PRB | Performance review body of the single european sky

Performance Review Body Monitoring Report

Poland - 2022

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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
2022: 4.67989 PLN

Share of Union-wide:
- **traffic (TSUs) 2022** 2.9%
- **en route costs 2022** 2.8%

Share en route / terminal costs 2022 80% / 20%

En route charging zone(s)
Poland

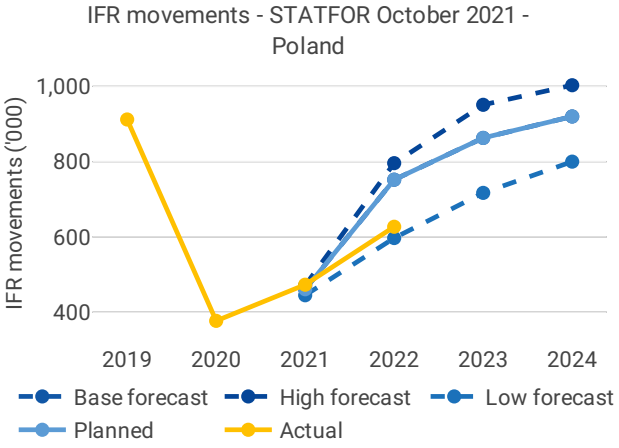
Terminal charging zone(s)
Poland EPWA
Poland Others

Main ANSP
- PANSA

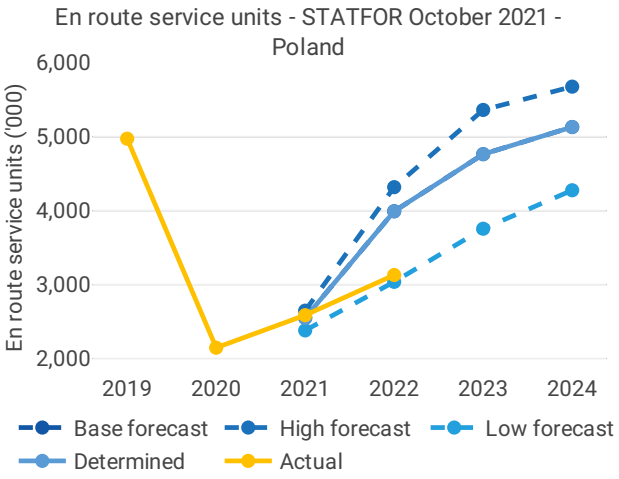
Other ANSPs
- Warmia i Mazury sp. z o.o.
- Port Lotniczy Bydgoszcz S.A.

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)

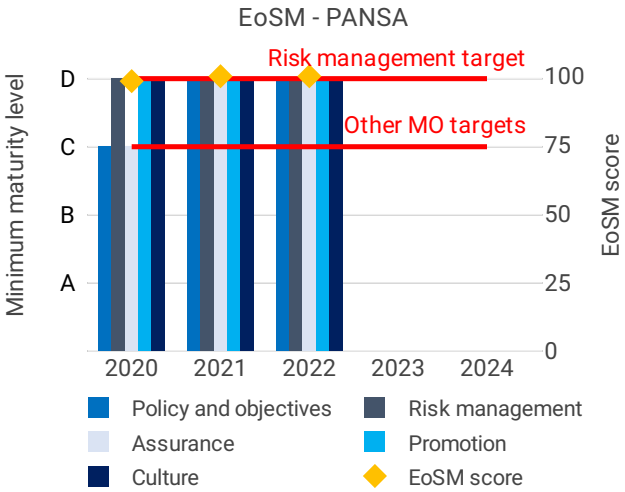


- Poland recorded 627K actual IFR movements in 2022, +32% compared to 2021 (473K).
- Actual 2022 IFR movements were -17% below the plan (752K).
- Actual 2022 IFR movements represent 69% of the actual 2019 level (912K).



- Poland recorded 3,129K actual en route service units in 2022, +21% compared to 2021 (2,586K).
- Actual 2022 service units were -22% below the plan (3,991K).
- Actual 2022 service units represent 63% of the actual 2019 level (4,972K).

1.3 Safety (Main ANSP)



• PANSA has already achieved RP3 targets in 2020 but has continued improvements and exceeded the RP3 EoSM targets in 2022 with level D for all management objectives.

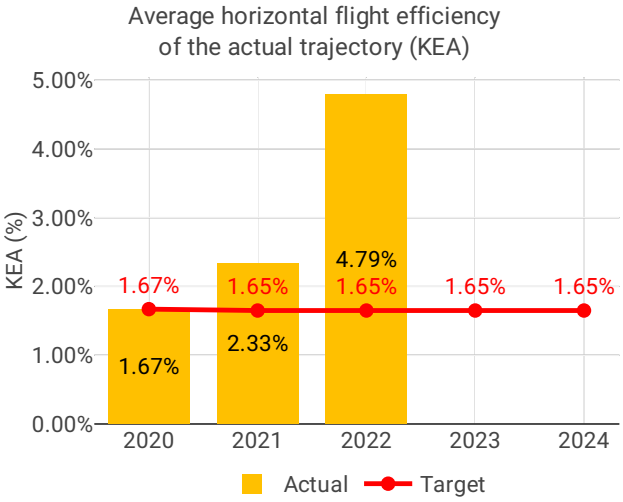
• Port Lotniczy Bydgoszcz S.A. achieved the RP3 targets for four other management objectives but requires improvement for safety risk management.

• Warmia i Mazury sp. z o.o. improved its performance in relation to safety risk management and successfully achieved all RP3 targets in 2022.

• Poland recorded an increase in the rate of runway incursions and significantly higher rate of separation minima infringements in 2022 relative to 2021. The rate of runway incursions is above the Union-wide average. PANSA should review the reasons for this increase and take appropriate mitigating actions, as necessary.

• Poland could improve its safety management by implementing automated safety data recording systems.

1.4 Environment (Member State)



• Poland achieved a KEA performance of 4.79% compared to its target of 1.65% and did not contribute positively towards achieving the Union-wide target. KEA worsened by 2.46 p.p. compared to 2021.

• SCR and KEP were at the highest levels seen in the past five years.

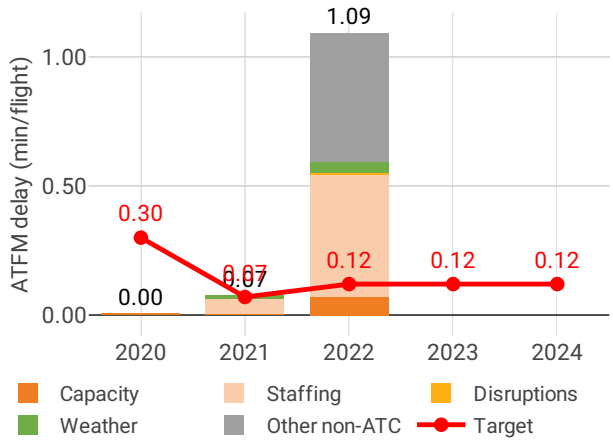
• The NSA states that the worsening environmental performance was largely due to external factors linked to the geopolitical situation (Belarus and Ukraine), leading to route extensions and increased military activities. Other factors include weather and user preferences.

• The share of CDO flights decreased by 8.23% compared to 2021.

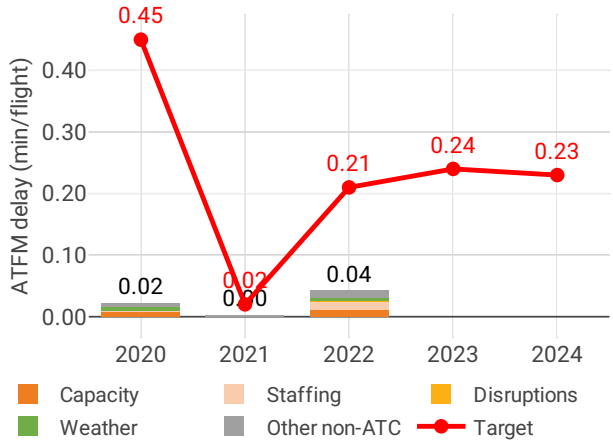
• During 2022, additional time in terminal airspace increased from 1.05 to 1.27 min/flight, while additional taxi out time increased from 2.11 to 2.28 min/flight.

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 1.32 minutes of average en route ATFM delay per flight during 2022, which has been adjusted to 1.30 during the post-ops adjustment process.

• Average en route ATFM delay per flight was further adjusted to 1.09 minutes per flight due to the exceptional event related to Russia's war of aggression against Ukraine, still not achieving the local target value of 0.12.

• The average number of IFR movements was 31% below 2019 levels in Poland in 2022.

• An 11% increase in the number of ATCOs in OPS is planned by the end of RP3, with the actual value remaining below the 2022 plan in Warsaw ACC.

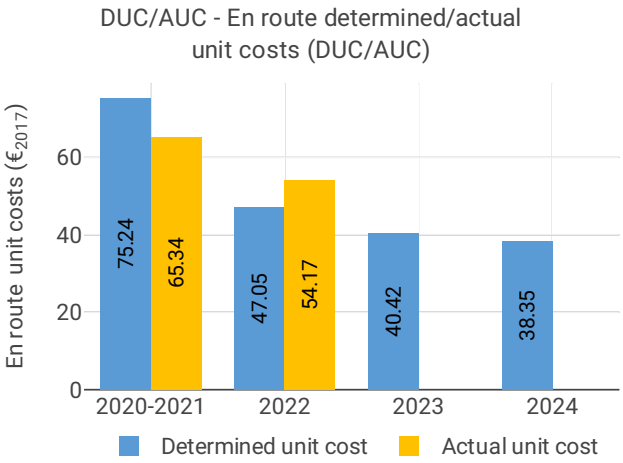
• Delays were highest between April and June, mostly due to ATC Staffing issues and the additional complexity due to the Ukrainian crisis.

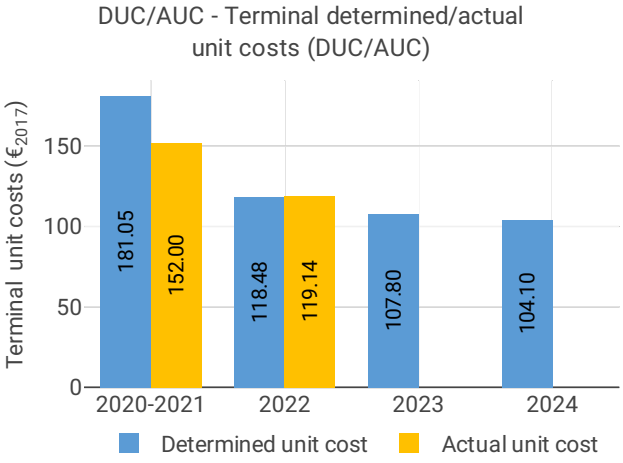
• The share of delayed flights with delays longer than 15 minutes in Poland increased by 1.52 p.p. compared to 2021 and was higher than 2019 values.

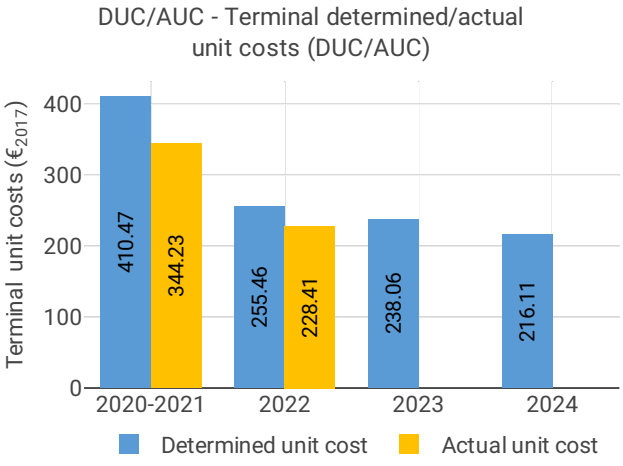
• The yearly total of sector opening hours in Warsaw ACC was 42,117 in 2022, showing a 15.6% increase compared to 2021. Sector opening hours are 8.3% below 2019 levels.

• Warsaw ACC registered 10.79 IFR movements per one sector opening hour in 2022, being 15.6% below 2019 levels.

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







• The en route 2022 actual unit cost of Poland was 54.12 €2017, 15% higher than the determined unit cost (47.05 €2017). The terminal zone 1 actual unit cost was 119.14 €2017, in line with the determined unit cost (118.48 €2017), while the terminal zone 2 actual unit cost was 228.41 €2017, 11% lower than the determined unit cost (255.46 €2017).

• The en route 2022 actual service units (3,129K) were 22% lower than the determined service units (3,991K).

• In 2022, the en route actual total costs were 18 M€2017 (-9.8%) lower than determined. Staff costs decreased (-9.1 M€2017, or -8.6%) as a result of higher inflation than expected, while other operating costs decreased (-8.9 M€2017, or -19%) mainly due to cost containment measures in response to Russia's war of aggression against Ukraine.

• Poland presented a deviation from the criteria to achieve capacity targets, which was considered justified. Considering that costs are significantly lower and that the 2022 en route capacity targets have not been achieved, the situation raises serious concern. The PRB invites the NSA to analyse the discrepancies and identify their reasons and the Member State to rectify the situation to ensure that the additional means granted through the capacity deviation are used to address the capacity issues.

• PANSA spent 45 M€2017 in 2022 related to costs of investments, in line with the plan. However, due to COVID-19 and Russia's war of aggression against Ukraine, some projects had to be adjusted (postponed, change of scope, and change of value). The slow up in investments has been offset by the increase in cost of capital due to higher WACC than planned.

• The en route actual unit cost incurred by users in 2022 was 61.12€, while the terminal zone 1 actual unit cost incurred by users was 133.20€ and 258.28€ for terminal zone 2.

2 SAFETY - POLAND

2.1 PRB monitoring

• PANSA has already achieved RP3 targets in 2020 but has continued improvements and exceeded the RP3 EoSM targets in 2022 with level D for all management objectives.

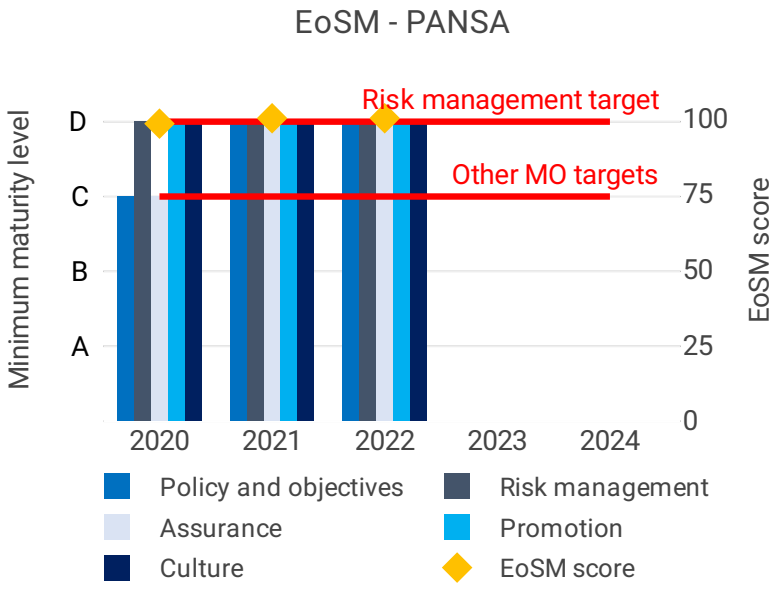
• Port Lotniczy Bydgoszcz S.A. achieved the RP3 targets for four other management objectives but requires improvement for safety risk management.

• Warmia i Mazury sp. z o.o. improved its performance in relation to safety risk management and successfully achieved all RP3 targets in 2022.

• Poland recorded an increase in the rate of runway incursions and significantly higher rate of separation minima infringements in 2022 relative to 2021. The rate of runway incursions is above the Union-wide average. PANSA should review the reasons for this increase and take appropriate mitigating actions, as necessary.

• Poland could improve its safety management by implementing automated safety data recording systems.

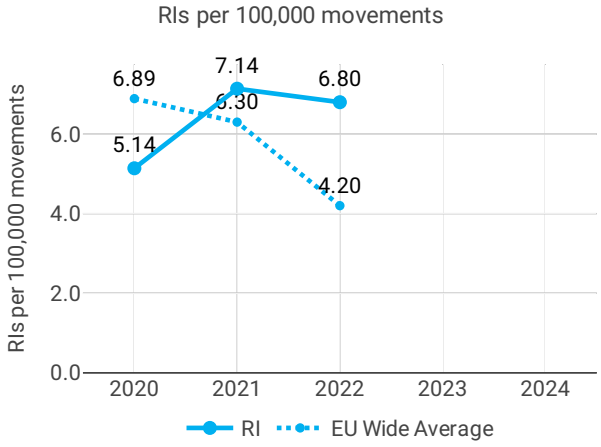
2.2 Effectiveness of Safety Management (EoSM) (KPI#1)

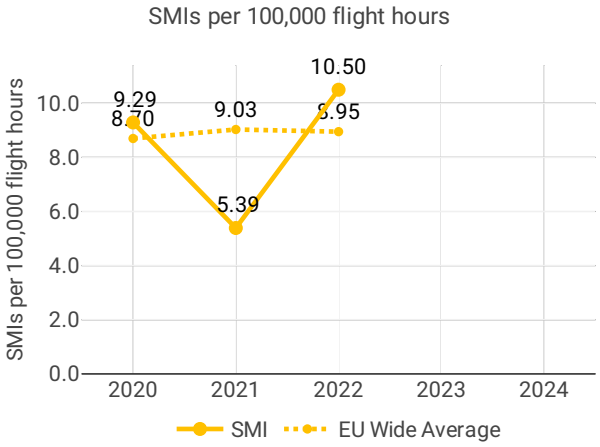


Focus on EoSM

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. Compared with 2021, in 2022 the "Safety Risk Management" component of Warmia i Mazury was improved and met the target maturity level. The ANSP achieved the RP3 target level for all five EoSM components.

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 4.79% compared to its target of 1.65% and did not contribute positively towards achieving the Union-wide target. KEA worsened by 2.46 p.p. compared to 2021.

• SCR and KEP were at the highest levels seen in the past five years.

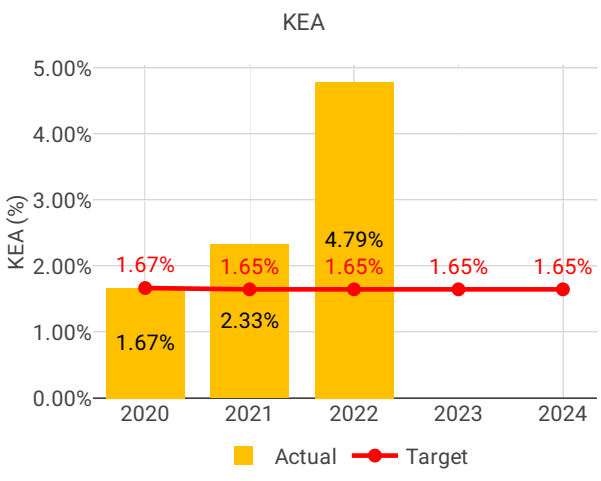
• The NSA states that the worsening environmental performance was largely due to external factors linked to the geopolitical situation (Belarus and Ukraine), leading to route extensions and increased military activities. Other factors include weather and user preferences.

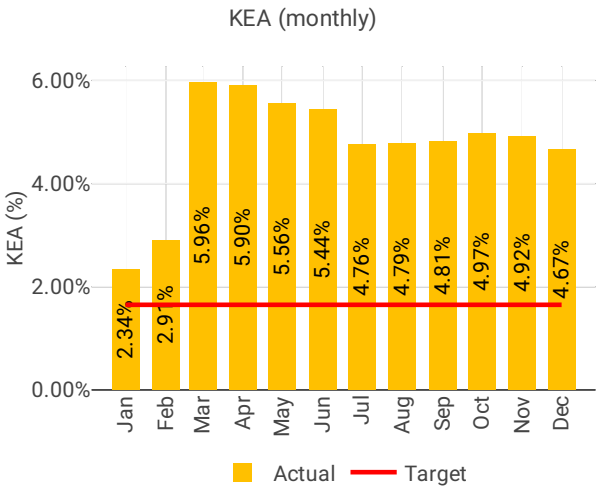
• The share of CDO flights decreased by 8.23% compared to 2021.

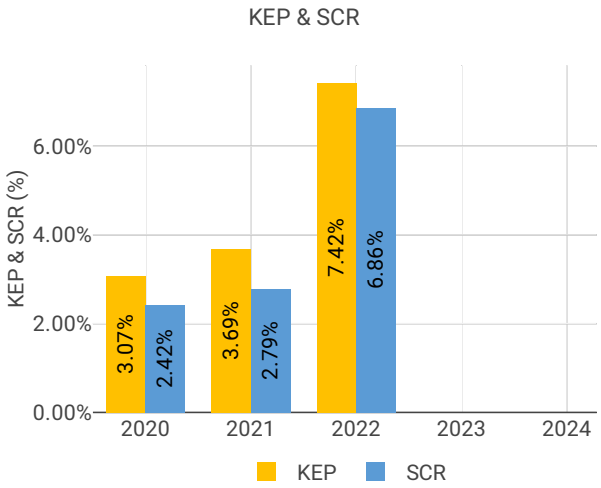
• During 2022, additional time in terminal airspace increased from 1.05 to 1.27 min/flight, while additional taxi out time increased from 2.11 to 2.28 min/flight.

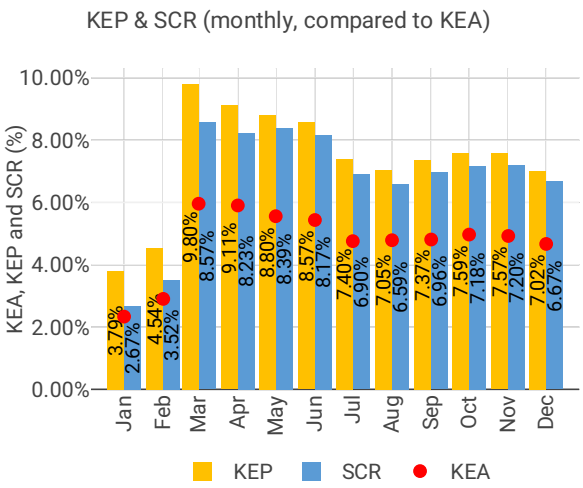
3.2 En route performance

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)



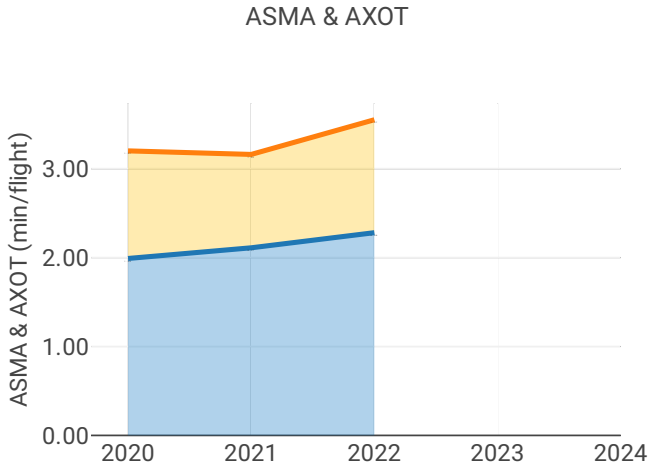


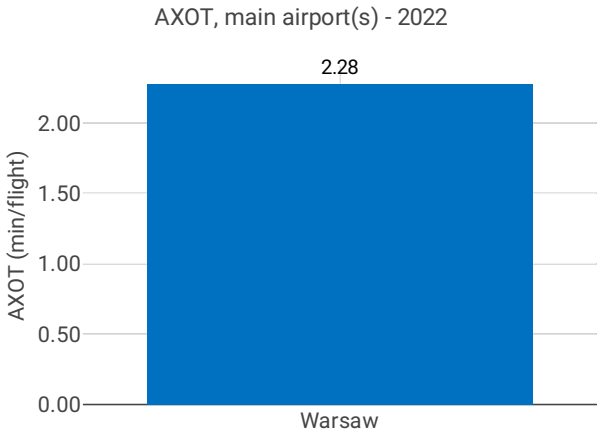


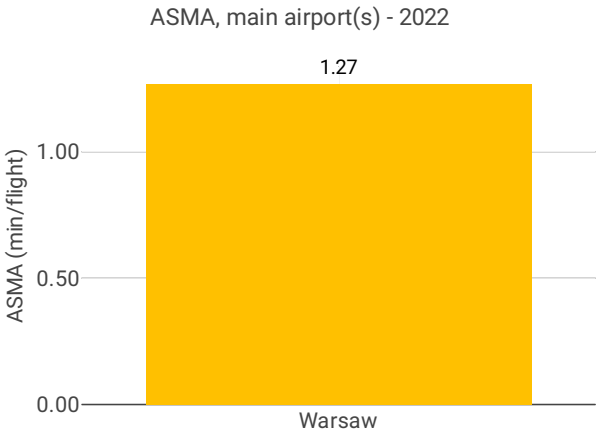


3.3 Terminal performance

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







Focus on ASMA & AXOT

AXOT

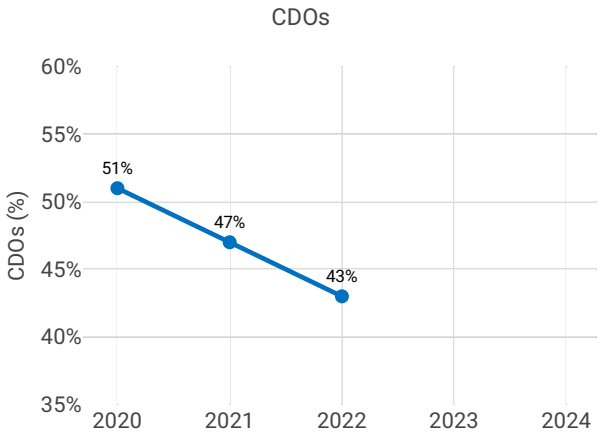
Additional taxi-out times at Warsaw (EPWA; 2019: 3.43 min/dep.; 2020: 1.99 min/dep.; 2021: 2.11 min/dep.; 2022: 2.28 min/dep.) slightly increased once more, although remained under the SES average for 2022 (2.52 min/dep.)

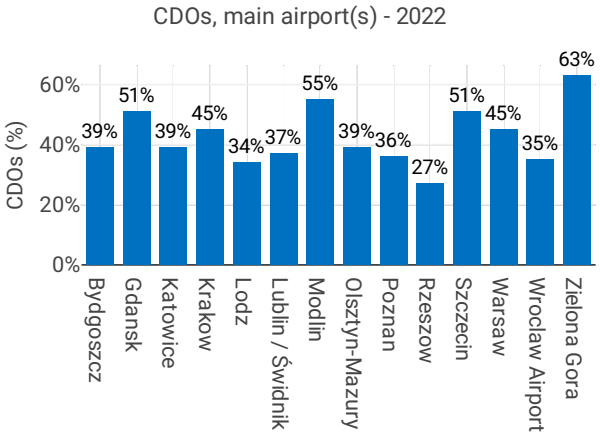
For information on measures implemented over 2020-2021, the Polish monitoring report refers to the respective Annual Monitoring Reports. No other measured for 2022 is mentioned.

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.) in 2022 increased exceeding the SES average of 1.06 min/arr.
For information on measures implemented over 2020-2021, the Polish monitoring report refers to the respective Annual Monitoring Reports. For 2022, the monitoring report mentions the following implementation:
RNAV 1 in TMA Operations – RNAV1 SID and STAR is implemented – 1Q 2022

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





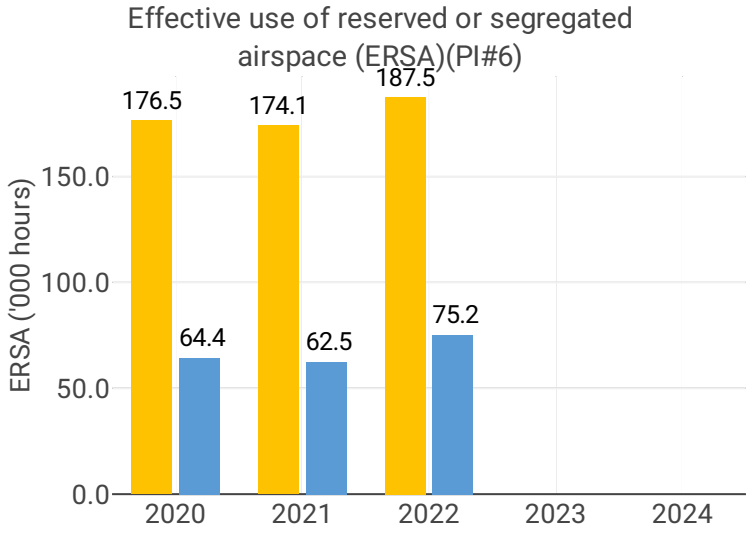
Focus CDOs

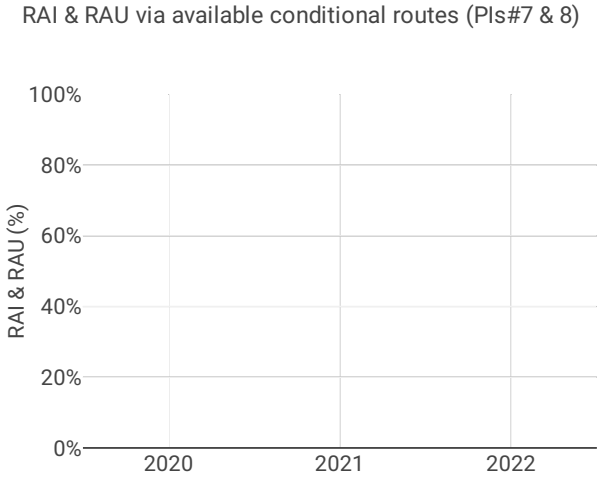
All airports have shares of CDO flights (well) above the overall RP3 value in 2022 (29.0%) except for Rzeszów-Jasionka (EPRZ - 26.7%).
Gdańsk im. Lecha Wałęsy, Kraków-Balice, Poznań-Ławica and Zielona Góra-Babimost had (slightly) higher values than in 2021 (EPGD: +1.3 percentage points; EPKK: +0.7 percentage points; EPPO: +0.1 percentage points; EPZG: + 1.8 percentage points) while the values for the other airports decreased (between -21.7 and -1.0 percentage points).
According to the Polish monitoring report: *For information on measures implemented over 2020-2021 please see the respective Annual Monitoring Reports.*
RNP 1 in TMA Operations - RNP-1 are already implemented for EPBY, EPRA, EPRZ, EPLL, EPLB, EPSY, EPSC (DEP&ARR) EPZG (ARR).
PANSA operational procedures allows the CCO/CDO operations in maximumal possible extent, ATCOs are trained for this kind of operations as one of the work-standards being regularly monitored and assessed.

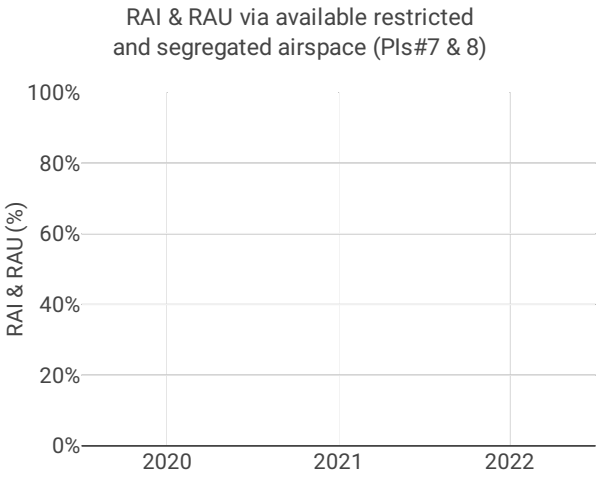
Airport level

	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	NA	NA	1.21	1.05	1.27	NA	NA	51%	49%	45%	NA	NA
Bydgoszcz	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	43%	42%	39%	NA	NA
Gdansk	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	58%	49%	51%	NA	NA
Krakow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	53%	45%	45%	NA	NA
Katowice	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	49%	46%	39%	NA	NA
Lublin / Świdnik	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	37%	39%	37%	NA	NA
Lodz	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	42%	35%	34%	NA	NA
Modlin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	66%	61%	55%	NA	NA
Poznan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	41%	36%	36%	NA	NA
Rzeszow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	53%	49%	27%	NA	NA
Szczecin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	53%	58%	51%	NA	NA
Olsztyn-Mazury	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	48%	54%	39%	NA	NA
Wroclaw Airport	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	43%	40%	35%	NA	NA
Zielona Gora	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	68%	61%	63%	NA	NA
Radom	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

3.4 Civil-Military dimension







Focus on Civil-Military dimension

Update on Military dimension of the plan

No data available

Military - related measures implemented or planned to improve capacity

No data available

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 neighbouring 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 POL-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.
- 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.
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 (POLFRA). 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.
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:
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- 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#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 1.32 minutes of average en route ATFM delay per flight during 2022, which has been adjusted to 1.30 during the post-ops adjustment process.

• Average en route ATFM delay per flight was further adjusted to 1.09 minutes per flight due to the exceptional event related to Russia's war of aggression against Ukraine, still not achieving the local target value of 0.12.

• The average number of IFR movements was 31% below 2019 levels in Poland in 2022.

• An 11% increase in the number of ATCOs in OPS is planned by the end of RP3, with the actual value remaining below the 2022 plan in Warsaw ACC.

• Delays were highest between April and June, mostly due to ATC Staffing issues and the additional complexity due to the Ukrainian crisis.

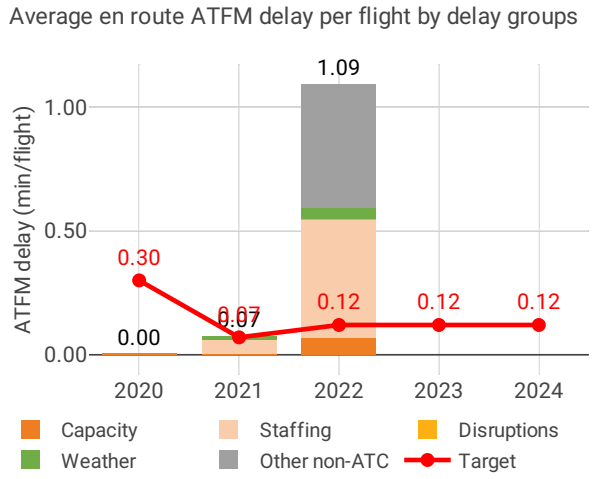
• The share of delayed flights with delays longer than 15 minutes in Poland increased by 1.52 p.p. compared to 2021 and was higher than 2019 values.

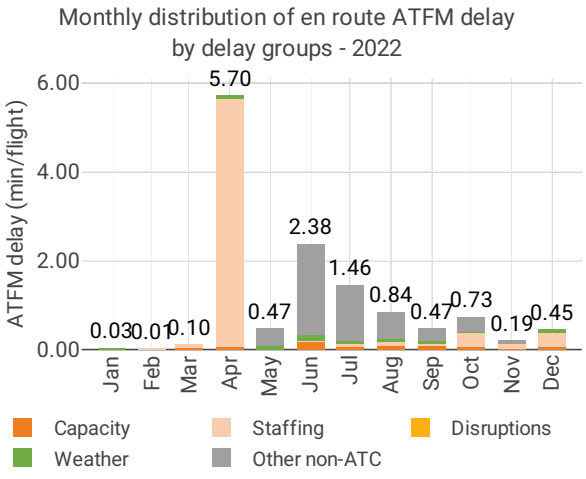
• The yearly total of sector opening hours in Warsaw ACC was 42,117 in 2022, showing a 15.6% increase compared to 2021. Sector opening hours are 8.3% below 2019 levels.

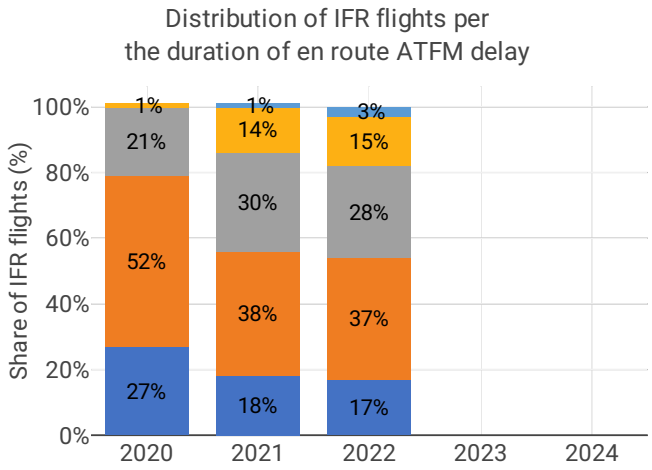
• Warsaw ACC registered 10.79 IFR movements per one sector opening hour in 2022, being 15.6% below 2019 levels.

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 473k flights in 2021 to 627k flights in 2022. However, traffic levels were still substantially below the 912k flights in 2019.
In 2022, Poland had 800k minutes of en route ATFM delay - 52% attributed to 'Other' (explained above as due to Ukraine war situation); 37% attributed to ATC staffing.
There were an additional 10k minutes of en route ATFM delay originating in the Warsawa ACC that were re-attributed to DFS (9k) and DSNA (1k) via the NM post operations delay attribution process, according to the NMB agreement for eNM/S22 measures, to ameliorate capacity shortfalls in both Karlsruhe UAC and Reims ACC.
A further 131k minutes of ATFM delay due to 'exceptional events' were excluded after consultation with the European Commission and the Network Manager, giving a final value of 669k minutes of en route ATFM delay.

NSA's assessment of capacity performance

The results in the CAPACITY KPA at the end of 2022 year for Poland (PANSA) was 1,30 minutes/flight with a target of 0,12 minutes/flight. [Corrected to 1,09 minutes per flight after exclusion of delays due to 'exceptional events'.]
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.
The main reasons for the imposed regulations related to the war in Ukraine were:
• increased air traffic in the sectors affected by the regulations (mainly in the south-eastern part of the Warsaw FIR), related to the need to bypass the space closed for traffic in Ukraine and restrictions on operating in the space of Belarus,
• space reservations by the military,
• requirements of the new operational situation resulting from the ongoing war beyond Poland's eastern border and the growing intensity of military air operations in FIR Warszawa. The need to reduce area capacities for all sectors and reduce the occupancy value for sectors NL, JK, JKL and CL,
• additionally, the redirection of traffic flows from the border sectors with Ukraine and Belarus (sector R) resulted in increased traffic volume and complexity in the JK sector, which meant that most regulations were imposed on this sector,
• due to the reservation of space by the military for 24 hours (tactically the reservation times were changed), some of the regulations were assumed pre-tactically.
In Polish CAA opinion all above mentioned ATFM regulations/actions taken by PANSA to mitigate negative impact of the external, political situation on the traffic in Poland fulfil the definition of the exceptional events as defined in in article 2 point 9 of the Commission Implementing Regulation (EU) 2019/317. However it was impossible to significantly reduce ATFM delays related to the exceptional events.
As a consequence, Poland wished to exclude the delays related to the war from the 2022 Monitoring Report.

The Polish National Supervisory Authority (NSA) proposed that en-route ATFM delays attributable to extraordinary events marked with the code “O” should not be taken into account for the en-route delay. EC did not accept this solution and presented its legal analysis .
The ATCO’s industrial action in April and May 2022 had a significant impact on the KPA Capacity. Actions taken by both trade unions and PANSA management resulted in the ceasing of the crisis, but the event resulted in increasing of delays.

Monitoring process for capacity performance

The fulfilment of the Polish Performance plan was regularly monitored by the NSA. The process of continuous oversight of all ANSPs was conducted based on the Regulation (EU) 2019/317) and Regulation 2017/373.
The monitoring activities included analysis of the ANSP’s business and annual plans and their consistency with the Performance Plan for RP3. They were covering, among the others, the following areas:- investment plan (CAPEX) execution:
- execution of planned costs
- use of public funding, including EU funding
- execution of employment plan
- execution of staff training plan
- ATCO productivity
- implementation of major projects aimed at increasing capacity and enhancing flight efficiency
- implementation of corrective measures in the safety area.

The monitoring of progress in achieving performance targets set in Performance Plan for RP3 was performed also by dedicated Polish NSA inspectors during routine inspections.

Capacity planning

Capacity planning over 2022 focused on mid to long-term planning based on STATFOR forecasts, NM data, PANSA simulations and internal recovery plan prepared by PANSA as well as short term planning (up to 4-6 weeks) under the NOP rolling planning initiative coordinated by the Network Manager. Capacity planning, especially over 1H 2022, was challenging due to the consequences of the war in Ukraine and sanctions for air traffic flows in the Polish airspace and related uncertainty as well as military activity resulting from the geopolitical developments.
Similarly, as over 2020-2021, 2022 rostering at PANSA still had to consider implementation of measures aimed at limiting the risk of virus spread among ATCOs.
Despite the war and challenges related thereto, PANSA continued to implement 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 new recruitment process for ATCO trainees, which started in January 2022),
- 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,
- development of tools supporting ATCOs and flow management optimisation (including implementation and use of Traffic Complexity Tool and update of Common Airspace Tool 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 contingency,
- preparations for 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),
- reorganisation of Kraków TMA – new sectors, new SID/STAR procedures (planned to be 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 following the 2020-2021 significant traffic drop,
- 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.

Following the observed negative impact of the war in Ukraine and related increased military activity on capacity, 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).

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 actively contributed to the implementation of Summer 2023 NM measures aimed at limiting delays in the mostly congested parts of the Network.

Plans for the following years of RP3 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 (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

Application of Corrective Measures for Capacity (if applicable)

Two main elements impacted the delay indicator over 2022 that resulted in not meeting the target:

1. military aggression of the Russian Federation on Ukraine,
2. social tensions at PANSA.

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 the number of NATO flights in eastern part of the Polish airspace. The significant portion of this part of airspace is reserved for military flights (performed H24) thus unavailable for civil traffic. An immediate consequence of the limited capacity (caused directly by the political circumstances) was significant increase of delays in the Polish airspace. 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).

On point 2 – following changes to remuneration regulations at PANSA introduced at the end of 2021 and in 2022, social tensions were visible at ACC and some APP units, which impacted the delays. New PANSA Management was running intensive negotiation process with the ATCO Trade Union to solve the issues.

The war in Ukraine and related geopolitical situation is expected to impact capacity indicator for Poland also in the subsequent years of RP3.

The situation will be deeply analysed with close cooperation with PANSA.

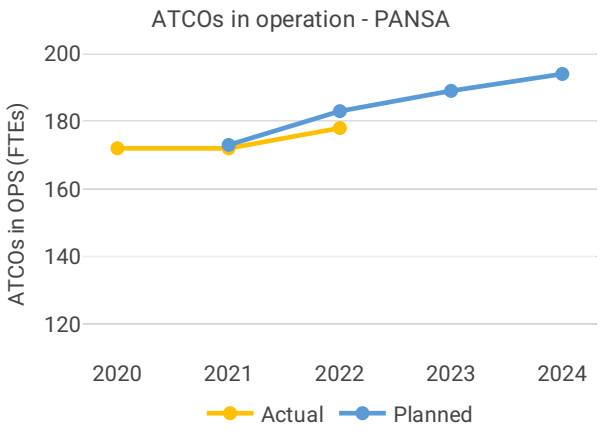
Additional Information Related to Russia's War of Aggression Against Ukraine The biggest impact on en-route capacity performance for Poland is linked with increased military activity and related limited capacity available to civil traffic. As indicated above, much wider military activities in the Polish airspace are visible, also linked to increased number of NATO flights in eastern part of the Polish airspace.

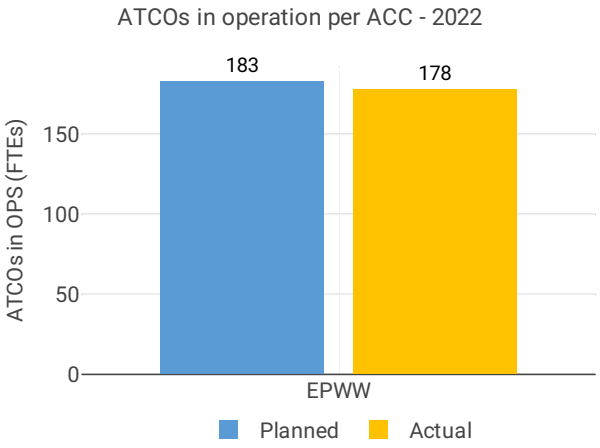
Significant portions of this part of airspace are reserved for military flights (performed H24), thus unavailable for civil traffic. At the same time, following closure of Ukrainian airspace and very limited possible use of Belarusian airspace, additional traffic flows are observed on the north-southern axis along the eastern Poland's border. The combination of limited airspace available and traffic demand leads to increase in delays. 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).

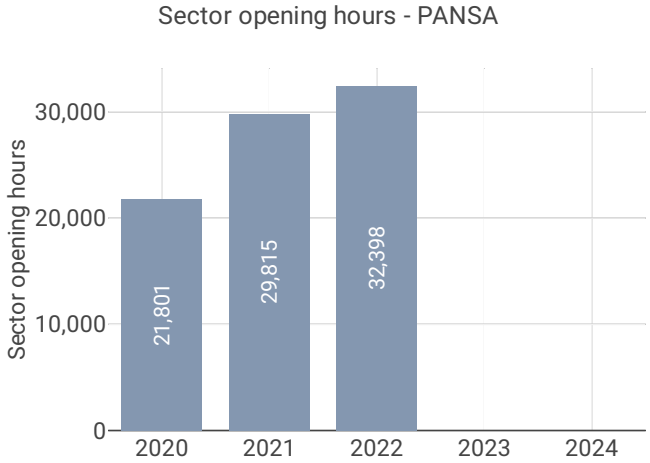
Following discussion with the Network Manager, since mid-March 2022 delays caused by the war in Ukraine have been marked as "O" (other) and thus also included in the data published by the Network Manager. Delays marked "O" are only related to the war in Ukraine and do not take into account other causes of delays. At the beginning of the war, before the code "O" started to be used, they were reported under the code "M". The delays coded "O" amounted to 419 394 minutes, while those coded "M" over

February-March amounted to 5 712 minutes.
In Poland's opinion, these above mentioned delays (all delays reported under "O" as well as delays reported under "M" which were linked to the war) meet the conditions for delays resulting from exceptional events as defined in in article 2 point 9 of the Commission Implementing Regulation (EU) 2019/317 of 11 February 2019 laying down a performance and charging scheme in the single European sky and repealing Implementing Regulations (EU) No 390/2013 and (EU) No 391/2013, and therefore shall be excluded from the calculation of the route delay indicator for PANSA in 2022.
Following the outbreak of the war, the EACCC was activated by the Network Manager. Although, for practical reasons, the EACCC was subsequently deactivated in May 2022, the circumstances triggering its activation still pertain and haven't changed.
As indicated above:
- PANSA implemented RAD measures and EU Restrictions that were aimed to reduce ATFM 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).

4.2.2 Other indicators







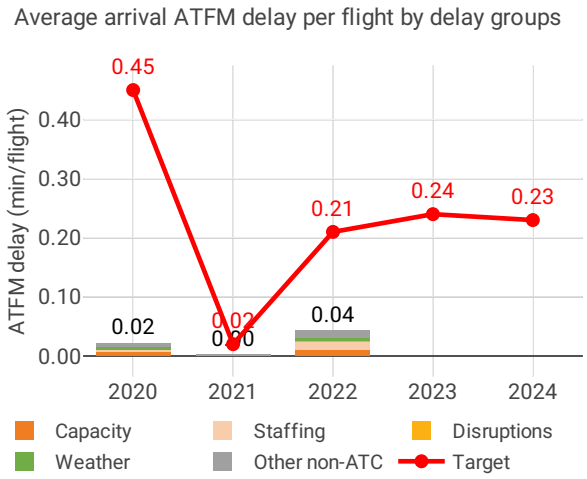
Focus on ATCOs in operations

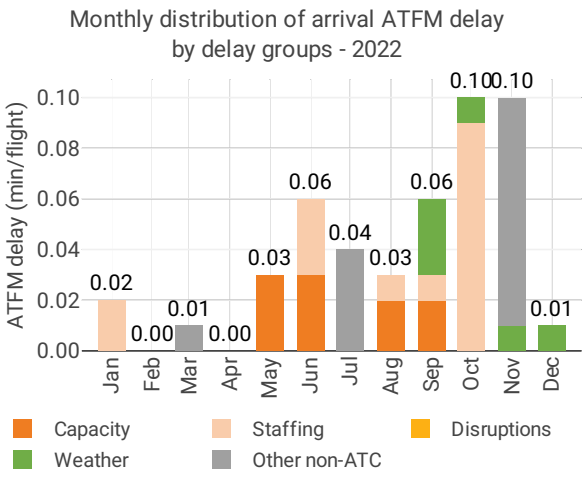
Number of additional ATCOs in OPS who have started working in the OPS room (FTEs): 13 consists of:
9 - new licenses
4 - shifts to PRU1 (ATCOs in OPS) category from other PRU categories
Number of ATCOs in OPS who have stopped working in the OPS room (FTEs): 6,75 consists of:

3 – termination of the contract
3 – shifts from PRU1 (ATCOs in OPS) category to other PRU categories
0,75 – 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

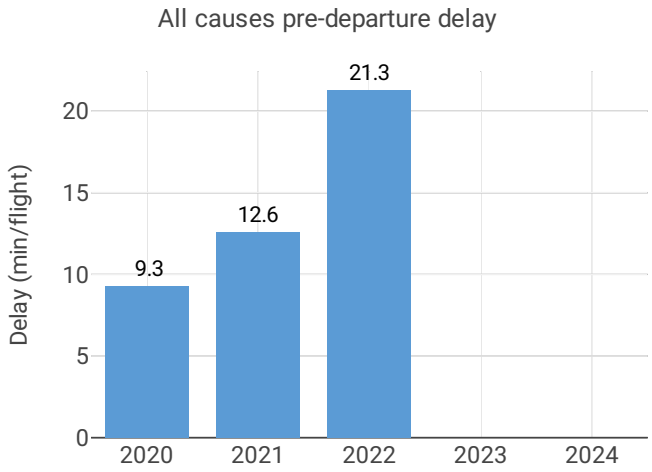
For Poland the scope of the RP3 monitoring comprises a total of 15 airports. However, in accordance with IR (EU) 2019/317 and the traffic figures, only the main airport Warsaw (EPWA) must be monitored for the pre-departure delay indicators.
The Airport Operator Data Flow, necessary for the monitoring 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 2022, regardless of an increase of 61% with respect to 2021, was still 14 % lower than in 2019.
EPRA has been closed for civil traffic due to airport extension project.
Average arrival ATFM delays in 2022 was 0.04 min/arr, compared to 0.00 min/arr in 2021.
ATFM slot adherence has improved (2022: 96.5%; 2021: 96.2%).
The Polish monitoring report mentions these measures planned to be implemented at Warsaw (EPWA) in 2022+:
- *Traffic Complexity Tool (2022),*
- *A-SMGCS (2024).*

Arrival ATFM delays in 2021 disappeared in 2021 at Polish airports. In 2022 some of these airports registered some delays, increasing the national average from 0.0 min/arr to 0.04 min/arr.
Warsaw registered very low delays (EPWA: 2022: 0.02 min/arr). Gdansk and Krakow observed the highest delays in average (EPGD: 2022: 0.12 min/arr; EPKK: 2022: 0.11 min/arr.) even if still low.
32% of the arrival ATFM delays in Poland were attributed to ATC Staffing issues (mostly at Gdansk) followed by 24% related to ATC Capacity and 17% due to Aerodrome Capacity issues (mostly at Krakow) and Weather (15%).
Regarding the impact of the war in Ukraine, the Polish monitoring report mentions: *The outbreak of the war in Ukraine impacted traffic to/from Rzeszów-Jasionka 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.*
Increased military activity in south-eastern part of Poland, following the outbreak of the war, had some impact on operations in Rzeszów airport over the period March-May 2022.
Below are the airport arrival ATFM delays for Rzeszów airport over March-May:
MAR: 100 minutes (codes: G, M),
APR: 24 minutes (code: G),

MAY: 153 minutes (code: C).
Over March-May period, the increased military activity in Eastern Poland had an impact on flights to/from Rzeszów airport.
Following introduction of RAD restrictions that aimed to improve the situation, traffic to/from Rzeszów airport was excluded from JKL sector, allowing for undisturbed traffic to/from that airport.
*For more information, see Annex 1 of the MR.*3. Arrival ATFM Delay – National TargetThe national target on arrival ATFM delay in 2022 was met.

Polish airports showed adherence between 89.9% and 98.1% and Warsaw (EPWA) reached 97.1%. The national average was 96.5%, slightly better than the previous year (96.2%). With regard to the 3.5% of flights that did not adhere, 1.7% was early and 1.8% was late.
According to the Polish monitoring report: *Performance achieved in 2022 should not be compared to previous years. Due to COVID-19 pandemic and Russia's war of aggression against Ukraine and related traffic drop, data for 2022 is not reliable and not comparable to periods before.*

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%	NA%
Gdansk	NA	NA	0.12	NA	93.3%	97.0%	96.6%	NA%
Katowice	NA	NA	0.05	NA	89.6%	92.3%	92.1%	NA%
Krakow	0.04	NA	0.11	NA	95.9%	97.9%	97.5%	NA%
Lodz	NA	NA	0.04	NA	100.0%	92.0%	95.6%	NA%
Lublin / Świdnik	NA	NA	NA	NA	91.7%	96.2%	98.1%	NA%
Modlin	0.01	NA	0.00	NA	96.4%	98.3%	98.1%	NA%
Olsztyn-Mazury	NA	NA	NA	NA	88.9%	100.0%	97.9%	NA%
Poznan	NA	0.01	0.00	NA	97.9%	97.3%	97.7%	NA%
Radom	NA	NA	NA	NA	NA	NA	NA	NA%
Rzeszow	NA	NA	0.04	NA	93.3%	98.4%	97.3%	NA%
Szczecin	NA	NA	0.02	NA	95.7%	100.0%	97.6%	NA%
Warsaw	0.04	0.00	0.02	NA	97.5%	97.4%	97.1%	NA%
Wroclaw Airport	NA	0.00	0.01	NA	88.9%	92.1%	93.9%	NA%
Zielona Gora	NA	NA	NA	NA	100.0%	100.0%	89.9%	NA%

Airport name	ATC pre departure delay (PI#2)				All causes pre departure delay (PI#3)			
	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	NA	9.3	12.6	21.3	NA
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

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 quality of the airport data reported by EPWA has improved after the COVID crisis and it is possible again to calculate this indicator.
The annual value for 2022 is very similar to the observed in 2021 and lower than pre-COVID (EPWA: 2019: 0.87 min/dep; 2021: 0.59 min/dep; 2022: 0.6 min/dep)

ATC 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 significantly increased in 2022 (EPWA: 2020: 9.32 min/dep.; 2021: 12.61 min/dep.; 2022: 21.26 min/dep.). The highest delays per flight were observed in Summer, averaging more than 30 min/dep.
According to the Polish monitoring report: Performance achieved in 2022 should not be compared to previous years. Due to COVID-19 pandemic and Russia's war of aggression against Ukraine and related traffic drop, data for 2022 is not reliable and not comparable to periods before.

All causes pre-departure delay

No data availablce: airport operator data flow not established, or more than two months of missing / non-validated data

5 COST-EFFIENCY - POLAND

5.1 PRB monitoring

• The en route 2022 actual unit cost of Poland was 54.12 €2017, 15% higher than the determined unit cost (47.05 €2017). The terminal zone 1 actual unit cost was 119.14 €2017, in line with the determined unit cost (118.48 €2017), while the terminal zone 2 actual unit cost was 228.41 €2017, 11% lower than the determined unit cost (255.46 €2017).

• The en route 2022 actual service units (3,129K) were 22% lower than the determined service units (3,991K).

• In 2022, the en route actual total costs were 18 M€2017 (-9.8%) lower than determined. Staff costs decreased (-9.1 M€2017, or -8.6%) as a result of higher inflation than expected, while other operating costs decreased (-8.9 M€2017, or -19%) mainly due to cost containment measures in response to Russia's war of aggression against Ukraine.

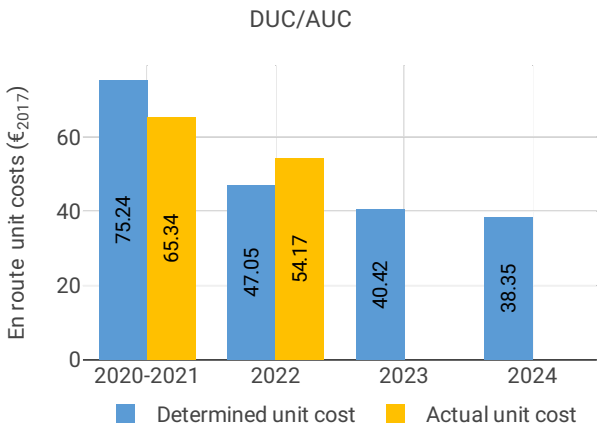
• Poland presented a deviation from the criteria to achieve capacity targets, which was considered justified. Considering that costs are significantly lower and that the 2022 en route capacity targets have not been achieved, the situation raises serious concern. The PRB invites the NSA to analyse the discrepancies and identify their reasons and the Member State to rectify the situation to ensure that the additional means granted through the capacity deviation are used to address the capacity issues.

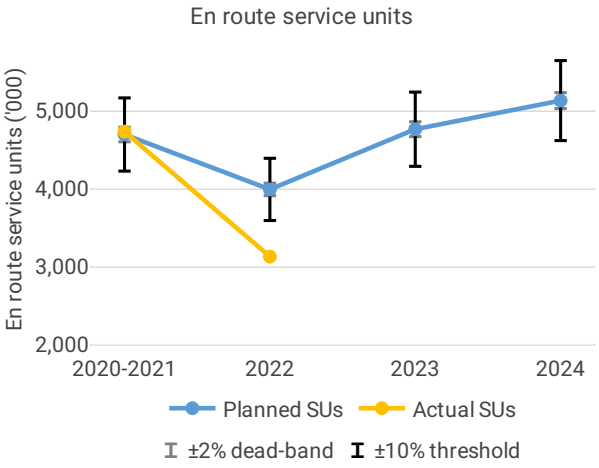
• PANSA spent 45 M€2017 in 2022 related to costs of investments, in line with the plan. However, due to COVID-19 and Russia's war of aggression against Ukraine, some projects had to be adjusted (postponed, change of scope, and change of value). The slow up in investments has been offset by the increase in cost of capital due to higher WACC than planned.

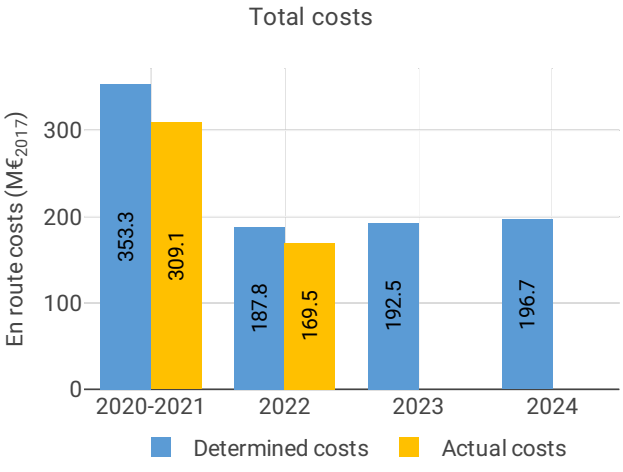
• The en route actual unit cost incurred by users in 2022 was 61.12€, while the terminal zone 1 actual unit cost incurred by users was 133.20€ and 258.28€ for terminal zone 2.

5.2 En route charging zone

5.2.1 Unit cost (KPI#1)

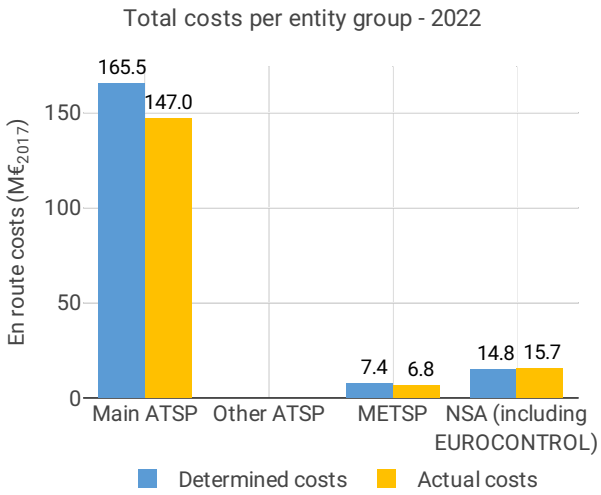


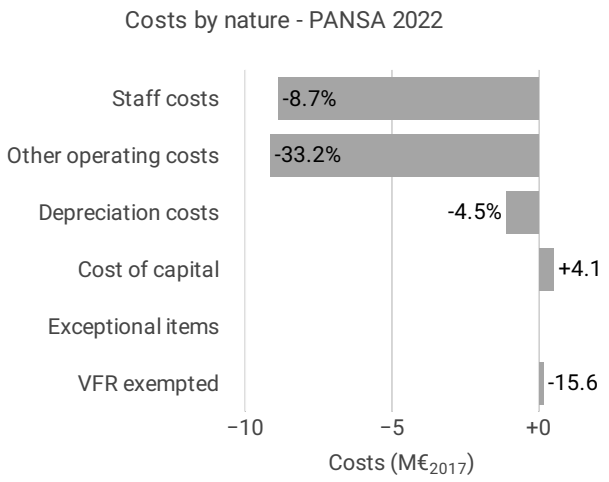




Actual and determined data

Total costs - nominal (M€)	2020-2021	2022	2023	2024
Actual costs	330	202	NA	NA
Determined costs	377	206	215	223
Difference costs	-47	-4	NA	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%	NA	NA
Actual inflation index	NA	127.6	NA	NA
Difference inflation index (p.p.)	NA	+14.2	NA	NA





Focus on unit cost

AUC vs. DUC

In 2022, the en route AUC was +15.0% (or +30.09 PLN2017, +7.07 €2017) higher than the planned DUC. This results from the combination of significantly lower than planned TSUs (-21.6%) and significantly lower than planned en route costs in real terms (-9.8%, or -78.4 MPLN2017, -18.4 M€2017). It should be noted that actual inflation index in 2022 was +14.2 p.p. higher than planned.

En route service units

The difference between actual and planned TSUs (-21.6%) 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, with the ANSP (PANSA) bearing a loss of -6.3 M€2017.

En route costs by entity

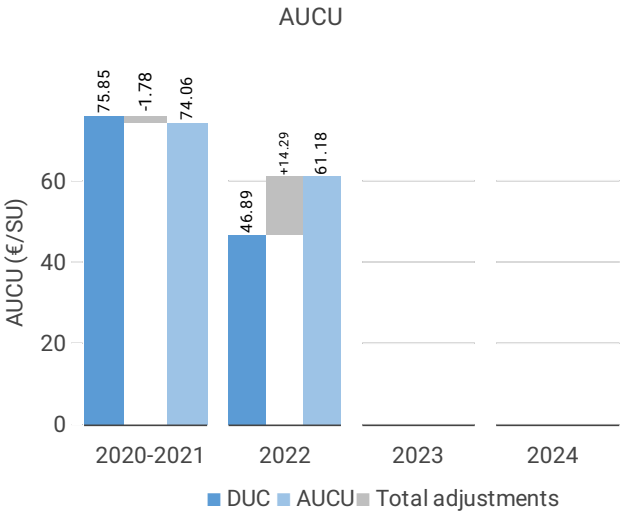
Actual real en route costs are -9.8% (-18.4 M€2017) lower than planned. This is the result of lower costs for the main ANSP, PANSA (-11.2%, or -18.5 M€2017) and the MET service providers (-8.7%, or -0.6 M€2017) and higher costs for the NSA/EUROCONTROL (+4.6%, or +0.7 M€2017).

En route costs for the main ANSP at charging zone level

Significantly lower than planned en route costs in real terms for PANSA in 2022 (-11.2%, or -18.5 M€2017) result from:

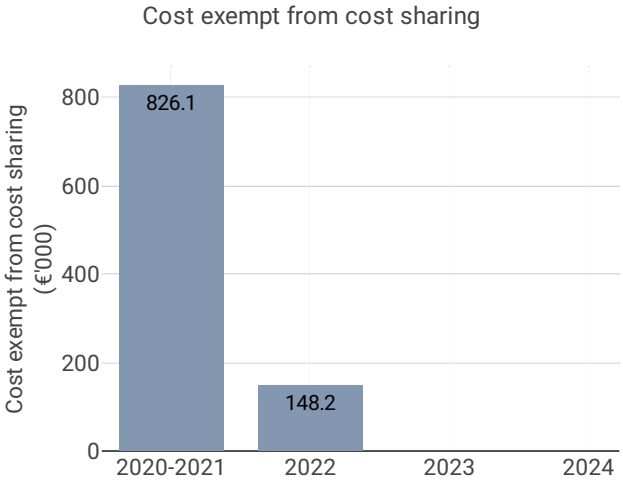
- Significantly lower staff costs (-8.7%), mainly due to inflation index impact (+14.2 p.p.) since in nominal terms staff costs are higher than planned by 2.7%.
- Significantly lower other operating costs (-33.2%), as a consequence of lower traffic and the review of PANSA plan resulting in one-off cost containment initiative and postponement of some activities. This result is also impacted by higher actual inflation index (+14.2 p.p.).
- Lower depreciation (-4.5%),due to the lower execution of investment plan.
- Higher cost of capital (+4.1%), resulting from higher WACC due to the higher interest rate in 2022.
- Significantly lower deduction for VFR exempted flights (-15.6%).

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



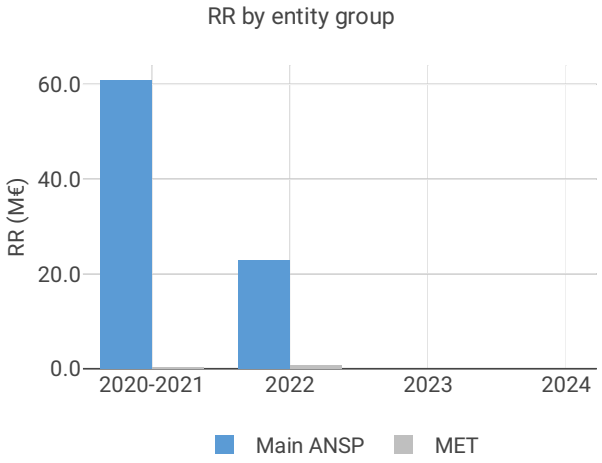
AUCU components (€/SU) – 2022

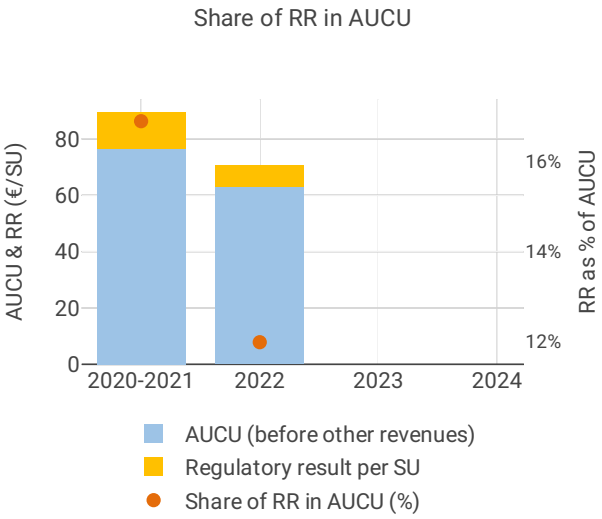
Components of the AUCU in 2022	€/SU
DUC	**46.89**
Inflation adjustment	5.60
Cost exempt from cost-sharing	0.05
Traffic risk sharing adjustment	9.13
Traffic adj. (costs not TRS)	1.46
Finantial incentives	0.00
Modulation of charges	0.00
Cross-financing	0.00
Other revenues	-1.94
Application of lower unit rate	0.00
Total adjustments	14.29
AUCU	**61.18**
AUCU vs. DUC	**+30.5%**

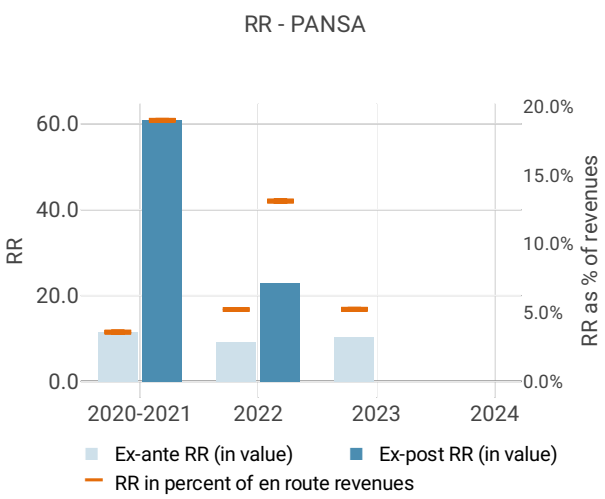


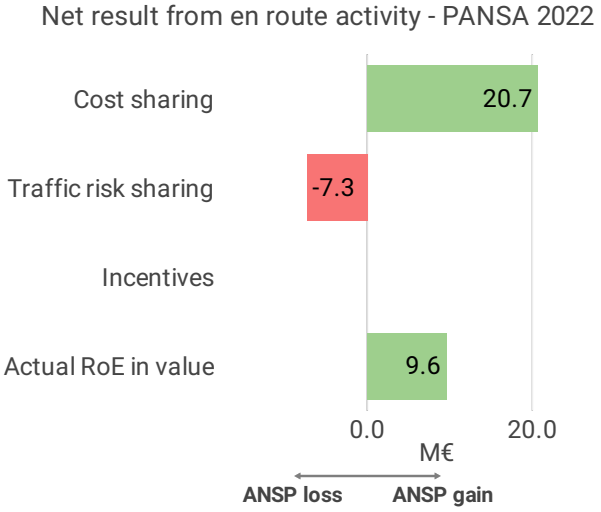
Cost exempt from cost sharing by item - 2022	€'000	€/SU
New and existing investments	-838.5	-0.27
Competent authorities and qualified entities costs	1.2	0.00
Eurocontrol costs	783.3	0.25
Pension costs	0.0	0.00
Interest on loans	201.8	0.06
Changes in law	0.5	0.00
Total cost exempt from cost risk sharing	**148.2**	**0.05**

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 2022

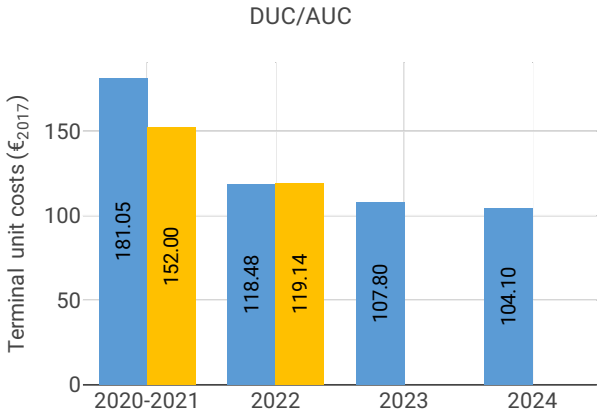
PANSA reported a net gain of +62.6 MPLN, as a combination of a gain of +96.7 MPLN arising from the cost sharing mechanism, with a loss of -34.2 MPLN arising from the traffic risk sharing mechanism.

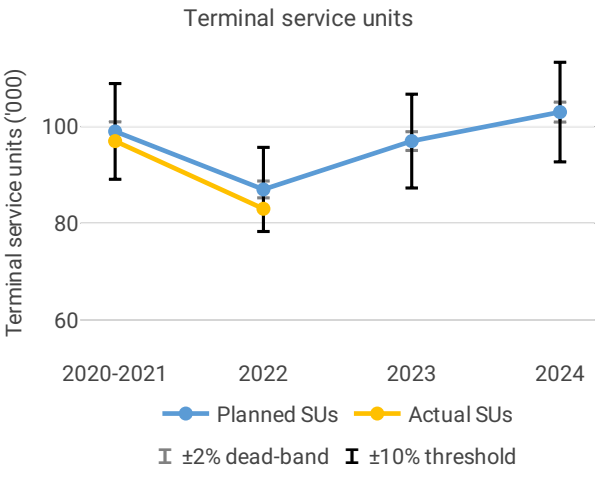
PANSA overall regulatory results (RR) for the en route activity

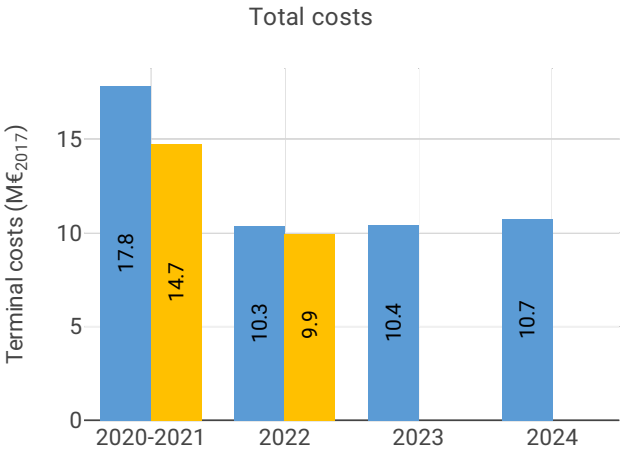
Ex-post, the overall RR taking into account the net gain from the en route activity mentioned above (+62.6 MPLN) and the actual RoE (+44.8 MPLN) amounts to +107.3 MPLN (13.1% of the en route revenues). The resulting ex-post rate of return on equity is 11.6%, which is higher than the 4.9% planned in the PP.

5.3 Terminal charging zone - Poland EPWA

5.3.1 Unit cost (KPI#1)

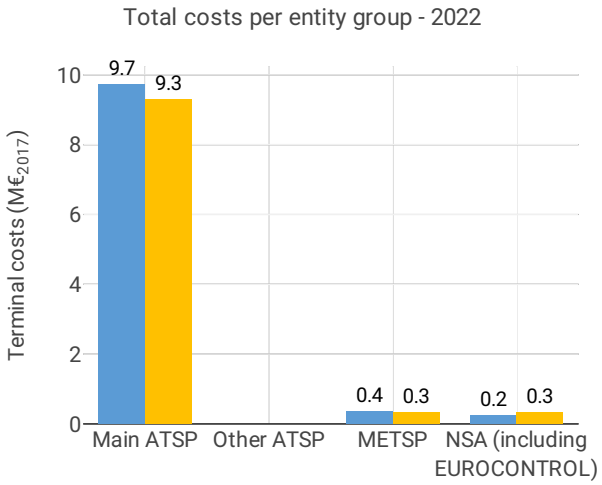


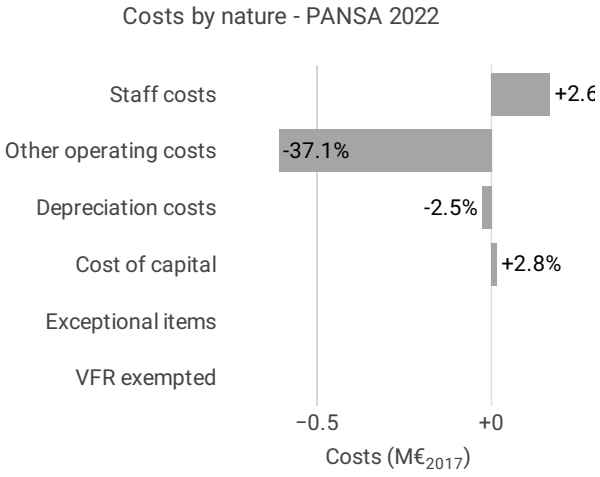




Actual and determined data

Total costs - nominal (M€)	2020-2021	2022	2023	2024
Actual costs	16	12	NA	NA
Determined costs	19	11	12	12
Difference costs	-3	1	NA	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%	NA	NA
Actual inflation index	NA	127.6	NA	NA
Difference inflation index (p.p.)	NA	+14.2	NA	NA





Focus on unit cost

AUC vs. DUC

In 2022, the terminal AUC was +0.6% (or +2.82 PLN2017, +0.66 €2017) higher than the planned DUC. This results from the combination of lower than planned TNSUs (-4.6%) and lower than planned terminal costs in real terms (-4.0%, or -1.8 MPLN2017, -0.4 M€2017). It should be noted that actual inflation index in 2022 was +14.2 p.p. higher than planned.

Terminal service units

The difference between actual and planned TNSUs (-4.6%) falls outside the ±2% dead band, but does not exceed the ±10% threshold foreseen in the traffic risk sharing mechanism. The resulting loss of terminal revenues is therefore shared between the ANSP and the airspace users, with the ANSP (PANSA) bearing a loss of -0.2 M€2017.

Terminal costs by entity

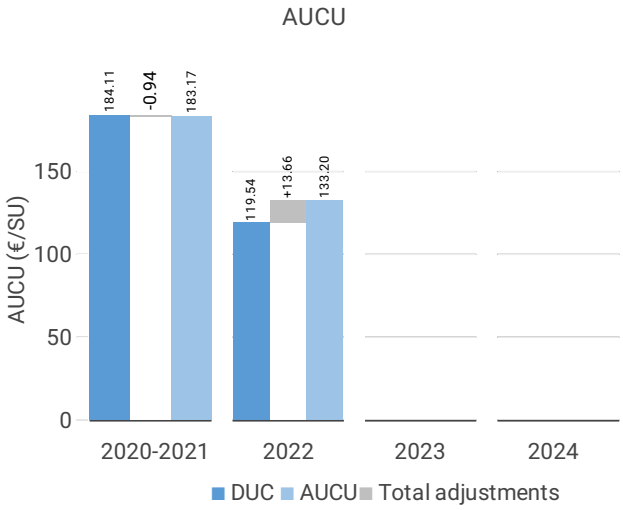
Actual real terminal costs are -4.0% (-0.4 M€2017) lower than planned. This is the result of lower costs for the main ANSP, PANSA (-4.7%, or -0.05 M€2017) and the MET service provider (-10.2%, or 0.05 M€2017) and higher costs for the NSA (+28.5%, or +0.1 M€2017).

Terminal costs for the main ANSP at charging zone level

Lower than planned terminal costs in real terms for PANSA in 2022 (-4.7%, or -0.5 M€2017) result from:
- Higher staff costs (+2.6%), resulting from 1) the changes in the remuneration scheme implemented in 2022 that affect also EPWA ATCOs remunerations, 2) additional costs that materialized in 2022 and represent the part of unspent budget of staff costs in 2021. This result is also impacted by higher actual inflation index (+14.2 p.p.).

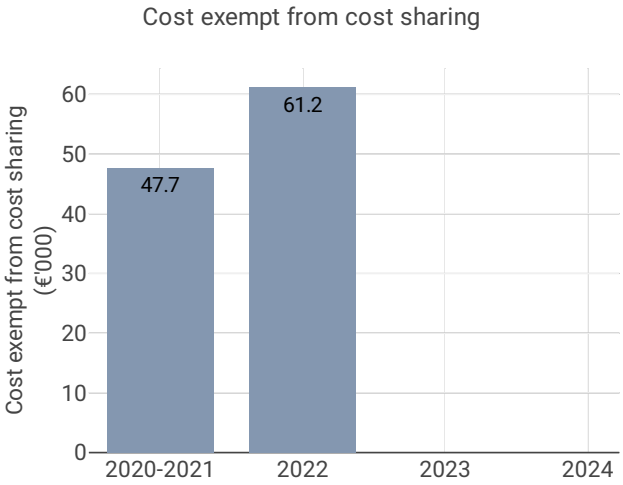
- Significantly lower other operating costs (-37.1%), as a consequence of lower traffic and the review of PANSA plan resulting in one-off cost containment initiative and postponement of some activities. This result is also impacted by higher actual inflation index (+14.2 p.p.).
- Lower depreciation (-2.5%), due to the postponement of some investment projects.
- Higher cost of capital (+2.8%), resulting from higher WACC due to the higher interest rate in 2022.

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



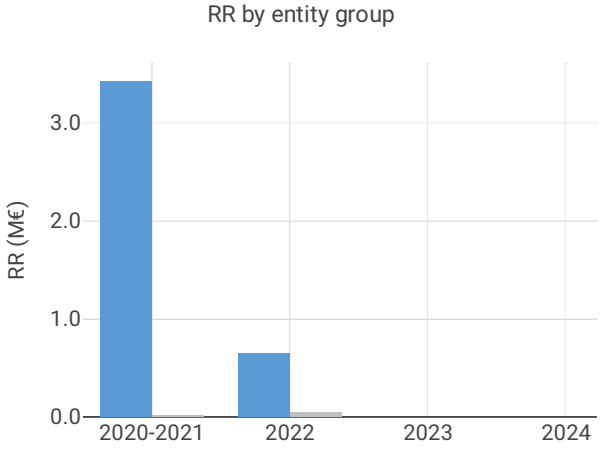
AUCU components (€/SU) – 2022

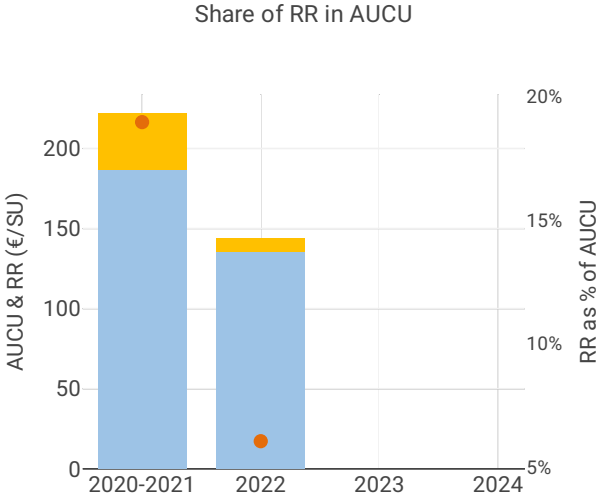
Components of the AUCU in 2022	€/SU
DUC	**119.54**
Inflation adjustment	13.19
Cost exempt from cost-sharing	0.73
Traffic risk sharing adjustment	2.13
Traffic adj. (costs not TRS)	0.33
Finantial incentives	0.00
Modulation of charges	0.00
Cross-financing	0.00
Other revenues	-2.72
Application of lower unit rate	0.00
Total adjustments	13.66
AUCU	**133.20**
AUCU vs. DUC	**+11.4%**

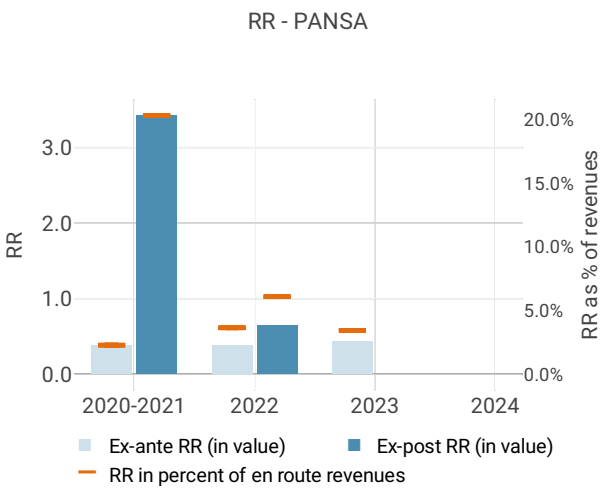


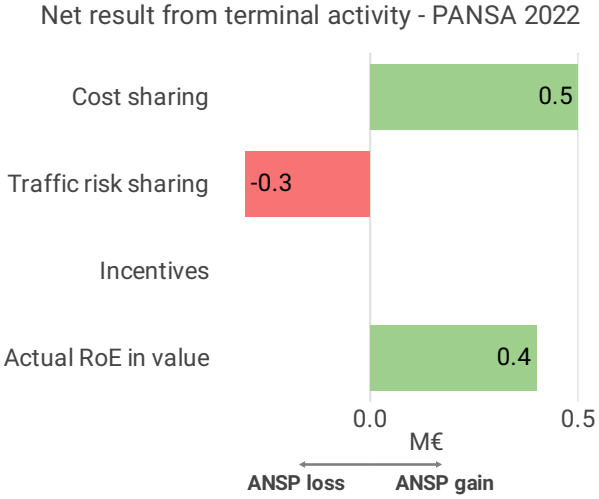
Cost exempt from cost sharing by item - 2022	€'000	€/SU
New and existing investments	-15.8	-0.19
Competent authorities and qualified entities costs	65.4	0.78
Eurocontrol costs	0.0	0.00
Pension costs	0.0	0.00
Interest on loans	11.5	0.14
Changes in law	0.0	0.00
Total cost exempt from cost risk sharing	**61.2**	**0.73**

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 2022

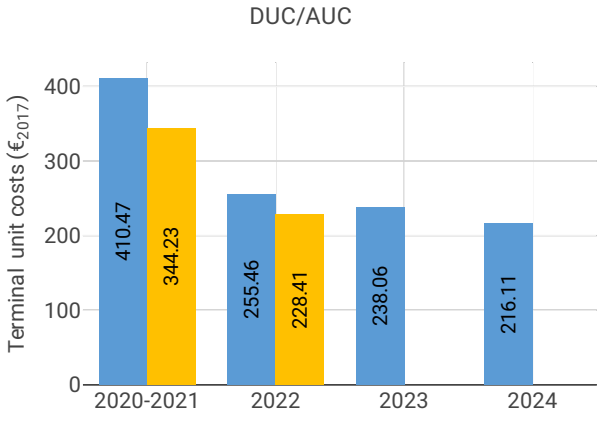
PANSA reported a net gain of +1.2 MPLN, as a combination of a gain of +2.4 MPLN arising from the cost sharing mechanism, with a loss of -1.3 MPLN arising from the traffic risk sharing mechanism.

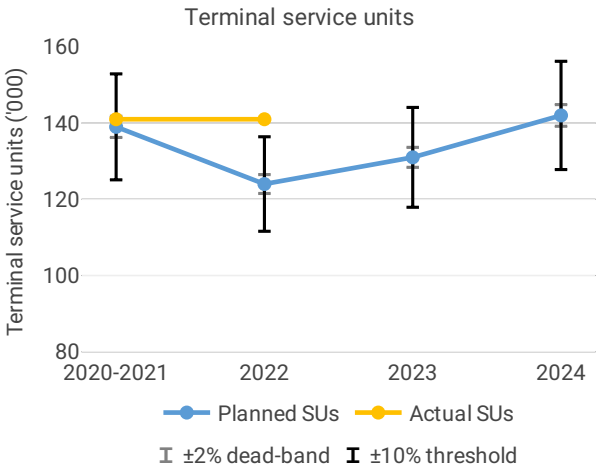
PANSA overall regulatory results (RR) for the terminal charging zone 1 activity

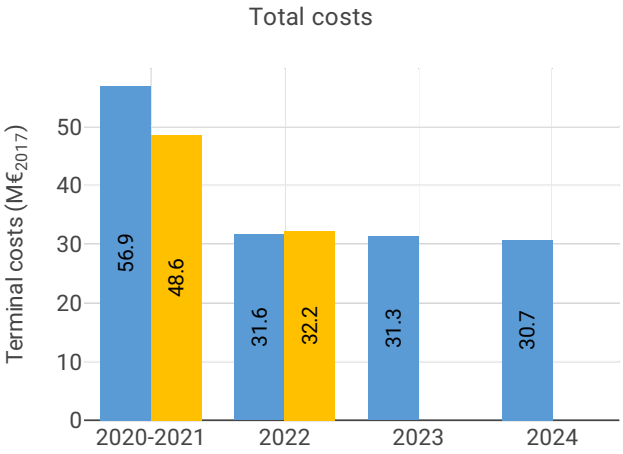
Ex-post, the overall RR taking into account the net gain from the terminal activity mentioned above (+1.2 MPLN) and the actual RoE (+1.9 MPLN) amounts to +3.0 MPLN (6.1% of the terminal revenues). The resulting ex-post rate of return on equity is 7.8%, which is higher than the 4.9% planned in the PP.

5.4 Terminal charging zone - Poland Others

5.4.1 Unit cost (KPI#1)

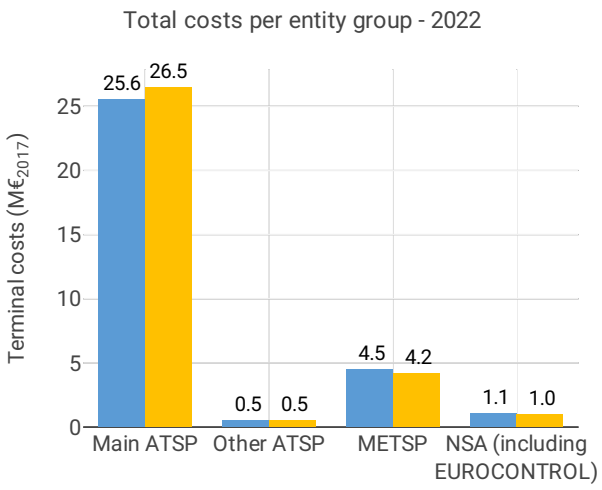


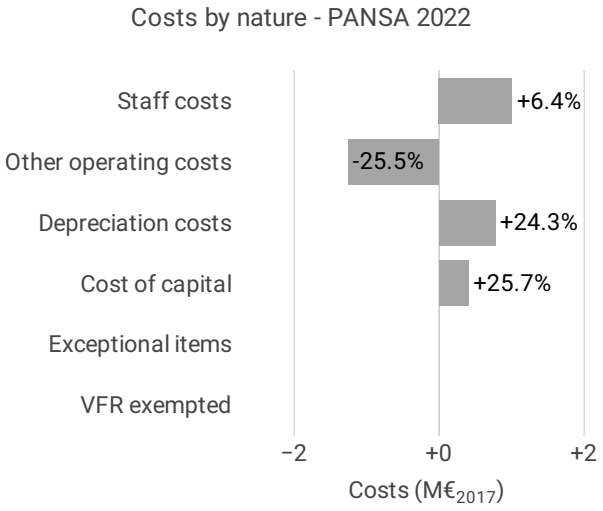




Actual and determined data

Total costs - nominal (M€)	2020-2021	2022	2023	2024
Actual costs	52	39	NA	NA
Determined costs	61	35	35	35
Difference costs	-9	4	NA	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%	NA	NA
Actual inflation index	NA	127.6	NA	NA
Difference inflation index (p.p.)	NA	+14.2	NA	NA





Focus on unit cost

AUC vs. DUC

In 2022, the terminal AUC was -10.6% (or -115.1 PLN2017, -27.05 €2017) lower than the planned DUC. This results from the combination of significantly higher than planned TNSUs (+13.7%) and higher than planned terminal costs in real terms (+1.7%, or +2.3 MPLN2017, +0.5 M€2017). It should be noted that actual inflation index in 2022 was +14.2 p.p. higher than planned.

Terminal service units

The difference between actual and planned TNSUs (+13.7%) 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, with the ANSP (PANSA) retaining an amount of +1.0 M€2017.

Terminal costs by entity

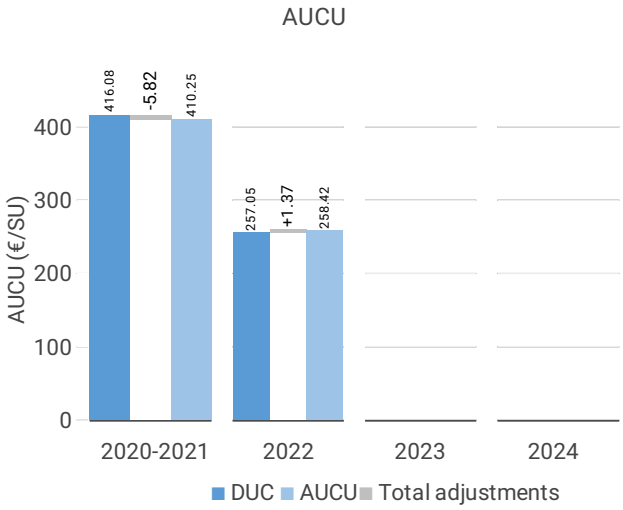
Actual real terminal costs are +1.7% (+0.5 M€2017) higher than planned. This is the result of higher costs for the main ANSP, PANSA (+3.7%, or +0.9 M€2017) and lower costs for the other ANSP (MODLIN, ANSP-BYDGOSZCZ and ANSP-Warmia-Mazury, -2.7%, or -0.01 M€2017), the NSA (-6.6%, or -0.1 M€2017) and the MET service providers (-7.1%, or -0.3 M€2017).

Terminal costs for the main ANSP at charging zone level

Higher than planned terminal costs in real terms for PANSA in 2022 (+3.7%, or +0.9 M€2017) result from:
- Significantly higher staff costs (+6.4%), resulting from 1) the changes in the remuneration scheme implemented in 2022 that affect also regional TWR ATCOs remunerations, 2) additional costs that materialized in 2022 and represent the part of unspent budget of staff costs in 2021. This result is also impacted by higher actual inflation index (+14.2 p.p.).

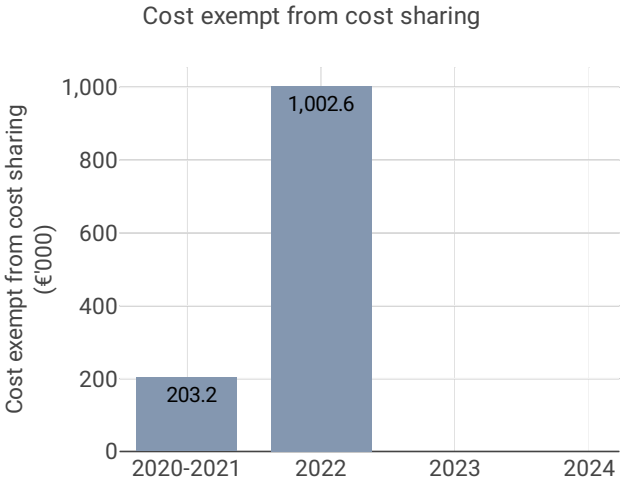
- Significantly lower other operating costs (-25.5%), due to the review of PANSA plan resulting in one-off cost containment initiative and postponement of some activities. This result is also impacted by higher actual inflation index (+14.2 p.p.).
- Significantly higher depreciation (+24.3%), due to the higher traffic and the increase in the costs allocated to TNC-CZ2.
- Significantly higher cost of capital (+25.7%), due to the higher WACC and higher asset base.

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



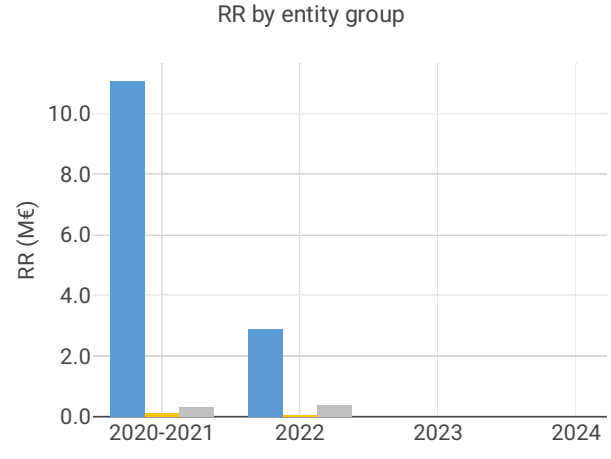
AUCU components (€/SU) – 2022

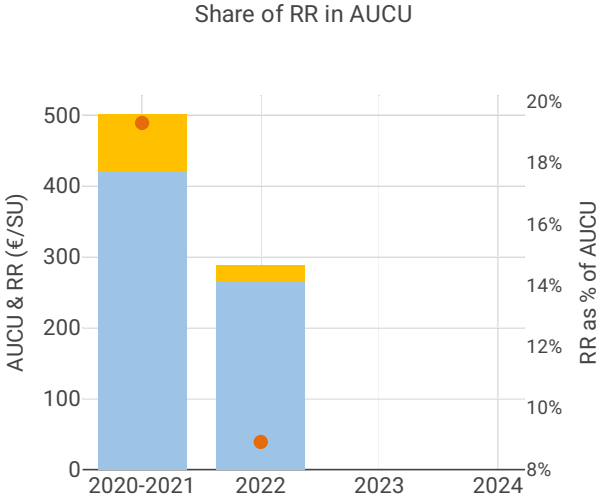
Components of the AUCU in 2022	€/SU
DUC	**257.05**
Inflation adjustment	23.20
Cost exempt from cost-sharing	7.11
Traffic risk sharing adjustment	-17.42
Traffic adj. (costs not TRS)	-5.41
Finantial incentives	0.00
Modulation of charges	0.00
Cross-financing	0.00
Other revenues	-6.11
Application of lower unit rate	0.00
Total adjustments	1.37
AUCU	**258.42**
AUCU vs. DUC	**+0.5%**

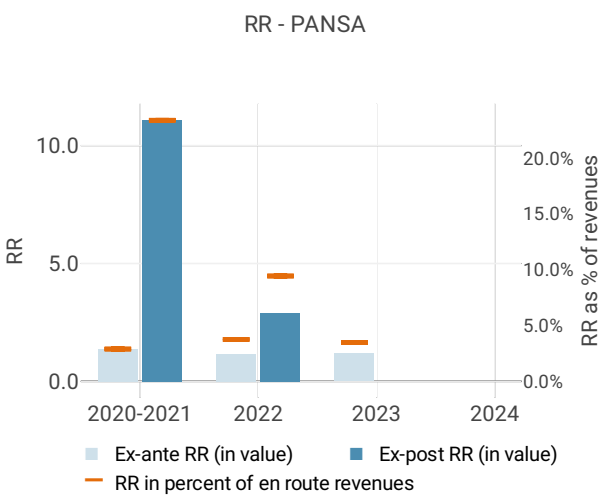


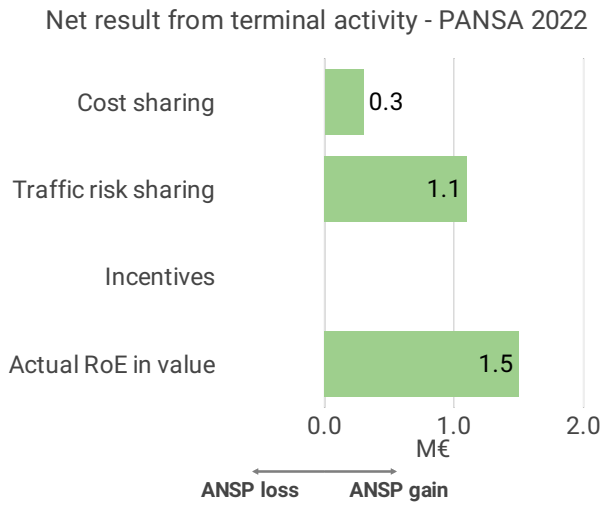
Cost exempt from cost sharing by item - 2022	€'000	€/SU
New and existing investments	1,018.4	7.23
Competent authorities and qualified entities costs	-64.9	-0.46
Eurocontrol costs	0.0	0.00
Pension costs	0.0	0.00
Interest on loans	49.0	0.35
Changes in law	0.2	0.00
Total cost exempt from cost risk sharing	**1,002.6**	**7.11**

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 2022

PANSA reported a net gain of +6.7 MPLN, as a combination of a gain of +1.4 MPLN arising from the cost sharing mechanism, with a gain of +5.3 MPLN arising from the traffic risk sharing mechanism.

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

Ex-post, the overall RR taking into account the net gain from the terminal activity mentioned above (+6.7 MPLN) and the actual RoE (+6.8 MPLN) amounts to +13.6 MPLN (9.4% of the terminal revenues). The resulting ex-post rate of return on equity is 9.6%, which is higher than the 4.9% planned in the PP.