PERFORMANCE REVIEW BOARD
of the Single European Sky

Performance Review Board Monitoring Report Germany - 2024

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Contents

1 OVERVIEW

1.1 Contextual information

National performance plan adopted following Commission Decision (EU) 2023/177 of 14 December 2022

List of ACCs 4
Bremen ACC
Langen ACC
Karlsruhe UAC
Munich ACC

No of airports in the scope of the performance plan:
- **≥80'K** 7
- **<80'K** 8

Exchange rate (1 EUR=)
2017: 1 EUR
2024: 1 EUR

Share of Union-wide:
- **traffic (TSUs) 2024** 10.9%
- **en route costs 2024** 14.1%

Share en route / terminal costs 2024 76% / 24%

En route charging zone(s)
Germany

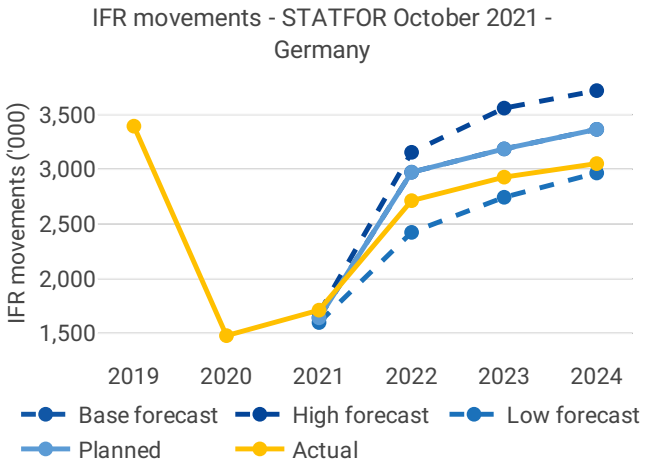
Terminal charging zone(s)
Germany

Main ANSP
- DFS

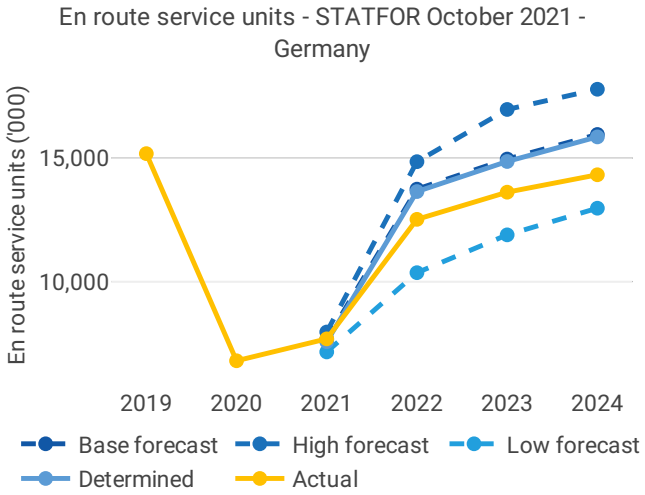
Other ANSPs
- MUAC

MET Providers
- Deutscher Wetterdienst (DWD)

1.2 Traffic (En route traffic zone)

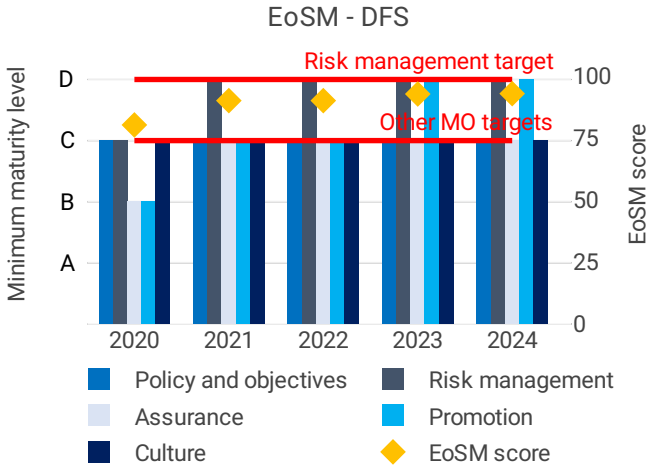


- Germany recorded 3,052K actual IFR movements in 2024, +4.2% compared to 2023 (2,928K).
- Actual 2024 IFR movements were -9.3% below the plan (3,365K).
- Actual 2024 IFR movements represent 90% of the actual 2019 level (3,394K).



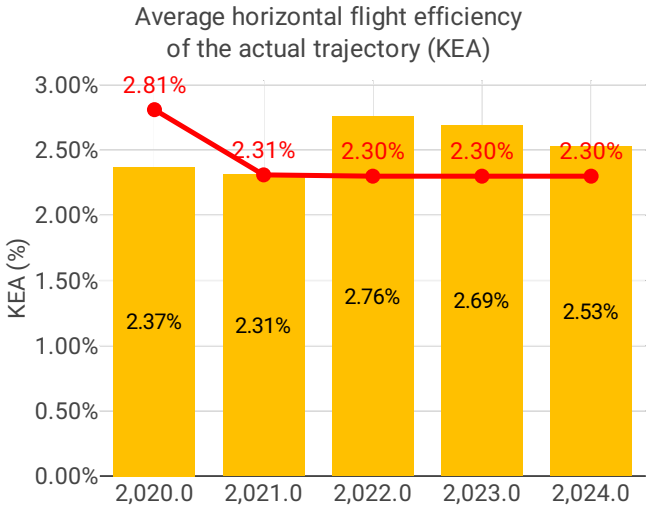
- Germany recorded 14,324 actual service units in 2024, +5.2% compared to 2023 (13,619K).
- Actual 2024 service units were -9.7% above the plan (15,858K).
- Actual 2024 service units represent 94% of the actual 2019 level (15,180K).

1.3 Safety (Main ANSP)



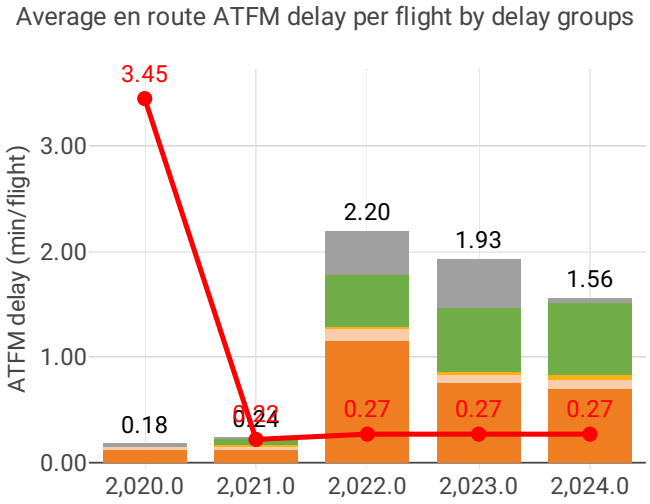
- DFS achieved the RP3 EoSM targets in 2021 and remained at or above the RP3 targets throughout the period.
- Germany reported a decrease in the rate of separation minima infringements (SMIs) in 2024, and no occurrences of runway incursions (RIs).
- As part of occurrence management at DFS, each reported safety-relevant event (e.g. RI and SMI) is analysed individually. Where appropriate, lessons are drawn from these analyses, and preventive measures are developed to avoid recurrence. In addition, continuous trend analyses are conducted, incorporating information from all SMS processes to identify systemic issues and support proactive safety management.

1.4 Environment (Member State)



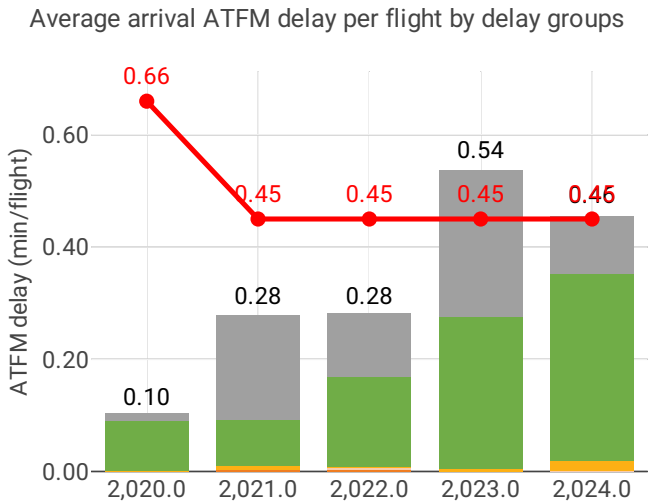
- Germany achieved a KEA performance of 2.53% compared to its target of 2.30% and did not contribute positively towards achieving the Union-wide target.
- The NSA states that the longer routes persist due to re-routings caused by the war in Ukraine and weather-related issues.
- Both KEP and SCR improved in comparison with 2023. Despite the KEA target being missed, KEA improved in 2024. Additionally, the improvement in SCR shows that Germany has enhanced the environmental efficiency of its airspace when accounting for impacts outside of its control.
- The share of CDO flights remained stable in 2024.
- Both additional taxi out time and additional time in terminal airspace remained stable in 2024 compared to 2023.

1.5 Capacity (Member State)



- Germany registered 1.41 minutes of average en route ATFM delay per flight during 2024, which has been adjusted to 1.56 during the post-ops adjustment process, thus not achieving the local target value of 0.27. Delays in Germany decreased by 0.35 minutes per flight year-on-year.

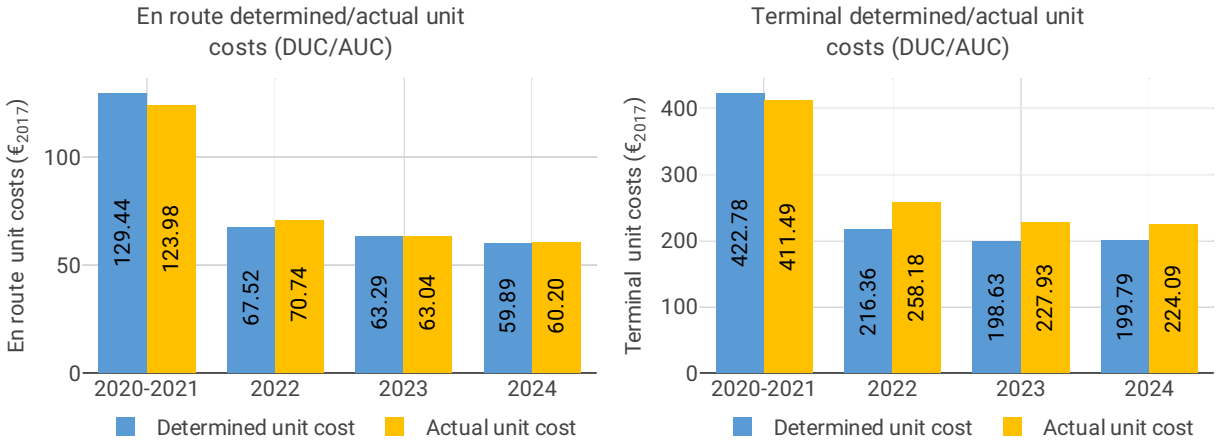
- Delays were highest between May and September, mostly driven by ATC Capacity issues and adverse weather conditions.
- The share of delayed flights with delays longer than 15 minutes in Germany increased by 3 percentage points compared to 2023 and was higher than 2019 values.
- The average number of IFR movements was 10% below 2019 levels in Germany in 2024.
- The number of ATCOs in OPS is 205, being below the 2024 plan in Bremen by 63 FTEs. The number of ATCOs in OPS is 372, being below the 2024 plan in Langen by 75 FTEs. The number of ATCOs in OPS is 416, being below the 2024 plan in Karlsruhe by 69 FTEs. The number of ATCOs in OPS is 228, being below the 2024 plan in Munich by 58 FTEs.
- The yearly total of sector opening hours in Munich ACC was 100,442, showing a 2.9% decrease compared to 2023. Sector opening hours are 3.4% above 2019 levels. The yearly total of sector opening hours in Bremen ACC was 82,760, showing a 0.3% decrease compared to 2023. Sector opening hours are 20.3% below 2019 levels. The yearly total of sector opening hours in Langen ACC was 120,451, showing a 1.4% decrease compared to 2023. Sector opening hours are 9.0% below 2019 levels. The yearly total of sector opening hours in Karlsruhe ACC was 141,204, showing a 0.2% decrease compared to 2023. Sector opening hours are 2.5% below 2019 levels.
- Karlsruhe ACC registered 13.11 IFR movements per one sector opening hour in 2024, being 3.7% above 2019 levels. Bremen ACC registered 6.09 IFR movements per one sector opening hour in 2024, being 3.8% below 2019 levels. Langen ACC registered 9.28 IFR movements per one sector opening hour in 2024, being 8.1% below 2019 levels. Munich ACC registered 9.79 IFR movements per one sector opening hour in 2024, being 20.8% below 2019 levels.
- Despite the significant improvement in 2024 compared to 2023, Germany still has a capacity gap. Germany should further expedite the re-cruitment and training of controllers. Actual 2025 values up to August show a further im-provement.



- Germany registered an average airport arrival ATFM delay of 0.46 minutes per flight in 2024, thus not achieving the local target of 0.45 minutes.
- Compared to 2023, average arrival ATFM delays in Germany were 15% lower in 2024, while the number of IFR arrivals increased by 4%.

- The main drivers of delays were weather, accounting for 73% of total delays, and other, non-ATC related causes, responsible for 22%.

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



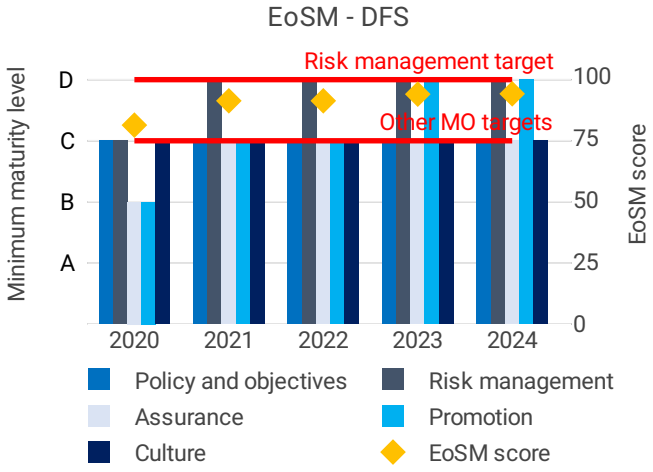
- The en route 2024 actual unit cost of Germany was 60.20€2017, +0.5% higher than the determined unit cost (59.89€2017). The terminal 2024 actual unit cost was 224.09€2017, +12% higher than the determined unit cost (199.79€2017).
- The en route 2024 actual service units (14.3M) were -9.7% lower than the determined service units (15.9M).
- The en route 2024 actual total costs were -87M€2017 (-9.2%) lower than determined. The difference is mainly driven by the staff costs of DFS (-64M€2017, or -11%). However, in nominal terms, the actual staff costs showed an increase of +15M€2017 (+2.2%). According to the NSA, this is mainly attributable to collective wage settlements and necessity to increase capacity provisions.
- DFS costs of investments were 93M€2017 in 2024 for both en route and terminal charging zones, -24% less than determined (122M€2017). According to the NSA, this reduction was a result of a significantly lower actual cost of capital (-63%), which is largely due to lower interest rates, affected by the pension scheme's interest balance and the ANSP's net interest income . The NSA stated that this gap will be considered in the unit rates for the following reference period. In addition, depreciation costs were lower than planned (-22%). The NSA attributed this difference to the decision not to implement the new iCAS system in Langen ACC.
- The en route actual unit cost incurred by users in 2024 was 75.99€ (+17% above the 2024 DUC), while the terminal actual unit cost incurred by users was 254.29€ (+17% above the 2024 DUC). The difference between the AUCU and the DUC for both charging zones is primarily attributable to the inflation adjustment and lower than planned SUs.

2 SAFETY - GERMANY

2.1 PRB monitoring

- DFS achieved the RP3 EoSM targets in 2021 and remained at or above the RP3 targets throughout the period.
- Germany reported a decrease in the rate of separation minima infringements (SMIs) in 2024, and no occurrences of runway incursions (RIs).
- As part of occurrence management at DFS, each reported safety-relevant event (e.g. RI and SMI) is analysed individually. Where appropriate, lessons are drawn from these analyses, and preventive measures are developed to avoid recurrence. In addition, continuous trend analyses are conducted, incorporating information from all SMS processes to identify systemic issues and support proactive safety management.

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



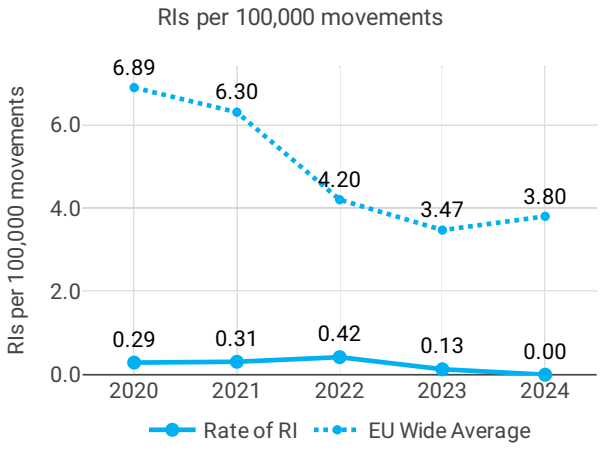
Focus on EoSM

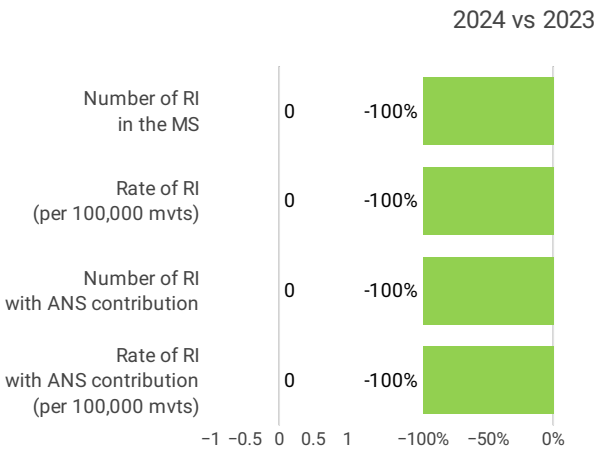
All five EoSM components of the ANSP meet the RP3 target level. The level was maintained compared with 2023.

DFS achieved the RP3 EoSM targets in 2021 and continued to improve their performance, reaching maturity level D also for Safety Promotion in 2023.

2.3 Safety occurrences

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



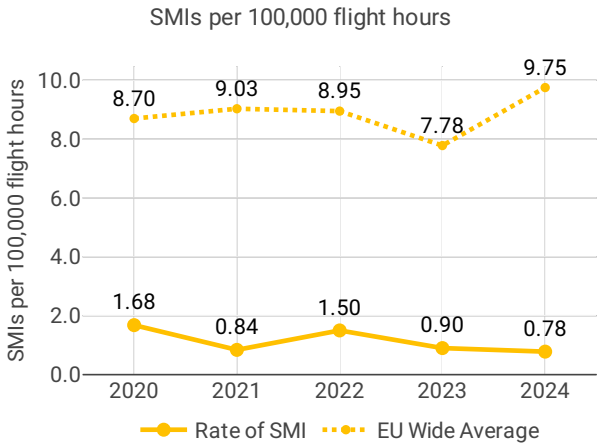


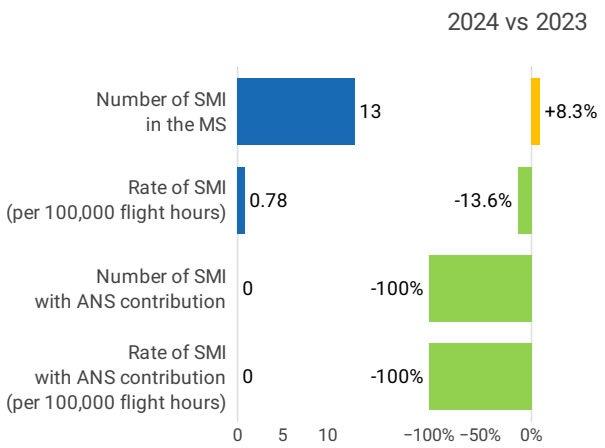
Rate of RIs per 100,000 airport movements - Germany				
#	Airport name	APT movements	Number of RI	Rate RI per 100,000
1	Frankfurt	401,548	0	0.00
2	Munich	304,561	0	0.00
3	Berlin - Brandenburg	196,254	0	0.00
4	Cologne-Bonn	165,458	0	0.00
5	Dusseldorf	151,456	0	0.00
6	Hamburg	138,654	0	0.00
7	Stuttgart	97,542	0	0.00
8	Leipzig-Halle	93,657	0	0.00
9	Hannover	74,256	0	0.00
10	Nuremberg	65,254	0	0.00
11	Muenster-Osnabrueck	43,568	0	0.00
12	Bremen	38,956	0	0.00
13	Dresden	28,659	0	0.00
14	Saarbruecken	11,378	0	0.00
15	Erfurt	7,968	0	0.00
16	Berlin - Tegel	0	0	NA

Focus on runway incursions

Throughout RP3, Germany maintained stable performance with respect to runway incursions, showing a decreasing trend since 2022. In 2024, Germany did not report any RIs.

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





Rate of SMI with ANS contribution per 100,000 flight hours											
		Flight hours					Number of SMIs				
#	ANSP	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
1	DFS	700,899	952,606	1,263,985	1,329,631	1,378,836	6	8	22	12	0

		Rate of SMI per 100,000 flight hours					% variation in rate of SMIs				
#	ANSP	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
1	DFS	2	1	2	1	0		-51%	+107%	-48%	-100%

Focus on separation minima

During RP3, Germany reported a low number of SMIs, resulting in a consistently low rate of SMI both at Member State level and of SMIs with ANS contribution at ANSP level. Between 2023 and 2024 both rates decreased further with no SMI occurrences with ANS contribution reported.

The rate of a Member State is significantly dependent on a number of factors like reporting culture, principles for determining safety impact, use of automated safety data recording system, operational environment, etc. Any comparison of a rate for one Member State with another Member State should therefore be done with caution.

2.3.3 Quality of occurences reporting

n/a

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

Use of automated safety data recording system - 2024	
For RIs	For SMIs
✗	✗

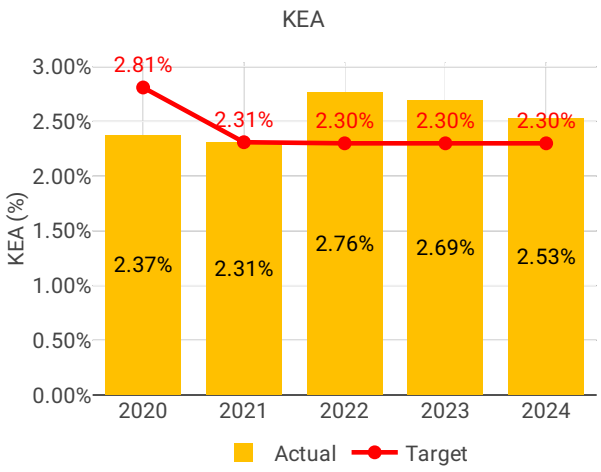
3 ENVIRONMENT - GERMANY

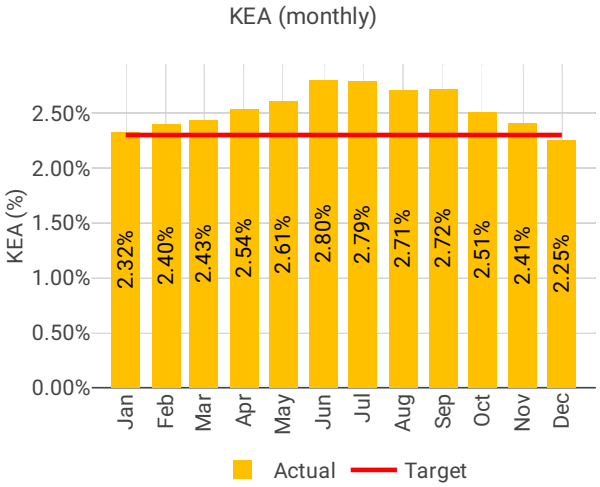
3.1 PRB monitoring

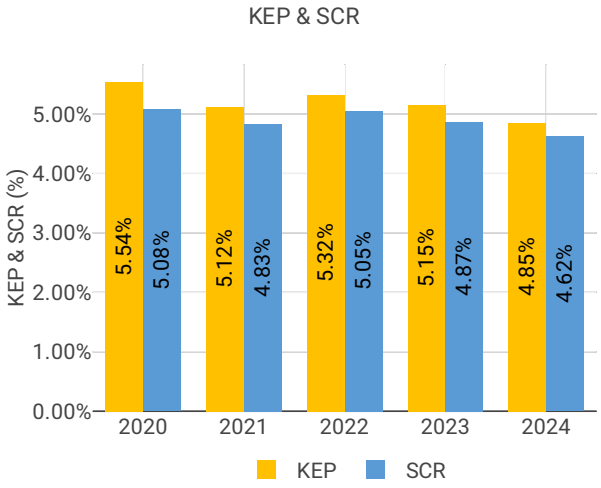
- Germany achieved a KEA performance of 2.53% compared to its target of 2.30% and did not contribute positively towards achieving the Union-wide target.
- The NSA states that the longer routes persist due to re-routings caused by the war in Ukraine and weather-related issues.
- Both KEP and SCR improved in comparison with 2023. Despite the KEA target being missed, KEA improved in 2024. Additionally, the improvement in SCR shows that Germany has enhanced the environmental efficiency of its airspace when accounting for impacts outside of its control.
- The share of CDO flights remained stable in 2024.
- Both additional taxi out time and additional time in terminal airspace remained stable in 2024 compared to 2023.

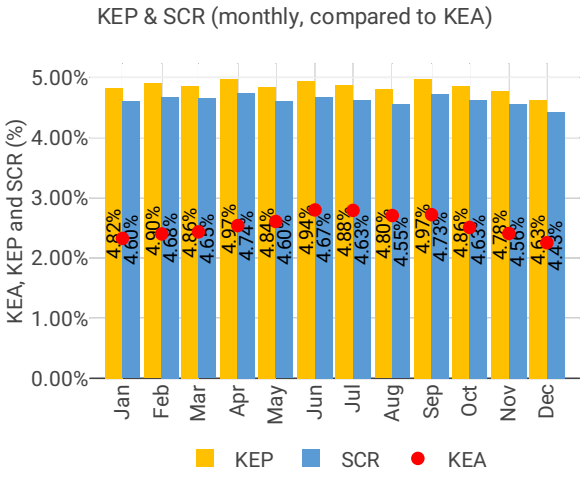
3.2 En route performance

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)



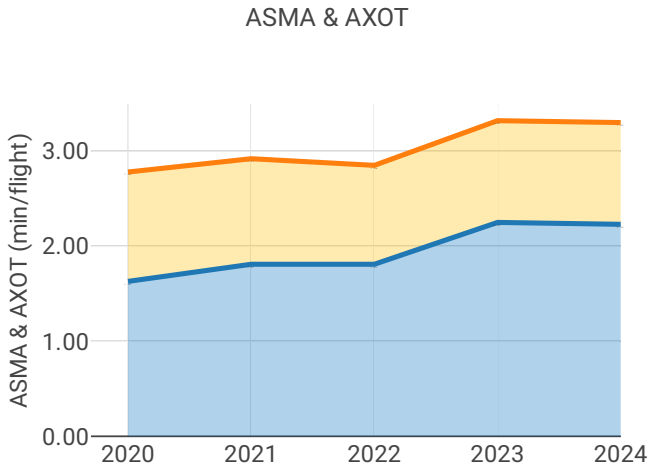


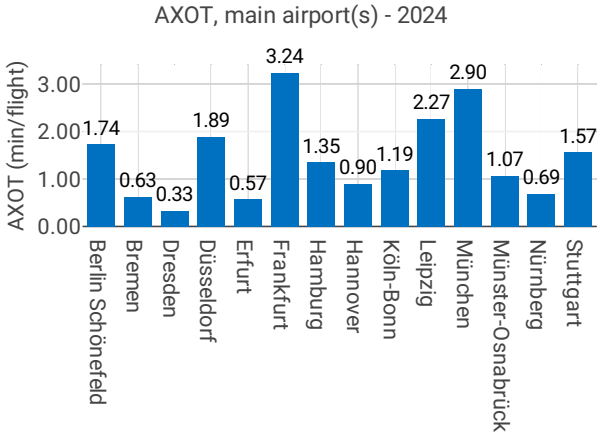


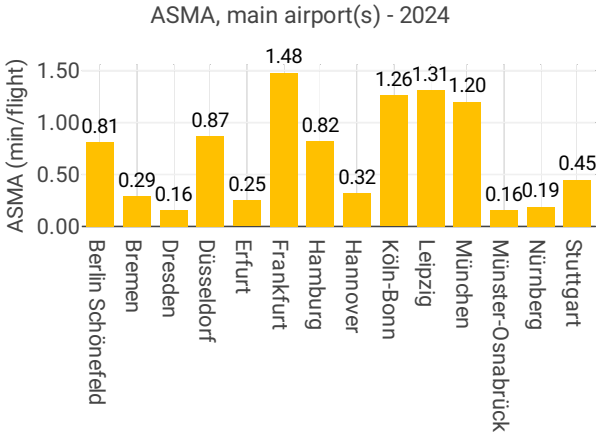


3.3 Terminal performance

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







Focus on ASMA & AXOT

AXOT

Globally, the additional taxi-out times at German airports in 2024 remained consistent with 2023 levels. While each airport showed varying trends without significant changes, slight improvements were observed in Cologne (EDDK) and Dusseldorf (EDDL), while Berlin (EDDB) experienced a modest increase. Frankfurt exceeded the SES average for additional taxi-out time in 2024: 2.91 minutes per departure.

According to the German monitoring report: *The development of improved Airport-CDM in cooperation with the airports continues. The NSA is monitoring the KPA Environment by regularly checking the current performance by using the existing dashboards.*

The German monitoring report takes the values from the SES DB:

(https://www.eurocontrol.int/prudata/dashboard/vis/2024/) and in line with the PRU ansperformance DB (old Methodology).

ASMA

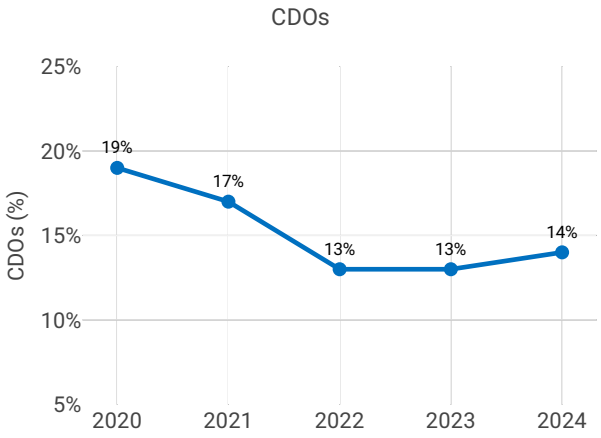
Like for the taxi-out, additional ASMA times at German airports in 2024 remained similar to 2023 levels, with slight improvements in Cologne (EDDK) and Dusseldorf (EDDL) and small deterioration in Berlin (EDDB).

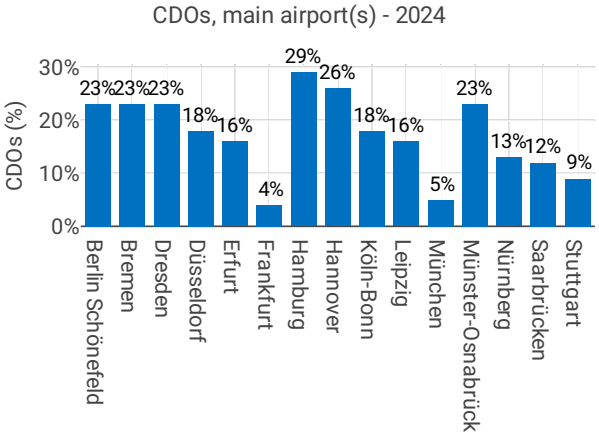
According to German monitoring report: *DFS is constantly optimising its approach system in order to improve capacity (open STARS) and to reduce detours (adjustments in IAPs during PBN transition). The NSA is monitoring the KPA Environment by regularly checking the current performance by using the existing dashboards.*

The German monitoring report takes the values from the SES DB:

(https://www.eurocontrol.int/prudata/dashboard/vis/2024/) and in line with the PRU ansperformance DB (old Methodology).

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





Focus CDOs

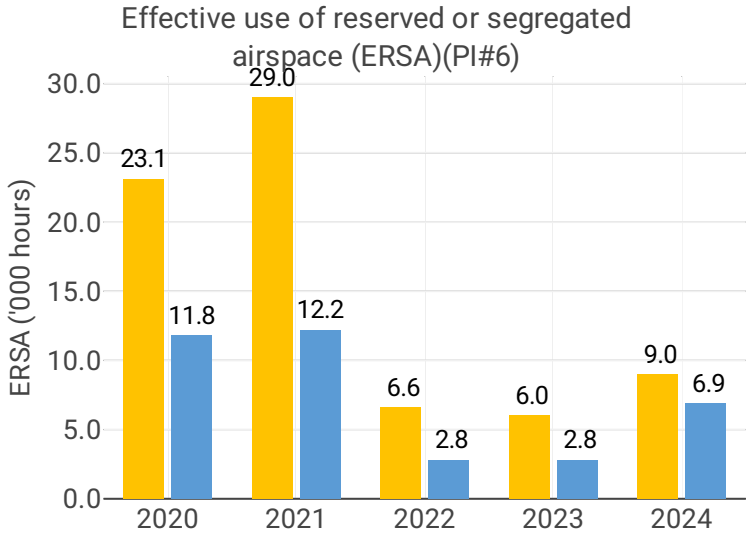
All German airports had shares of CDO flights below the RP3 overall value in 2024 (29.3%). Hamburg (EDDH) saw the highest improvement in the share of CDOs from 24.2% to 28.5%. Overall, the share of CDO increased from 12.0% to 12.9% in 2024. The two airports with the highest traffic numbers, Frankfurt (EDDF) and Munich (EDDM), still have a very low share of CDO flights.

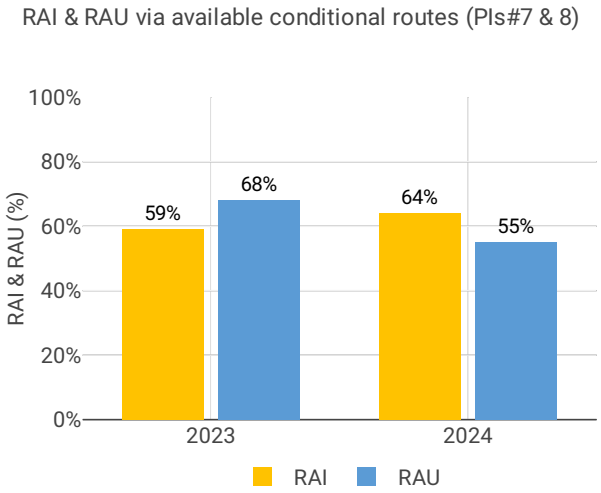
According to the German monitoring report: *No additional procedures are currently planned or being considered. Continuous Descent Operations (CDO) are applied within the framework of published procedures whenever traffic conditions allow. The NSA is monitoring the KPA Environment by regularly checking the current performance by using the existing dashboards. Source of the above shown values is unknown*.

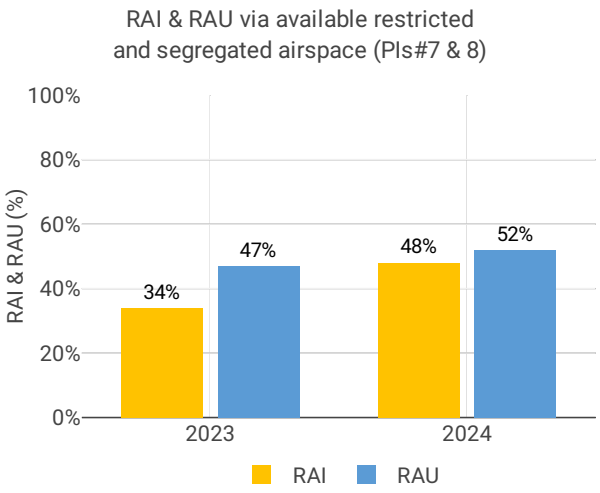
The SES Dashboard shows the following values for 2024: EDDB 0,18; EDDC 0,22; EDDE 0,14; EDDG 0,20; EDDH 0,23; EDDK 0,19; EDDL 0,17; EDDM 0,04; EDDP 0,13; EDDV 0,23; EDDW 0,21

Airport level															
	Additional taxi-out time (PI#3)					Additional ASMA time (PI#4)					Share of arrivals applying CDO (PI#5)				
Airport	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
Berlin Schönefeld	1.29	1.90	1.58	1.91	1.74	0.40	0.93	0.59	0.74	0.81	29%	23%	21%	22%	23%
Berlin-Tegel	0.94	NA	NA	NA	NA	0.72	NA	NA	NA	NA	26%				
Bremen	0.60	0.65	0.69	0.56	0.63	0.51	0.26	0.29	0.33	0.29	25%	16%	23%	24%	23%
Köln-Bonn	1.36	1.34	1.22	1.39	1.19	0.88	1.27	1.30	1.36	1.26	29%	25%	18%	18%	18%
Dresden	0.46	0.46	0.76	0.39	0.33	0.40	0.19	0.15	0.15	0.16	24%	22%	21%	21%	23%
Düsseldorf	1.37	1.33	1.63	1.92	1.89	1.25	0.59	0.91	0.96	0.87	27%	24%	19%	16%	18%
Erfurt	0.41	0.48	0.59	0.63	0.57	0.17	0.26	0.69	0.43	0.25	20%	22%	14%	17%	16%
Frankfurt	1.90	1.34	1.81	3.10	3.24	1.73	1.51	1.65	1.50	1.48	8%	7%	5%	4%	4%
Hamburg	0.91	1.12	1.37	1.30	1.35	0.60	0.45	0.55	0.84	0.82	33%	26%	27%	24%	29%
Hannover	1.03	0.73	1.01	1.04	0.90	0.65	0.13	0.24	0.33	0.32	33%	32%	27%	26%	26%
Leipzig	2.01	3.68	2.40	2.59	2.27	2.07	1.91	1.61	1.16	1.31	18%	15%	12%	14%	16%
Münster-Osnabrück	1.02	1.19	1.09	1.06	1.07	0.53	0.28	0.39	0.32	0.16	17%	19%	23%	24%	23%
München	2.48	3.12	2.70	2.94	2.90	1.12	1.20	0.92	1.17	1.20	11%	10%	5%	5%	5%
Nürnberg	0.63	0.92	1.35	0.84	0.69	0.43	0.32	0.33	0.22	0.19	21%	19%	14%	14%	13%
Saarbrücken	2.43	2.72	2.15	2.01	NA	0.61	0.46	0.43	0.38	NA	14%	11%	12%	12%	12%
Stuttgart	1.85	1.87	1.91	1.66	1.57	0.56	0.32	0.51	0.46	0.45	16%	16%	10%	9%	9%

3.4 Civil-Military dimension







Focus on Civil-Military dimension

Update on Military dimension of the plan

For obvious flight safety reasons, military activities must be segregated from civil flows which has an impact on both horizontal (HFE) and vertical flight efficiency (VFE). Because ASM manageable areas form an integral part of the nominal system, military airspace reservations shall be considered as part of the performance baseline rather than a key factor degrading environmental KPIs.

As a result of implementation of the FUA concept the impact of military activities using Restricted Airspace -RSA on civil performance is highly minored when associated with an efficient ASM process:

- At strategic level (HLAPB) by designing areas in accordance with A-FUA concept (MVPA/VGA structures), especially for congested airspaces.
- At pre-tactical level (AMC), by managing these areas in a dynamic way, with an associated level 2 CDM process, validated by HLAPB.

- At tactical level (ACC/Regional Military Control Centre) by activating/deactivating areas as close as possible to actual use and allowing crossing or direct routes when possible (in accordance with TRA status), with an associated level 3 CDM process validated by HLAPB.
- At each level, HLAPB, AMC or ACC/Regional Military Control Centre, a key factor of efficiency is a trust-driven civil-military cooperation. As a counterpart, AOs and CFSPs must be reactive and take efficiently into account available or released airspaces. At last, ANSP have also to adapt the route network to create more DCTs within military areas.

Finally, local circumstances (e.g. constrained airspace, proximity of international hubs, etc….) as well as a large number of military missions that differ from one State to another must be taken into account. Therefore, airspace needs (e.g. airspace requirements for the 5th generation fighters) and related ASM procedures of the States differ and standardized objectives cannot be defined.

Military - related measures implemented or planned to improve capacity

FABEC States are working on mid-term improvements regarding implementation of ASM level 1, 2, and 3 procedures. Some local initiatives regarding ASM/ATFCM convergence, like the traffic Light Scheme concept in France are promoted at FABEC level, as well as at ECAC level in the EUROCONTROL OEP framework.

Another major improvement is the interconnection of the existing ASM tools (e.g. LARA, STANLY_ACOS) at FABEC Level, to enhance regional coordination among FABEC AMCs as well as with the NM.

Initiatives implemented or planned to improve PI#6

n/a

Initiatives implemented or planned to improve PI#7

n/a

Initiatives implemented or planned to improve PI#8

n/a

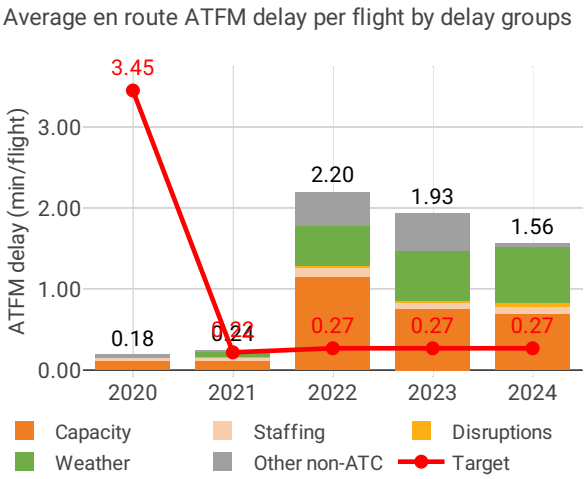
4 CAPACITY - GERMANY

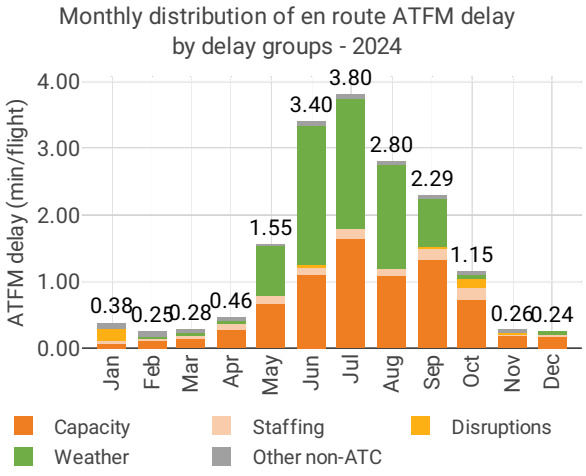
4.1 PRB monitoring

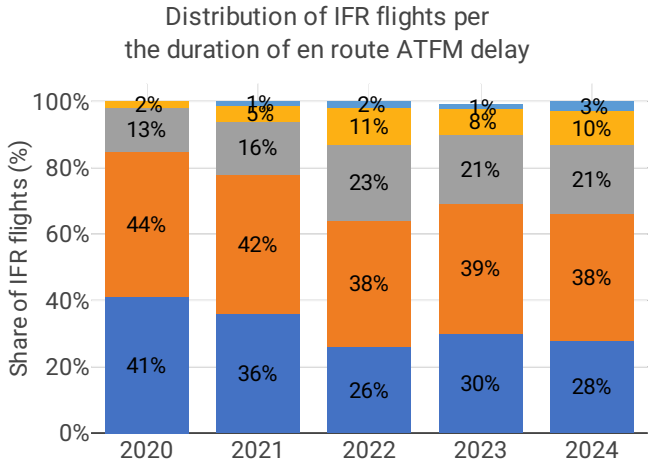
- Germany registered 1.41 minutes of average en route ATFM delay per flight during 2024, which has been adjusted to 1.56 during the post-ops adjustment process, thus not achieving the local target value of 0.27. Delays in Germany decreased by 0.35 minutes per flight year-on-year.
- Delays were highest between May and September, mostly driven by ATC Capacity issues and adverse weather conditions.
- The share of delayed flights with delays longer than 15 minutes in Germany increased by 3 percentage points compared to 2023 and was higher than 2019 values.
- The average number of IFR movements was 10% below 2019 levels in Germany in 2024.
- The number of ATCOs in OPS is 205, being below the 2024 plan in Bremen by 63 FTEs. The number of ATCOs in OPS is 372, being below the 2024 plan in Langen by 75 FTEs. The number of ATCOs in OPS is 416, being below the 2024 plan in Karlsruhe by 69 FTEs. The number of ATCOs in OPS is 228, being below the 2024 plan in Munich by 58 FTEs.
- The yearly total of sector opening hours in Munich ACC was 100,442, showing a 2.9% decrease compared to 2023. Sector opening hours are 3.4% above 2019 levels. The yearly total of sector opening hours in Bremen ACC was 82,760, showing a 0.3% decrease compared to 2023. Sector opening hours are 20.3% below 2019 levels. The yearly total of sector opening hours in Langen ACC was 120,451, showing a 1.4% decrease compared to 2023. Sector opening hours are 9.0% below 2019 levels. The yearly total of sector opening hours in Karlsruhe ACC was 141,204, showing a 0.2% decrease compared to 2023. Sector opening hours are 2.5% below 2019 levels.
- Karlsruhe ACC registered 13.11 IFR movements per one sector opening hour in 2024, being 3.7% above 2019 levels. Bremen ACC registered 6.09 IFR movements per one sector opening hour in 2024, being 3.8% below 2019 levels. Langen ACC registered 9.28 IFR movements per one sector opening hour in 2024, being 8.1% below 2019 levels. Munich ACC registered 9.79 IFR movements per one sector opening hour in 2024, being 20.8% below 2019 levels.
- Despite the significant improvement in 2024 compared to 2023, Germany still has a capacity gap. Germany should further expedite the re-cruitment and training of controllers. Actual 2025 values up to August show a further im-provement.
- Germany registered an average airport arrival ATFM delay of 0.46 minutes per flight in 2024, thus not achieving the local target of 0.45 minutes.
- Compared to 2023, average arrival ATFM delays in Germany were 15% lower in 2024, while the number of IFR arrivals increased by 4%.
- The main drivers of delays were weather, accounting for 73% of total delays, and other, non-ATC related causes, responsible for 22%.

4.2 En route performance

4.2.1 En route ATFM delay (KPI#1)







Focus on en route ATFM delay

Summary of capacity performance

Germany experienced an increase in traffic from 2 928k flights with 5.2 million minutes of en route ATFM delay in 2023, to 3 052k flights in 2024 with a lower level of en route ATFM delay - 4.5 million minutes- handled by DFS & EUROCONTROL MUAC.

The total of en route ATFM delays includes 399k minutes of en route ATFM delay that were re-attributed to DFS according to the eNM/S24 measures, but which originated elsewhere. The eNM/S24 measures were developed to mitigate the capacity shortfall in Karlsruhe UAC by re-routing traffic to adjacent ANSPs.

NSA's assessment of capacity performance

The GER 2024 en route capacity target of 0,27 min/flight was not met. The actual value for 2024 was 1,57 min/flight which is 1,30 min/flight above the target. It should however be emphasized, that despite more traffic in 2024 compared to 2023, there is an improvement of en route delay in comparison to the value of the previous year.

As stated in the national PP, the targets remain challenging/unachievable for DFS. The traffic increase during summer 2024 combined with a significantly higher airspace complexity, emphasised by increased military activities linked with the war in the Ukraine and staff shortages especially in Karlsruhe UAC Sector family South, were contributing factors for the achieved performance level.

In addition, there were some events or framework conditions that led to further bottlenecks such as iCAS system implementation in Munich (the implementation did not proceed as planned and this led to further capacity reduction in 2024) and as ever, high traffic volatility and poor predictability (intensive work is being done with all system partners and with NM to improve flight plan adherence).

To address the challenges at staff level, DFS training for new ATCOs has been at a maximum level in 2024 for EDUU, EDWW and EDMM.

Monitoring process for capacity performance

Data received from DFS was checked, consolidated and in terms of unclarities further information was requested. Besides this there is a well established monitoring process during the past years where the NSA requested regularly information on the Capacity performance, remedial actions and their progress as well as on outlooks.

MUAC reports its en-route capacity performance to the states through the MUAC Finance and Performance committee. The performance data is also monitored on a monthly basis through the AFG/PMG (ANSP FABEC Group / Performance Management Group) capacity report. This report is based on MUAC data and available PRU data, which is consolidated and analysed and the results compared to the reference and indicative values.

Value shown above for 2024 is in line with the SES Dashboard

(https://www.eurocontrol.int/prudata/dashboard/vis/2024/). It has to be considered that the ansperformance Dashboard (https://ansperformance.eu/data/) shows a value of 1,46 for 2024 1,79 for 2023 and 2,04 for 2022.

Capacity planning

As stated in the national PP, the targets remain challenging/unachievable for DFS. The traffic increase during summer 2024 combined with a significantly higher airspace complexity, emphasised by increased military activities linked with the war in the Ukraine and staff shortages especially in Karlsruhe UAC Sector family South, were contributing factors for the achieved performance level.

In addition, there were some events or framework conditions that led to further bottlenecks such as iCAS system implementation in Munich (the implementation did not proceed as planned and this led to further capacity reduction in 2024) and as ever, high traffic volatility and poor predictability (intensive work is being done with all system partners and with NM to improve flight plan adherence).

To meet the challenges DFS training for new ATCOs has been on maximum level in 2024 for EDUU [Karlsruhe UAC], EDWW [Bremen ACC] and EDMM [Munich ACC].

MUAC sector capacities are regularly reviewed and updated if technological or other developments allow to do so, leading to increased sector productivity. Staff planning is performed using STATFOR forecasts for traffic growth and taking into account an extrapolated increase

of sector productivity for the planning horizon. MUAC has not experienced any structural staffing issues during 2024.

Application of Corrective Measures for Capacity (if applicable)

Traffic increase during summer 2024; significantly higher airspace complexity with increased military activities; iCAS system implementation in Munich (the implementation did not proceed as planned and this led to further capacity reduction in 2024); high traffic volatility and poor predictability.

As the given reasons for the capacity situation are various, the NSA was and will still be in regular contact with the ANSPs to evaluate the situation in the course of the year, the outcome of the previous years remedial actions and the implementation of further remedial actions.

Remedial measures include:

- Cooperation with NM - eNM24 - Network Measures Summer 2024 - RAD package to relieve Karlsruhe UAC. (This initiative will also be continued in 2025) - implemented;
- More extensive use of extra shifts - the labour agreement provides flexibility to make more extensive use of incentivised extra ATCO shifts, as needed - labour agreement implemented since 2018;
- ATCO training capacity - DFS training for new ATCOs has been at maximum level in 2024 for Bremen ACC, Munich ACC and Karlsruhe UAC, and will be further increased from 2026;
- Flight plan adherence - Due to the poor predictability, traffic flow measures are sometimes carried out below the standard capacity values in order to avoid congestion situations. this results in wasted capacity. Intensive work is being done with all system partners and with NM to improve flight plan adherence - ongoing;
- Airspace - continuous development and implementation of airspace redesign and adaptation of procedures - continuous;
- Weather management - Support of network weather procedures and implementationof additional local weather related activities - ongoing;
- Complexity tools - Operational use of the Complexity Tool 'AirMagic' and iFMP (new releases; 4 releases have been implemented) - implemented and further development planned.

Additional Information Related to Russia's War of Aggression Against Ukraine

There was an concentration of traffic due to the war in Ukraine on the European south-east axis. This exacerbated the capacity bottlenecks. Furthermore, there are increased airspace requirements from the military, which led to higher airspace complexity.

The shift of traffic patterns (especially for the Hannover sectors) as a result of the continuing Russian war against Ukraine continued in 2024. At this time, MUAC is not experiencing structural staffing or capacity issues in the Hannover sectors as a result of this shift. However, it should be noted that any traffic increase also takes places according to these shifted patterns, which on-load mainly the Ruhr/Muenster/Solling sectors, potentially creating a bottleneck.

Since 2023, the implementation of military corridors has been suspended. Unlike in 2022, no delays were therefore generated in 2024 in connection with the corridors. The concentration of traffic on the south/east axis and thereby in the saturated family south of Karlsruhe UAC can at the time of submission of this monitoring report not be quantified. Minor delays occurred in the Hannover sectors over 2024, but this cannot be exclusively attributed to Russia's war of agression against Ukraine.

War in Ukraine with increased military traffic still leads to significantly higher airspace complexity. These extraordinary circumstances led to a significant increase in workload in numerous sector families, which had the effect of reducing capacity for civil traffic. The military traffic volume remains above average (+11% compared to 2019). DFS is in cooperation with the German Armed Forces to minimise the military impact on civil aviation.

Unpredictability about the continuation of the situation leads to the necessity for higher planning margins for especially the DECO sectors of MUAC, in case traffic patterns shift back due to changes in the geo-political situation or (partial) relief of sanctions against Russia.

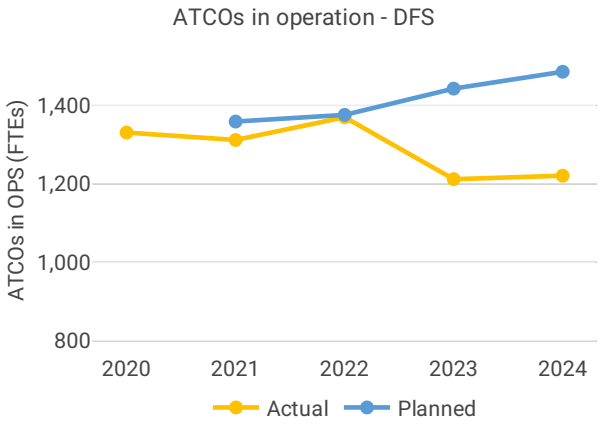
En route Capacity Incentive Scheme

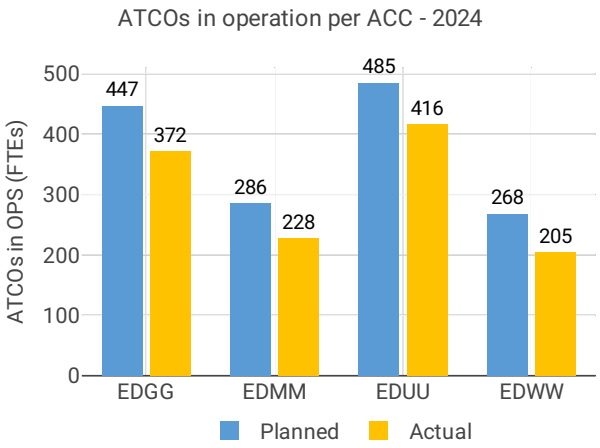
DFS: The incentive scheme is based only on delays attributed to C,R,S,T,M & P delay codes. The DFS target was set at 0.162 minutes per flight and the actual performance is reported as 0.87 minutes per flight (CRSTMP only). This results in a reported malus of €4 235 376. Note: The National monitoring report states that the PRU dashboard was used to verify actual delay calculations. The PRU dashboard does not verify the consistency of delay codes and the PRC/PRU have frequently raised issues about the lack of transparency in attribution of delay codes.

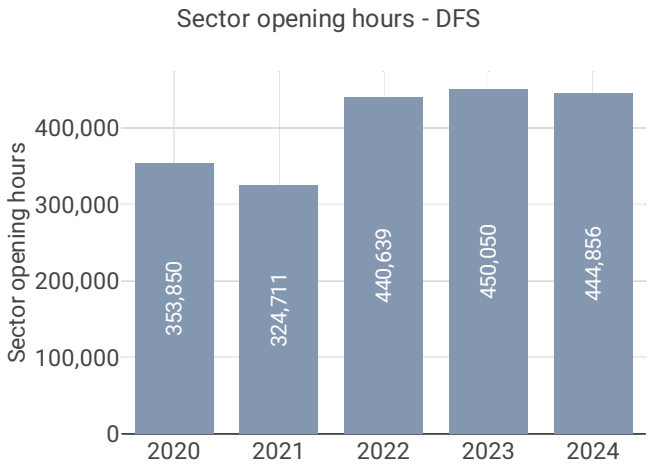
MUAC: The incentive scheme is based only on delays attributed to C,R,S,T,M & P delay codes. The MUAC target was set at 0.092 minutes per flight and the actual performance is reported as 0.11 minutes per flight (CRSTMP only). This falls within the deadband resulting in neither bonus nor malus.

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





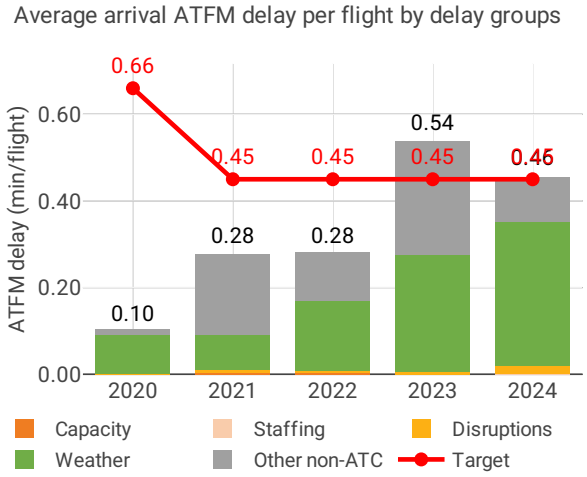


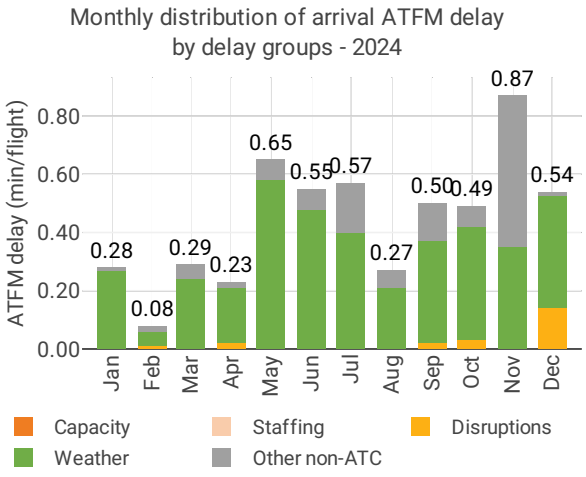
Focus on ATCOs in operations

n/a

4.3 Terminal performance

4.3.1 Arrival ATFM delay (KPI#2)





Focus on arrival ATFM delay

Germany identifies a total of 15 airports as subject to RP3 monitoring (Flight Operation at Berlin-Tegel were suspended on 08/11/2020 and the airport was finally decommissioned on 05/05/2021.). However, in accordance with IR (EU) 2019/317 and the traffic figures, only 7 of those airports must be monitored for pre-departure delays. The Airport Operator Data Flow, necessary for the monitoring of these pre-departure delays, is established for the 7 airports required. Nevertheless, the quality of the reporting does not allow for the calculation of the ATC pre-departure delay at Cologne (EDDK) , with more than 60% of the reported delay not allocated to any cause.

In 2024, traffic at the ensemble of German airports under monitoring was still 22% lower with respect to 2019, and 4% higher than in 2023. The traffic recovery at Stuttgart (EDDS), Dusseldorf (EDDL) and Munich (EDDM) is worse than at most European airports, with traffic still at 65 to 78% of 2019 levels.

Average arrival ATFM delays in 2023 was 0.46 min/arr, compared to 0.54 min/arr in 2022. The national target (0.45 min/arr) was not met.

ATFM slot adherence has slightly deteriorated but remains high (2023: 97.1%; 2024: 97.6%).

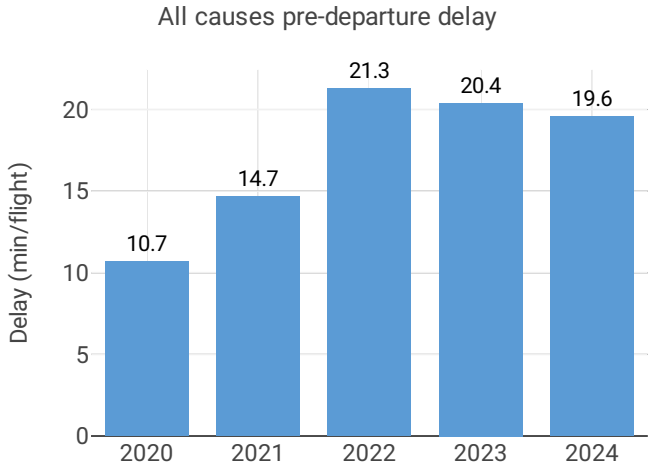
Average arrival ATFM delays in 2023 at German airports was 0.46 min/arr. The most important delays were observed at Frankfurt (EDDF: 2019: 0.69 min/arr.; 2020: 0.19 min/arr.; 2021: 0.19 min/arr.; 2022: 0.38 min/arr.; 2023: 1.33 min/arr.; 2024: 1.15 min/arr.). 73% of the delays at these airports were attributed to weather, followed by 16% attributed to Aerodrome Capacity.

According to the German monitoring report: *Values shown above for 2024 are in line with the SES Dashboard (https://www.eurocontrol.int/prudata/dashboard/vis/2024/) as well as with the PRUs an performance DB (https://ansperformance.eu/data/). Adverse weather conditions during summer (CB/TS) and winter (FG, FZFG, FZRN and SN), failure of network connections with temp. ATM data loss, frequency issues + temp. radar problems at EDDF and ILS-outage at EDDP caused most of the delay during the year. The largest delay-causing factor by far was adverse weather. Anyways, the deviation from the actual value to the target value is very minor and the performance has improved significantly in 2024.*

The NSA recommends to improve the handling of weather delays, which, as shown below, is already in progress.

The German performance plan sets a national target on arrival ATFM delay for 2024 of 0.45 min/arr. This target was not met, with an actual performance of 0.46 min/arr. The incentive scheme uses modulated pivot values limited to CRSTMP delay causes. According to the German monitoring report, this pivot value for CRSTMP is 0.026 min/arr in 2024 and based on the attribution of the regulation reason, the actual CRSTMP value for 2023 was 0.022 min/arr. This actual value falls within the dead band for the incentive scheme, so no bonus nor penalty applies.

4.3.2 Other terminal performance indicators (PI#1-3)



Airport level										
	Avg arrival ATFM delay (KPI#2)					Slot adherence (PI#1)				
Airport name	**2020**	**2021**	**2022**	**2023**	**2024**	**2020**	**2021**	**2022**	**2023**	**2024**
Berlin Schönefeld	NA	0.94	0.04	0.01	0.05	97.7%	98.3%	99.3%	99.4%	99.5%
Berlin-Tegel	0.05					94.2%				
Bremen	0.01	0.02	0.01	NA	NA	94.9%	92.5%	95.6%	96.6%	96.3%
Dresden	NA	0.00	0.06	0.02	NA	99.7%	98.8%	98.8%	98.8%	97.9%
Düsseldorf	0.26	0.03	0.12	0.15	0.12	95.8%	98.2%	98.0%	98.3%	98.4%
Erfurt	NA	NA	0.22	NA	NA	96.0%	97.4%	98.4%	97.1%	97.9%
Frankfurt	0.19	0.19	0.38	1.33	1.15	92.3%	96.4%	96.4%	96.3%	97.1%
Hamburg	0.03	0.01	0.05	0.04	0.04	97.5%	97.6%	97.8%	97.8%	97.6%
Hannover	NA	0.07	0.03	0.00	NA	95.9%	94.4%	94.2%	95.7%	97.6%
Köln-Bonn	0.03	0.80	1.31	1.04	0.53	97.2%	97.0%	97.8%	98.0%	98.5%
Leipzig	0.14	0.31	0.20	0.53	0.29	98.9%	96.9%	99.0%	97.6%	98.6%
München	0.08	0.13	0.22	0.29	0.38	94.3%	96.9%	97.6%	95.1%	95.6%
Münster-Osnabrück	NA	NA	NA	NA	0.00	97.1%	97.1%	96.8%	97.8%	98.4%
Nürnberg	NA	0.01	NA	0.01	0.00	97.6%	97.7%	98.2%	97.6%	98.3%
Saarbrücken	NA	0.00	NA	NA	NA	98.4%	98.7%	97.2%	97.9%	97.2%
Stuttgart	NA	0.02	0.08	0.05	0.12	98.9%	98.9%	98.9%	98.9%	98.7%

	ATC pre departure delay (PI#2)					All causes pre departure delay (PI#3)				
Airport name	**2020**	**2021**	**2022**	**2023**	**2024**	**2020**	**2021**	**2022**	**2023**	**2024**
Berlin Schönefeld	0.04	0.32	0.27	0.46	0.39	8.2	12.3	20.1	19.9	17.8
Berlin-Tegel	NA					6.7				
Bremen	0.01	0.10	0.14	0.17	0.13	3.4	4.9	11.1	11.7	10.8
Dresden	0.00	0.00	0.00	0.00	0.00	7.9	9.0	12.0	15.3	14.6
Düsseldorf	0.11	0.03	0.10	0.16	0.11	8.2	11.6	20.6	18.1	16.7
Erfurt	0.00	0.00	0.00	0.00	0.00	4.8	7.8	14.4	18.0	11.9
Frankfurt	0.28	0.14	0.18	0.33	0.11	16.5	20.4	27.9	25.8	23.2
Hamburg	0.08	0.12	0.34	0.50	0.42	7.4	10.2	19.0	20.0	18.5
Hannover	0.01	0.08	0.26	0.27	0.19	11.6	16.1	20.8	17.9	17.5
Köln-Bonn	NA	NA	NA	NA	NA	10.8	16.7	25.7	20.4	22.0
Leipzig	0.16	0.12	0.12	0.15	0.59	15.2	21.9	19.2	18.5	17.1
München	0.01	0.07	0.02	0.00	0.00	7.3	9.0	16.7	18.4	19.7
Münster-Osnabrück	0.00	NA	0.01	0.01	0.04	8.6	9.9	10.6	10.4	14.1
Nürnberg	0.03	NA	0.17	0.17	0.07	13.4	15.9	22.7	21.6	21.5
Saarbrücken	0.00	0.00	0.02	0.00	0.00	3.3	6.3	14.4	12.1	12.8
Stuttgart	0.05	0.01	0.05	0.06	0.10	6.9	9.0	13.7	14.4	15.6

Focus on performance indicators at airport level

ATFM slot adherence

All German airports showed adherence above 95% and the national average was 97.6%, an improvement with respect to 2023 (97.1%). With regard to the 2.4% of flights that did not adhere, 1.7% were early and 0.7% were late.

According to the German monitoring report: *The consistently high proportion of well over 95% of regulated flights that departed within the Slot Tolerance Window demonstrates that the established procedures and processes at the airports are excellent.*

ATC pre-departure delay

The share of unidentified delay reported by Cologne (EDDK) during the entire RP3 has been above 40% for more than 2 months in the year, preventing the calculation of this indicator.

The German monitoring report adds:

This data is not collected by DFS.

No initiatives are planned by DFS.

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 implemented at all the airports above 80 000 movements.

However, there are several quality checks before EUROCONTROL can produce the final value which is established as the average minutes of pre-departure delay (delay in the actual off block time) associated to the IATA delay code 89 (through the APDF, for each delayed flight, the reasons for that delay have to be transmitted and coded according to IATA delay codes.

However, sometimes the airport operator has no information concerning the reasons for the delay in the off block, or they cannot convert the reasons to the IATA delay codes. In those cases, the airport operator might:

- Not report any information about the reasons for the delay for that flight (unreported delay)
- Report a special code to indicate they do not have the information (code ZZZ)
- Report a special code to indicate they do not have the means to collect or translate the information (code 999)

To be able to calculate with a minimum of accuracy the PI for a given month, the minutes of delay that are not attributed to any IATA code reason should not exceed 40% of the total minutes of pre-departure delay observed at the airport. In 2024, out of those airports above 80 000 movements, only EDDK still has a very high share of unexplained delay.

Finally, to be able to produce the annual figure, at least 10 months of valid data is requested by EUROCONTROL which has been the case for EDDF, EDDB, EDDL, EDDH, EDDM, EDDS. In order to provide information for remaining German airports, data provided by the airlines through the Aircraft Operator Data Flow (AODF) published by PRU has been used by the NSA for other airports for this reporting even if it covers only about 70% of the flights, while the airport operator data flow covers all flights at the airport. In order to improve the situation EUROCONTROL contacts regularly the airports to check on the status of the reporting and provide support in the final correct implementation of the APDF. EUROCONTROL is also part of an ACI sub-group (APN) that includes several airports and informs them regularly on data provision issues.

All causes pre-departure delay

The total (all causes) delay in the actual off block time at German airports in 2024 decreased on average at the monitored airports. The highest pre-departure delays were observed at Frankfurt (EDDF: 2023: 25.75 min/dep; 2024: 23.17 min/dep) that even with the reduction compared to 2023, results in the 4th highest pre-departure delay in the SES area.

According to the German monitoring report there are no initiatives planned by DFS in this area. The German monitoring report also mentions:

All cause departure delay is very generic and ATFM delay is only a small contributor. Departure delay can be generated by ATFM en-route delay (not only local airport, but the complete Network) but also reactionary and turnaround delay, technical issues with the aircraft, airport operations, problems with passengers and or luggage, etc. In other words, it is not always possible to address a specific reason as this delay is quite generic.

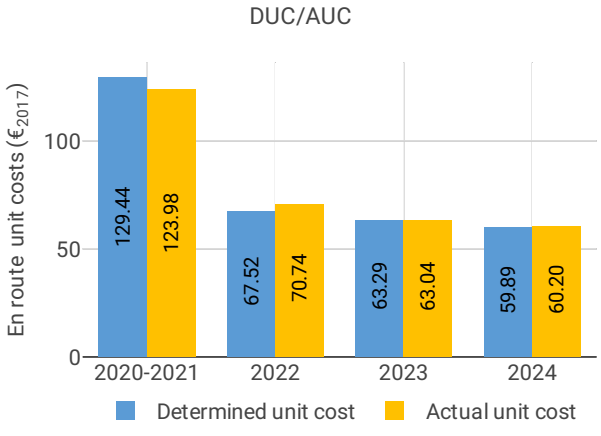
5 COST-EFFICIENCY - GERMANY

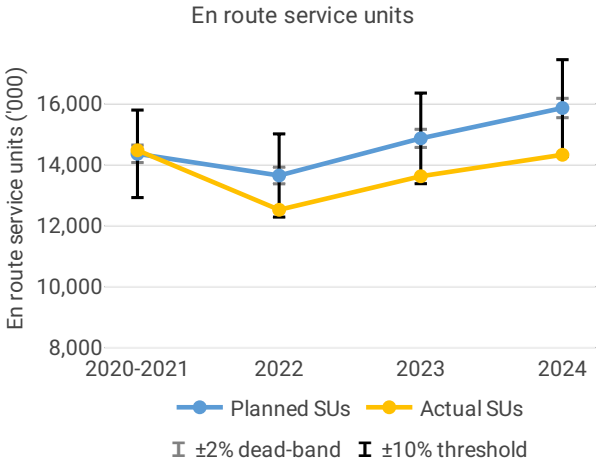
5.1 PRB monitoring

- The en route 2024 actual unit cost of Germany was 60.20€2017, +0.5% higher than the determined unit cost (59.89€2017). The terminal 2024 actual unit cost was 224.09€2017, +12% higher than the determined unit cost (199.79€2017).
- The en route 2024 actual service units (14.3M) were -9.7% lower than the determined service units (15.9M).
- The en route 2024 actual total costs were -87M€2017 (-9.2%) lower than determined. The difference is mainly driven by the staff costs of DFS (-64M€2017, or -11%). However, in nominal terms, the actual staff costs showed an increase of +15M€2017 (+2.2%). According to the NSA, this is mainly attributable to collective wage settlements and necessity to increase capacity provisions.
- DFS costs of investments were 93M€2017 in 2024 for both en route and terminal charging zones, -24% less than determined (122M€2017). According to the NSA, this reduction was a result of a significantly lower actual cost of capital (-63%), which is largely due to lower interest rates, affected by the pension scheme's interest balance and the ANSP's net interest income . The NSA stated that this gap will be considered in the unit rates for the following reference period. In addition, depreciation costs were lower than planned (-22%). The NSA attributed this difference to the decision not to implement the new iCAS system in Langen ACC.
- The en route actual unit cost incurred by users in 2024 was 75.99€ (+17% above the 2024 DUC), while the terminal actual unit cost incurred by users was 254.29€ (+17% above the 2024 DUC). The difference between the AUCU and the DUC for both charging zones is primarily attributable to the inflation adjustment and lower than planned SUs.

5.2 En route charging zone

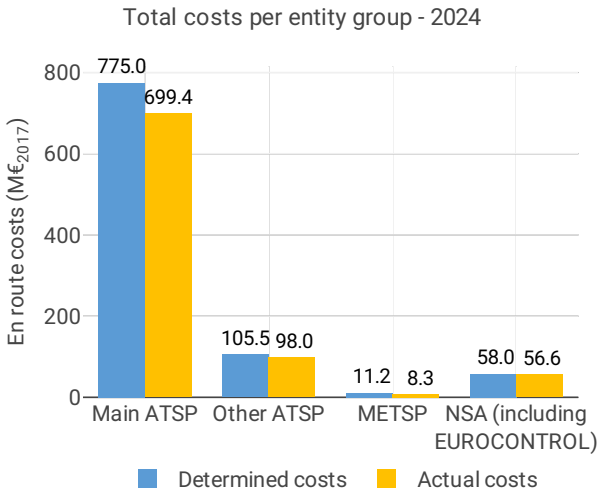
5.2.1 Unit cost (KPI#1)

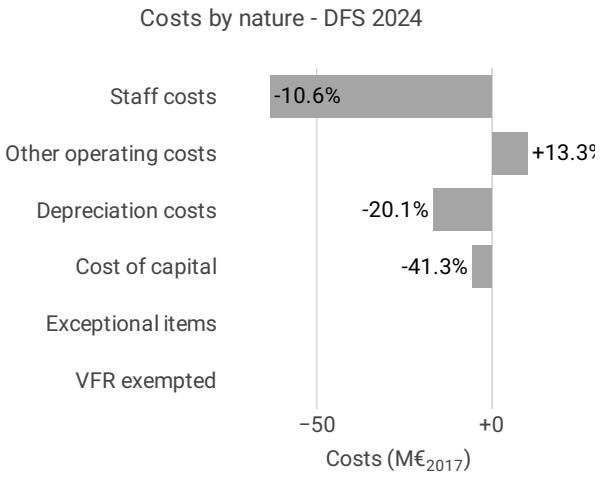




Actual and determined data				
Total costs - nominal (M€)	**2020-2021**	**2022**	**2023**	**2024**
Actual costs	1,877	1,000	1,025	1,054
Determined costs	1,935	977	1,010	1,034
Difference costs	-59	23	15	21

Inflation assumptions	**2020-2021**	**2022**	**2023**	**2024**
Determined inflation rate	NA	1.1%	1.5%	1.7%
Determined inflation index	NA	107.2	108.8	110.6
Actual inflation rate	NA	8.7%	6.0%	2.5%
Actual inflation index	NA	116.4	123.4	126.4
Difference inflation index (p.p.)	NA	+9.1	+14.5	+15.8





Focus on unit cost

AUC vs. DUC

In 2024, the en route AUC was +0.5% (or +0.31 €2017) higher than the planned DUC. This results from the combination of significantly lower than planned TSUs (-9.7%) and significantly lower than planned en route costs in real terms (-9.2%, or -87.4 M€2017). It should be noted that the actual inflation index in 2024 was +15.8 p.p. higher than planned.

En route service units

The difference between actual and planned TSUs (-9.7%) falls outside the ±2% dead-band, but does not exceed 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 (see the main ANSP loss in Box 11).

En route costs by entity

Actual real en route costs are -9.2% (-87.4 M€2017) lower than planned. This is the result of lower costs for the main ANSP, DFS (-9.8%, or -75.6 M€2017), the other ANSP (MUAC), -7.1%, or -7.5 M€2017), the MET service provider (-26.2%, or -2.9 M€2017) and the NSA/EUROCONTROL (-2.4%, or -1.4 M€2017).

En route costs for the main ANSP at charging zone level

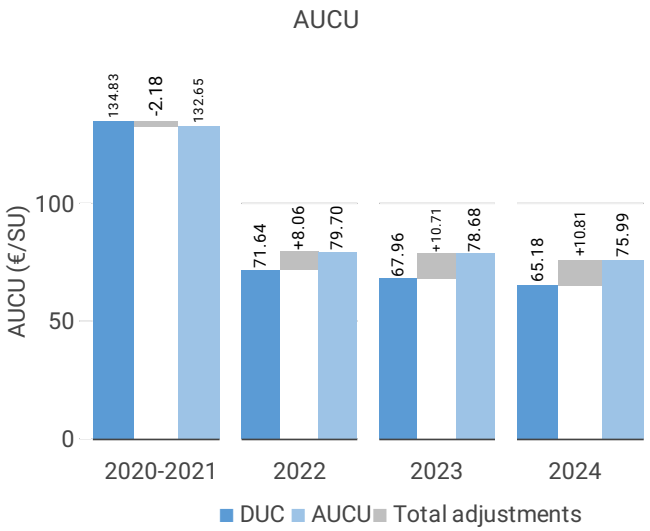
Significantly lower than planned en route costs in real terms for DFS in 2024 (-9.8%, or -75.6 M€2017) result from:

- Significantly lower staff costs (-10.6%), mainly due to inflation index impact (+15.8 p.p.) as in nominal terms staff costs are higher than planned by +2.2%, due to the 2023-2026 wage collective agreement, compensation for the inflation and extraordinary payments for additional shifts and overtime partially compensated by -122 operational FTEs than planned and lower pension costs.
- Significantly higher other operating costs (+13.3% or +29.5% in nominal terms), as a result of inflation, higher prices of gas, more external staff employed than expected and training needs,
- Significantly lower depreciation (-20.1%), due to the decision not to implement iCAS in Langen and related projects, along with some maintenance activities,
- Significantly lower cost of capital (-41.3%) mainly due to * "the coverage gap for interest on pensions, which is recalculated annually based on differences between planned and actual interest rates"*. The 2024 cost of capital exclude the income of commercial papers, which had previously been included in the actual costs of 2021 and 2022.

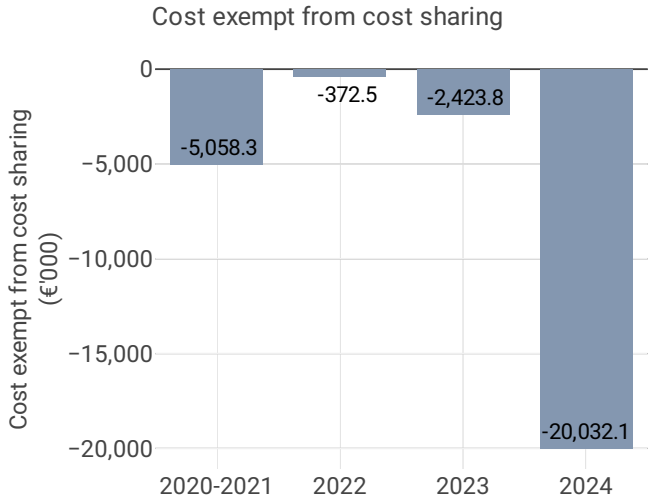
RP3 summary

When considering the whole of RP3 (2020-2024) for Germany en route charging zone, actual TSUs are -6.4% lower than planned, while actual costs in real terms are -5.8% lower than the determined costs (some -269.1 M€2017). As a result, the weighted average actual unit cost over RP3 (80.11 €2017) is +0.7% higher than planned in the PP (79.53 €2017).

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

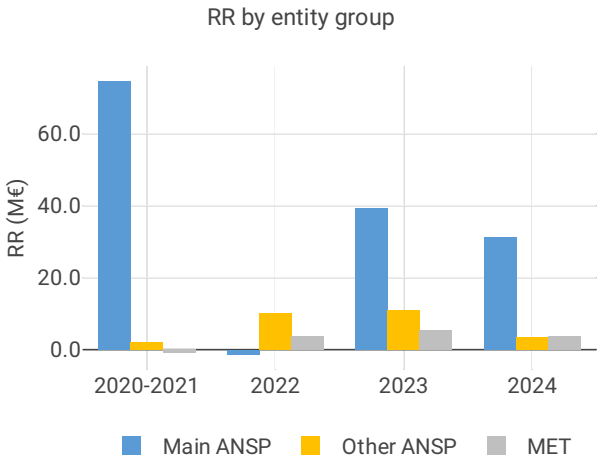


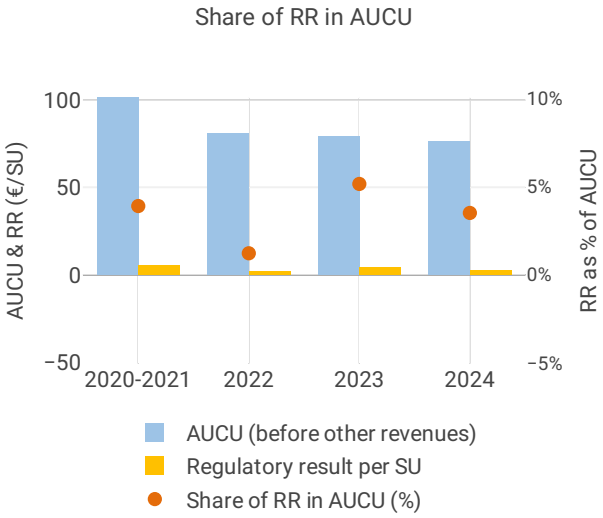
AUCU components (€/SU) – 2024	
Components of the AUCU in 2024	**€/SU**
DUC	**65.18**
Inflation adjustment	8.71
Cost exempt from cost-sharing	-1.40
Traffic risk sharing adjustment	3.61
Traffic adj. (costs not TRS)	0.47
Finantial incentives	-0.30
Modulation of charges	0.00
Cross-financing	0.00
Other revenues	-0.29
Application of lower unit rate	0.00
Total adjustments	10.81
AUCU	**75.99**
AUCU vs. DUC	**+ 16.6%**

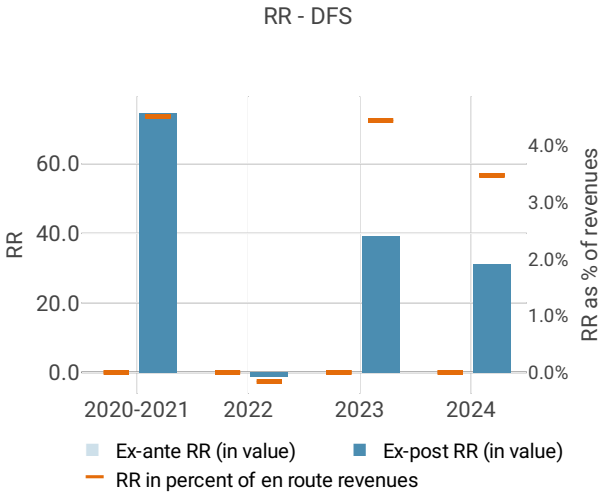


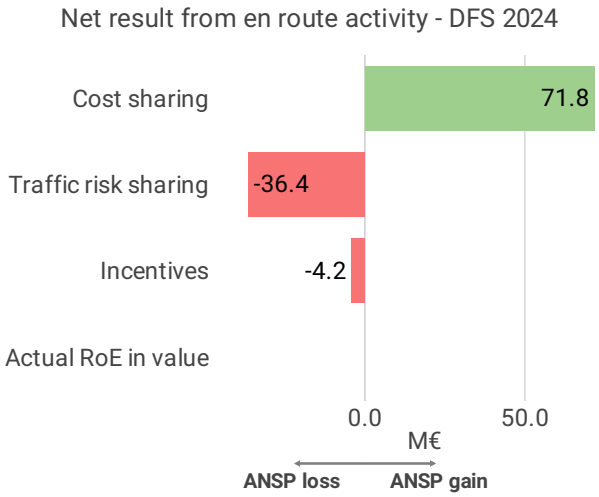
Cost exempt from cost sharing – 2024		
Cost exempt from cost sharing by item - 2024	**€'000**	**€/SU**
New and existing investments	-17,518.8	-1.22
Competent authorities and qualified entities costs	-2,171.1	-0.15
Eurocontrol costs	791.6	0.06
Pension costs	-3,149.8	-0.22
Interest on loans	0.0	0.00
Changes in law	2,016.0	0.14
Total cost exempt from cost risk sharing	**-20,032.1**	**-1.40**

5.2.3 Regulatory result (RR)









Focus on regulatory result

DFS net gain/loss on activity in the Germany en route charging zone in the year 2024

DFS reported a net gain of +31.1 M€, as a combination of a gain of +71.8 M€ arising from the cost sharing mechanism, with a loss of -36.4 M€ arising from the traffic risk sharing mechanism and a loss of -4.2 M€ relating to financial incentives.

DFS overall regulatory result (RR) for the en route activity

Ex-post, the overall RR comprises only the net gain from the en route activity mentioned above (+31.1 M€) amounts to 3.5% of the en route revenues, as the RoE for DFS has been set to zero. The resulting ex-post rate of return on equity is 2.7%.

RP3 summary

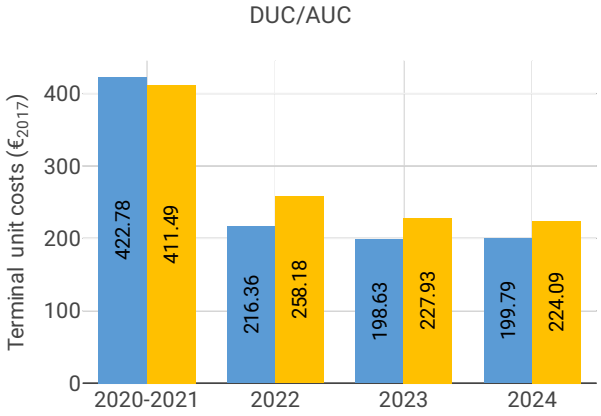
When considering the whole of RP3 (2020-2024), DFS generated a cumulative gain in respect of cost sharing of +238.6 M€, as actual total costs for RP3 were lower than planned. The traffic risk sharing mechanism generated a loss of -86.7 M€. Adding the loss of -8.4 M€ to be retained by the ATSP in respect of financial incentives leads to an overall regulatory

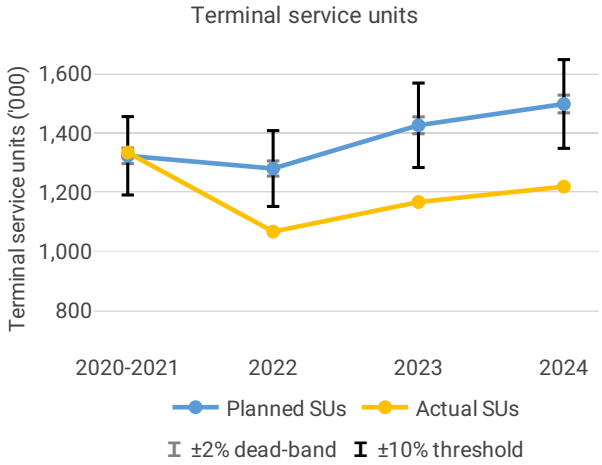
result of +143.6 M€ (the RoE for DFS has been set to zero), which corresponds to an average ex-post rate of return on equity of 3.5%.

Note 1: The proportion of financing through equity for 2021A and 2022A should be corrected to reflect the actual share, in spite of the specific composition of the asset base and the significantly higher than planned cost of capital reported to be due to *"the negative development of the commercial papers"*. For the purpose of the analysis, it has been set at the level of the 2021D and 2022D presented in the revised draft performance plan.

5.3 Terminal charging zone

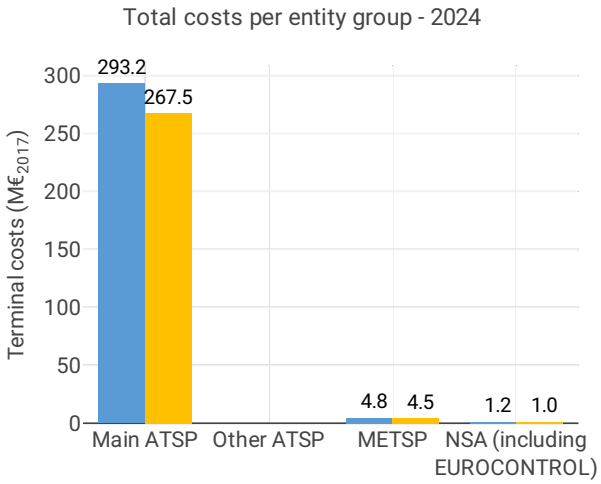
5.3.1 Unit cost (KPI#1)

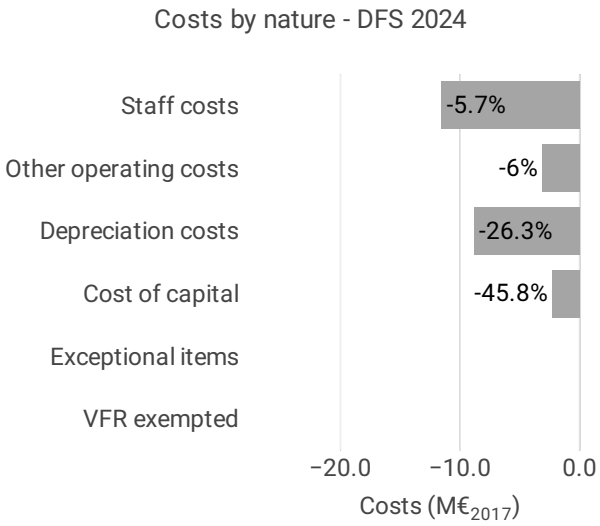




Actual and determined data				
Total costs - nominal (M€)	**2020-2021**	**2022**	**2023**	**2024**
Actual costs	576	313	321	337
Determined costs	584	294	305	327
Difference costs	-8	19	16	11

Inflation assumptions	**2020-2021**	**2022**	**2023**	**2024**
Determined inflation rate	NA	1.1%	1.5%	1.7%
Determined inflation index	NA	107.2	108.8	110.6
Actual inflation rate	NA	8.7%	6.0%	2.5%
Actual inflation index	NA	116.4	123.4	126.4
Difference inflation index (p.p.)	NA	+9.1	+14.5	+15.8





Focus on unit cost

AUC vs. DUC

In 2024, the terminal AUC was +12.2% (or +24.29 €2017) higher than the planned DUC. This results from the combination of significantly lower than planned TNSUs (-18.7%) and significantly lower than planned terminal costs in real terms (-8.8%, or -26.2 M€2017). It should be noted that the actual inflation index in 2024 was +15.8 p.p. higher than planned.

Terminal service units

The difference between actual and planned TNSUs (-18.7%) falls outside 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 (see the main ANSP loss in Box 11).

Terminal costs by entity

Actual real terminal costs are -8.8% (-26.2 M€2017) lower than planned. This is the result of lower costs for the main ANSP, DFS (-8.8%, or -25.8 M€2017), the MET service provider (-6.0%, or -0.3 M€2017) and the NSA (-15.0%, or -0.2 M€2017).

Terminal costs for the main ANSP at charging zone level

Significantly lower than planned terminal costs in real terms for DFS in 2024 (-8.8%, or -25.8 M€2017) result from:

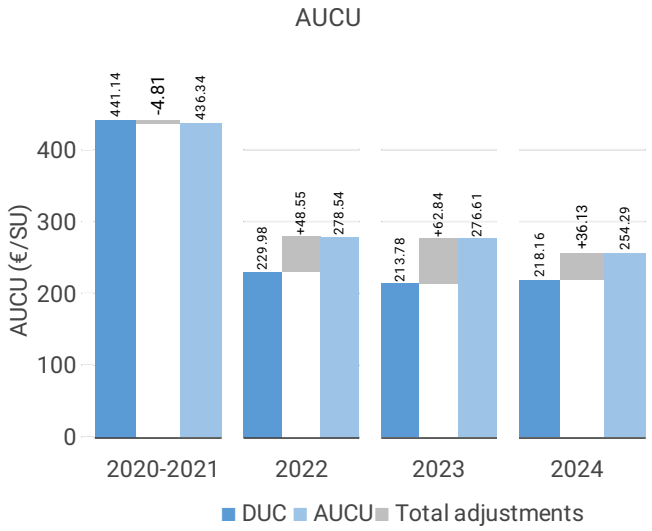
- Significantly lower staff costs (-5.7%), mainly due to inflation index impact (+15.8 p.p.) as in nominal terms staff costs are higher than planned by +7.8%, due to the 2023-2026 wage collective agreement, compensation for the inflation and extraordinary payments for additional shifts and overtime partially compensated by -46 operational FTEs than planned,
- Significantly lower other operating costs (-6.0%) mainly due to inflation index impact as in nominal terms other operating costs are higher than planned by 7.4%, as a result of inflation, higher prices of gas, more external staff employed than programmed and training needs,

- Significantly lower depreciation (-26.3%), "*mainly caused by the project Tower ATS next Generation due to an updated implementation plan". (…)"In addition, DFS has decided to no longer continue the Drone Detection System projec*t",
- Significantly lower cost of capital (-45.8%) mainly due to "*the coverage gap for interest on pensions, which is recalculated annually based on differences between planned and actual interest rates*". The 2024 cost of capital exclude the income of commercial papers.

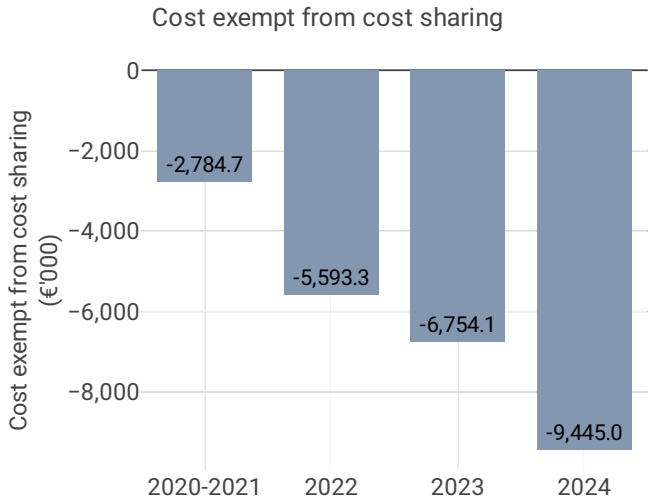
RP3 summary

When considering the whole of RP3 (2020-2024) for Germany terminal charging zone , actual TNSUs are -13.4% lower than planned, while actual costs in real terms are -3.9% lower than the determined costs (some -55.4 M€2017). As a result, the weighted average actual unit cost over RP3 (284.85 €2017) is +11.0% higher than planned in the PP (256.71 €2017).

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

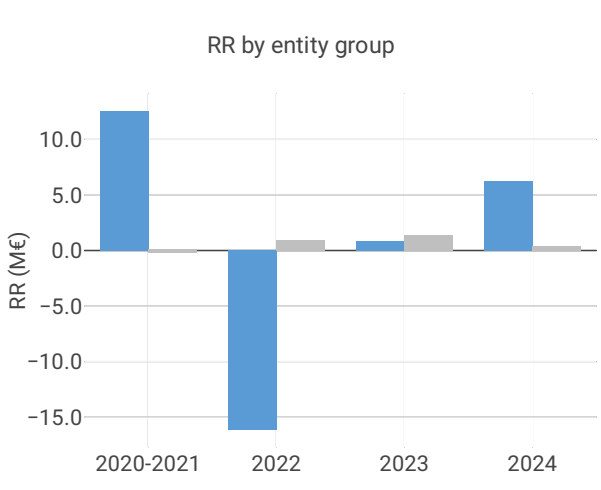


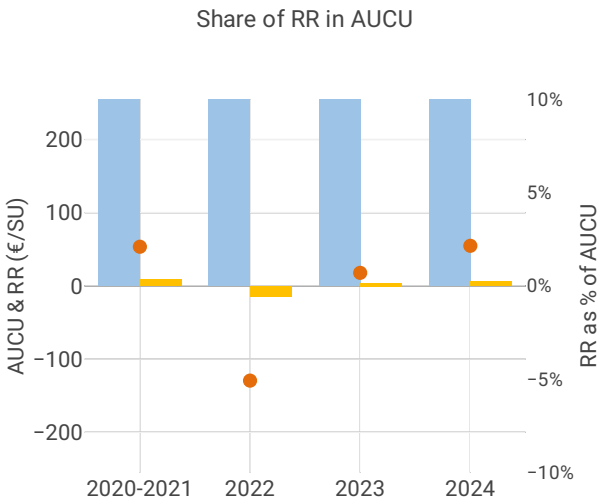
AUCU components (€/SU) – 2024	
Components of the AUCU in 2024	**€/SU**
DUC	**218.16**
Inflation adjustment	33.56
Cost exempt from cost-sharing	-7.75
Traffic risk sharing adjustment	37.47
Traffic adj. (costs not TRS)	0.99
Finantial incentives	0.00
Modulation of charges	0.00
Cross-financing	0.00
Other revenues	-0.42
Application of lower unit rate	-27.72
Total adjustments	36.13
AUCU	**254.29**
AUCU vs. DUC	**+ 16.6%**

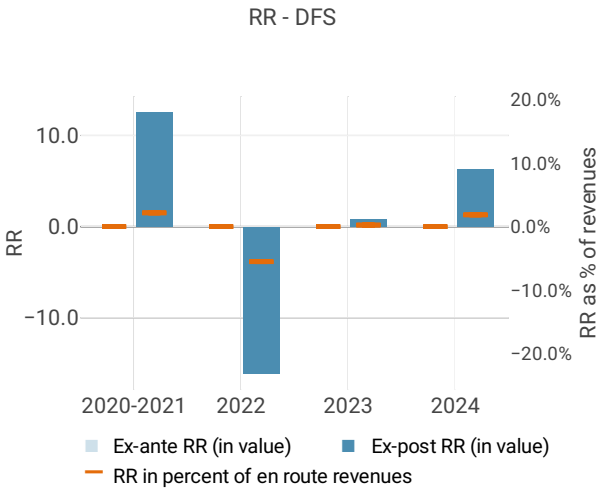


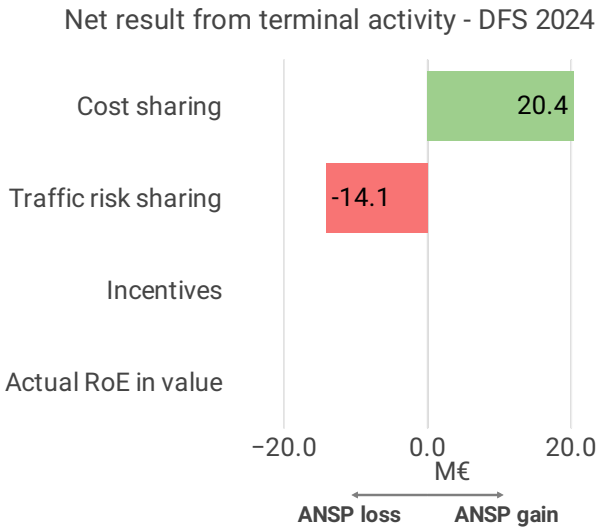
Cost exempt from cost sharing – 2024		
Cost exempt from cost sharing by item - 2024	**€'000**	**€/SU**
New and existing investments	-8,831.1	-7.25
Competent authorities and qualified entities costs	-184.6	-0.15
Eurocontrol costs	0.0	0.00
Pension costs	-1,192.6	-0.98
Interest on loans	0.0	0.00
Changes in law	763.3	0.63
Total cost exempt from cost risk sharing	**-9,445.0**	**-7.75**

5.3.3 Regulatory result (RR)









Focus on regulatory result

DFS net gain/loss on activity in the Germany terminal charging zone in the year 2024

DFS reported a net gain of +6.3 M€, as a combination of a gain of +20.4 M€ arising from the cost sharing mechanism, with a loss of -14.1 M€ arising from the traffic risk sharing mechanism.

DFS overall regulatory result (RR) for the terminal activity

Ex-post, the overall RR comprises only the net gain from the terminal activity mentioned above (+6.3 M€) and amounts to 1.9% of the terminal revenues, as the RoE for DFS has been set to zero. The resulting ex-post rate of return on equity is 1.4%. See also Note 3 in Box 10 above.

RP3 summary

When considering the whole of RP3 (2020-2024), DFS generated a cumulative gain in respect of cost sharing of +35.7 M€, as actual total costs for RP3 were lower than planned. The traffic risk sharing mechanism generated a loss of -35.1 M€. Adding the gain of +3.0 M€ to be retained by the ATSP in respect of financial incentives leads to an overall regulatory result of +3.5 M€ (the RoE for DFS has been set to zero), which corresponds to an average ex-post rate of return on equity of 0.3%. See also Note 3 in Box 10 above.

Note 2: The proportion of financing through equity for 2021A and 2022A should be corrected to reflect the actual share, in spite of the specific composition of the asset base and the significantly higher than planned cost of capital reported to be due to "*the negative development of the commercial papers*". For the purpose of the analysis, it has been set at the level of the 2021D and 2022D presented in the revised draft performance plan.

Note 3: Ex-post RR does not take into account the application of lower unit rates as per Art. 29.6 (loss in revenues for DFS corresponds to -2.8 M€ for 2020-2021 and -33.8 M€ for 2024).