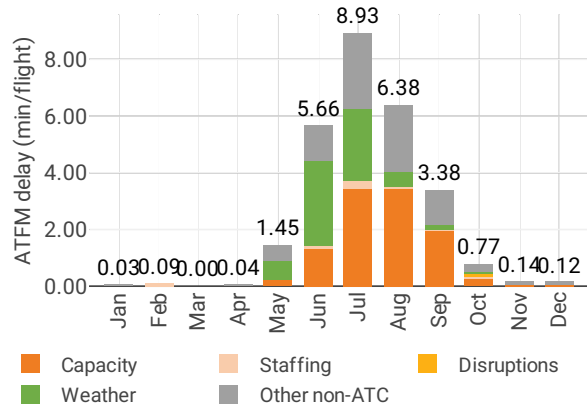
## 4.2 En route performance

### 4.2.1 En route ATFM delay (KPI#1)

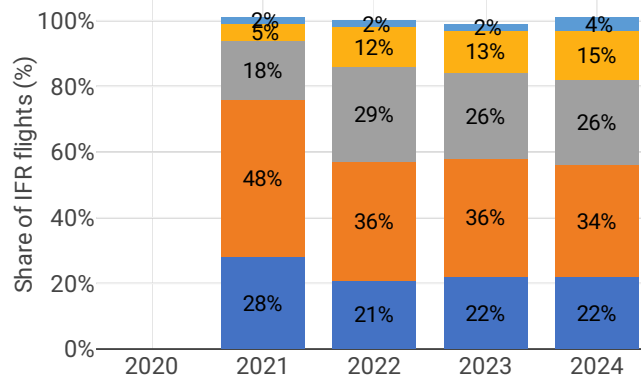
Average en route ATFM delay per flight by delay groups



Monthly distribution of en route ATFM delay by delay groups - 2024



Distribution of IFR flights per the duration of en route ATFM delay



## Focus on en route ATFM delay

### Summary of capacity performance

Hungary experienced an increase in traffic from 1034k flights in 2023 to 1100k flights; during the same period en route ATFM delays increased from 832k minutes to 3014k minutes. For reference in 2019, HungaroControl handled 892k flights with 1.4 million minutes of en route ATFM delay.)

There were an additional 119k minutes of ATFM delay originating in other States that were re-attributed to the HungaroControl via the NM post operations delay attribution process, according to the NMB agreement for eNM/S24 measures, to ameliorate the capacity shortfall in Budapest ACC. (59k minutes in Serbia & Montenegro; 58k in Bulgaria; 2k in Greece; <1k in Slovakia; and <1k in Romania).



## NSA's assessment of capacity performance

1. The Ukrainian war continued to have a significant impact on both the operational and the economic context of the ANS service provision 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, but 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 significant amount of additional traffic. Traffic demand was to increase further in 2024, as the traffic between Europe and Asia (mainly China) started to gain momentum. The Hungarian ANSP experienced a very strong recovery (with ENR flights passing the 2019-level by +23% on avg in 2024), 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 momentary complexity in the Hungarian airspace.

2. CAP KPIs were also impacted by the traffic growth: The war has caused a significant increase of traffic in Budapest ACC, resulting in +23% on avg vs2019 levels in 2024. Budapest ACC was able to manage the traffic growth but with around the clock regulations and significant delays. Although Hungary was one of the delay hotspots in 2024, it should be noted that air traffic on the Eastern border of the Network was operated without any particular problems. In the summer of 2024, the capacity problems caused by the influx of traffic were compounded by extremely bad weather. With the number of days with thunderstorms significantly higher than in previous years, it is likely that the effects of global warming in continental areas will be felt this way in the future. Learning from last year's weather, meteorological staff will be present in the ops room in 2025.

Our view is that a very significant part of the excess delay BUDAPEST ACC struggled with in 2024 was due to the war. And in agreement with NM, also in 2024 we reported our delay minutes associated with the war (based on some method agreed with the NM) under the "O" other delay category.

3. Reaction time: In 2023 already, 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 deteriorated. Even the increased number of trainees will not be enough to serve this traffic we are currently serving. HungaroControl 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).



## **Monitoring process for capacity performance**

Due to the third year of war in the neighbouring country, turnover in the ACC in Budapest continued to increase, resulting in 25% higher turnover compared to pre-COVID 2019 levels.

Unfortunately, Budapest ACC was not able to repeat the good performance of previous years and further reduce delays compared to 2019, mainly due to insufficient ATCO staff to safely manage traffic and extremely unfavourable weather conditions.

NSA has monitored the roster planning for the summer season and also the evaluation of ATCO utilisation during the daily shift rostering.

The workload of the ATCOs and the ACC sectors was also monitored and it was found that the number of intruders in certain sectors was very high, which often resulted in overloading of the sectors.

Delay trends were also constantly monitored, but given the ATCO resources available, no potential areas of intervention were identified that could significantly reduce delays.

## **Capacity planning**

Already during the capacity planning for 2024 which was completed in January was clear that there will be capacity problems during summer period.

The main reason for the capacity issues was the lack of sufficient number of ACC ATCOs, which made impossible to open as much sector as needed. The rostering plan for the summer was aligned, in order to be able to open 7 sectors during the busiest periods of the day.

In addition to that, all office staff with valid ACC licences have been assigned to work as much as possible in the ACC sectors in Budapest.

Unfortunately, just before the summer season, the number of available ACC ATCOs dropped by almost 10%, mainly due to the departure of ATCOs to foreign ACCs and prolonged illnesses, which ruined the preliminary plans and made it very often impossible to operate in 7 sectors.

## **Application of Corrective Measures for Capacity (if applicable)**

The war in Ukraine has continued a significant impact on traffic figures in Budapest ACC, and as a consequences the traffic was well above the pre-COVID 2019 traffic levels in 2024.

The drop in available ACC ATCOs just before the summer season and the adverse weather conditions during the high traffic period resulted that the applied measures which were introduced by HungaroControl ATM management was not enough to mitigate the capacity shortage.

Unfortunately, it has become clear that capacity cannot be further increased just by modifying the duty rostering and there are no indications that the war in Ukraine will end in the near future, and with the demand for overflight traffic in the Budapest ACC still very high, the number of available ATCOs needs to be increased, which can be achieved in the short term by recruiting foreign ATCOs and in the medium term by increasing training capacity.

Considering the training efficiency, it is necessary to increase the initial number of students in the training courses in order to ensure that the planned number of ATCO students would obtain their licences at the end of the on-the job training.



Additional measures to improve performance include:

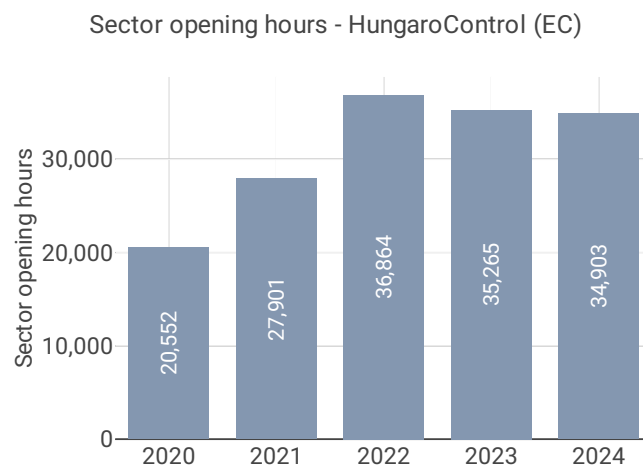
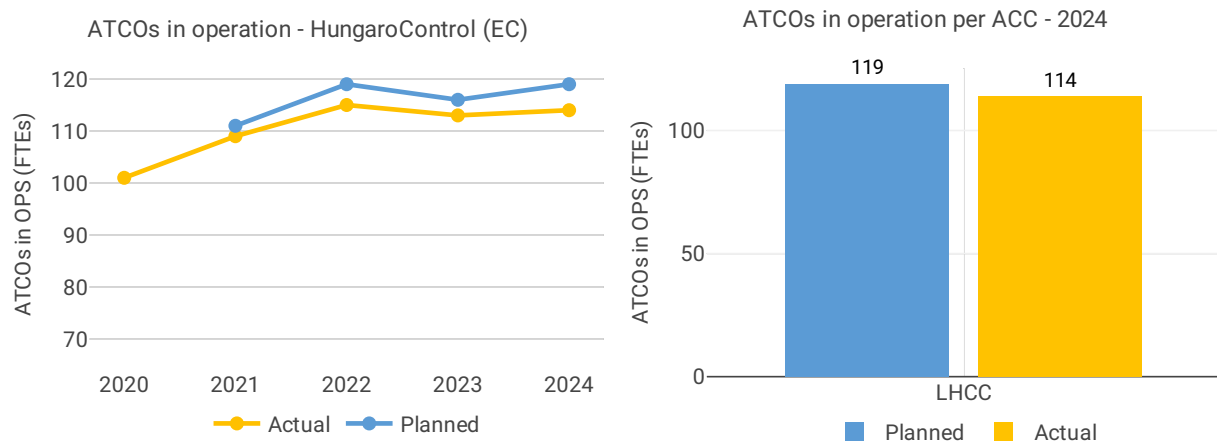
- Review of sector capacity values - the ACC en-route sectors capacity values will be reviewed as a result of a CAPAN study (As a result of CAPAN study, certain sectors will have capacity adjustments in Q2 2025);
- Recruiting foreign ATCOs - ACC licensed foreign ATCOs to be trained for KFOR sector in order to increase the number of ATCOs in the Budapest ACC sectors (11 ACC licensed foreign ATCOs started training for KFOR sector in 2024);
- Redesign the traffic flows in order to better use the capacity of available ACC sectors - with the help of the NM, certain traffic flows are redirected into sectors where traffic complexity is low, allowing a large number of aircraft to be handled.

### En route Capacity Incentive Scheme

**HungaroControl:** According to incentive scheme defined in monitoring report a penalty of HUF 204 386 675 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



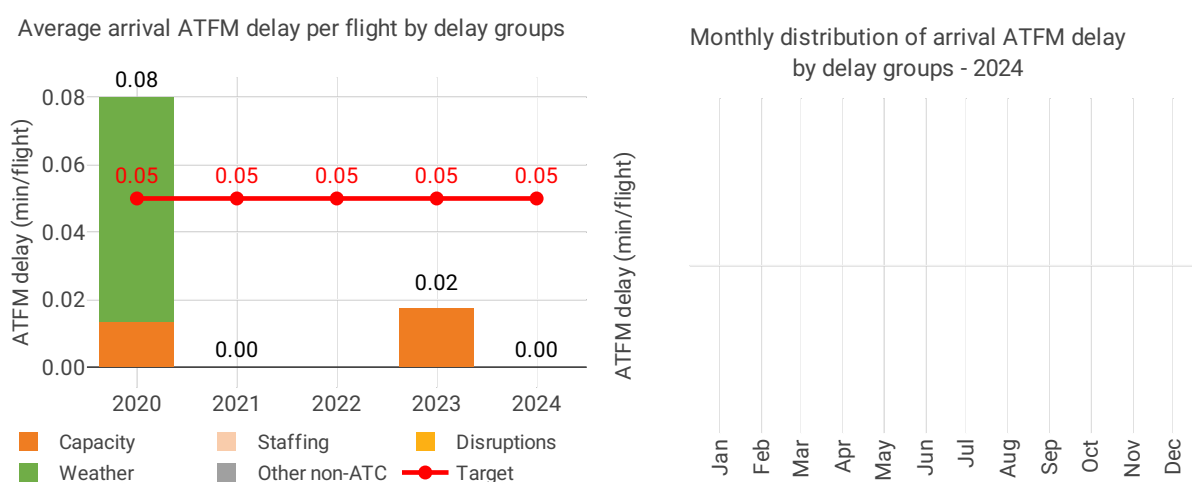
## Focus on ATCOs in operations

9% of ATCOs in OPS FTE are dedicated to KFOR service provision. 2024 year-end FTEs are reported excluding the two dedicated foreign KFOR ATCOs who are employed exclusively in the KFOR sector. However, it should be noted that the time allocated from BUDAPEST ACC to KFOR ACC decreased thanks to the foreign KFOR ATCOs, i.e. the available ATCO hours are higher in BUDAPEST ACC. This change is not reflected in the FTEs. The significance of this impact will be higher in RP4.

ATCO FTE is lower than plan, due to some ATCOs moving to other (mostly Western European) ANSPs. It should be mentioned that the planned FTE values were submitted before the outbreak of the war in Ukraine.

## 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 2024 observed an important increase of 17% compared to the previous year and it surpassed for the first time the 2019 traffic (+3%). Arrival ATFM delays averaged zero at Budapest in 2024 while ATFM slot adherence has slightly improved (2023: 96.2%; 2024: 96.6%).

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.; 2024: 0.00 min/arr.) have been zero or very low during RP3.

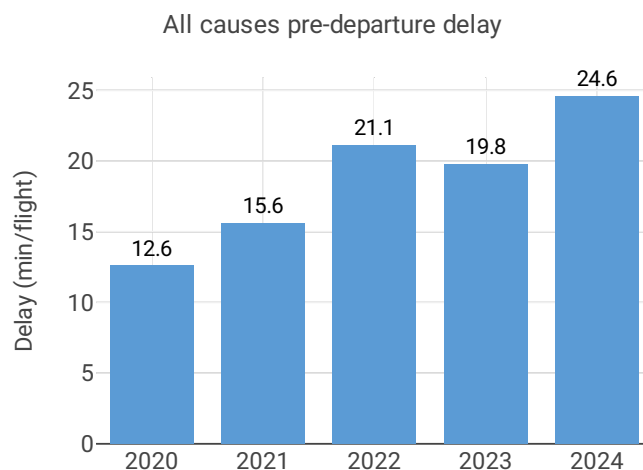
According to the Hungarian monitoring report: *Traffic at LHBP Airport in 2024 was 5% higher than in 2019. Since the Russian's war of aggression has continued against Ukraine all flights to/and from Russia and Ukraine were cancelled also in 2024 which represented less than 10% of LHBP traffic. There was no war related delay at LHBP in 2024.*

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 min/arr.



According to the Hungarian monitoring report, this performance corresponds to the maximum bonus (0.50%), computed by the NSA as HUF 48613507

#### 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 | 2024 | 2020                  | 2021  | 2022  | 2023  | 2024  |
| Budapest      | 0.08                           | 0.00 | NA   | 0.02 | NA   | 96.2%                 | 96.0% | 95.4% | 96.2% | 96.6% |

|              | ATC pre departure delay (PI#2) |      |      |      |      | All causes pre departure delay (PI#3) |      |      |      |      |
|--------------|--------------------------------|------|------|------|------|---------------------------------------|------|------|------|------|
| Airport name | 2020                           | 2021 | 2022 | 2023 | 2024 | 2020                                  | 2021 | 2022 | 2023 | 2024 |
| Budapest     | 0.14                           | 0.14 | 0.10 | 0.05 | 0.08 | 12.6                                  | 15.6 | 21.1 | 19.8 | 24.6 |

### Focus on performance indicators at airport level

#### ATFM slot adherence

Budapest's ATFM slot compliance was 96.6%, a slight improvement with respect to 2023 (96.2%). With regard to the 3.37% of flights that did not adhere, 0.94% was early and 2.43% was late.

The Hungarian monitoring report remarks that *despite the increasing traffic at LHBP the ATFM compliance improved in 2024.*

#### ATC pre-departure delay

The performance in terms of ATC pre-departure delay at Budapest has slightly deteriorated with respect to the previous year (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.; 2024: 0.08 min/dep.).

According to the Hungarian monitoring report: *The actual performance in the field of pre-departures delay was just a bit lower than in 2023, but this is still in line with the expectation.*



**All causes pre-departure delay**

The total (all causes) delay in the actual off block time at Budapest increased significantly in 2024 (LHBP: 2020: 12.58 min/dep.; 2021: 15.61 min/dep.; 2022: 21.12 min/dep.; 2023: 19.76 min/dep.; 2024: 24.63 min/dep.) resulting in the highest observed delay amongst the RP3 monitored airports.

According to the Hungarian monitoring report: *The actual performance in this respect was slightly worse than in the previous year, which can be explained by the increase in traffic at LHBP.*



## 5 COST-EFFICIENCY - HUNGARY

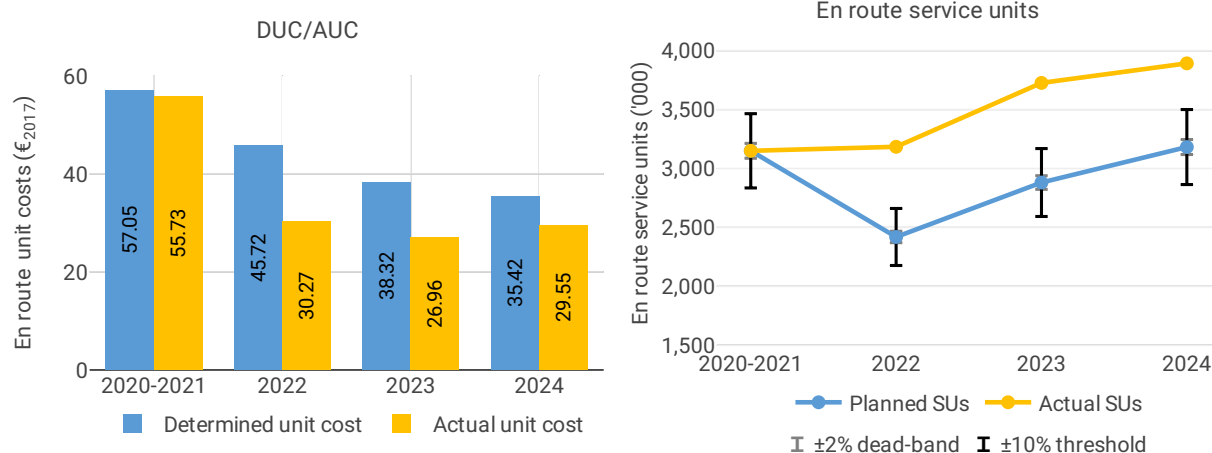
### 5.1 PRB monitoring

- The en route 2024 actual unit cost of Hungary was 29.55€2017, -17% lower than the determined unit cost (35.42€2017). The terminal 2024 actual unit cost was 281.17€2017, -16% lower than the determined unit cost (335.29€2017).
- The en route 2024 actual service units (3.9M) were +22% higher than the determined service units (3.2M).
- The en route 2024 actual total costs were 2.3M€2017 (+2.0%) higher than determined. The largest difference was a higher than determined staff costs for HungaroControl (+3.5M €2017, or +7.2%), due to salary increases for both ATCO and non-ATCO positions resulting from high inflation, partly offset by lower than planned staff numbers . This difference is partially compensated by lower other operating costs in real terms (-3.1M€2017, or -12%), due to the effect of inflation.
- HungaroControl costs of investments were 32M€2017 in 2024 for both en route and terminal charging zones, -21% less than determined (40M€2017). The difference is mainly due to underspend of -23% (-5.8M €2017) in depreciation. The NSA explained that the lower than planned depreciation is due to delays in the implementation of the investment plan accumulated during RP3.
- The en route actual unit cost incurred by users in 2024 was 32.04€ (-1.5% below the 2024 DUC), while the terminal actual unit cost incurred by users was 288.25€ (-4.2% below the 2024 DUC).
- Hungary's RP3 performance plan included justifications for a deviation to achieve the RP3 capacity targets. The main measures included the recruitment and training of new ATCOs and a number of investments to increase capacity. Hungary has not submitted a detailed report of the capacity-related measures implemented. However, the number of ATCOs in operation at the end of RP3 is below the plan, and costs for new major investments are significantly lower than determined. Hungary should reimburse to airspace users the excess funds received by the ANSP for measures not implemented.



## 5.2 En route charging zone

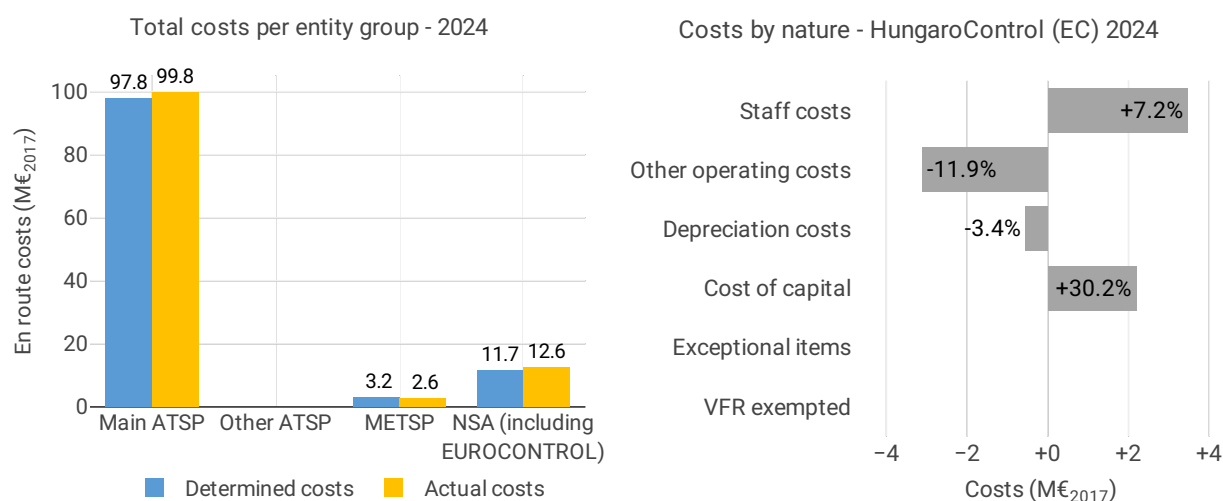
### 5.2.1 Unit cost (KPI#1)



#### Actual and determined data

| Total costs - nominal (M€) | 2020-2021 | 2022 | 2023 | 2024 |
|----------------------------|-----------|------|------|------|
| Actual costs               | 191       | 117  | 137  | 162  |
| Determined costs           | 195       | 124  | 127  | 132  |
| Difference costs           | -4        | -7   | 10   | 30   |

| 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% | 3.7%  |
| Actual inflation index            | NA        | 133.4 | 156.1 | 161.9 |
| Difference inflation index (p.p.) | NA        | +15.4 | +34.3 | +36.4 |



## Focus on unit cost

### AUC vs. DUC

In 2024, the en route AUC was -16.6% (or -1 814.01 HUF2017, -5.87 €2017) lower than the planned DUC. This results from the combination of significantly higher than planned TSUs (+22.3%) and higher than planned en route costs in real terms (+2.0%, or +713.4 MHUF2017, +2.3 M€2017). It should be noted that the actual inflation index in 2024 was +36.4 p.p. higher than planned.

### En route service units

The difference between actual and planned TSUs (+22.3%) falls outside the  $\pm 10\%$  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 (see the main ANSP gain in Box 11).

### En route costs by entity

The 2024 actual real en route costs are +2.0% (+2.3 M€2017) higher than planned. This is the result of higher than planned costs for the main ANSP, HungaroControl (+2.0%, or +2.0 M€2017) and the NSA/EUROCONTROL (+7.6%, or +0.9 M€2017) and lower costs for the MET service provider (-18.1%, or -0.6 M€2017).

### En route costs for the main ANSP at charging zone level

The actual real en route costs for HungaroControl are higher than planned in 2024 (+2.0%, or +2.0 M€2017), and result from:

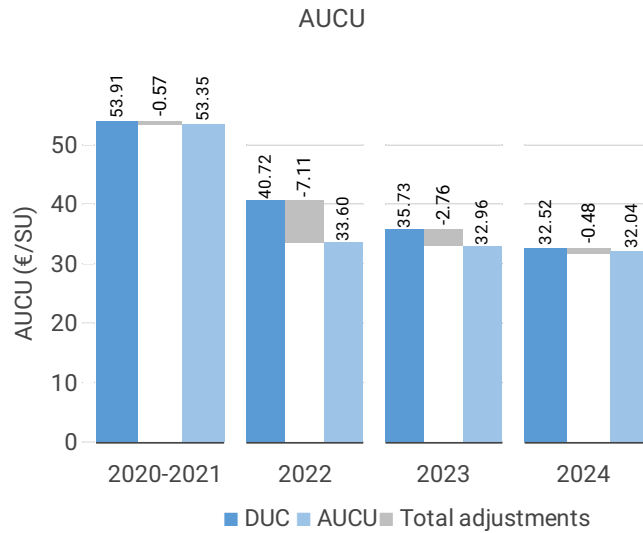
- Significantly higher than planned staff costs (+7.2%), mainly due to *“pay rises (...) for both ATCO and non-ATCO positions”*,
- Significantly lower than planned other operating costs (-11.9%), but higher in nominal terms (+13.7%) mainly due to *“extra payment to the government (...), energy price (...), local business tax (...), supplier charges (...), aviation liability insurance premiums.”*
- Lower than planned depreciation costs (-3.4%), *“caused by investment (...) behind schedule, (...) and certain assets put into operation later than planned”*,
- Significantly higher than planned cost of capital (+30.2%), mainly due to *“the recognition of the pension related obligations in the employed capital”*.

### RP3 summary

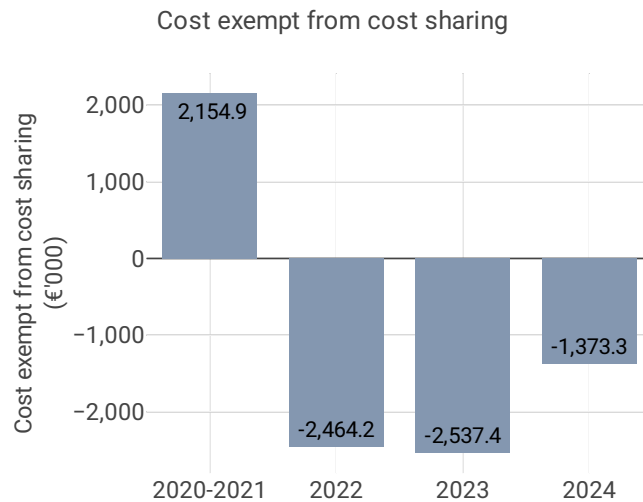
When considering the whole of RP3 (2020-2024) for Hungary en route charging zone, actual TSUs are +19.9% higher than planned, while actual costs in real terms are -5.1% lower than the determined costs (some -8 051.1 MHUF2017 or -26.1 M€2017). As a result, the weighted average actual unit cost over RP3 (10 794.32 HUF2017 or 34.93 €2017) is -20.9% lower than planned in the PP (13 638.76 HUF2017 or 44.14 €2017).



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

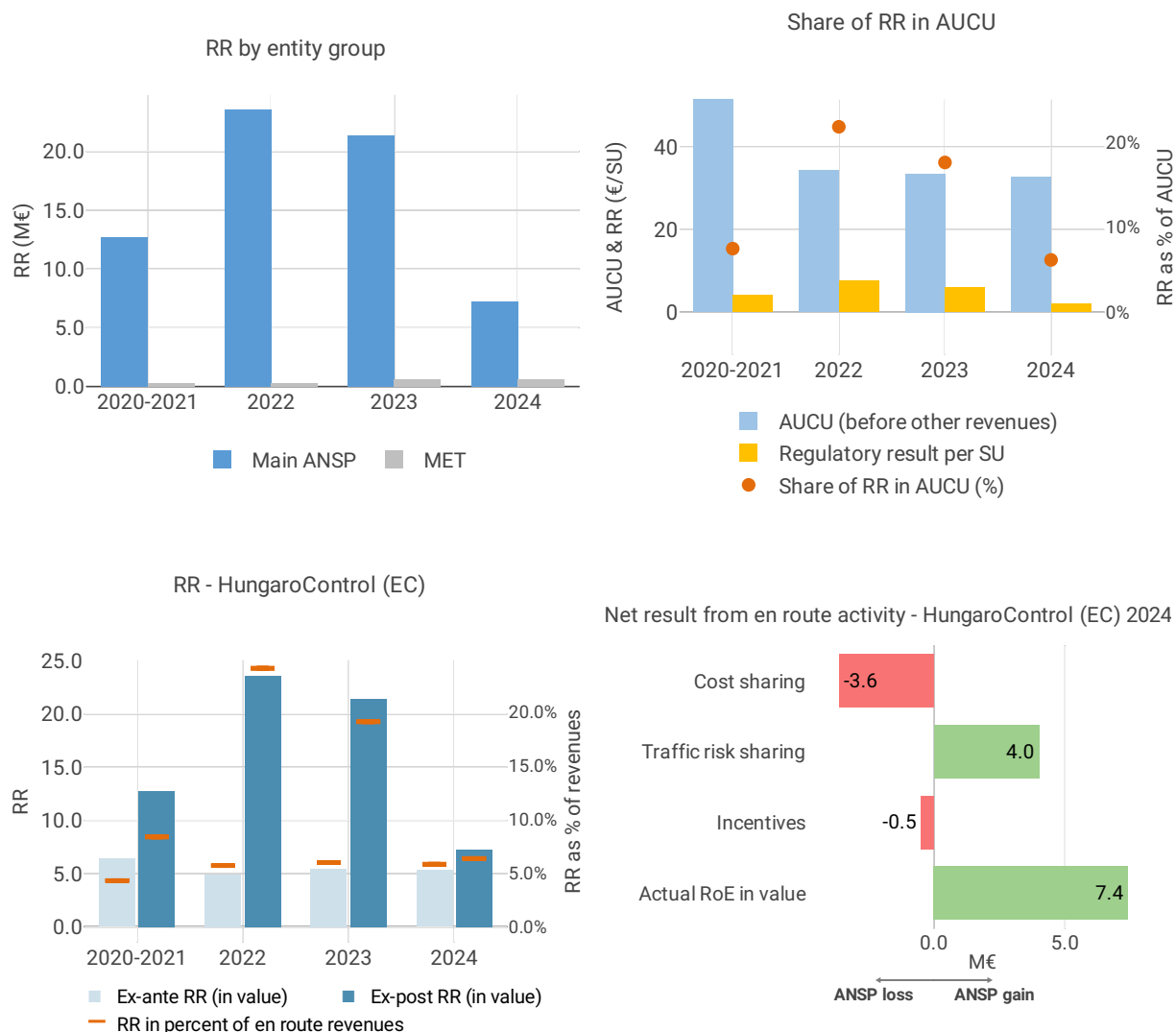


| AUCU components (€/SU) - 2024         |              |
|---------------------------------------|--------------|
| <b>Components of the AUCU in 2024</b> | <b>€/SU</b>  |
| <b>DUC</b>                            | <b>32.52</b> |
| Inflation adjustment                  | 5.60         |
| Cost exempt from cost-sharing         | -0.35        |
| Traffic risk sharing adjustment       | -4.21        |
| Traffic adj. (costs not TRS)          | -0.69        |
| Financial incentives                  | -0.13        |
| Modulation of charges                 | 0.00         |
| Cross-financing                       | 0.00         |
| Other revenues                        | -0.69        |
| Application of lower unit rate        | 0.00         |
| Total adjustments                     | -0.48        |
| <b>AUCU</b>                           | <b>32.04</b> |
| <b>AUCU vs. DUC</b>                   | <b>-1.5%</b> |



| Cost exempt from cost sharing – 2024               |                 |              |
|--|-----------------|--------------|
| Cost exempt from cost sharing by item - 2024       | €'000           | €/SU         |
| New and existing investments                       | -2,066.7        | -0.53        |
| Competent authorities and qualified entities costs | 677.4           | 0.17         |
| Eurocontrol costs                                  | 16.0            | 0.00         |
| Pension costs                                      | 0.0             | 0.00         |
| Interest on loans                                  | 0.0             | 0.00         |
| Changes in law                                     | 0.0             | 0.00         |
| <b>Total cost exempt from cost risk sharing</b>    | <b>-1,373.3</b> | <b>-0.35</b> |

### 5.2.3 Regulatory result (RR)



## Focus on regulatory result

### HungaroControl net loss on activity in the Hungary en route charging zone in the year 2024

HungaroControl reported a net loss of -57.0 MHUF, as a combination of a loss of -1 440.7 MHUF arising from the cost sharing mechanism, with a gain of +1 588.2 MHUF arising from



the traffic risk sharing mechanism and a loss of -204.4 MHUF relating to financial incentives.

### HungaroControl overall regulatory result (RR) for the en route activity

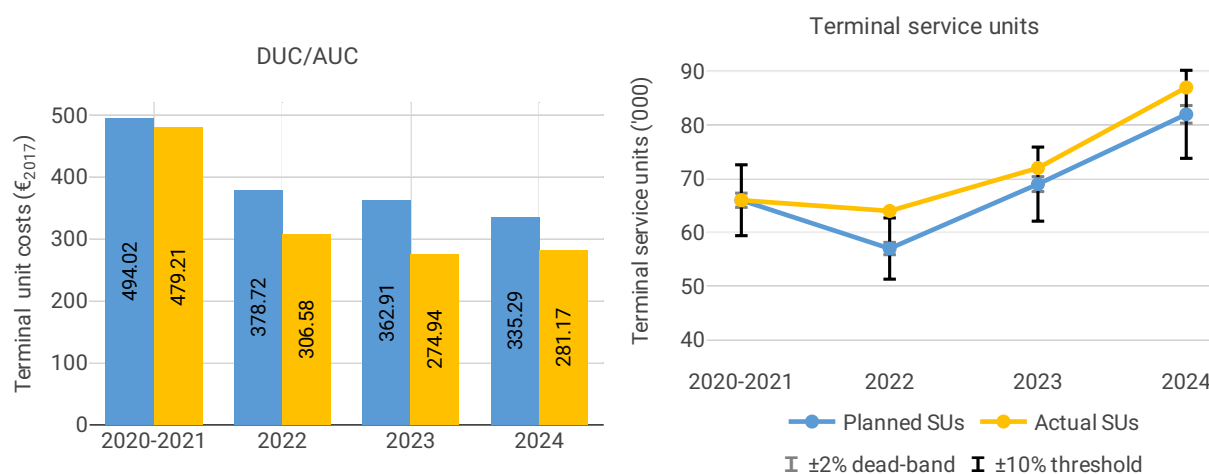
Ex-post, the overall RR taking into account the net loss from the en route activity mentioned above (-57.0 MHUF) and the actual RoE (+2 917.3 MHUF) amounts to +2860.4 MHUF (6.3% of the en route revenues). The resulting ex-post rate of return on equity is 7.0%, which is lower than the 7.7% planned in the PP.

### RP3 summary

When considering the whole of RP3 (2020-2024), HungaroControl generated a cumulative gain in respect of cost sharing of +9 371.0 MHUF, as actual total costs for RP3 were lower than planned. The traffic risk sharing mechanism generated a gain of +4 600.2 MHUF. Adding the loss of -400.6 MHUF to be retained by the ATSP in respect of financial incentives and the actual RoE (+11 186.3 MHUF over RP3) leads to an overall regulatory result of +24 756.9 MHUF, which corresponds to an average ex-post rate of return on equity of 14.6% (compared to 6.9% initially planned in the PP).

## 5.3 Terminal charging zone

### 5.3.1 Unit cost (KPI#1)

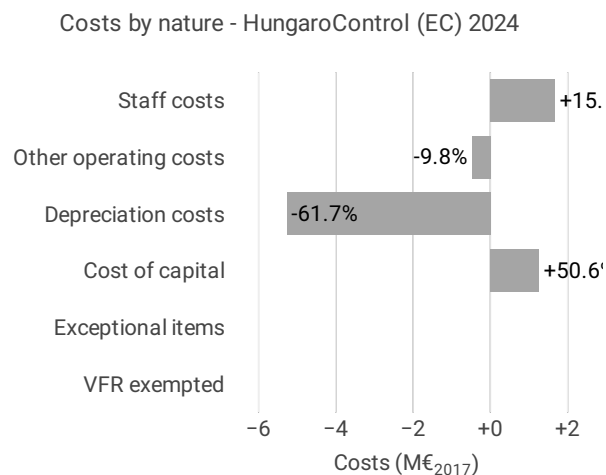
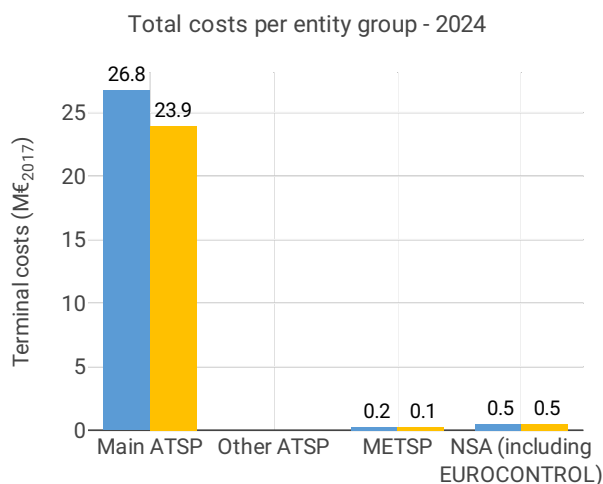


### Actual and determined data

| Total costs - nominal (M€) | 2020-2021 | 2022 | 2023 | 2024 |
|----------------------------|-----------|------|------|------|
| Actual costs               | 35        | 24   | 27   | 35   |
| Determined costs           | 36        | 25   | 28   | 31   |
| Difference costs           | -1        | 0    | -2   | 4    |

| 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% | 3.7%  |
| Actual inflation index            | NA        | 133.4 | 156.1 | 161.9 |
| Difference inflation index (p.p.) | NA        | +15.4 | +34.3 | +36.4 |





## Focus on unit cost

### AUC vs. DUC

In 2024, the terminal AUC was -16.1% (or -16 723.37 HUF<sub>2017</sub>, -54.12 €<sub>2017</sub>) lower than the planned DUC. This results from the combination of significantly lower than planned terminal costs in real terms (-10.4%, or -877.0 MHUF<sub>2017</sub>, -2.8 M€<sub>2017</sub>) and significantly higher than planned TNSUs (+6.9%). It should be noted that the actual inflation index in 2024 was +36.4 p.p. higher than planned.

### Terminal service units

The difference between actual and planned TNSUs (+6.9%) 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 (see the main ANSP gain in Box 11).

### Terminal costs by entity

The 2024 actual real terminal costs are -10.4% (-2.8 M€<sub>2017</sub>) lower than planned. This is the result of lower than planned costs for the main ANSP, HungaroControl (-10.5%, or -2.8 M€<sub>2017</sub>) and the MET service provider (-18.5%, or -0.03 M€<sub>2017</sub>) and higher costs for the NSA (+2.3%, or +0.01 M€<sub>2017</sub>).

### Terminal costs for the main ANSP at charging zone level

The actual real terminal ANS costs are significantly lower than planned for HungaroControl in 2024 (-10.5%, or -2.8 M€<sub>2017</sub>), and result from:

- Significantly higher than planned staff costs (+15.5%), mainly due to “*pay rises (...) for both ATCO and non-ATCO positions*”,
- Significantly lower than planned other operating costs (-9.8%), but higher in nominal terms (+16.3%), mainly due to “*extra payment to the government (...), energy price (...), local business tax (...), supplier charges (...), aviation liability insurance premiums*.”
- Significantly lower than planned depreciation costs (-61.7%), “*caused by investment (...) behind schedule (...) and certain assets (...) put into operation later than planned*”,

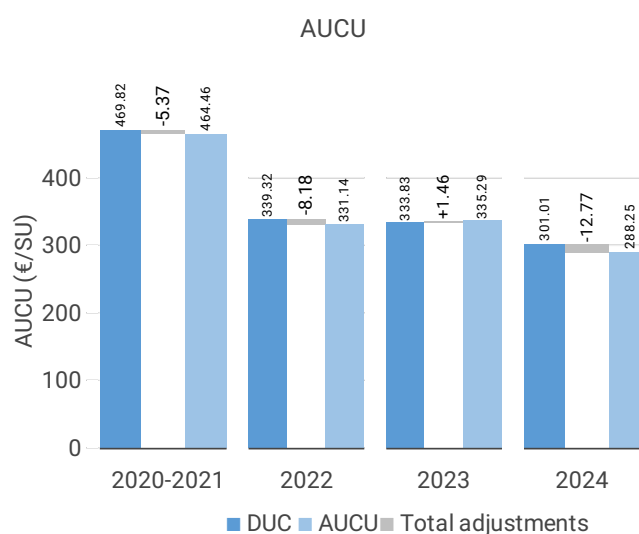


- Significantly higher than planned cost of capital (+50.6%), mainly due to “the recognition of the pension related obligations in the employed capital”.

### RP3 summary

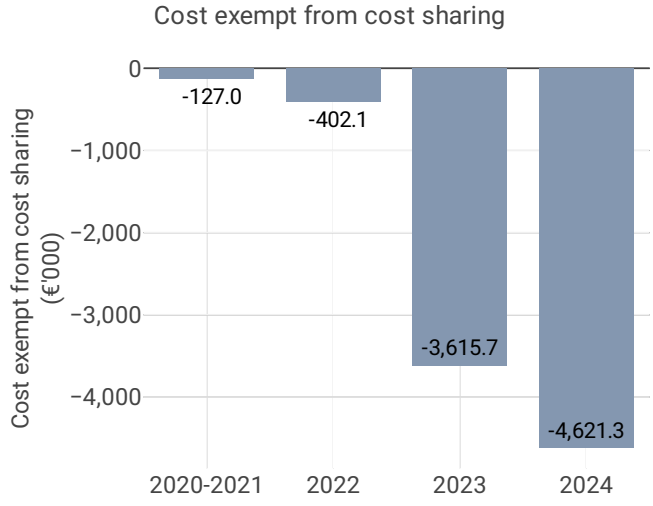
When considering the whole of RP3 (2020-2024) for Hungary terminal charging zone, the actual TNSUs are +5.7% higher than planned, while actual costs in real terms are -10.4% lower than the determined costs (some -3 413.8 MHUF2017 or -11.0 M€2017). As a result, the weighted average actual unit cost over RP3 (102 083.69 HUF2017 or 330.38 €2017) is -15.2% lower than planned in the PP (120 357.78 HUF2017 or 389.52 €2017).

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



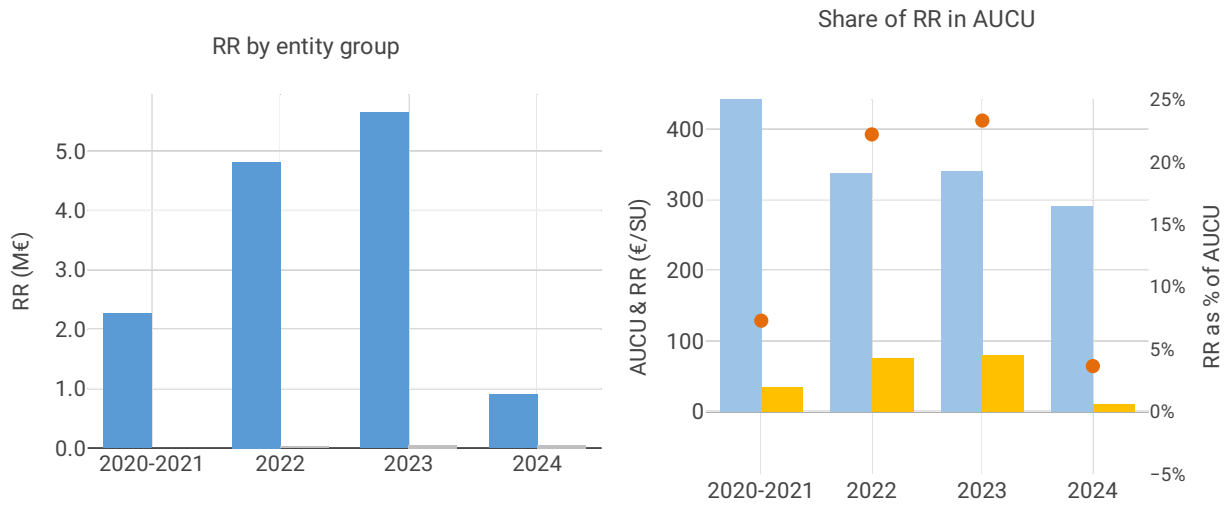
| AUCU components (€/SU) - 2024         |               |
|---------------------------------------|---------------|
| <b>Components of the AUCU in 2024</b> | <b>€/SU</b>   |
| <b>DUC</b>                            | <b>301.01</b> |
| Inflation adjustment                  | 51.65         |
| Cost exempt from cost-sharing         | -52.88        |
| Traffic risk sharing adjustment       | -9.44         |
| Traffic adj. (costs not TRS)          | -0.43         |
| Financial incentives                  | 1.41          |
| Modulation of charges                 | 0.00          |
| Cross-financing                       | 0.00          |
| Other revenues                        | -3.07         |
| Application of lower unit rate        | 0.00          |
| Total adjustments                     | -12.77        |
| <b>AUCU</b>                           | <b>288.25</b> |
| <b>AUCU vs. DUC</b>                   | <b>-4.2%</b>  |

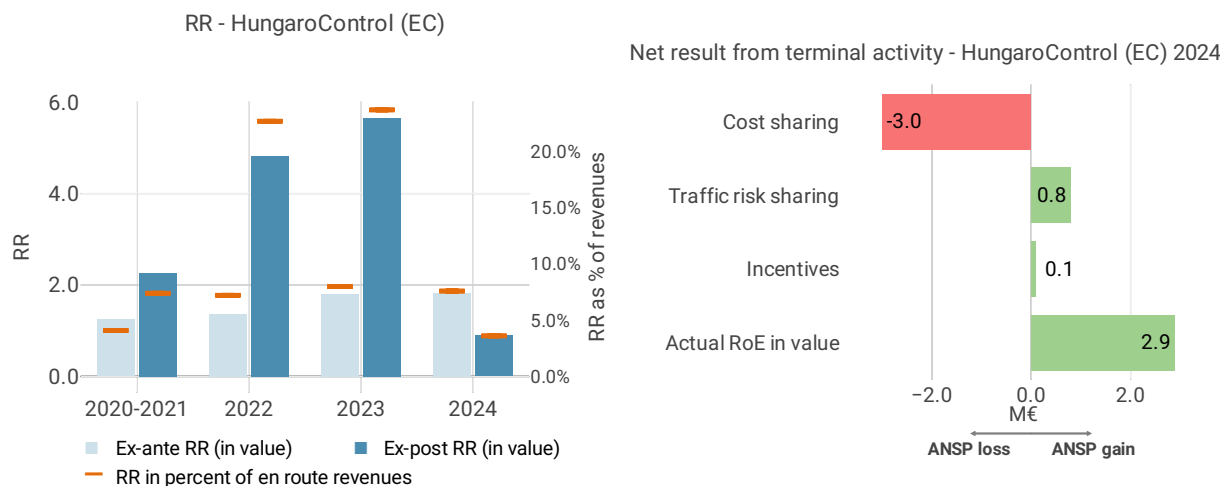




| Cost exempt from cost sharing – 2024               |                 |               |
|--|-----------------|---------------|
| Cost exempt from cost sharing by item - 2024       | €'000           | €/SU          |
| New and existing investments                       | -4,629.7        | -52.98        |
| Competent authorities and qualified entities costs | 8.5             | 0.10          |
| 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          |
| <b>Total cost exempt from cost risk sharing</b>    | <b>-4,621.3</b> | <b>-52.88</b> |

5.3.3 Regulatory result (RR)





## Focus on regulatory result

### HungaroControl net loss on activity in the Hungary terminal charging zone in the year 2024

HungaroControl reported a net loss of -806.4 MHUF, as a combination of a loss of -1 184.9 MHUF arising from the cost sharing mechanism, with a gain of +329.9 MHUF arising from the traffic risk sharing mechanism and a gain of +48.6 MHUF relating to financial incentives.

### HungaroControl overall regulatory result (RR) for the terminal activity

Ex-post, the overall RR taking into account the net loss from the terminal activity mentioned above (-806.4 MHUF) and the actual RoE (+1 160.4 MHUF) amounts to +354.0 MHUF (3.6% of the terminal revenues). The resulting ex-post rate of return on equity is 2.2%, which is lower than the 7.7% planned in the PP.

### RP3 summary

When considering the whole of RP3 (2020-2024), HungaroControl generated a cumulative gain in respect of cost sharing of +555.6 MHUF, as actual total costs for RP3 were lower than planned. The traffic risk sharing mechanism generated gain of +873.5 MHUF. Adding the gain of +92.5 MHUF to be retained by the ATSP in respect of financial incentives and the actual RoE (+3 673.6 MHUF over RP3) leads to an overall regulatory result of +5 195.2 MHUF, which corresponds to an average ex-post rate of return on equity of 9.6% (compared to 7.2% initially planned in the PP).

