PRB | Performance review body of the single european sky

Performance Review Body Monitoring Report

Poland - 2023

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

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1 OVERVIEW

1.1 Contextual information

National performance plan adopted following Commission Decision (EU) 2022/779 of 13 April 2022

List of ACCs 1
Warsaw ACC

No of airports in the scope of the performance plan:
- **≥80'K** 1
- **<80'K** 14

Exchange rate (1 EUR=)
2017: 4.25483 PLN
2023: 4.53803 PLN

Share of Union-wide:
- **traffic (TSUs) 2023** 2.9%
- **en route costs 2023** 2.9%

Share en route / terminal costs 2023 79% / 21%

En route charging zone(s)
Poland

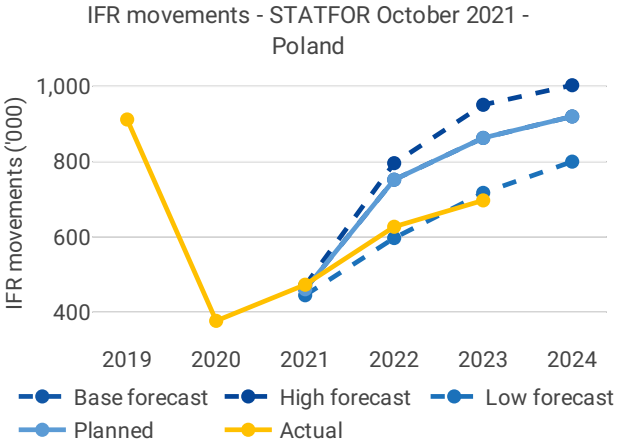
Terminal charging zone(s)
Poland EPWA
Poland Others

Main ANSP
- PANSA

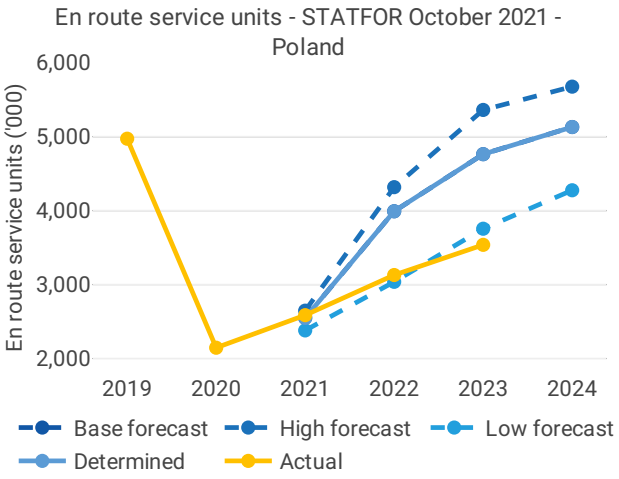
Other ANSPs
- Warmia i Mazury sp. z o.o.
- Port Lotniczy Bydgoszcz S.A.

MET Providers
- Institute of Meteorology and Water Management - National Research Institute (IMWM)
- Radom Meteo sp. z o.o.

1.2 Traffic (En route traffic zone)

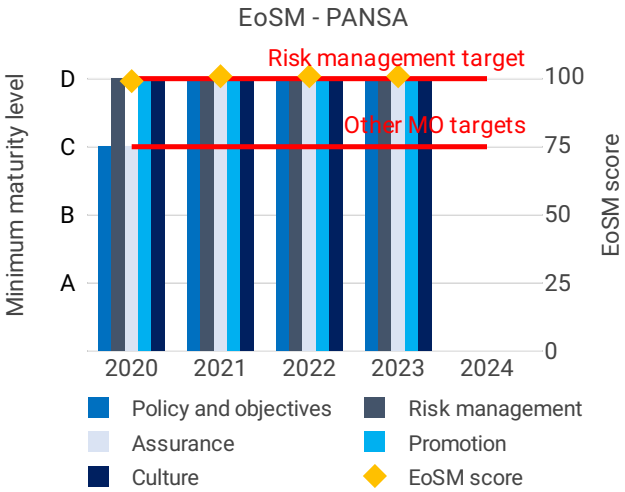


- Poland recorded 697K actual IFR movements in 2023, +11% compared to 2022 (627K).
- Actual 2023 IFR movements were -19% below the plan (863K).
- Actual 2023 IFR movements represent 76% of the actual 2019 level (912K).



- Poland recorded 3,537K actual en route service units in 2023, +13% compared to 2022 (3,129K).
- Actual 2023 service units were -26% below the plan (4,763K).
- Actual 2023 service units represent 71% of the actual 2019 level (4,972K).

1.3 Safety (Main ANSP)



• PANSA has already exceeded RP3 targets in 2022 and maintained the levels in 2023. PANSA continuously improves its safety function according to SMS development roadmap.

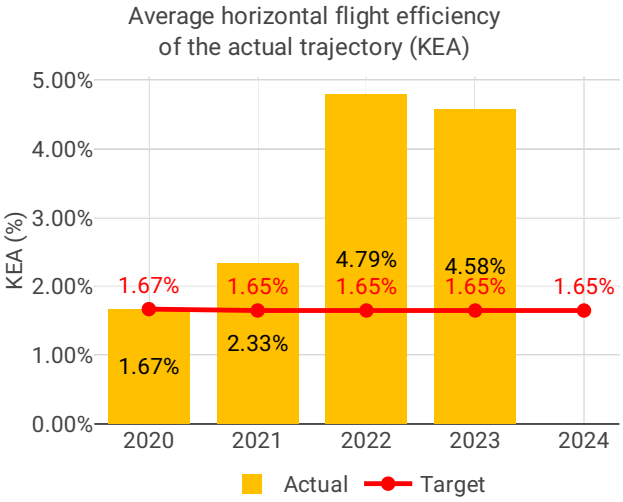
• Port Lotniczy Bydgoszcz S.A. achieved the RP3 targets for four other management objectives but requires improvement for safety risk management.

• Warmia i Mazury sp. z o.o. achieved its RP3 EoSM targets levels already in 2022 and maintained these levels through 2023.

• Poland recorded a stable performance with respect to the occurrences with lower rate of runway incursions and separation minima infringements in 2023 compared with 2022 despite the traffic increase. Polish CAA urges PANSA to continue implementation of measures related to reduction of separation minima infringements foreseen in RP3 performance plan.

• Poland do not use automated safety data recording systems.

1.4 Environment (Member State)



• Poland achieved a KEA performance of 4.58% compared to its target of 1.65% and did not contribute positively towards achieving the Union-wide target.

• The NSA states that the worsening environmental performance was largely due to external factors linked to the geopolitical situation (Belarus and Ukraine), leading to route extensions and increased military activities.

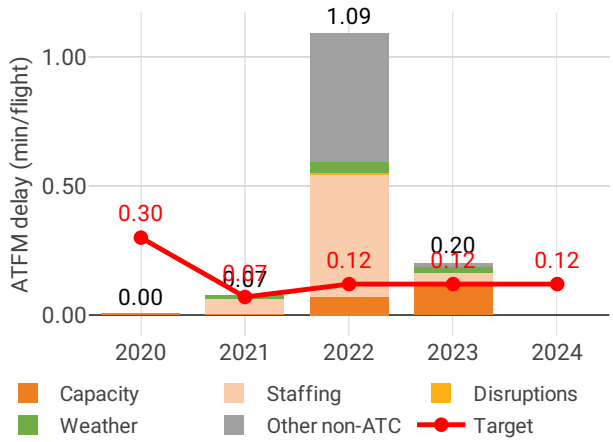
• Both KEP and SCR improved in comparison with 2022. Despite the KEA target being missed, the improvement in SCR shows that Poland has improved the environmental efficiency of its airspace when accounting for impacts outside of its control.

• The share of CDO flights decreased marginally from 43.47% to 42.78% in 2023.

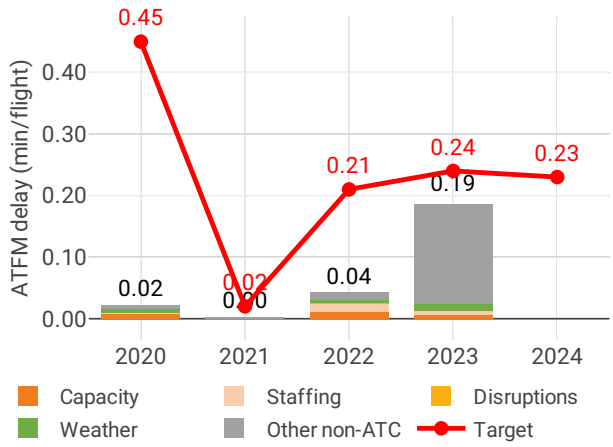
• During 2023, additional time in terminal airspace decreased from 1.27 to 1.19 min/flight, while additional taxi out time increased from 2.28 to 2.59 min/flight.

1.5 Capacity (Member State)

Average en route ATFM delay per flight by delay groups



Average arrival ATFM delay per flight by delay groups



• Poland registered 0.21 minutes of average en route ATFM delay per flight during 2023 which has been adjusted to 0.2 during the post-ops adjustment process, thus not achieving the local target value of 0.12. Flight delays in Poland decreased by 0.89 minutes per flight year-on-year.

• Delays were highest between July and October, mainly driven by ATC capacity and staffing issues.

• The share of delayed flights with delays longer than 15 minutes in Poland decreased by 16 p.p. compared to 2022 and was lower than 2019 values.

• The average number of IFR movements was 23% below 2019 levels in Poland in 2023.

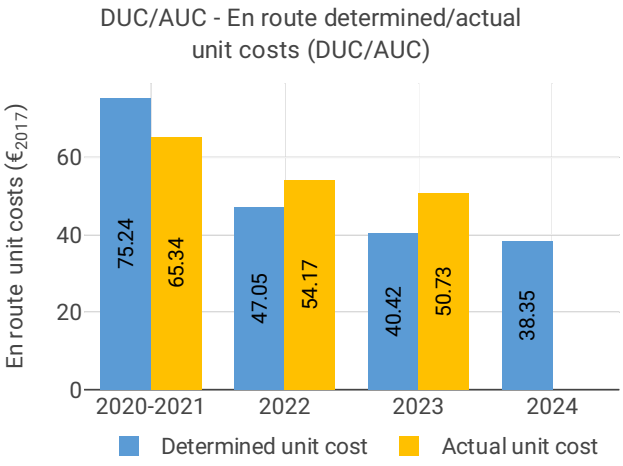
• The number of ATCOs in OPS is expected to increase by 11% by 2024, with the actual value being below the 2023 plan in Warsaw by 12 FTEs.

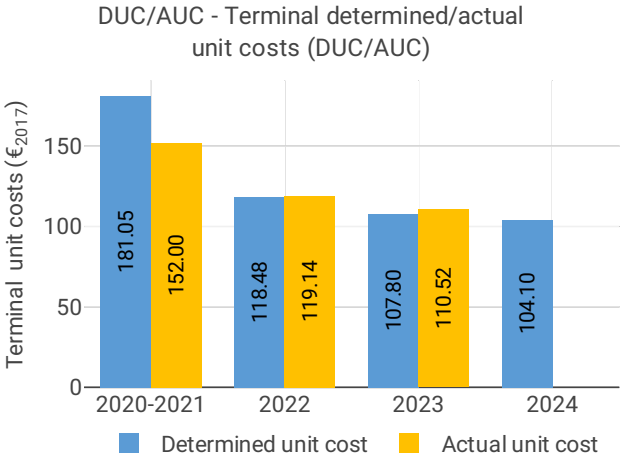
• The yearly total of sector opening hours in Warsaw ACC was 35,002, showing an 8% increase compared to 2022. Sector opening hours are 18.3% below 2019 levels.

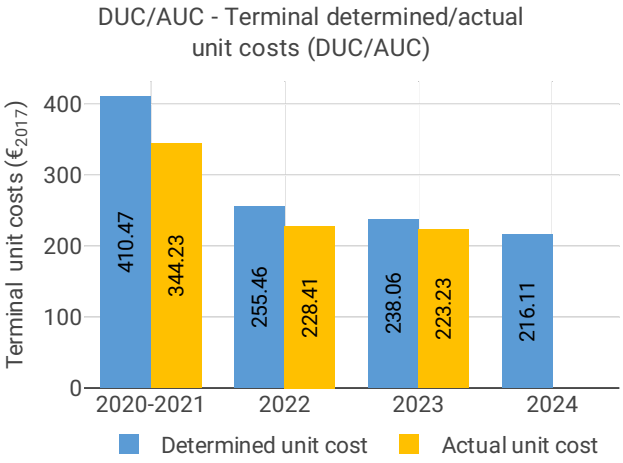
• Warsaw ACC registered 17.19 IFR movements per one sector opening hour in 2023, being 10.5% below 2019 levels.

• Year-on-year traffic growth was 12% in 2023 in Poland, still IFR movements remained 21% below the STATFOR October 2021 Base forecast. While there is still a capacity gap mainly driven by ATCO issues, capacity performance was significantly improved compared to 2022. Poland should continue to enhance capacity provision to fully close the gap in the coming years.

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







• The en route 2023 actual unit cost of Poland was 50.73 €2017, +26% higher than the determined unit cost (40.42 €2017). The terminal zone 1 actual unit cost was 110.52 €2017, which is +2.5% higher than the determined unit cost (107.80 €2017), while the terminal zone 2 actual unit cost was 223.23 €2017, -6.2% lower than the determined unit cost (238.06 €2017).

• The en route 2023 actual service units (3.5M) were -26% lower than the determined service units (4.8M), mainly due to shifted traffic flows caused by the Russia's war of aggression against Ukraine.

• In 2023, the en route actual total costs were -13 M€2017 (-6.8%) lower than determined, mainly due to the difference in other operating costs (-10 M€2017, or -22%). This substantial cost reduction was primarily due to lower expenses in several areas, including training, outsourced IT services, rental expenses, consultancy fees, and maintenance costs.

• Poland presented a deviation from the criteria to achieve capacity targets, which was considered justified. Considering that costs are significantly lower and that the 2023 en route capacity targets have not been achieved, the situation raises serious concern.

• PANSA spent 46 M€2017 in 2023 related to costs of investments for both en route and terminal charging zones, which is -1.8% lower than determined (47 M€2017).

• The en route actual unit cost incurred by users in 2023 was 60.17€ (+42% above the 2023 DUC), while the terminal zone 1 actual unit cost incurred by users was 134.74€ (+18% above the 2023 DUC) and 252.15€ (+0.1% above the 2023 DUC) for terminal zone 2. The difference between the AUCU and the DUC for both charging zones is mainly driven by the inflation adjustment (+33 M€ for the en route charging zone and +2.0 M€ for the terminal charging zone).

• 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 Poland 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 Poland to consider the reimbursement to airspace users of excess funds received by ANSPs for measures not implemented.

2 SAFETY - POLAND

2.1 PRB monitoring

• PANSA has already exceeded RP3 targets in 2022 and maintained the levels in 2023. PANSA continuously improves its safety function according to SMS development roadmap.

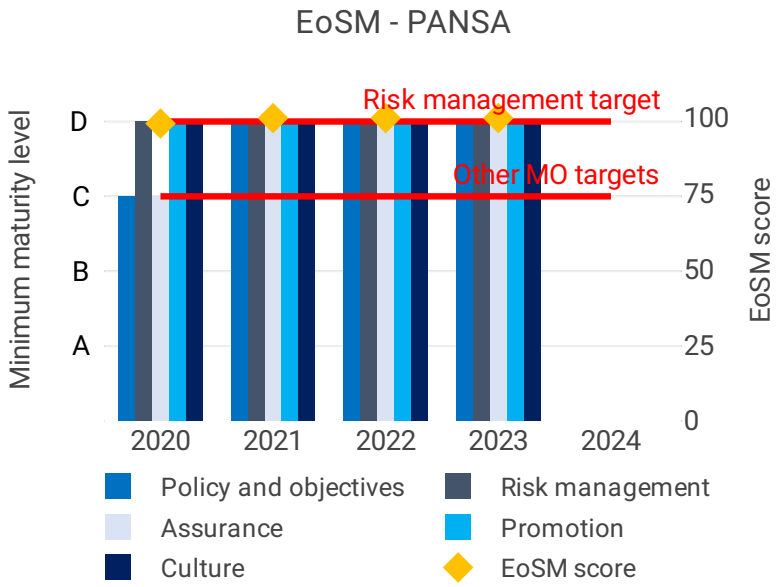
• Port Lotniczy Bydgoszcz S.A. achieved the RP3 targets for four other management objectives but requires improvement for safety risk management.

• Warmia i Mazury sp. z o.o. achieved its RP3 EoSM targets levels already in 2022 and maintained these levels through 2023.

• Poland recorded a stable performance with respect to the occurrences with lower rate of runway incursions and separation minima infringements in 2023 compared with 2022 despite the traffic increase. Polish CAA urges PANSA to continue implementation of measures related to reduction of separation minima infringements foreseen in RP3 performance plan.

• Poland do not use automated safety data recording systems.

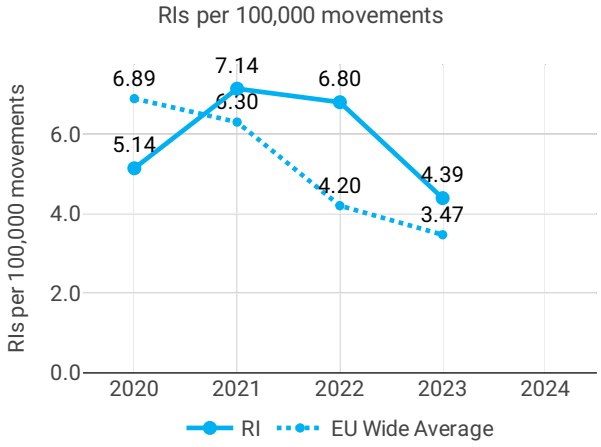
2.2 Effectiveness of Safety Management (EoSM) (KPI#1)

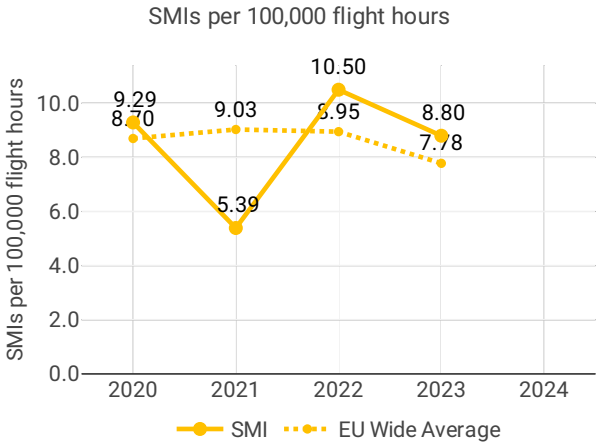


Focus on EoSM

All five EoSM components of PANSA meet or exceed the RP3 target level. The ANSP has already achieved the maximum level of maturity. Four out of five EoSM components of Port Lotniczy Bydgoszcz meet the RP3 target level with only “Safety Risk Management” is below the target. Improvements in “Safety Risk Management” are still required during RP3 to achieve RP3 targets. Warmia i Mazury achieved the RP3 target level for all five EoSM components in 2022 and maintained the levels over 2023.

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





3 ENVIRONMENT - POLAND

3.1 PRB monitoring

• Poland achieved a KEA performance of 4.58% compared to its target of 1.65% and did not contribute positively towards achieving the Union-wide target.

• The NSA states that the worsening environmental performance was largely due to external factors linked to the geopolitical situation (Belarus and Ukraine), leading to route extensions and increased military activities.

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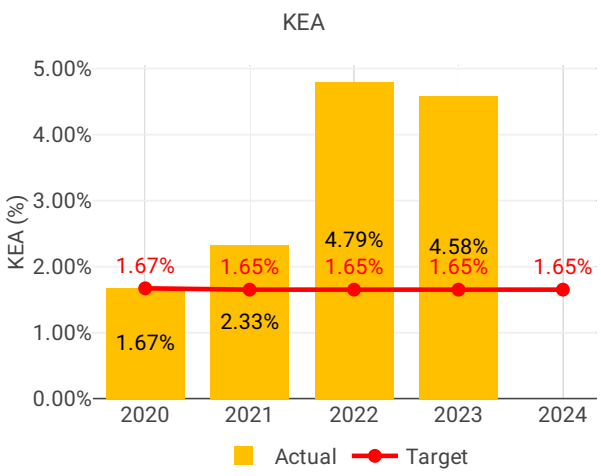
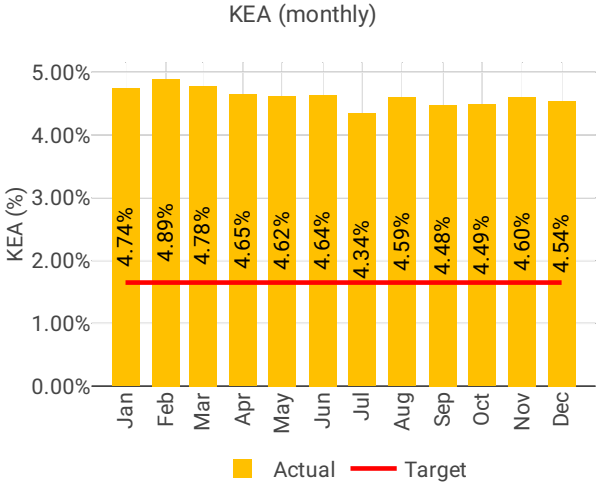
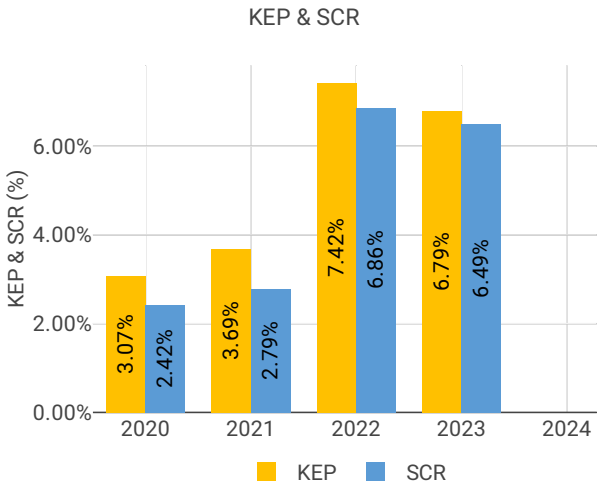
• During 2023, additional time in terminal airspace decreased from 1.27 to 1.19 min/flight, while additional taxi out time increased from 2.28 to 2.59 min/flight.

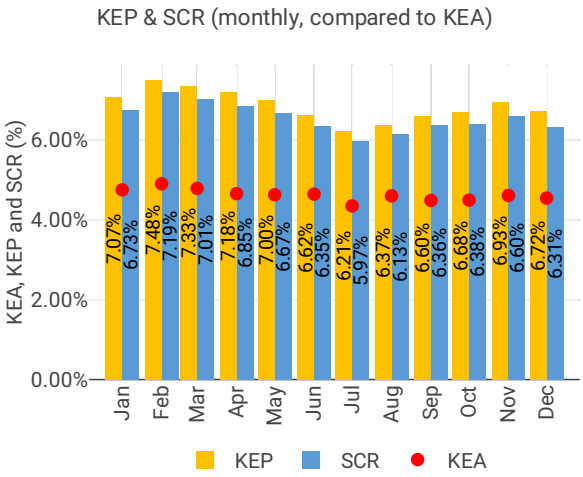
3.2 En route performance

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)



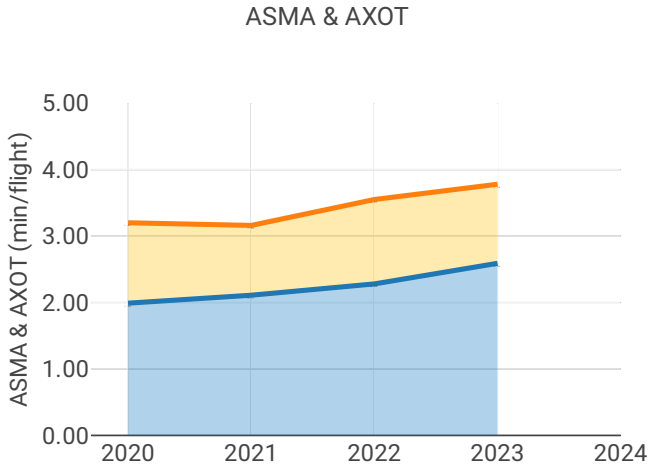


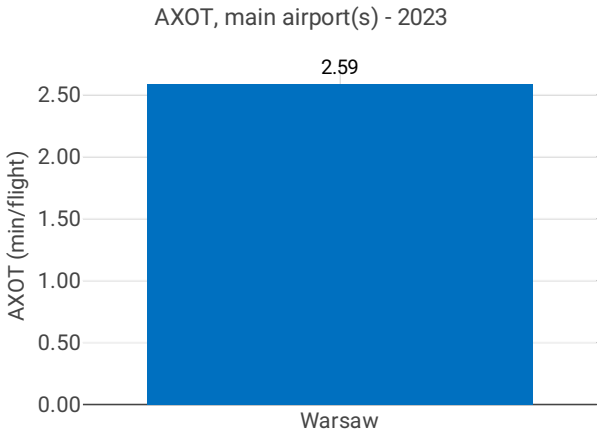


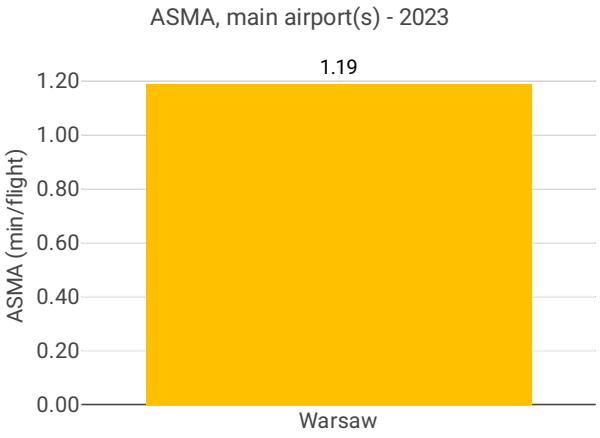


3.3 Terminal performance

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 Warsaw (EPWA; 2019: 3.43 min/dep.; 2020: 1.99 min/dep.; 2021: 2.11 min/dep.; 2022: 2.28 min/dep.; 2023: 2.59 min/dep.) slightly increased once more, although remained under the SES average for 2023 (2.81 min/dep.)

According to the Polish monitoring report: *2023 additional taxi-out time may be attributed to significant*

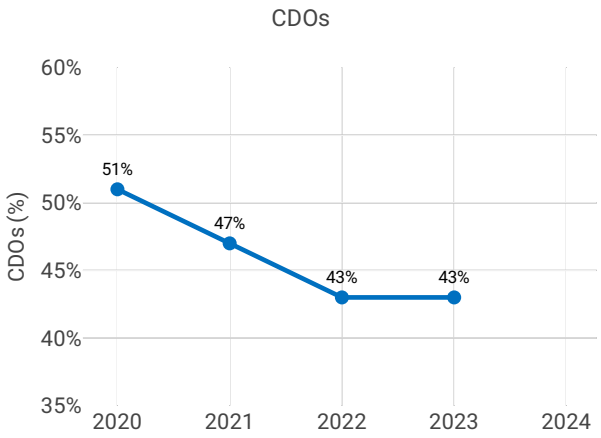
airside work in progress. Ongoing work on revalidating A-CDM may be a factor in reducing this index in near future. Planned initiatives include Traffic Complexity Tool (Fast time simulations) and A-SMGCS.

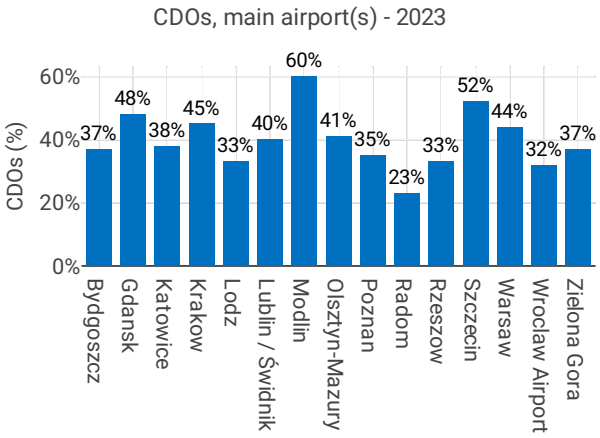
ASMA

Additional times in the terminal airspace of Warsaw (EPWA; 2019: 2.09 min/arr.; 2020: 1.21 min/arr.; 2021: 1.05 min/arr.; 2022: 1.27 min/arr.; 2023: 1.19 min/arr.) in 2023 decreased slighlty but they still exceed the SES average of 1.16 min/arr.

For information on measures implemented over 2020-2022, the Polish monitoring report refers to the respective Annual Monitoring Reports.For 2023, the Polish monitoring report mentions: *There are several changes in Warszawa TMA planned to reduce the additional time in that airspace. A change to the radar separation minimum from 5 NM to 3 NM in the TMA is planned as well as a partial implementation of RECAT-EU. Both of these changes are expected to allow to reduce the distance flown by the aircraft in the terminal airspace thus reducing the time. Moreover, sectorisation change of the Warszawa TMA is planned that is expected to bring further improvement. All of the above-mentioned changes are planned to be implemented early RP4.*

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





Focus CDOs

All airports have shares of CDO flights (well) above the overall RP3 value in 2023 (28.8%) except for Warszawa-Radom (EPRA - 22.5%).

Lublin, Olsztyn-Mazury, Rzeszów-Jasionka, Szczecin-Goleniów and Warszawa/Modlin had (slightly) higher values than in 2022 (EPLB: +3.5 percentage points; EPSY: +1.5 percentage points; EPRZ: +6.7 percentage points; EPSC: + 0.8 percentage points; EPMO: + 5.0 percentage points) while the values for the other airports decreased (between -26.2 and -0.1 percentage points).

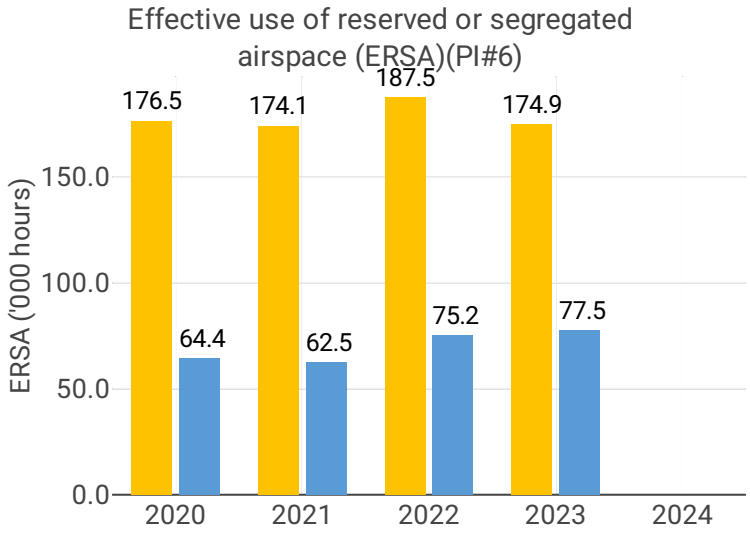
According to the Polish monitoring report: *For information on measures implemented over 2020-2022 please see the respective Annual Monitoring Reports.*

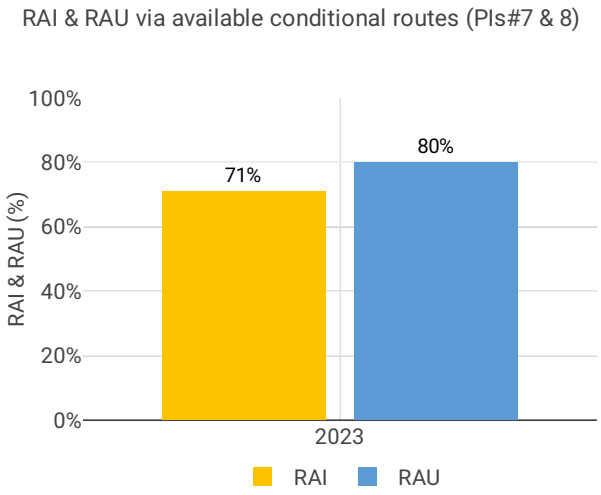
Planned reduction of the radar separation minimum in Warszawa TMA from 5 NM to 3 NM is expected to allow a greater number of operations to be performed as CDA. The change is planned to be implemented early RP4.

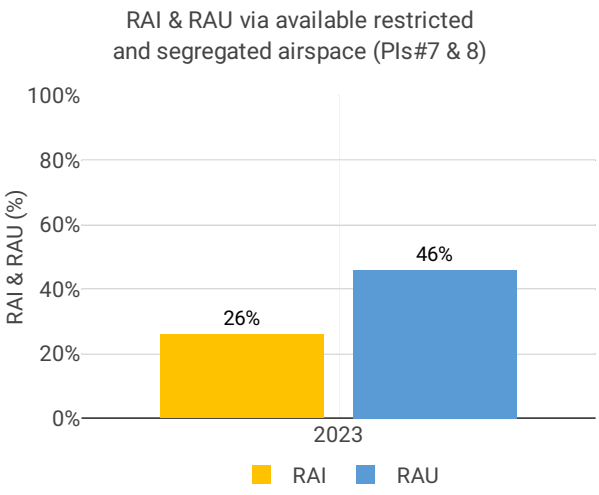
Airport level

	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
Warsaw	1.99	2.11	2.28	2.59	NA	1.21	1.05	1.27	1.19	NA	51%	49%	45%	44%	NA
Bydgoszcz	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	43%	42%	39%	37%	NA
Gdansk	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	58%	49%	51%	48%	NA
Krakow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	53%	45%	45%	45%	NA
Katowice	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	49%	46%	39%	38%	NA
Lublin / Świdnik	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	37%	39%	37%	40%	NA
Lodz	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	42%	35%	34%	33%	NA
Modlin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	66%	61%	55%	60%	NA
Poznan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	41%	36%	36%	35%	NA
Rzeszow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	53%	49%	27%	33%	NA
Szczecin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	53%	58%	51%	52%	NA
Olsztyn-Mazury	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	48%	54%	39%	41%	NA
Wroclaw Airport	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	43%	40%	35%	32%	NA
Zielona Gora	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	68%	61%	63%	37%	NA
Radom	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23%	NA

3.4 Civil-Military dimension







Focus on Civil-Military dimension

Update on Military dimension of the plan

There are over 30 permanent military areas extending over FL95 in FIR EPWW that have the impact on civil traffic flows and thereby can influence the horizontal flight efficiency indicator. Additionally, in FIR EPWW

recurring significant multinational NATO military exercises are held including: Anakonda, Astral Knight, AVDET Rotation, Baltops, Defender, Dragon, Rammstein Guard, Tobruq Legacy. Due to large scale of those exercises there are aircraft stopovers and regroupings on military aerodromes in FIR EPWW that increase the load on ACC GAT and OAT Warszawa that might impact the route efficiency of civil aircrafts. Military aerodromes, including EPLK, EPKS, EPPW, EPMM, are located nearby the main civil aerodromes.
There are agreed procedures and LoA signed between PANSA and the Military side describing the process of airspace management at pre-tactical and tactical level in order to optimise its use. The procedures are continuously updated according to the current needs of both the civilian and military sides. The local ASM system (CAT) automatically exchanges the data with the Network Manager system. ASM information is available in ATM system, additionally published on PANSA website.

Military - related measures implemented or planned to improve capacity

On strategic airspace management level, all significant military exercises and permanent military areas are evaluated and analysed taking into account historic civil traffic flows and civil traffic predictions taking into account both entry count and occupancy.
The locations of the military activities are, whenever possible, designed not to affect the main traffic flows, ATC routes, DCTs and BALTIC FAB connectivity and to have minimal or even No impact on capacity. Segmentation, time and level restrictions are imposed when needed to mitigate the impact in location in heavy traffic periods of the day. If possible, class C TRA airspace is implemented to minimize the impact on civil operations.
Further measures include:
- update of local ASM system/radar data added to visualize military activity in segregated areas. As a result, update of coordination procedures to reduce the time required to release segregated areas back to civil traffic.
- implementation of closer cooperation between AMC Poland and FMP Warszawa in order to reduce as much as possible negative influence of segregated areas on civil traffic. Implementation of new coordination procedures (NPZ management) taking into account forecasted demand of civil traffic on segregated airspace allocation in time on the day of the operations.

Initiatives implemented or planned to improve PI#6

On strategic airspace management level, all significant exercises and permanent areas are evaluated and analysed taking into account historic civil traffic flows and civil traffic predictions.
The impact, depending on the scale, is consulted with the key stakeholders including neighboring states, aerodrome operators, aircraft operators, ATS, military, EUROCONTROL NM.
The lateral and vertical limits of the airspace elements published are designated considering the actual needs of users and nature of activities. All airspace elements shall be planned only for the time period necessary to perform the intended task. The user is obliged to specify precisely the period of activity of a selected element and all timely suspensions of activity between these periods.
The locations of the activities are designed not to affect the main traffic flows, ATC routes, DCTs and FRA connectivity. Segmentation, time and level restrictions are imposed when needed to mitigate the impact in location in heavy traffic periods of the day. If possible class C TRA airspace is implemented to minimize the impact on civil routing.
When the areas excess the set scale they are always divided into smaller modules/segments. Each of these segments is designed in order to fit particular activities without necessity to activate the whole area to perform specific assignments. The shape of these segments is always aligned with main civil traffic flows to minimize the horizontal flight inefficiency.
Further measures include:
- update of local ASM system/radar data added to visualize military activity in segregated areas. As a result, update of coordination procedures to reduce the time required to release segregated areas back to civil traffic.
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Annual review of the efficiency of airspace utilization is conducted.

Initiatives implemented or planned to improve PI#7

The available flight planning options are constantly updated to allow Aircraft Operator (AO) to plan the most horizontally effective trajectory, even when the areas are active. Except ATS network and DCTs, the AOs have the possibility to plan in the Free Route Airspace environment (FRA). Implementation of cross-border free route airspace operations within Lithuanian and Polish airspace (BALTIC FRA) and the cross border operations between BALTIC FRA and South East Europe FRA were implemented in 1Q 2022 which could further increase the planning opportunities. It is planned to further expand cross-border options by implementation of cross-border FRA operations between Poland, Czechia and Sweden by the end of 2024.
The lateral and vertical limits of the airspace elements published are designated considering the actual needs of users and nature of activities. All airspace elements shall be planned only for the time period necessary to perform the intended task. The user is obliged to specify precisely the period of activity of a selected element and all timely suspensions of activity between these periods.
Segmentation, time and level restrictions are imposed when needed to mitigate the impact in location in heavy traffic periods of the day. If possible class C TRA airspace is implemented to minimize the impact on civil routing.
Special procedures are prepared including dynamic change of level or segment and creation of new temporary routings for avoidance of military traffic.
Further measures include:
- update of local ASM system/radar data added to visualize military activity in segregated areas. As a result, update of coordination procedures to reduce the time required to release segregated areas back to civil traffic.
- implementation of closer cooperation between AMC Poland and FMP Warszawa in order to reduce as much as possible negative influence of segregated areas on civil traffic. Implementation of new coordination procedures (NPZ management) taking into account forecasted demand of civil traffic on segregated airspace allocation in time on the day of the operations.
Due to the war in Ukraine and significantly increased number of NATO flights in Polish airspace special procedures were implemented in order to easy flight planning process for AUs. For some areas FUA restrictions are dynamically managed and if possible are not activated on a given days.

Initiatives implemented or planned to improve PI#8

The lateral and vertical limits of the airspace elements published are designated considering the actual needs of users and nature of activities. All airspace elements shall be planned only for the period necessary to perform the intended task. The user is obliged to specify precisely the period of activity of a selected element and all timely suspensions of activity between these periods.
Segmentation, time and level restrictions are imposed when needed to mitigate the impact in location in heavy traffic periods of the day. If possible class C TRA airspace is implemented to minimize the impact on civil routing.
Special procedures are prepared including dynamic change of level or area segment.
Further measures include:
- update of local ASM system/radar data added to visualize military activity in segregated areas. As a result, update of coordination procedures to reduce the time required to release segregated areas back to civil traffic.
- implementation of closer cooperation between AMC Poland and FMP Warszawa in order to reduce as much as possible negative influence of segregated areas on civil traffic. Implementation of new coordination procedures (NPZ management) taking into account forecasted demand of civil traffic on segregated airspace allocation in time on the day of the operations.

4 CAPACITY - POLAND

4.1 PRB monitoring

• Poland registered 0.21 minutes of average en route ATFM delay per flight during 2023 which has been adjusted to 0.2 during the post-ops adjustment process, thus not achieving the local target value of 0.12. Flight delays in Poland decreased by 0.89 minutes per flight year-on-year.

• Delays were highest between July and October, mainly driven by ATC capacity and staffing issues.

• The share of delayed flights with delays longer than 15 minutes in Poland decreased by 16 p.p. compared to 2022 and was lower than 2019 values.

• The average number of IFR movements was 23% below 2019 levels in Poland in 2023.

• The number of ATCOs in OPS is expected to increase by 11% by 2024, with the actual value being below the 2023 plan in Warsaw by 12 FTEs.

• The yearly total of sector opening hours in Warsaw ACC was 35,002, showing an 8% increase compared to 2022. Sector opening hours are 18.3% below 2019 levels.

• Warsaw ACC registered 17.19 IFR movements per one sector opening hour in 2023, being 10.5% below 2019 levels.

• Year-on-year traffic growth was 12% in 2023 in Poland, still IFR movements remained 21% below the STATFOR October 2021 Base forecast. While there is still a capacity gap mainly driven by ATCO issues, capacity performance was significantly improved compared to 2022. Poland should continue to enhance capacity provision to fully close the gap in the coming years.

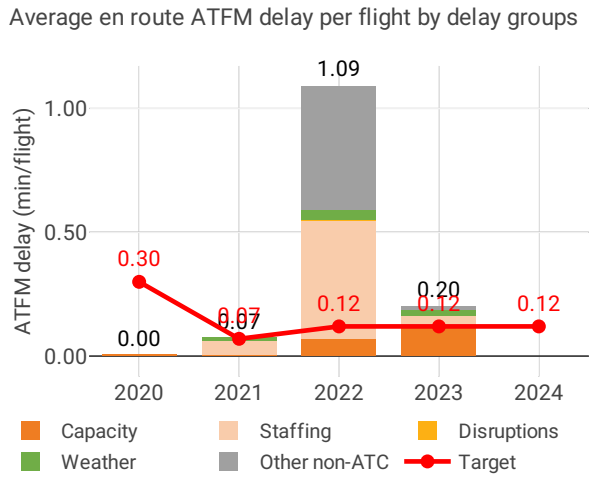
• Poland registered an average airport arrival ATFM delay of 0.19 minutes per flight in 2023, achieving the local target of 0.24 minutes.

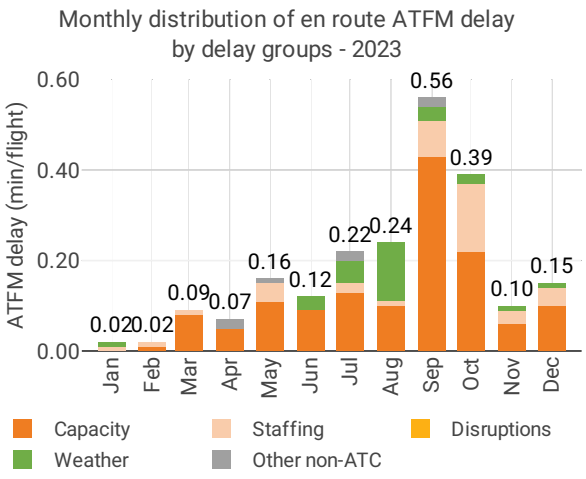
• Compared to 2022, average arrival ATFM delays in Poland were 324% higher in 2023, while the number of IFR arrivals increased by 13%.

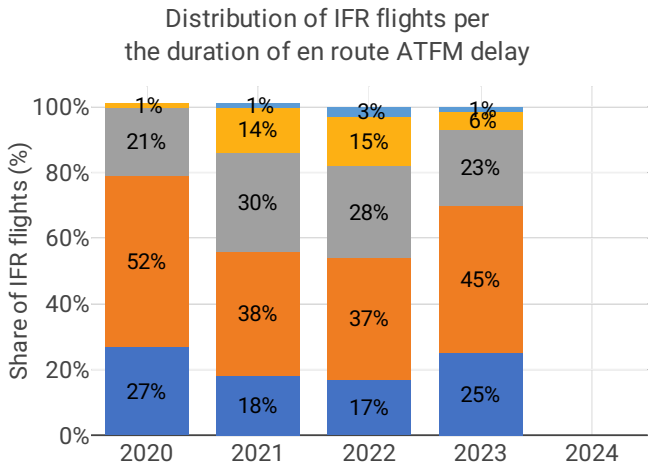
• The main reasons for delays were other, non-ATC related causes, accounting for 87% of delays, and weather, responsible for 6%.

4.2 En route performance

4.2.1 En route ATFM delay (KPI#1)







Focus on en route ATFM delay

Summary of capacity performance

Poland experienced an increase in traffic from 627k flight in 2022, with 669k minutes of ATFM delay, to 697k flights in 2023 with 136k minutes of en-route ATFM delay.
There was an additional 6k minutes of delay originating in Poland 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

Performance over 2023 was strongly impacted by the consequence of the military aggression of the Russian Federation on Ukraine, a war right behind Poland's eastern border. The resulting closure of the Ukrainian airspace and further restrictions imposed on traffic flows on east-western axis (as a consequence of sanctions and reciprocal actions) led to significant changes to traffic flows in the Polish airspace (including drop in overflights and increase in traffic on the north-southern axis along Poland's eastern border). Uncertainty regarding traffic evolution in FIR Warszawa was still visible in 2023. At the same time, a direct consequence of the war was significant increase in military activity (including NATO) in FIR Warszawa, which impacted airspace availability for civil traffic. All this had an impact on capacity and increased complexity.
PANSA has to maintain its operational abilities aimed at allowing it to effectively respond to traffic increase once the military conflict is over and traffic flows come back to their pre-war, shorter, routes. This necessitated continuation of actions aimed at increasing capacity in subsequent years.
The results in the CAPACITY KPA at the end of 2023 year for Poland (PANSA) was 0,20 minutes/flight with a target of 0,12 minutes/flight.

The aggression of the Russian Federation against Ukraine has a significant impact on the air navigation services in Poland due to the introduction of a number of restrictions in FIR Warszawa. A direct consequence of this situation are significant delays in Polish airspace, especially the en route delays rate.

Monitoring process for capacity performance

Evolution of capacity situation and delays is performed every day based on own PANSA OPS data as well as NM data. Monthly monitoring is implemented based on EUROCONTROL (ANS performance) data. The results in the CAPACITY KPA at the end of 2023 year for Poland (PANSA) was 0,20 minutes/flight with a target of 0,12 minutes/flight. The significant increase of delays in Polish airspace, especially the en route delays rate is a direct consequence of the Russian Federation against Ukraine. This situation continues since the beginning of the invasion in February 2022.

Capacity planning

Capacity planning over 2023 focused on mid to long-term planning based on STATFOR forecasts, NM data, PANSA simulations as well as short term planning (up to 8 weeks) under the NOP rolling planning initiative coordinated by the Network Manager.
Capacity planning, was challenging due to higher than pre-RP3 uncertainty regarding traffic levels as well as military activity resulting from the geopolitical developments.
Despite the war in Ukraine and challenges related thereto, PANSA continued implementing initiatives aimed at improving capacity in FIR Warszawa to meet challenges related to traffic increase after the crisis as well as potential changes in traffic flows.
These included, among others, the following:
- continuation of new ATCOs training (continued training process for trainees employed before the pandemic outbreak and trainees from recruitment processes started in 2022 (new ATCO course in 2022), as well as new recruitment process for ATCO started in 2023),
- continued adaptation of the air traffic management system (Pegasus_21) to operational needs and modernisation of the ATM system as well as works – under international iTEC cooperation – on new ATM system to be implemented in the future,
- use of tools supporting ATCOs and flow management optimisation (including use of Traffic Complexity Tool and NMP Flow),
- continued investments in infrastructure (CNS) and technology allowing for optimisation of airspace structures and optimisation of coverage in the Polish airspace as well as supporting contingency,
- implementation of the first stage of airspace three-layer vertical split (south-eastern part of the Polish airspace – JR sectors – operationally deployed in April 2023) and preparation for implementation of subsequent stages in RP4,
- reorganisation of Kraków TMA – new sectors, new SID/STAR procedures (operationally deployed in 2023),
- continued harmonisation of GAT and OAT traffic leading to implementation of EUROAT,
- refreshment trainings for current ATCOs to maintain their competence,
- continuation of flexible rostering,
- evolving ACC sector configurations and management to cope with updated traffic forecasts,
- continued FMP dynamic management and ATFCM techniques including STAM,
- improvement of comprehensive airspace management.

PANSA also actively contributed to the implementation of Summer 2023 NM measures aimed at limiting delays in the mostly congested parts of the Network.
Plans for 2024 include continuation of the above listed initiatives, among others:
- further works on reorganisation of ACC Warszawa sector configuration – three layer vertical division – further stages (planned to be operationally deployed in RP4),
- continuation of training process for new ATCOs (including new recruitments), with initiatives supporting increased efficiency of the recruitment and training processes,
- adaptation of the air traffic management system to operational needs and modernisation of the ATM System,
- continued investments in infrastructure (CNS) and technology allowing for optimisation of airspace structures and optimisation of coverage in the Polish airspace as well as supporting resilience, scalability and flexibility of service provision,
- development of CPDLC operational use (logon-list).

Application of Corrective Measures for Capacity (if applicable)

The following elements impacted the en-route delay indicator over 2023 that resulted in not meeting the target:
1. Military aggression of the Russian Federation on Ukraine,
2. Reorganisation of Kraków TMA.

On point 1 - the Russian aggression against Ukraine resulted in the introduction of restrictions in FIR Warszawa (specifically, along Poland's eastern border), impacting availability of the airspace for civil traffic. Much wider military activities are visible, also linked to increased number of NATO flights in eastern part of the Polish airspace. Significant portion of this part of the airspace is reserved for military flights (performed H24) thus unavailable for civil traffic. The limited capacity (caused directly by the political circumstances), coupled with increased demand in sectors group J (due to limited possibilities of planning through sector

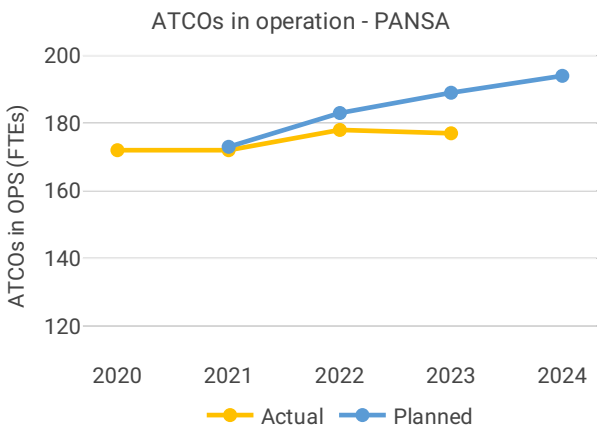
R, caused by NPZ), has an impact on delays in the Polish airspace. Moreover, unpredictability of certain military operations (including NATO ad hoc operations) results in difficulties for strategic planning of traffic flows, requiring implementation of tactical measures. The impact on delays can be especially visible during the period of higher traffic levels (when the traffic demand exceeds the available capacity in the parts of FIR Warszawa which were impacted by the restrictions).
On point 2 – the airspace reorganisation was necessary following analysis of delays recorded in 2019 as well as due to significant increase in traffic in South-Eastern part of the Polish airspace (especially to/from EPRZ airport) following the outbreak of the war in Ukraine. The change in TMA boundaries, new sectorization and new SID/STAR procedures were aimed at improving the traffic flow management and increasing capacity of the Kraków TMA. However, during the implementation phase, temporary reduction of occupancy values had to be applied, what impacted the level of delays – this impact was especially visible over September-October 2023.
The ANSP, PANSA, has implemented two specific measures to remedy the capacity situation:
- Improved sectorisation within the ACC - New sector configurations have been implemented in JKZR priotion of airspace since June 2022; and the first stage of a three-layer vertical airspace split was implemented in April 2023.
- Traffic flow management - evaluations of traffic flows, carried out on regular basis, in order to modify flows and move from congested areas to volumes of airspace where spare capacity can be found - this is ongoing.

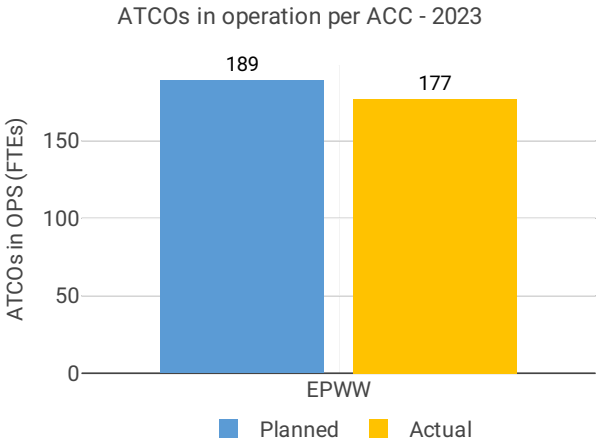
Additional Information Related to Russia's War of Aggression Against Ukraine The war in Ukraine and related geopolitical situation is expected to impact capacity indicator for Poland also in 2024. Due to unpredictability of the situation (unpredictability related to further evolution of the conflict and of possible impact on Poland) as well as uncertainty regarding military activities in FIR Warszawa, it is difficult to assess the possible impact on 2024 capacity results.
The biggest impact on en-route capacity performance for Poland is linked with increased military activity and related limited capacity available to civil traffic. As indicated above, much wider military activities in the Polish airspace are visible, also linked to increased number of NATO flights in eastern part of the Polish airspace. Significant portion of this part of airspace is reserved for military flights (performed H24), thus unavailable for civil traffic. At the same time, following closure of Ukrainian airspace and very limited possible use of Belarusian airspace, additional traffic flows are observed on the north-southern axis along the eastern Poland's border. The combination of limited airspace available and traffic demand leads to increase in delays. Moreover, unpredictability of certain military operations (including NATO ad hoc operations) results in difficulties for strategic planning of traffic flows, requiring implementation of tactical measures. The impact can be especially visible during the period of higher traffic levels (when the traffic demand exceeds the available capacity in the parts of FIR Warszawa which were impacted by the restrictions).
Following discussion with the Network Manager, since mid-March 2022 delays directly caused by the war in Ukraine have been marked as "O" (other) and thus also included in the data published by the Network Manager. Delays marked "O" are only related to the war in Ukraine and do not take into account other causes of delays. Certain delays marked "M" are also considered as related to the war in Ukraine. Over 2023, the delays coded "O" amounted to 2 635 minutes, while those coded "M" related to the war amounted to 569 minutes.
Mitigation measures implemented n regards to capacity include:
As indicated in Annual Monitoring Report for 2022 and above:
- PANSA implemented RAD measures and EU Restrictions that were aimed to reduce ATFCM delays within EPWW FIR sectors with limited capacity due to additional military activity.
- PANSA also implemented solutions aimed at minimising this negative impact, especially in the south-eastern part of the Polish airspace: level change of military areas, RAD and PTR to change EPRZ traffic profiles, new sector configurations in JKZR part since 17.06.2022, coordination with LZBB to unblock PODAN and KEFIR border points (above FL315).
- Further improvements in the sectorisation in the south-eastern part of the Polish airspace were made through introduction of three-layer vertical split (first stage implemented in April 2023).

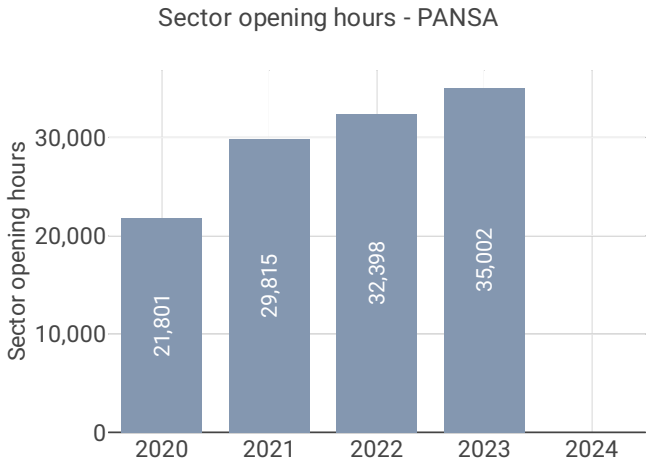
En route Capacity Incentive Scheme

Polish Air Navigation Services Agency (PANSA): The NSA reports that a penalty of 16,252,603 is due PLN.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





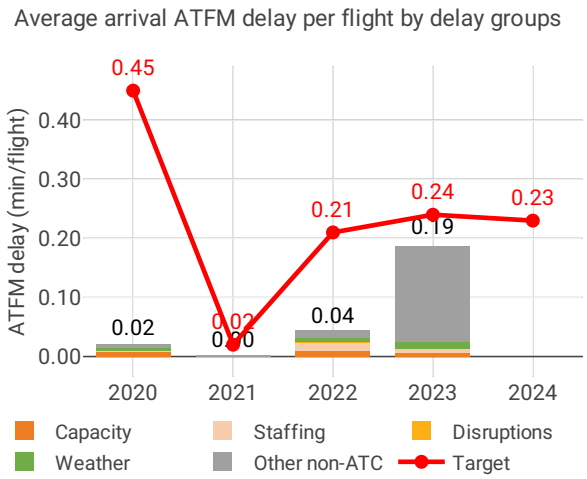


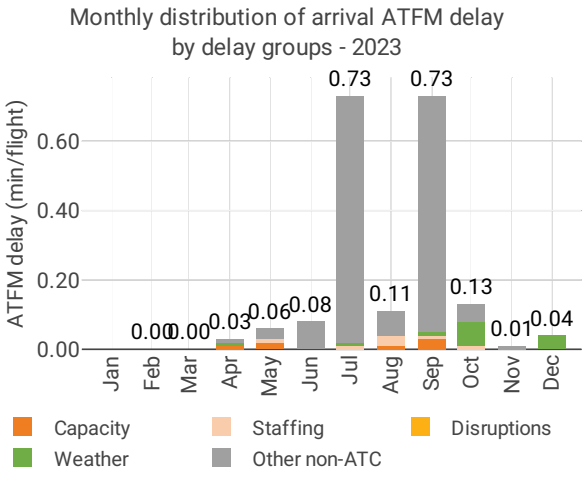
Focus on ATCOs in operations

Number of additional ATCOs in OPS who have started working in the OPS room (FTEs): 9 consists of:
6 - new licenses & 3 - shifts to PRU1 (ATCOs in OPS) category from other PRU categories.
Number of ATCOs in OPS who have stopped working in the OPS room (FTEs): 9,8 consists of:
4 – termination of the contract; 5 – shifts from PRU1 (ATCOs in OPS) category to other PRU categories & 0,8 – balance of increase and reduction of working time on the request of employee.

4.3 Terminal performance

4.3.1 Arrival ATFM delay (KPI#2)





Focus on arrival ATFM delay

For Poland the scope of the RP3 monitoring comprises a total of 15 airports. However, in accordance with IR (EU) 2019/317 and the traffic figures, only the main airport Warsaw (EPWA) must be monitored for the pre-departure delay indicators.
The Airport Operator Data Flow, necessary for the monitoring of the pre-departure delays, is correctly established where required and the monitoring of these indicators can be performed.
Traffic at the ensemble of these 15 airports in 2023, after a 13% increase with respect to 2022, was almost back to precovid levels (-2.5% with respect to 2019)
Average arrival ATFM delays in 2023 was 0.19 min/arr, compared to 0.04 min/arr in 2022. National target was met.
ATFM slot adherence was similar to the previous year (2023: 96.6%; 2022: 96.5%).

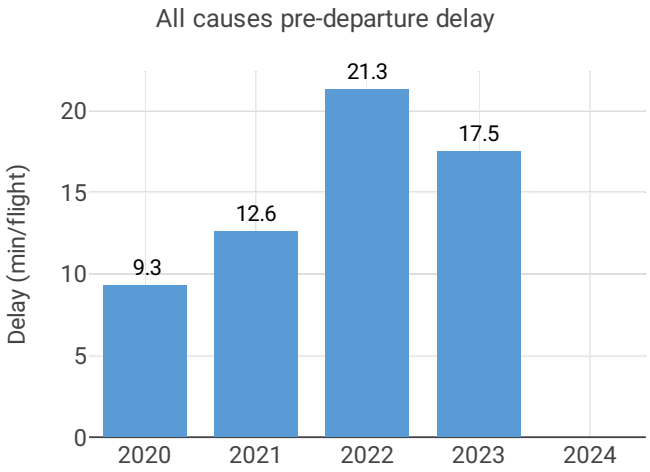
On average, arrival ATFM delays have increased at Polish airports, with most delays concentrated at Warsaw (EPWA; 2023: 0.36 min/arr).
The national average arrival ATFM delay in 2023 was 0.19 min/arr. 83% of all delays at Polish airports were attributed to Aerodrome Capacity, followed by 6% attributed to Weather.
According to the Polish monitoring report:
The actual performance over 2023 was better than the target set in the adopted RP3 PP.
Large majority of delays recorded in 2023 were linked to non-ATC reasons. Aerodrome-related delays accounted for 84% of the terminal delays and Weather conditions generated 6% of the terminal delays. ATC-related delays accounted for 10% of terminal delays in 2023.
The outbreak of the war in Ukraine impacted traffic to/from Rzeszów-Jasionka (EPRZ) airport, which became kind of a transportation hub for Ukraine. As a consequence, significant traffic increase at this airport, as compared to both previous years as well as the assumptions underlying the adopted RP3 PP, was observed.
Moreover, military exercises are being organized at/around the airport and military operations are performed at the airport - causing also temporary closure of the airport.
Increased military activity, following the outbreak of the war, had some impact on delays in Rzeszów-Jasionka (EPRZ) airport over 2023.
Below are the airport arrival ATFM delays for Rzeszów-Jasionka (EPRZ) airport over 2023 related to the war in Ukraine:

For measuring addition to the information provided above, see the measures implemented in 2022, provided in Annual Performance Monitoring Report for 2022.

Poland's performance plan sets a national target on arrival ATFM delay for 2023 of 0.24 min/arr. This target was met with an actual performance of 0.19 min/arr. The incentive scheme uses modulated pivot values

limited to CRSTMP delay causes. According to the Polish monitoring report, this pivot value for CRSTMP is 0.05 min/arr in 2023 and based on the attribution of the regulation reason, the actual CRSTMP value for 2023 was 0.019 min/arr (the NSA reports a CRSTMP value of 0.026 min/arr that could not be verified) The NSA calculates a bonus of PLN 3 326 247.

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
Bydgoszcz	NA	NA	NA	NA	94.0%	100.0%	97.0%	98.2%
Gdansk	NA	NA	0.12	0.04	93.3%	97.0%	96.6%	97.1%
Katowice	NA	NA	0.05	0.01	89.6%	92.3%	92.1%	93.1%
Krakow	0.04	NA	0.11	0.04	95.9%	97.9%	97.5%	98.2%
Lodz	NA	NA	0.04	NA	100.0%	92.0%	95.6%	93.9%
Lublin / Świdnik	NA	NA	NA	NA	91.7%	96.2%	98.1%	98.1%
Modlin	0.01	NA	0.00	0.58	96.4%	98.3%	98.1%	98.0%
Olsztyn-Mazury	NA	NA	NA	NA	88.9%	100.0%	97.9%	97.1%
Poznan	NA	0.01	0.00	0.03	97.9%	97.3%	97.7%	96.8%
Radom	NA	NA	NA	NA	NA	NA	NA	97.8%
Rzeszow	NA	NA	0.04	0.19	93.3%	98.4%	97.3%	96.9%
Szczecin	NA	NA	0.02	NA	95.7%	100.0%	97.6%	94.5%
Warsaw	0.04	0.00	0.02	0.36	97.5%	97.4%	97.1%	97.5%
Wroclaw Airport	NA	0.00	0.01	0.00	88.9%	92.1%	93.9%	92.8%
Zielona Gora	NA	NA	NA	NA	100.0%	100.0%	89.9%	93.2%

	ATC pre departure delay (PI#2)				All causes pre departure delay (PI#3)			
Airport name	2020	2021	2022	2023	2020	2021	2022	2023
Bydgoszcz	NA	NA	NA	NA	NA	NA	NA	NA
Gdansk	NA	NA	NA	NA	NA	NA	NA	NA
Katowice	NA	NA	NA	NA	NA	NA	NA	NA
Krakow	NA	NA	NA	NA	NA	NA	NA	NA
Lodz	NA	NA	NA	NA	NA	NA	NA	NA
Lublin / Świdnik	NA	NA	NA	NA	NA	NA	NA	NA
Modlin	NA	NA	NA	NA	NA	NA	NA	NA
Olsztyn-Mazury	NA	NA	NA	NA	NA	NA	NA	NA
Poznan	NA	NA	NA	NA	NA	NA	NA	NA
Radom	NA	NA	NA	NA	NA	NA	NA	NA
Rzeszow	NA	NA	NA	NA	NA	NA	NA	NA
Szczecin	NA	NA	NA	NA	NA	NA	NA	NA
Warsaw	0.32	0.54	0.56	0.61	9.3	12.6	21.3	17.5
Wroclaw Airport	NA	NA	NA	NA	NA	NA	NA	NA
Zielona Gora	NA	NA	NA	NA	NA	NA	NA	NA

Focus on performance indicators at airport level

ATFM slot adherence

Polish airports showed adherence between 92.8% and 98.2% and Warsaw (EPWA) reached 97.5%. The national average was 96.6%, similar to the previous year (96.5%). With regard to the 3.4% of flights that did not adhere, 2.1% was early and 1.3% was late.
According to the Polish monitoring report: *Performance achieved in 2023 still may be influenced by consequences of COVID-19 pandemic and Russia's war of aggression against Ukraine and related traffic drop. It should not be compared to the first years of RP3 and the previous periods.*

ATC pre-departure delay

The calculation of the ATC pre-departure delay is based on the data provided by the airport operators through the Airport Operator Data Flow (APDF) which is properly implemented at Warsaw.
The annual value for 2023 was very similar to the observed in 2021 and 2022 and lower than pre-COVID (EPWA: 2019: 0.87 min/dep; 2021: 0.59 min/dep; 2022: 0.6 min/dep; 2023: 0.61 min/dep)
According to the Polish monitoring report: *DCL implementation and subsequent implementation of Ground Planner position will improve pre-departure planning and is expected to improve pre-departure delays if caused by ATC.*

All causes pre-departure delay

Warsaw is the only Polish airport subject to the monitoring of this indicator.
The total (all causes) delay in the actual off block time at Warsaw decreased in 2023 (EPWA: 2020: 9.32 min/dep.; 2021: 12.61 min/dep.; 2022: 21.26 min/dep.; 2023: 17.53 min/dep.)
According to the Polish monitoring report: *2023 performance may be attributed to significant airside work in progress. No significant actions were taken to improve this indicator in 2023. DCL/GND planner position and revalidation of A-CDM are short term actions that are aimed at improving overall performance (partially in 2024).*

5 COST-EFFIENCY - POLAND

5.1 PRB monitoring

• The en route 2023 actual unit cost of Poland was 50.73 €2017, +26% higher than the determined unit cost (40.42 €2017). The terminal zone 1 actual unit cost was 110.52 €2017, which is +2.5% higher than the determined unit cost (107.80 €2017), while the terminal zone 2 actual unit cost was 223.23 €2017, -6.2% lower than the determined unit cost (238.06 €2017).

• The en route 2023 actual service units (3.5M) were -26% lower than the determined service units (4.8M), mainly due to shifted traffic flows caused by the Russia's war of aggression against Ukraine.

• In 2023, the en route actual total costs were -13 M€2017 (-6.8%) lower than determined, mainly due to the difference in other operating costs (-10 M€2017, or -22%). This substantial cost reduction was primarily due to lower expenses in several areas, including training, outsourced IT services, rental expenses, consultancy fees, and maintenance costs.

• Poland presented a deviation from the criteria to achieve capacity targets, which was considered justified. Considering that costs are significantly lower and that the 2023 en route capacity targets have not been achieved, the situation raises serious concern.

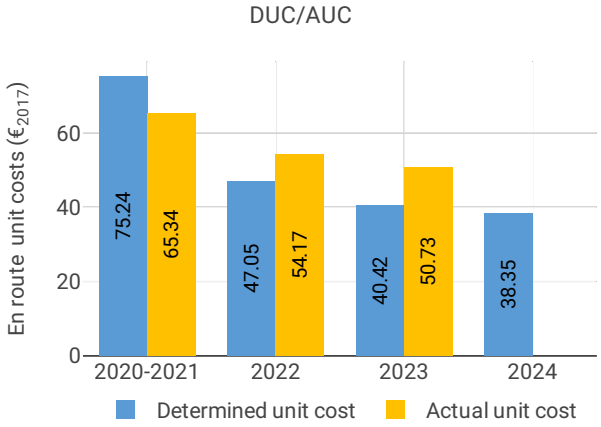
• PANSA spent 46 M€2017 in 2023 related to costs of investments for both en route and terminal charging zones, which is -1.8% lower than determined (47 M€2017).

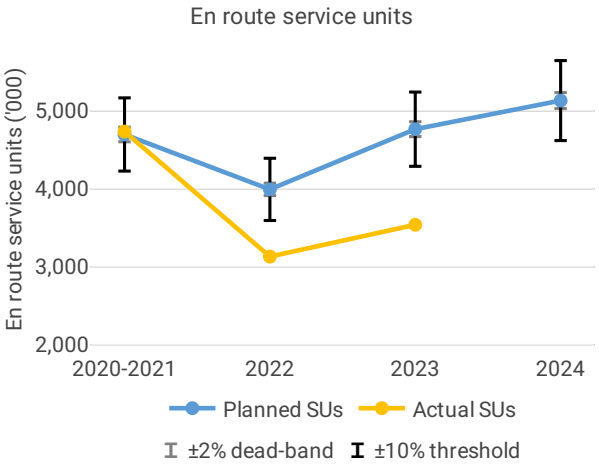
• The en route actual unit cost incurred by users in 2023 was 60.17€ (+42% above the 2023 DUC), while the terminal zone 1 actual unit cost incurred by users was 134.74€ (+18% above the 2023 DUC) and 252.15€ (+0.1% above the 2023 DUC) for terminal zone 2. The difference between the AUCU and the DUC for both charging zones is mainly driven by the inflation adjustment (+33 M€ for the en route charging zone and +2.0 M€ for the terminal charging zone).

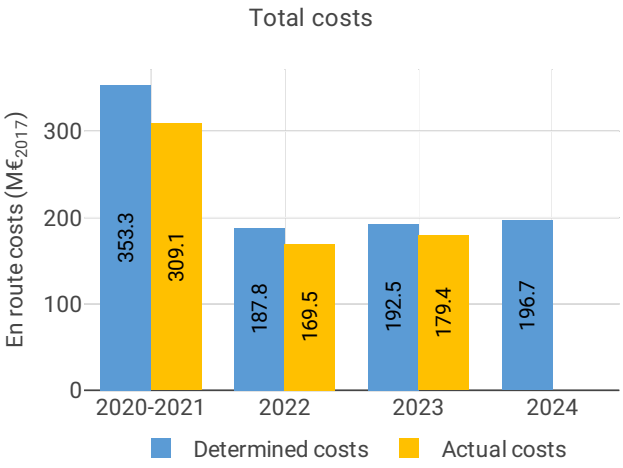
• The PRB will take into consideration the implementation of the RP3 performance plans when assessing the RP4 cost-efficiency targets and recommends that the NSA of Poland submits a detailed report of the capacity-related measures implemented during 2024. Should the RP3 planned measures not be implemented by the end of RP3, the PRB recommends Poland 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)

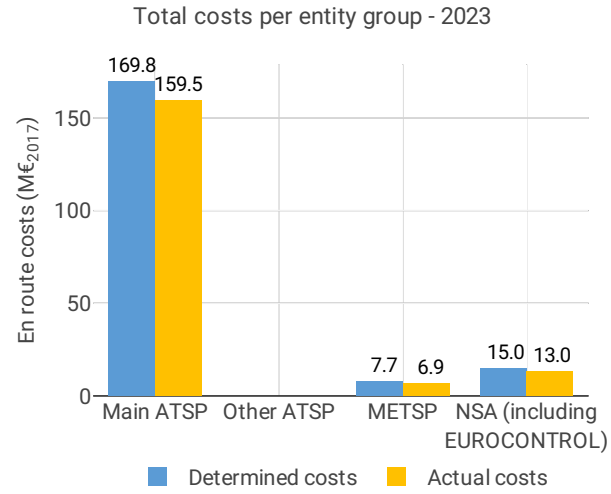


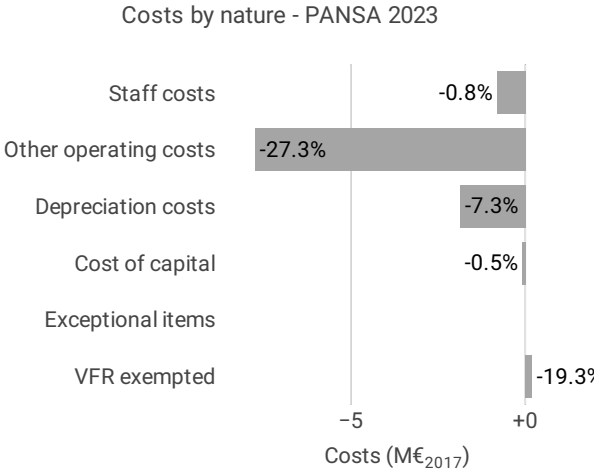




Actual and determined data

Total costs - nominal (M€)	2020-2021	2022	2023	2024
Actual costs	330	202	233	NA
Determined costs	377	206	215	223
Difference costs	-47	-4	18	NA
Inflation assumptions	**2020-2021**	**2022**	**2023**	**2024**
Determined inflation rate	NA	2.5%	2.5%	2.5%
Determined inflation index	NA	113.4	116.2	119.1
Actual inflation rate	NA	13.2%	10.9%	NA
Actual inflation index	NA	127.6	141.5	NA
Difference inflation index (p.p.)	NA	+14.2	+25.3	NA





Focus on unit cost

AUC vs. DUC

In 2023, the en route AUC was +25.5% (or +43.9 PLN2017, +10.32 €2017) higher than the planned DUC. This results from the combination of significantly lower than planned TSUs (-25.7%) and lower than planned en route costs in real terms (-6.8%, or -55.6 MPLN2017, -13.1 M€2017). It should be noted that actual inflation index in 2023 was +25.3 p.p. higher than planned.

En route service units

The difference between actual and planned TSUs (-25.7%) falls outside the ±10% threshold foreseen in the traffic risk sharing mechanism. The resulting loss of en route revenues is therefore shared between the ANSP and the airspace users.

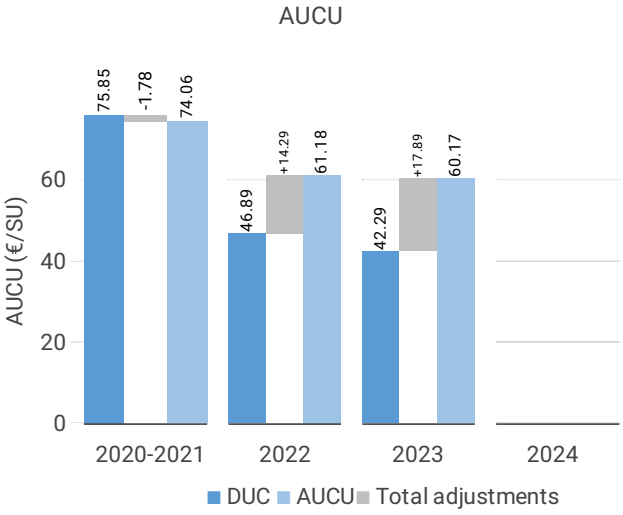
En route costs by entity

Actual real en route costs are -6.8% (-13.1 M€2017) lower than planned. This is the result of lower costs for the main ANSP, PANSA (-6.1%, or -10.3 M€2017), the NSA/EUROCONTROL (-13.4%, or -2.0 M€2017) and the MET service provider (-9.8%, or -0.8 M€2017).

En route costs for the main ANSP at charging zone level

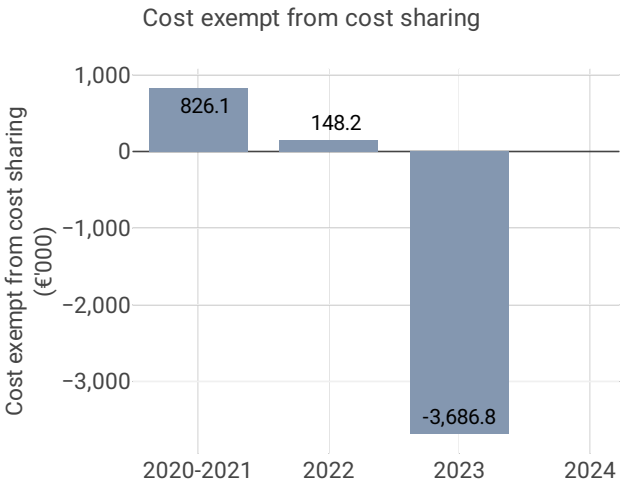
Lower than planned en route costs in real terms for PANSA in 2023 (-6.1%, or -10.3 M€2017) result from:
- Slightly lower staff costs in real terms (-0.8%) but higher in nominal terms (+ 20.8%); driven by significant increase in inflation rates; these costs reflect mainly obligations of PANSA towards its employees based on the current remuneration scheme reflecting inflation compensation payments calculated for 2022 and 2023;
- Significantly lower other operating costs in real terms (-27.3%) and nominal terms (-11.5%), driven by cost reductions which more than offset the increase in energy costs due to higher energy prices.
- Lower depreciation (-7.3%), mainly due to "*uncertainty from global crises and the war in Ukraine, which led to the postponement or review of some projects*."
- Slightly lower cost of capital (-0.5%) mainly due to a lower asset base, despite a higher WACC rate caused by a substantial increase in the annual interest rate on debt and rising WIBOR reference rates.
- Significantly lower deduction for VFR exempted flights in real terms (-19.3%) and nominal terms (-1.8%).

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



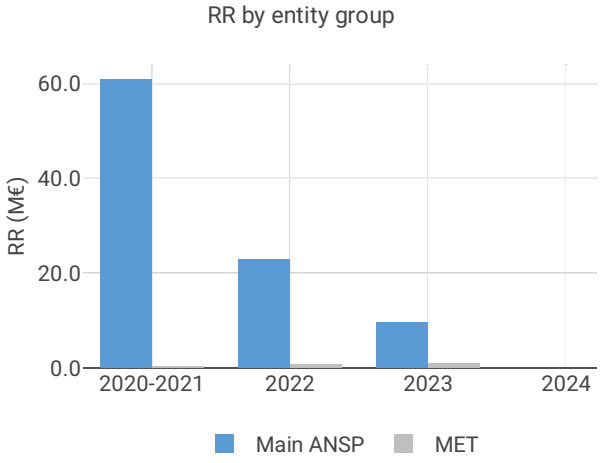
AUCU components (€/SU) – 2023

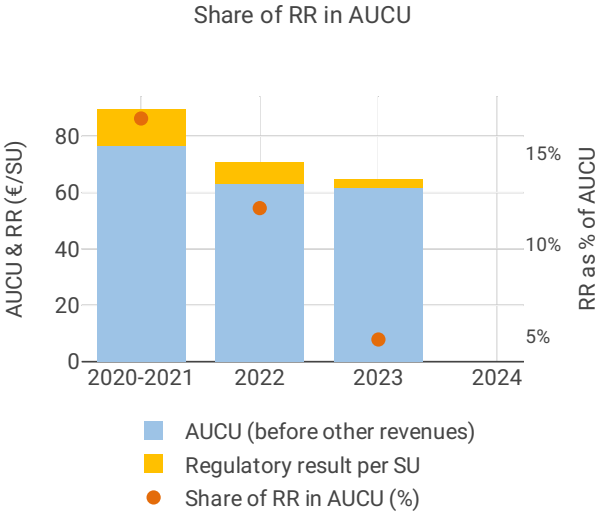
Components of the AUCU in 2023	€/SU
DUC	**42.29**
Inflation adjustment	9.21
Cost exempt from cost-sharing	-1.04
Traffic risk sharing adjustment	10.80
Traffic adj. (costs not TRS)	1.63
Finantial incentives	-1.01
Modulation of charges	0.00
Cross-financing	0.00
Other revenues	-1.70
Application of lower unit rate	0.00
Total adjustments	17.89
AUCU	**60.17**
AUCU vs. DUC	**+42.3%**

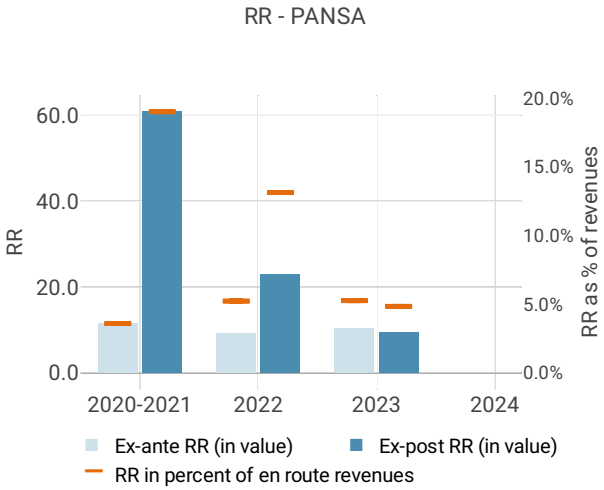


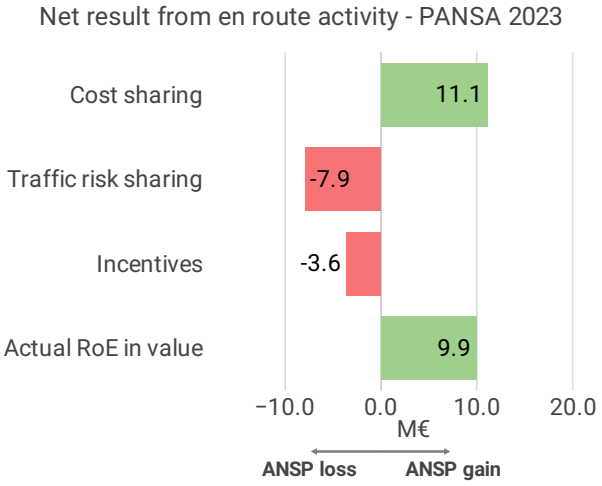
Cost exempt from cost sharing by item - 2023	€'000	€/SU
New and existing investments	-2,018.9	-0.57
Competent authorities and qualified entities costs	207.5	0.06
Eurocontrol costs	-2,081.9	-0.59
Pension costs	0.0	0.00
Interest on loans	206.5	0.06
Changes in law	0.0	0.00
Total cost exempt from cost risk sharing	**-3,686.8**	**-1.04**

5.2.3 Regulatory result (RR)









Focus on regulatory result

PANSA net gain on activity in the Poland en route charging zone in the year 2023

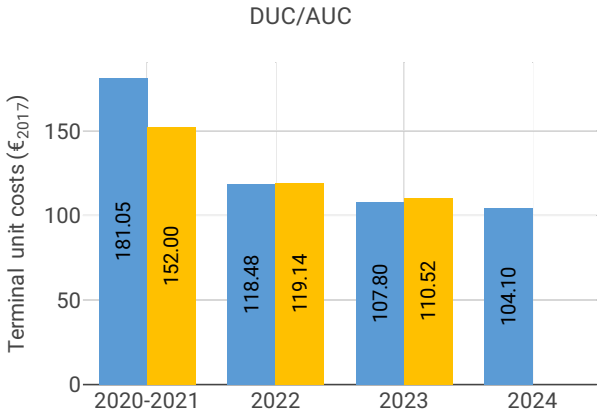
PANSA reported a net loss of -1.5 MPLN, as a combination of a gain of +50.5 MPLN arising from the cost sharing mechanism, with a loss of -35.8 MPLN arising from the traffic risk sharing mechanism and a loss of -16.3 MPLN relating to financial incentives.

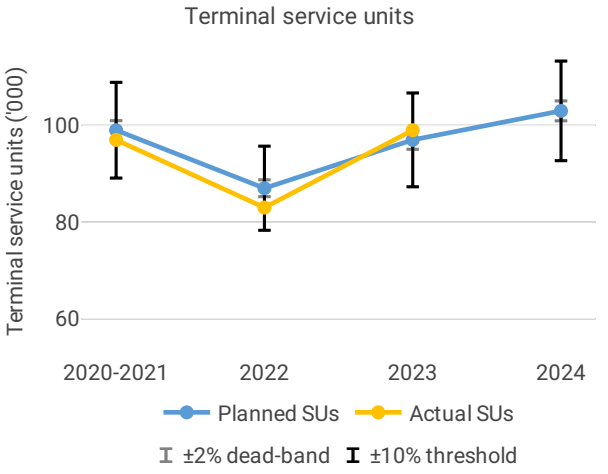
PANSA overall regulatory results (RR) for the en route activity

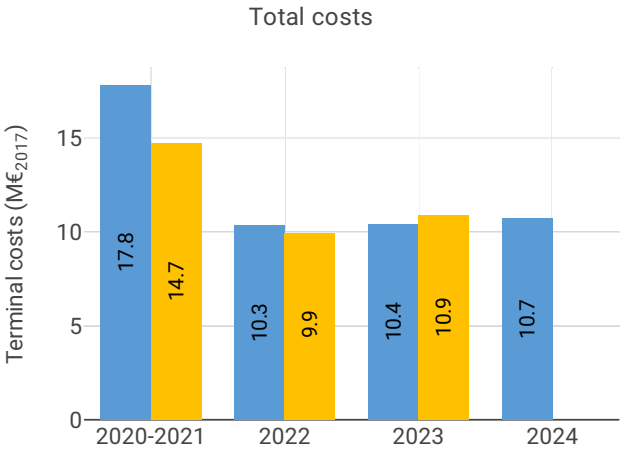
Ex-post, the overall RR taking into account the net loss from the en route activity mentioned above (-1.5 MPLN) and the actual RoE (+44.8 MPLN) amounts to +43.3 MPLN (4.9% of the en route revenues). The resulting ex-post rate of return on equity is 4.9%, which is lower than the 5.1% planned in the PP.

5.3 Terminal charging zone - Poland EPWA

5.3.1 Unit cost (KPI#1)

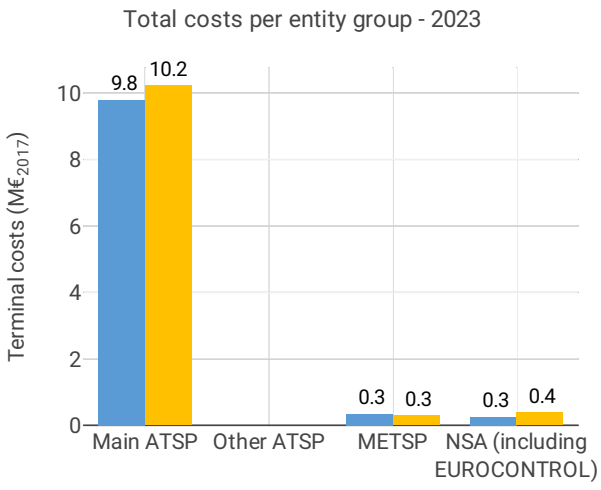


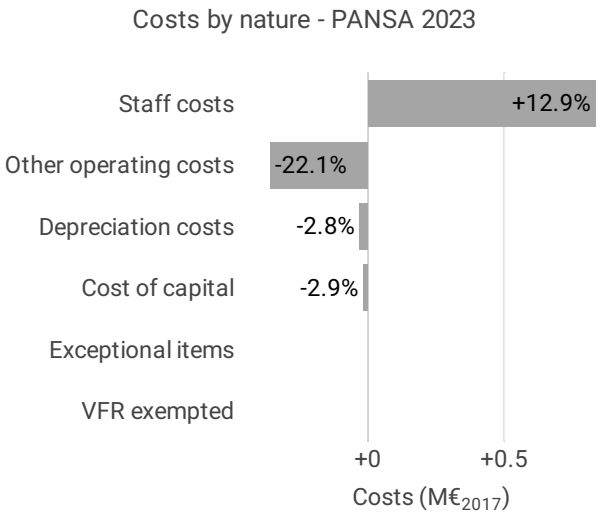




Actual and determined data

Total costs - nominal (M€)	2020-2021	2022	2023	2024
Actual costs	16	12	15	NA
Determined costs	19	11	12	12
Difference costs	-3	1	3	NA
Inflation assumptions	**2020-2021**	**2022**	**2023**	**2024**
Determined inflation rate	NA	2.5%	2.5%	2.5%
Determined inflation index	NA	113.4	116.2	119.1
Actual inflation rate	NA	13.2%	10.9%	NA
Actual inflation index	NA	127.6	141.5	NA
Difference inflation index (p.p.)	NA	+14.2	+25.3	NA





Focus on unit cost

AUC vs. DUC

In 2023, the terminal AUC was +2.5% (or +11.56 PLN2017, +2.72 €2017) higher than the planned DUC. This results from the combination of higher than planned terminal costs in real terms (+4.9%, or +2.2 MPLN2017, +0.5 M€2017) and higher than planned TNSUs (+2.3%). It should be noted that actual inflation index in 2023 was +25.3 p.p. higher than planned.

Terminal service units

The difference between actual and planned TNSUs (+2.3%) 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 .

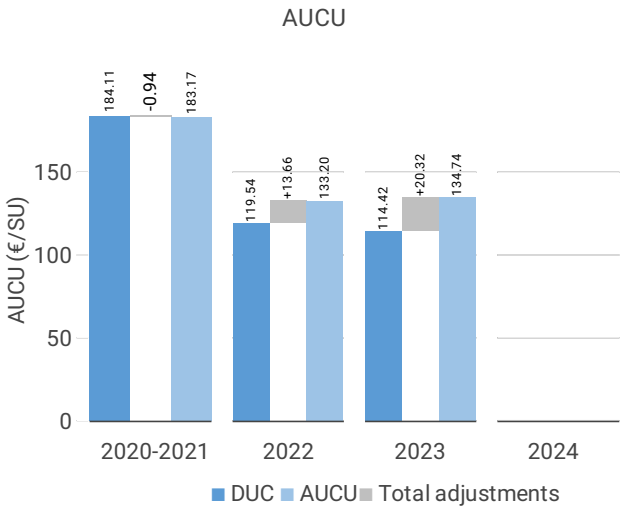
Terminal costs by entity

Actual real terminal costs are +4.9% (+0.5 M€2017) higher than planned. This is the result of higher costs for the main ANSP, PANSA (+4.4%, or +0.4 M€2017) and the NSA (+51.0%, or +0.1 M€2017) and lower costs for the MET service provider (-14.0%, or -0.05 M€2017).

Terminal costs for the main ANSP at charging zone level

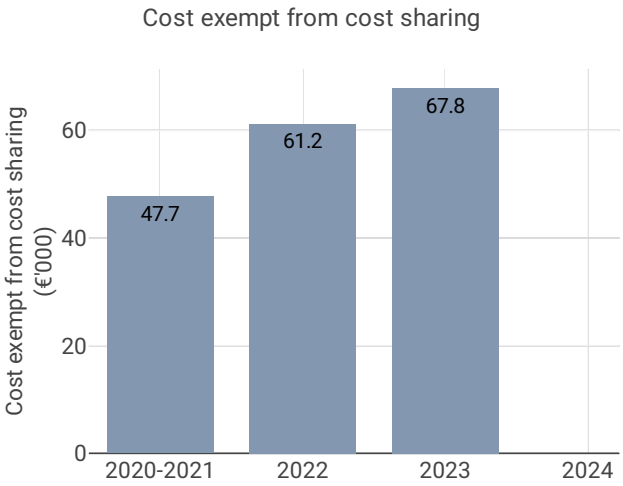
Higher than planned terminal costs in real terms for PANSA in 2023 (+4.4%, or +0.4 M€2017) result from:
- Significantly higher staff costs in real terms (+12.9%) and nominal terms (+37.4%), driven by significant increase in inflation rates; these costs reflect mainly obligations of PANSA towards its employees based on the current remuneration scheme reflecting inflation compensation payments calculated for 2022 and 2023;
- Significantly lower other operating costs in real terms (-22.1%) and nominal terms (5.1%), driven by cost reductions, which more than offset the increase in energy costs due to higher energy prices.
- Lower depreciation (-2.8%), mainly "*uncertainty from global crises and the war in Ukraine, which led to the postponement or review of some projects*.";
- Lower cost of capital (-2.9%), mainly due to a lower asset base, despite a higher WACC rate caused by a substantial increase in the annual interest rate on debt and rising WIBOR reference rates.

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



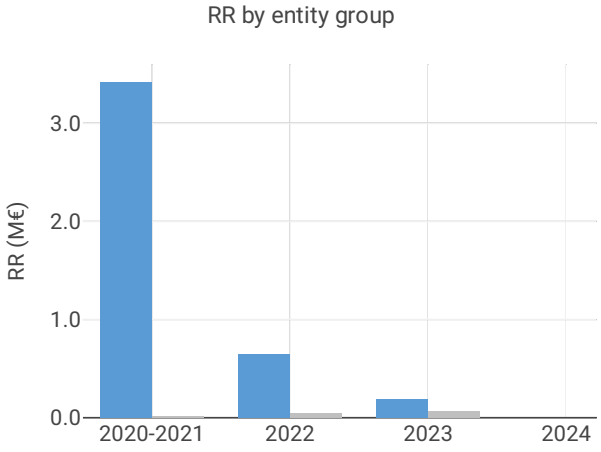
AUCU components (€/SU) – 2023

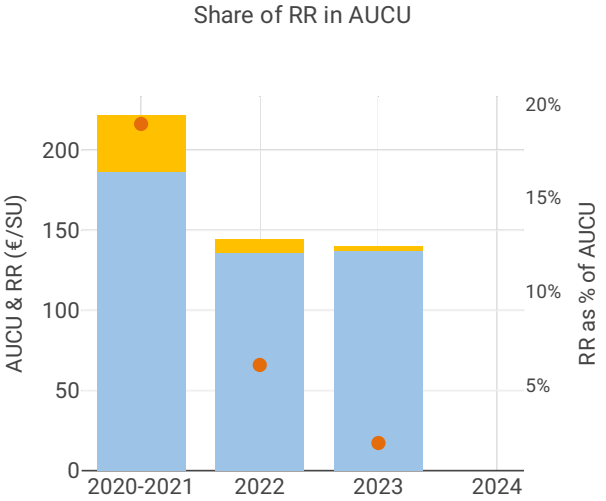
Components of the AUCU in 2023	€/SU
DUC	**114.42**
Inflation adjustment	20.30
Cost exempt from cost-sharing	0.69
Traffic risk sharing adjustment	-0.24
Traffic adj. (costs not TRS)	-0.15
Finantial incentives	2.11
Modulation of charges	0.00
Cross-financing	0.00
Other revenues	-2.38
Application of lower unit rate	0.00
Total adjustments	20.32
AUCU	**134.74**
AUCU vs. DUC	**+17.8%**

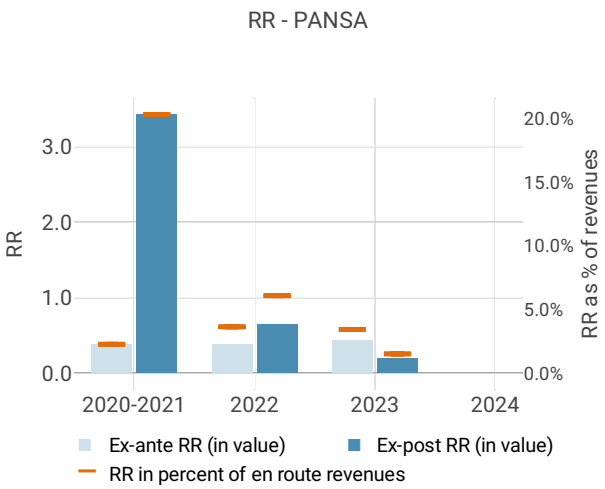


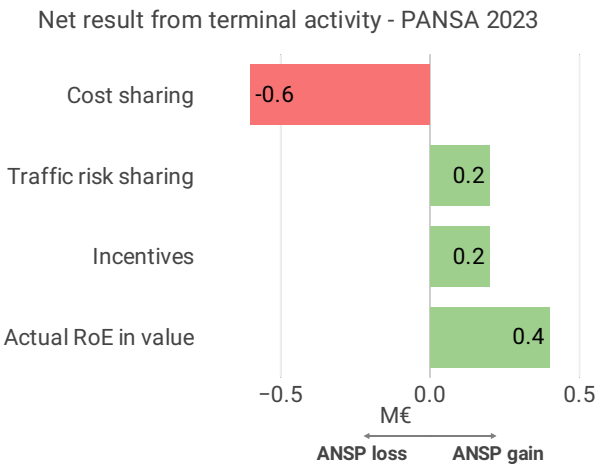
Cost exempt from cost sharing by item - 2023	€'000	€/SU
New and existing investments	-67.8	-0.69
Competent authorities and qualified entities costs	124.3	1.26
Eurocontrol costs	0.0	0.00
Pension costs	0.0	0.00
Interest on loans	11.3	0.11
Changes in law	0.0	0.00
Total cost exempt from cost risk sharing	**67.8**	**0.69**

5.3.3 Regulatory result (RR)









Focus on regulatory result

PANSA net gain on activity in the Poland terminal charging zone 1 in the year 2023

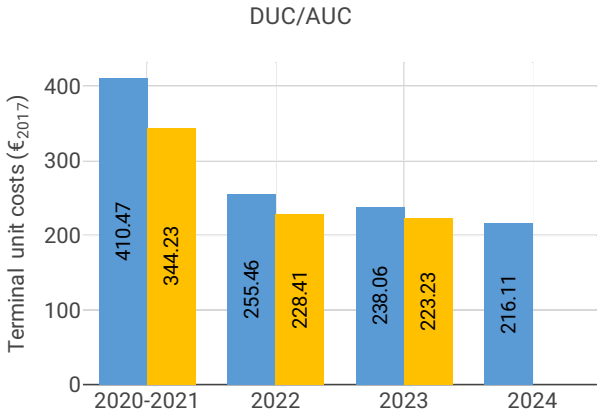
PANSA reported a net loss of -1.0 MPLN, as a combination of a loss of -2.9 MPLN arising from the cost sharing mechanism, with a gain of +1.0 MPLN arising from the traffic risk sharing mechanism and a gain of +0.9 MPLN relating to financial incentives.

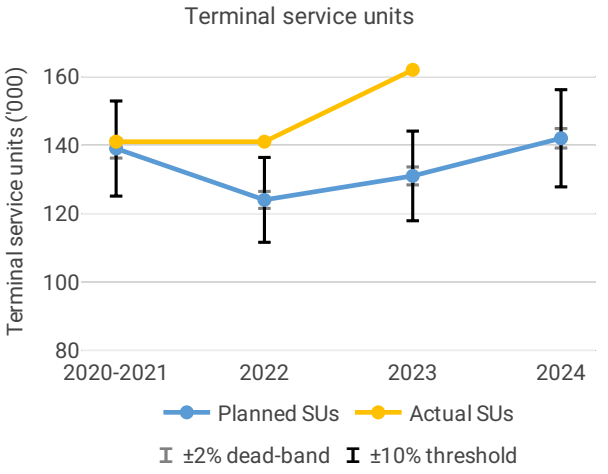
PANSA overall regulatory results (RR) for the terminal charging zone 1 activity

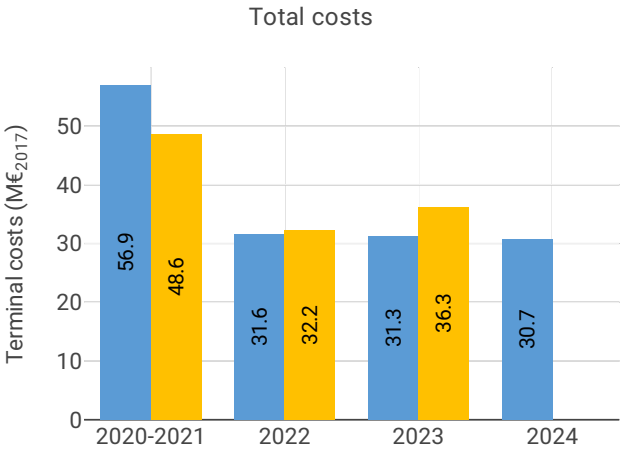
Ex-post, the overall RR taking into account the net loss from the terminal activity mentioned above (-1.0 MPLN) and the actual RoE (+1.8 MPLN) amounts to +0.9 MPLN (1.5% of the terminal revenues). The resulting ex-post rate of return on equity is 2.4%, which is lower than the 5.1% planned in the PP.

5.4 Terminal charging zone - Poland Others

5.4.1 Unit cost (KPI#1)

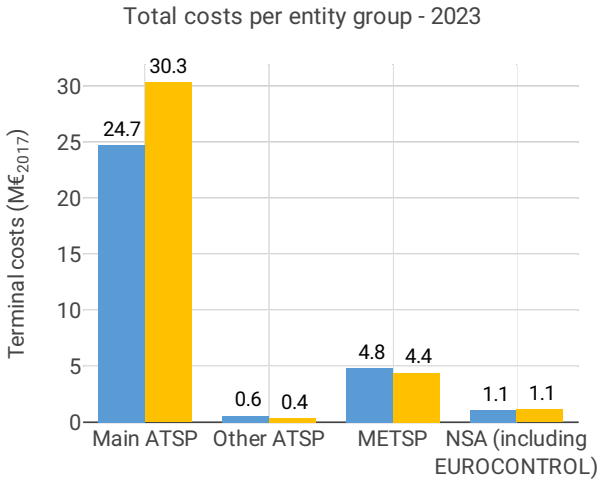


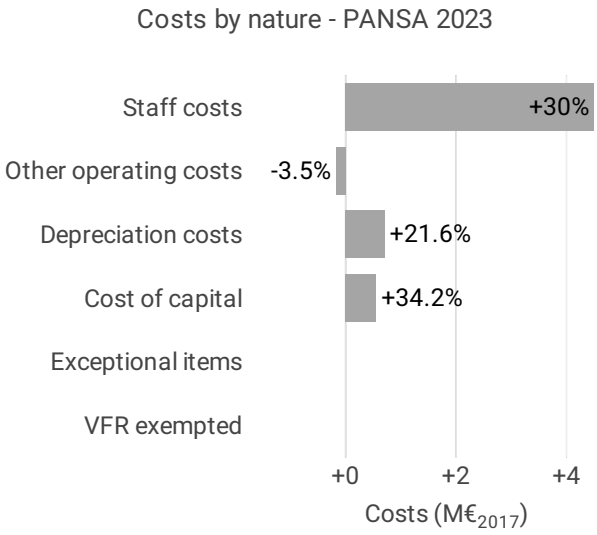




Actual and determined data

Total costs - nominal (M€)	2020-2021	2022	2023	2024
Actual costs	52	39	48	NA
Determined costs	61	35	35	35
Difference costs	-9	4	13	NA
Inflation assumptions	**2020-2021**	**2022**	**2023**	**2024**
Determined inflation rate	NA	2.5%	2.5%	2.5%
Determined inflation index	NA	113.4	116.2	119.1
Actual inflation rate	NA	13.2%	10.9%	NA
Actual inflation index	NA	127.6	141.5	NA
Difference inflation index (p.p.)	NA	+14.2	+25.3	NA





Focus on unit cost

AUC vs. DUC

In 2023, the terminal AUC was -6.2% (or -63.07 PLN2017, -14.82 €2017) lower than the planned DUC. This results from the combination of significantly higher than planned TNSUs (+23.7%) and significantly higher than planned terminal costs in real terms (+16.0%, or +21.2 MPLN2017, +5.0 M€2017). It should be noted that actual inflation index in 2023 was +25.3 p.p. higher than planned.

Terminal service units

The difference between actual and planned TNSUs (+23.7%) falls outside 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

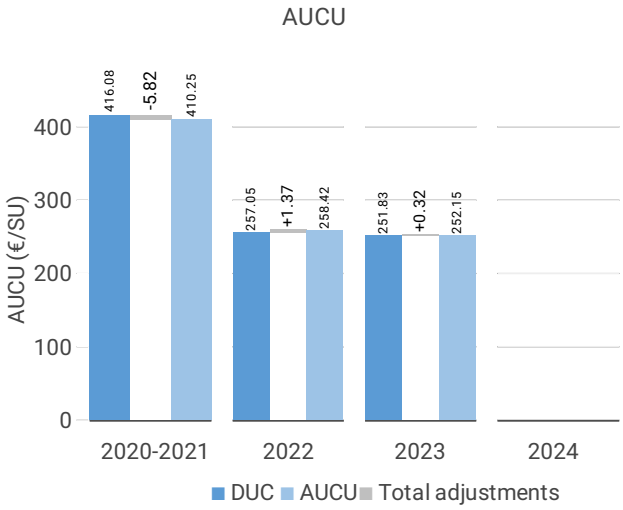
NA

Terminal costs for the main ANSP at charging zone level

Significantly higher than planned terminal costs in real terms for PANSA in 2023 (+22.6%, or +5.6 M€2017) result from:

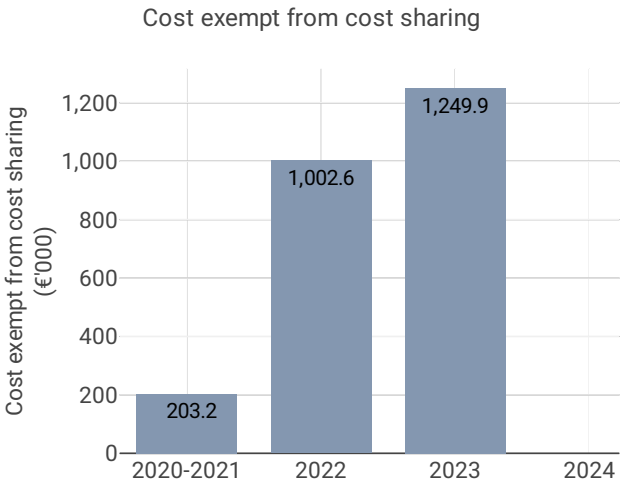
- Significantly higher staff costs (+30.0%) due to changes in remuneration regulations byt also dynamic recovery of traffic at regional airports leading to additional payments for overtime.
- Lower other operating costs in real terms (-3.5%) but higher in nominal tersm (+17.4%);
- Significantly higher depreciation (+21.6%) due to higher traffic in charging zone leading to increase in cost allocation related to the usage of assets necessary for providing ANS;
- Significantly higher cost of capital (+34.2%) due to a higher asset base (+16.7%) from changes in traffic structure and an increased WACC rate driven by rising annual interest rates and WIBOR reference rates.

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



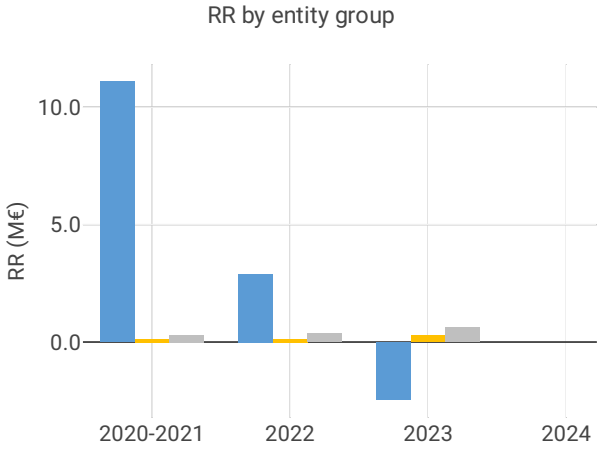
AUCU components (€/SU) – 2023

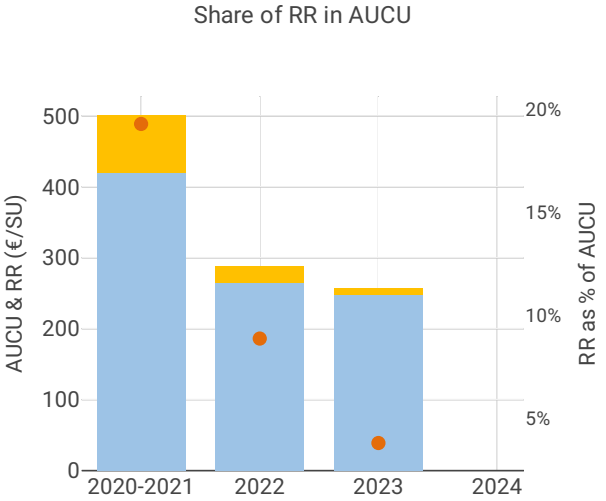
Components of the AUCU in 2023	€/SU
DUC	**251.83**
Inflation adjustment	36.02
Cost exempt from cost-sharing	7.69
Traffic risk sharing adjustment	-31.81
Traffic adj. (costs not TRS)	-9.09
Finantial incentives	3.23
Modulation of charges	0.00
Cross-financing	0.00
Other revenues	-5.72
Application of lower unit rate	0.00
Total adjustments	0.32
AUCU	**252.15**
AUCU vs. DUC	**+0.1%**

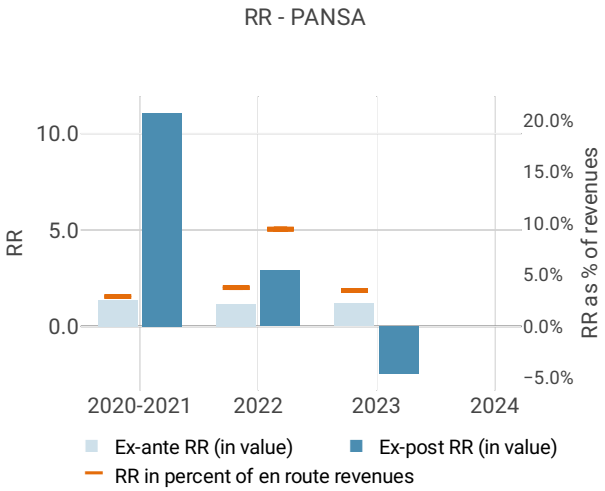


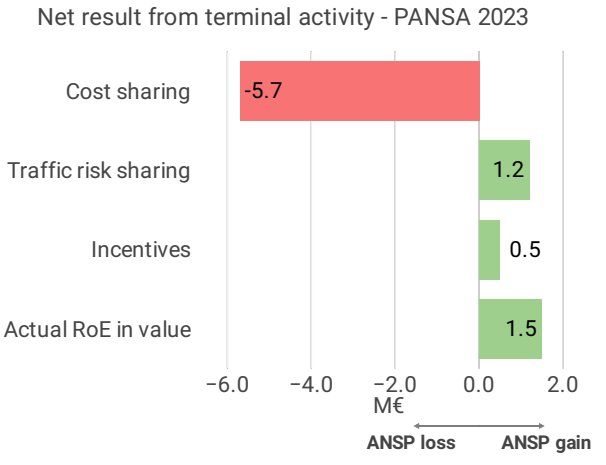
Cost exempt from cost sharing by item - 2023	€'000	€/SU
New and existing investments	1,171.9	7.21
Competent authorities and qualified entities costs	27.1	0.17
Eurocontrol costs	0.0	0.00
Pension costs	0.0	0.00
Interest on loans	51.0	0.31
Changes in law	0.0	0.00
Total cost exempt from cost risk sharing	**1,249.9**	**7.69**

5.4.3 Regulatory result (RR)









Focus on regulatory result

PANSA net gain on activity in the Poland terminal charging zone 2 in the year 2023

PANSA reported a net loss of -18.1 MPLN, as a combination of a loss of -25.7 MPLN arising from the cost sharing mechanism, with a gain of +5.2 MPLN arising from the traffic risk sharing mechanism and a gain of +2.4 MPLN relating to financial incentives.

PANSA overall regulatory results (RR) for the terminal charging zone 2 activity

Ex-post, the overall RR taking into account the net loss from the terminal activity mentioned above (-18.1 MPLN) and the actual RoE (+6.9 MPLN) amounts to -11.2 MPLN (-7.3% of the terminal revenues).