

PRB advice on the detailed examination of the performance targets in the revised draft performance plan of Belgium-Luxembourg (en route cost-efficiency targets)

ANNEX - Detailed analysis (ranges)

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TABLE OF CONTENTS

INTRODUCTION	4
1 MEASURES INVOKED BY BELGIUM AND LUXEMBOURG IN ORDER TO JUSTIFY THE OBSERVED DEVIATIONS FROM UNION-WIDE COST-EFFICIENCY TRENDS ON THE GROUNDS OF ADDITIONAL COSTS FOR THE ACHIEVEMENT OF CAPACITY TARGETS	5
1.1 <i>Information requests sent to Belgium for the detailed examination</i>	5
1.2 <i>Overview of the seven measures</i>	6
1.3 <i>Analysis of the measures presented by Belgium</i>	6
1.4 <i>Conclusions</i>	14
2 COMPLEXITY OF THE PROVISION OF AIR NAVIGATION SERVICES IN THE CHARGING ZONE, AND ITS EVOLUTION OVER TIME	16
2.1 <i>Information requests sent to Belgium for the detailed examination</i>	16
2.2 <i>Analysis</i>	16
2.3 <i>Conclusions</i>	20
3 DETAILED ASSUMPTIONS AND PARAMETERS UNDERLYING THE DETERMINED COSTS OF SKEYES AND MUAC, FOR EACH YEAR OF RP3 AND BROKEN DOWN PER COST CATEGORY AND SERVICE	22
3.1 <i>Information requests sent to Belgium for the detailed examination</i>	22
3.2 <i>Analysis</i>	22
3.3 <i>Conclusions</i>	32
4 SERVICE UNITS RECORDED AND FORECASTED IN THE CHARGING ZONE, BROKEN DOWN PER ANSP	33
4.1 <i>Information requests sent to Belgium for the detailed examination</i>	33
4.2 <i>Analysis</i>	33
4.3 <i>Conclusions</i>	40
5 DISTRIBUTION OF THE MUAC COSTS AND SERVICE UNITS BETWEEN THE BRUSSELS SECTOR AND THE OTHER SECTORS WITHIN THE MUAC AREA OF RESPONSIBILITY	41
5.1 <i>Information requests sent to Belgium for the detailed examination</i>	41
5.2 <i>Analysis</i>	41
5.3 <i>Conclusions</i>	46
6 CAPACITY PLANNING OF SKEYES AND MUAC INCLUDING WITH REGARD TO THE PLANNED NUMBER OF ATCOS, ATCO TRAINING, AND PLANNED INVESTMENTS IN FIXED ASSETS	47
6.1 <i>Information requests sent to Belgium for the detailed examination</i>	47
6.2 <i>Analysis</i>	47
6.3 <i>Conclusions</i>	50
7 COST ALLOCATION BETWEEN EN ROUTE AND TERMINAL SERVICES, AND BETWEEN SERVICES IN THE SCOPE OF THE PERFORMANCE PLAN AND OTHER SERVICES	51
7.1 <i>Information requests sent to Belgium for the detailed examination</i>	51
7.2 <i>Analysis</i>	51
7.3 <i>Conclusions</i>	55
8 ‘DISPO’ PRE-RETIREMENT SCHEME FOR AIR TRAFFIC CONTROLLERS IN BELGIUM	56
8.1 <i>Information requests sent to Belgium for the detailed examination</i>	56
8.2 <i>Analysis</i>	56
8.3 <i>Conclusions</i>	60

9	CROSS-BORDER SERVICE PROVISION ARRANGEMENTS WITH NEIGHBOURING COUNTRIES, AND THEIR OPERATIONAL AND FINANCIAL IMPACT	61
9.1	<i>Information requests sent to Belgium for the detailed examination.....</i>	<i>61</i>
9.2	<i>Analysis.....</i>	<i>61</i>
9.3	<i>Conclusions.....</i>	<i>65</i>
10	COSTS CHARGED TO AIRSPACE USERS IN RP2 IN RESPECT OF POSTPONED OR DELAYED INVESTMENTS IN FIXED ASSETS	66
10.1	<i>Information requests sent to Belgium for the detailed examination.....</i>	<i>66</i>
10.2	<i>Analysis.....</i>	<i>66</i>
10.3	<i>Conclusions.....</i>	<i>68</i>

INTRODUCTION

- 1 This report is the Annex to the PRB's advice to the European Commission (EC) in relation to the detailed examination of the cost-efficiency performance targets for the Belgium-Luxembourg charging zone, and provides the detailed analysis of the additional information provided by Belgium on the following ten elements:
 - Measures invoked by Belgium and Luxembourg in order to justify the observed deviations from Union-wide cost-efficiency trends on the grounds of additional costs for the achievement of capacity targets;
 - Complexity of the provision of air navigation services in the charging zone, and its evolution over time;
 - Detailed assumptions and parameters underlying the determined costs of skeyes and MUAC, for each year of RP3 and broken down per cost category and service;
 - Service units recorded and forecasted in the charging zone, broken down per ANSP;
 - Distribution of the MUAC costs and service units between the Brussels sector and the other sectors within the MUAC area of responsibility;
 - Capacity planning of skeyes and MUAC including with regard to the planned number of ATCOs, ATCO training, and planned investments in fixed assets;
 - Cost allocation between en route and terminal services, and between services in the scope of the performance plan and other services;
 - 'DISPO' pre-retirement scheme for air traffic controllers in Belgium;
 - Cross-border service provision arrangements with neighbouring countries, and their operational and financial impact; and
 - Costs charged to airspace users in RP2 in respect of postponed or delayed investments in fixed assets.

Confidential information has been indicated as ranges in this version of the report.

1 MEASURES INVOKED BY BELGIUM AND LUXEMBOURG IN ORDER TO JUSTIFY THE OBSERVED DEVIATIONS FROM UNION-WIDE COST-EFFICIENCY TRENDS ON THE GROUNDS OF ADDITIONAL COSTS FOR THE ACHIEVEMENT OF CAPACITY TARGETS

2 This section analyses the element of the detailed examination concerning the seven measures submitted by Belgium to justify the deviations from the Union-wide cost-efficiency trends on the grounds of additional costs to achieve the capacity targets:

- Measure 1: Recruitment and training of additional air traffic controllers (skeyes);
- Measure 2: Replacement of the ATM system (skeyes);
- Measure 3: General Condition of Employment package (MUAC);¹
- Measure 4: Post-Operations Analysis and Business intelligence facilities “PABI” (MUAC);
- Measure 5: Ab initio recruitment (MUAC);
- Measure 6: Recruitment of ATCOs for the Brussels sector (MUAC); and
- Measure 7: Manpower planning system for advanced rostering (MUAC).

3 This section analyses the costs related to the measures Belgium proposed in the revised draft performance plan 2022, and the draft performance plan 2021. It also evaluates the reasons for any cost changes provided by Belgium during the detailed examination.

1.1 Information requests sent to Belgium for the detailed examination

4 The EC sent to Belgium an information request regarding the measures proposed by Belgium and Luxembourg to justify deviations from Union-wide cost-efficiency targets (Table 1).

Questions asked by the European Commission
A) Please provide a build-up of the costs of each measure. In other words, please provide all the relevant calculation steps from cost drivers or unit costs to total costs per measure.
B) Please provide the justification(s) behind the contribution of the measures (and, if applicable, their components) to substantiate their need to provide the required levels of capacity.
C) Please provide a clear and detailed justification of why the Belgian NSA concluded that the costs of the measures had been under-estimated in the November 2021 submission, compared to June 2022.

Table 1 – Summary of main information requested in respect of Element 1.

Assessment of completeness of additional information provided by Belgium

5 Belgium provided most of the information requested on the seven measures, such as certain breakdowns of costs, justifications of costs and their changes, and the expected contribution to the achievement of the capacity targets. Belgium has not clarified the status of the “Shared Air Traffic Services System” (SAS3 project). The impact of the project on staffing and other resources of skeyes that were initially allocated to the SAS3 project, remains open.

6 Nevertheless, the PRB found the information provided sufficient for the purpose of the analysis. Where necessary, the PRB used other available data to complement its assessment. The assessment of capacity enhancements generated by each measure is based on the information provided by Belgium and complemented with the analysis provided in Element 6 of this Annex.

¹ The revised draft performance plan 2022 states that for all MUAC related measures, only costs attributable to Belgium and Luxembourg are included.

1.2 Overview of the seven measures

- 7 Belgium has proposed three types of measures. Four measures relate to air traffic controllers: Measure 1 concerns skeyes and measures 3, 5, and 6 concern MUAC Belgium and Luxembourg. The estimated cost for these four measures is related to additional ATCOs including their training, recruitment, and remuneration. In total, these four measures represent 87% (59M€₂₀₁₇) of the requested additional determined costs submitted in 2022 associated with the proposed deviation.
- 8 Measure 2 concerns the replacement of the ATM system of skeyes with a new system planned to be developed under the SAS3 project (and the midlife upgrade of the current system), and is estimated to represent 11% (7.4M€₂₀₁₇) of the requested additional determined costs. Belgium reported that skeyes, the Belgian Defence, and MUAC are currently discussing the future of the project. Belgium has indicated that the earliest date for the harmonised SAS3 system to become operational is expected to be 2030 (i.e. during RP5 at the earliest). Discussions on the extent to which skeyes will participate in the investment are ongoing.
- 9 Measures 4 and 7 of MUAC Belgium and Luxembourg are related to systems that optimise operations and rostering, and represent 2% (1.7M€₂₀₁₇) of the requested additional determined costs.
- 10 The justification of the measures provided by Belgium during the detailed examination and the assessment of each measure by the PRB are presented below.

1.3 Analysis of the measures presented by Belgium

Measure 1: skeyes – Recruitment and training of additional air traffic controllers (ATCOs)

- 11 In the revised draft performance plan 2022, Belgium reported additional en route costs relating to recruitment and training of additional ATCOs for skeyes necessary to achieve capacity targets (hereafter referred to as measure 1). The costs relating to measure 1 are shown in Table 2.
- 12 Belgium increased by +26% the total nominal costs of measure 1 in the revised draft performance plan 2022 compared to the draft performance plan 2021. On 8th December 2022, Belgium explained that:
 - The amounts presented in the revised draft performance plan 2022 are more accurate, and reflect the expected actual costs of recruitment.
 - The revised amounts reflect a faster traffic recovery and a higher training failure rate of ATCO students.
- 13 On 12th January 2023, Belgium further explained that its latest estimates also reflect:
 - The cumulative increase in the inflation forecast between the draft performance plans 2021 and the revised draft performance plan 2022 (8% for 2021-2024).
 - The amounts in the draft performance plan 2021 were only referring to en route, while the revised draft performance plan 2022 includes the costs for the regulated terminal services (increasing by +1.1M€ in 2024 the costs of the measure).

Measure 1 (M€ ₂₀₁₇)	2020	2021	2022	2023	2024	RP3 sum
Revised draft performance plan 2022	3.0	3.8	6.2	7.3	7.0	27.2

Table 2 – Additional en route costs of measure 1 planned by Belgium to achieve capacity targets (Source: PRB elaboration on the revised draft performance plan 2022).

- 14 Belgium stated that skeyes plans to recruit and train additional ATCOs to compensate for the “functional availability” and “pre-retirement leave” of ATCOs (known as the “DISPO” scheme and analysed in detail in Element 8). Belgium plans to recruit additional ATCOs up to its maximum training capacity (3 x 14 = 42 per year) to prevent understaffing, ATFM delay, and sector overload. Belgium justified the need of measure 1 as follows:
 - Without the planned recruitment, ATCOs in operations at skeyes would decrease by 10% to 15% by the end of RP3 compared to the 2020 ATCO FTE levels (up to -24 ATCO FTEs) and by 40% at the end of RP4 (-108 ATCOs), causing severe capacity restrictions; and

- Major projects such as sustainable aviation and the mid-life upgrade and replacement of part of the ATM system require additional ATCO and ATSEP workforce during RP3 and RP4.
- 15 Belgium explained that the plan is similar to the previous summer capacity planning cycles of skeyes, as described in the Local Single Sky Implementation document of 2021. Without the planned recruitment during RP3, Belgium noted that:
- Skeyes delayed projects during the previous years that should resume in RP3, leading to fewer available ATCOs in operation;
 - Skeyes could only open, under normal conditions, two sectors during the day as of 2024;
 - Projects including sustainable aviation, as well as the mid-life upgrade and replacement of the ATM system would need to stop; and
 - The number of staff would decrease by -10% and the capacity of the Brussels area control centre would be halved compared to 2019.
- 16 Belgium did not provide details to explain the need for increasing the number of newly trained ATCOs (which depends on the failure rate of trainees), or the expected training cost per ATCO FTE.

PRB assessment of measure 1

- 17 The planned need for the training and recruitment of ATCOs for skeyes is justified by the need to replace a large number of ATCOs that will leave operations in RP3 based on the DISPO scheme (see Element 8), as well as the need for additional resources for the implementation of major projects including sustainable aviation and the mid-life upgrade of the ATM system. The data provided by Belgium shows a growing number of ATCOs during RP3 that are planned to benefit from the DISPO scheme. This number is planned to increase even further during RP4.²
- 18 Belgium did not sufficiently justify the increase of costs related to measure 1 between the draft performance plan 2021 and the revised draft performance plan 2022. Of the total cost increase in nominal term (+26%), Belgium explained that +8% corresponds to the cumulative increase in actual and forecasted inflation for 2021-2024, which seems justified.
- 19 The PRB could not verify, assess, and justify the remainder +18% cost increase (in real terms) related to the inclusion of certain terminal costs as part of the en route measure, and fast traffic recovery and change in the failure rate in training.
- 20 Regarding the inclusion of certain terminal costs as part of the en route measure, the cost allocation methodology did not change between the draft performance plan 2021 and the revised draft performance plan 2022. Belgium should not have had a different treatment of the en route and terminal cost allocation in relation to this measure. The PRB had already raised concerns in relation to the change in the cost allocation methodology applied by Belgium between RP2 and RP3 in its assessment of the revised draft performance plan 2022 (see Element 7). The PRB recommends to the EC not to consider as justified these costs increase.
- 21 Regarding the faster traffic recovery and a change in the failure rate in training, the PRB could not reconcile the planned number of ATCOs in recruitment and training provided by Belgium with the planned number of ATCOs in OPS FTEs (see Element 6). Moreover, in the revised draft performance plan 2022, Belgium reduced the number of ATCOs in OPS compared to the draft performance plan 2021 (-6% less ATCOs in operation in 2024). The revised draft performance plan 2022 foresees an increase in ATCOs in training to 42 ATCOs per year in 2022-2024 (at maximum training capacity) to maintain the necessary workforce to provide the required capacity. However, as the number of ATCOs in OPS has been reduced from the previous plan, it is assumed that the additional costs relating to the increased number of ATCOs in training is at least compensated. The PRB recommends to the EC not to consider as justified these costs increase.

² Element 8 analyses the DISPO scheme.

22 The PRB concludes that measure 1 of skeyes to recruit and train new ATCOs as proposed by Belgium is needed to achieve the capacity targets. However, only the costs in real terms of measure 1 as submitted by Belgium in the draft performance plan 2021 (23.1M€₂₀₁₇) are justified, while the cost increases related to measure 1 as submitted in the revised draft performance plan 2022 should not be accepted. Therefore, the justified costs of measure 1 reduce the deviation from the long-term criteria by -7.7M€₂₀₁₇.

Measure 2: skeyes - Replacement of part of the ATM system

23 In the revised draft performance plan 2022, Belgium planned additional en route costs relating to the mid-life upgrade and subsequent replacement of part of the ATM system for skeyes, necessary to achieve capacity targets (hereafter referred to as measure 2). The costs relating to measure 2 are shown in Table 3.

24 Belgium decreased by -4% the costs of measure 2 in the revised draft performance plan 2022 compared to the draft performance plan 2021.³ Belgium explained that the latest estimates were more accurate and reflect better the expected actual costs, based on the actual contract value of the mid-life upgrade and a reduction in the WACC as indicated by the NSA. However, this justification appears to be unclear. Specifically, the reported WACC rate components or the regulated fixed asset base are not changing between the draft performance plan 2021 and the revised draft performance plan 2022.

Measure 2 (M€ ₂₀₁₇)	2020	2021	2022	2023	2024	RP3 sum
Revised draft performance plan 2022	0	1.3	1.7	2.0	2.4	7.4

Table 3 – Additional en route costs of measure 2 planned by Belgium to achieve capacity targets (Source: PRB elaboration on the revised draft performance plan 2022).

25 Belgium noted that measure 2 is necessary to achieve the capacity targets as:

- Skeyes requires a mid-life upgrade of the ATM system to decrease the risk of technical failures and ensure the reliability of the air navigation system and services during RP3 and until the new system is deployed; and
- Considering the complexity of the Belgian airspace, skeyes needs to invest in the ATM system to enable civil-military integration and improve capacity provision in RP4.

26 Belgium reported that, in December 2021, skeyes signed a contract to commission the mid-life upgrade of its ATM system, which includes a technical upgrade to ensure business continuity and a functional upgrade that will bring a positive impact on capacity expected in RP4.

27 Belgium stated that skeyes intends to replace part of its ATM system with a single, integrated and harmonised airspace management system for MUAC and the Belgian Defence, which the PRB assumes refers to the SAS3 project. Belgium specified that the new ATM system will improve capacity and operational efficiencies for the following reasons:

- Efficient data sharing and integrated airspace use;
- Maximum compliance with customer needs (i.e. airlines, airports, and military bases);
- Civil-military integration by allowing ATCOs to work from any work station on any airspace sector; and
- The implementation of the functionalities required by the CP1 regulation.

28 Belgium initially reported that skeyes would develop the new system during RP3 and deploy it in RP4. During the detailed examination, third parties informed the EC in December 2022 that skeyes' future participation in the SAS3 project was under discussion. Belgium did not contest this information, while explaining that discussions were still taking place with respect to the future of the project.

29 During the detailed examination Belgium provided a detailed breakdown of the costs of measure 2 (Table 4, next page). 20% (1.5M€₂₀₁₇) of the total costs of measure 2 relate to investment costs (i.e. depreciation and cost of

³ Belgium reported an underspent of -11% in measure 2 compared to the determined costs that Belgium had proposed in the revised draft performance plan 2022.

capital) of the ATM system mid-life upgrade and the new system. While Belgium did not specify which new system, it is assumed in this analysis that it relates to the SAS3 project. As Belgium noted:

- Depreciation costs for the SAS3 project are not foreseen before RP5, it is assumed that the investment costs of the new system only correspond to the cost of capital related to the SAS3 project.
- 80% (5.9M€₂₀₁₇) of the total costs of measure 2 relate to other operating costs (i.e. external support such as project management and experts). However, Belgium did not provide further details on these costs.

Breakdown of measure 2 (M€ ₂₀₁₇)	2020	2021	2022	2023	2024	RP3 sum
Investment costs (i.e. depreciation and cost of capital)	0	0.06	0.1	0.4	0.9	1.5
<i>Mid-life upgrade</i>		0.04	0.1	0.2	0.5	0.9
<i>New system (not specified)</i>		0.02	0.05	0.2	0.4	0.6
Other operating costs (i.e. external support)	0	1.2	1.6	1.5	1.5	5.9
Total costs	0	1.3	1.7	2.0	2.4	7.4⁴

Table 4 – Detailed breakdown of total costs of measure 2 planned by Belgium (Source: PRB elaboration on the information provided during the detailed examination).

PRB assessment of measure 2

- 30 Belgium justified the need for the additional costs of skeyes to commission a mid-life upgrade of its ATM system to ensure business continuity during RP3, and until the new system (SAS3) is deployed. However, Belgium did not demonstrate the need for the additional costs of skeyes to implement the new ATM system (SAS3) to justify its deviation from the Union-wide targets, as Belgium informed that its future participation in the SAS3 project was under discussion.
- 31 Based on the information provided on the investment costs of measure 2, the PRB concludes that the depreciation and cost of capital related to the mid-life upgrade of the ATM system should be considered as additional costs of skeyes given that their need to achieve the capacity targets in RP3 is justified. Differently, the investment costs of the replacement of the ATM system (SAS3) should not be considered as additional costs, considering the uncertainty of its implementation and the fact that in any case, the new ATM system would not be deployed before RP5.
- 32 In relation to the other operating costs of measure 2 consisting of costs of project management and experts, Belgium did not provide a breakdown indicating which relate to the mid-life upgrade and which to the replacement of the ATM system. Regardless of this lack of specification, the PRB found that these operating costs should be considered as normal operations which are not directly related to the achievement of capacity targets. The PRB concludes that all other operating costs of measure 2 should not be accepted as additional costs of skeyes to justify its deviation from the Union-wide targets.
- 33 The PRB concludes that only the depreciation cost and the cost of capital related to the mid-life upgrade of the ATM system (0.9M€₂₀₁₇) are justified as additional costs necessary to achieve capacity targets. Therefore, the justified costs of measure 2 reduce the deviation from the long-term criteria by -0.3M€₂₀₁₇.

⁴ There is a discrepancy of -40K€₂₀₁₇ compared to the costs of measure 2 provided by Belgium in the draft performance plan 2022 (Table 4).

Measure 3: MUAC – General Condition of Employment Package

- 34 In the revised draft performance plan 2022, Belgium reported additional en route costs relating to a General Condition of Employment Package (GCE package) for MUAC necessary to achieve capacity targets (hereafter referred to as measure 3). The costs relating to measure 3 are shown in Table 5.
- 35 There was no change in the costs of measure 3 in real terms between the revised draft performance plan 2022 and the draft performance plan 2021. Belgium did not provide the actual costs (for 2020 and 2021) of measure 3 as requested by the EC.

Measure 3 (M€ ₂₀₁₇)	2020	2021	2022	2023	2024	RP3 sum
Revised draft performance plan 2022	2.1	2.7	2.8	2.8	2.8	13.2

Table 5 – Additional en route costs of measure 3 planned by Belgium to achieve capacity targets (Source: PRB elaboration on the revised draft performance plan 2022).

- 36 Belgium noted that measure 3 is necessary to achieve the capacity targets as:
- When the GCE package was approved in 2019 (pre-COVID), MUAC expected to save delay costs to airspace users;
 - The GCE package would increase ATCO availability over RP3 while reinforcing health protection, as MUAC estimates this would allow to have additional shifts (from 1,050 in 2019 to 3,150 in 2024); and
 - The GCE package costs would be comparable to hiring additional ATCOs to cover staff shortages.
- 37 According to Belgium, the GCE package aimed to accommodate traffic demand by increasing the availability of ATCOs through the following initiatives:
- An increase in basic salary scales by +10.75% over a two-year period;
 - An increase in annual working time for newly recruited ATCOs;
 - Added flexibility of shifts and possible flexibility of leave arrangements;
 - The possibility to contract additional working days for staff currently in post; and
 - The possibility of extending the retirement age to 60 years with the consent of the ATCO.
- 38 Belgium reported that MUAC gradually introduced the +10.75% salary increase that was agreed in the GCE package: +7% from 1st July 2019, +3.75% from 1st July 2020. The increases from 2022 are due to the indexation of remuneration. Belgium explained that the GCE package would have budgetary implications comparable to having the corresponding amount of additional ATCOs to cover for the staff shortages. Belgium stated that, if the amendments would have been implemented in 2018, 0.3M minutes of delay could have been avoided for airspace users (representing a cost impact estimated by MUAC of 30M€ on users). MUAC’s annual report 2019 indicates that the 2019 delay due to staffing was significantly reduced with the implementation of the GCE package.

PRB assessment of measure 3

- 39 Belgium explained that the amendments to the GCE package were expected to have a proportionate effect and that MUAC estimated that, during the 2019-2024 period, MUAC would gradually gain 1,050 additional shifts in 2019 to 3,150 additional shifts in 2024. However, in 2020 and 2021, the heavy downturn in traffic due to COVID-19 created exceptional circumstances where the additional flexibility brought by the GCE package was not necessary.
- 40 The en route ATFM delays for MUAC in 2018 amounted to 1.5M minutes, of which 0.5M minutes are due to staffing. The PRB estimates that this represents a cost impact of 52M€ on users.⁵ The PRB analysis shows that in 2019, the year when the GCE package was implemented (although the number of flights was only -0.5% lower than in 2018), the total minutes of delay amounted to 0.3M (a decrease of -79% compared to 2018), of which

⁵ Based on the cost of 100€ per minute of delay as per Cook, A.J. and Tanner, G. 2011. “European airline delay cost reference values” Euro-control Performance Review Unit.

0.05M minutes were due to staffing (representing a cost impact of 4.9M€ on users, which decreased by -91% compared to 2018). The cost impact on users of the reduction in the minutes of delays caused by staffing in 2019 compared to 2018 amounts to a reduction of -48M€.

- 41 Although the total reduction in the delays caused by staffing in 2019 compared to 2018 is probably not entirely attributable to the GCE package, the impact of the GCE package seems nevertheless confirmed. The PRB found credible the estimation done by MUAC on 2018 referring to an impact of 30M€. The flexibility available under the GCE package can improve the availability of the resources, aiming to maximise at short notice the capacity made available at times of high traffic demand.
- 42 In 2020 and 2021, the heavy downturn in traffic due to COVID-19 created exceptional circumstances where the additional flexibility brought by the GCE package was not necessary, showing that the costs of measure 3 may not be proportionate during low traffic demand. To mitigate the impact of the additional costs linked to the GCE package, the revised draft performance plan 2022 specifies that “some of the surplus shifts from 2020 and the first quarter of 2021” were deferred in order to be used in the rest of RP3 at no additional costs, which the PRB assesses as a contribution to maintain the proportionality of the costs. The PRB also notes that the offer of additional capacity (from the surplus shifts) for the remainder of RP3 ensures the provision of capacity to achieve the targets. The PRB recognises that the measure could improve the availability and allocation of the resources, and maximise the capacity made available at short notice and at times of high traffic demand.
- 43 The PRB concludes that the costs of measure 3 (13.2M€₂₀₁₇) are justified as additional costs necessary to achieve capacity targets. The costs considered for measure 3 reduce the deviation from the long-term criteria by -4.4M€₂₀₁₇.

Measure 4: MUAC - Post-Operations Analysis and Business intelligence facilities - “PABI”

- 44 In the revised draft performance plan 2022, Belgium reported additional en route costs relating to Post-Operations Analysis and Business intelligence facilities (PABI) for MUAC necessary to achieve capacity targets (hereafter referred to as measure 4). The planned costs relating to measure 4 are shown in Table 6.
- 45 There was no change in the costs of measure 4 between the revised draft performance plan 2022 and the draft performance plan 2021.

Measure 4 (M€ ₂₀₁₇)	2020	2021	2022	2023	2024	RP3 sum
Revised draft performance plan 2022	0.3	0.5	0.04	0	0	0.9

Table 6 – Additional en route costs of measure 4 planned by Belgium to achieve capacity targets (Source: PRB elaboration on the revised draft performance plan 2022).

- 46 Belgium highlighted the following benefits from this project:
 - Cost-efficiency improvement of the ATM operations, systems, concepts and strategies, as well as stability and long-term sustainability of services owing to the insights provided by consolidated performance data; and
 - Additional capacity and delay reduction expected from avoidance of over-regulation and better determination of the number of ATCOs required to cover contingencies.
- 47 Belgium reported that the PABI project aims to:
 - Enhance the post-operations analysis at MUAC to optimise the planning of daily operations; and
 - Develop associated business intelligence facilities to: a) Create efficient monitoring of key performance indicators, reporting workflows, and dashboards; and b) perform data mining.

PRB assessment of measure 4

- 48 The PABI project is planned to be completed in 2022 and will contribute to the achievement of capacity targets. Belgium reported benefits stemming from this measure such as better airspace management, staffing

optimisation, and enhanced ATCO productivity, which result in reduced delays. The measure is considered proportionate and justified.

- 49 In 2018 and 2019, MUAC registered en route ATFM delay exclusively due to ATC capacity and ATC staffing around 0.85M minutes and 0.15M minutes, respectively. These are the types of delay that can be reduced by the use of PABI or similar tools. Using the standard estimate for the cost of one minute of ATFM delay (100€ per minute), the minutes of delay in 2018 and 2019 represent a cost impact on users of 85M€ and 15M€, respectively.⁶ The costs associated with measure 4 are negligible when compared to the impact of the delays that can be mitigated by the measure.
- 50 The PRB concludes that the costs related to the post-operations analysis and business intelligence facilities (0.9M€₂₀₁₇) are justified as additional costs necessary to achieve capacity targets. The costs considered for measure 4 reduce the deviation from the long-term criteria by -0.3M€₂₀₁₇.

Measure 5: MUAC - Ab initio recruitment

- 51 In the revised draft performance plan 2022, Belgium reported additional en route costs relating to ab initio recruitment for MUAC necessary to achieve capacity targets (hereafter referred to as measure 5). The costs relating to measure 5 are shown in Table 7.
- 52 Measure 5 was not included in the draft performance plan 2021, while indicated as additional costs for reaching capacity targets in the revised draft performance plan 2022 (similar to measures 6 and 7). Belgium explain this addition “as it became clear that it would be difficult to reach both the short and long-term cost-efficiency targets”.

Measure 5 (M€ ₂₀₁₇)	2020	2021	2022	2023	2024	RP3 sum
Revised draft performance plan 2022	3.0	2.8	2.8	2.7	2.8	14.2

Table 7 – Additional en route costs of measure 5 planned by Belgium to achieve capacity targets (Source: PRB elaboration on the revised draft performance plan 2022).

- 53 Belgium noted that measure 5 is necessary to achieve the capacity targets. Belgium reported that continued ATCO recruitment and ab initio training would be required by MUAC to avoid capacity constraints in RP3 and future reference periods, and that the performance of MUAC in 2022 and beyond is benefiting from such ab initio recruitment and training. Belgium stated that MUAC planned to recruit new ATCOs to compensate for the expected retirement of ATCOs, following a freeze in ab-initio recruitment after 2007. The costs submitted in the revised draft performance plan 2022 include staff costs for ab initio ATCOs, “sim” pilots needed for training, and costs of initial training at ENAC. Belgium reported that, prior to this, MUAC had outsourced initial training from IANS (Luxembourg) to ENAC (Toulouse).

PRB assessment of measure 5

- 54 In Element 6, the PRB found that the planned increase in the number of ATCOs in OPS FTEs appears justified by the planned increase in capacity profiles for MUAC. Moreover, Belgium confirmed that this planning would not be affected by possible changes in the planning/development phase of the SAS3 project.
- 55 The PRB concludes that while the costs incurred for measure 5 (14.2M€₂₀₁₇) are significant, they can be considered proportionate in light of the operational capacity benefits that the measure will provide in the medium and long-term. The costs considered for measure 5 reduce the deviation from the long-term criteria by -4.7M€₂₀₁₇.

Measure 6: MUAC – Recruitment of air traffic controllers for Brussels sector

- 56 In the revised draft performance plan 2022, Belgium reported additional en route costs relating to the recruitment of air traffic controllers for Brussels sector for MUAC necessary to achieve capacity targets (hereafter referred to as measure 6). The planned costs relating to measure 6 are shown in Table 8 (next page). Belgium

⁶ Based on the cost of 100€ per minute of delay as per Cook, A.J. and Tanner, G. 2011. “European airline delay cost reference values” Euro-control Performance Review Unit.

reported that the nominal average cost of an ATCO is approximately [150-200K€].⁷ The total costs of measure 6 correspond to [the confidential information provided by Belgium regarding the employment of additional ATCOs and the associated costs].

- 57 Measure 6 was not included in the draft performance plan 2021, while indicated as additional costs for reaching capacity targets in the revised draft performance plan 2022 (similar to measures 5 and 7). Belgium defined these measures in the revised draft performance plan 2022 “as it became clear that it would be difficult to reach both the short and long-term cost-efficiency targets”.

Measure 6 (M€ ₂₀₁₇)	2020	2021	2022	2023	2024	RP3 sum
Revised draft performance plan 2022	0	0.2	0.6	1.7	2.0	4.4

Table 8 – Additional en route costs of measure 6 planned by Belgium to achieve capacity targets (Source: PRB elaboration on the draft performance plan 2022).

- 58 Belgium noted that measure 6 is necessary to achieve the capacity targets, as based on the experience of other ANSPs having difficulties coping with traffic recovery due to staff shortage in 2022. The continued ATCO recruitment and ab initio training is required by MUAC to avoid capacity constraints in RP3 and beyond.
- 59 In the revised draft performance plan 2022, Belgium reported that the number of ATCO FTEs in the Brussels sector of MUAC will rise from 106 to 119 over RP3, due to past under-recruitment by MUAC.⁸ Belgium explained that measure 6, combined with the GCE package (measure 3), will provide additional capacity within the MUAC area of responsibility over Belgium-Luxembourg.

PRB assessment of measure 6

- 60 The planned increase in the number of ATCOs in OPS FTEs presented in measure 6 seems justified by the planned increase in capacity profiles for MUAC. The costs are proportionate considering [the confidential information provided by Belgium regarding the employment of additional ATCOs and the associated costs]. The costs are also proportionate in light of the operational capacity benefits that the measure will provide in the medium and long-term, including the avoidance of costly ATFM delay.
- 61 The PRB concludes that the costs related to the recruitment of air traffic controllers for Brussels sector (4.4M€₂₀₁₇) are justified as additional costs necessary to achieve capacity targets. The costs considered for measure 6 reduce the deviation from the long-term criteria by -1.5M€₂₀₁₇.

Measure 7: MUAC - Manpower Planning Suite

- 62 In the revised draft performance plan 2022, Belgium reported additional en route costs relating to Manpower Planning Suite for MUAC necessary to achieve capacity targets (hereafter referred to as measure 7). The costs relating to measure 7 are shown in Table 9.
- 63 Measure 7 was not included in the draft performance plan 2021, while indicated as additional costs for reaching capacity targets in the revised draft performance plan 2022 (similar to measures 5 and 6). Belgium defined these measures in the revised draft performance plan 2022 “as it became clear that it would be difficult to reach both the short and long-term cost-efficiency targets”.

Measure 7 (M€ ₂₀₁₇)	2020	2021	2022	2023	2024	RP3 sum
Revised draft performance plan 2022	0.2	0.2	0.2	0.2	0.1	0.8

Table 9 – Additional en route costs of measure 7 planned by Belgium to achieve capacity targets (Source: PRB elaboration on the revised draft performance plan 2022).

⁷ The amount cannot be expressed to real terms given that the reference year(s) has not been provided. The average salary is reported for ATCOs starting at level O3 (fully automated separation assurance in the basic traffic).

⁸ However, in measure 5 Belgium reported that the number of ATCO FTEs in the Brussels sector of MUAC will rise from 111 (instead of 106) in 2020 to 119 in 2024.

- 64 Belgium identified the following benefits of measure 7 that are necessary to achieve capacity targets:
- Facilitate the implementation of new operational requirements; and
 - Enable future 24/7 service provision.
- 65 In the revised draft performance plan 2022, Belgium reported that MUAC aims to develop a new tool called the Manpower Planning Suite (MPS) in stages:
- The first two stages will focus on a new framework and a modernised roster tool; and
 - The next stages will develop further tools based on the same framework.
- 66 Belgium reported that the project costs at MUAC level are forecasted based on the actual costs incurred, equivalent to 563K€₂₀₁₇ in 2020 and 525K€₂₀₁₇ in 2021. On that basis, MUAC forecasted the total MUAC level costs of this measure equivalent to 519K€₂₀₁₇ in 2022, 502K€₂₀₁₇, and 246K€₂₀₁₇ in 2024. From the MUAC level costs, only the costs attributable to Belgium and Luxembourg are included in the costs of the charging zone. Belgium has not provided a build-up of the actual and determined costs, that is the individual cost drivers and/or unit costs comprised in the total costs of measure 7.

PRB assessment of measure 7

- 67 In 2018 and 2019, MUAC registered en route ATFM delay around 0.86M minutes and 0.16M minutes in 2018 and 2019, respectively.⁹ Using the standard estimate for the cost of one minute of ATFM delay (100€ per minute), the minutes of delay in 2018 and 2019 represent a cost impact on users of 86M€ and 16M€ on users.¹⁰
- 68 The measure will contribute to the achievement of capacity targets during RP3 by improving the rostering of ATCOs and their operational efficiency during RP3 and future reference periods. The measure is considered proportionate and justified, as the costs associated with measure 7 are negligible when compared to the impact of the delays that can be mitigated by the measure.
- 69 The PRB concludes that the costs related to the Manpower Planning Suite (0.8M€₂₀₁₇) are justified as additional costs necessary to achieve capacity targets. The costs considered for measure 7 reduce the deviation from the long-term criteria by -0.3M€₂₀₁₇.

1.4 Conclusions

- 70 Belgium provided most of the information regarding the additional costs required to achieve capacity targets. When appropriate, the PRB relied on its own analysis to assess the necessity and proportionality of Belgium's proposed measures in terms of capacity and cost, including the total costs of all the measures and the change in costs between the draft performance plan 2021 and the revised draft performance plan 2022 for each specific measure.
- 71 Of the estimated total costs over RP3 for the seven measures proposed by Belgium (67.8M€₂₀₁₇), the PRB considered that 84% of those costs (57.4M€₂₀₁₇) were necessary and proportionate to justify the proposed deviation from the Union-wide cost-efficiency targets. The costs the PRB recommends to approve reduce the deviation from the long-term criteria (43.7M€₂₀₁₇) by -44% (-19.2M€₂₀₁₇), which results in a remaining deviation of 24.5M€₂₀₁₇.
- 72 These costs are considered proportionate and necessary both individually and together. The justified costs of the measures are complementary, being related to staff and investment costs of skeyes (measure 1 and 2), staff costs of MUAC (measure 3 GCE package, measure 5 training and measure 6 recruiting), investment costs of MUAC (measure 4 for post operational and measure 7 for manpower planning). Although the costs for measures 3, 5 and 6 of MUAC all relate to staff, the PRB recognises that these measures are complementary to ensure

⁹ The delay figures quoted in measure 7 refer to delays attributable to the ANSP and therefore are slightly higher than the delay figures quoted in measure 4 which only refer to delays under specific delay codes (namely ATC staffing and ATC capacity delay codes).

¹⁰ Based on the cost of 100€ per minute of delay as per Cook, A.J. and Tanner, G. 2011. "European airline delay cost reference values" Euro-control Performance Review Unit.

adequate ATCO staffing level to accommodate the forecast traffic in RP3 and are not overlapping each other (i.e. the costs are not accounted for more than once).

- 73 The measures planned by skeyes and MUAC aiming at improving capacity performance are fully in line with the measures included in the 2022 July edition of the the European Network Operations Plan (NOP), and are considered as combined effects in the planned capacity profiles. All the measures are included in the ANSPs' capacity plans, which are checked, challenged, and validated by the Network Manager and are included in the calculation of the forecast capacity provision of skeyes and MUAC. The Network Manager also estimates the forecast capacity gap/surplus, showing that the measures planned by skeyes and MUAC are complementary, being together necessary and proportionate to achieve the local capacity targets. Approving only some of the planned measures could create a capacity gap should the forecasted traffic materialise.

Measure 1: The PRB concludes that the measure 1 of skeyes to recruit and train new ATCOs as proposed by Belgium is needed to achieve the capacity targets. However, only the costs in real terms of measure 1 as submitted by Belgium in the draft performance plan 2021 (23.1M€₂₀₁₇) are justified, while the cost increases related to measure 1 as submitted in the revised draft performance plan 2022 should not be accepted. The justified costs of measure 1 reduce the deviation from the long-term criteria by -7.7M€₂₀₁₇.

Measure 2: The PRB concludes that the depreciation cost and the cost of capital related to the mid-life upgrade of the ATM system (0.9M€₂₀₁₇) are justified as additional costs necessary to achieve capacity targets. The justified costs of measure 2 reduce the deviation from the long-term criteria by -0.3M€₂₀₁₇.

Measure 3: The costs are significant and may not be considered proportionate during low traffic demand. However, the flexibility offered by the measure could improve the availability and allocation of the resources, and maximise the capacity made available at short notice. The PRB concludes that the costs of measure 3 (13.2M€₂₀₁₇) are justified as additional costs necessary to achieve capacity targets. The justified costs of measure 3 reduce the deviation from the long-term criteria by -4.4M€₂₀₁₇.

Measure 4: The PRB concludes that the costs related to the post-operations analysis and business intelligence facilities (0.9M€₂₀₁₇) are justified as additional costs necessary to achieve capacity targets. The justified costs of measure 4 reduce the deviation from the long-term criteria by -0.3M€₂₀₁₇.

Measure 5: The PRB concludes that while the costs incurred for measure 5 (14.2M€₂₀₁₇) are significant, they can be considered proportionate in light of the operational capacity benefits that the measure will provide in the medium and long-term. The justified costs of measure 5 reduce the deviation from the long-term criteria by -4.7M€₂₀₁₇.

Measure 6: The PRB concludes that the costs related to the recruitment of air traffic controllers for Brussels sector (4.4M€₂₀₁₇) are justified as additional costs necessary to achieve capacity targets. The justified costs of measure 6 reduce the deviation from the long-term criteria by -1.5M€₂₀₁₇.

Measure 7: The PRB concludes that the costs related to the Manpower Planning Suite (0.8M€₂₀₁₇) are justified as additional costs necessary to achieve capacity targets. The justified costs of measure 7 reduce the deviation from the long-term criteria by -0.3M€₂₀₁₇.

2 COMPLEXITY OF THE PROVISION OF AIR NAVIGATION SERVICES IN THE CHARGING ZONE, AND ITS EVOLUTION OVER TIME

74 This section analyses the relationship between the complexity of traffic and the costs of the service provision, benchmark traffic complexity in the Belgian sectors with similar ANSPs, and analyses how the key factors evolved over time.

2.1 Information requests sent to Belgium for the detailed examination

75 The EC sent to Belgium an information request regarding the complexity of the provision of air navigation services in the charging zone, its evolution over time, and how complexity impacts workload and the cost-efficiency KPAs (Table 10).

Questions asked by the European Commission
A) Please provide any relevant evidence and calculations regarding the complexity of the Belgium-Luxembourg airspace, its variables and components for each year of the reference period.
B) Please provide your observations and analysis of the evolution of airspace complexity from 2015 to 2024 and its drivers.
C) Please describe your airspace sectors and provide their maximum capacity for skeyes and MUAC (in minutes intervals).
D) Please explain and quantify, for each ANSP, how the workload of air traffic controllers is impacted by the complexity (and the variation of the complexity over time). Please provide concrete examples.
E) Please explain and quantify, for each ANSP, how complexity impacts the cost-efficiency KPA and leads to costs. Please provide concrete examples and refer to metrics such as working hours, productivity, staff costs, other operating costs, investment costs.
F) Please describe the structural measures in place (and foreseen) to mitigate the impact of complexity and its drivers and how they are reflected within the cost base (e.g. procedures, technological solutions, etc.).

Table 10 – Summary of main information requested in respect of Element 2.

Assessment of completeness of the additional information provided by Belgium

76 The information provided by Belgium did not include sufficient detail on the complexity of its airspace during the years 2020 to 2024 (i.e. the relationships between complexity, controller workload, and costs were only partially explained by Belgium). The PRB has complemented the information provided with data from the Aviation Intelligence Unit of Eurocontrol, and from the NEST tool of Eurocontrol. As data from the Aviation Intelligence Unit of Eurocontrol on traffic complexity is only available until 2019, and Belgium did not provide any additional information relating to complexity for the years 2020-2024, the analysis for this period was limited to the data coming from the NEST tool of Eurocontrol.

2.2 Analysis

77 This analysis focuses on four main topics:

- The complexity of traffic in the area of responsibility of skeyes and MUAC with a comparison to similar ANSPs in Europe;
- Evolution of complexity over time;
- The analysis on future complexity; and
- The link between the evolution of traffic complexity and the planned increase in costs.

Comparison of complexity scores and their evolution over time for skeyes and MUAC

- 78 For the purpose of this analysis, the complexity of traffic in an airspace block is measured by the traffic complexity score, as calculated by the Aviation Intelligence Unit of Eurocontrol. The traffic complexity score is the product of the following two factors:
- The adjusted density, indicating how saturated the airspace is; and
 - The structural complexity, which is a sum of three components: i) The vertical index, measuring how the vertical movements of flights affect complexity; ii) the speed index, capturing how differences between the speed of aircraft affect complexity; and iii) the horizontal index, measuring how conflicting trajectories affect complexity.
- 79 These figures are provided on a daily basis for each ANSP for the time period of 2014-2019. However, the figures from the period 2014-2016 and 2017-2019 are not directly comparable, due to a change in methodology.¹¹ This change was assessed and was considered not to significantly affect the conclusions.
- 80 The overview of the comparison of MUAC and skeyes with the most relevant similar ANSPs (i.e. DFS, MUAC, LVNL, Skyguide, and Austrocontrol) is shown in Figure 1 (next page). For the purpose of this analysis, similarity was defined either based on size of the ANSP and the nature of the operations and/or based on the comparator groups applied for the cost-efficiency criteria.
- 81 Within the compared ANSPs, MUAC shows the second highest complexity scores since 2016 overall (second to Skyguide).¹² The result is mostly driven by the high adjusted density. The structural index of MUAC is the fourth highest, as both the speed and the vertical indices are relatively low. The overall complexity score increased marginally over the period 2017-2019. This result was driven by the increase in adjusted density, as the structural index remained stable. The vertical index shows a minor decrease over the entire period, whereas the horizontal score remained almost stable during 2014-2019. Speed scores cannot be compared between 2014-2016 and 2017-2019, thus a long-term trend cannot be established.
- 82 Within the compared ANSPs, the complexity score of skeyes does not show a consistent ranking. When looking at the two factors composing the complexity score, skeyes has the highest structural index, mainly due to the relatively high speed and vertical indices in the airspace controlled by skeyes. In terms of adjusted density, skeyes consistently has the lowest scores in the comparison. The values of these factors are still relatively high when compared against the wider Union-wide average.
- 83 LVNL and skeyes are similar in their ATS services, as both ANSPs operate in the lower airspace, and have delegated services to MUAC above flight level 245. There are significant differences in their traffic complexity scores, driven by the higher structural index of skeyes. Based on the information provided during the detailed examination, there are three main reasons behind this difference:
- Skeyes is in the middle of the 'FLAP' area, geographically surrounded by four major hub airports (besides Brussels Airport): Frankfurt, London, Amsterdam, and Paris. According to the analysis based on traffic sampling of the peak periods in 2019, 2021, and 2022, traffic flying to and from these airports accounted for 24% to 34% of all IFR movements.
 - Belgium reported that large portions of the airspace are used by military stakeholders, either as military TMAs and CTRs or as training areas for military flights. These blocks of airspace are in operation for most

¹¹ The change affected the calculation of the speed index component, thus other individual aspects of the complexity may be compared for the entire period.

¹² The complexity score of MUAC is an average of the three main sector groups operated in the ACC: The Brussels sector group, the DECO sector group (mostly covering the area of the Netherlands), and the Hannover sector group. Detailed information on the complexity scores of the sector groups has not been provided during the detailed examination. The information provided by Belgium indicates that the Brussels sector group had a significantly higher complexity score in 2018 than the two other sector groups (complexity scores for the groups were 15.04, 8.8, and 9.3 for Brussels, DECO, and Hannover respectively). Due to the lack of data, the evolution of these figures could not be assessed.

of the day during weekdays, thus making them inaccessible to civilian flights. This forces civilian traffic to fly in between the military airspace blocks, creating more complexity in the traffic patterns.

- The airspace structure of Belgium is further complicated by recreational airspaces (paradrop areas) extending up to flight level 150, and the complex standard instrument departure routes (SIDs) and standard arrivals routes (STARs) to and from the various airports located in and around Belgium. Due to the relatively low volume of airspace available, these SIDs and STARs cannot be fully deconflicted strategically, resulting in more complex operations.

84 When looking at the past evolution of the complexity scores, no clear indication of an increasing trend could be observed for skeyes. All components of the complexity scores of skeyes were relatively stable, with a minor increase in 2018 followed by a minor decrease in 2019. The drop in the speed index and the structural index from 2016 to 2017 is due to the change in methodology and should not be considered. The vertical and horizontal scores are not affected by this change; however, no significant variation could be observed in these factors. For the years 2020-2024, no information has been provided during the detailed examination.

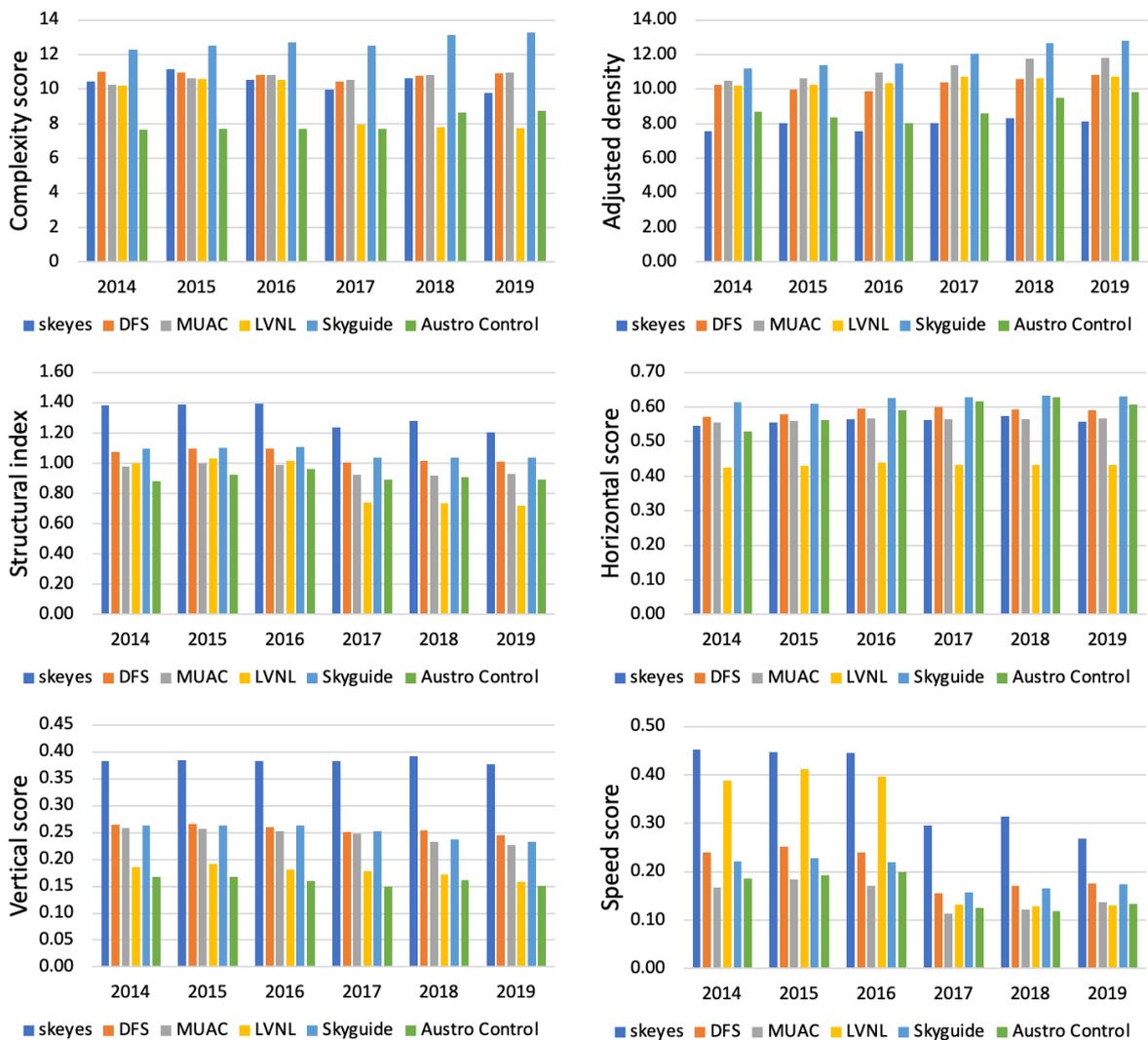


Figure 1 – Comparison of traffic complexity and its evolution over time (Source: PRB elaboration on the data provided by the Aviation Intelligence Unit of Eurocontrol).

Analysis of future traffic complexity

85 Traffic complexity scores is not available in the dataset of the Aviation Intelligence Unit of Eurocontrol for years after 2019. To estimate the complexity of traffic for both skeyes and the MUAC Brussels Sector Group, the PRB considered components of traffic complexity through a set of metrics, without establishing an overall complexity score. The metrics used are similar to the ones used in the methodology applied by the Aviation Intelligence Unit of Eurocontrol and are as follows:

- A vertical composition score indicating the mixture of traffic per the vertical movement of aircraft (climbing, cruising, or descending);
- A weight composition score indicating the mixture of traffic per weight category of the aircraft (low, medium, high);
- The average hourly IFR flights entering the airspace indicating the traffic component of complexity, where a higher figure indicates more density;
- The average crossing distance per flight, where the higher distance indicates a higher ATCO workload;
- The average crossing time per flight, where a higher time value indicates a higher ATCO workload; and
- The average number of flight level changes per flight, indicating another aspect of the vertical complexity of traffic.

86 The components of complexity for the period 2018 to 2024 for both Brussels ACC (skeyes) and the MUAC Brussels sector group (MUAC BSG) are shown in Figure 2. Values for 2018-2022 are actuals measured by the NEST tool of Eurocontrol during the peak periods of the years (i.e. last two weeks of July and first two weeks of August). Data for 2023 and 2024 is simulated and based on the STATFOR traffic forecast base scenario, as available in the 2207 AIRAC dataset of the NEST tool of Eurocontrol.

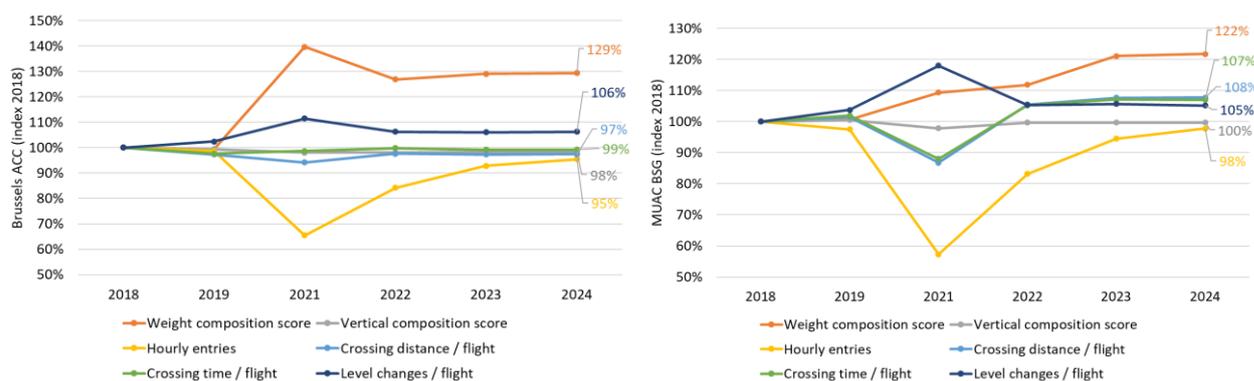


Figure 2 – Complexity components estimated for the period of 2018-2024 for Brussels ACC and the MUAC BSG indexed base 2018 (Source: PRB elaboration on the data from the NEST tool of Eurocontrol). Year 2020 is omitted from the graphs due to the impact of COVID-19.

87 The analysis did not provide clear results, as the elements of traffic complexity are forecasted to evolve differently. For skeyes, the weight composition score and the average number of level changes per flight are forecasted to increase by 2024, but all other aspects are forecasted to stay below 2018 levels.

88 For the MUAC BSG, the weight composition score, the average crossing time per flight, and the average number of level changes per flight are forecasted to increase by 2024. The vertical composition score is forecasted to remain at 2018 levels, while the average number of hourly entries is forecasted to be still below 2018 levels in 2024.

89 The scores and metrics used in this complexity forecast cannot be directly linked to the components of the traffic complexity scores calculated by Eurocontrol, and there is no sound methodology to combine the various aspects into an overall complexity indicator. However, if all aspects of complexity were expected to be at or above 2018 levels, it would be reasonable to expect that the overall complexity of traffic would also be higher in 2024. Similarly, if all components were forecasted to be at or below 2018 levels, it would be reasonable to expect that overall traffic complexity would not be higher in 2024. Since some of the components of complexity are

forecasted below 2018 levels, there is no evidence of an increase in the overall complexity of traffic in the remaining years of RP3.

Analysing the link between traffic complexity and costs of ANSPs

90 No quantitative information has been provided by Belgium to establish a link between costs and traffic complexity. In order to analyse a potential link between traffic complexity and the costs incurred by skeyes and MUAC, the PRB compared the number of IFR movements, average traffic complexity scores and total costs of the ANSPs for each year between 2014 and 2024. Actual complexity data is only available for the period of 2014-2019 (Figure 3). The results of the comparison are the following:

- IFR movements and complexity scores seem to have the tendency to move in the same direction, although the year-on-year changes of the indicators were showing a significant difference, thus there is no proportionate or quantifiable link between the two factors;
- Traffic complexity and costs seem to evolve independently during the period for which complexity scores are available (2014-2019); and
- The link between IFR movements and costs is not apparent during the period 2014-2019, although both IFR movements and costs had the same overall tendency of increasing. However, variations in the number of IFR movements were not always accompanied by similar changes in costs (e.g. in 2019, there were less IFR movements than in 2018, but the costs of both ANSPs remained higher).

91 Overall, the analysis shows that a dependency between complexity and costs is difficult to be observed and estimate. Moreover, the complexity score did not vary in the past years, and it is not foreseen to vary in the remaining years of RP3, as analysed in the sections above. Therefore, the increase in operational costs cannot be justified by an increase in the complexity scores.

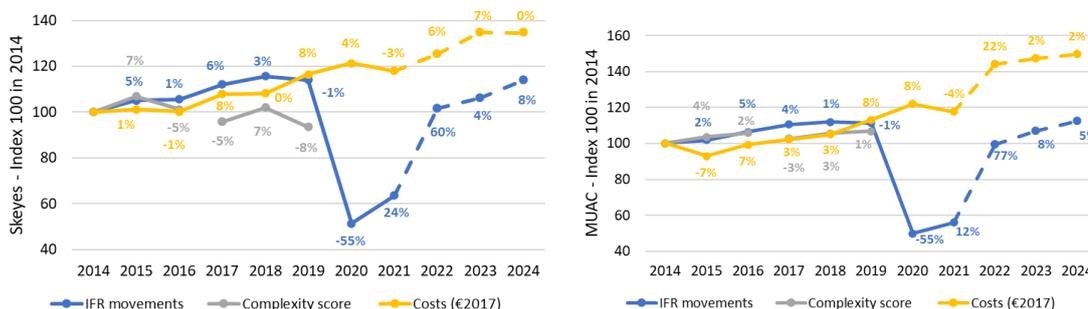


Figure 3 – Comparison of IFR movements, complexity scores, and costs of skeyes and MUAC – index 100 in 2014. The numbers show the evolution year-on-year (Source: PRB elaboration on the data provided by the Aviation Intelligence Unit of Eurocontrol and on the revised draft performance plan 2022).

2.3 Conclusions

- Complexity is relatively high in Belgium airspace, both for skeyes and MUAC, as it is the case for the other ANSPs included in the comparator group. For skeyes, complexity is mostly driven by the high levels of vertical and speed scores, whereas for MUAC the main component of higher complexity is the level of adjusted density.
- The complexity of an airspace and its possible impact on cost are considered with the composition of the comparator groups and the related baseline value of the determined cost. Therefore, higher costs due to complexity of an airspace are already considered when assessing cost-efficiency targets in respect of the DUC level.
- Complexity is partly driven by exogenous factors such as traffic patterns and the volume of traffic. These aspects of complexity cannot be affected by the ANSPs/Member States. On the other hand, there are aspects of complexity which are under the influence of the Member State and the ANSP (e.g. airspace design, airspace management, and military operations).

- For skeyes, airspace design and airspace management aspects have a significant impact on complexity. Member State/ANSPs should try reducing complexity through better airspace design, better implementation of FUA and better CIV/MIL cooperation. Belgium provided information that skeyes is planning measures in this regard, which should result in lower complexity in the coming years.
- It is not possible to observe any significant increase in traffic complexity in the period 2017-2019. For skeyes, complexity scores varied, while for MUAC, there has been a slight increase. Similarly, there is no evidence of an increase in complexity during the remaining years of RP3. Therefore, neither of these tendencies could account for a significant increase in operational costs.

3 DETAILED ASSUMPTIONS AND PARAMETERS UNDERLYING THE DETERMINED COSTS OF SKEYES AND MUAC, FOR EACH YEAR OF RP3 AND BROKEN DOWN PER COST CATEGORY AND SERVICE

92 This section analyses the actual cost structure and the evolution of costs at charging zone level for skeyes and MUAC separately, including the assumptions underlying the determined costs for RP3. It also identifies areas where costs could be reduced.

3.1 Information requests sent to Belgium for the detailed examination

93 The EC sent to Belgium an information request regarding the assumptions and parameters underlying the determined costs of skeyes and MUAC for each year of RP3 broken down per cost category and service (Table 11).

Questions asked by the European Commission
A) Please provide a breakdown of the actual staff costs, presented separately for skeyes and MUAC, and broken down per calendar year from 2019 to 2021 for the different categories of staff (including ATCOs in operation, other ATCOs, maintenance staff and support/administrative staff, staff in training). Please present also the number of staff associated with each category.
B) Please provide a breakdown of the pension costs of skeyes and MUAC from 2019 (included) for the different categories of staff (including ATCOs in operation, ATCOs in training, other ATCOs, maintenance staff and support/administrative staff).
C) Please provide a breakdown of the actual/determined other operating costs for skeyes and MUAC from 2019 (included) into the different categories (e.g. utilities, training, ATCO licensing, etc.).
D) Please describe the procedure followed by the NSA for the establishment of the determined costs as included in the draft revised performance plan, as well as for the verification of the cost eligibility.
E) Please provide an analysis of the accounts for regulated and non-regulated activities for each of the ANSP included in the en route charging zone.

Table 11 – Summary of main information requested in respect of Element 3.

Assessment of completeness of the additional information provided by Belgium

94 Belgium provided most of the information requested, although in some instances this was not fully reconcilable with the data included in the revised draft performance plan (e.g. skeyes total 2019 staff costs included in the staff costs breakdown table provided by Belgium in December 2022 does not reconcile either with the actual 2019 staff costs data included in the reporting tables or with the 2019 baseline value stemming from the revised draft performance plan). Additionally, details concerning ATCO licensing and training costs were not clearly presented.

95 Nevertheless, the PRB found the information provided sufficient for the purpose of the analysis. Where necessary, the PRB has complemented the information provided with data from other sources, including supporting material provided during the stakeholders consultations to the revised draft performance plan, as well as skeyes and MUAC annual reports and accounts.

3.2 Analysis

Overview of costs included in the charging zone

96 The Belgium-Luxembourg en route charging zone includes costs relating to en route and approach services provided by four different entities:

- Skeyes, providing en route services in the airspace of Belgium and Luxembourg below FL245 and approach services to the Belgian airports;
- ANA LUX, providing approach services to Luxembourg airport;

- The Maastricht Upper Area Control Centre (MUAC), serving the upper airspace,¹³ and
- The local National Supervisory Authorities of Belgium and of Luxembourg.

A summary of costs, service units, and unit costs of the Belgium-Luxembourg en route charging zone is shown in Table 12. The 2024 determined costs for Belgium-Luxembourg are expected to increase by +8.1% (+17M€₂₀₁₇) and +22% (+41M€₂₀₁₇) above the 2019 and 2014 baseline values respectively, which in turn are higher than the respective actual costs (see section below on the baseline analysis). MUAC and skeyes are the entities contributing the most to the increase.

- 97 The en route DUC is estimated to reach 89.87€₂₀₁₇ in 2024, the highest in the SES area, that is +7.9% and +9.9% above the 2019 and 2014 baseline DUC values respectively.

En route costs (M€ ₂₀₁₇)	2014B	2019B	2024D	2014B-2024D CAGR	2019B-2024D CAGR
skeyes	114	131	135	+1.8%	+0.7%
ANA LUX	5.8	6.5	6.2	+0.7%	-0.9%
MUAC (Belgium-Luxembourg)	54	61	75	+3.7%	+5.5%
Belgium-Luxembourg NSAs*	13	13	12	-0.5%	-1.9%
Total Belgium-Luxembourg	187	211	228	+2.2%	+2.0%

En route service units (M) – Belgium-Luxembourg	2.3	2.5	2.5	+1.2%	+0.0%
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En route unit costs (€₂₀₁₇) - Belgium-Luxembourg	81.78	83.26	89.87	+1.1%	+1.9%
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Table 12 – Summary of costs, service units, and unit costs of Belgium-Luxembourg en route charging zone (Source: PRB elaboration on the revised draft performance plan). * NSAs costs include contributions to Eurocontrol.

- 98 The en route cost-efficiency targets included in the revised draft performance plan of Belgium-Luxembourg do not meet any of the criteria provided in Annex IV of performance and charging Regulation. The PRB and the EC therefore considered them as not being consistent with the Union-wide RP3 criteria:
- The planned RP3 DUC trend (+1.9%) is worse than the Union-wide trend (+1.0%);
 - The planned long-term DUC trend (+1.1%) is worse than the Union-wide trend (-1.3%); and
 - The 2019 DUC level is +13% above the average of the comparator group.¹⁴
- 99 The planned deviation from the long-term DUC trend (+44M€₂₀₁₇) exceeds the additional costs for the capacity related measures as included by Belgium-Luxembourg (Element 1) in the revised draft performance plan by +23M€₂₀₁₇ (Table 13, next page).

¹³ MUAC provides air traffic services in the upper airspace (above FL 245) of Belgium, Luxembourg, the Netherlands, and part of Germany. Its costs are allocated across the four Member States based on agreed sharing-keys (see Element 0).

¹⁴ Including Belgium-Luxembourg, Switzerland, the Netherlands, and Austria.

RP3 en route cost-efficiency assessment criteria	Union-wide targets/average comparator group level	Belgium-Luxembourg targets	Deviation (M€ ₂₀₁₇)
DUC consistency with the Union-wide RP3 DUC target	+1.0%	+1.9%	+8.2
DUC consistency with the Union-wide long-term DUC target trend	-1.3%	+1.1%	+44
DUC level consistency	73.53	83.26	+25
Deviation capacity proposed	n/a	23	+21
Deviation restructuring	n/a	n/a	n/a

Table 13 – RP3 cost-efficiency consistency criteria for Belgium-Luxembourg en route charging zone (Source: PRB elaboration on the revised draft performance plan).

Improvements in the revised draft performance plan 2022 vs draft performance plan 2021

- 100 The trends presented in the revised draft performance plan 2022, although not consistent with the Union-wide criteria for RP3, represent an improvement compared to the draft performance plan 2021 (+5.7% and +4.0% over RP3 and the long-term respectively). The cost-efficiency improvement observed between the performance plans are, for the most part, the result of a reduction in the 2024 determined costs at charging zone level (-19M€₂₀₁₇) and, to a lesser extent, the result of the higher traffic presented in the STATFOR June 2022 base forecast. Amongst the entities included in the Belgium-Luxembourg en route charging zone, skeyes made the most significant contribution to the cost reduction with a decrease of -16M€₂₀₁₇ in its 2024 cost base.
- 101 Based on the information provided in the revised draft performance plan 2022, skeyes achieved this reduction in costs through productivity improvements (-5.5M€₂₀₁₇), the revision of the investment plan and other operational expenses (-4.2M€₂₀₁₇), and the refund of the ANSP's 2021 cost sharing result (-6.5M€₂₀₁₇, included as exceptional item in the 2024 cost base). Over the three-year period 2022-2024, skeyes reduced the total determined costs by -41M€₂₀₁₇. MUAC's contribution to the cost reduction observed between the performance plans amounted to -0.3M€₂₀₁₇ in both 2023 and 2024.

RP3 and long-term DUC trends applied to skeyes and MUAC

- 102 Considering their relative weight in the cost base of the charging zone, this analysis considers the contribution of skeyes and MUAC to the deviations from the Union-wide cost-efficiency targets. The analysis focused only on the two trend criteria (i.e. consistency with RP3 DUC trend and long-term DUC trend), which are applied to each entity's DUC computed using the total service units for the entire charging zone.
- 103 Skeyes' estimated 2024 DUC is +0.7% CAGR above both the 2014 and the 2019 baseline DUC values (Table 14). This meant that while skeyes is consistent with the RP3 DUC trend, skeyes' DUC increase over the long-term (RP2+RP3) is not consistent with the Union-wide target. The deviation from the long-term trend is estimated at +22M€₂₀₁₇, half of the deviation at charging zone level.

RP3 en route cost-efficiency assessment criteria	Union-wide targets	Targets applied to skeyes	Deviation (M€ ₂₀₁₇)
DUC consistency with the Union-wide RP3 DUC target	+1.0%	+0.7%	n/a
DUC consistency with the Union-wide long-term DUC target trend	-1.3%	+0.7%	+22

Table 14 – RP3 cost-efficiency consistency criteria for skeyes en route entity (Source: PRB elaboration on the revised draft performance plan).

104 MUAC's 2024 DUC is higher than both the 2014 baseline (+2.5% CAGR) and the 2019 baseline (+5.5% CAGR) DUC values (Table 15). As a result, MUAC's DUC evolution over RP3 is not consistent with neither of the two trend criteria. The relative costs deviations are estimated at +12M€₂₀₁₇ for RP3 (this deviation is compensated, at charging zone level, by the positive contribution brought by skeyes as well as the other entities) and +22M€₂₀₁₇ over the long-term trend (the remaining half of the total deviation at charging zone level).

RP3 en route cost-efficiency assessment criteria	Union-wide targets	MUAC (BE-LUX) targets	Deviation (M€ ₂₀₁₇)
DUC consistency with the Union-wide RP3 DUC target	+1.0%	+5.5%	+12
DUC consistency with the Union-wide long-term DUC target trend	-1.3%	+2.5%	+22

Table 15 – RP3 cost-efficiency consistency criteria for MUAC (Belgium-Luxembourg) en route entity (Source: PRB elaboration on revised draft performance plan).

Reconciliation of actual en route costs included by skeyes and MUAC in the revised draft performance plan

105 Skeyes actual costs presented in the revised draft performance plan have been compared to the figures provided in the annual financial statements for the years 2019-2021.¹⁵ Overall, the data provided in the revised draft performance plan is broadly consistent with skeyes audited accounts.¹⁶

106 MUAC costs for the same period are also overall consistent with the figures presented in the MUAC annual reports. The costs allocated to the Belgium-Luxembourg en route charging zone results from the application of specific sharing keys agreed by the four MUAC Member States (see analysis of Element 5).

2014 and 2019 baseline

107 Belgium-Luxembourg included a number of adjustments to both the 2014 and 2019 cost baselines (ten and 11 adjustments respectively) to ensure consistency with the scope of the RP3 determined costs:

- For skeyes, three adjustments were included in both the 2014 and the 2019 cost baselines (relating to staff, other operating, and depreciation costs), which resulted from changes to the cost allocation methodology for approach services used in RP3 compared to RP2 (Element 7). These adjustments amount to +14M€₂₀₁₇ for 2014 and +14M€₂₀₁₇ for 2019 and have a significant impact on the entity's cost baselines, which are respectively +14% and +12% above the 2014 and 2019 actuals.
- For MUAC, the adjustments to the 2014 and 2019 baseline values reflect the transfer from the general Eurocontrol budget to the specific MUAC budget of the costs related to the tax compensation on pensions (progressively borne by the four MUAC Member States over the 2016-2022 period) and of the costs for support services provided to MUAC by other functions of the Eurocontrol Agency (entirely allocated to the four Member States as of 2016). These costs result in a +6.0M€₂₀₁₇ increase (+12%) of the 2014 baseline compared to the 2014 actual costs and a +3.3M€₂₀₁₇ increase (+5.8%) for 2019.

108 Removing the adjustments to the 2019 baseline value for skeyes and MUAC (+18M€₂₀₁₇) would have resulted in a unit cost of 76.30€₂₀₁₇, which is -8.4% lower than when considering the 2019 baseline.¹⁷ Despite this (possible) reduction, the DUC level would still have been +3.8% above the average DUC of the comparator group (thus not being consistent with the DUC level criterium, although significantly reduced compared to the current +13%). On the other hand, a lower 2019 baseline value would have resulted in a deterioration of the RP3 trend. Thus,

¹⁵ To reconcile these figures, terminal data for the regulated (EBBR) and un-regulated (airports outside the scope of SES performance and charging scheme) airports were considered too.

¹⁶ Minor differences have been found and are attributable to activities outside the scope of the performance scheme. It is understood that the difference between the other operating costs included in the annual accounts and the figures reported in the draft performance plan reflects the contributions paid by skeyes to the Eurocontrol and MUAC budgets.

¹⁷ The other adjustments included in the 2019 baseline value, relating to ANA LUX and the NSA/Eurocontrol entity were maintained, as their impact is considered negligible.

the analysis shows that a revision of the adjustments to the 2019 baseline included in the revised draft performance plan would not have made the plan consistent with the cost-efficiency targets.

Overview on cost-efficiency performance over RP2 and RP3

- 109 Belgium-Luxembourg en route unit costs show a steady upward trend over the period 2014-2024. The observed growth in unit cost (+3.1% per annum) results from a +3.9% CAGR increase in total costs, while the average traffic growth remained below +1% yearly (Figure 4).
- 110 Actual costs increased every year over RP2, with year-on-year variations above +5% in 2017 and 2019. For the period 2014-2018, the increase in en route costs was broadly in line with the increase in traffic, leading to a relatively stable unit cost. In 2019, costs and traffic started to diverge (+7.6% and -0.9% respectively). In 2020 and 2021 there was a drastic traffic decrease with only marginal cost reductions (however costs were below the 2019 baseline). The expected 2022-2024 recovery towards pre-pandemic levels is shows a strong cost increase, with determined costs significantly increasing compared to the 2019 baseline (+45M€₂₀₁₇ cumulatively).

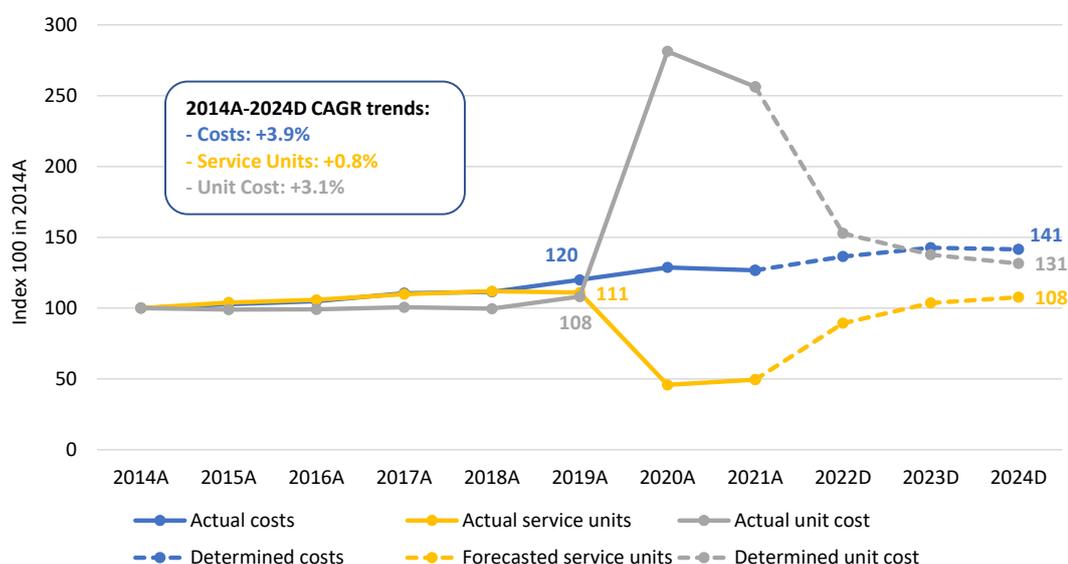


Figure 4 – 2014A-2024D evolution of costs, traffic, and unit costs in Belgium-Luxembourg charging zone – index 100 in 2014A (Source: PRB elaboration on the revised draft performance plan).

- 111 Given their relative weight in the charging zone’s cost base, skeyes and MUAC are the main contributors to the cost increase. Over RP2, both entities had a strong increase in staff and other operating costs. For skeyes, staff and other operating costs grew from 87M€₂₀₁₇ in 2015 to 105M€₂₀₁₇ in 2019 (+11%, or +8.2€₂₀₁₇ in staff costs and +84%, or +9.3M€₂₀₁₇ in other operating costs). MUAC’s operating costs increased by +28% (+19%, or +7.1M€₂₀₁₇ in staff costs and +117%, or +4.7M€₂₀₁₇ in other operating costs). Differently, depreciation and cost of capital decreased progressively over RP2 for skeyes and remained broadly stable for MUAC.
- 112 Skeyes’ 2022 total determined costs are planned to remain below the 2019 baseline (as was the case for the 2020-2021 actuals), and to increase in 2023 and in 2024 (+3.0% above the baseline for both years). Staff costs and other operating costs are the main contributors to the increase, while depreciation costs are expected to increase above the baseline only in 2024. The inclusion of negative exceptional costs in skeyes’ 2024 determined cost base helped smooth the increase.
- 113 For MUAC, the difference between 2022-2024 determined costs and 2019 baseline costs is more significant and is fully attributable to the increase in staff costs (+40M€₂₀₁₇ cumulatively over 2022-2024).

Skeyes and MUAC unit cost evolution against the service providers within the comparator group

- 114 Skeyes’ and MUAC’s unit cost evolution over RP2 is assessed against the entities involved in the provision of services within each of the en route charging zones included in the same comparator group.¹⁸ The unit costs of the main ANSPs across the four charging zones in the comparator group remained relatively stable between 2014 and 2019, although both skeyes and LVNL (including their relative shares of MUAC costs) increased them already in 2019.
- 115 In 2020-2021, the drop in traffic resulted in a significant increase in unit costs for all the entities. Over the 2022-2024 period, the increase in forecasted service units is uneven across the different charging zones. For the Netherlands and Belgium-Luxembourg, 2024 service units are broadly in line with the 2019 level, whilst for Austria and Switzerland they are expected to increase by +5.4% and +6.0% above the 2019 baseline, respectively. Cost trends differ significantly across the four entities. While Austro Control’s RP3 costs are expected to remain below the 2019 levels (2024 costs are -17% lower than the 2019 baseline), for LVNL (including MUAC) and Skyguide¹⁹ the increase in costs is respectively +2.0% and +5.7% (2024D vs 2019B). Skeyes’ (including MUAC) 2024 costs are planned to increase by +11%, resulting in a similar increase in the DUC. As a result, in 2024 skeyes-MUAC DUC is expected to be the highest across the comparator group (Figure 5).

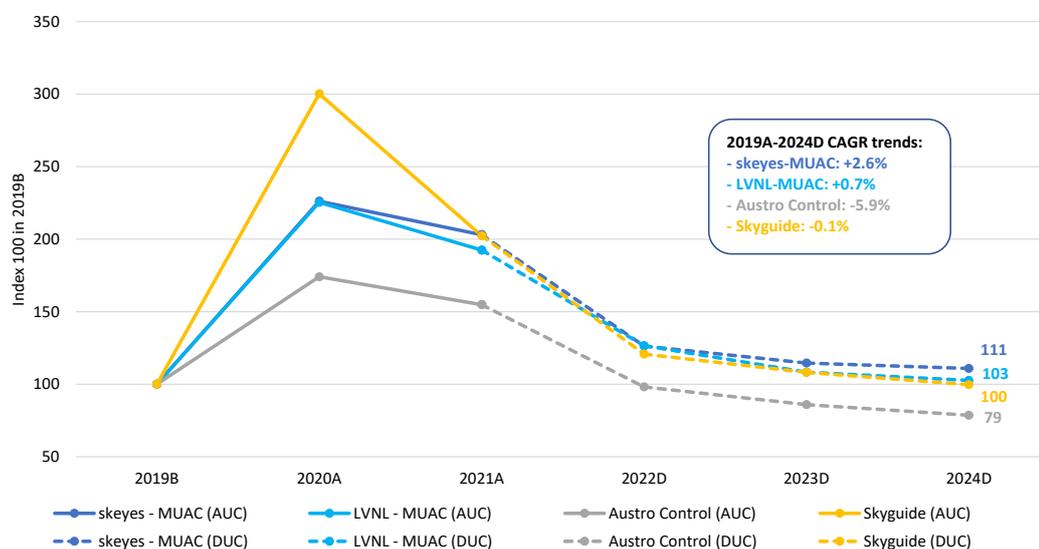


Figure 5 – 2019B-2024D evolution of actual/determined unit costs for the service providers in the comparator group – index 100 in 2019B (Source: PRB elaboration on revised draft performance plan).

Detailed assumptions and parameters underlying the determined costs of skeyes over RP3

- 116 In the revised draft performance plan, Belgium decided not to apply the inflation forecast published by the IMF in April 2022, but to rely on the forecast provided by the Belgium Federal Planning Bureau. Belgium deemed this consistent with the national indexation mechanism. As a result, apart from the year 2022, the inflation forecast used by Belgium in the revised draft performance plan is higher than the one provided by the IMF. However, the inflation forecast applied by Belgium-Luxembourg is closer to the latest IMF update (October 2022).
- 117 Skeyes’ RP3 determined costs, as included in the revised draft performance plan, are expected to increase over the remainder of RP3 and reach 135M€₂₀₁₇ in 2024 (+3.0% compared to the 2019 baseline value and +12% over the average 2020-2021 actual costs). The increase is particularly significant for the years 2023 and 2024

¹⁸ For Belgium-Luxembourg, skeyes and MUAC (for the part allocated to the Belgium-Luxembourg en route charging zone) are considered, for the Netherlands, LVNL, and MUAC (for the part allocated to the Netherlands en route charging zone), for Austria (Austro Control), and for Switzerland (Skyguide). Considering that skeyes is the only entity providing meteorological services internally, MET costs have been removed from skeyes cost base.

¹⁹ Skyguide RP3 costs are influenced by the change in capitalisation rules and the reduced financing of delegated airspace, which resulted in additional costs for the provider. However, the impact of these changes is offset by the inclusion of negative exceptional items in the determined costs.

(+4.0M€₂₀₁₇ and +3.9M€₂₀₁₇ above the 2019 baseline, respectively), also considering the inclusion of negative exceptional items in the 2024 cost base (-6.5M€₂₀₁₇), reflecting the difference between actual and determined costs in 2021. Although this trend is explained by increases in all the cost categories, staff and other operating costs, which together represent over 90% of the total 2024 cost base, are the two categories contributing the most to the increase.

118 A summary of skeyes' en route costs for the years 2019 actual and 2024 determined, as well as the impact of the adjustments to the 2019 baseline value, are provided in Table 16.

skeyes en route costs (M€ ₂₀₁₇)	2019B	2024D	Difference M€ ₂₀₁₇ (FTEs)
Staff costs –information provided during the detailed examination	98²⁰	102	+4.1 (+56)
<i>ATCO</i>	[30-50]	[30-50]	[(-10)-0] [(-10)-0]
<i>ATCO in training</i>	[0-5]	[0-5]	[0-2] [(-10)-0]
<i>ATCO in DISPO</i>	[0-5]	[5-10]	[0-10] [(-10)-0]
<i>Other Air Traffic Services</i>	[5-10]	[5-10]	[0-5] [(-10)-0]
<i>Aeronautical Information Services</i>	[0-5]	[0-5]	[(-5)-0] [(-10)-0]
<i>Meteorological services</i>	[0-5]	[0-5]	[(-5)-0] [(-5)-0]
<i>Technical services</i>	[10-15]	[10-15]	[0-5] [(-10)-0]
<i>IT</i>	[0-5]	[0-5]	[0-5] [(-10)-0]
<i>Project Management</i>	[0-5]	[0-5]	[0-5] [(-10)-0]
<i>Facilities and administration</i>	[10-15]	[10-15]	[(-5)-0] [(-10)-0]
<i>Safety, security and quality</i>	[0-5]	[0-5]	[0-5] [(-10)-0]
<i>Other staff costs (e.g. training)</i>	[5-10]	[5-10]	[(-5)-0] [(-5)-0]
Of which Pension costs ²¹	[10-20]	[10-20]	[0-5]
	2019B	2024D	Difference
Staff costs adjustment to 2019B	+11	n/a	-11
Staff costs – revised draft performance plan	95	102	+6.5

²⁰ Skeyes detailed breakdown of en route staff costs provided during the detailed examination includes, for the year 2019, a total staff cost of 98M€₂₀₁₇. This amount differs from the 2019 actual data included in the reporting tables of the draft performance plan (84M€₂₀₁₇) and from the 2019 baseline value (95M€₂₀₁₇). As it is closer to the baseline value, it is assumed that the data provided refers to the 2019 baseline values. As a result of this difference, the 2019 actual costs for ATCOs in DISPO ([0-5]M€₂₀₁₇) differs from the value included in Element 8 ([0-5]M€₂₀₁₇).

²¹ Pension costs could not be clearly allocated across the different staff categories presented in the table. Therefore, although presented for information, their impact is included as part of the staff costs

	2019A	2024D	Difference
Other operating costs –information provided during the detailed examination	20	25	+4.4
<i>Maintenance and Repair - Premises</i>	5.0	7.5	+2.6
<i>Supplies for the company</i>	3.1	4.7	+1.5
<i>Third party payments</i>	11	10	-0.5
<i>Amounts written down - trade debts (ST)</i>	0.3	2.2	+1.9
<i>Provision for other risks & liabilities</i>	2.0	0	-2.0
<i>Others and ancillary revenues</i>	-0.9	0.1	+0.9

	2019B	2024D	Difference
Other operating costs adjustment to 2019B	+2.6	n/a	-2.6
Other operating costs 2019B and 2024D	23	25	+1.8

	2019A	2024D	Difference
Depreciation costs – revised draft performance plan	8.2	11	+2.9

	2019B	2024D	Difference
Depreciation costs adjustment to 2019B	1.0	n/a	-1.0
Depreciation costs 2019B and 2024D	9.2	11	+1.8

	2019A/B	2024D	Difference
Cost of capital – revised draft performance plan	3.4	3.6	+0.2

Table 16 – Skeyes’ detailed costs breakdown – 2019 actual and 2024 determined, including baseline adjustments (Source: PRB elaboration on the revised draft performance plan and on the information provided during the detailed examination).

119 Staff costs in 2024 are expected to be +6.9% (+6.5M€₂₀₁₇) above the 2019 baseline and +12% (+11M€₂₀₁₇) above the average 2020-2021 actual staff costs. Based on the information provided during the detailed examination, Belgium states that three main factors contribute to the increase in staff costs:

- The FTEs evolution, including the recruitment of ATCO trainees and other technical profiles as well as the costs associated with the growing number of ATCOs going in pre-retirement (see Element 8);
- Raising inflation and automatic salary indexation (although this effect is removed when analysing the changes in costs in real terms); and
- The salary grade and merits increase ([0.5-3]% yearly).

120 Based on the information provided, the total number of skeyes en route staff, including the share of approach staff allocated to en route, is planned to increase by +[5%-10%] (+[40-70] FTEs) between 2019B and 2024. This increase is mostly due to the increased recruitment of technical personnel ([20-25]%, or [15-20] FTEs), other ATS staff ([10-15]%, or [10-15] FTEs) and, to a lesser extent, ATCOs students ([5-10]%, or [0-5] FTEs). The number of operational ATCOs is expected to remain relatively stable between 2019B and 2024 ([(-5)-0]%, or [(-5)-0] FTEs), although this result is strongly affected by the growing number of ATCOs entering the DISPO scheme, thus transitioning from one staff category to the other (Element 8). As a result, it seems that the RP3 ATCOs recruitment process aims at offsetting the impact of the DISPO scheme, for the purpose of maintaining capacity at 2019 levels.

121 The changes in the staff costs for each staff item provided in Table 16 reflect this evolution, although in some cases the variation in staff costs differs significantly from the variation in FTEs numbers, because of different evolutions in the average staff costs per staff category.

122 The PRB analysis shows that, in relation to the increase in the number of staff, the increase of ATCOs in the DISPO scheme has a major impact on the staff evolution over RP3 (+113%, or +27 FTEs in DISPO between 2019B and

2024). The observed trend in pre-retirements is expected to continue after RP3, as the number of ATCOs in DISPO is foreseen to grow until 2030. The DISPO mechanism has a significant impact on skyes' staff costs, as the costs associated with the pre-retirement scheme are expected to grow at a higher rate than the number of staff joining the scheme (Element 8). DISPO-related measures are expected to cause +5.3M€₂₀₁₇ of the cost increase between 2024 and 2019. The removal of these costs would bring the 2024 determined staff costs close to the 2019 baseline level.

- 123 Pension costs are expected to grow over the remainder of RP3, from [10-15]M€₂₀₁₇ in the 2019 baseline to [15-20]M€₂₀₁₇ in 2024 ([10-15]%, or [0-10]M€₂₀₁₇). The share of pension costs is expected to remain stable around 15% of the total staff costs for the period 2020-2024.
- 124 Other operating costs increase by +7.7% in 2024 as compared to the 2019 baseline value (and +36% with respect to the average 2020-2021 actual 2019 other operating costs). While there is a reduction in 2020 and 2021, these costs continue to increase until the end of RP3. Based on the information provided during the detailed examination, the +4.4M€₂₀₁₇ increase between 2019 actuals and 2024 determined costs is mainly due to higher costs for maintenance, supplies as well as trade debt write-down. These were partially compensated by lower provisions for risk and liabilities. In this respect, part of the increase in maintenance and supply costs might be attributed to the fact that, compared to RP2, a greater portion of approach costs is allocated to en route. The increase in 2024 operating costs is reduced to +1.8M€₂₀₁₇ when compared to the 2019 baseline.
- 125 According to the analysis, depreciation costs are expected to remain below the 2019 baseline level in 2021-2023, and to increase in 2024 (+20%, or +1.8M€₂₀₁₇ above the 2019 baseline value). The increase is due to the implementation of the RP3 investment plan, leading to a steep increase in the net book value of fixed assets by the end of RP3. The cost of capital is also expected to increase by the end of RP3 although, in absolute values, it remains well below the cost of capital charged in RP2 due to the application of a lower return on equity and an average interest on debt close to 0%.

Detailed assumptions and parameters underlying the determined costs of MUAC (Belgium-Luxembourg) over RP3

- 126 Based on the information provided, MUAC's determined costs allocated to the Belgium-Luxembourg en route charging zone are planned to increase steadily over the last three years of RP3, reaching a total of 75M€₂₀₁₇ in 2024 (+24%, or +15M€₂₀₁₇ above the 2019 baseline costs value). Over this period, the total cost base is expected to exceed 70M€₂₀₁₇ with +41M€₂₀₁₇ added, cumulatively for the three years, to the 2019 baseline (+60M€₂₀₁₇ to the 2014 baseline).
- 127 A summary of MUAC's en route costs for the years 2019 actual and 2024 determined, including the 2019 baseline adjustments is provided in Table 17 (next page).

MUAC (Belgium-Luxembourg) (M€ ₂₀₁₇)	2019A	2024D	Difference
Staff costs –information provided during the detailed examination	45	64	+18
<i>Remuneration²²</i>	<i>[30-45]</i>	<i>[20-64]</i>	<i>[0-15]</i>
<i>Pensions</i>	<i>[0-5]</i>	<i>[10-20]</i>	<i>[5-10]</i>
<i>Tax compensation</i>	<i>[0-5]</i>	<i>[5-10]²³</i>	<i>[(-5)-0]</i>

	2019B	2024D	Difference
Staff costs adjustment to 2019B	3.3	n/a	-3.3
Staff costs 2019B and 2024D	49	64	+15

	2019A/B	2024D	Difference
Other operating costs –information provided during the detailed examination	8.7	8.8²⁴	+0.2
Direct operating costs	7.2	7.9	+0.8
<i>Staff related: training (including Ab initio training) and travel costs</i>	<i>1.6</i>	<i>1.2</i>	<i>-0.4</i>
<i>External assistance</i>	<i>2.1</i>	<i>1.8</i>	<i>-0.4</i>
<i>Accommodation, communications, data processing, general administration, finance & insurance, unrecoverable VAT, and miscellaneous revenues</i>	<i>3.5</i>	<i>5.1</i>	<i>+1.6</i>
HQ support operating costs	1.4	1.2	-0.2
1M€ reduction 2024 ²⁵	-	-0.3	-0.3

	2019A/B	2024D	Difference
Depreciation costs – revised draft performance plan	3.2	2.7	-0.5

	2019A/B	2024D	Difference
Cost of capital – revised draft performance plan	0.04	0.1	+0.1

Table 17 – MUAC detailed costs breakdown – 2019 actual and 2024 determined, including baseline adjustments (Source: PRB elaboration on the revised draft performance plan and on the information provided during the detailed examination).

128 The expected increase in MUAC costs over the remainder of RP3 is entirely driven by higher staff costs, which are planned to reach a total of 64M€₂₀₁₇ in 2024 (+18M€₂₀₁₇ above the 2019 actual staff costs). This increase in staff costs is the result of the following trends:

- Higher remuneration costs, which are planned to increase by [0-15]M€₂₀₁₇ in 2024 compared to the actual 2019 value;
- Higher pension costs, planned to increase by [5-10]M€₂₀₁₇; and
- Higher tax compensation on pensions, the impact of which is included in the staff and pension costs variations noted above and that cannot be isolated for 2024.

²² Remuneration costs are estimated as difference between staff and pension costs. For 2019, also tax compensation costs were removed.

²³ 2024 determined tax compensation costs could not be clearly isolated from pension and remuneration costs. Therefore, although presented in Table 17 for information, their impact is included in the remuneration and pension costs.

²⁴ The readjustment to the new inflation index used in the revised draft performance plan has been allocated proportionally across the different entries within the other operating costs category.

²⁵ In the revised draft performance plan 2022, MUAC included savings for 1M€ for both the determined years 2023 and 2024 compared to the draft performance plan 2021. The share of this reduction included in the 2024 Belgium-Luxembourg en route cost base amounts to 0.3M€₂₀₁₇.

Considering the +3.3M€₂₀₁₇ adjustment to the 2019 baseline value, MUAC's 2024 total staff costs are expected to be +15M€₂₀₁₇ (or +30%) above the 2019 baseline staff costs value.

129 Although a breakdown of staff costs per staff category is provided only for the 2019-2021 period, data shows [confidential information regarding the average remunerations]. The entry into force of the General Condition of Employment package, which granted a +/-10% increase in remuneration in return for additional flexibility (Element 1), is the main driver. The total number of staff employed by MUAC increased slightly in 2020 and 2021 compared to 2019, mainly due to the intake of additional ab initio trainees, as well as to other maintenance, support, and administrative staff (Element 6). Based on the information provided in the context of the stakeholders' consultation, the total MUAC staff number is expected to remain relatively stable over the 2022-2024 period.

130 Besides staff costs, the variations in the other costs items within the MUAC cost base are minor.

3.3 Conclusions

- Skeyes' and MUAC's actual costs, as included in the revised draft performance plan, are broadly consistent with the annual accounts of the two entities for the years 2019-2021.
- Both skeyes and MUAC included several adjustments to their 2014 and 2019 cost baselines. These reflect the change in the cost allocation methodology for skeyes and the allocation of tax compensation and support costs to the MUAC budget for MUAC.
- Skeyes' and MUAC's costs showed a steady increase over RP2, mostly driven by higher staff and other operating costs, broadly in line with the traffic trend. The increase in costs is expected to continue during the remainder of RP3, despite the reduced traffic levels. Within the comparator group (at ANSP level), skeyes and MUAC are expected to have the highest DUC by the end of RP3.
- Skeyes' 2024 determined costs are expected to raise by +3.0% (or +3.9M€₂₀₁₇) above the 2019 baseline value. This increase is mostly attributable to the expected increase in staff and other operating costs (+6.9%, or +6.5M€₂₀₁₇ in staff costs and +7.7%, or +1.8M€₂₀₁₇ for other operating costs).
- MUAC's 2024 determined costs are expected to raise by +24% (or +15M€₂₀₁₇) above the 2019 baseline value. This increase is mainly attributable to the expected increase in staff costs (+30%, or +15M€₂₀₁₇).
- Considering their relative weight in the cost base of the charging zone, the contribution of skeyes and MUAC to the deviations from the long-term DUC trend (+44M€₂₀₁₇) at charging zone level is equal and amounts to +22M€₂₀₁₇ for each ANSP.

4 SERVICE UNITS RECORDED AND FORECASTED IN THE CHARGING ZONE, BROKEN DOWN PER ANSP

- 131 This section analyses the service units controlled by skeyes and MUAC within the Belgium-Luxembourg charging zone.
- 132 For skeyes, this allows for the examination of the costs and unit cost structure and evolution of skeyes in comparison to LVNL, the most comparable ANSP with respect to the services provided. The analysis is based on the service units controlled by each ANSP (excluding those controlled by MUAC in each charging zone). This allows the identification of areas where improvements could be sought to reduce the deviation from the RP3 Union-wide cost-efficiency targets.
- 133 For MUAC, this enables the assessment of the impact of the methodology defined and applied by the four MUAC Member States (Belgium, Luxembourg, Germany, and the Netherlands) to allocate the MUAC costs to the different charging zones where MUAC provides air navigation services (presented in Element 5).

4.1 Information requests sent to Belgium for the detailed examination

- 134 The EC sent to Belgium an information request regarding the service units recorded and forecasted in the charging zone, broken down per ANSP (Table 18).

Questions asked by the European Commission
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Please provide the actual and determined service units from 2015 to 2024 for each ANSP included in the en route charging zone.
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Table 18 – Summary of main information requested in respect of Element 4.

Assessment of completeness of the additional information provided by Belgium

- 135 Belgium provided some of the information requested. It included the actual en route service units controlled by MUAC in the different charging zones for the period 2015-2021 (numbers are also reported in MUAC's annual reports), while the forecasted service units for MUAC airspace have not been provided. These PRB has estimated these values for the present analysis.
- 136 Belgium did neither provide estimates for the en route service units controlled by skeyes in the Belgium-Luxembourg en route charging zone. The PRB has estimated the missing values as the difference between the total service units and those provided or estimated for MUAC. The en route service units controlled by LVNL in the Netherlands en route charging zone have been estimated in a similar manner.
- 137 Despite the lacking information, the PRB found the information provided sufficient for the purpose of the analysis.

4.2 Analysis

- 138 To analyse the costs of skeyes per service units that skeyes controls, the PRB compared the situation to a similar environment, such as the one of the Netherlands' charging zone. This analysis is therefore composed by the comparison of:
- Characteristics of the charging zones;
 - En route service units in the charging zones;
 - En route unit costs in the charging zones;
 - En route unit costs by nature in the charging zones; and
 - Cost allocation within charging zones.

Comparability of the charging zones of Belgium-Luxembourg and of the Netherlands

- 139 The Belgium-Luxembourg en route charging zone has two specific characteristics:
- Belgium-Luxembourg is the only common charging zone among the Member States of the Single European Sky covering the airspace of two Member States; and

- The services above FL245 in the entire airspace are provided by MUAC. This is also the case for the Netherlands en route charging zone, while the services provided by MUAC in Germany above FL245 only cover a part of the airspace. In the Belgium-Luxembourg en route charging zone, the en route air navigation services below FL245 are provided by skeyes, whereas approach services, for which costs are partially allocated to the en route cost base, are provided by skeyes and ANA Luxembourg. In the Netherlands, en route air navigation services below FL245, as well as approach services, are provided by LVNL.

140 The two ANSPs are also comparable in size, traffic complexity, traffic controlled, number of ATCOs in operation, cost of living, etc. (Table 19) and are part of the same comparator group for the assessment of the 2019 baseline DUC level.

2019 key operational data for skeyes and LVNL	skeyes	LVNL
Service provision	below FL245	below FL245
Size of controlled airspace	39,500	53,000
Traffic complexity scores *	9.8	7.7
ATCOs in OPS total	206	212
Number of ACC operational units	1	1
ATCOs in OPS ACC	72	72
Size of OPS room area (m ²)	1,054	1,800
Number of sectors open at maximum configuration	6	5
IFR ACC movements	634,665	597,769
Service units controlled **	727,326	984,812
Flight-hours controlled ACC	80,386	86,533
Average transit time in minutes	8	9
Total IFR flights controlled by the ACC	634,665	597,769
Number of APP operational units	4	3
Number of TWR operational units	5	4
ATCOs in OPS APP/TWR	134	140
IFR airport movements controlled by the ANSP	365,485	555,220
Cost of living indexes based on PPPs (IMF)	1.10	1.14

Table 19 – 2019 key operational data for skeyes and LVNL (Source: PRB elaboration on the ACE Benchmarking Report 2019). *Element 2
**Estimated based on the difference between the total service units in the en route charging zone and those provided for MUAC.

En route service units in the charging zones of Belgium-Luxembourg and of the Netherlands

141 The proportion of service units controlled by MUAC and by skeyes in Belgium-Luxembourg, and by MUAC and LVNL in the Netherlands is broadly similar (around 70%/30%, Table 20, next page), although slightly higher for LVNL.

Belgium-Luxembourg en route charging zone	2014A	2019A	2022D	2023D	2024D
Total service units	2,362	2,620	2,108	2,445	2,542
Service units for flights controlled by MUAC	1,674	1,892	1,522	1,766	1,837
<i>In percentage of total</i>	71%	72%	72%	72%	72%
Service units for flights controlled by skeyes	688	727	585	679	706
<i>In percentage of total</i>	29%	28%	28%	28%	28%

The Netherlands en route charging zone	2014A	2019A	2022D	2023D	2024D
Total service units	2,767	3,381	2,593	3,081	3,294
Service units for flights controlled by MUAC	1,938	2,396	1,838	2,183	2,334
<i>In percentage of total</i>	70%	71%	71%	71%	71%
Service units for flights controlled by LVNL	830	985	755	898	960
<i>In percentage of total</i>	30%	29%	29%	29%	29%

Table 20 – En route service units ('000) in the charging zones of Belgium-Luxembourg and the Netherlands (Source: PRB elaboration on the draft revised performance plans and on the information provided during the detailed examination).²⁶

142 The total number of service units is lower in the Belgium-Luxembourg charging zone than in the Netherlands charging zone (by -15% in 2014, -23% in 2019, and -23% for 2024 determined). At ANSP level, the number of service units controlled by skeyes is also lower than for LVNL (by -17% in 2014, -26% in 2019, and -26% for 2024 determined, Figure 6).

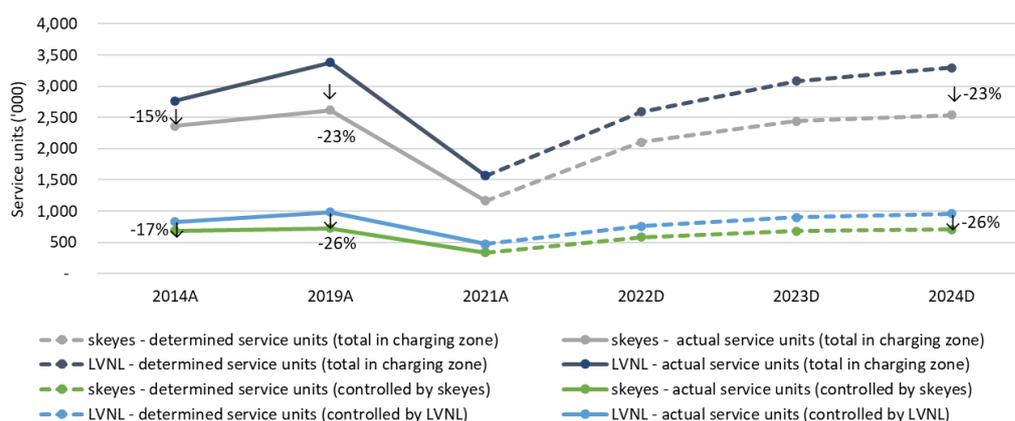


Figure 6 – En route service units ('000) in the charging zones of Belgium-Luxembourg and the Netherlands (Source: PRB elaboration).²⁷

En route costs and unit costs for skeyes and LVNL/KNMI

143 The en route costs and unit costs of skeyes include MET costs, as MET services are provided by skeyes. For consistency, the costs and unit costs of LVNL are presented together with the MET costs provided by the Royal Netherlands Meteorological Institute (KNMI) to enable a comparative analysis.

144 At the end of RP1 and of RP2, skeyes unit costs were lower than for LVNL/KNMI (by -8.1% and -10%, respectively, Table 21, next page). Due to the adjustments to the 2019 baseline (Element 3), the unit cost computed based on the 2019 baseline (cost and service units) is +2.2% higher for skeyes and the difference increases to +4.3% for 2024 (+9.4% when excluding the one-off reduction on 2024 on exceptional items, Element 3).

²⁶ The service units controlled by skeyes and LVNL have been estimated by deducting MUAC service units from the charging zone service units, MUAC service units 2022-2023 have been allocated on the basis of the total service units per charging zone and the 2019 proportions.

²⁷ Service units controlled by skeyes and LVNL have been estimated by deducting MUAC service units from the charging zone service units, MUAC service units 2022-2023 have been allocated on the basis of the 2019 proportions, and the 2019 baseline figures have been corrected for M2/M3.

skeyes	2014A²⁸	2019A	2019B	2024D
En route costs (in '000€ ₂₀₁₇)	100,056	116,528	130,874	134,747
Service units controlled (in '000)	688	727	705	706
En route unit cost (in € ₂₀₁₇)	145	160	186	191

LVNL/KNMI	2014A	2019A	2019B	2024D
En route costs (in '000€ ₂₀₁₇)	131,228	175,500	175,500	175,597
Service units controlled (in '000)	830	985	965	960
En route unit cost (in € ₂₀₁₇)	158	178	182	183

skeyes vs LVNL/KNMI	2014A	2019A	2019B	2024D
En route costs (in '000 € ₂₀₁₇)	-24%	-34%	-25%	-23%
Service units controlled (in '000)	-17%	-26%	-27%	-26%
En route unit cost (in € ₂₀₁₇)	-8.1%	-10%	+2.2%	+4.3%

Table 21 – En route unit costs per service unit controlled by skeyes (Source: PRB elaboration on the revised draft performance plans and on the information provided during the detailed examination).²⁹

En route costs and unit costs for skeyes and LVNL, by nature of costs

145 In order to understand the drivers for higher skeyes unit costs in the 2019 baseline value and at the end of RP3, the unit costs are broken down per cost nature (Table 22, next page).

²⁸ If the 2014 baseline values are considered, i.e. reflecting 1) the adjustments to the baseline 2014 costs due to the revised cost-allocation methodology for skeyes and 2) the M2/M3 correction to service units, the en route costs in €₂₀₁₇ for skeyes would be -13% lower than for LVNL/KNMI, the service units controlled would be -18% lower for skeyes than for LVNL and the resulting en route unit cost in €₂₀₁₇ would be +6.2% higher for skeyes compared to LVNL/KNMI.

²⁹ Service units controlled by skeyes and LVNL have been estimated by deducting MUAC service units from the charging zone service units, MUAC service units 2022-2023 have been allocated on the basis of the total service units per charging zone and the 2019 proportions and the 2019 baseline figures have not been corrected for M2/M3.

En route unit costs per SU controlled by skeyes, by nature of costs (in € ₂₀₁₇)	2014A	2019A	2019B	2024D
Staff	107	116	135	144
Other operating costs	15	28	33	35
Depreciation	16	11	13	16
Cost of capital	7	5	5	5
Exceptional items	0	0	0	-9
Costs for exempted VFR flights	0	0	0	0
Total	145	160	186	191

En route unit costs per SU controlled by LVNL/KNMI, by nature of costs (in € ₂₀₁₇)	2014A	2019A	2019B	2024D
Staff	116	114	116	118
Other operating costs	31	51	52	39
Depreciation	9	13	14	26
Cost of capital	2	1	1	1
Exceptional items	0	0	0	0
Costs for exempted VFR flights	-1	-1	-1	-1
Total	158	178	182	183

skeyes vs LVNL/KNMI	2014A	2019A	2019B	2024D
Staff	-7.2%	+2.2%	+16%	+23%
Other operating costs	-52%	-44%	-37%	-10%
Depreciation	+72%	-16%	-4.2%	-40%
Cost of capital	+203%	+367%	+373%	+340%
Exceptional items				
Costs for exempted VFR flights	-100%	-100%	-100%	-100%
Total	-8.1%	-10%	+2.2%	+4.3%

Table 22 – En route unit costs per SU controlled by skeyes and LVNL/KNMI, by cost nature (Source: PRB elaboration on the revised draft performance plans and on the information provided during the detailed examination).

146 Staff costs represent the larger share of en route costs for both skeyes and LVNL/KNMI (in 2019 baselines, 70% for LVNL, 72% for skeyes). The actual unit costs for staff costs for skeyes were -7.2% lower than for LVNL/KNMI in 2014, while +2.2% higher in 2019. When adding the adjustments due to the change of cost allocation between en route and terminal activities for the computation of the baseline value (Element 3), the 2014 unit cost for staff costs for skeyes becomes +8% higher than for LVNL while the 2019 unit cost for staff costs for skeyes becomes +16% higher than LVNL, and this difference reaches +23% in 2024 (Figure 7, next page). This +23% difference in the 2024 staff unit cost corresponds to a difference of +18.7M€₂₀₁₇.

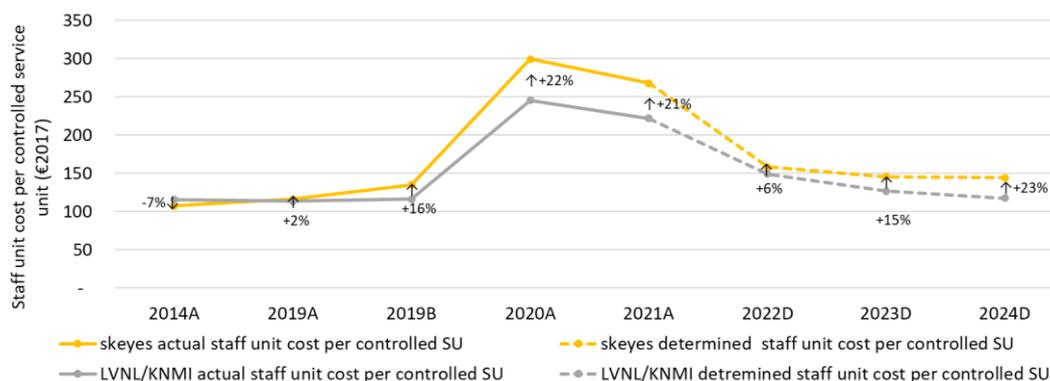


Figure 7 – En route staff unit costs for skeyes and LVNL/KNMI in €₂₀₁₇. (Source: PRB elaboration on the draft revised performance plans and on the information provided during the detailed examination).

147 The findings on the staff costs are consistent with the findings of Element 3, i.e.:

- Over RP2, skeyes staff costs showed a significant increase (+11%, or +8.2€₂₀₁₇ between 2015 and 2019);
- The adjustment to the 2019 cost baseline resulting from the changes to the cost allocation methodology used in RP3 compared to RP2 (Element 7) in respect of staff costs amounts to +11M€₂₀₁₇, and represents an increase of +13% over the actual staff costs for 2019; and
- Staff costs are planned to increase further in RP3. Values for 2024 are estimated to be +6.9% (+6.5M€₂₀₁₇) above the 2019 baseline and +12% (+11M€₂₀₁₇) above the average 2020-2021 actual staff costs. This increase is mainly due to: i) The FTEs evolution, including the recruitment of ATCO trainees and other technical profiles; and ii) the costs associated with the growing number of ATCOs going in pre-retirement (see Element 8).

148 Other operating costs represent 28% for LVNL/KNMI in 2019 and 18% for skeyes. The unit costs for other operating costs for skeyes was significantly lower than for LVNL/KNMI in 2014 (by -52%) and in 2019 (by -44%). This gap reduces to -37% for the 2019 baseline value and to -10% in 2024. These results are strongly influenced by the costs of KNMI. Without the KNMI costs, the unit cost for other operating costs for skeyes was lower than for LVNL in 2014 (by -45%) and in 2019 (by -37%). This gap reduces to -28% for the 2019 baseline value, but the situation is reversed in 2024, when the unit cost for skeyes is +10% higher than for LVNL.

149 The findings of Element 3 indicate that the increase in other operating costs between the 2019 actual and 2024 determined costs (+21%, or +4.4M€₂₀₁₇) is mainly due to:

- The adjustment to the 2019 cost baseline resulting from the changes to the cost allocation methodology used in RP3 compared to RP2 (Element 7) amounting to +2.6M€₂₀₁₇, and representing an increase of +13% over the actual staff costs for 2019; and
- An increase of +1.8M€₂₀₁₇ between the 2019 baseline and 2024 determined costs mainly due to higher costs for maintenance, supplies, as well as trade debt write-down.

150 Depreciation costs account for 7.5% of the en route costs for LVNL in 2019 and 7.0% for skeyes. Although the depreciation unit cost of skeyes, in 2014, was significantly higher than that of LVNL (by +72%), it was lower than LVNL's in 2019 (by -16%). The adjustment to the 2019 baseline value reduces this gap to -4.2% for 2019 baseline, however the gap widens to -40% for 2024. This is mainly due to an increase in depreciation from 2023 onwards for LVNL as a result of the entry in operation of the iCAS.

151 The cost of capital represents 0.6% of the en route costs for LVNL/KNMI in 2019 and 2.9% for skeyes. For both ANSPs, the cost of capital is relatively low. LVNL has no equity, hence no return on equity, and its cost of capital only reflects the interest on debt. For skeyes, the cost of capital reflects both the average interest on debt and the return on equity. For both ANSPs, the cost of capital included in the RP3 performance plans is below the efficient cost of capital and the maximum risk exposure.

- 152 The analysis of Element 3 indicates that skeyes’ depreciation and cost of capital decreased progressively over RP2 and are expected to increase in RP3. Depreciation costs are expected to remain below the 2019 baseline level in 2021-2023, and to increase in 2024 (+20%, or +1.8M€₂₀₁₇ above the 2019 baseline value) due to the implementation of the RP3 investment plan, leading to a significant increase in the net book value of fixed assets by the end of RP3. The cost of capital is also expected to increase over the end of RP3 although, in absolute values, it remains well below the cost of capital charged in RP2 due to the application of a lower return on equity and an average interest on debt close to 0%.
- 153 Regarding the net book value of fixed assets (in operation and under construction), the amounts were higher in skeyes than in LVNL in RP1 and decreased steadily until 2017 and then started increasing slowly until 2020. It is expected to increase significantly in RP3 with an increase of +11% per year on average (Figure 8). For LVNL, the net book value of fixed assets has been growing steadily since the beginning of RP1 and is expected to be 2.5 time higher than that of skeyes by 2024. This seems to indicate that skeyes has underinvested throughout RP2 and seems to validate the need to resume investment programmes in RP3.

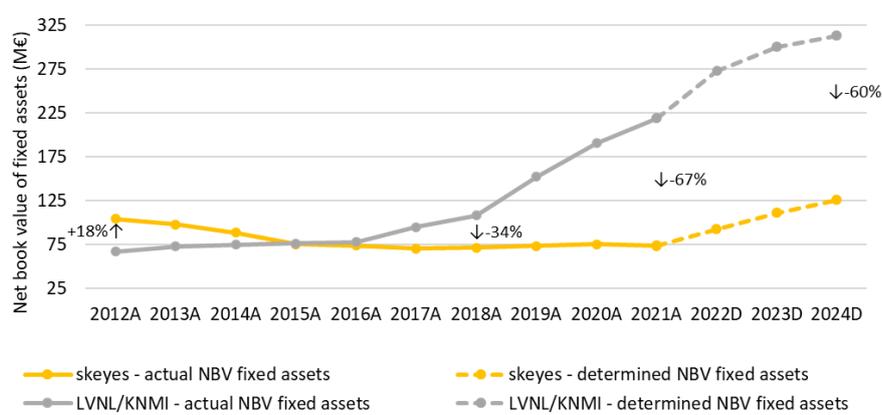


Figure 8 – Evolution of skeyes and LVNL/KNMI net book value of fixed assets (M€) (Source: PRB elaboration on the revised draft performance plans).

- 154 Exceptional items are presented by skeyes for 2024 as a negative value. This amount (-6.5M€₂₀₁₇) corresponds to the difference between the amounts charged to users in 2021 and the actual costs incurred in that year in respect of staff and other operating costs (the investment costs being covered by the so-called “cost exempt from cost-sharing”).
- 155 Skeyes does not deduct any costs for exempted VFR flights from its cost base (Element 3) while LVNL deducts some -0.6M€ from the cost-basis annually.

Cost-allocation to en route and terminal cost bases for skeyes and LVNL

- 156 The allocation of costs between en route and terminal cost bases for the two ANSPs is broadly similar after the change in methodology applied by skeyes for RP3 and reflected in the 2019 baseline (Table 23). Therefore, this analysis is not influenced by significant differences in the allocation of costs to en route and terminal cost bases by the two ANSPs.

Cost allocation to en route	2019A	2019B	2024D
skeyes (%)	65%	73%	71%
LVNL/KNMI (%)	71%	71%	72%
skeyes vs LVNL/KNMI (in percentage points)	-5.6	2.3	-0.3

Table 23 – Cost-allocation to en route for skeyes and LVNL/KNMI (Source: PRB elaboration on the revised draft performance plans).

4.3 Conclusions

- The two ANSPs, skeyes and LVNL/KNMI, both provide en route and terminal services below FL245 and are comparable in size, complexity of the airspace, traffic controlled, number of ATCOs in operation, cost of living, etc. They are also part of the same comparator group for the assessment of the 2019 baseline DUC level.
- Although the proportion of service units controlled by MUAC and by skeyes in Belgium-Luxembourg and by MUAC and LVNL in the Netherlands is broadly similar (around 70%/30%), the number of service units controlled by skeyes is lower than for LVNL (by -17% in 2014, -26% in 2019, and -26% for 2024 determined).
- At the end of RP1 and of RP2, skeyes unit costs were lower than for LVNL/KNMI (by -8.1% and -10%, respectively). With the adjustments to the 2019 baseline, the unit cost is +2.2% higher for skeyes and the difference increases to +4.3% for 2024 (+9.4% when excluding the one-off reduction in 2024 on exceptional items).
- This difference is due to staff costs (in 2019 baselines, 70% for LVNL/KNMI, 72% for skeyes). The actual unit costs for staff costs for skeyes was -7.2% lower than for LVNL/KNMI in 2014 while +2.2% higher in 2019. With the adjustments to the baselines, the 2014 unit cost for staff costs for skeyes becomes +8% higher than for LVNL, the 2019 unit cost for staff costs for skeyes becomes +16% higher than LVNL and this difference reaches +23% in 2024 (corresponding to +18.7M€₂₀₁₇).
- Regarding the net book value of fixed assets (in operation and under construction), in RP1 the values of skeyes were higher than those of LVNL and decreased steadily until 2017 when they started increasing slowly until 2020. The net book value of fixed asset of skeyes is planned to increase significantly in RP3, +11% per year on average. For LVNL, the net book value of fixed assets has been growing steadily since the beginning of RP1 and is expected to be 2.5 time higher than that of skeyes by 2024. This seems to indicate that skeyes has under-invested during RP2 and seems to validate the need to resume investing in RP3.

5 DISTRIBUTION OF THE MUAC COSTS AND SERVICE UNITS BETWEEN THE BRUSSELS SECTOR AND THE OTHER SECTORS WITHIN THE MUAC AREA OF RESPONSIBILITY

- 157 This section analyses the methodology defined and applied by the four MUAC Member States (Belgium, Luxembourg, Germany, and the Netherlands) to allocate the MUAC costs to the different charging zones where MUAC provides air traffic services.
- 158 Belgium invoked the allocation of the MUAC cost among the MUAC Member States as a factor leading to higher costs per service unit for the Belgium-Luxembourg charging zone. Belgium argued that these higher unit costs impact the achievement of consistency with Union-wide performance targets in the area of cost-efficiency. This section analyses the impact of the MUAC cost allocation methodology on Belgium-Luxembourg en route cost-efficiency targets. It also also examines another issue in the information provided during the detailed examination, Belgium claims that the methodology “does not follow the economic regulation imposed by the performance scheme since 2010”.

5.1 Information requests sent to Belgium for the detailed examination

- 159 The EC sent to Belgium an information request regarding the distribution of the MUAC costs and service units between the Brussels sector and the other sectors within the MUAC area of responsibility (Table 24).

Questions asked by the European Commission
A. Please provide a breakdown of the MUAC actual costs and actual service units broken down between the Brussels sector and the other sectors within the MUAC area of responsibility from 2015 to 2021 (included).
B. Please provide a breakdown of the MUAC determined costs and forecasted service units broken down between the Brussels sector and the other sectors within the MUAC area of responsibility from 2022 to 2024 (included).

Table 24 – Summary of main information requested in respect of Element 5.

Assessment of completeness of the additional information provided by Belgium

- 160 Belgium provided most of the information requested. Belgium provided the information on MUAC costs in the charging zone for each year and the estimated actual service units controlled by MUAC in the charging zone for the period 2015-2021. Belgium did not provide the forecasted service units for 2022-2024 for MUAC in the charging zone, stating that these are not available. The PRB has estimated the values, and deemed the information provided sufficient for the purpose of the analysis.

5.2 Analysis

Distribution of the MUAC costs between the different sectors in area of responsibility

- 161 The methodology applied to share the MUAC determined costs relating to GAT between the three sector groups (Brussels, DECO, and Hannover) is based on the number of ATCOs employed or forecast to be employed on 1st January of the year concerned.³⁰ The actual costs are allocated applying the same keys.³¹
- 162 The allocation keys methodology based on the number of ATCOs in each sector considers the workload for providing the services and hence the costs of the service and complexity of each sector. The Brussels sector group is the most complex of the three sector groups (Element 2), and has the highest number of ATCOs assigned to it (Table 25, next page). The number of ATCOs assigned to the Brussels sector group is increasing over time whereas in other sector groups the number of ATCOs is decreasing. According to the information provided during the detailed examination, this is due to newly qualified ATCOs having been assigned to the Brussels sector group

³⁰ The MUAC costs relating to OAT are financed through contributions from the Member States concerned (Germany and the Netherlands) and include the costs of the Special Operations Group (SOG).

³¹ In RP2, the actual keys could be adapted if the difference between the determined key and the computation based on the actual number of qualified ATCOs on 1st January of the relevant year would show a deviation of more than 1 percentage point. This was the case in 2019.

in priority over the period. Hence, the proportion of costs allocated to the Brussels sector group is increasing over time.

MUAC sector	2015A	2016A	2017A	2018A	2019A	2020A	2021A	2022D	2023D	2024D
Brussels	106	107	106	107	112	111	113	111	117	119
DECO	99	100	101	99	96	95	93	93	96	98
Hannover	100	99	97	95	95	95	94	97	106	108
MUAC total	305	306	304	301	303	301	300	301	319	325

Table 25 – ATCOs allocated to the different sector groups of MUAC (Source: PRB elaboration on the information provided during the detailed examination).

Distribution of the MUAC costs between the different charging zones

163 The geographical boundaries of the three sector groups do not exactly coincide with the geographical boundaries of the charging zones of the MUAC Member States. The number of ATCOs in each sector group is therefore further allocated to the different charging zones to take account of the intra-MUAC cross-border areas:

- For the Brussels sector group, which covers the airspace of Belgium and Luxembourg and areas situated in the Netherlands and in Germany,³² the number of ATCOs is further allocated to the three charging zones based on the number of controlled kilometres. For the years 2022 to 2024, based on actual data from July 2021, 92% of the ATCOs (and therefore the costs) are allocated to the Belgium-Luxembourg charging zone,³³ 4% to the Netherlands charging zone, and 4% to Germany charging zone;
- For the DECO sector group, which is partly in German and Dutch airspace, the metric used for the allocation to the two charging zones is the sectors opening hours, with some common costs being shared between the two Member States on a 50/50 basis. The resulting allocation of the ATCOs and the costs of the DECO sector group for the years 2022 to 2024 based on actual data covering January to June 2021, is 59% for the Netherlands and 41% for Germany; and
- The ATCOS and costs of the Hannover sector group are fully allocated to Germany, where it is situated.

164 The resulting GAT cost allocation keys for the three charging zones in RP3 are presented in Table 26, together with actual values for 2014 and 2019.

Charging zone	2014A	2019A	2020A	2021A	2022D	2023D	2024D	2024D /2014A	2024D /2019A
Germany	46%	46%	44%	47%	46%	47%	47%	+0.4 p.p.	+0.7 p.p.
Netherlands	22%	21%	22%	19%	20%	19%	19%	-2.4 p.p.	-2.0 p.p.
Belgium-Luxembourg	32%	33%	34%	34%	34%	34%	34%	+2.1 p.p.	+1.3 p.p.
MUAC total	100%	0.0 p.p.	0.0 p.p.						

Table 26 – MUAC GAT cost allocation keys per charging zone (Source: PRB elaboration on the information provided during the detailed examination and on the revised draft performance plans).

165 The share of MUAC costs allocated to the Belgium-Luxembourg charging zone is increasing slightly over time (from 32% in 2014 to 34% in 2024, Table 26 above), impacting the evolution of the charging zone costs and the cost-efficiency trends. The sharing key for 2024 is +2.1 percentage points higher than the 2014 key and +1.3 percentage points higher than the 2019 key.

166 This leads to an increase in MUAC costs (in €₂₀₁₇, Table 27, next page) for Belgium-Luxembourg of +5.1% on average per year between 2014 and 2024 and +8.9% on average per year between 2019 and 2024, which is larger than for the other charging zones. The analysis of the MUAC determined costs for RP3 and their increases over RP3 are presented in Element 3 (Table 27 does not take into account the transfer relating to internal tax

³² Including the cross-border areas of SASKI, Maastricht, and Aachen (Element 9).

³³ The costs are further shared between Belgium and Luxembourg on the basis of an agreed fixed key, 97% for Belgium and 3% for Luxembourg.

and support costs in RP2 and the deduction of 1M€ in total agreed between the four Member States for 2023 and 2024).

MUAC costs (in M€ ₂₀₁₇)	2014 A	2019 A	2020 A	2021 A	2022 D	2023 D	2024 D	2014A- 2024D CAGR	2019A- 2024D CAGR
Germany	69	76	80	82	100	104	105	+4.8%	+8.4%
Netherlands	32	35	40	34	42	42	43	+3.3%	+5.2%
Belgium-Luxembourg	48	54	62	60	73	75	76	+5.1%	+8.9%
MUAC total	149	165	182	176	215	220	224	+4.6%	+7.9%

Table 27 – MUAC GAT costs per charging zone in M€₂₀₁₇ (Source: PRB elaboration on the information provided during the detailed examination and on the revised draft performance plans). The costs do not take account of the transfer relating to internal tax and support costs in RP2 and the deduction of 1M€ in total agreed between the four Member States for 2023 and 2024.

Distribution of the MUAC service units controlled between the different charging zones

- 167 The actual number of service units controlled by MUAC in each charging zone is estimated by MUAC and published annually in MUAC annual reports. For the purpose of this analysis, the forecast service units controlled by MUAC in each charging zone for years 2022 to 2024 has been estimated on the basis of both the total service units presented in the revised performance plans, and the proportion of the estimated service units controlled by MUAC in 2019 in each charging zone concerned (Table 28).
- 168 The proportion of service units controlled by MUAC in the Belgium-Luxembourg en route charging zone is the smallest. In 2019, the share of service units controlled by MUAC in the Belgium-Luxembourg en route charging zone was 25%, whereas the share of MUAC costs allocated to it was 33%.

	2014A	2019A	2020A	2021A	2022D	2023D	2024D
Germany (services units)	2,862	3,313	1,559	1,719	2,987	3,253	3,471
Netherlands (service units)	1,938	2,396	1,050	1,093	1,838	2,183	2,334
Belgium-Luxembourg (service units)	1,674	1,892	779	827	1,522	1,766	1,837
MUAC total (service units)	6,473	7,601	3,388	3,639	6,347	7,203	7,642
Germany share in total (%)	44%	44%	46%	47%	47%	45%	45%
Netherlands share in total (%)	30%	32%	31%	30%	29%	30%	31%
Belgium-Luxembourg share in total (%)	26%	25%	23%	23%	24%	25%	24%
MUAC total (%)	100%						

Table 28 – Estimates of the service units relating to GAT controlled by MUAC per charging zone in '000 (Source: Actual data provided during the detailed examination, forecast data PRB elaboration on the basis of the total service units forecasted in each charging zone multiplied by the estimated proportion of service units controlled by MUAC in 2019 in each charging zone concerned).

MUAC unit costs per service units controlled by MUAC in the different charging zones

- 169 As a result of a higher share of MUAC costs being allocated to the Belgium-Luxembourg charging zone and a lower share of service units controlled, the MUAC unit cost per service units controlled is significantly higher for the Belgium-Luxembourg en route charging zone than for the other two charging zones concerned (Table 29 and Figure 9, next page). In 2019, the MUAC actual unit cost for Belgium-Luxembourg (28€) was nearly double than that of the Netherlands (15€) and +24% higher than that of Germany (23€). In addition, the unit cost for Belgium-Luxembourg increased by +9.7% comparing 2019 to 2024, against +7.2% for Germany and +5.9% for the Netherlands.

€ ₂₀₁₇	2014 A	2019 A	2020 A	2021 A	2022 D	2023 D	2024 D	2014A-2024D CAGR	2019A-2024D CAGR
Germany	24	23	52	48	33	32	30	+2.6%	+7.2%
Netherlands	17	15	38	31	23	19	18	+1.2%	+5.9%
Belgium-Luxembourg	29	28	79	72	48	42	41	+4.0%	+9.7%
MUAC total	23	22	54	48	34	31	29	+2.7%	+7.8%

Table 29 – MUAC unit cost per service unit controlled per charging zone in €₂₀₁₇ (Source: PRB elaboration on the information provided during the detailed examination and on the revised draft performance plans).

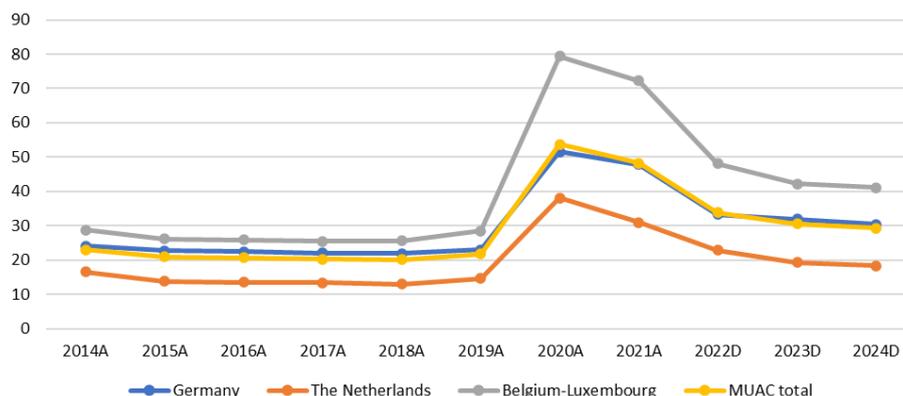


Figure 9 – MUAC unit cost per service unit controlled per charging zone (PRB elaboration on the information provided during the detailed examination and the revised draft performance plans).

Impact of the methodology on Belgium-Luxembourg en route cost-efficiency targets

- 170 During the detailed examination, Belgium reiterated that it “has for many years expressed its disagreement with the cost sharing of MUAC. Indeed, the costs incurred by Belgium in relation to the service units performed by MUAC in the Belgian airspace are much higher than for the other MUAC States. This imbalance was accentuated during the second reporting period with the capacity problems encountered before the Corona crisis. This situation not only penalises Belgian airspace users but also has an impact on the achievement of performance targets in the area of cost-efficiency”.
- 171 Belgium also stated that “in 2019, the four States agreed to carry out an extensive study covering the financial, institutional and operational aspects of MUAC. The study recommended simplifying and adapting the cost allocation mechanism through adopting a hybrid approach that combines resource requirement (input) and traffic (output) metrics, and which shares the net cost of delegated airspace across all four States. However, no agreement could be reached between the four States on the proposed revision” to date.

Impact on the revenues of MUAC and skeyes

- 172 During the detailed examination, Belgium pointed out that the “methodology dates from 1986 and is based on a cost recovery system for the costs of MUAC. It does not follow the economic regulation imposed by the performance scheme since 2010”.
- 173 Belgium noted in the revised draft performance plan, that “unlike other ANSPs, MUAC is not directly financed from air navigation charges paid by the airspace users. Instead, MUAC’s budget is financed from contributions by the four Members States who, in turn, include these contributions in their respective chargeable cost base towards airspace users”.³⁴
- 174 The contributions paid by the Member States is based on MUAC actual costs allocated to their respective charging zones. This indicates that MUAC applies a full cost recovery system and does not bear the financial risks

³⁴ Annex R – Justifications for the local cost-efficiency targets.

and/or benefits stemming from the different incentives mechanisms foreseen in the performance and charging Regulation.

- 175 In the case of MUAC costs relating to Belgium, these financial risks and/or benefits are borne by skeyes. On the one hand, the charges that skeyes collects from airspace users are based on the determined costs of MUAC allocated to Belgium. On the other hand, the payments made by skeyes to MUAC are based on MUAC's actual costs allocated to Belgium. This means that any difference between actual and determined costs for MUAC results in an additional revenue or loss for skeyes. It also means that skeyes bears the financial risks and/or benefits stemming from the different adjustments resulting from the incentives mechanisms (inflation, traffic risk-sharing, cost-sharing, and incentives on performance targets in the key performance area of capacity).
- 176 For RP2 overall, the difference between the revenue skeyes received from charges for services provided by MUAC and the actual costs of MUAC allocated to Belgium in the charging zone resulted in an estimated additional revenue of +16.4M€ for skeyes (Table 30). For the combined year 2020-2021, the difference results in an estimated additional revenue of +1.1M€.

Revenues and costs for MUAC Belgium (M€)	2015A	2016A	2017A	2018A	2019A	RP2A	2020-2021A
Determined costs billed	46.3	46.3	48.3	49.5	49.1	239.6	124.5
Inflation adjustment	-0.2	0.0	0.5	0.9	0.9	2.1	0.9
Traffic risk sharing adjustment	0.0	0.0	0.0	0.0	0.6	0.6	0.0
Cost exempt from cost-sharing	0.0	2.4	3.0	2.9	4.1	12.3	-0.1
Financial incentives	-0.2	-0.2	-0.3	-0.3	0.0	-1.0	0.0
Total adjustments	-0.5	2.2	3.2	3.6	5.6	14.0	0.8
Route charges revenue	45.8	48.5	51.5	53.1	54.7	253.6	125.3
Actual costs	42.4	44.9	46.8	49.1	53.9	237.1	124.2
Additional revenue (+) or loss (-) for skeyes	3.4	3.6	4.7	4.0	0.8	16.4	1.1

Table 30 – Difference between revenues and costs relating to MUAC in the Belgium-Luxembourg en route charging zone in M€ (Source: PRB elaboration on the en route reporting tables for RP2 and on the revised draft performance plan).

- 177 The arrangements among the MUAC Member States have significant consequences:
- There is no financial incentive for MUAC to improve the cost-efficiency performance as provided in the performance and charging scheme (namely to reduce costs or adapt costs in function of traffic variations, or to keep the minutes of en route ATFM delays per flight below the targets. This does not seem to be in line with the Regulation which stipulates that:
 - In respect of traffic risk-sharing, the additional revenue or the resulting revenue loss shall be borne in full by the air navigation service provider or providers concerned.³⁵
 - In respect of the cost-sharing mechanism, differences between determined costs included in the performance plan and actual costs should be borne by the ANSP concerned, except for a limited number of cost items subject to specific requirements which shall be shared between air navigation service providers and airspace users.³⁶
 - In respect of the incentive schemes relating to capacity (and environment, if applicable), the financial advantages and disadvantages are set for the ANSPs and charging zones identified in the performance plan as being subject to the schemes.³⁷
 - For skeyes, there are additional financial risks and/or benefits borne by the company as a consequence of the MUAC arrangements:

³⁵ Article 27 of the performance and charging Regulation 2019/317.

³⁶ Article 28 of the performance and charging Regulation 2019/317.

³⁷ Article 11 of the performance and charging Regulation 2019/317.

- In respect of traffic risk-sharing, skeyes bears the share of additional revenue or resulting revenue calculated based on the MUAC costs and the difference between actual and determined service units set at charging zone level.
- In respect of the cost-sharing mechanism, differences between determined costs included in the performance plan and actual costs in respect of MUAC are borne by skeyes. MUAC is required to keep its actual costs within the limits of the MUAC budget which is approved annually by the four Member States for the following year.
- In respect of the incentive schemes relating to capacity (and environment, if applicable), the financial advantages and disadvantages are borne by skeyes in relation to MUAC Belgium.

5.3 Conclusions

- The methodology defined and applied by the four MUAC Member States to allocate the MUAC costs to the different sectors is based on the number of ATCOs in each sector and reflects the workload for providing the services and hence the costs of the service and complexity of each sector.
- The Brussels sector group, allocated at 92% to the Belgium-Luxembourg charging zone, is the most complex of the three sector groups and the one with the smallest number of service units. This leads to significantly higher costs per service units controlled by MUAC for the Belgium-Luxembourg en route charging zones than for the other MUAC Member States.
- The current arrangements between the MUAC Member States impact the revenues of MUAC and skeyes. MUAC operates under a full cost recovery system and does not bear the financial risks and/or benefits stemming from the different incentives mechanisms of the Regulation. In the case of the MUAC costs relating to Belgium, these financial risks and/or benefits are borne by skeyes. This resulted in an estimated additional revenue of +16.4M€ for skeyes for RP2 overall, and +1.1M€ for the combined year 2020-2021. The arrangements between the MUAC Member States do not reflect the principles of the Regulation, this may even lead to a situation contradictory to the objectives of performance and charging scheme.

6 CAPACITY PLANNING OF SKEYES AND MUAC INCLUDING WITH REGARD TO THE PLANNED NUMBER OF ATCOS, ATCO TRAINING, AND PLANNED INVESTMENTS IN FIXED ASSETS

178 This section analyses how skeyes and MUAC plan to enhance their capacity to provide air traffic control services and meet traffic demand in RP3 without generating delays. This analysis investigates the factors and drivers behind the capacity plans, and examine if the plans are adequately addressing any foreseen capacity constraints or gaps.

6.1 Information requests sent to Belgium for the detailed examination

179 The EC sent to Belgium an information request regarding the capacity planning of skeyes and MUAC, including the planned number of ATCOs, ATCO training, and planned investments in fixed assets (Table 31).

Questions asked by the European Commission
A) Please provide a detailed description on the capacity planning of skeyes and MUAC including planned number of fulltime including ATCOs in operation, ATCOs in training, and planned investments in fixed assets.
B) Please describe your airspace sectors and provide the planned maximum capacity for skeyes and MUAC (in minutes intervals) until 2024.
C) Do you horizontally and vertically split the sectors in order to accommodate the traffic? Please describe in detail.

Table 31 – Summary of main information requested in respect of Element 6.

Assessment of completeness of the additional information provided by Belgium

180 Belgium provided most of the information requested, but no data on planned sector capacities. Nevertheless, the PRB found the information provided sufficient for the purpose of the analysis. Where necessary, the PRB has complemented the information provided with data from other sources, such as the revised draft performance plan, and the data available through the 2022 July edition of the NOP.

6.2 Analysis

Analysis of the planned capacity profiles

181 Capacity profiles are used to measure the peak capacity an ANSP is able to sustain over a longer period of time (i.e. longer than a few hours). Capacity profiles are expressed as hourly IFR movements and correspond to the number of IFR flights that an ANSP can handle within an hour. The Network Manager uses capacity profiles to create strategic plans for the operation of the network and measures ex-post results for all calendar years, which are called the baseline values. Figure 10 and Figure 11 (next pages) show the evolution of baseline capacity profiles as well as the evolution of the planned profiles. The figures also show the reference profiles and the difference between the reference and the planned profiles. The reference profiles indicate the hourly throughput capacity, which would enable the ANSP to meet its average en route ATFM delay breakdown values.

182 For skeyes, historical data shows a significant drop in baseline values in 2016, which is reflected in actual delay values as well. In all other years, the baseline and planned values were consistent, except for 2017, when the planned capacity was lower than the actual baseline value. The average growth of baseline values was 1.5% annually over 2015-2018 and significantly decreased in 2019, which was also reflected in en route ATFM delays in that year.

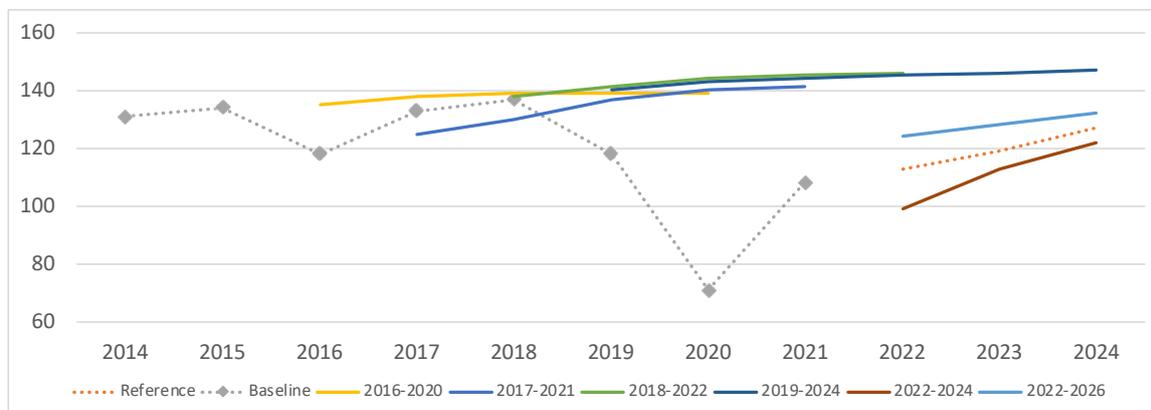
183 The latest planned capacity profile shows an average annual growth of 3.2% over 2022-2024. Based on the capacity plan, a reasonable capacity surplus is expected in all remaining years of RP3 if the traffic recovery follows the STATFOR base forecast. According to the NOP, if the traffic recovery follows the STATFOR high forecast, Brussels ACC would face a minor capacity gap in 2023 and 2024 (-3% and -4% respectively).

184 Skeyes defined two measures in the revised draft performance plan to improve capacity:

- The upgrade of the ATM system; and
- The recruitment and training of ATCOs.

185 The measures planned by skeyes are in line with the NOP although the NOP contains three additional measures which Belgium did not list in the revised draft performance plan. However, Belgium during the detailed examination explained that the additional measures are focusing on improved civil-military coordination and improved route structure. All these measures are considered by the Network Manager for the calculation of the capacity profiles.

Brussels ACC (EBBU)



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Reference									113	119	127
Baseline	131	134	118	133	137	118	71	108			
2016-2020			135	138	139	139	139				
2017-2021				125	130	137	140	141			
2018-2022					138	141	144	145	146		
2019-2024						140	143	144	145	146	147
2022-2024									99	113	122
2022-2026									124	128	132
Latest vs Reference									10%	8%	4%

Figure 10 – Overview of the capacity profile plans of skeyes (Brussels ACC) (Source: PRB elaboration on the data from the Network Operations Plan 2022 July edition).

186 For MUAC, historical data shows a minor decrease in the baseline values in 2015, followed by an increase in 2017 to reach the 2014 level. In 2019, the baseline values have increased significantly compared to the previous year closing most of the capacity gap, which was reflected in the lower amount of en route ATFM delays. The planned values were consistently higher than the baseline values over the period, indicating that in the past the ANSP was not able to fully realise its capacity improvement plans.

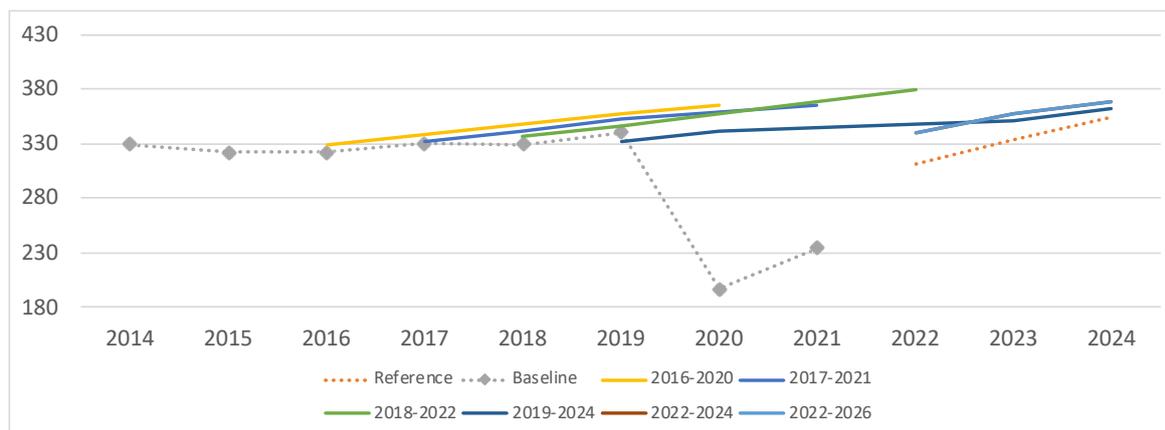
187 The latest planned capacity profile shows an average annual growth of 4% during 2022-2024. These plans result in a reasonable capacity surplus in the remaining years of RP3 if traffic recovery follows the STATFOR base forecast. According to the NOP, if traffic recovery follows the STATFOR high forecast, MUAC would face a minor capacity gap in 2023 and 2024 (-5% and -4% respectively).

188 MUAC defined five measures in the revised draft performance plan to improve capacity:

- Training of new staff and cross-training additional controllers;
- Scrutinising the use of operational staff in developments;
- A new agreement with the social partners (also known as the GCE package) for increasing the flexibility of working hours and enable a more flexible rostering scheme;
- A study on reducing the number of sectors during the night; and
- A set of airspace management related initiatives.

189 These measures are fully in line with the Network Operations Plan, and the Network Manager considers them in the calculation of the capacity profiles.

Maastricht ACC (EDYY)



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Reference									312	334	354
Baseline	329	322	322	330	329	340	197	234			
2016-2020			328	338	348	358	365				
2017-2021				332	342	352	359	366			
2018-2022					337	347	357	368	379		
2019-2024						332	342	345	348	351	362
2022-2024									340	357	368
2022-2026									340	357	368
Latest vs Reference									9%	7%	4%

Figure 11 – Overview of the capacity profile plans of MUAC (all sector groups) (Source: PRB elaboration on the data from the Network Operations Plan 2022 July edition).

Analysis of the planned number of ATCOs in OPS FTEs

- 190 The planned number of ACC ATCOs in OPS FTEs for skeyes and MUAC (entire ANSP) as provided during the detailed examination is shown in Table 32 and in Table 33 (next page). Details for MUAC Belgium have not been provided.
- 191 Skeyes plans an increase of +11 FTEs compared to 2019, which corresponds to a +14% increase. This increase in the number of ATCOs in OPS FTEs is slightly larger than the planned increase of capacity profiles over the same period (+11%). Moreover, in 2018 skeyes was able to provide +3.8% higher capacity profiles with -5.5% less ATCOs in OPS FTEs than the planned figures for 2024. Belgium explains that the increase in ATCOs in OPS FTEs is due to the retirement wave of ATCOs that is expected to ramp up as of 2024. The planned number of ATCOs in OPS FTEs was reduced between the draft performance plan submitted in October 2021 and the revised draft performance plan submitted in July 2022. Belgium explained, that this reduction (5.8 FTEs in total for 2024) was due to a lower than expected success rate of training in 2021 and 2022.
- 192 In RP3 skeyes plans to maximise its recruitment and training capacity, estimating 42 ab initio trainees in training each year, while also adding an additional eight FTEs to the ATCOs in OPS FTEs in both 2025 and 2026. Belgium did not provide information during the detailed examination to explain how the 42 ab initio trainees will be converted into ATCO FTEs (the numbers provided correspond to a conversion rate of 19%). It is also not clear from the data provided by Belgium how skeyes would utilise 126 ab initio trainees in RP3, as a result of three years of training at maximum capacity.
- 193 Belgium did not provide detailed information on how it expects the increase in the number of ATCOs in OPS FTEs to impact the capacity performance of skeyes. However, according to the NOP, the maximum number of sectors open is planned to increase from four to five in Brussels ACC as of 2023.

	2018A	2019A	2020A	2021A	2022P	2023P	2024P
Additional ATCOs in OPS to start working in the OPS room	0.8	5	5	4	2	7	8
ATCOs in OPS to stop working in the OPS room	4	12.3	2	1	3	6	3
ATCOs in OPS to be operational at year-end	87.8	80.5	83.5	86.5	85.5	86.5	91.5

Table 32 – En route planned number (P) of ACC ATCOs in OPS FTEs for skeyes (Source: PRB elaboration on the information provided during the detailed examination).

- 194 MUAC plans an increase of +25 FTEs compared to 2019, which corresponds to an +8.6% increase. This increase in the number of ATCOs in OPS FTEs is in line with the planned increase of capacity profiles over the same period (+8.2%). The planned number of ATCOs in OPS FTEs and the planned capacity profiles for 2024 correspond to the numbers of earlier years.
- 195 Belgium did not provide detailed information on how the increase in the number of ATCOs in OPS FTEs will impact the capacity performance of MUAC. However, the maximum number of sectors open is planned to remain at six sectors for the Brussels sector group, and it is planned to increase by one for both the DECO and the Hannover sector groups as of 2024 according to the NOP (from five to six, and from six to seven, respectively).

	2018A	2019A	2020A	2021A	2022P	2023P	2024P
Additional ATCOs in OPS to start working in the OPS room	2	2.2	0.5	6.4	19	16.8	9.8
ATCOs in OPS to stop working in the OPS room	2.5	2.5	6	3	0	10	8.5
ATCOs in OPS to be operational at year-end	292	292	286	290	309	315	317

Table 33 – Planned number of ACC ATCOs in OPS FTEs for MUAC (total, not specific to the Brussels sector group) (Source: PRB elaboration on the information provided during the detailed examination).

Analysis of sector numbers and sector capacities

- 196 Belgium did not provide detailed information on the planned evolution of sector capacities for skeyes and MUAC. The PRB was unable to fully assess this aspect. The NOP indicates the maximum number of sectors, as well as the strategically planned sector opening schemes (only for 2022). As noted above, the maximum number of sectors is planned to increase both in skeyes (by one from 2023) and in MUAC (by two from 2024). It is not clear from the available information how the sector opening schemes is planned to evolve in the long-term. Belgium confirmed that both skeyes and MUAC split their sectors horizontally and/or vertically depending on the traffic demand.

6.3 Conclusions

- Both skeyes and MUAC have a reasonable capacity plan, which shows a minor capacity surplus when compared to the STATFOR base forecast. This is in line with the recommendation of the Network Manager and serves as a buffer in case traffic recovers faster than the base forecast. Both ANSPs are expected to experience a slight capacity gap if the STATFOR high forecast materialise.
- Measures planned by skeyes and MUAC to improve capacity are in line with the Network Operations Plan and are considered by the Network Manager when calculating the capacity gap/surplus.
- The planned increase in the number of ATCOs in OPS FTEs of skeyes considers the future retirement wave of ATCOs, as well as the planned increase in capacity profiles.
- It is unclear how the figures provided by Belgium for the recruitment and training of ATCOs in skeyes correspond to the planned number of ATCOs in OPS FTEs.
- The planned increase in the number of ATCOs in OPS FTEs appears justified by the planned increase in capacity profiles for MUAC.

7 COST ALLOCATION BETWEEN EN ROUTE AND TERMINAL SERVICES, AND BETWEEN SERVICES IN THE SCOPE OF THE PERFORMANCE PLAN AND OTHER SERVICES

197 This section analyses the revised methodology of the cost allocation of skeyes between en route and terminal and its impact on the baselines, and identifies whether the revised methodology is reasonable and, where appropriate, the areas for improvements or corrections.

7.1 Information requests sent to Belgium for the detailed examination

198 The EC sent to Belgium an information request regarding the cost allocation between en route and terminal services, and between services in the scope of the performance plan and other services (Table 34).

Questions asked by the European Commission
A) Please provide an analysis of the accounts for regulated and non-regulated activities for each of the ANSPs (en route and terminal).
B) Please provide for each of the ANSPs a detailed description of the cost allocation methodology between the en route and terminal services per cost item by nature and by service. Please provide a detailed description of any changes between RP2 and RP3.
C) Please provide for each of the ANSPs the list of assets by service and their allocation between en route and terminal air navigation services pre-defined and established. Please provide the details of the methodology applied for each of the assets (i.e. sharing key per cost item).
D) Please provide the procedure for verifying the cost allocation between en route and terminal services and how it is implemented by the NSA(s).

Table 34 – Summary of main information requested in respect of Element 7.

Assessment of completeness of the additional information provided by Belgium

199 Belgium provided most of the information requested. However, while the amounts allocated between en route and terminal charging zones have been provided, detailed descriptions of the cost allocation methodology per cost item have not been provided.

200 Nevertheless, the PRB found the information provided sufficient for the purpose of the analysis. Where necessary, the PRB has complemented the information provided with data from other source, such as the airspace users' consultation of July 2022.

7.2 Analysis

Overview of the principles and criteria for cost allocation methodology between en route and terminal

201 Skeyes reports to have a system designed to allocate as many costs as possible directly to the appropriate cost/activity centre. Skeyes lists cost centres at four levels: 1) organisational units (e.g. per directorate), 2) type of services (e.g. communication, surveillance, etc.), 3) final products (e.g. ACC, APP, terminals, etc), and 4) airports with Brussels airport (EBBR, the only airport in the scope of SES performance and charging scheme in RP3) and regional airports that are outside the scope of SES performance and charging scheme. Skeyes structures the cost centres in various groups including: 1) corporate, 2) operations (ATS, "Meteo" and AIS), 3) equipment, 4) finance and administration, and 5) buildings. For the costs that may not be allocated directly to cost centres, skeyes defines allocation keys based on the general principle that every user (internal customer) is paying for the requested services.

202 The expenses skeyes directly allocates to the en route cost base include: 1) staff costs of en route air traffic controllers and engineers working on development and maintenance of en route systems, 2) depreciation of equipment and systems used in ACC, 3) depreciation of building and general building expenses used for en route activity, and 4) communication of en route data and maintenance costs of en route systems.

203 Allocation keys of shared expenses (general expenses or overhead costs) vary with the nature of the cost. Examples of allocation keys are the number of positions, the number of controllers, the squared meters used in the building, frequencies and time spent in the area.

Review of changes to cost allocation methodology between RP2 and RP3 and its impact on the baselines

- 204 Belgium reports that the cost allocation methodology changed in RP3 compared to RP2 for 1) approach services and 2) supervision costs.
- 205 Skeyes' revised methodology seems to allocate the costs of approach services entirely to the en route cost base, while keeping the aerodrome control services within the terminal cost base. Belgium justifies this change, stating that the new methodology better reflects the operational arrangements and the airspace structure of Belgium. In RP2, skeyes calculated the en route share of approach costs by estimating the total volume of controlled airspace from which it deducted a 20km "cylinder" around an airport. Belgium stated that most of the workload of approach controllers occurs outside the 20km cylinder and therefore the allocation method applied in RP2 assigned a disproportionate part of approach costs to the terminal cost base.
- 206 Allocating the approach services fully to en route implies that overflights are financing approach services which they do not use (PRB en route and terminal cost allocation methodology review).³⁸ Article 22(5)(b) of the Regulation states that cost included in the terminal determined cost base shall cover the costs of "air traffic services related to the approach and departure of aircraft within a certain distance of an airport". Therefore, it is expected that a portion of the costs for approach services should be allocated to the en route cost base.
- 207 Regarding supervision costs, Belgium states that the cost allocation methodology in RP3 will better reflect the workload related to each charging zone and each regional airport. Belgium notes that the cost allocation key in RP3 "is based on the proportion of notifications of changes with potential impact on safety related to each unit (ACC, APP, TWR) during the last 3 years". In contrast, in RP2, the supervision costs were allocated proportionally to the cost base of each charging zone and each final product (e.g. ACC, APP, and TWR).
- 208 The analysis shows that the changes to the cost allocation methodology of skeyes impact the baselines of Belgium. The impact on the 2019 baseline due to the change in the approach allocation methodology is an increase of +14.3M€₂₀₁₇ in the en route cost base and a reduction of -4.4M€₂₀₁₇ in the terminal cost base. In Annex M of the draft performance plan, the financial impact on all airports corresponds to the amount reallocated to en route, while in the draft performance plan the only terminal charging zone is EBBR airport (-4.4M€₂₀₁₇ to terminal cost base).
- 209 Based on the information provided by Belgium, the PRB estimates that the deduction for EBBR (Brussels) airport is equivalent to the deductions for EBCI (Charleroi) and EBLG (Liège) airports, despite the differences in size and volumes of traffic served between these airports. Belgium explains that the difference in the amounts deducted by airport zones is due to the airspace structure (some airports having larger TMAs than others). Belgium provided details on the allocation between en route and terminal of approach costs by airports in RP2, RP3, and the difference between the two reference periods (Table 35, next page).

³⁸ [PRB en route and terminal cost allocation methodology review, September 2021.](#)

	Cost allocation RP2 (M€)		Cost allocation RP3 (M€)		Difference between RP2 and RP3 (M€)	
	En route	Terminal	En route	Terminal	En route	Terminal
EBBR (Brussels)	20	37	24	32	4.6	-4.6
EBAW (Antwerp)	0	6.9	0	6.9	0	0
EBCI (Charleroi)	2.4	8.2	6.5	4.2	4.1	-4.1
EBLG (Liège)	4.7	10	9.2	5.6	4.6	-4.6
EBOS (Ostende-Brugge)	6.1	2.5	7.7	0.9	1.6	-1.6
Total	33	64	48	49	15	-15

Table 35 – Impact of the change in cost allocation between RP2 and RP3 based on the costs of 2019, between en route and terminal charging zones for 2019 (Source: PRB elaboration on the Annex M of the revised draft performance plan).

Cost allocation of EBBR and airports outside the scope of SES performance and charging scheme

- 210 Belgium provided an overview of skeyes' costs from 2019 to 2024 detailed by nature and split between en route, EBBR (Brussels), and airports outside the scope of SES performance and charging scheme (Table 36, next page).
- 211 The allocation of total costs remains stable over RP3, with on average 72% of total costs allocated to en route, 19% to EBBR, and 9% to airports outside the scope of SES performance and charging scheme. When considering only regulated services, on average over RP3, 79% of total costs are allocated to en route and 21% to terminal services.
- 212 The allocation of costs is similar when analysing costs by nature, except for:
- Cost of capital with an average of 63% of costs allocated to en route, 25% to EBBR, and 12% to airports outside the scope of SES performance and charging scheme; and
 - Exceptional items (negative) with an average of 80% of "negative costs" allocated to en route, 20% to EBBR, and nothing allocated to airports outside the scope of performance and charging Regulation.
- 213 As reported by Belgium, the cost allocation between RP2 and RP3 changed, and as a result, the total costs for en route moved from 65% in 2019 to 71% in 2024 (+6 p.p.), for EBBR it moved from 20% in 2019 to 19% in 2024 (-1 p.p.; or 17% of the decrease), and for airports outside the scope of performance and charging Regulation it reduced from 15% in 2019 to 10% in 2024 (-5 p.p.; or 83% of the decrease).
- 214 The PRB analysis shows that the differences in the percentages of cost allocations between 2019 and 2024 are not aligned with the changes in the 2019 cost baseline. The impact of the change in allocation methodology between RP2 and RP3 is +14.3M€₂₀₁₇ for en route, -4.4M€₂₀₁₇ (31% of the decrease) for EBBR, and -10M€₂₀₁₇ (69% of the decrease) for airports outside the scope of performance and charging Regulation.
- 215 The percentage decrease in total costs for airports outside the scope of performance and charging Regulation is greater than the adjustments made to the 2019 baseline. Belgium has not provided information that justifies this difference.

Cost category	% of cost allocated to en route					
	2019A	2020A	2021F	2022F	2023F	2024F
Staff costs	64%	72%	73%	72%	72%	72%
Other operating costs	67%	71%	72%	74%	74%	75%
Depreciation	71%	71%	70%	69%	68%	67%
Cost of capital	73%	66%	63%	63%	63%	62%
Exceptional items	n/a	n/a	n/a	n/a	n/a	80%
Total	65%	72%	72%	72%	72%	71%

Cost category	% of cost allocated to EBBR (Brussels)					
	2019A	2020A	2021F	2022F	2023F	2024F
Staff costs	20%	18%	18%	19%	19%	19%
Other operating costs	20%	21%	20%	20%	19%	19%
Depreciation	21%	21%	21%	20%	21%	23%
Cost of capital	21%	24%	25%	25%	24%	26%
Exceptional items	n/a	n/a	n/a	n/a	n/a	20%
Total	20%	19%	19%	19%	19%	19%

Cost category	% of cost allocated to airports outside the scope of performance and charging Regulation					
	2019A	2020A	2021F	2022F	2023F	2024F
Staff costs	16%	9%	9%	10%	10%	10%
Other operating costs	13%	8%	8%	6%	7%	6%
Depreciation	8%	8%	9%	11%	11%	11%
Cost of capital	7%	10%	11%	12%	13%	12%
Exceptional items	n/a	n/a	n/a	n/a	n/a	0%
Total	15%	9%	9%	9%	9%	10%

Table 36 – Percentage of costs allocated to en route, EBBR, and airports outside the scope of performance and charging Regulation from 2019 to 2024 (Source: PRB elaboration on the information provided during the detailed examination).

Cost allocation of investments

- 216 The analysis shows that, on average over RP3, 76% of skeyes' costs related to investments are allocated to en route and 24% to terminal (Table 37, next page). This is broadly in line with the allocation of total costs in RP3 (on average 79% allocated to en route and 21% to terminal as mentioned above).
- 217 When looking at specific investments, each project has its own allocation key(s) between en route and terminal. The methodologies underlying some of the allocations are unclear. For example, for the projects "Replacement of ILS System", "Replacement Meteoradar", and "Voice recording system", the rationale for the proportion allocated to en route is not apparent. These investments are mainly concerning terminal services and have limited impact on the RP3 cost bases for en route and terminal.³⁹
- 218 In the airspace users' consultation of July 2022, airspace users stated that the sharing keys of investments between en route and terminal should be based on technical capability instead of the actual or operational use. Airspace users took the project "Replacement of ILS System" as an example, noting that the allocation of it should be revised, and encouraged the NSA to conduct an independent assessment regarding the sharing keys of the investment plan of skeyes. Belgium noted that an external independent audit on the cost allocation system has

³⁹ For "Replacement of ILS System": 57% of costs are allocated to en route, 26% to EBBR, and 17% to airports outside the scope of SES performance and charging scheme; for "Replacement Meteoradar": 62% to en route, 37% to EBBR, and 1% to airports outside the scope of SES performance and charging scheme; and for "Voice recording system": 72% to en route, 26% to EBBR, and 2% to airports outside the scope of SES performance and charging scheme.

been performed in 2019. The results of the audit and how it is taken into account are not included in the information provided by Belgium.

	Allocation (%)	
	En route	Terminal
Costs of new major investments	n/a	n/a
<i>Of which "ATM Next Generation"</i>	78%	22%
<i>Of which "remote radio sites"</i>	82%	18%
<i>Of which "Wide Area Networking"</i>	87%	13%
<i>Of which "A-SMGCS 2 system EBBR"</i>	0%	100%
Costs of other new investments	77%	23%
Costs of existing investments	77%	23%
Total costs of investments (average)	76%	24%

Table 37 – Average allocation of investments costs in RP3 (Source: PRB elaboration on the revised draft performance plan).

7.3 Conclusions

- Belgium changed the cost allocation methodology with respect to RP2 for approach services and supervision costs based on operational requirements. Allocating the approach services fully to en route implies that overflights are financing approach services which they do not use (PRB en route and terminal cost allocation methodology review).⁴⁰ The PRB notes that Article 22 (5)(b) of the performance and charging Regulation states that a part of approach costs shall be assigned as well to the terminal cost base.
- The change in the methodology compared to RP2 results in an increase of +14.3M€₂₀₁₇ in the en route 2019 baseline costs, while the decrease in terminal baseline costs is -4.4M€₂₀₁₇. The difference between the adjustments comes from the fact that some of the airports benefiting from the new allocation lie outside the scope of the SES performance and charging scheme. Nevertheless, inconsistencies remain with respect to the percentage changes between RP2 and RP3 in terminal total costs and between the baseline adjustments, in particular in the context of the airports outside the scope of the SES performance and charging scheme. This has not been adequately explained by Belgium.

⁴⁰ [PRB en route and terminal cost allocation methodology review, September 2021.](#)

8 'DISPO' PRE-RETIREMENT SCHEME FOR AIR TRAFFIC CONTROLLERS IN BELGIUM

219 This section summarises the legal basis and analyses the cost impact and any cost mitigation measures related to the 'DISPO' pre-retirement scheme for air traffic controllers in Belgium.

8.1 Information requests sent to Belgium for the detailed examination

220 The EC sent to Belgium an information request regarding the 'DISPO' pre-retirement scheme for air traffic controllers in Belgium (Table 38).

Questions asked by the European Commission
Please describe in detail the 'DISPO' pre-retirement scheme for air traffic controllers in Belgium, its legal basis, its development over time since RP1, as well as the cost impact broken down for en route and terminal services, and any related cost mitigation measures implemented or foreseen.

Table 38 – Summary of main information requested in respect of Element 8.

Assessment of completeness of the additional information provided by Belgium

221 Belgium provided most of the information requested on the DISPO scheme, for example the en route and terminal cost development since RP1. However, Belgium did not indicate any cost mitigation measures that had been implemented or were planned.

222 Nevertheless, the PRB found the information provided sufficient for the purpose of the analysis. The PRB complemented the information provided with the two Royal Decrees of Belgium governing the DISPO scheme, dated 14th September 1997 and 23th April 2017.

8.2 Analysis

Legal basis

223 The Royal Decree of Belgium of 14th September 1997 entitled ATCOs and ATS experts to be removed from operational services five years before retirement while granting them a waiting salary.⁴¹ The social agreement reached within the Joint Commission of Belgocontrol (now skeyes) on 4th July 2014 determined that employees who reached the age of 55 before 1st January 2017, and who were entitled to functional availability before the 1st January 2017 were mandatorily placed under functional availability.

224 The Royal Decree of 23th April 2017 implemented new conditions for granting the functional availability defining a period with a waiting salary, and new conditions for pre-retirement leave with a waiting salary. The new scheme applies on a voluntary basis. The staff member must request to apply the scheme by a registered letter to the Human Resources Director of skeyes nine months before the first day of the month in which the functional availability is to take effect, unless the Chief Executive Officer of skeyes accepts a shorter period at the request of the staff member concerned.

225 The staff member can request functional availability if three cumulative conditions are met:

- The staff member is a permanent employee and holds a certain grade (grades are listed in article 1 of the Royal Decree of 23th April 2017);
- The staff member has reached the minimum age (55 before 2017, 56 years from 2020, 57 years from 2025, and 58 years from 2030); and
- The period of functional availability does not exceed five years (condition for the retirement pension). The functional availability may be less than five years, if the ATCO placed in DISPO becomes eligible for retirement in less than five years after entering the DISPO scheme.

⁴¹ «Arrêté royal déterminant à l'entreprise publique autonome Belgocontrol, les conditions d'octroi d'une disponibilité avec traitement d'attente et d'un congé préalable à la pension avec traitement d'attente. - Erratum».

226 According to the Royal Decree of 23th April 2017, the waiting salary during functional availability shall amount to 75% of the last salary while on active duty and shall be increased by 1%, up to a maximum of 10%, for each year of service in excess of twenty years in the grades defined in article 5 of the same Royal Decree. In summary, ATCOs in functional availability receive a “waiting salary” between 75% and 85% of their last salary while on active duty without having to work as an ATCO.

227 The Royal Decree of 23th April 2017 determines that the functional availability period (of up to five years) may be supplemented until 2029 by a pre-retirement leave (of up to three years) for ATCOs who do not have sufficient years of service to qualify for a retirement pension after five years of functional availability. The maximum periods of pre-retirement leave, set out in the Royal Decree, are shown in Table 39. Article 6 of the Royal Decree determines that ATCOs in pre-retirement leave receive a "waiting salary" equal to the retirement pension to which the employee is entitled to, and is capped to the highest (maximum) retirement pension in force at the given moment.

From	To	Maximum months of pre-retirement leave
1 st January 2017	31 th December 2019	36
1 st January 2020	31 th December 2024	24
1 st January 2025	31 th December 2029	12

Table 39 – Maximum months of pre-retirement leave by date (Source: PRB elaboration on the Royal Decree of 23th April 2017).

228 Belgium indicated that the pre-retirement leave is intended to enable ATC units to absorb the operational impact of the increase in the age when ATCOs become eligible for functional availability, however Belgium did not substantiate this statement. In principle, the pre-retirement leave adds up to three additional years for ATCOs to be removed from service, which impacts operations and increases the needs of skeyes to recruit and train new ATCOs.

229 The Royal Decree of 23th April 2017 determines that during the functional availability period and the pre-retirement leave, the employee must be at the disposal of skeyes and may be recalled temporarily into service. Before starting any temporary service, the employee is informed about the starting date, his/her new duties, and the finalisation date of the temporary service. During the temporary service:

- The functional availability or pre-retirement leave of the employee is suspended;
- The employee recalled will benefit at least from the last salary while on active duty before going into functional availability or pre-retirement leave; and
- If the employee recalled refuses to comply with the respective temporary service request, the employee will lose the waiting salary.

Cost impact

230 During the detailed examination, Belgium provided numbers on the ATCO FTEs in functional availability and pre-retirement leave for 2015-2024, as well as the average cost per FTE aggregated for en route and terminal and including BRU and airports outside the scope of the Regulation. Belgium also provided the percentage allocations of these costs between en route and terminal services (Table 40, next page).

231 The analysis of the information provided shows that:

- The costs for en route functional availability and pre-retirement leave for RP3, is 29M€₂₀₁₇, nearly double than for RP2 (15M€₂₀₁₇);
- The cost increase in RP3 is due to the expected increase of the number of ATCO FTEs under the scheme: From 24 in 2020 to 51 in 2024. The number of ATCOs in DISPO in 2024 is relatively high compared to the total ATCO FTEs of skeyes in 2024 (91.5); and

- The average costs per ATCO FTE over RP2 and RP3 [confidential information on the evolution] ([100-250]K€₂₀₁₇ in RP2 and [100-250]K€₂₀₁₇ in RP3)⁴².

RP2 functional availability and pre-retirement leave - en route	2015	2016	2017	2018	2019	RP2 sum
Total costs (M€ ₂₀₁₇)	[0-5]	[0-5]	[0-5]	[0-5]	[0-5]	15.0
<i>Of which functional availability (M€₂₀₁₇)</i>	[0-5]	[0-5]	[0-5]	[0-5]	[0-5]	14.9
<i>Of which pre-retirement leave (M€₂₀₁₇)</i>	[0-5]	[0-5]	[0-5]	[0-5]	[0-5]	0.1
Estimated ATCO FTEs	20	18	17	17	18	
Average cost per ATCO FTE (K€ ₂₀₁₇)	[100-250]	[100-250]	[100-250]	[100-250]	[100-250]	

RP3 functional availability and pre-retirement leave - en route	2020	2021	2022	2023	2024	RP3 sum
Total costs (M€ ₂₀₁₇)	[0-5]	[0-5]	[5-10]	[5-10]	[5-10]	29
<i>Of which functional availability (M€₂₀₁₇)</i>	[0-5]	[0-5]	[0-5]	[5-10]	[5-10]	27
<i>Of which pre-retirement leave (M€₂₀₁₇)</i>	[0-5]	[0-5]	[0-5]	[0-5]	[0-5]	2.5
Estimated ATCO FTEs	24	24	31	43	51	
Average cost per ATCO FTE (K€ ₂₀₁₇)	[100-250]	[100-250]	[100-250]	[100-250]	[100-250]	

Table 40 – RP2 and RP3 total costs, estimated ATCO FTEs, and average cost per ATCO FTE in functional availability and pre-retirement leave for en route (Source: PRB elaboration on the information provided during the detailed examination).

- 232 Based on the ATCO FTE data and the en route share assumption, the PRB estimates that during RP4 (2025 – 2029), the ATCOs in functional availability and pre-retirement for en route services will increase from 53 in 2025 to 78 FTEs in 2029 (Table 41).⁴³ Based on the available information, the PRB estimated that the total costs of functional availability and pre-retirement leave are expected to reach approximately 54M€₂₀₁₇ for en route in RP4, which is an increase of +86% compared to RP3 (29M€₂₀₁₇).⁴⁴

RP4 functional availability and pre-retirement leave - en route	2025	2026	2027	2028	2029	RP4 sum
Estimated total costs (M€ ₂₀₁₇)	[5-10]	[5-10]	[10-15]	[10-15]	[10-15]	54
Estimated ATCO FTEs	53	57	63	68	78	n/a
Average cost per FTE (K€ ₂₀₁₇) (2024 cost assumed constant)	[100-250]	[100-250]	[100-250]	[100-250]	[100-250]	n/a

Table 41 – RP4 estimate total costs, estimated ATCO FTEs, and estimated average cost per ATCO FTE in functional availability and pre-retirement leave for en route (Source: PRB elaboration on the information provided during the detailed examination).

- 233 The cost estimations shown above do not consider the indirect costs related to the functional availability and pre-retirement scheme. Belgium reported that keyes pays, as part of its staff costs, a pension contribution of 35% on salary costs to the Belgian State for all public servants, which includes ATCOs in functional availability and pre-retirement leave who remain public servants until full retirement. Moreover, the functional availability

⁴² Belgium considers that figures regarding the staff costs incurred for air traffic controllers are confidential. According to Belgium, allowing other service providers insight into this information would result in an “unfair competitive (dis)advantage on the ATCO-market”. The related data is therefore presented in the form of ranges.

⁴³ The share of en route ATCO FTEs in functional availability and pre-retirement leave for 2025-2029 were estimated by multiplying the total ATCO FTEs in functional availability and pre-retirement leave in all services (en route, and EBBR and airports outside the scope of SES performance and charging scheme) provided by Belgium for 2025-2029 times the en route cost allocation key of 72% over RP3 provided by Belgium.

⁴⁴ The estimated total cost is [confidential information on the calculation methodology], assuming the latter remains constant over RP4. The PRB’s estimate is a mid-point scenario, since the cost per FTE over time could potentially both increase or decrease in real terms.

and pre-retirement leave may require an earlier replacement by new ATCOs, which may translate into additional recruitment and/or training costs.

Cost mitigation measures

234 The draft performance plan 2021 and revised draft performance plan 2022 do not set out specific cost mitigation measures for the costs of functional availability, pre-retirement leave, the pension contribution for functional availability and pre-retirement leave, and the associated training costs required to replace the ATCOs in those categories. The performance plans indicate that skeyes has only adopted processes to reduce recruitment costs and intends to make operations more efficient (without explaining the relations to the DISPO scheme):

- A joint venture with Entry Point North (EPN) which reduces the cost compared to training abroad;
- Direct recruitment of ATCOs into area control centres, which eliminates the need for controllers to begin their career in approach services; and
- More efficient rostering processes and rationalised night-time operations, which improve service provision during low traffic levels.

235 Belgium reported that, since 2015, skeyes has recalled 17 ATCOs in DISPO, multiple times over multiple years to perform various tasks. During the detailed examination, Belgium provided to the EC the number of months per year when ATCOs were recalled for each function. Based on the number of months provided by Belgium, the PRB estimated the number of DISPO FTEs recalled per function as shown in Table 42. The percentage of DISPO FTEs recalled to perform tasks peaked in 2019 (24%) but is envisaged to decline to 2% by 2023.

Estimated FTEs recalled	2015	2016	2017	2018	2019	2020	2021	2022	2023
Back office	0	0	0	0.8	1.4	2.0	2.0	2.3	0.7
Instructor	0	0	0	0.2	2.6	1.5	0.1	0	0
Operations	0.8	1.0	1.0	0.7	3.2	1.3	0.8	2.0	0.3
Total estimated	0.8	1.0	1.0	1.6	7.2	4.8	2.8	4.3	1.0

Estimated FTEs recalled as % of FTEs in functional availability and pre-retirement leave	2%	3%	4%	5%	24%	14%	9%	10%	2%

Table 42 – Estimated FTEs recalled by skeyes to perform tasks since 2015 (Source: PRB elaboration on the information provided during the detailed examination).

8.3 Conclusions

- The PRB estimated that the en route costs over RP3 of the waiting salaries of ATCOs in functional availability and pre-retirement leave are 29M€₂₀₁₇, almost double that for RP2 (15M€₂₀₁₇). They are expected to reach approximately 54M€₂₀₁₇ in RP4.
- The functional availability and pre-retirement leave costs are also associated with additional pension contribution, and potentially additional training and recruitment costs.
- The percentage of DISPO FTEs recalled to perform tasks is very low and foreseen to further decrease to 2% in 2023.
- Belgium has not provided mitigation measures to reduce the costs related to functional availability, pre-retirement leave costs, and associated costs.

9 CROSS-BORDER SERVICE PROVISION ARRANGEMENTS WITH NEIGHBOURING COUNTRIES, AND THEIR OPERATIONAL AND FINANCIAL IMPACT

236 This section analyses the cross-border service provision arrangements where air traffic services are delegated to/from skeyes and/or MUAC, focusing on the Belgian-Luxembourg charging zone and its immediate vicinity. It also cross-checks the provided information during the detailed examination with other data sources, identifies the most relevant arrangements in terms of operational and financial impact, and estimates the impact of each relevant arrangement for each ANSP.

9.1 Information requests sent to Belgium for the detailed examination

237 The EC sent to Belgium an information request regarding the cross-border service provision arrangements with neighbouring countries, and their operational and financial impact (Table 43).

Questions asked by the European Commission
A) Please explain the cross-border service provision arrangements with neighbouring countries, and their operational and financial impact.
B) Please quantify for each main cross-border service provision the financial agreements in place between ANSPs and quantify the related costs and revenues for each ANSP.

Table 43 – Summary of main information requested in respect of Element 9.

Assessment of completeness of the additional information provided by Belgium

238 While Belgium provided information on the cross-border arrangements of MUAC including details on the geographical scope of the arrangements and their estimated operational and financial impact, it did not provide a similar breakdown in relation to skeyes.

239 Nevertheless, the PRB found the information provided sufficient for the purpose of the analysis. Where necessary, the PRB considered information available from the operational databases (data files provided by the Aviation Intelligence Unit of Eurocontrol and data from the Demand Data Repository of Eurocontrol).

9.2 Analysis

240 Cross-border arrangements are driven by operational aspects, aiming to simplify the work of all the stakeholders involved. These arrangements delegate air traffic services (ATS) in a defined block of airspace within a FIR to the ANSP of a neighbouring FIR. This results in less need for voice coordination between the ATCOs of neighbouring ANSPs, a reduced number of sector changes for airspace users, reduced complexity of traffic, and less workload compared to the situation without the ATS delegation. The PRB recognises the operational benefits of the arrangements.

Cross-border arrangements of skeyes

241 Belgium listed 17 cross-border arrangements for skeyes. Belgium provided information about their name, the definition of the areas in terms of altitude/flight level, and the direction of the service delegation (i.e. delegation to or from skeyes). Belgium did not provide other relevant information about the area's size and exact location. The PRB identified two cross-border arrangements, where both the size of the area and the volume of traffic are significant, these are shown in Figure 12 (next page). These two arrangements concern services provided by skeyes to another ANSP (SASKI area and the Maastricht area).

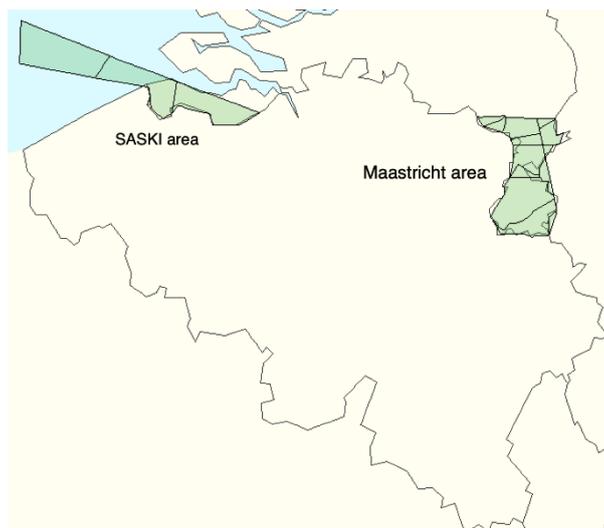


Figure 12 – Cross-border areas of skeyes with significant area and traffic volume (Source: PRB elaboration on the information provided during the detailed examination and data from the Eurocontrol NEST tool).

242 Both areas are in the charging zone of the Netherlands, with ATS delegated to skeyes. These areas are significant due to their relatively large area and the volume of traffic flying through these airspace blocks. Belgium reported that there are no financial arrangements in place regarding these two service delegations, thus the costs for providing the services are borne by skeyes, while the en route service units are recorded in the Netherlands. This may have an impact on the unit rates charged to users and on the level of the DUCs for both Member States. The key figures for these two cross-border areas are shown in Table 44.

Name of the area	Size of the area (km ²)	Average. daily IFR flights	Average distance flown per flight (Nautical Miles)
SASKI area	1,200	71	22
Maastricht area	1,300	131	12

Table 44 – Cross-border areas of skeyes with significant area and traffic volume (Source: PRB elaboration on the data from the Eurocontrol NEST tool).

Cross-border arrangements of MUAC

243 Belgium listed 17 cross-border arrangements for MUAC. Belgium provided detailed information on all 17 cross-border areas, including the coordinates of their boundaries, and also an analysis of their significance. Belgium concluded that three areas need to be highlighted as having a meaningful impact on ATCO workload and thus costs and revenues: These are the KOSIT and BITBU areas over Germany and the PINOT/SORAL area over France.

244 The PRB identified other areas as significant in terms of the size of the area covered and traffic volume associated with the airspace block. These are additional significant airspace blocks over Germany and the Netherlands, in which ATS is delegated to the Brussels sector group of MUAC. Belgium explained that the operational impact generated by these areas is considered in the ATCO allocation keys between the three MUAC sector groups concerned, thus they do not have an impact on the total costs of Belgium (these arrangements are concluded between the different sector groups of MUAC). Therefore, the PRB did not examine the financial impact of the SASKI area, the Maastricht area, and the Aachen area.

245 All cross-border areas identified as significant are shown in Figure 13 (next page).



Figure 13 – Cross-border areas of MUAC Brussels sector group with significant area and traffic volume (Source: PRB elaboration on the information provided during the detailed examination and on the data from the Eurocontrol NEST tool).

246 For the BITBU, KOSIT, and the PINOT/SORAL areas, Belgium reported that the operational and financial impact is not covered by the MUAC allocation keys, as these arrangements are concluded between MUAC and DFS (Germany)/DSNA (France). Belgium also provided an estimation of the workload and the financial impact associated with these areas. The key figures for the identified areas are shown in Table 45.

Name of the area	Size of the area (km ²)	Average daily IFR flights	Average distance flown per flight (Nautical Miles)
KOSIT	985	84	11
BITBU	2,200	513	16
PINOT/SORAL	3,470	435	28

Table 45 – Cross-border areas of MUAC Brussels sector group not covered by the allocation keys (Source: PRB elaboration on the data from the Eurocontrol NEST tool).

Analysis of financial impact associated with the cross-border arrangements

247 In summary, for skeyes there are two cross-border areas with a significant geographical area and amount of traffic where skeyes provides ATS in the charging zone of the Netherlands. For MUAC, there are three cross-border areas with a significant geographical area and amount of traffic where the MUAC Brussels sector group provides ATS in the charging zones of Germany and France. This analysis considers all these areas to have a significant operational impact that may affect the costs borne and revenues collected by Belgium.

248 Belgium did not provide an estimate of the cost impact of the two cross-borders areas (SASKI area and Maastricht area).

249 Belgium provided the results of an internal analysis conducted by MUAC on the cost impact of cross-border arrangements. These results cover the impact of the areas in the charging zones of the Netherlands, Germany, and France. As mentioned in the previous section, the costs of the areas over the Netherlands (SASKI area and Maastricht area) and the areas within the Hannover UIR over Germany (Aachen area) are allocated to the respective MUAC sector groups, thus are not borne by Belgium. The costs of the BITBU, KOSIT, and PINOT/SORAL areas are fully borne by Belgium, while the related service units are recorded by Germany and France in the respective charging zones. An analysis has been undertaken by MUAC to estimate the actual workload, using the number of kilometres controlled in 2021 and concluded that this represents approximatively between 7M€ and 9M€ per year allocated to the Belgian/Luxembourg charging zone for services provided in Germany and France (while the service units and corresponding revenues are allocated to France and Germany). Belgium also noted that these results should be confirmed by independent analysis.

250 In order to examine the financial impact of all the significant cross-border arrangements of both skeyes and MUAC, the PRB developed a methodology to estimate the workload generated by each of the areas. The methodology uses the total distance controlled as the proxy for the workload so that the results are comparable with those provided by Belgium and is based on traffic samples covering two AIRAC cycles (1907 and 1908). The average distances controlled in each of the areas are collected from the sample for each day of the AIRAC cycles and are compared to the average distance controlled in the Belgian FIR (limited to en route operations). For cross-border areas concerning MUAC, the distances controlled in each of the cross-border areas are also compared to the average distances controlled in that part of the Brussels sector group, which is in the Belgium-Luxembourg charging zone. The methodology also considers the seasonal difference between the summer averages and the overall yearly averages for each airspace block concerned. The resulting ratios are used to indicate the workload associated with each cross-border area.

251 The results of the calculations are shown in Table 46. For each cross-border area, the table provides the charging zone in which the area is located, the ANSP providing the services in the area, and the ratio of the total distance controlled in the area compared to that of the Belgium-Luxembourg charging zone. The ratios indicate the workload associated with each cross-border area compared to the workload associated with the Belgium-Luxembourg charging zone.

Name of the area	Charging zone	ANSP in control	Ratio of distance controlled vs BE-LU charging zone (%)
SASKI	NL	skeyes	0.67%
Maastricht	NL	skeyes	0.56%
Total for skeyes		skeyes	1.23%
KOSIT	DE	MUAC	0.34%
BITBU	DE	MUAC	3.07%
PINOT/SORAL	FR	MUAC	4.45%
Total for MUAC		MUAC	7.87%

Table 46 – Estimated workloads of the significant cross-border areas of skeyes and MUAC (Source: PRB elaboration on the data from the Eurocontrol NEST tool).

252 On the basis of the distance ratio of each of the identified cross-border areas in the charging zone and the observed apportionment between the distance controlled in upper airspace controlled by MUAC (70%) and in the lower airspace controlled by skeyes (30%), the PRB estimates that MUAC controls 11% of the total distance in the identified zones and skeyes 4% (Table 47, next page).

253 Applying these percentages to the 2019 costs baselines presented by both entities in the revised draft performance plan, the costs for the services provided in the identified cross-border areas would amount to 12.2M€₂₀₁₇ (5.4M€₂₀₁₇ for skeyes and 6.8M€₂₀₁₇ for MUAC, respectively). If these costs would be removed from the 2019 cost baseline value for the en route charging zone of Belgium-Luxembourg, the 2019 baseline DUC level assessed against the comparator group average (also reflecting a mirrored impact on the Netherlands 2019 DUC baseline relating to the services provided by skeyes in the Netherlands en route charging zone) would be reduced by -4.8€₂₀₁₇. Such reduction would however not suffice to be consistent with the 2019 baseline DUC criteria, as it would still be +5.9% higher than the comparator group average (from +13.2% higher in the revised draft plan). The impact on the trends would be negligible, as such costs are incurred yearly in the same proportion.

254 By applying these percentages to the 2024 determined costs, the estimated cost for the provision of services in the identified cross-border areas would equal 14M€₂₀₁₇ (5.5M€₂₀₁₇ for skeyes and 8.5M€₂₀₁₇ for MUAC). The results of the analysis conducted by MUAC concluding that the costs for the services it provides in the cross-border areas in the Belgium-Luxembourg charging zone are confirmed by PRB’s analysis (i.e. these represent between 7M€ and 9M€ per year, whereas the corresponding service units are allocated to France and Germany).

255 According to the Regulation, the geographical scope of charging zones shall be consistent with the provision of air navigation services and may include services provided by an air navigation service provider established in another Member State in relation to cross-border airspace and the cost base for en route charges shall consist

of the determined costs related to the provision of air navigation services in the charging zone concerned.⁴⁵ These provisions suggest that the determined and actual costs in the Belgium-Luxembourg en route charging zone should not include costs relating to the provision of services outside its geographical scope and that appropriate financial agreements with the parties concerned should be put in place.

ANSP	% Km in CZ	proportion of km in CZ (%)	% Km for ANSPs	Impact on 2019 baseline costs (M€ ₂₀₁₇)	Impact on 2024 determined costs (M€ ₂₀₁₇)
skeyes	1.23%	30%	4.1%	+5.4	+5.5
MUAC	7.87%	70%	11%	+6.8	+8.5
Total	9.10%	100%	9.1%	+12.2	+14

Table 47 – Estimated financial impact of the identified cross-border areas of skeyes and MUAC on the 2019 DUC baseline and on the 2024 determined costs (Source: PRB elaboration on the data from the Eurocontrol NEST tool, on the information provided during the detailed examination, and on the draft performance plan).

9.3 Conclusions

- The cross-border arrangements of skeyes and MUAC deliver operational benefits by reducing the need for coordination between operational units and by facilitating the handling of traffic to all the stakeholders involved in those arrangements.
- There are two significant cross-border areas where services are provided by skeyes outside the Belgian airspace (SASKI area and Maastricht area), and three areas where services are provided by MUAC Brussels sector group outside the Belgian and MUAC airspaces (BITBU, KOSIT, PINOT/SORAL).
- The five areas are not covered by financial arrangements, thus the cost associated with providing ATS services in these areas are borne by Belgium-Luxembourg, whereas the corresponding service units are recorded in the Netherlands for the two areas managed by skeyes, in Germany for BITBU and KOSIT, and in France for PINOT/SORAL for the areas managed by MUAC.
- According to the PRB analysis, the costs for providing the services in the cross-border areas can be estimated at +12.2M€₂₀₁₇ (+5.4M€₂₀₁₇ for skeyes and +6.8M€₂₀₁₇ for MUAC in respect of the 2019 baseline costs, respectively). Applying the same additional distance ratios to the 2024 determined costs would result in an estimate of the costs for providing the services in the identified cross-border areas at +14M€₂₀₁₇ (+5.5M€₂₀₁₇ for skeyes and +8.5M€₂₀₁₇ for MUAC, respectively).
- If these costs would be removed from the 2019 cost baseline value for the en route charging zone of Belgium-Luxembourg, the 2019 baseline DUC level assessed against the comparator group average (also reflecting a mirrored impact on the Netherlands 2019 DUC baseline relating to the services provided by skeyes in the Netherlands en route charging zone) would be reduced by -4.8€₂₀₁₇. Such reduction would however not suffice to be consistent with the 2019 baseline DUC criteria, as it would still be +5.9% higher than the comparator group average (from +13.2% higher in the revised draft plan). The impact on the trends would be negligible, as such costs are incurred yearly in the same proportion.
- According to the Regulation, the cost base for en route charges shall consist of the determined costs related to the provision of air navigation services in the charging zone concerned, suggesting that the determined and actual costs in the Belgium-Luxembourg en route charging zone should not include costs relating to the provision of services outside its geographical scope and that appropriate financial agreements with the parties concerned should be put in place.

⁴⁵ Articles 21 and 22 of Commission implementing Regulation 2019/317.

10 COSTS CHARGED TO AIRSPACE USERS IN RP2 IN RESPECT OF POSTPONED OR DELAYED INVESTMENTS IN FIXED ASSETS

256 This section analyses the RP3 cost estimates of skeyes and MUAC to determine if these estimates include costs relating to any RP2 investment that have been charged to airspace users and not been materialised in RP2.

10.1 Information requests sent to Belgium for the detailed examination

257 The EC sent to Belgium an information request regarding costs charged to airspace users in RP2 in respect of postponed or delayed investments in fixed assets (Table 48).

Questions asked by the European Commission
A) Please provide the details (per year) of the determined and actual costs for each of the investments postponed, delayed or cancelled in RP2 for each ANSP.
B) Please provide the procedure and the analysis applied by the NSA to ensure that the investment plan for RP3 does not include any RP2 investments that have not materialised (i.e. postponed, delayed or cancelled).

Table 48 – Summary of main information requested in respect of Element 10.

Assessment of completeness of the additional information provided by Belgium

258 Belgium provided limited information for both skeyes and MUAC regarding the details of the determined and actual costs for each of the RP2 investments. The procedure and the analysis applied by the NSA to ensure that the investment plan for RP3 does not include any RP2 investments that have not been materialised has not been provided. The PRB therefore based its analysis on the information reported for the RP2 performance plans and the RP3 draft performance plans. Due to the limited amount of information available, the PRB can only draw limited conclusions.

10.2 Analysis

259 The unit rates charged to airspace users in RP2 included determined depreciation costs and cost of capital for some planned investments projects in RP2 that may have been cancelled or postponed. Airspace users were charged for these investments while not getting the expected benefits. Moreover, if the RP3 cost base includes costs already charged in RP2 in respect of postponed or delayed investments in fixed assets, corrections and/or adjustments in the RP3 cost bases of skeyes and MUAC should be considered. It should be ensured that costs relating to specific investments are not being double charged to airspace users.

Analysis of RP2 and RP3 investment plan of skeyes

260 The en route and terminal actual CAPEX of skeyes for RP2 was 72% of the determined amount for the same period and the underspend on CAPEX was 25M€. In terms of costs related to investments, airspace users have financed 21M€ (7.8M€ for en route and 13M€ for terminal) for investments that have not materialised (Table 49, next page). The current reporting system is not tracking the operating costs related to the implementation of the investments (i.e. staff costs and other operating costs). The underspend, the delay, the postponement, and/or the cancellation of an investment have further indirect costs that cannot be quantified. Therefore, airspace users may have financed a larger amount related to the investments that have not been materialised. Belgium noted that, during RP2, there was no legal requirement to refund airspace users.

261 Due to the lack of detailed information provided by Belgium, it is not possible to determine if Belgium is double charging users for costs relating to postponed or delayed investments in fixed assets of RP2 already charged in RP2 through the RP3 investments. In response to a request for additional information, Belgium provided a list of several skeyes investments that were planned during RP2 and that were postponed to RP3. Costs related to these investments will be charged to airspace users in RP3.⁴⁶ However, in the RP3 performance plans, only new major

⁴⁶ Investments “ATM infrastructure of the new control tower at Charleroi airport: now part of the Digital Tower project”; “New Surveillance Layer (WAM and/or ADS-B)”; “Replacement of the A-SMGCS at EBBR”; “ILS at the Brussels, Liège, Ostend, Charleroi and Antwerp airports”; and “Weather sensing”.

investments are detailed and reported by project, which complicates the analysis of the investment plan of skeyes, as the reported names of investment projects can change between reference periods and during its entire construction and lifecycle.⁴⁷ Thus, there is the possibility that these investments may be double charged; however Belgium did not provide further details.

	RP2 determined costs (M€)	RP2 actual costs (M€)	Difference (M€)
Total depreciation costs related to investments	83	62	-20
<i>Of which en route</i>	52	44	-7.6
<i>Of which terminal</i>	31	18	-13
Total cost of capital related to investments	23	23	-0.4
<i>Of which en route</i>	17	16	-0.2
<i>Of which terminal</i>	6.3	6.2	-0.1
Total costs related to investments	111	90	-21
<i>Of which en route</i>	68	61	-7.8
<i>Of which terminal</i>	43	30	-13

Table 49 – RP2 total costs (en route and terminal) related to investments of skeyes (Source: PRB elaboration on RP2 reporting tables).

Analysis of RP2 and RP3 investment plan of MUAC

- 262 MUAC’s en route actual RP2 CAPEX was 36% of the determined amount. This reflects a CAPEX underspending of 50M€ in RP2. In terms of costs relating to investments, airspace users have financed 9M€ for investments that have not materialised. More specifically, for the part of MUAC concerning the Belgium-Luxembourg charging zone, airspace users have financed 2.1M€ for investments that have not materialised (Table 50, next page). The current reporting system does not track the operating costs related to the implementation of the investments (i.e. staff costs and other operating costs). The underspend, the delay, the postponement, and/or the cancellation of an investment have further indirect costs that cannot be quantified. Therefore, airspace users may have financed a larger amount related to the investments that have not materialised.
- 263 It is unclear if MUAC is double charging to users costs related to postponed or delayed investments in fixed assets of RP2 already charged in RP2 throughout the RP3 investments. As per skeyes, the information available does not enable a thorough analysis of this issue. From the information provided in the RP2 performance plan and RP3 revised draft performance plan, it is understood that at least two new major investments from RP2 remain in the asset base of MUAC during RP3.⁴⁸ It is not clear if investments such as these are being double charged, since Belgium has not provided the necessary detail.

⁴⁷ Over RP3, costs related to new major investments represent only 6.6% on average of the total planned costs related to investments, while costs related to other investments (other new investments and existing investments) represent 93% of costs related to investments. In addition to the information provided in the draft performance plan, in Annex E of the draft performance plan, Belgium reported additional information regarding other new investments, which represent 16% of costs related to investments.

⁴⁸ Investments “New Voice Communication System” that had an underinvestment in RP2 and “Back up Voice Communication System”.

	RP2 determined costs (M€)	RP2 actual costs (M€)	Difference (M€)
Depreciation costs related to investments	16	14	-2.1
Cost of capital related to investments	0	0	0
Total costs related to investments	16	14	-2.1

Table 50 – RP2 total costs (en route) related to investments of MUAC BE and MUAC LUX (Source: PRB elaboration on the RP2 reporting tables).

10.3 Conclusions

- Several investments included in the RP3 cost bases of skeyes and MUAC may include costs that have already been charged in RP2 relating to postponed or delayed investments in fixed assets. Belgium has not provided detailed information to allow the PRB to determine if this is the case. It should be ensured that airspace users are not double charged for investments.
- In RP2, in terms of depreciation and cost of capital for skeyes, airspace users have financed 21M€ (7.8M€ for en route and 13M€ for terminal) for investments that have not materialised. In RP2, in terms of depreciation and cost of capital for MUAC Belgium and Luxembourg, airspace users have financed 2.1M€ for investments that have not materialised. Belgium noted that, during RP2, there was no legal requirement to refund airspace users.
- Belgium provided limited information about costs charged to airspace users in RP2 associated with postponed or delayed investments in fixed assets. If the RP3 cost base includes costs already charged in RP2 in respect of postponed or delayed investments in fixed assets, corrections and/or adjustments in the RP3 cost bases of skeyes and MUAC should be considered.