



Performance Review Body Monitoring Report

Croatia - 2023

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TABLE OF CONTENTS

1	OVERVIEW	3
1.1	Contextual information	3
1.2	Traffic (En route traffic zone)	3
1.3	Safety (Main ANSP)	4
1.4	Environment (Member State)	4
1.5	Capacity (Member State)	4
1.6	Cost-efficiency (En route/Terminal charging zone(s))	5
2	SAFETY - CROATIA	5
2.1	PRB monitoring	5
2.2	Effectiveness of Safety Management (EoSM) (KPI#1)	6
2.3	Safety occurrences	6
2.4	Use of automated safety data recording system (ASDRS) (PI#3)	7
3	ENVIRONMENT - CROATIA	8
3.1	PRB monitoring	8
3.2	En route performance	8
3.3	Civil-Military dimension	9
4	CAPACITY - CROATIA	10
4.1	PRB monitoring	10
4.2	En route performance	10
5	COST-EFFICIENCY - CROATIA	13
5.1	PRB monitoring	13
5.2	En route charging zone	13

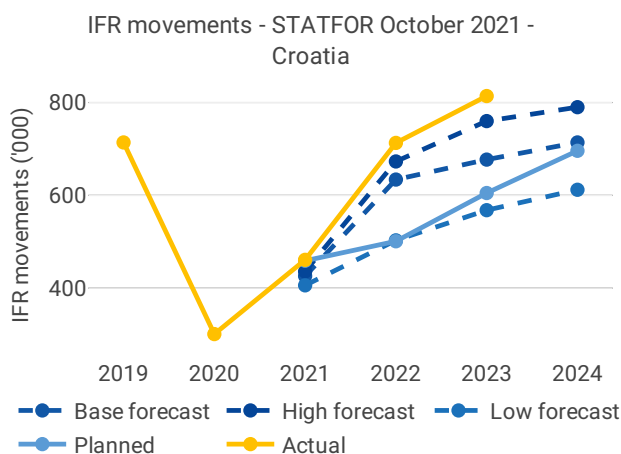
1 OVERVIEW

1.1 Contextual information

National performance plan adopted following Commission Decision (EU) 2022/764 of 13 April 2022

List of ACCs	1	Exchange rate (1 EUR=)		Main ANSP	
	Zagreb ACC		2017: 1 EUR		• Croatia Control
			2023: 1 EUR		
No of airports in the scope of the performance plan:		Share of Union-wide:		Other ANSPs	–
• ≥80'K	0	• traffic (TSUs) 2023	2.1%	MET Providers	–
• <80'K	0	• en route costs 2023	1.3%		
		Share en route / terminal costs 2023	100% / 0%		
		En route charging zone(s)			
		Croatia			
		Terminal charging zone(s)			
		–			

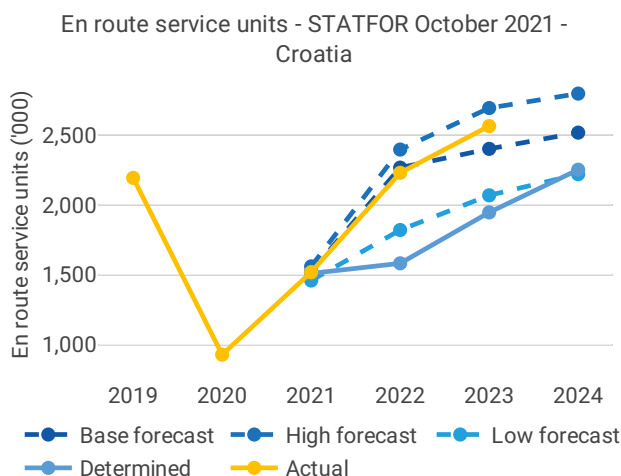
1.2 Traffic (En route traffic zone)



- Croatia recorded 814K actual IFR movements in 2023, +14% compared to 2022 (713K).

- Actual 2023 IFR movements were +35% above the plan (605K).

- Actual 2023 IFR movements are +14% above the actual 2019 level (714K).



- Croatia recorded 2,563K actual en route service units in 2023, +15% compared to 2022 (2,229K).

- Actual 2023 service units were +32% above the plan (1,946K).

- Actual 2023 service units are +17% above the actual 2019 level (2,193K).

1.3 Safety (Main ANSP)



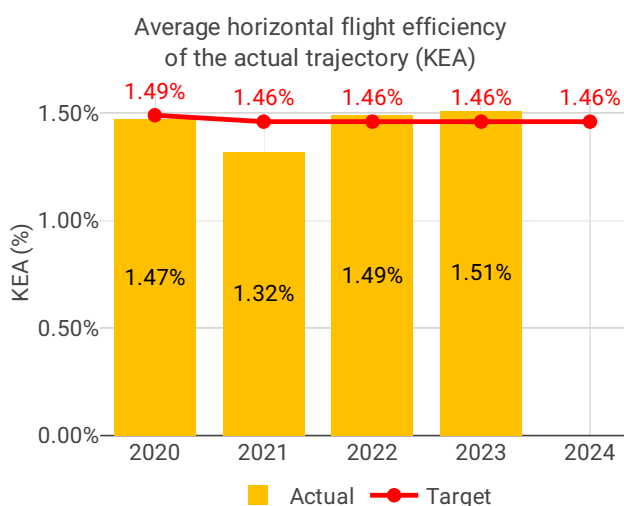
- Croatia Control improved its performance in safety risk management but not sufficiently to achieve the RP3 target. The establishment of a proactive safety management system at CCL gave confidence that the ANSP can achieve the RP3 targets before the end of RP3.

- Croatia recorded an increase of runway incursions (RIs) in 2023. The rate of separation minima infringements (SMIs) decreased compared with 2022. Croatia Control adopted the European Action Plan for the Prevention of Runway Incursions.

- Croatia monitored safety performance using specific safety tools, including the automated safety

data recording systems for the recording of SMIs and RIs.

1.4 Environment (Member State)



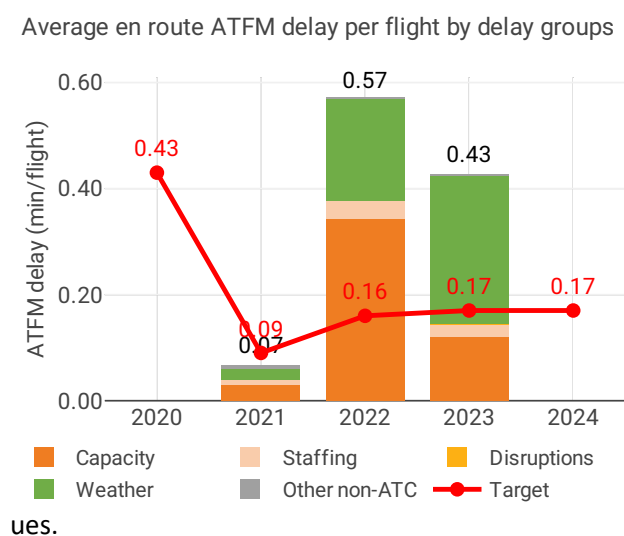
- Croatia achieved a KEA performance of 1.51% compared to its target of 1.46% and did not contribute positively towards achieving the Union-wide target.

- The NSA states that after the establishment of FRA there was limited ability for the ANSP to influence KEA.

- Both KEP and SCR deteriorated in comparison to 2022.

- Croatia has no airports that are regulated under the performance and charging scheme.

1.5 Capacity (Member State)



- Croatia registered 0.48 minutes of average en route ATFM delay per flight during 2023 which has been adjusted to 0.43 during the post-ops adjustment process, thus not achieving the local target value of 0.17. Delays in Croatia decreased by 0.15 minutes per flight year-on-year.

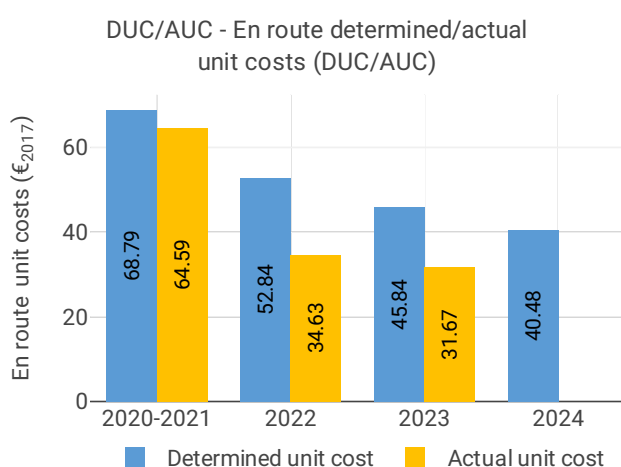
- Delays were highest in the summer season, mostly due to adverse weather and ATC Capacity reasons.

- The share of delayed flights with delays longer than 15 minutes in Croatia decreased by 3 p.p. compared to 2022 and was higher than 2019 values.

- The average number of IFR movements was 15% above 2019 levels in Croatia in 2023.

- The number of ATCOs in OPS is expected to increase by 32% by 2024, with the actual value being below the 2023 plan in Zagreb by 15 FTEs.
- The yearly total of sector opening hours in Zagreb ACC was 37,865, showing an 11.9% increase compared to 2022. Sector opening hours are 3.5% above 2019 levels.
- Zagreb ACC registered 20.53 IFR movements per one sector opening hour in 2023, being 12.8% above 2019 levels.
- Croatia experienced a 14% year-on-year traffic growth, with IFR movements being 20% higher than the STATFOR October 2021 Base forecast and is highly affected by seasonal traffic variation. While capacity provision improved in 2023 compared to previous years, a capacity gap still exists. Adverse weather also impacted capacity performance. Thus, Croatia should work closely with the NM and all concerned stakeholders to mitigate weather impact as much as possible.

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



- The en route 2023 actual unit cost of Croatia was 31.65 €2017, -31% lower than the determined unit cost (45.84 €2017). Croatia does not have a terminal charging zone.

- The en route 2023 actual service units (2.6M) were +32% higher than the determined service units (1.9M).

- The en route 2023 actual total costs were -8.1 M€2017 (-9.1%) lower than determined, as all categories registered lower-than-planned costs. This was mainly attributable to lower other operating costs (-4.4 M€2017, or -21%). The NSA attributed

this mainly to the deferral of investment projects, which resulted in lower maintenance and third-party services costs, as well as to the lower-than-expected expenditures on licenses and leases of intangible assets. The PRB highlights that the actual number of ATCOs in OPS FTEs for Croatia Control were -13% below plan.

- Croatia Control spent 11 M€2017 in 2023 related to costs of investments, -8.9% less than determined (12 M€2017), mainly due to the postponement of investment projects

- The en route actual unit cost incurred by users in 2023 was 40.10€ (-17% below the 2023 DUC), mainly affected by higher than planned SUs.

- The en route regulatory result for Croatia Control amounted to +16 M€, or 16% 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 urges Croatia to take immediate, adequate, and proportionate action to implement the relevant ATCO and investment plans committed to in the RP3 performance plan.

2 SAFETY - CROATIA

2.1 PRB monitoring

- Croatia Control improved its performance in safety risk management but not sufficiently to achieve the RP3 target. The establishment of a proactive safety management system at CCL gave confidence that the ANSP can achieve the RP3 targets before the end of RP3.

- Croatia recorded an increase of runway incursions (RIs) in 2023. The rate of separation minima infringements (SMIs) decreased compared with 2022. Croatia Control adopted the European Action Plan for the Prevention of Runway Incursions.

- Croatia monitored safety performance using specific safety tools, including the automated safety data recording systems for the recording of SMIs and RIs.

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



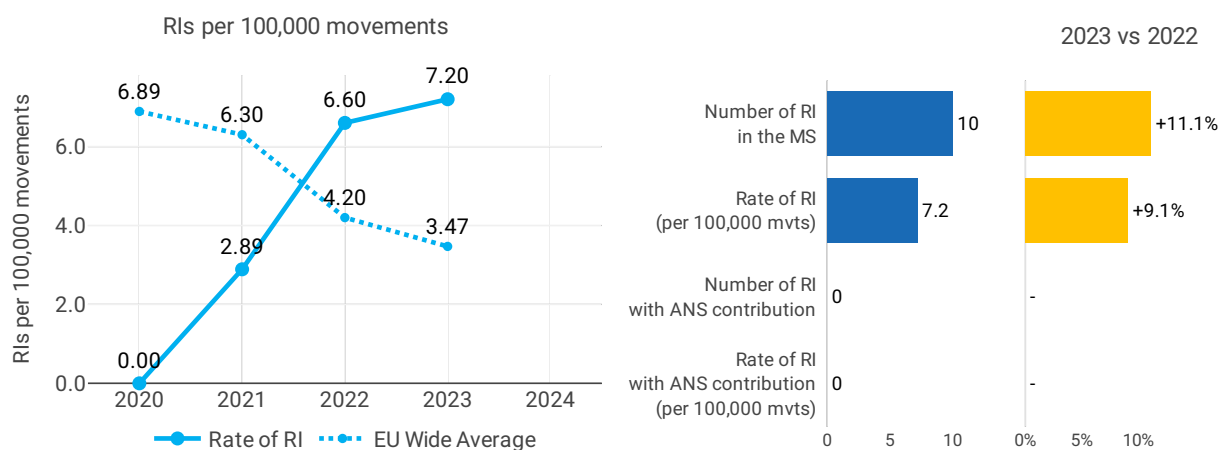
Focus on EoSM

Four out of five EoSM components of the ANSP meet the RP3 EoSM target level. Only “Safety Risk Management” is below 2024 target level. Over 2023, one question was improved for this component, and only a single question remains still below the RP3 target.

Detailed information on Safety performance monitoring for the year 2023 are included in Performance Review Body Monitoring Report 2023, Annex I – Safety report

2.3 Safety occurrences

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



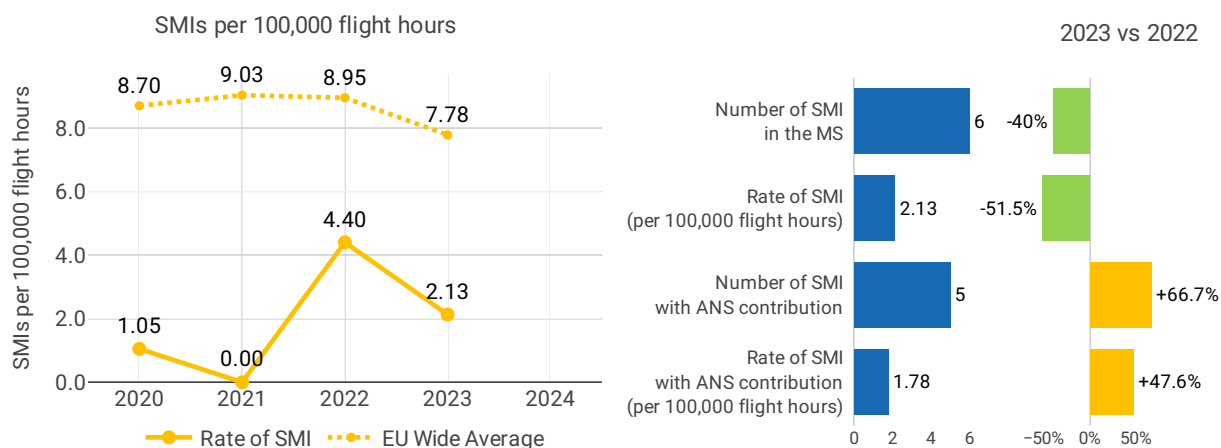
Rate of RIs per 100,000 airport movements - Croatia

#	Airport name	APT movements	Number of RI	Rate RI per 100,000
1	Zagreb	NA	NA	NA

Focus on runway incursions

Detailed information on Safety performance monitoring for the year 2023 are included in Performance Review Body Monitoring Report 2023, Annex I – Safety report

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	Croatia Control	106,693	155,957	249,018	281,231	NA	0	0	3	5	NA

#	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	Croatia Control	0.0	0.0	1.2	1.8	NA	NA	0%	0%	+48%	NA

Focus on separation minima

Detailed information on Safety performance monitoring for the year 2023 are included in Performance Review Body Monitoring Report 2023, Annex I – Safety report

2.3.3 Quality of occurrences reporting

Detailed information on Safety performance monitoring for the year 2023 are included in Performance Review Body Monitoring Report 2023, Annex I – Safety report

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

2023	
For RIs	For SMIs
✓	✓

Detailed information on Safety performance monitoring for the year 2023 are included in Performance Review Body Monitoring Report 2023, Annex I – Safety report

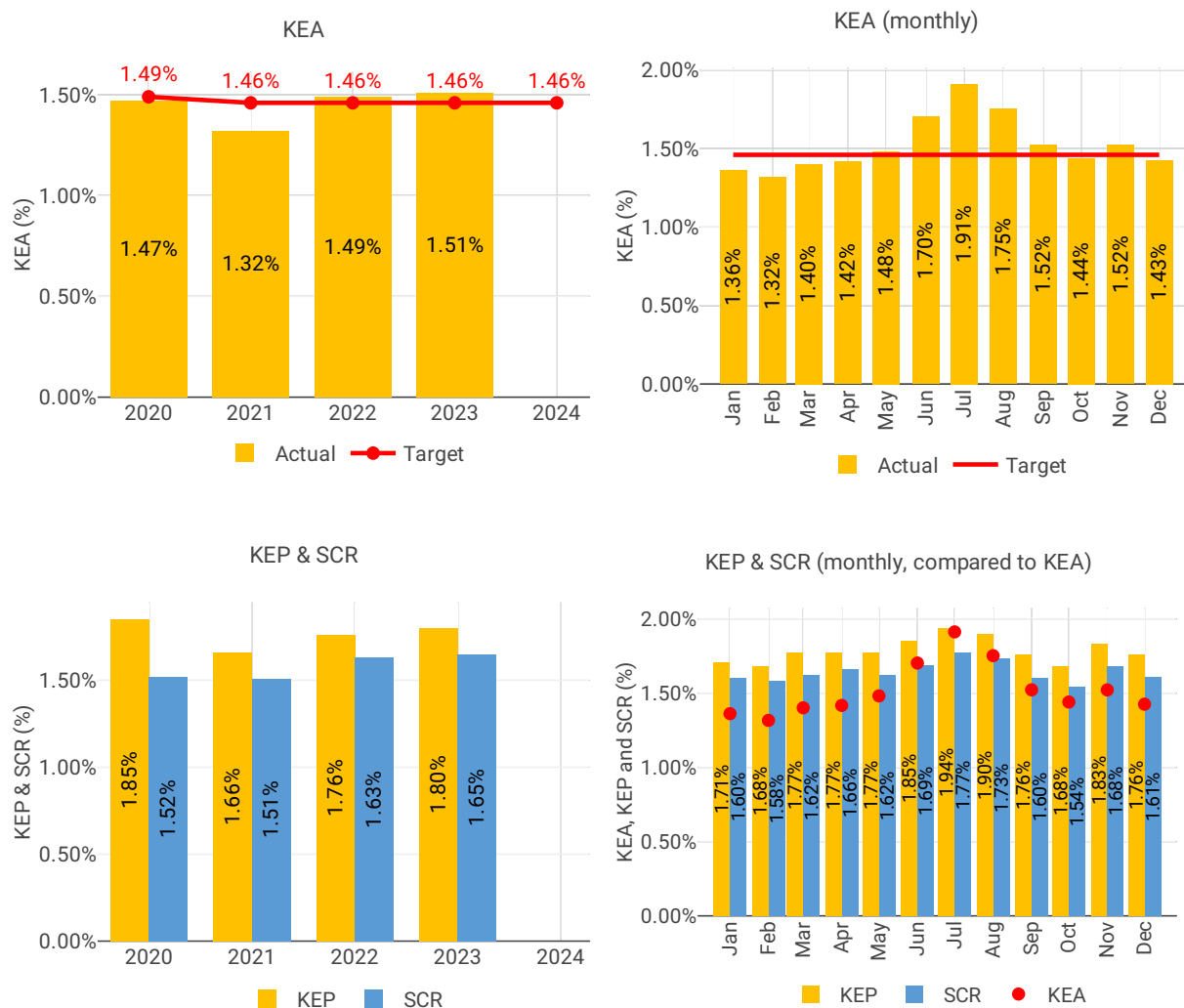
3 ENVIRONMENT - CROATIA

3.1 PRB monitoring

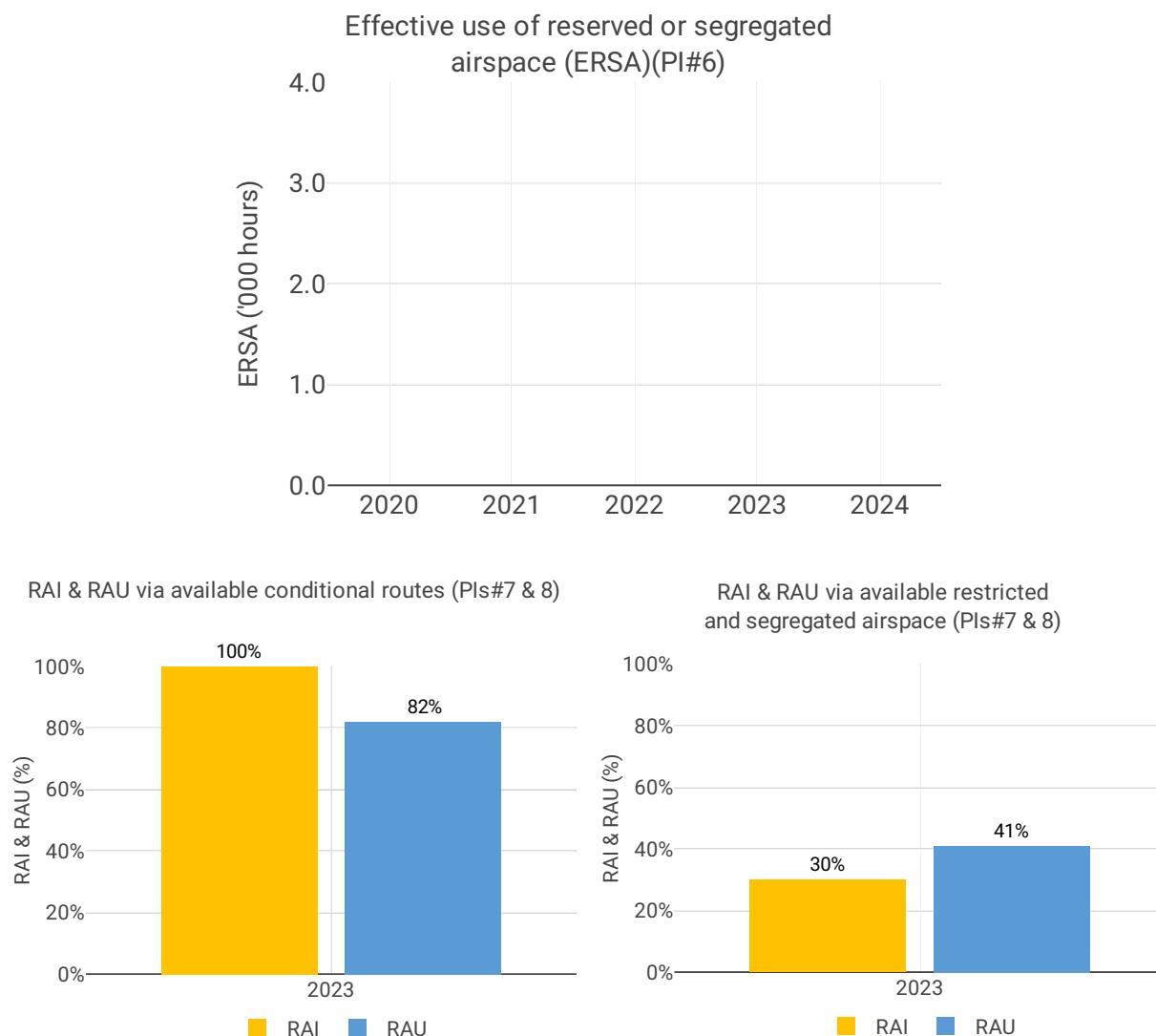
- Croatia achieved a KEA performance of 1.51% compared to its target of 1.46% and did not contribute positively towards achieving the Union-wide target.
- The NSA states that after the establishment of FRA there was limited ability for the ANSP to influence KEA.
- Both KEP and SCR deteriorated in comparison to 2022.
- Croatia has no airports that are regulated under the performance and charging scheme.

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 Civil-Military dimension



Focus on Civil-Military dimension

Update on Military dimension of the plan

N/A

Military - related measures implemented or planned to improve capacity

N/A

Initiatives implemented or planned to improve PI#6

The Network Manager shall provide on a monthly basis the data required for the monitoring of this indicator for monitoring referred to Regulation (EU) 2019/317 point 6 of Annex VI. Data regarding ratio has been received from NM upon request but the data regarding hours allocated and used have not been delivered by NM nor are available on the NM/PRU dashboards.

Initiatives implemented or planned to improve PI#7

The Network Manager shall provide on a monthly basis the data required for the monitoring of this indicator for monitoring referred to Regulation (EU) 2019/317 point 6 of Annex VI. Data regarding ratio has been received from NM upon request but the data regarding hours allocated and used have not been delivered by NM nor are available on the NM/PRU dashboards.

Initiatives implemented or planned to improve PI#8

No data available.

4 CAPACITY - CROATIA

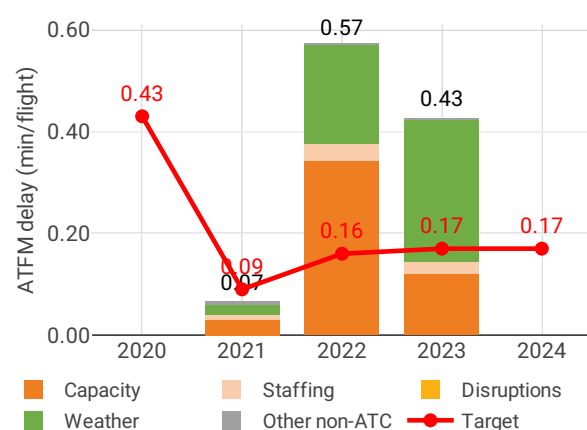
4.1 PRB monitoring

- Croatia registered 0.48 minutes of average en route ATFM delay per flight during 2023 which has been adjusted to 0.43 during the post-ops adjustment process, thus not achieving the local target value of 0.17. Delays in Croatia decreased by 0.15 minutes per flight year-on-year.
- Delays were highest in the summer season, mostly due to adverse weather and ATC Capacity reasons.
- The share of delayed flights with delays longer than 15 minutes in Croatia decreased by 3 p.p. compared to 2022 and was higher than 2019 values.
- The average number of IFR movements was 15% above 2019 levels in Croatia in 2023.
- The number of ATCOs in OPS is expected to increase by 32% by 2024, with the actual value being below the 2023 plan in Zagreb by 15 FTEs.
- The yearly total of sector opening hours in Zagreb ACC was 37,865, showing an 11.9% increase compared to 2022. Sector opening hours are 3.5% above 2019 levels.
- Zagreb ACC registered 20.53 IFR movements per one sector opening hour in 2023, being 12.8% above 2019 levels.
- Croatia experienced a 14% year-on-year traffic growth, with IFR movements being 20% higher than the STATFOR October 2021 Base forecast and is highly affected by seasonal traffic variation. While capacity provision improved in 2023 compared to previous years, a capacity gap still exists. Adverse weather also impacted capacity performance. Thus, Croatia should work closely with the NM and all concerned stakeholders to mitigate weather impact as much as possible.

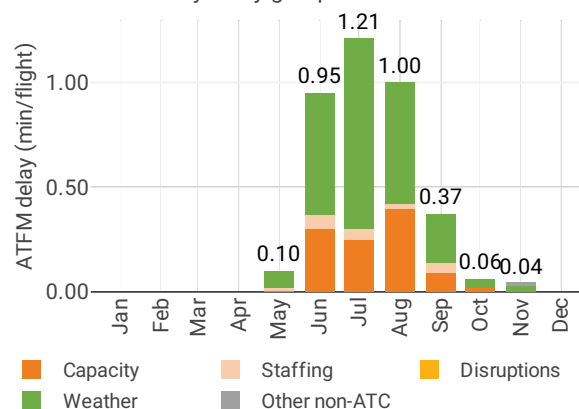
4.2 En route performance

4.2.1 En route ATFM delay (KPI#1)

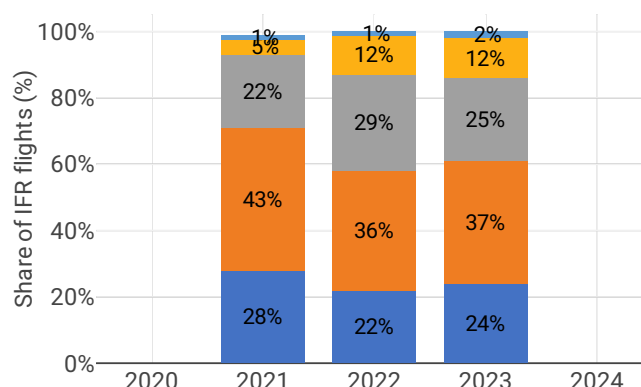
Average en route ATFM delay per flight by delay groups



Monthly distribution of en route ATFM delay by delay groups - 2023



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



Focus on en route ATFM delay

Summary of capacity performance

Croatia experienced an increase in traffic, from 713k flights in 2022, to 814k flights in 2023 (a significant increase on 2019 traffic of 714k flights). In 2023, Croatia had 347k minutes of delay, significantly lower than in 2022 (408k minutes of delay) despite the increase in traffic. (538k minutes of delay in 2019). There were an additional 39k minutes of delay originating in Croatia that were re-attributed to DFS via the NM post operations delay attribution process, according to the NMB agreement for eNM/S23 measures, to ameliorate capacity shortfalls in Karlsruhe UAC.

NSA's assessment of capacity performance

In the year 2023 there were significant challenges for LDZO ACC capacity KPI as the actual traffic was around 35% higher than planned in the RP3 Performance plan while summer season traffic was 10% above historical highest year (2022). As a consequence, limitations occurred during summer season due to unplanned high increase of traffic demand in peak hours.

Monitoring process for capacity performance

Monitoring of all available KPI's and PI's is done through the Single European Sky Data Portal which is considered as the main source of information.

Capacity planning

Capacity planning is performed in line with the Network Cooperative Decision-Making processes through dedicated groups CAPLAN, NETOPS and NDOP. Capacity planning is done in line with NM's initiative for development of a rolling NOP document in which short-term capacity and demand on the Network level is described. The expected traffic outlook is given for eight weeks ahead and revised weekly, while capacity is adapted to traffic demand and reported to NM which assesses the efficiency for planned period. In the planning process on local level, several departments are involved in strategic and tactical development of the plan.

Application of Corrective Measures for Capacity (if applicable)

The NSA has implemented a bi-annual meeting practice in order to continuously monitor the management of demand-capacity imbalances by CroControl. The first meeting was held ahead of the summer season on 31st March 2023 and the next one was held 17th of January 2024.

Croatia was projected to have 771,000 flights in 2023 under the base scenario, but the actual number reached 812,671. The average annual traffic increase from 2022 to 2023 was 14%, with the first few months of 2023 seeing increases over 35%. The number of flights in the air traffic control center in 2023 also rose by 14% compared to 2022 and was 17% higher than in 2019, with significantly reduced delays. Operational data on traffic, sector hours, and generated delays show a significant improvement in capacity management efficiency by CroControl. Controller working hours in 2022 were 8% lower compared to 2019 but returned to 2019 levels in 2023. Efficiency in traffic and capacity management is evident from the comparison of generated delays: 614,160 minutes in 2019, 397,083 minutes in 2022, and 3% less in

2023, totaling 386,246 minutes. According to data presented by CroControl representatives, efficiency increased by 17% in 2023.

The primary cause of delays were adverse weather conditions, responsible for almost two-thirds of the delay minutes, while capacity issues and staff shortages accounted for 28.6%. The NSA did not have any additional recommendations, considering the actions defined in the NOP as being adequate for dealing with recognised shortcomings. The measures that have been put in place are:

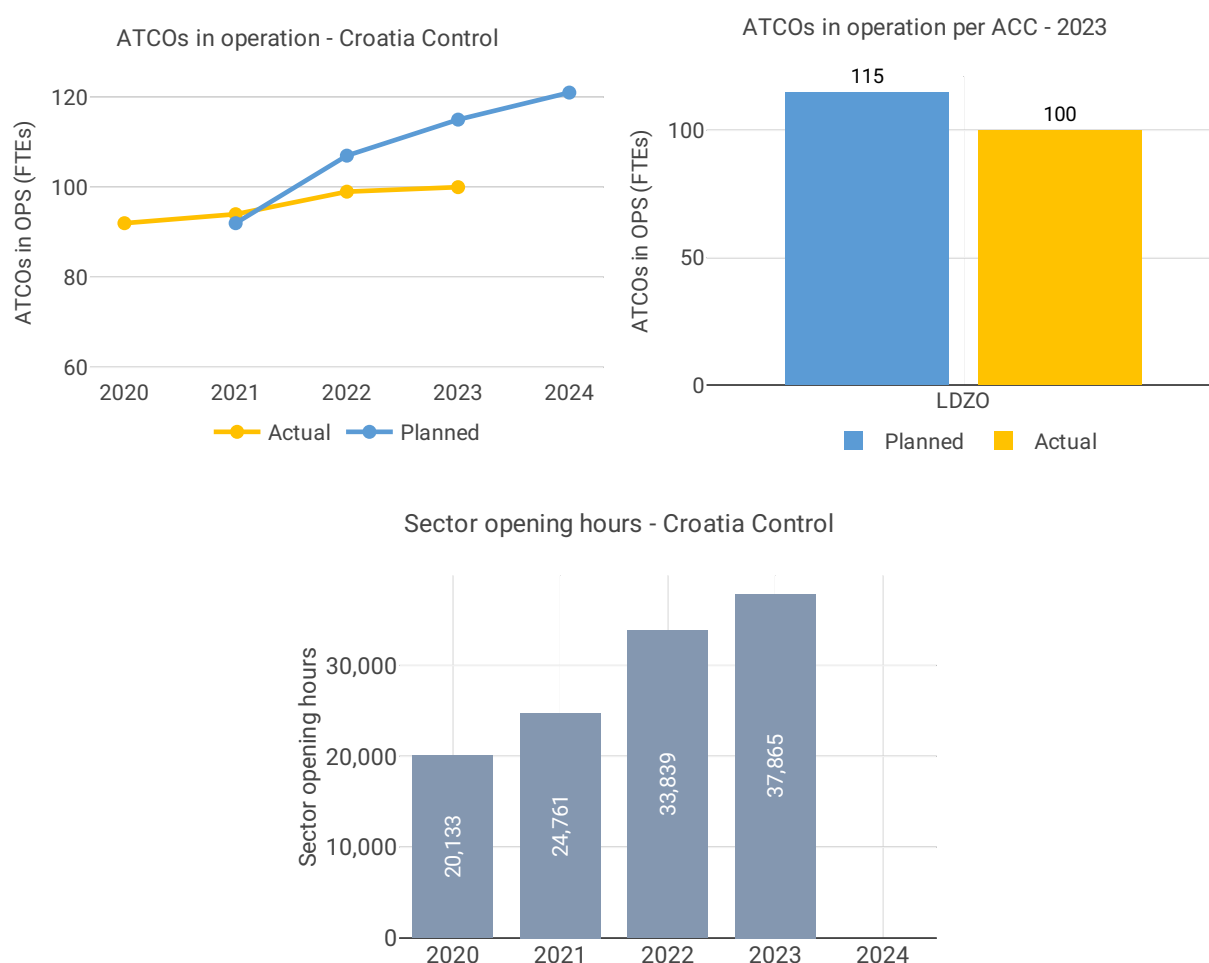
1. Increased number of ATCOs - CroControl is continuously trying to provide training for new ATCOs, through the course of 2023, 6 new ATCOs have been put in operations. This process is continuing.
2. CroFAST system implementation - the development and implementation of an FMP system which helps monitor sector opening times, rostering, implemented regulations and their effect. The system was implemented fully in 2023.
3. Cross border weather workshop - working on predictability and effectiveness of measures taken in case of bad weather - workshop was held in November 2023.

The NSA considers that significant risks remain which are likely to lead to performance targets being missed in the future. Attracting new ATCOs is problematic (across the majority of Member States). The ever increasing traffic demand and the resulting large number of delay minutes gives a false impression and undermines the efforts that CroControl is making to improve its own capacities. The NSA has no options to encourage people to apply for ATCO training.

En route Capacity Incentive Scheme

Croatia Control: Despite the improvement in capacity performance, the NSA reports that, CroControl is liable for a financial penalty of 959,519 €. 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

During 2023 there was an increase in the ATCO in OPS FTE compared to 2022 due to increased ATCO in OPS utilisation following high traffic during summer season on Southeast Axis traffic flow. Difference between planned and actual number of ATCO in OPS FTE is mainly due to higher than planned number of ATCOs in OPS who have stopped working in the OPS room and lower than planned ATCO training success rate.

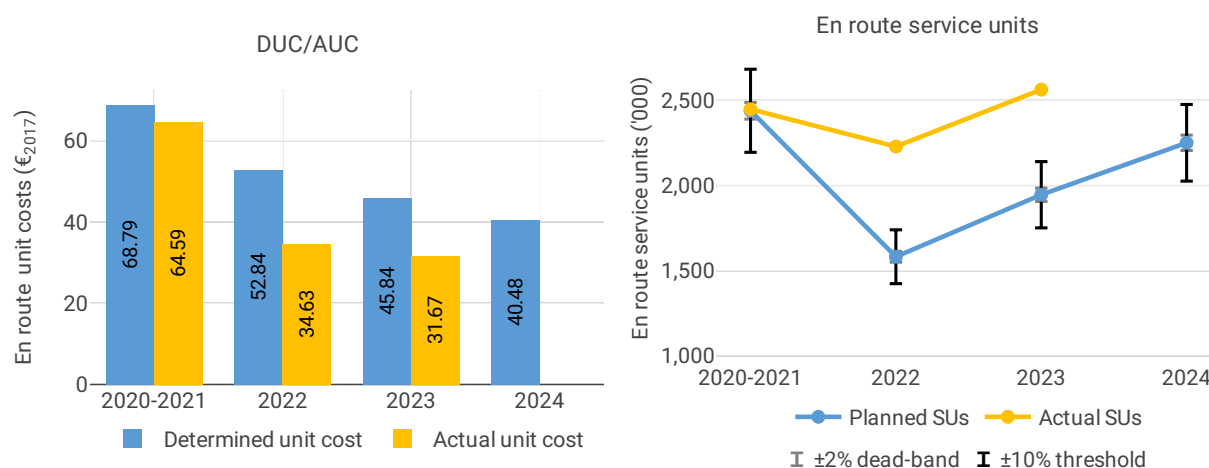
5 COST-EFFICIENCY - CROATIA

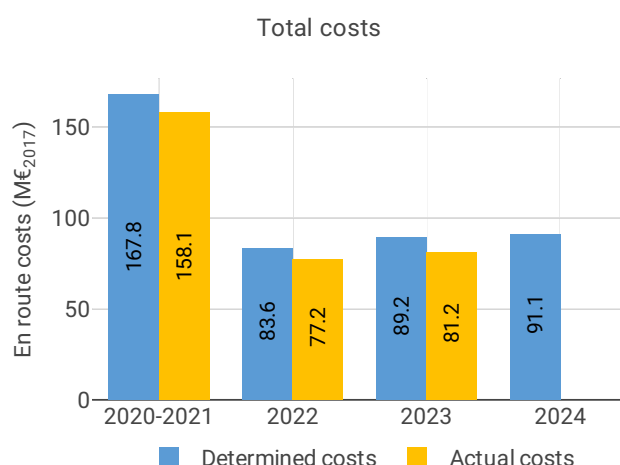
5.1 PRB monitoring

- The en route 2023 actual unit cost of Croatia was 31.65 €2017, -31% lower than the determined unit cost (45.84 €2017). Croatia does not have a terminal charging zone.
- The en route 2023 actual service units (2.6M) were +32% higher than the determined service units (1.9M).
- The en route 2023 actual total costs were -8.1 M€2017 (-9.1%) lower than determined, as all categories registered lower-than-planned costs. This was mainly attributable to lower other operating costs (-4.4 M€2017, or -21%). The NSA attributed this mainly to the deferral of investment projects, which resulted in lower maintenance and third-party services costs, as well as to the lower-than-expected expenditures on licenses and leases of intangible assets. The PRB highlights that the actual number of ATCOs in OPS FTEs for Croatia Control were -13% below plan.
- Croatia Control spent 11 M€2017 in 2023 related to costs of investments, -8.9% less than determined (12 M€2017), mainly due to the postponement of investment projects
- The en route actual unit cost incurred by users in 2023 was 40.10€ (-17% below the 2023 DUC), mainly affected by higher than planned SUs.
- The en route regulatory result for Croatia Control amounted to +16 M€, or 16% 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 urges Croatia to take immediate, adequate, and proportionate action to implement the relevant ATCO and investment plans committed to in the RP3 performance plan.

5.2 En route charging zone

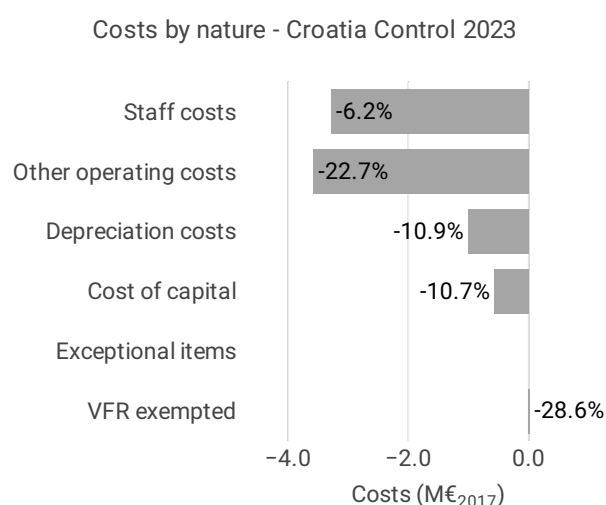
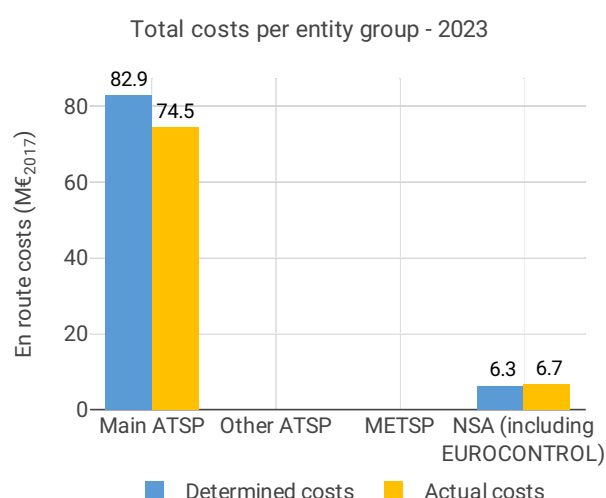
5.2.1 Unit cost (KPI#1)





Actual and determined data				
Total costs - nominal (M€)	2020-2021	2022	2023	2024
Actual costs	162	87	97	NA
Determined costs	171	86	94	97
Difference costs	-9	0	4	NA

Inflation assumptions	2020-2021	2022	2023	2024
Determined inflation rate	NA	1.1%	1.9%	2.2%
Determined inflation index	NA	104.3	106.3	108.7
Actual inflation rate	NA	10.7%	8.4%	NA
Actual inflation index	NA	116.4	126.2	NA
Difference inflation index (p.p.)	NA	+12.1	+19.9	NA



Focus on unit cost

AUC vs. DUC

In 2023, the en route AUC was -31.0% (or -14.19 €2017) lower than the planned DUC. This results from the combination of significantly higher than planned TSUs (+31.7%) and significantly lower than planned en route costs in real terms (-9.1%, or -8.1 M€2017). It should be noted that actual inflation index in 2023 was +19.9 p.p. higher than planned.

En route service units

The difference between actual and planned TSUs (+31.7%) 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.

En route costs by entity

Actual real en route costs are -9.1% (-8.1 M€2017) lower than planned. This is the result of lower costs for the main ANSP, Croatia Control (-10.2%, or -8.4 M€2017) and higher costs for the NSA/EUROCONTROL (+5.4%, or +0.3 M€2017).

En route costs for the main ANSP at charging zone level

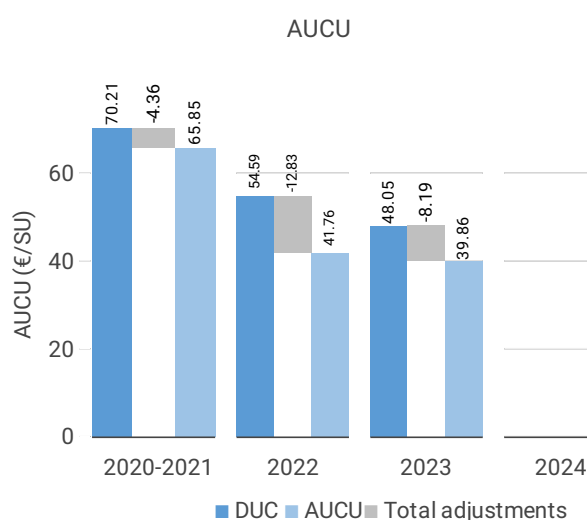
Significantly lower than planned en route costs in real terms for Croatia Control in 2023 (-10.2%, or -8.4 M€2017) result from:

- Significantly lower staff costs in real terms (-6.2%) but higher costs in nominal terms (+11.3%), “predominantly driven by a new CCL collective agreement and the adjustment of labour expenses to partially align with inflation trends”;
- Significantly lower other operating costs (-22.7%), “due to the slowdown of CAPEX-driven operational

costs as a result of the postponement of CAPEX projects and to lower-than-planned expenditures on licenses and leases of intangible assets (SaaS)";

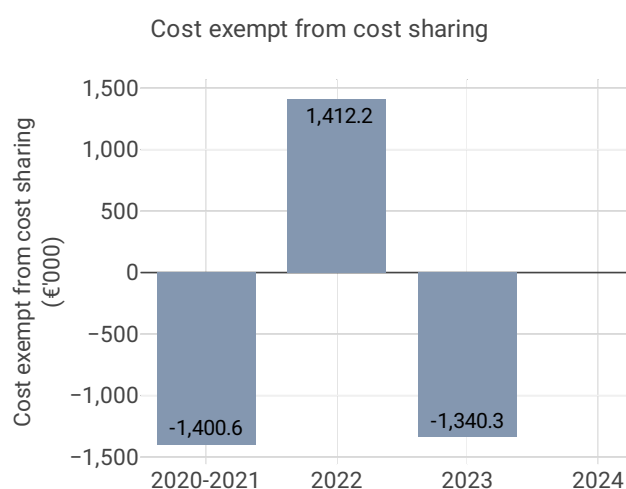
- Significantly lower depreciation (-10.9%), influenced by the decommissioning of assets at the end of their useful life and delays in implementing new CAPEX projects;
- Significantly lower cost of capital (-10.7%), mainly due to the reduction of average value of fixed assets;
- Significantly lower deduction for VFR exempted flights (-28.6%).

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



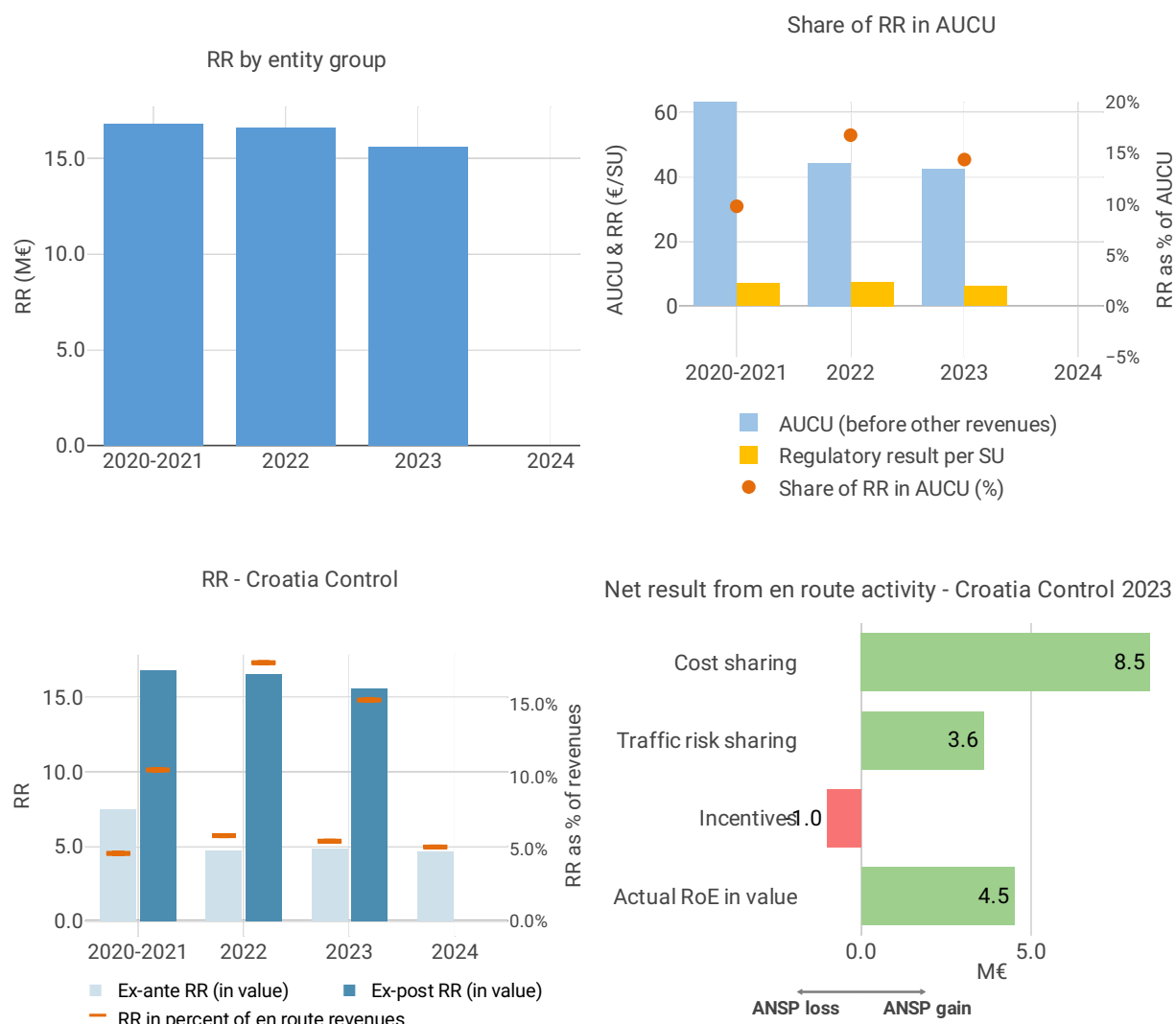
AUCU components (€/SU) – 2023

Components of the AUCU in 2023	€/SU
DUC	48.05
Inflation adjustment	5.32
Cost exempt from cost-sharing	-0.52
Traffic risk sharing adjustment	-8.63
Traffic adj. (costs not TRS)	-1.54
Financial incentives	-0.37
Modulation of charges	0.00
Cross-financing	0.00
Other revenues	-2.44
Application of lower unit rate	0.00
Total adjustments	-8.19
AUCU	39.86
AUCU vs. DUC	-17.0%



Cost exempt from cost sharing by item - 2023	€'000	€/SU
New and existing investments	-1,062.4	-0.41
Competent authorities and qualified entities costs	109.1	0.04
Eurocontrol costs	294.5	0.11
Pension costs	-717.1	-0.28
Interest on loans	35.6	0.01
Changes in law	0.0	0.00
Total cost exempt from cost risk sharing	-1,340.3	-0.52

5.2.3 Regulatory result (RR)



Focus on regulatory result

Croatia Control net gain on activity in the Croatia en route charging zone in the year 2023

Croatia Control reported a net gain of +11.8 M€, as a combination of a gain of +9.2 M€ arising from the cost sharing mechanism, with a gain of +3.6 M€ arising from the traffic risk sharing mechanism and a loss of -1.0 M€ relating to financial incentives.

Croatia Control 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 (+11.8 M€) and the actual RoE (+4.5 M€) amounts to +16.3 M€ (15.9% of the en route revenues). The resulting ex-post rate of return on equity is 25.5%, which is higher than the 7.0% planned in the PP.

Note: Croatia joined the euro area on 1 January 2023. On that date the euro replaced the Croatian kuna at the fixed exchange rate of €1 = HRK 7.53450. This may result in slight differences in determined and actual costs comparing to previous monitoring reports.