Performance Review Body:
PRB Monitoring Report 2018

The 2018 monitoring consists of five reports:

- **PRB Monitoring Report 2018**
- Annex I – Union-wide detailed analysis for experts
- Annex II – Member States' detailed analysis for experts
- Annex III – Safety Report
- Annex IV – CAPEX Report

October 2019

Remarks from the Chair

The core task of Air Navigation Services Providers (ANSPs) is to control air traffic safely and efficiently. In 2018, many ANSPs have fulfilled this task - a few were unable to provide efficient services. The European aviation industry left millions of passengers stranded at airports, waiting for their flights. Airlines incurred millions of Euros in extra cost. Not only stakeholders but also Ministers of Transport promised to learn and to improve. Eurocontrol managed to convince stakeholders to take extraordinary measures to mitigate the effects of a shortage of capacity. They took these measures to provide additional capacity, resulting in lower delay levels in 2019. Such measures work as a transitory solution. Significant and sustainable improvement of the capacity where and when it is needed will require structural changes of European air traffic management as set out in the SESAR Airspace Architecture Study and the recommendations of the Wise Persons Group.

The cost of the large delays incurred in 2018 was borne by the airlines and passengers. Under the current Performance and Charging system, penalties for ANSPs are minimal. Overall, the penalties amounted to 4M€$_{2009}$, whereas, according to calculation done by the PRB, the cost of delays for airlines amounted to 1.7B€$_{2009}$.

Air traffic management (ATM) is still a human-centric business. In 2018 – as in previous years – around 60% of the cost of an ANSP were spent on **salaries** – and increasingly – on **pensions**. Most of the air traffic controllers deliver a stellar performance day-in and day-out. Some of them manage over 90 flights en route per hour in a complex environment, whilst neighbouring colleagues barely get to half of that number. These results are important for defining the requirements for the third Reference Period (RP3): spending more money on air traffic controllers does not automatically translate into higher performance. The productivity of a controller in terms of throughput per hour, hours spent at the position, the number of open sectors and applicable restrictions are important tools to analyse the contribution of controllers to performance. In the current human-centric processes, optimal staffing and rostering directly translate into better performance. There are several Air Navigation Service Providers in Europe demonstrating daily that this is possible thanks to leadership, including good labour relationships and good planning.

The results of 2018 show that the **environmental performance** of ATM must improve. The horizontal flight efficiency, measured in excess flown miles, achieved by 11 countries contributed positively towards the Functional Airspace Block (FAB) (and network) targets, while the rest of the Single European Sky Member States need to do better, in some cases implementing Free Route Airspace (FRA). Once FRA is adopted in all states, environmental performance can only be improved with a gate to gate approach, including vertical flight efficiency and operations in the terminal zone and airport operations. This will be a must, because overall, the CO_2 output of aviation in the EU Member States has again grown in 2018 (+4.7%), despite heavy investments by airlines in more fuel-efficient aircraft. Last, but not least, releasing airspace reserved for the military to make it available to civil aircraft if not needed by the military can also make a significant difference where it can provide benefit to the network.

Monitoring is not a purpose in itself. It needs to translate into insights and learnings and ultimately actions, not only for the past but also when assessing the Performance Plans for the upcoming Reference Period, starting 2020. Each monitoring report of the PRB has included recommendations to the European Commission and Member States and the PRB highlights the importance of stakeholders acting upon these recommendations to improve performance of ATM in Europe.

On behalf of the PRB, I would like to thank Eurocontrol, EASA and the European Commission for the excellent cooperation preparing this report.

Regula Dettling-Ott
Chair

Table of Contents

1. About this document

1   The PRB Monitoring Report 2018 provides analysis of the performance achieved by Member States of the Single European Sky (SES), covering the fourth year (2018) of the second Reference Period (RP2), which runs for five years from 2015 to 2019.

2   In 2018, the PRB Monitoring Report is supported by four Annexes to provide detailed analysis of performance:

- **PRB Monitoring Report 2018**
- Annex I – Union-wide detailed analysis for experts
- Annex II – Member States' detailed analysis for experts
- Annex III – Safety Report
- Annex IV – CAPEX Report

3   This document is the PRB Monitoring Report 2018 and it has been developed based on the data assessed and verified by the Member States, the Performance Review Unit (PRU), the Network Manager and the European Aviation Safety Agency (EASA). It aims to explain the performance of European Air Traffic Management in 2018 in the context of the second Reference Period and to identify the key issues for each Key Performance Area (KPA). It is a digest of the monitoring results and the PRB has kept the language simple, without too much technical detail. Experts who wish to consult a detailed analysis may find this in Annexes I-IV.

4   Monitoring is one of the primary tasks of the Performance Review Body, ensuring that Member States, the European Commission and stakeholders are informed about how Air Navigation Service Providers (ANSPs) perform in relation to performance targets. This report is built on data verified by Member States. Accurate data is crucial for monitoring and it is a lengthy process to provide, verify and analyse it.

5   From the PRB's point of view, Member States should make data available earlier – not for the PRB's sake, but for their own. Certain European Air Navigation Service Providers, such as DFS (Germany) and DSNA (France), were unable to provide sufficient capacity in 2018. This illustrates how crucial it is for supervisory authorities and ministries to have access to full and complete data, including critical information concerning the number of air traffic controllers and their productivity. As of now, Member States receive or provide this data with a delay of more than a year. Underperforming Area Control Centres, in particular, should be obliged to provide up-to-date numbers on where they stand in terms of managing their controllers.

6   Monitoring implies comparison, not only within the comparator groups as defined by the European regulatory framework for performance but also beyond Europe. In March 2019, the Commission and Eurocontrol published an update of the U.S. – Europe continental comparison and ANS Cost-Efficiency trends. Acknowledging that the comparison between the U.S. and European air traffic management has limitations, it is important and useful to learn from this study, because the results for the main cost-efficiency metrics still demonstrate significant discrepancies.

2. Facts and figures from 2018

2.1 Traffic continues to increase above plans with higher revenues for Air Navigation Service Providers

7   In 2018, the number of flights (Instrument Flight Rules movements) continued to grow with an increase of 3.7% from 2017 to 2018. At the same time, airlines used larger aircraft and thus paid higher charges for the services of Air Traffic Management, since these depend on the maximum take-off weight of the aircraft (each chargeable unit is called a 'service unit'). A higher number of movements combined with larger aircraft resulted in substantially increased revenues for Air Navigation Service Providers. In 2018, service units increased by 5.6%, which resulted in actual service units being 9.7% higher than the value set in the Performance Plans in February 2014.[1]

8   Figures 1 and 2 show these developments: the number of Instrument Flight Rules movements remained within the high forecast, while service units were above the February 2014 high forecast.[2] As actual Instrument Flight Rules movements are within the boundaries of predictability, the traffic growth (and required capacity) should not have come as a surprise to Member States. It makes it difficult to understand why, in summer 2018, high levels of delay were generated in some of the Area Control Centres.

Forecast Traffic vs Actual Traffic (Instrument Flight Rule Movements)
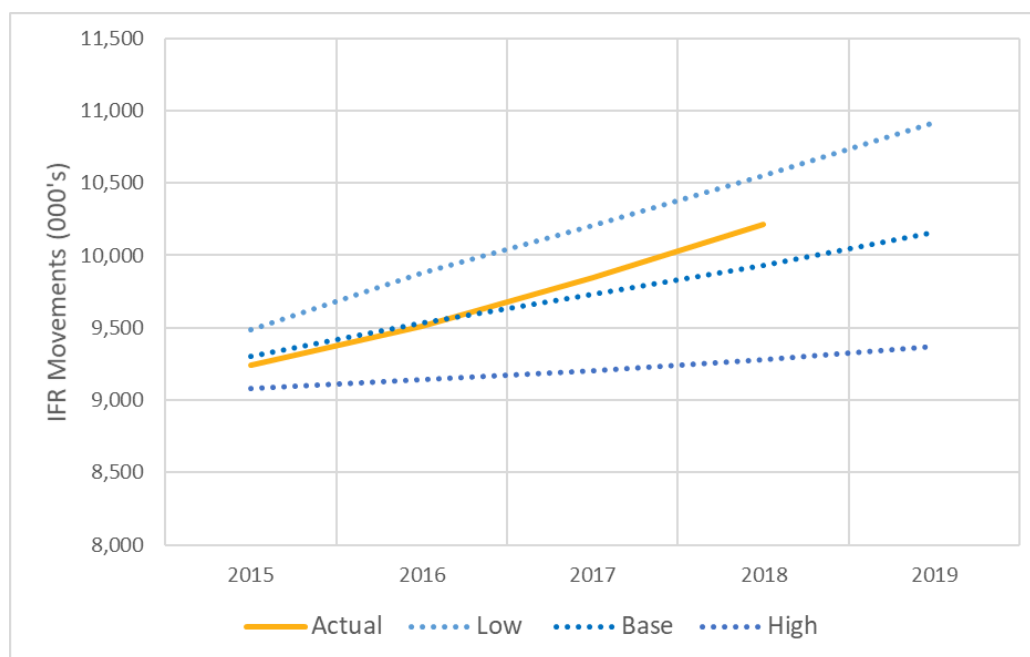
Figure 1 - Actual movements compared with the high, base and low forecasts (Source: 7-year STATFOR forecast February 2014/2019)[3], showing that the actual traffic is still within the forecast for the second Reference Period.

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[1] This forecast is what many Member States and the European Commission chose as the basis for the second Reference Period .

[2] EUROCONTROL/STATFOR provides impartial air traffic forecasts in three scenarios: high, low and base.

[3] Based on the SES area as defined in STATFOR forecast.

## Forecast service units vs. actual service units
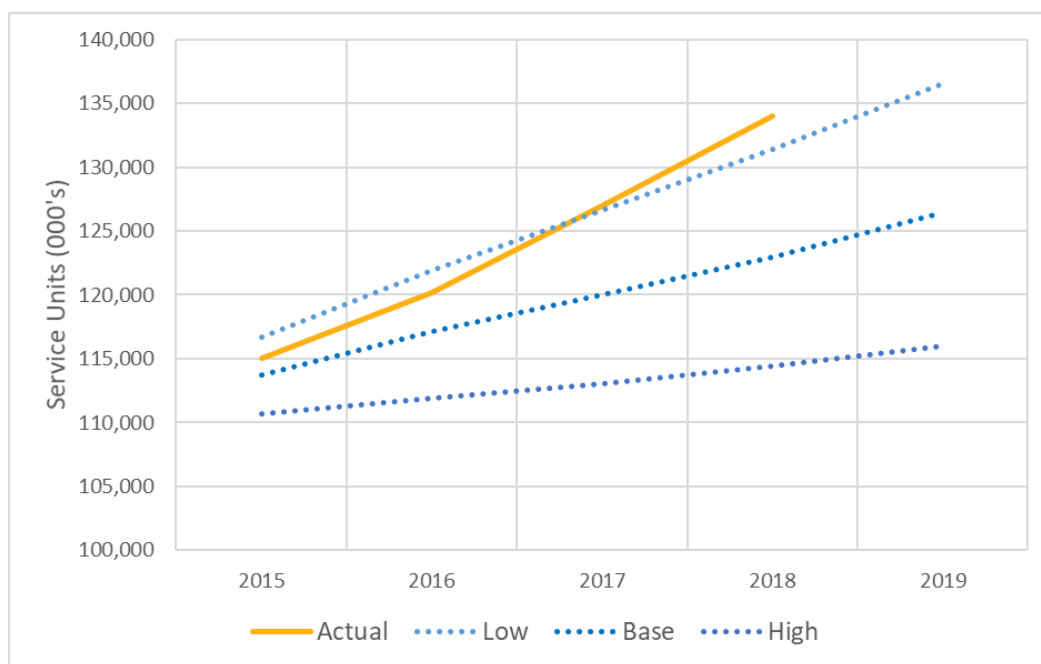
Figure 2 - Actual en route service units compared with the high, base and low forecasts for service units (Source: 7-year STATFOR forecast February 2014/2019), showcasing that service units have shown greater growth than Instrument Flight Rules movements.

3. Safety

3.1 Air Navigation Services related European Union accidents and serious incidents show a downward trend and safety management scores are improving

9   Under the Performance Scheme, the Effectiveness of Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the national authorities and for the Air Navigation Service Providers.

10   Safety levels of the Air Navigation Service Providers remain high. The number of accidents and serious incidents related to Air Traffic Management fluctuate around a plateau with a small increase in 2018 (Figure 3).[4] Out of four aviation accidents in 2018, only one was with indirect contribution of Air Traffic Management and was non-fatal (turbulence encounter). The data indicates that Air Navigation Service Providers are managing the major risks well and continue to improve, although the rate of improvement is levelling out.

Number of accidents and serious incidents related to Air Traffic Management
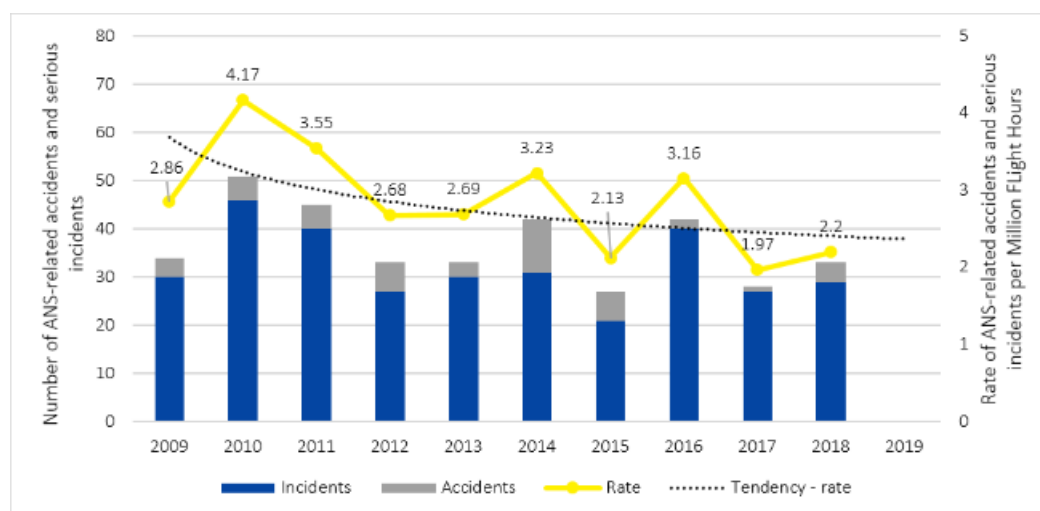
Figure 3 – Number of Air Navigation Services related accidents and serious incidents (Source: PRB elaboration of EASA draft monitoring data), showing improvements over the last years; the rate of improvement is levelling out.

11   During 2018, the Air Navigation Service Providers improved the effectiveness of their safety management (Figure 4) and the scores for the Management Objectives: Safety Policy and Objectives, Safety Risk Management, Safety Assurance, Safety Promotion. All Air Navigation Service Providers have achieved the target for the safety culture objectives. Although many Air Navigation Service Providers are on track to or have already reached the target for the second Reference Period for the remaining objectives, some Air Navigation Service Providers will require further improvements. If the current rate of improvement continues, it is likely that not all Air Navigation Service Providers will reach the target by end of the second Reference Period.

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[4] "ANS related" means that the Air Navigation Service system may not have contributed to a given occurrence, but it may have a role in preventing similar occurrences in the future. "ANS contribution" means that at least one Air Navigation Service factor was in the causal chain of events leading to an occurrence, or at least one ANS factor potentially increased the level of risk, or it played a role in the occurrence encountered by the aircraft.

Number of Air Navigation Service Providers meeting the Union-wide target and associated average EoSM score increase
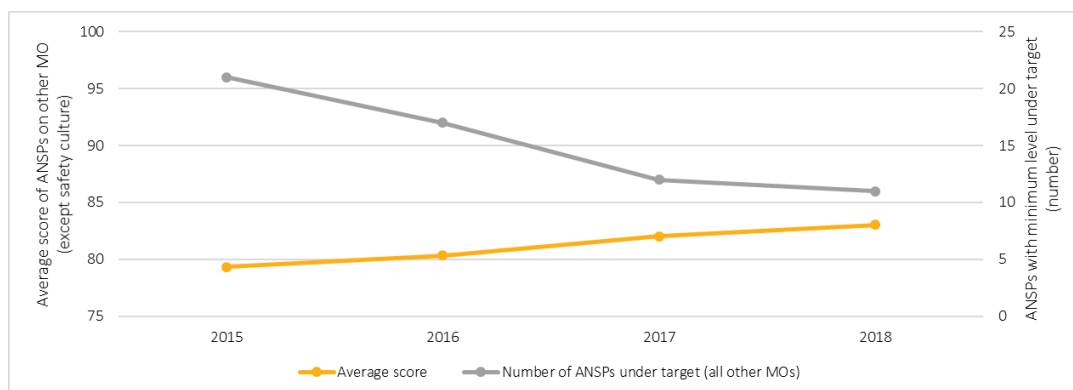
Figure 4 – Development in the Effectiveness of Safety Management of the Air Navigation Service Providers (all management objectives except safety culture) (Source: Performance Review Body elaboration of European Aviation Safety Agency draft monitoring data), showing a constant improvement during Reference Period 2 levelling out after 2017.

12 Member States have also improved the Effectiveness of their Safety Management. While the number of Member States with a minimum level below the target did not improve from 2016 to 2017, further improvements were seen between 2017 and 2018 with six Member States reaching the target level for the second Reference Period. However, as for Air Navigation Service Providers, not all Member States will reach the target at the end of the second Reference Period. Improvement measures need to be implemented for the third Reference Period.

13 Member States below the target have a minimum maturity level of B (target being level C) with one State (Belgium) still being at (the lowest) level A in one Management Objective. A number of Member States (Bulgaria and Hungary), despite being below targets, have only shown little improvements with other Member States below target (Denmark, Estonia and Portugal) improving over the second Reference Period, but still not sufficient to reach the targets.

14 Based on the review of the 2018 FAB Monitoring Report, it appears that there is no harmonised approach to the implementation of Just Culture. Some FABs have confirmed a common approach has been defined at State and/or ANSP level (Blue Med, Denmark-Sweden, FAB Central Europe, FAB Europe Central and UK-Ireland, South West - ANSP only - and Northern Europe FAB - ANSP only), made a commitment to apply the Just Culture principles and to work together on Just Culture issues. In some cases, no progress is reported on improvements to be implemented. Others have not established a common approach (Baltic FAB and Danube FAB) but may have national improvements under implementation.

15 When compared with 2017, very little has changed and further work is needed in the area of improving Just Culture. Improving Just Culture is a pre-requisite for achieving European-wide safety improvements.

4. Environment

4.1 Environmental performance remains a concern

16   The current Performance Scheme measures environmental performance in terms of the excess horizontal length of the planned route and the actual route an aircraft takes. This so-called horizontal flight efficiency (KEA indicator) has slightly worsened in 2018 (Union-wide level). In 2018, flew an additional 2.83% up from 2.81% in 2017 (Figure 5). Most FABs showed this worsening performance in horizontal flight efficiency except for UK-Ireland FAB and North Europe FAB (NEFAB). Only South West FAB achieved its 2018 reference value.

Environmental Performance 2018		
Key Performance Indicators	European Union target	Actual performance
KEP – Horizontal flight efficiency of planned route	4.27%[5]	4.71%
KEA – Horizontal flight efficiency of actual route	2.69%	2.83%

17   The reason for the performance cannot be attributed to a single cause. It is surprising given the improvements in network route structure and local coordination with the military. Possible causes may be increased airspace restrictions, airspace user preferences and that constraints in capacity resulted in longer routes being offered and flown. The latter is likely to have had the largest impact, with May to August having greater variation in horizontal flight efficiency than in previous years.

18   Given the performance in 2018 and the required improvements to meet the planned horizontal flight efficiency targets at the end of 2019, significant actions from Air Navigation Service Providers will be required. In addition, Member States, the Network Manager and airspace users will need to cope with the consequences of the seven measures agreed between the Network Manager and Member States to mitigate the lack of capacity. In some cases, the measures imply longer routes for aircraft.

19   The Network Manager provided the PRB with an assessment of the impact of these measures on fuel burnt and average distance flown in Europe. Between May and September 2018 the rerouting caused an extra 0.03 nautical miles per flight leading to an additional 0.19kg of fuel burnt per flight on average compared to 2017. This impact is minimal. The Network Manager has also provided initial data for the summer 2019, which shows an impact of 10.55kg per flight and 1.62 nautical miles compared with 2017. This is a greater impact but represents less than 0.2% of the average fuel burnt per flight[6].

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[5] This is the indicative target for 2018 to achieve the RP2 target in 2019. No binding targets were set for KEP before 2019.
[6] Calculation based on an average fuel burn per flight of 6037kg (Standard Inputs for Eurocontrol CBAs. Edition no. 8.0)

Environmental performance 2018 – percentage of extra horizontal distance flown or planned
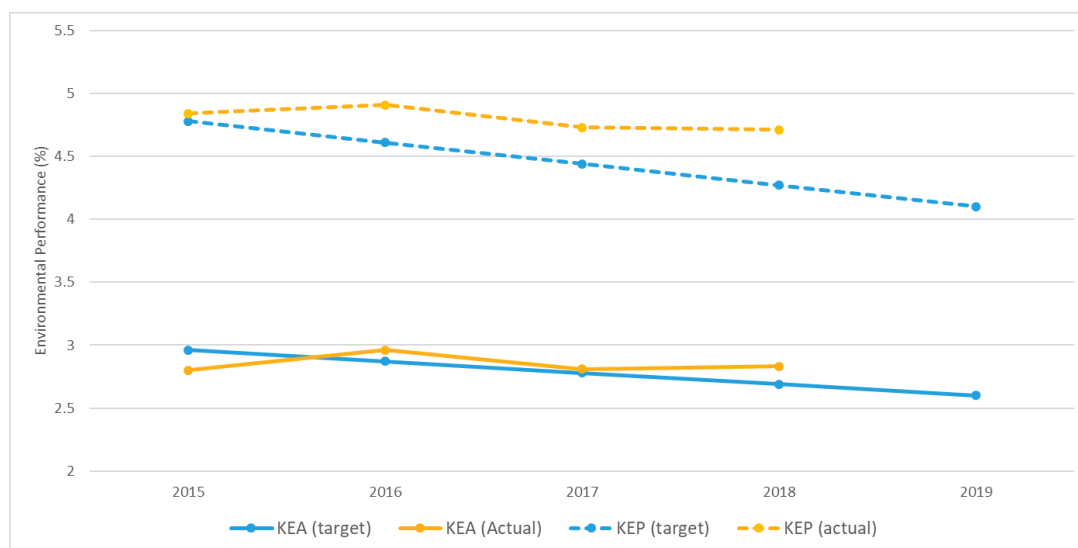
Figure 5 – Actual (KEA) and planned (KEP) horizontal flight efficiencies against respective the second Reference Period reference values (Source: PRB elaboration of Eurocontrol data), highlighting the worsening performance from 2017 to 2018.

20 Improving the environmental performance of aviation has been a vital part of the Single European Sky from the beginning. The goal of saving CO_2 (and fuel) through using more efficient routes was a main driver of the project. Over the years and especially in 2018, this aspect fell behind as the unprecedented delays became the big challenge. The environmental impact of aviation needs to remain at the forefront. The original goal of the Single European Sky included a 10% reduction of impact of aviation on the environment per flight. This implies a reduction of the total gate-to-gate emissions, including improved airport operations and optimised routings in terms of distance and flight levels. The improvements monitored by the Performance Review Body stemming from shortening the distance (horizontal flight efficiency) only covers one area of the total emissions. The focus on the other areas, namely the vertical flight efficiency, should be increased.

4.2 CO_2 output continues to increase

21 The European Aviation Environmental Report, published by the European Union Aviation Safety Agency (EASA) in close collaboration with the European Environment Agency and Eurocontrol, assesses other aspects of environmental performance. In January 2019, the latest environmental report was published with a chapter on Air Traffic Management and operations (Chapter 4), taking into account data available until 2017.

22 The European Aviation Environmental Report 2019 shows that between 2013 and 2017, total verified CO_2 emissions from aviation covered by the European Union emission trading (EU ETS) have increase by 4.7% on average per year, an increase of 53 million tonnes to 64 million tonnes (report p.76). This suggests that traffic growth has negated the improvements more fuel-efficient aircraft have brought.[7]

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[7] 8.1% improvement in fuel efficiency between 2014 and 2017 (kg/passenger km) – European Aviation Environmental Report 2019.

Aviation CO₂ emission growth compared to passenger growth
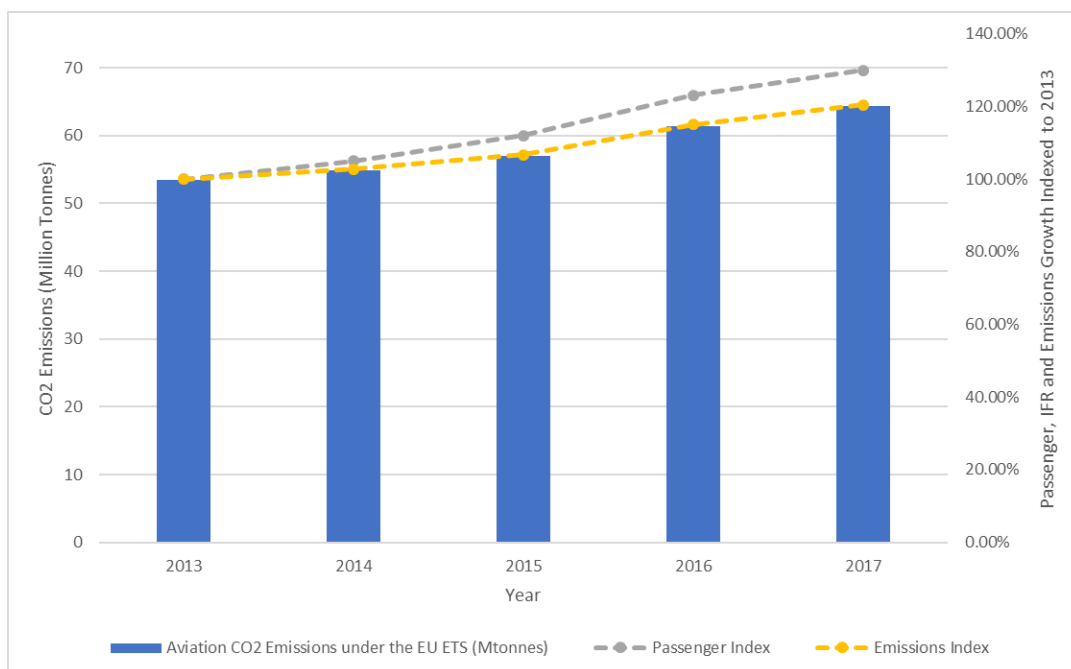
Figure 6 - Aviation CO₂ emissions under the EU ETS in 2013- (Source: Performance Review Body Adaptation of European aviation environmental report 2019, Table 6.1 to show the passenger index).

4.3 Other environment indicators

23   As part of the Performance Review Body's monitoring activities, a number of environmental indicators are measured beyond horizontal flight efficiencies, notably the additional time in terminal airspace and the additional taxi-out time. Both indicators help monitor the environmental impact of aviation, as well as delays.

24   The most constrained airports have the highest impact – in some cases with additional time in local airspace and during taxiing greater than seven minutes per flight. Many airports have only recently started to monitor these indicators. These will require further analysis as more airports report environmental data.

25   The PRB notes that less than 40% of the airports that are required to monitor these additional metrics actually report this data in their annual monitoring submissions. It is important that NSAs enforce this requirement to enable the PRB to assess the full environmental performance of Member States and the progress towards the Single European Sky's high-level goals.

26   Additionally, the use of military airspace is one of the core issues with respect to improving environmental performance (and capacity). The PRB notes that it still does not have sufficient visibility of available data to develop an action plan for improving the optimum use of airspace. The release of available airspace and the timely and efficient reporting of the demand for airspace are both required to establish procedures ensuring that environmental performance and capacity requirements are optimised.

5. Capacity

5.1 Delays increased exponentially in summer 2018

27   During most of 2018, en route flights (on an aggregate level) suffered from delays above the target. They increased from an average of 0.94 minutes of delay per flight in 2017 to 1.83 minutes of delay per flight in 2018. In both years, the target was 0.5 minutes of delay per flight.

Capacity Performance 2018		
Key Performance Indicator	European Union target	Actual performance
Average ATFM delay minutes per flight	0.5	1.83

28   Most of the delays were accumulated in the summer, the largest during July with an average Air Traffic Flow Management (ATFM) delay of 4.04 minutes per flight (an increase from 2.12 minutes per flight in July 2017). Although the accumulation of delays is expected to occur during the peak summer months, the extent of the delays for 2018 was much greater than predicted.

29   Three Functional Airspace Blocks (FAB Central Europe, South-West FAB and FAB Europe Central) were responsible for most of the network delays. Functional Airspace Block Europe Central and, in particular Germany and France, were the greatest contributors (30% and 32% of the total, respectively). DSNA (France) and DFS (Germany) caused more delays in 2018 compared to the other Air Navigation Service Providers in their comparator group (i.e. with similar operational and economic environments).

30   The Performance Review Body is concerned that according to delay forecasts the three most underperforming Area Control Centres in 2018, namely Karlsruhe, Reims and Marseille will continue to produce heavy delays on peak days. It will be important to fully understand the reasons of this underperformance. Karlsruhe had no significant increase in traffic, with summer traffic and peak day traffic both lower than in 2016. Its key issue was, and still is, a significant shortcoming in available air traffic controllers, a development which has not been anticipated in due time. For Reims and Marseille, a lack of air traffic controllers is also a key reason for their underperformance. For Marseille, there were also significant delays due to industrial actions.[8]

31   The underperformance of these Area Control Centres is even more remarkable, because they are not facing insurmountable or unexpected difficulties. Other Air Navigation Service Providers face comparable challenges in terms of traffic, size of airspace and complexity. Of these, several are able to manage traffic efficiently, such as Maastricht Upper Area Control Centre (MUAC), Poland or many states of the Functional Airspace Block Central Europe. It will be important to learn from them how to manage the capacity irrespective of weather, because en route traffic in particular is comparable among different parts of Europe.

32   Under the Single European Sky (SES) legislation, Air Navigation Service Providers must state the reasons for delay by allocating delay codes. They have a certain discretion in using these codes. It is difficult to assess in hindsight how the codes were allocated. Analysing the overall picture, the

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[8] ACE Reports: https://www.Eurocontrol.int/ACE/ACE-Home.html

Performance Review Body observes that, in 2018, the use of the most common delay codes increased. Notably, from 2017 the codes for staffing and weather causes increased by +183% and +108% respectively.

33   These numbers are unprecedented: despite all the technological progress, many Area Control Centres today are less able to cope with weather and lack resilience. Neither Member States, the Commission, the Performance Review Body, nor Eurocontrol have sufficient data to fully explain these developments. The increase in weather-related delays in some Member States and the number of planned hours of air traffic controllers indicate that the affected Area Control Centres will again record high delays in 2019. Pending further analysis, a more demand-oriented rostering and planning of vacations of air traffic controllers is necessary to maintain capacity in difficult situations.

34   The Performance Review Body acknowledges that poor weather conditions in certain regions create unique circumstances that impact performance. For example, poor weather in a certain Area Control Centres may result in the closure of airspace that re-routes traffic into unaffected areas. Those Area Control Centres may then record higher than normal delays but not assign a weather delay code. Whilst it is not possible for the Performance Review Body to identify these cases, Air Navigation Service Providers are encouraged to investigate the assignment of delay codes.

35   Figure 3 shows the declared reasons for delay from 2012 to date. The blue and black dotted lines show the indexed values from 2012 for the average delay and the Instrument Flight Rules movements, respectively. The values indicate the disproportionate increase of delays with respect to traffic; 12% increase in traffic against a 288% increase in delays over the same period.

Development of delays in 2018 (including the reasons) compared to increase in Instrument Flight Rules movements
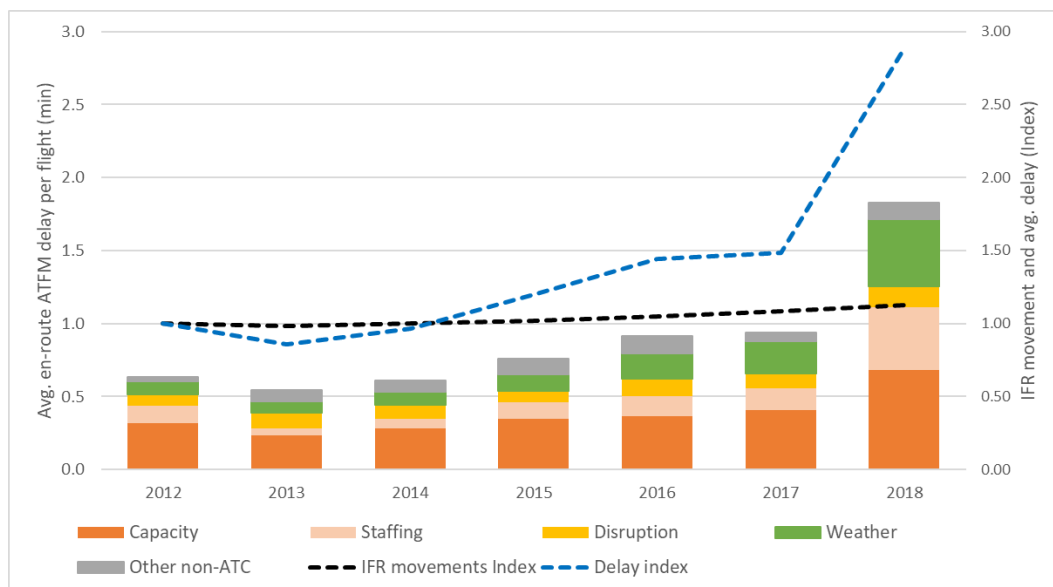
Figure 7 - Average en route Air Traffic Flow Management delay per flight with causes (Source: Performance Review Body elaboration), showing that the delay has increased substantially while traffic has increased far less. Data from 2016 include post-ops adjustments.

6. Cost-efficiency

6.1 Determined costs decreased with lowest underspend during the second Reference Period

36   In 2018, Member States met the Union-wide target for en route cost-efficiency. The Union-wide actual unit costs were lower than the 2018 determined unit cost.

Cost-efficiency Performance 2018		
Key Performance Indicator	European Union target[9]	Actual performance
En route cost per forecast service unit (€2009)	51.00	45.43

37   Figure 8 shows the evolution of actual and determined values over the second Reference Period (in terms of total costs and unit costs). Regarding the local targets, only three Member States, Malta, Portugal and Sweden did not achieve the cost efficiency targets.

Actual costs vs Determined (planned) costs
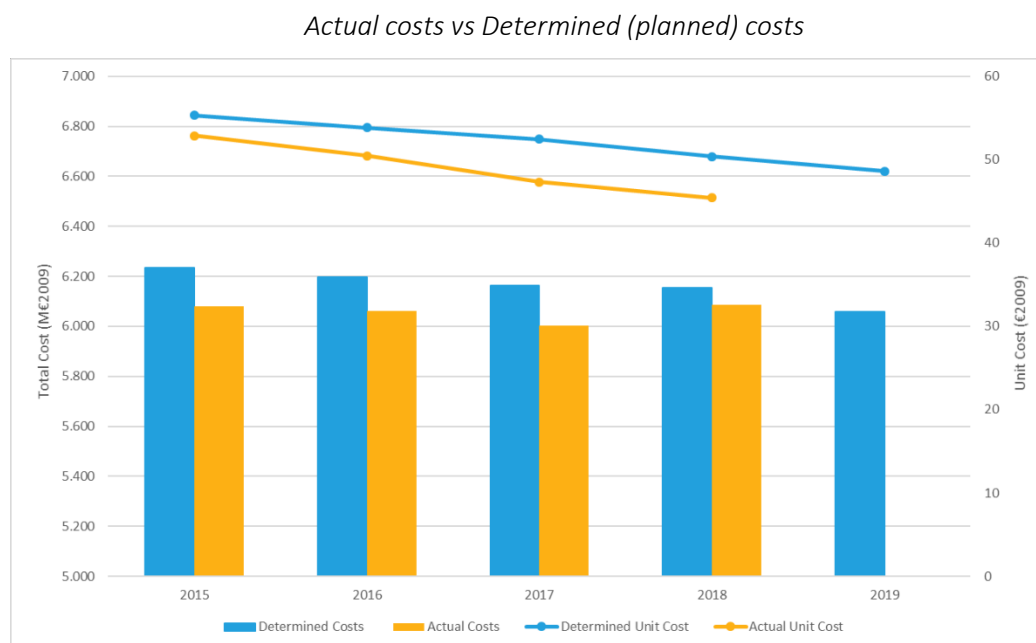
Figure 8 – En route unit and total cost Actual vs Performance Plans (Source: Performance Review Body elaboration), showing actual costs below the determined cost for the entire second Reference Period.

38   Union-wide targets have been reached due to both en route costs being below the determined costs (-1.1%) and service units above the forecast values (+9.7%). In terms of actual costs, 2018 showed a slightly different picture than the rest of the reference period: as expected, actual costs in 2018 rose for the first time, growing by 1.4% compared to 2017.

39   In 2018, Air Navigation Service Providers generated additional gains for the provision of en route services through cost sharing, traffic risk sharing and incentives, as set out under the Performance

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[9] Commission Decision 2014/132 of 11 March 2014

Scheme. These are legal mechanisms by which Air Navigation Service Providers can gain additional revenue for activities beyond what was planned – the aim is to ensure quality of service. In 2018, this amounted to 232M€$_{2009}$, bringing total additional gains from en route services since 2015 (second Reference Period) to almost 1B€$_{2009}$.

40   Compared to 2017, these additional gains dropped by 29%. Most of this decrease is due to a 97M€$_{2009}$ (or 58%) decrease in cost sharing (from 167M€$_{2009}$ in 2017 to 70M€$_{2009}$ in 2018). Member States thus operated closer to what was planned for the second Reference Period. At the same time, ANSPs received additional revenue from traffic risk sharing in 2018 of (only) 11M€$_{2009}$ (or 7%) compared to 2017 (from 155M€$_{2009}$ in 2017 to 166M€$_{2009}$ in 2018). As in previous years, incentives (i.e. bonuses and penalties) continued to have a limited effect. Despite the high delays in 2018, the penalties Air Navigation Service Providers had to pay to airspace users for this poor performance only amounted to 4M€$_{2009}$.

41   Figure 9 shows the estimated cost to airspace users for air navigation services, including the cost of delay (at 100€ per minute) they incurred.[10] In 2018, the expenditure amounted to 8.2B€$_{2009}$, of which 6B€$_{2009}$ corresponds to actual costs of the service provided, 336M€$_{2009}$ corresponds to the difference between charged amounts and actual costs, and finally, 1.7B€$_{2009}$ from the cost of ATFM delays. This is considerably more than the 4M€$_{2009}$ of penalties that Air Navigation Service Providers had to pay to airspace users.

42   In the years 2015 to 2018, the total expenditure of airlines for en route air navigation services amounts to around 30B€$_{2009}$ of which 24B€$_{2009}$ corresponds to actual costs of the Air Navigation Service Provider, 1.6B€$_{2009}$ of difference between charged amounts and actual costs, and 3.9B€$_{2009}$ are the cost of ATFM delay.

43   This analysis has to take into account that part of the actual costs, which may be considered as additional gain to the service provider, specifically the surplus embedded in the cost of capital. This surplus amounts to 285M€$_{2009}$ in 2018 (a total of 1B€$_{2009}$ in the second Reference Period to date). However, at the same time, part of the charged amounts must be returned to the airlines in 2019 and 2020 (total of 750M€$_{2009}$).[11]

44   It is positive to note that actual costs have remained almost constant since 2015 and the gains are generally shrinking. However, considering the increasing ATFM delays, the overall economic cost for airspace users has dramatically risen during the recent four years. Not having to bear the larger part of the costs of the additional delays they inflict on air space users, the monopolistic service providers face weak incentives to keep delays at the agreed level.

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[10] 100€ in 2014 Euros as defined in the study by the University of Westminster 'The cost of delay to air transport in Europe', corresponding to 90.7€$_{2009}$.
[11] This amount relates to the N+2 mechanisms (e.g. inflation adjustments, traffic risk sharing mechanism, etc.) originated in 2017 and 2018.

Total economic cost to airlines since 2015 (second Reference Period) including the increase in traffic and the total economic cost index
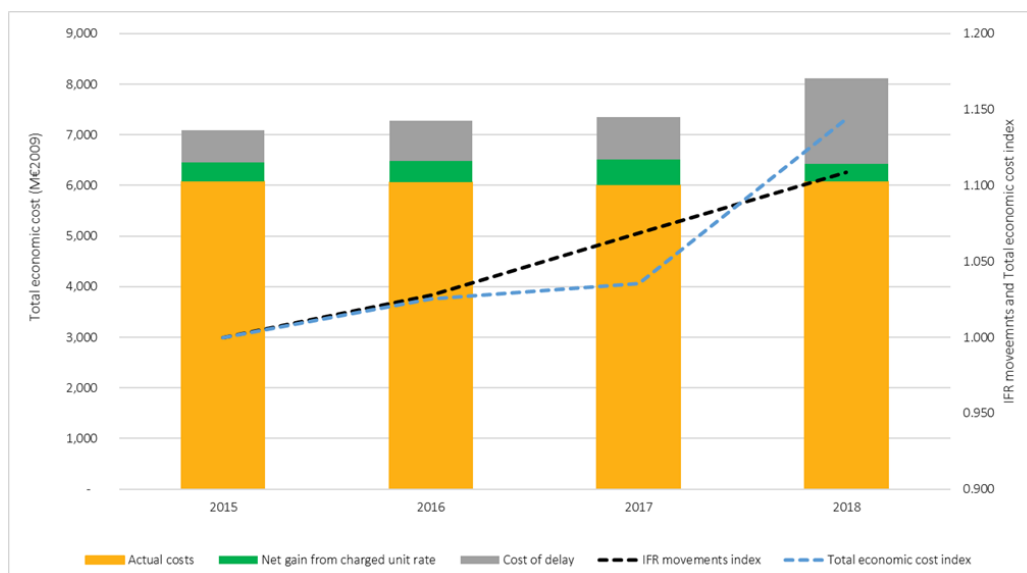
Figure 9 – Union-wide total economic cost (Source: PRB elaboration), showing that cost and gains of Air Navigation Service Providers have remained constant while the total economic cost born by airlines has substantially increased.

45 In terms of investments, for the first time in the second Reference Period, Member States in 2018 invested more than planned. Figure 10 shows the difference between the actual and planned capital expenditure for each Member State in 2018 (orange and blue bars) and as percentage of the second Reference Period to date (grey line).[12]

Capital expenditure spending 2018 (planned vs. actual)
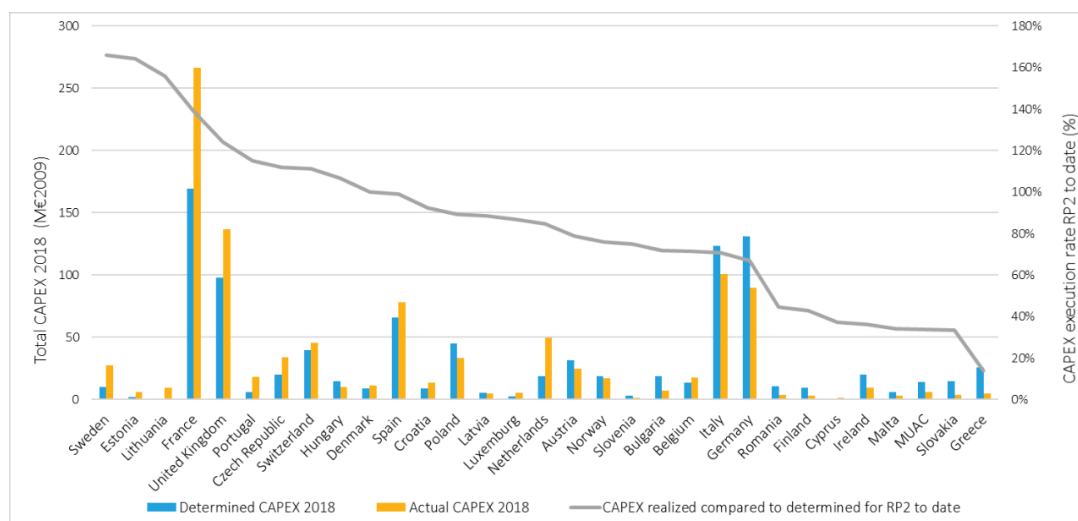
Figure 10 – Actual capital expenditure spending compared to planned spending (Source: PRB elaboration). Most Member States spent more than planned capital expenditure overspending during 2018.

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[12] The Performance Review Body will publish a detailed analysis of capital expenditure represented in Annex IV – CAPEX report. The value presented in this paragraph includes the OPEX related to CAPEX as reported by DSNA.

46 In 2018, Union-wide, Air Navigation Service Providers overspent 85M€$_{2009}$ (9%) compared to the planned capital expenditure. Despite this overspend, Member States are still lagging by 283M€$_{2009}$ or 7% compared with the total planned investments for the second Reference Period.

47 The Member States with the greatest capital overspend in 2018 were France, spending, 97M€$_{2009}$ (+57%) more than originally planned, the UK, which spent 39M€$_{2009}$ (+40%) more, and the Netherlands, which overspent 30M€$_{2009}$ (+160%).[13] The Member States with the greatest underspend were Germany at 41M€$_{2009}$ (-31.60%), Italy at 23M€$_{2009}$ (-19%) and Greece at 21M€$_{2009}$ (-80%).

48 In 2018, a number of Member States continued to spend less than planned on staff costs (Figure 9). This continues the general trend of the second Reference Period regarding lower expenditures on staff costs and higher delays. In some other Member States, staff costs have substantially increased over the second Reference Period.

49 The Performance Review Body finds it surprising that Member States with a lack of capacity, such as Germany, are underspending on staff costs since 2015 (second Reference Period). One would expect an increase in costs to accommodate the additional traffic and to improve capacity performance. These issues have been known since 2016. As it takes two years on average to train an air traffic controller, increased staff costs would be anticipated (assuming staff costs per air traffic controller remain stable) translating into integrated newly trained controllers in 2018.

Operational expenditure spending (operational expenditures – staff cost) 2018 planned vs. actual for each charging zone (CZ)[14]
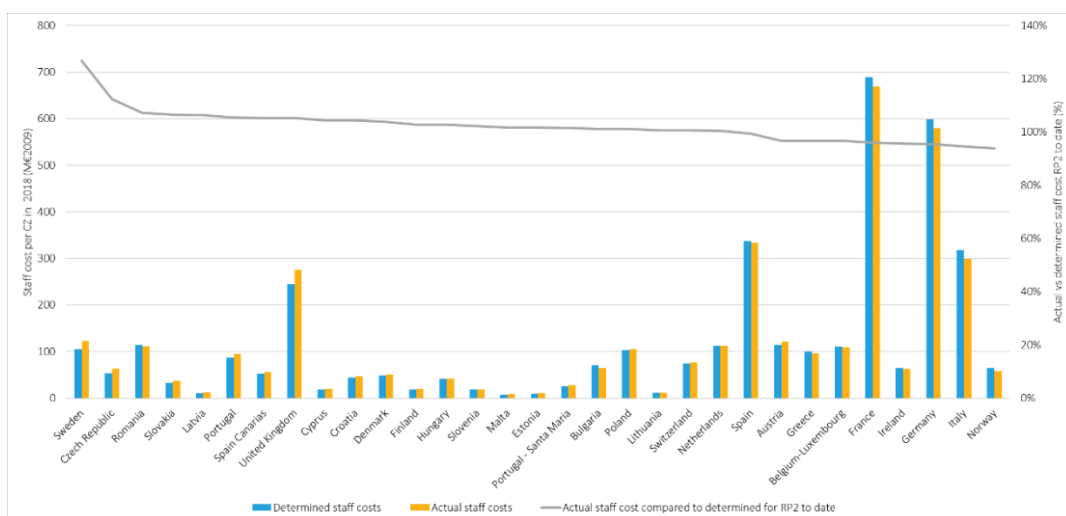
Figure 11 – Staff costs Actual vs Determined staff costs (Source: PRB elaboration), showing that some States have lower staff costs than originally planned.

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[13] The value presented in this paragraph includes the OPEX related to CAPEX as reported by DSNA.
[14] A charging zone is the area for which a Member State will receive revenues for the provision of air navigation services.

7. Key conclusions

50   In 2018, European Air Navigation Service Providers managed a record number of flights, slightly more than in 2017. Their services were **safe** – there was no accident or severe incident in 2018 where air traffic management was a direct contibuting factor.

51   In terms of **capacity**, many of the Member States met or came very close to meeting the targets. However, eight out of more than 50 Area Control Centres caused 69% of the total delays, with many unable to provide the necessary capacity due to the lack of air traffic controllers and inadequate rostering. This caused unprecedented delays and impacted the entire European network, with millions of passengers affected. In 2019 (until September), in comparaison to 2018, delays (per flight) are lower, although traffic has slightly increased (+1.2%). The joint efforts of all stakeholders have rendered positive results. However, delays remain far too high in 2019. Delays caused by Air Navigation Service Providers were almost three times higher than the Union-wide targets.

52   There is a significant **gap between the increase in traffic and the increase in delays**. In the summer of 2018, traffic increased moderately, only 3.7% higher than in 2017. In some critical areas, such as Germany and France, the increase in traffic was even less. Nevertheless, delays in these areas increased significantly due to lack of air traffic controllers. There is insufficient reliable and up-to-date information on the number of operational air traffic controllers at each Area Control Centre and Member State. Given this is the most important cause of delay, benchmarking and understanding air traffic controller numbers across Europe is paramount. Member States should report more actual data to the Network Manager and the European Commission.

53   Delays by several Air Navigation Service Providers were significantly higher due to weather issues. In some parts of Europe, there is insufficient resilience to cope with (expected) weather situations.

54   In terms of **cost efficiency**, the results of 2018 are better than the targets. This finding is also disconcerting: most Air Navigation Service Providers did not invest as planned and/or did not spend the money they received from airlines. Underspending is one of the reasons for lack of capacity.

55   **Environmental performance** in terms of unnecessary extension of routes flown by airlines was unsatisfactory in 2018. Air Navigation Service Providers and airspace users need to become more efficient providing and then choosing routings with the best environmental perfomance. The horizontal flight efficiency is not the only area where improvements are required. Gate-to-gate emissions should also be considered.

8. PRB recommendations

Safety

56 Whilst some progress has been observed regarding the Effectiveness of Safety Management for States, the PRB recommends:

1. Additional focus on improvement for the States (namely Belgium, Bulgaria, Denmark, Estonia, Hungary, Portugal and Spain) and for the Air Navigation Service Providers (namely CYATS and PANSA, the Cypriot and Polish ANSPs, respectively) that are trailing behind and careful monitoring of the progress made.

2. Additional oversight arrangements for these States and to maintain these arrangements beyond the second reference period (RP2) to ensure continued improvements.

57 Regarding the application of the Risk Assessment Tool, the PRB recommends:

3. The Commission to investigate the reasons why Poland and the Netherlands do not apply the Risk Assessment Tool for Separation Minima Infringements and Runway Incursions and why there is no data on the use of the tool for Luxembourg.

4. To take the necessary actions to support the improvement in the level of application of the Risk Assessment Tool or that limitations are well documented.

58 Regarding the application of Just Culture, the PRB recommends:

5. Investigating how to foster a common approach and increased level of harmonisation related to Just Culture at Union level and where beneficial, promote or initiate improvements.

Environment

59 In 2017, the PRB agreed with the corrective measures proposed by the Functional Airspace Blocks (FABs) to improve environmental performance and requested for additional effort to support the European Route Network Improvement Plan (ERNIP). This was particularly important since only two FABs (South West FAB and Denmark-Sweden) have achieved the targets. However, this year only South West FAB achieved the targets whilst Denmark-Sweden FAB nearly achieved their targets (missed by +0.01%). Other than the North European FAB (NEFAB), which closed the gap between the actual achievement and the target, the remaining FABs reported poorer performance than in 2017.

60 With regards to the environment KPA, the PRB recommends:

6. To prioritise initiatives relating to cross-border services and accelerate the implementation of Free Route Airspace.

7. Steps to be taken to improve the supply of data according to the Eurocontrol Airport Operator Data flow for airports over 70,000 Instrumental Flight Rules (IFR) movements.

8. That measures are taken to improve the data provided on the civil-military impact on capacity, and the application of Flexible Use of Airspace (FUA). The PRB is coordinating with the European Military Institutions to understand the impact of civil-military cooperation on performance, and to improve the transparency of data already available and better inform the monitoring process.

Capacity

61 In 2018, only three FABs achieved their capacity KPA target, as following:

- BALTIC FAB;

- Denmark-Sweden FAB; and

- North European FAB.

62   The following FABs have significantly missed their capacity KPA targets (by more than 100%) for 2018:

- FAB Central Europe;

- FAB Europe Central; and

- South-West FAB.

63   In 2018, the situation deteriorated compared to 2017, in terms of FABs achieving the capacity KPA target, whereas, in 2017 six FABs reached their respective targets. The PRB recommends the Commission to request the National Supervisory Authorities to plan and apply corrective measures for the respective FABs not reaching the targets. The PRB will closely monitor the implementation of the capacity enhancement measures on FAB level and accompanied local contribution with the focus of closing the capacity gap in the early years of the third reference period (RP3).

Cost efficiency

64   The PRB does not have any specific recommendations with respect to cost efficiency. The European target for cost efficiency was achieved in 2018 because both en route costs were lower than the determined costs and service units were higher than planned.

65   The PRB urges Member States to invest the gains from the regulated activities into capacity enhancing measures to close the capacity gap where one exists and to then increase capacity in line with traffic demand. In this regard, the PRB recommends greater transparency in the reporting of investments costs and relative impacts. Specifically:

- Transparency in reporting the difference between Union-wide public funding and the projects linked to Pilot Common Projects (PCP) is needed.

- To develop an end-to-end CBA methodology that ensures that all public investments are evaluated in terms of impact on the KPAs and KPIs for the Performance Scheme.

- To ensure that the CBA tool is applied in the future to both all public funding processes/awards and to ANSP internal major investments.

- To develop a methodology based on the RP2 implementation and CBA/RP3 Performance Plans that enables the corresponding investments/projects to be tracked in RP3 during and after their implementation in the yearly PRB monitoring activity.

66   The PRB reiterates its recommendation to the Commission made in its Annual monitoring report 2015, published in December 2016, to inspect the compliance of Greece with the performance and charging scheme. In particular, the issues raised by the PRB regarding the loan taken out by the Greek government in 2001 and the related cash flows since then should be looked into, together with other cost issues underlined by the PRB such as cost of capital and depreciation. The PRB stresses the importance to verify whether rules have been implemented correctly.

9. Member States' Summary

9.1 About this section

68 This chapter contains a summary of the 2018 performance of each Member State of the Single European Sky (SES). The data used was submitted by Member States and was pre-analysed by the Performance Review Unit (PRU) before the Performance Review Body (PRB) produced this document. The PRB would like to thank National Supervisory Authorities (NSAs) and Eurocontrol for their contributions.

69 This document aims at assisting stakeholders to quickly understand their 2018 performance in the context of the second Reference Period thus far and to identify the key issues per Key Performance Area (KPA). It is intended to be read as a digest of the monitoring results by all stakeholders – therefore, the PRB has kept the language simple, without too much technical detail. Experts who wish to consult a detailed analysis may find this in Annexes I-IV.

9.2 Austria

Comments from the Performance Review Body
Austria performed well for safety, capacity and cost efficiency until 2016. In 2017 and 2018, delays increased significantly (+300% and +170%, respectively). In 2018, Austria had more revenue than planned due to higher service units (+9.2%). At the same time, costs remained below planned, although staff costs increased. In view of the expected traffic increase, Austria must invest in order to provide capacity and resilience. In terms of environmental performance, Austria missed the targets in 2018. The Performance Review Body calculated the cost of delays that airspace users had to absorb because of the lack of capacity in Austrian air traffic management. It amounted to 64M€$_{2009}$. As in almost all other Member States of the Single European Sky (SES), airspace users in Austria faced a much higher cost of delay than in previous years. AustroControl, the Air Navigation Service Provider (ANSP) of Austria, kept its costs relatively stable and below the planned values, despite increased traffic, meaning that it did not spend all of the planned revenue received from airspace users for investments and staff. In 2019, delays are forecasted to almost double again because the Area Control Centre (ACC) in Vienna - in addition to high traffic volumes - will receive additional diverted traffic to compensate for the lack of capacity in the Karlsruhe Area Control Centre in Germany. This development will most likely remain a severe challenge during the third Reference Period starting in 2020.

Safety – Air Navigation Service Provider Effectiveness of Safety Management	Capacity – en route Air Traffic Flow Management delay by cause

Environment – FAB CE evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines
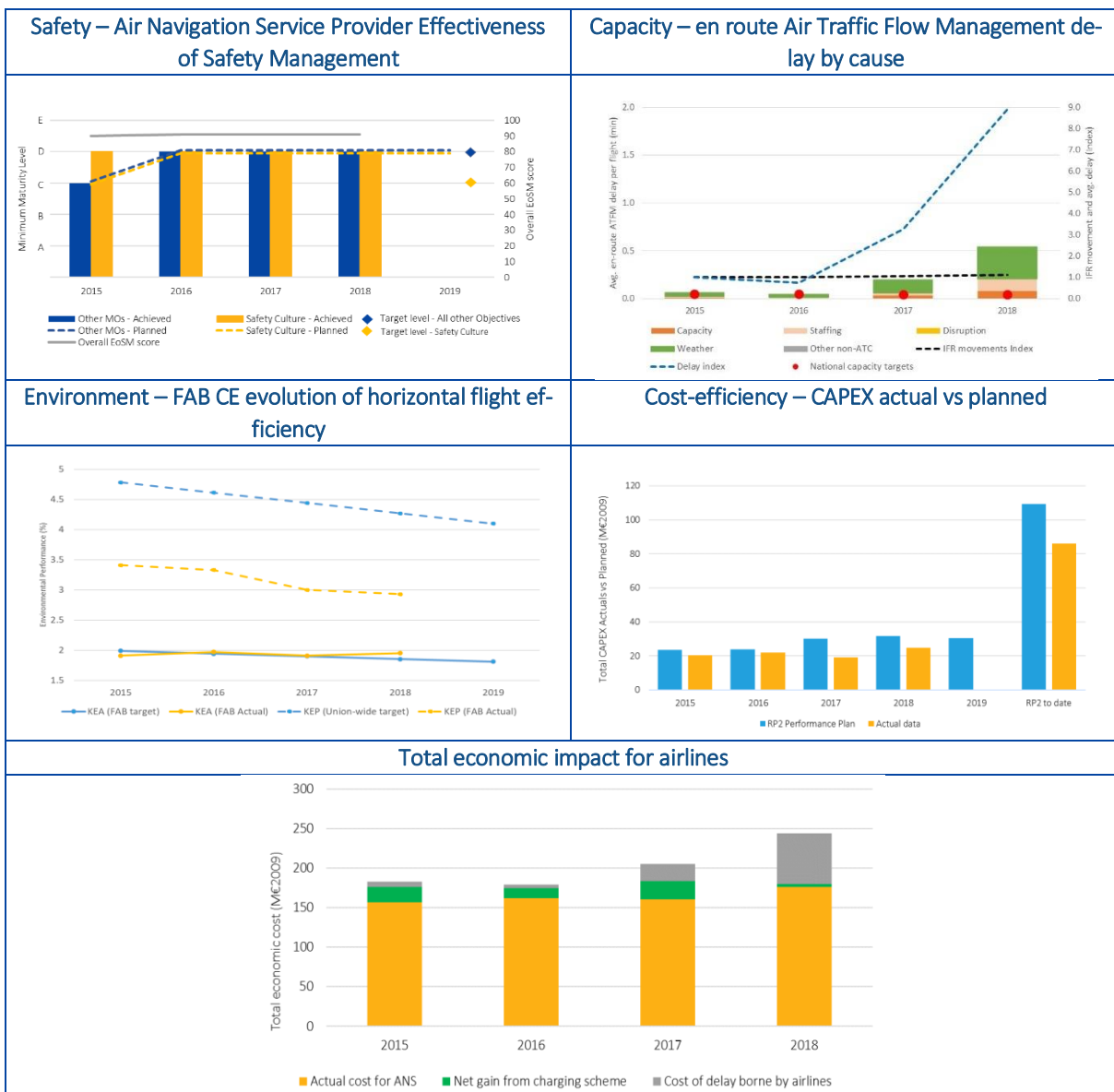
Key issues (Key Performance Areas)

Safety

70 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

71 During 2018, the authorities of Austria improved their overall EoSM score from 58 in 2015 to 67 in 2018 (out of 100). Austrian authorities already achieved the target in all safety areas in 2017.

72 AustroControl achieved a high and stable overall EoSM result, reaching 91 (out of 100) in 2018. With respect to Safety Culture, AustroControl has exceeded the target.

73 Both Austria and AustroControl in 2018 reached the targets for the application of the Risk Analysis Tool.

Environment

74 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of the Functional Airspace Block Central Europe (FAB CE) and allocated to each Member State.

75 The FAB CE states missed their targets for environmental performance (KEA) for the third year in a row and by a margin of 0.10% in 2018. The Functional Airspace Block target was 1.85%. Performance worsened in each year of the second Reference Period so far.

76 Austria did not contribute positively to the Functional Airspace Block target by recording a KEA of 2.21%, which is a slightly worse performance compared to 2017.

77 During 2018, additional taxi-out time at Vienna airport worsened, but no explanation has been provided.

78 Additional time spent in terminal airspace improved in each year of the second Reference Period and this continued in 2018.

79 Five out of six Austrian airports that should report airport level data have not established the Eurocontrol Airport Operator Data Flow.

Capacity

80 FAB CE has achieved its capacity target for the first three years of the current Reference Period. FAB CE did not achieve its capacity target in the fourth year of the second Reference Period with an Air Traffic Flow Management delay of 0.82 minutes per flight, compared to a target of 0.28 minutes per flight.

81 In 2018, Austria experienced 5.6% increase in Instrumental Flight Rules (IFR) movements compared to 2017. Austria missed the capacity target in 2018. Instead of reaching a delay target of 0.19 minutes per flight, 2018 shows 0.54 minutes per flight delay. This indicates that AustroControl was not able to cope with capacity constraints, triggered by an increase in traffic above the planned values (but still within the Eurocontrol high forecast), significant weather disturbances and an increase in sector complexity (caused by multiple reasons) between 2017 and 2018.

82 According to AustroControl, 50% of all en route delays were due to adverse weather. The capacity shortfall in Austria was also partially caused by the delays stemming from the German Air Navigation Service Provider (DFS), particularly in Karlsruhe ACC's area of responsibility, because DFS, the German Air Navigation Service Provider is responsible for providing services over a portion of Austrian airspace (Karlsruhe UAC).

Cost-efficiency

83 In 2018, Austria met its cost-efficiency target, with the actual unit cost (55.08€$_{2009}$) being lower than the determined (59.61€$_{2009}$). The target has been met because the increase of actual service units (+9.2%) was much higher than the increase in actual costs (+0.9%) compared to the determined ones.

84 The increase of actual costs compared to the determined was mainly due to higher staff costs (+9.2M€$_{2009}$, or +9%). According to the information provided by AustroControl, staff costs have been impacted by changed actuarial parameters and mortality tables, which for some parts according to the regulation are not costs exempted, and therefore included in actual costs.

85 In 2018, Austria underspent 7.1M€$_{2009}$ on actual total CAPEX compared to the determined. This trend is similar throughout the second Reference Period to date. Considering the traffic increase,

which Austria experienced and is forecasted to continue, investment is paramount for Austria, making sure this results in improved performance.

86   AustroControl incurred a penalty of 0.96M€$_{2009}$ (0.54% of the determined costs) for missing the capacity national performance target and the one of its Functional Airspace Block. The PRB highlights that the penalties under the applicable performance scheme have a very limited effect.

9.3 Belgium and Luxembourg

Comments from the Performance Review Body
Belgium controls the lower airspace on behalf of Luxembourg, whilst both have delegated their upper airspace to Eurocontrol, i.e. the Maastricht Upper Area Control Centre (MUAC). The comments from the Performance Review Body focus on en route service provision, which is provided by Belgium and MUAC.
Belgium achieved the target of cost-efficiency by exactly reaching the determined unit costs. However, Belgium showed worsening performance in the other Key Performance Areas.
With respect to safety, Belgium still needs to improve in several areas to reach targets related to safety management.
In terms of environmental performance, Belgium missed the targets in 2018.
Regarding capacity, Brussels Area Control Centre and Skeyes, the Air Navigation Service Provider of Belgium, performed well although this is expected to deteriorate slightly in 2019 due to industrial action.
During the assessment of the Belgian performance, MUAC's contribution was taken into account. In 2018, Maastricht Upper Area Control, despite showing excellent air traffic controller productivity, showed a large capacity deficit, which is expected to extend (NOP 2019 -2024) into the whole third Reference Period. Belgium would have to monitor MUAC ATM performance and closely coordinate all activities aiming at improving capacity and cost-efficiency in order to minimise additional cost on airspace users.
In 2018, Belgium experienced traffic (and service units) as forecasted in the Performance Plan. Costs were also as determined and therefore there were less additional revenues than expected in 2018. Belgium spent more than determined on capital expenditure but is still behind planned values for the entire reporting period (2015 – 2019) due to underspending during 2015 and 2016.
The Performance Review Body calculated that the cost of delays that airspace users (airlines and passengers) had to absorb due to the lack of capacity amounted to around 101M€$_{2009}$ in 2018.

Safety – Air Navigation Service Provider Effectiveness of Safety Management	Capacity – en route Air Traffic Flow Management delay by cause
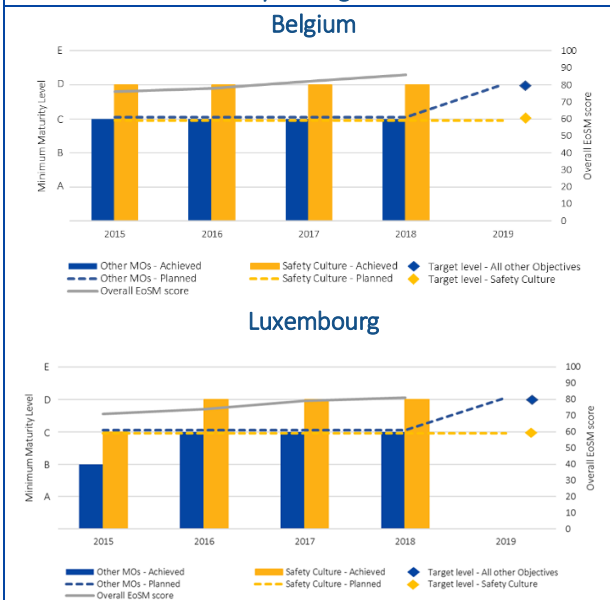
Belgium

Luxembourg
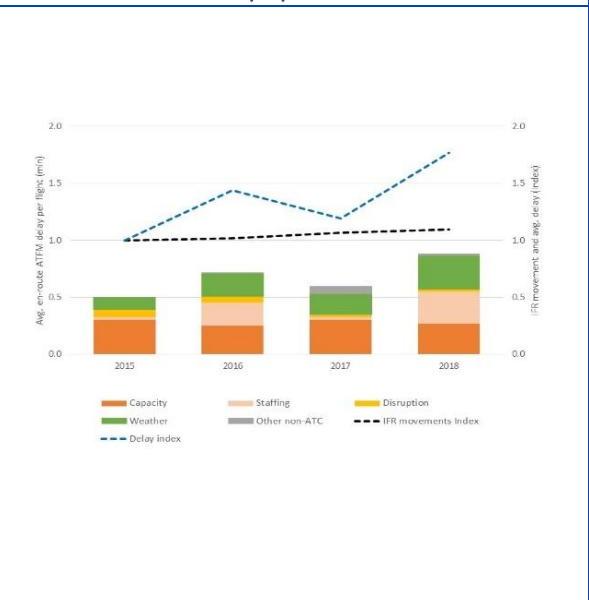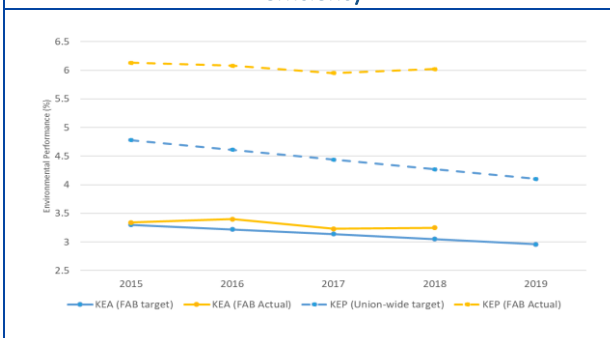
Environment – FABEC evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned (Belgium)
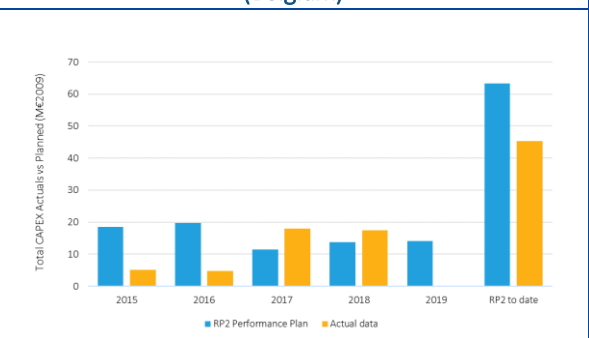
Total economic impact for airlines
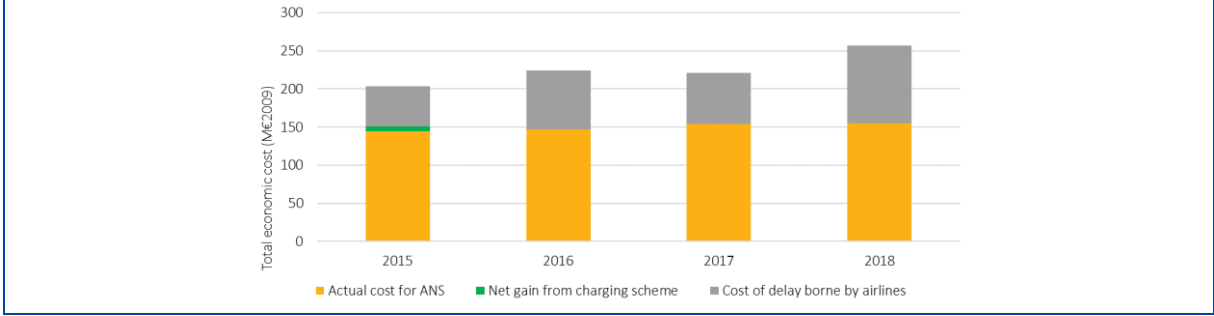
Key issues (Key Performance Areas)

Safety

87 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

Safety (Belgium)

88   During 2018, the authorities of Belgium improved their overall EoSM score from 62 in 2015 to 68 in 2018 (out of 100). To achieve the target in 2019, Belgium must improve the areas related to Safety Policy and Objectives and Safety Culture, which currently exhibit a low maturity (a score of B for Safety Policy and Objectives and a score of A for Safety Culture).

89   The Air Navigation Service Provider of Belgium, Skeyes, has constantly improved its overall Effectiveness of the Safety Management score to 86 (out of 100) in 2018. In 2018, Skeyes has successfully reached the targets with the minimum level D.

90   Both Belgium and Skeyes in 2018 reached the targets for the application of Risk Analysis Tool.

Safety (Luxembourg)

91   During 2018, the authorities of Luxembourg improved their overall EoSM score from 47 in 2015 to 63 in 2018 (out of 100). To achieve the target in 2019, Luxembourg must improve the areas related to Safety Risk Management and Safety Culture, which currently exhibit a low maturity (a score of B for both with one area in each needing to be improved).

92   The Air Navigation Service Provider of Luxembourg, ANA LUX, has constantly improved its overall Effectiveness of the Safety Management score to 81 (out of 100) in 2018. In 2016, ANA-LUX has successfully reached the targets and has remained on targets since them.

93   The State did not provide any data on the RAT application in 2018 for any category and the achievement of the target was not proved.

Environment

94   Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all the member states of the Functional Airspace Block Europe Central (FABEC) and allocated to each Member State.

95   The FABEC target in 2018 was 3.05% on the environmental performance (KEA) while 3.25% was achieved, the largest performance gap observed so far in the second Reference Period.

96   Belgium achieved a KEA of 3.88% representing a small worsening from their 2017 result. Skeyes did not commit to any investment that could improve the environmental performance in its Performance Plan and the lack of investment in en route capacity is likely to not have helped.

97   Skeyes noted in its monitoring submission that airspace users prefer less direct routes if the charges are lower, which makes improvements in the environmental performance difficult; the PRB is of the view that this preference has implications for the entire performance scheme.

98   During 2018, additional taxi-out time at Brussels and Charleroi airports worsened, but no explanation has been provided. Additional taxi-out times at Luxembourg airport decreased by 35% with respect to 2017.

99   Additional time spent in terminal airspace improved at Brussels airport remained stable at Charleroi airport. At Luxembourg it decreased by 32%.

100 Three out of five Belgian airports that should report airport level data have not established the Eurocontrol Airport Operator Data Flow. The Airport Operator Data Flow is fully implemented for Luxembourg airport and both environment indicators can be properly monitored as of 2017.

Capacity

101 FABEC has missed its capacity target for the fourth year in a row with an increasing margin of underperformance each year. Notably, in 2018, an Air Traffic Flow Management delay of 2.14 minutes per flight meant that the target was missed by 1.72 minutes per flight. FABEC's target for 2018 was 0.42 minutes per flight.

102 Belgium continued to miss its capacity targets in 2018 and recorded its worst delays thus far since 2015. Whilst en route weather played a role, the data shows that addressing these issues within the control of the Air Navigation Service Provider (e.g. staffing and capacity) would have improved performance considerably.

103 In 2018, Belgium experienced 2.9% increase in Instrument Flight Rules (IFR) movements compared to 2017. Brussels Area Control Centre was close to achieving the level of aircraft throughput required to achieve the Union-wide target. Most delays originated from the Maastricht Upper Area Control Centre (MUAC), where overflights for Belgium are managed. MUAC needs to increase its throughput by 7.8% in order to reduce delays to the optimum level. It is forecasted that this will not be achieved in the next six years, despite the measures taken by MUAC to help reduce delays in the short term (e.g. air traffic controller recruitment), according to the Network Operations Plan for 2019 – 2024.

104 The performance regarding capacity in other performance areas was more promising with arrival delay for Brussels terminal airspace at the lowest level in the last four years, and best-in-class adherence to air traffic flow management slots. Liege airport received the maximum financial bonus for its arrival delay performance.

105 Arrival ATFM delay in Luxembourg increased slightly from 0.05 minutes per flight in 2017 to 0.09 minutes per flight in 2018, but the national target has been met in each year of RP2 to date.

Cost-efficiency (en route)

106 In 2018, Belgium met its cost-efficiency target, with the actual unit cost (58.74€$_{2009}$) equal to the determined cost. The target has been achieved because of a decrease in both the actual service units (-0.2%) and actuals costs (-0.2%) compared to the determined ones.

107 The decrease in the actual costs compared to the determined ones is a combination of several factors. The biggest deviations from the Performance Plan underscored by Skeyes are the lower depreciation costs (-2.3M€$_{2009}$, or -28.1%), resulting from delays in the investment programme during the first years of RP2, and the much higher operating costs (+5.5M€$_{2009}$, +58.1%), resulting from increased costs for temporary reinforcement of staff.

108 In 2018, Belgium overspent 3.8M€$_{2009}$ on actual total CAPEX compared to the determined one. However, this was not always the pattern, as in 2015 and 2016, Belgium had underspent largely compared to the Performance Plan, resulting in a total CAPEX underspend of 17.9M€$_{2009}$ (-28.28%).

109 A penalty of 0.46M€$_{2009}$ (0.3% of the determined costs) was applied for missing the capacity performance target at Functional Airspace Block level.

Comments from the Performance Review Body
Bulgaria showed a good performance for capacity and cost-efficiency. There were almost zero delays in 2018, similar to 2017. Safety and environment areas require attention.

On a State level, Bulgaria had issues with achieving the targets for safety management with limited improvements observed over the second Reference Period, while the Air Navigation Service Provider (ANSP) performed on target and better than planned in the area of Safety Culture.

The environmental target for the Danube Functional Airspace Block was missed due to the political situation in Crimea, which caused an unexpected increase of traffic that was not planned for during target setting and Performance Planning.

Bulgaria had 9% higher service units than planned in its revised Performance Plan, which helped to lower the actual unit cost in 2018. BULATSA, the Bulgarian ANSP, had difficulties recruiting additional air traffic controllers. The lower-than-expected social security costs helped to achieve its cost-efficiency targets. Fortunately, this did not impact its ability to provide capacity.

Safety – Air Navigation Service Provider Effectiveness of Safety Management	Capacity – en route Air Traffic Flow Management delay by cause

Environment – DANUBE FAB evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines

Key issues (Key Performance Areas)

Safety

110   Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

111   During 2018, the authorities of Bulgaria did not improve their overall EoSM score, which in 2018, dropped to 40 (out of 100). Bulgarian authorities remained behind their plans to achieve their minimum EoSM target and have not improved since 2016 apart from Safety Culture (achieved level C). Many areas for the other Management Objectives are at level B and quite significant effort will be required to reach the target level C in 2019.

112   BULATSA, the Air Navigation Service Provider for Bulgaria, throughout the second Reference Period, had a stable overall EoSM score of around 90. The ANSP has followed or performed better

than planned for the minimum EoSM level in both Safety Culture and other Management Objectives and has since 2017 achieved the second Reference Period target levels and exceeded it for Safety Culture (achieved level D).

113 The Risk Analysis Tool has not been applied for Runway Incursions (both ground and overall) during the second Reference Period. For other Risk Analysis Tool areas, the 2019 targets have been reached in 2018.

Environment

114 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of the Danube Functional Airspace Block (FAB) and are allocated to each Member State.

115 The Danube FAB missed its target for environmental performance in 2018 and the monitoring submission highlighted the impact of the geopolitical situation in Crimea, the impact of the Network Manager capacity measures and airline route preferences. The Danube Functional Airspace Block regards these circumstances to be outside the control of the Air Navigation Service Provider.

116 In 2018, the Functional Airspace Block target was not met by a margin of 0.41%, which is a deterioration of performance with respect to the beginning of the Reference Period, and followed the trend of deteriorating each year of the Reference Period. The target in 2018 was 1.41%.

117 Bulgaria did not contribute positively to the FAB target by achieving a KEA of 2.01%, which is a worse performance compared to 2017.

118 Only one airport (Sofia) is subject to monitoring.

119 In 2018, additional taxi-out time decreased to 1.81 minutes per flight, although, this remains worse than the performance at the start of the Reference Period.

120 In terms of additional time spent in terminal airspace, Sofia airport has improved since the beginning of the Reference Period achieving 0.30 minutes per flight compared to 0.36 minutes per flight.

121 All airports subject to monitoring have established the Eurocontrol Airport Operator Data Flow.

Capacity

122 In 2018, the Danube FAB did not achieve its capacity target for the first time during this Reference Period with an Air Traffic Flow Management delay of 0.08 minutes per flight, compared to a target of 0.03 minutes per flight.

123 In 2018, Bulgaria experienced 11.2% increase in Instrument Flight Rule movements compared to 2017. Bulgaria achieved the capacity target in 2018 as it has done so for the entire second Reference Period. The en route Air Traffic Flow Management (ATFM) delay has been 0.00 minutes per flight since 2017.

124 The Danube FAB Monitoring Report submission warns that Bulgaria expects capacity problems due in part to the operation of the new Istanbul airport and high traffic levels in general. However, this cautious view does not appear to be shared by the Network Manager in the 2019 Network Operations Plan (NOP), which is confident that no capacity problems will occur in Bulgaria for the remainder of the Reference Period if the current capacity plans are implemented.

125 Bulgaria continued to achieve zero minutes of arrival Air Traffic Flow Management delay as it has done so since 2015.

Cost-efficiency

126   In 2018, Bulgaria met its cost-efficiency target, with actual unit cost (25.04€$_{2009}$) being lower than the determined one (29.89€$_{2009}$). The target has been met because of the increase in actual service units (+9%) and a decrease in actual costs (-8.7%), compared to the determined ones. In part, the increase of service units was caused by traffic being rerouted through Sofia Area Control Centre as a result of geopolitical constraints.

127   The decrease in actual costs compared to the determined is a combination of several factors. According to additional information provided by BULATSA, this is mainly due to lower staff costs (-6M€$_{2009}$ or -8.6%) caused by difficulties in recruiting additional air traffic controllers and by lower than expected social security costs.

128   In 2018, Bulgaria underspent 11.4M€$_{2009}$ on actual total CAPEX compared to the Performance Plan. The trend is similar during the second Reference Period to date, where Bulgaria was consistently underspending, with an exception in 2015.

129   A bonus of 0.02M€$_{2009}$ (0.1% of the determined costs) was awarded for achieving the capacity performance target at national and Functional Airspace Block level.

9.5 Croatia

Comments from the Performance Review Body
Croatia performed well in all Key Performance Areas but it did not meet the national capacity target for the ATFM delay per flight.
Safety has improved over the second Reference Period, however both the State and Air Navigation Service Provider (ANSP) level need to improve one area of safety management to achieve the target.
No data was submitted for Croatian airports until 2018 and the Environment target was not met on Functional Airspace Block Central Europe (FAB CE) level, although, Croatia made a positive contribution.
The FAB CE capacity target was not met, mainly due to an unexpected increase of traffic, staff shortage and weather conditions, although Croatia made a positive contribution.
Croatia Control, the Air Navigation Service Provider of Croatia, underspent on investments during most of the Reference Period but reversed this trend in 2018 and brought expenditure in line with planned during 2018. This is a good sign as capital expenditure was increased to close the gap between planned spend and actual. The increase in service units helped to achieve a lower than planned unit cost.

Safety – Air Navigation Service Provider Effectiveness of Safety Management	Capacity – en route Air Traffic Flow Management delay by cause

Environment – FAB CE evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines

Key issues (Key Performance Areas)

Safety

130 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

131 During 2018, Croatia improved its overall EoSM score from 47 in 2015 to 57 in 2018. The State has followed its plan for the minimum EoSM level and remains on level B in 2018. To reach level C, the State must improve in the Management Objective related to Safety Culture.

132 Croatia Control improved the overall EoSM score from 77 in 2015 to 87 in 2018. The ANSP has followed its plan on the minimum EoSM level, exceeding the target level C for Safety Culture in 2016 (achieved level D). The other management objectives remain at level C as planned. In order to

achieve level D, the ANSP must improve one area under Safety Promotion, which should be achievable during 2019.

133 Croatia achieved the target for the Risk Analysis Tool application for SMIs in 2018. However, no occurrences were reported on RIs because the severity was below C hence, there was no scope for the application of the Risk Analysis Tool.

Environment

134 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of the Functional Airspace Block Central Europe (FAB CE) and allocated to each Member State.

135 The FAB CE States missed their targets for environmental performance (KEA) for the third year in a row and by a margin of 0.10% in 2018. The Functional Airspace Block target was 1.85%. Performance worsened in each year of the second Reference Period so far.

136 For Croatia, the result in 2018 remained consistent with 2017 (1.53% vs. 1.51%, respectively). Despite this marginal change, Croatia provided a positive contribution towards the FAB CE target.

137 No data has been submitted for the Croatian airports until 2018, since Zagreb implemented the Airport Operator Data Flow in August 2017.

138 In 2018, additional taxi-out time was 1.12 minutes per flight and additional time spent in terminal airspace was 0.36 minutes per flight.

139 All airports subject to monitoring have established the Eurocontrol Airport Operator Data Flow.

Capacity

140 FAB CE achieved its capacity target for the first three years of this Reference Period, but did not achieve its capacity target in 2018, with an Air Traffic Flow Management delay of 0.82 minutes per flight compared to a target of 0.28 minutes per flight.

141 In 2018, Croatia experienced a 10.2% increase in Instrumental Flight Rules (IFR) movements compared to 2017. Croatia missed the national capacity target after achieving good results in 2016 and 2017. The delay increased from 0.04 minutes per flight in 2016 to 0.12 minutes per flight in 2017 and 0.60 minutes per flight in 2018. In contrast, national capacity targets were 0.22, 0.21 and 0.21 minutes per flight for 2016, 2017, and 2018 respectively. Most of the delays, as with many FAB CE states, were due to weather (45% of delays) and capacity. The latter is largely due to the lack of available staff during peak times and increased IFR traffic (+10.2%).

142 Zagreb airport achieved zero arrival Air Traffic Flow Management delay in 2018. .

Cost-Efficiency

143 In 2018, Croatia met its cost-efficiency target with an actual unit cost (41.04€$_{2009}$) which is lower than the determined (43.79€$_{2009}$). The target has been met because of the increase in actual service units (+7%) was higher than the slight increase in actual costs (+0.3%) compared to the determined ones.

144 The increase in the actual costs, compared to the determined ones, is a combination of several factors. According to additional information provided by Croatia Control, this is mainly due to higher staff costs (+3.4M€$_{2009}$, or +7.8%) as a result of accommodating a significantly higher yearly traffic demand than planned for the second Reference Period.

145 In 2018, Croatia overspent 4.5M€$_{2009}$ on actual total CAPEX compared to the Performance Plan. However, Croatia largely underspent in 2015 and 2016, whereas in 2017 and 2018 they significantly overspent on CAPEX, resulting overall in a total underspent CAPEX of 3.3M€$_{2009}$ (-7.9%).

146 A penalty of 0.37M€$_{2009}$ (0.06% of the determined costs) was applied for missing the national and Functional Airspace Block level capacity performance target.

9.6 Cyprus

Comments from the Performance Review Body
The performance of Cyprus is vital for the European Air Traffic Management, connecting European airspace with that of third countries. Insufficient capacity in the airspace of Cyprus creates a bottle-neck for the European network, generating considerable delays in several Single European Sky countries. This happened again in 2018. Due to the geopolitical issues affecting the island, Cyprus is also impacted by developments which remain out of its control.
In 2018, traffic increased substantially with service units rising by 27.4% compared to 2017, generating a large increase in revenues. Cyprus has experienced a fall in unemployment of 10% and a growing economy which likely contributed to the increased traffic. While actual costs are increasing every year, the Air Navigation Service Provider has still had lower than planned costs for every year of the second Reference Period.
The State has achieved the targets for safety management, while the ANSP still need improvements in many management areas to achieve the targets in 2019. The PRB notes that a focussed effort is required to achieve targets in 2019.
In terms of environmental performance, Cyprus missed the targets in 2018.
Cyprus will need to improve its capacity and environment performance through further investments in infrastructure and additional recruitment of air traffic controllers. Additional revenues received should be used to fund these developments.

Safety – Air Navigation Service Provider Effectiveness of Safety Management	Capacity – en route Air Traffic Flow Management delay by cause
Environment – Blue Med FAB evolution of horizontal flight efficiency	**Cost-efficiency – CAPEX actual vs planned**
Total economic impact for airlines	

Key issues (Key Performance Areas)

147 Cyprus is a member of Blue Med Functional Airspace Block. The Performance Plan of this FAB was only adopted in early 2019 with changes to the capacity targets. Due to the lack of binding targets from the Performance Plan, the Performance Review Body monitored the performance of Cyprus based on the values assigned by the Network Manager (reference values) and did not consider previous Performance Plan stated targets.

Safety

148 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

149 During 2018, the authorities of Cyprus met the planned values with respect to the Effectiveness of the Safety Management for the Single European Sky (60 out of 100). Cyprus achieved the safety targets with the level C for each area.

150 CYATS, the Air Navigation Service Provider of Cyprus, met its 2018 planned target and reached an overall EoSM score of 59 (out of 100). To reach the target in 2019, CYATS must improve its level in many areas. A dedicated effort will be required to achieve the targets by the end of 2019.

151 Both Cyprus and CYATS in 2018 reached the targets for the application of the Risk Analysis Tool.

Environment

152 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all the Member States of Blue Med Functional Airspace Block and allocated to each Member State.

153 Blue Med Functional Airspace Block missed its reference value in 2018 for environmental performance by achieving an environmental performance of 2.91% compared to a target of 2.54%. The target has not been met in any year of the Reference Period.

154 Particularly notable is the worsening of the actual horizontal flight efficiency in Cyprus. The excess length of a flight has worsened from 2.00% in 2015 to 4.22% in 2018. This concerning deterioration in the performance is most likely the result of geopolitical issues surrounding North Africa and the Middle East, thereby impacting the Cypriot airspace.

155 Cypriot airports have not reported any airport level data in any year of the second Reference Period.

Capacity

156 Blue Med FAB did not achieve its capacity reference value for 2018, which increased from 0.18 minutes per flight to 0.24 minutes per flight after adoption of its Performance Plan in 2019. Despite the planned increase, Blue Med FAB did not achieve its performance target. Air Traffic Flow Management (ATFM) delay was 0.35 minutes per flight in 2018.

157 In 2018, Cyprus experienced 9.5% increase in Instrument Flight Rule (IFR) movements compared to 2017. The capacity performance of Cyprus improved marginally during 2018. In 2015, there was an average of 2.47 minutes per flight delay from air traffic flow management. Since then, it decreased to 0.63 minutes per flight in 2016, 1.11 minutes per flight in 2017, and 1.10 minutes per flight in 2018. Cyprus managed to achieve this improvement despite unstable traffic.

158 Nevertheless, the capacity performance of Cyprus in 2018, whilst improved, was well below the reference value and remained a bottleneck for European airspace. Cyprus should focus on those aspects within its control whilst recognising, and where possible mitigating, the impact of the regional factors outside of their control.

159 Arrival ATFM delay was 0.82 minutes per flight in 2018 with Cyprus stating that one of their airports should not be included within monitoring as the IFR movements are less than 70,000.

Cost-efficiency

160 In 2018, Cyprus has met its cost-efficiency target with an actual unit cost (25.38€$_{2009}$) lower than the determined (32.54€$_{2009}$). The target has been met due to an increase in actual service units (+27.4%) and a decrease in actual costs (-0.6%) compared to the determined ones.

161 According to additional information of the Department of Civil Aviation (DCAC), the main reason for the decrease in actual cost compared to the determined is the much lower depreciation costs (-1.8M€$_{2009}$, or -41.5%), mainly due to postponements of planned investments.

162 Although Cyprus had not planned any CAPEX investment for 2018, 1.1M€$_{2009}$ was invested.

163 No payments under the incentive scheme were reported for 2018.

9.7 Czech Republic

<table>
<tr><th>Comments from the Performance Review Body</th></tr>
<tr><td>

The Czech Republic performed well in safety, with no issues recorded at State or Air Navigation Service Provider (ANSP) level.

At Functional Airspace Block level, environmental performance targets were missed. Although above the Functional Airspace Block Central Europe (FAB CE) target, the environmental performance of the Czech Republic remained stable.

Most concerningly, the Air Traffic Flow Management (ATFM) delay increased drastically in 2018. Whilst some disruptions were predicted due to restructuring projects and new system installations that are supposed to increase capacity, the 2019 Network Operations Plan suggests that at least a -10% capacity gap will remain for the foreseeable future.

In terms of cost-efficiency, whilst the Czech Republic managed to lower the actual unit rate below the determined amount by 0.8%, there is an underlying issue where costs grew by 7.3% and 7.9% for the past two years, which is a step change compared to the previous trend. It is imperative that the Air Navigation Service Provider protects itself and airspace users from lower traffic situations that would expose the effect of the higher cost base.

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</table>

Safety – Air Navigation Service Provider Effectiveness of Safety Management	Capacity – en route Air Traffic Flow Management delay by cause

Environment – FAB CE evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines

Key issues (Key Performance Areas)

Safety

164 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

165 During 2018, the authorities of the Czech Republic improved their overall score of the Effectiveness of the Safety Management from 69 in 2015 to 80 in 2018. The State has followed its plan for the minimum EoSM level up to 2017 and reached the target level C in 2018 ahead of plan.

166 The Air Navigation Service Provider (ANSP) of the Czech Republic (ANS CR) has throughout the second Reference Period recorded a stable overall EoSM score of 83. Since 2015, the ANSP has been on or ahead of its plan on the minimum EoSM level and achieved the targets already in 2015.

167 The application of the Risk Analysis Tool is at a level achieving the targets for all areas.

Environment

168 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of the Functional Airspace Block Central Europe (FAB CE) and allocated to each Member State.

169 The FAB CE States missed their targets for environmental performance (KEA) for the third year in a row and by a margin of 0.10% in 2018. The Functional Airspace Block target was 1.85%. Performance continuously worsened in each year of the second Reference Period.

170 The Czech Republic achieved a stable environmental performance during the entire second Reference Period, with a slight worsening in 2018 (2.35%). Therefore, the Member State did not positively contribute to the FAB target.

171 Average additional taxi-out time at Prague airport increased in 2018 to 2.51 minutes per flight. The performance at the beginning of the Reference Period was 1.81 minutes per flight and in 2017 it was 2.53%.

172 The average additional time in the terminal area of Prague reached 1.48 minutes per arrival in 2017, but marginally improved to 1.38 minutes per arrival in 2018.

173 There are four airports in the Czech Republic subject to monitoring. Nevertheless, the airport operator data flow is only established for Prague and data is only available for that airport.

Capacity

174 FAB CE achieved its capacity target for the first three years of this Reference Period. FAB CE did not achieve its capacity target in 2018 with an Air Traffic Flow Management delay of 0.82 minutes per flight compared to a target of 0.28 minutes per flight.

175 In 2018, Air Traffic Flow Management delay in the Czech Republic increased to 0.38 minutes per flight, compared to 0.05 minutes per flight in 2017. It was stated that one of the key contributors was a change in the number of Instrumental Flight Rules (IFR) movements, which was 7.4% higher. The main reasons assigned to delays were bad weather during the summer, a lack of staff, and daily operational variability – as part of the capacity issues in the core of Europe.

176 In addition, as stated in the monitoring report, Prague Flight Information Region's (FIR) complexity rose significantly and resulted in a decrease in capacity despite the improvements made by the Air Navigation Service Provider. This could be due to the participation of the Air Navigation Service Provider in the 4ACC initiative.[15] It must be acknowledged that the Czech Republic agreed to support the 4ACCs initiative and managed more traffic to support network performance at the expense of its own performance. The complexity of the Czech airspace increased as well as the shifting of traffic flows.

177 The Network Manager in the 2018 Network Operations Plan (NOP) expected capacity shortfalls in Prague Area Control Centre (ACC) during 2018 and 2019 because of an air traffic services restruc-

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[15] 4ACC initiative brought together for the first time four en route centres (NATS in London, DSNA in Reims, EUROCONTROL's Maastricht UAC and DFS's Karlsruhe UAC) to draw up a common plan to manage the optimisation of the available capacity across some of the most critical parts of the European ATM network. The initiative was made possible by the active support of 11 other ANSPs, which helped handle additional traffic flows and supported the mitigation actions agreed to at a network level, making the initiative a genuinely ground-breaking, network-level success.

turing project and the implementation of new systems, both of which are expected to lead to reductions in available capacity. In the 2019 Network Operations Plan, these capacity issues materialized and led to worse results than expected.

Cost-efficiency

178 In 2018, Czech Republic met its cost-efficiency target with the actual unit cost (35.76€$_{2009}$) being lower than the determined one (36.06€$_{2009}$). The target has been achieved because the increase in actual service units (+8.8%) was higher than the increase in actual costs (+7.9%) compared to the Performance Plan.

179 The increase in actual costs compared to the determined is a combination of several factors. According to ANS CR, this is mostly due to much higher staff costs (+9.4M€$_{2009}$, or +18.3%) caused by high traffic increase and irregular development of traffic within the year and related bonuses for performance. Additional information provided by ANS CR highlights that the higher staff costs are linked to air traffic controllers overtime and the air traffic services optimisation restructuring project aiming to improve capacity performance in the future.

180 In 2018, Czech Republic overspent 13.8M€$_{2009}$ on actual CAPEX compared to the Performance Plan. This trend has been observed throughout the second Reference Period, however, in 2015 Czech Republic underspent 11.8M€$_{2009}$ on actual CAPEX.

181 A maximum penalty of 0.47M€$_{2009}$ (0.02% of the determined costs) was applied for missing the national and Functional Airspace Block capacity performance target.

Comments from the Performance Review Body
Denmark continued to be among the leading Member States in three out of four KPAs in the Single European Sky with the results of 2018 showing that in the areas of environment, capacity and cost-efficiency the targets are more than achieved. The State still has to improve the safety performance in several areas to reach the targets and a dedicated effort will be required to meet targets in 2019. When analysing the safety performance of the Air Navigation Service Provider (ANSP), the results remained stable with one area that needs to be improved in 2018 to reach the targets for safety management.

Safety – Air Navigation Service Provider Effectiveness of Safety Management	Capacity – en route Air Traffic Flow Management delay by cause

Environment – DK-SE FAB evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines
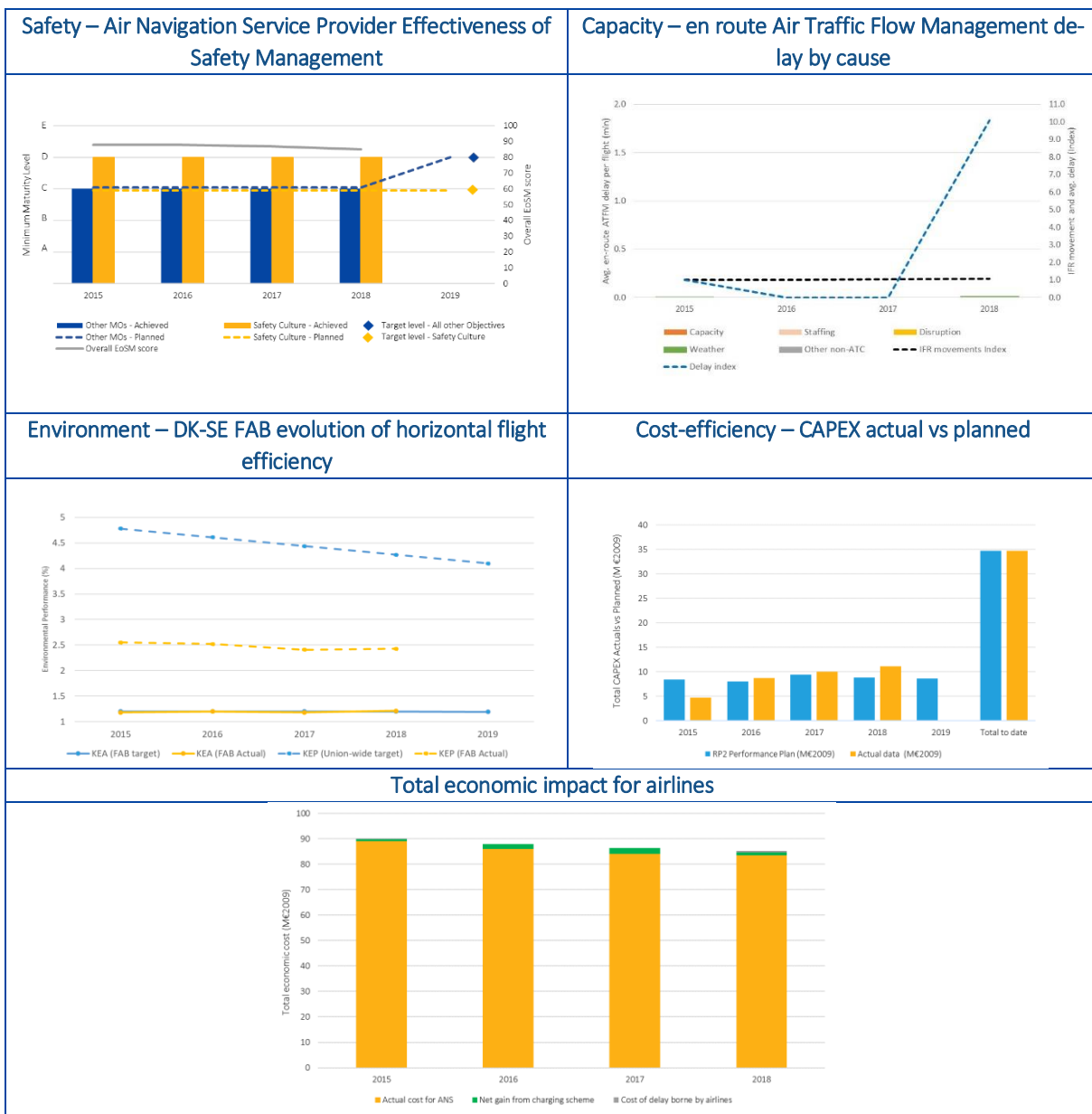
Key issues (Key Performance Areas)

Safety

182 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

183 During 2018, the State improved its average score of the Effectiveness of the Safety Management from 42 in 2015 to 50 in 2018. In 2018, improvements were seen for Safety Policies and Objectives (from Level B to Level C) and in Safety Promotion (from Level A to Level B). For Denmark to achieve the targets by end of 2019 a dedicated effort is required to improve the levels. In 2018, Denmark did not meet the 2019 EoSM target Level C for three out of five components.

184 The Air Navigation Service Provider in Denmark (Naviair) remained at a stable level on the overall EoSM score over the second Reference Period but dropped from 87 to 85 between 2017 and

2018. Naviair remained on the 2019 EoSM target Level D on all Management Objectives except in Safety Promotion (achieved Level C). The Level for Safety Risk Management dropped from Level E to Level D between 2017 and 2018, corresponding to the drop of the overall EoSM score.

185 The application of the Risk Analysis Tool improved over the period 2015 to 2017 but dropped in 2018 from 100% to 8% for Runway Incursion (RI) (overall), and ATM Specific Occurrences (overall) from 100% to 90%. At the end of 2019, the application of Risk Analysis Tool improved and achieved the target level for Separation Minima Infringement, and Runway Incursion occurrences. The Risk Analysis Tool application for the ATM Specific Occurrences remained below the target level.

Environment

186 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of the Functional Airspace Block Denmark-Sweden (FAB DK-SE) and allocated to each Member State.

187 The FAB DK-SE target was not met by a margin of 0.01% in 2018. Military activities, regulations both within the Functional Airspace Block and the rest of Europe and bad weather were the main reasons for the FAB not meeting the target. The target was 1.20% in 2018.

188 Denmark contributed positively to the FAB target by achieving a KEA of 1.13%, which is a slightly worse performance compared to 2017.

189 Additional taxi-out time in Copenhagen airport rose in 2018 from 1.91 minutes per flight in 2017 to 3.00 minutes per flight. The reason for the increase is due to adverse weather requiring extra time for de-icing, limited airport gates, combined with increased traffic.

190 Denmark's average additional time in the terminal area of Copenhagen dramatically improved from 2.11 minutes per flight to 1.02 minutes per flight between 2017 and 2018.

191 All airports subject to monitoring have established the Eurocontrol Airport Operator Data Flow.

Capacity

192 FAB DK-SE achieved its capacity target for the four years of this Reference Period with an Air Traffic Flow Management (ATFM) delay of 0.04 minutes per flight compared to a target of 0.09 minutes per flight in 2018.

193 In 2018, Denmark experienced 3.6% increase in Instrumental Flight Rules (IFR) movements compared to 2017. Denmark achieved the target in 2018. The ATFM en route delay increased from 0.00 minutes per flight in 2017 to 0.01 minutes per flight in 2018, but still remained below the target level of 0.09 minutes per flight. This delay was mainly due to disruptions in February and August.

194 Traffic levels in 2017 and 2018 for Denmark remained above those initially predicted for the Performance Plans +4.7% in IFR movements. The 2019 Network Operations Plan (NOP) predicts similar capacity performance for the rest of the second Reference Period.

195 Arrival ATFM delay increased for the first time this Reference Period in 2018 to 0.06 minutes per flight, but is still below the target.

Cost-efficiency

196 In 2018, Denmark met its cost-efficiency target with the actual unit cost (48.87€$_{2009}$) being lower than the determined one (52.53€$_{2009}$). The target has been achieved because of an increase in actual service units (+6.3%) and a slight decrease in actual costs (-1.1%) compared to the determined ones.

197 The decrease in actual costs compared to the determined can be explained by several reasons. According to the additional information provided by Naviair, the biggest deviations from the Performance Plan are lower cost of capital (-2.9M€$_{2009}$, or -49.1%) due to repayments on the subordinated loan to the State/Owner and higher staff costs (+2.8M€$_{2009}$, or +6.5%) mainly due to the inflation index impact.

198 In 2018, Denmark overspent 2.4M€$_{2009}$ on actual CAPEX compared to the Performance Plan. This is in line with the trend throughout the second Reference Period, where Denmark consistently overspent with an exception in 2015 (-3.7M€$_{2009}$, or -44.2%) resulting in CAPEX investments as set in the Performance Plan.

199 The capacity incentive scheme was not activated for Denmark.

Comments from the Performance Review Body

Estonia performed well in 2018 in the areas of safety, capacity, and cost-efficiency and managed this during a time of traffic growth beyond the Performance Plan. The performance targets for all Key Performance Areas were met, except for the State in respect to effectiveness of safety management and environment.

Estonia did not contribute positively to the Functional Airspace Block environmental target but was not far off.

Nonetheless, capacity performance requires further consideration by Estonia as its usual performance of almost zero delay was no longer maintained in 2018. Whilst still performing well, Estonia is approaching the target and should aim to reverse this trend to ensure that the targets can continue to be met. A capacity gap is not anticipated in the Tallinn Area Control Centre (ACC).

Also, 2018 was the first year that Estonia registered an increase in actual costs beyond the planned amounts.

Safety – Air Navigation Service Provider Effectiveness of Safety Management	Capacity – en route Air Traffic Flow Management delay by cause

Environment - NEFAB evolution of horizontal flight efficiency	Cost-Efficiency – CAPEX actual vs planned

Total economic impact for airlines

Key issues (Key Performance Areas)

Safety

200　Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

201　During 2018, Estonia slightly improved its overall Effectiveness of the Safety Management score from 46 in 2015 to 56 in 2018. The State achieved the 2019 EoSM target Level C for Safety Policy and Objectives in 2016 and for the Safety Assurance in 2017. The remaining objectives are at Level B. The State aims at reaching Level C in all Management Objectives in 2019, which will require an important effort, considering the improvements from 2016 only increased the minimum level in one objective (Safety Assurance).

202 The Air Navigation Service Provider (ANSP) of Estonia (EANS) improved their overall score for EoSM from 82 (2015) to 88 (2018). The ANSP achieved the 2019 EoSM target Level D and Level C in Safety Culture already in 2016 and exceeded the target level for Safety Risk Management having reached the Level E in 2017.

203 The targets for the application of the Risk Analysis Tool were achieved for all areas in 2018.

Environment

204 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of the North European Functional Airspace Block (NEFAB) and allocated to each Member State.

205 In 2018, the Key Environmental indicator actual reference target for North European Functional Airspace Block was not achieved by 0.05% showcasing an improvement on the previous year when it was missed by considerably more (0.29%). The target in 2018 was 1.26%.

206 On a national level, Estonia reported an improved KEA for 2018 and showed generally consistent environmental performance for the second Reference Period, which has not contributed positively to the Functional Airspace Block target. Estonia achieved an environmental performance of 1.33%. The National Supervisory Authorities of NEFAB note that a contribution may come from the deviations from optimal flight plan due to unit rate differences, airspace restrictions and weather.

207 Additional taxi-out times have shown considerable improvements from 2017 (1.02 minutes per flight vs. 0.81 minutes per flight) at Tallinn airport.

208 Additional time spent in terminal airspace is 0.17 minutes per flight, an improvement since reporting began in 2016 of 0.23 minutes per flight at Tallinn airport.

209 One out of two Estonian airports that should report airport level data has not established the Eurocontrol Airport Operator Data Flow.

Capacity

210 NEFAB achieved its capacity target for the fourth year in a row during this Reference Period with an Air Traffic Flow Management (ATFM) delay of 0.03 minutes per flight compared to a target of 0.13 minutes per flight.

211 In 2018, Estonia experienced 7.6% increase in Instrument Flight Rules (IFR) movements compared to 2017. Estonia achieved 0.12 minutes per flight of Air Traffic Flow Management delay and contributed positively to the FAB target, but with worse performance than for previous years. In 2017, delays were at 0.02 minutes per flight.

212 There is zero delay per flight in terms of arrival Air Traffic Flow Management delay at both reporting airports.

Cost-efficiency

213 In 2018, Estonia met its cost-efficiency target with the actual unit cost (23.41€$_{2009}$) being slightly lower than the determined one (23.48€$_{2009}$). The target has been met because the increase in actual service units (+7.5%) was slightly higher than the increase in actual costs (+7.2%).

214 The increase in actual costs compared to the determined ones, is a combination of several factors. According to the additional information provided by EANS, the Estonian Air Navigation Service Provider, the main reason is the much higher depreciation costs (+20.9%, or +0.5M€$_{2009}$) due to new investments (software of ATM system and data link system - DLS).

215 In 2018, Estonia overspent 4M€$_{2009}$ on actual CAPEX compared to the Performance Plan. The same trend is visible in 2017, when Estonia doubled the total actual CAPEX compared to the determined overspending 3.7M€$_{2009}$, resulting in a total actual CAPEX overspent RP2 to date of 6.2M€$_{2009}$ (+64.58%).

216 No financial incentive was activated as capacity performance lay within the dead band.

9.10   Finland

Comments from the Performance Review Body
Finland performed well in 2018 in the areas of safety, environment, capacity and cost-efficiency and has managed this during a time of traffic growth beyond the Performance Plan. The performance targets for all Key Performance Areas were met. Finland contributed positively to the environmental targets and helped the North Europe Functional Airspace Block (NE FAB) to get significantly closer to their reference value. The determined unit cost was 13.5% lower than planned. The decrease in costs was mainly driven by lower depreciation costs (-30.5%) and lower cost of capital (-59.2%) from delayed investment. It is interesting to note that, despite significant capital expenditure underspend, Finland has not yet suffered from performance issues. It should be ensured that these delays do not impact future performance and capacity plans are achieved to continue the excellent performance.

Safety – Air Navigation Service Provider Effectiveness of Safety Management	Capacity – en route Air Traffic Flow Management delay by cause

Environment –NEFAB evolution of horizontal flight efficiency	Cost-Efficiency – CAPEX actual vs planned

Total economic impact for airlines

Key issues (Key Performance Areas)

Safety

217 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

218 During 2018, the State improved its average score of the Effectiveness of the Safety Management from 61 in 2015 to 84 in 2018. Since 2016, the State's EoSM level remained on Level C and Level D, respectively. The Safety Culture is constantly on Level B since 2016. The State plans to achieve the Level C in all components in 2019.

219   The Air Navigation Service Provider in Finland has reached the stable level of 86 over the past two years on the overall score for EoSM starting at 75 in 2015. The ANSP achieved, and in the Safety Culture component exceeded, the 2019 EoSM target levels already in 2016.

220   The target for the application of the Risk Analysis Tool was achieved for all areas in 2015 and for each year thereafter.

Environment

221   Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of the North Europe Functional Airspace Block (NEFAB) and allocated to each Member State.

222   In 2018, the Key Environmental indicator Actual reference target for North European Functional Airspace Block was not achieved by 0.05% showcasing an improvement on the previous year when it was missed by considerably more (0.29%). The target in 2018 was 1.26%.

223   On a national level, Finland reported a marginal worsening in environmental performance and achieved 0.95% for 2018. Finland has achieved generally consistent performance for the second Reference Period and contributed positively to the FAB target.

224   There was an increase in average additional taxi-out time at Helsinki airport to 3.1 minutes per flight from 2.86 minutes per flight at Vantaa airport.

225   The average additional time spent in terminal airspace reduced slightly from 1.08 minutes per flight in 2017 to 1.05 minutes per flight in 2018 at Vantaa airport.

226   All airports subject to monitoring have established the Eurocontrol Airport Operator Data Flow.

Capacity

227   NEFAB achieved its capacity target for the fourth year in a row during this Reference Period with an Air Traffic Flow Management delay of 0.03 minutes per flight compared to a target of 0.13 minutes per flight.

228   Finland achieved zero minutes of Air Traffic Flow Management (ATFM) delay per flight in 2018, the same as its performance for the entire second Reference Period since 2015.

229   Finland experienced an increase in Instrument Flight Rules (IFR) movements by 7.7% in 2018 - the first time strong growth was recorded this Reference Period – emphasising their impressive performance to date.

230   Arrival ATFM delay increased to 0.37 minutes per flight and is above the target (0.14 minutes per flight) as it has been since 2015.

Cost-efficiency

231   In 2018, Finland met its cost-efficiency target with the actual unit cost (39.31€$_{2009}$) being lower than the determined one (45.43€$_{2009}$). The target has been met because of the increase in actual service units (+11.5%) and the decrease in actual costs (-3.5%).

232   The increase in actual costs compared to the determined is a combination of several factors. According to additional information provided by ANS Finland, the biggest deviations from the Performance Plan are due to higher staff costs (+1.1M€$_{2009}$, or +6.3%), "caused by the separation of ANS from airport operator Finavia in 2017" and much lower depreciation costs (-1.3M€$_{2009}$, or -30.5%), due to "delayed investments and investment cost included in other operating costs".

233 In 2018, Finland underspent 6.4M€$_{2009}$ on actual CAPEX compared to the determined one. This trend has been observed throughout RP2 as Finland was consistently underspending compared to the Performance Plan.

234 A bonus of 0.4M€$_{2009}$ (1% of the determined costs) was awarded as result of achieving its local capacity target.

9.11 France

Comments from the Performance Review Body
During 2018, France showed a good performance for safety and cost-efficiency, but unfortunately, the severe problems with respect to capacity and environment continued in 2018.
The Area Control Centres (ACCs) across France caused some of the main bottlenecks of the European Air Traffic Management network, which resulted in significant delays. The performance observed in 2017 worsened further, doubling the number of minutes of delay compared with 2017. The main reasons for delay were staffing, weather, industrial actions and capacity. Industrial actions taken by the air traffic controllers negatively impacted air traffic flows causing delays in France and over Europe. The total cost to airlines caused by the capacity issues in 2018 was 542M€$_{2009}$.
The French Air Navigation Service Provider, DSNA, in 2018 continued to spend less than planned in terms of total cost. In view of the significant delays already experienced, staff and other operating costs were expected to increase.
Regarding the Effectiveness of Safety Management (EoSM), both the ANSP and the State are likely to meet the target by 2019 and both need to improve performance in one area.
In terms of environmental performance, France missed the Functional Airspace Block targets in 2018.
In the 2019 NOP, the Network Manager predicts a lack of capacity in France which will continue during the third reference period, despite measures to improve the situation. The lack of capacity will result in delays and costs to airspace users.

Safety – Air Navigation Service Provider Effectiveness of Safety Management	Capacity – en route Air Traffic Flow Management delay by cause

Environment - FABEC evolution of horizontal flight efficiency	Cost-Efficiency – CAPEX actual vs planned

Total economic impact for airlines
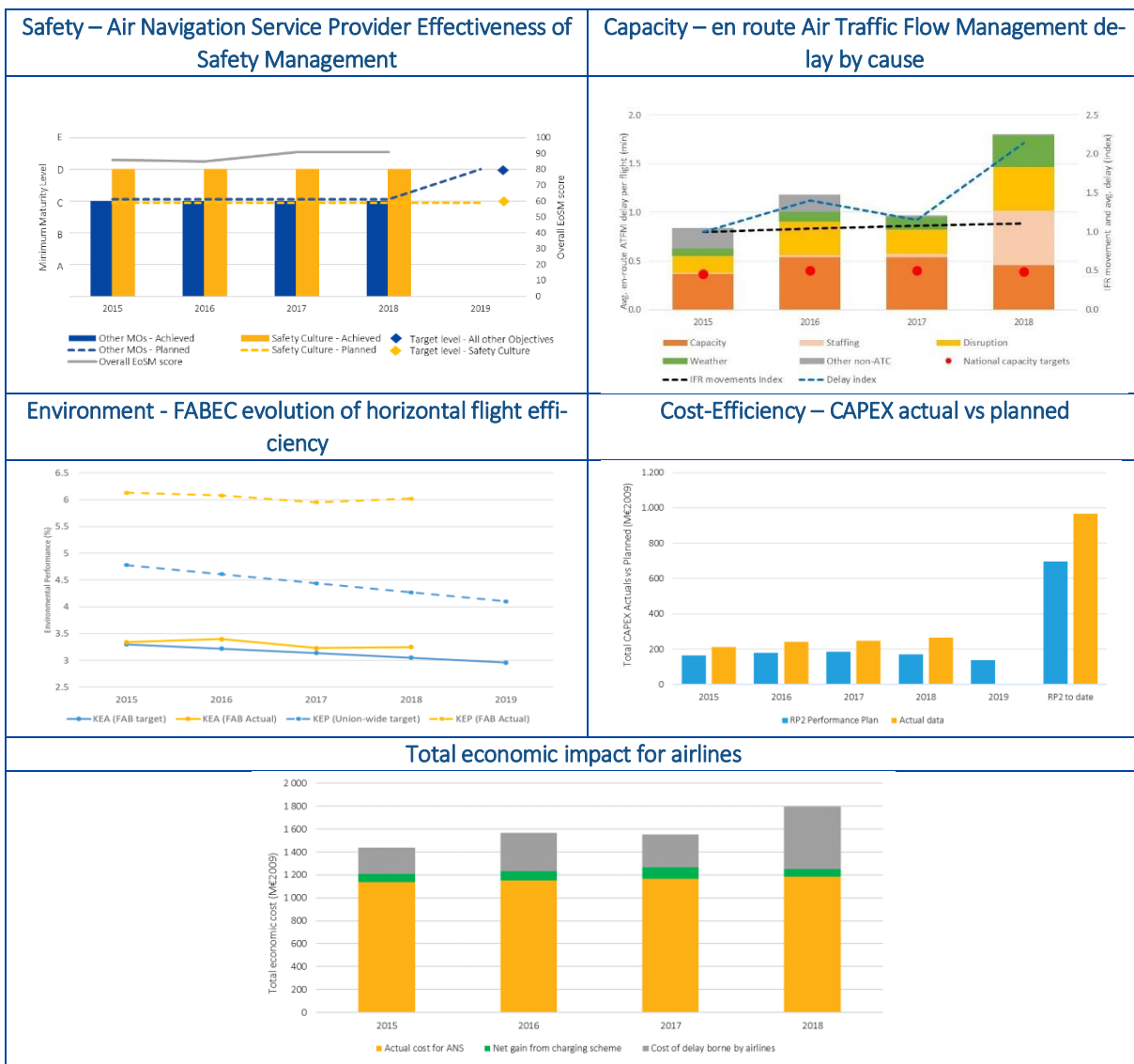
Key issues (Key Performance Areas)

Safety

235 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

236 For the performance of the French authorities in terms of safety, the French Performance Plan for the second Reference Period only included a planned level for the Effectiveness of the Safety Management for 2019. France should be able to achieve this target in 2019 given improvements in the area of safety culture.

237 For DSNA, the ANSP of France, the Effectiveness of the Safety Management remained at a stable and high level (91 out of 100) over the past two years. DSNA is in line with its planned target for 2019, but still needs to improve in one area to reach the target.

238 The targets for the application of the Risk Analysis Tool were achieved for Runway Incursions, ATM Specific and SMI (overall) Occurrences while only minimally missed for the SMI (ground) with application rate of 99%.

Environment

239 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all the States belonging to the Functional Airspace Block Europe Central (FABEC) and allocated to each Member State

240 Functional Airspace Block Europe Central (FABEC)'s target in 2018 was 3.05% on the environmental performance (KEA) while 3.25% was achieved registering the worse performance so far in Reference Period 2.

241 France recorded a KEA of 3.38%, meaning it did not contribute positively to the FAB target.

242 Average additional taxi-out time at Paris Charles de Gaulle, Nice-Cote d'Azur, and Bale-Mulhouse airports all increased in 2018, meaning performance was worse than in 2017.

243 The average additional time spent in the terminal airspace also increased for Paris Charles de Gaulle, Nice-Cote d'Azur, and Paris Orly airports, meaning performance was worse than in 2017.

244 Two out of five French airports that should independently report airport level data have not established the Eurocontrol Airport Operator Data Flow. The smaller airports that report as one bloc did not submit any results.

Capacity

245 FABEC has missed its capacity target for the fourth year in a row and the margin of underperformance has increased each year (significantly so for 2018). In 2018, an Air Traffic Flow Management delay of 2.14 minutes per flight meant that the target was missed by 1.72 minutes per flight. FABEC's target for 2018 was 0.42 minutes per flight.

246 In 2018, France experienced a 2.7% increase in Instrument Flight Rules (IFR) movements compared to 2017. France continued to struggle to provide sufficient capacity lagging behind its national capacity target (0.39 minutes per flight). Air Traffic Flow Management delays almost doubled from 0.97 minutes per flight in 2017 to 1.80 minutes per flight in 2018.

247 DSNA anticipated this deterioration in its performance and described the second Reference Period as a "transition period". Some of the delay should decrease in 2019 according to the binding FABEC Performance Plan due to the implementation of new technologies i.e. 4-flight and Co-flight systems in five Area Control Centres (ACCs). However, the French National Supervisory Authority (NSA) has reported that the technology would not be deployed sooner than the third Reference Period. Therefore, it is unlikely that benefits of these will be realised in the second Reference Period.

248 Industrial actions by air traffic controllers have been causing significant delays for the past four years. Furthermore, planned capacity improvement measures decreased against the advice of the European Commission and the Performance Review Body (PRB Monitoring Report 2017). However, according to the 2017 local level implementation plan, DSNA did not anticipate any significant capacity issues. In the 2018 local level implementation plan all but one ACC (Paris) are expected to have serious capacity issues.

249 Arrival Air Traffic Flow Management delay remained within the local target during the past four years. Airports with lower traffic (Alpes–Isère, Cannes – Mandelieu and Paris Airport-Le Bourget) individually reported higher delays compared to the performance of larger airports.

250 According to the capacity plans, the two crucially important Area Control Centres (ACCs) in Bordeaux and Marseille will experience a capacity deficit of nearly 20% compared to optimum levels for the foreseeable future. Additional and concerted efforts will be required to reverse this trend.

Cost-efficiency

251 In 2018, as for every year in the second Reference Period, France met its cost-efficiency target, with the actual unit cost (55.26€$_{2009}$) being lower than the determined (59.21€$_{2009}$). The target has been met because of an increase in actual service units (+6.2%) and a decrease in actual costs (-0.9%) compared to the determined ones.

252 The decrease in the actual costs compared to the determined is a combination of several factors. According to the additional information provided by DSNA, the biggest deviations from the Performance Plan are caused by: lower staff costs (-18.1M€$_{2009}$, -2.8%), mainly due to "the effects of the 2016-2019 social agreement aiming to significantly improve its operational and economic performance by 2020"; and higher other operating costs (+17.9M€$_{2009}$, +7.3%), mainly due to "the French State's specific public accounting rules, which do not allow the depreciation of certain investment expenses (and record them instead as Other operating costs (called T3 Technic)".

253 In 2018 France overspent 96.8M€$_{2009}$ on actual total CAPEX compared to the Performance Plan. This is consistent with the trend observed during the first years of the second Reference Period resulting in a total CAPEX overspent of 270.1M€$_{2009}$ (+39%) compared to the Performance Plan.[16]

254 A penalty of 4.53M€$_{2009}$ (0.38% of the determined costs) was applied for missing the Functional Airspace Block capacity performance target.

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[16] The value presented in this paragraph includes the OPEX related to CAPEX as reported by DSNA.

9.12   Germany

Comments from the Performance Review Body
During 2018, Germany showed a good performance for safety, environment and cost-efficiency, but unfortunately, the severe problems with respect to capacity continued. DFS, the German Air Navigation Service Provider (ANSP) was responsible for an unprecedented lack of capacity. The Network Operations Plan for 2017-2021 advised Germany to plan according to the high traffic growth capacity profile scenario. The STATFOR traffic forecast for Germany for 2018 remained again within the expected boundaries.

Delays caused in the German Area Control Centres (ACCs) impacted the entire European Air Traffic Management network and generated a significant portion of total Air Traffic Flow Management (ATFM) delays in Europe. Delays caused by the Karlsruhe Area Control Centre increased extremely in 2018 not showing any relation to traffic growth. From 2014 until 2018, traffic in Karlsruhe ACC in every respect (peak days, summer traffic, yearly traffic) showed little growth or even slightly decreased and nevertheless, delays increased from 0.34 minutes per flight (2014) to 3.18 minutes per flight (2018). The problems in Karlsruhe and other German ACCs are due to a lack of air traffic controllers and a lack of investment.

In 2018, as in previous years, DFS underinvested significantly compared to their plan, which means they have not spent the revenue received from airlines, creating a surplus of 141M€$_{2009}$ (in 2018). At the same time, airspace users incurred estimated costs of 509M€$_{2009}$ due to the delays.

The targets within the Key Performance Area (KPA) of safety are already met by both the Member State and the ANSP in 2019.

In terms of environmental performance, Germany contributed positively to the FAB target.

Germany has delegated the control a proportion of its upper airspace to Eurocontrol, i.e. the Maastricht Upper Area Control Centre (MUAC). In the assessment of the German performance, MUAC's contribution was taken into account. In 2018, Maastricht showed a large capacity deficit, despite excellent air traffic controller productivity. This deficit will most likely stay during the next five years and will cause significant cost to airlines.

Looking forward, DFS and the German authorities urgently need to address the capacity shortage. |

Safety – Air Navigation Service Provider Effectiveness of Safety Management	Capacity – en route Air Traffic Flow Management delay by cause

Environment – FABEC evolution of horizontal flight efficiency	Cost-Efficiency – CAPEX actual vs planned

Total economic impact for airlines
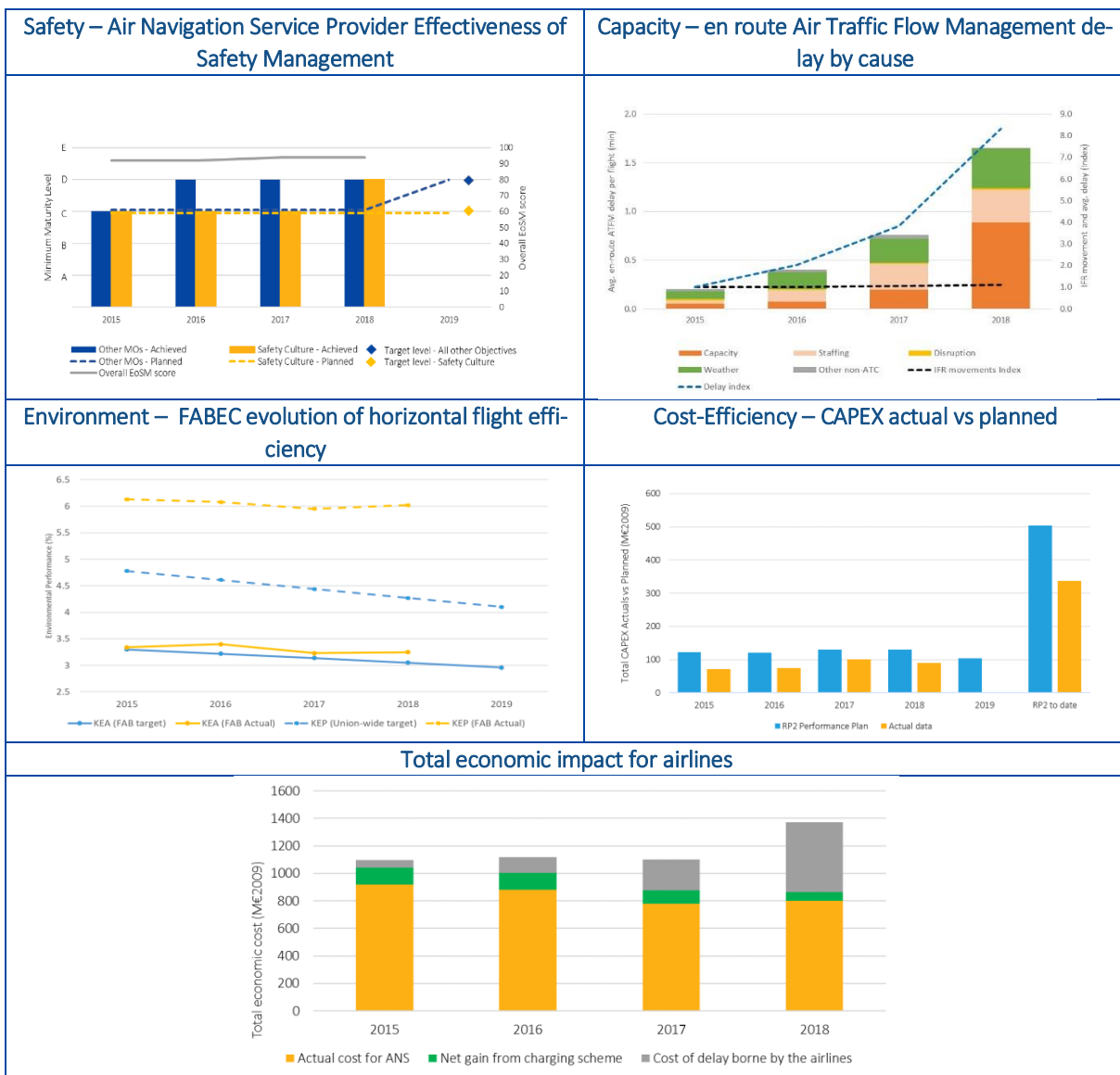
Key issues (Key Performance Areas)

Safety

255 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

256 For the performance of the German authorities in terms of safety, the German Performance Plan for the second Reference Period only included a planned level of the Effectiveness of the Safety Management for the State. Germany already in 2018 achieved the targets for all monitored areas.

257 Since 2015, DFS has had a high and stable overall Effectiveness of the Safety Management score reaching (94 out of 100) in 2018 and already achieved the 2019 targets, and beyond within the area of safety culture.

258 The target for the application of the Risk Analysis Tool was achieved for Separation Minima In-fringements and ATM Specific Occurrences. In the area of Runway Incursions, the target was not achieved.

Environment

259 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all the member states of the Functional Airspace Block Europe Central (FABEC) and allocated to each Member State.

260 The FABEC target in 2018 was 3.05% on the environmental performance, while 3.25% was achieved, thereby registering the worse performance so far in the second Reference Period.

261 Germany recorded an environmental performance of 2.85% in 2018, which continues its performance thus far in the Reference Period. Germany contributed positively towards the FAB target in 2018.

262 Eight airports in Germany recorded higher additional taxi-out times – Frankfurt, Munich and Saar-bruecken, in particular.

263 Only six airports recorded higher additional time spent in terminal airspace in 2018 whilst the rest improved performance in this area.

264 One out of 16 German airports that should report airport level data has not established the Euro-control Airport Operator Data Flow.

Capacity

265 FABEC has missed its capacity target for the fourth year in a row and the margin of underperformance has increased each year, significantly so for 2018. In 2018, an Air Traffic Flow Management (ATFM) delay of 2.14 minutes per flight meant the target was missed by 1.72 minutes per flight. FABEC's target for 2018 was 0.42 minutes per flight.

266 In 2018, Germany experienced 4.4% increase in Instrument Flight Rules movements compared to 2017. Germany achieved its national delay optimum value in 2015 and has since then experienced increasing delays, peaking at 1.65 minutes per flight in 2018. In 2017, an approximate 4% rise in traffic (Instrumental Flight Rules movements) saw a 90% rise in delays.

267 The key reason behind the poor performance is staff shortage and a lack of investments, for which Germany did not provide any explanation. 2020 is the earliest year when DFS expects additional operational air traffic controllers, including for Karlsruhe and Langen Area Control Centres (ACCs). Nevertheless, Germany will continue to miss its optimum capacity levels by up to 15%. To overcome the capacity shortage, Germany must not only increase staff and investments but also provide transparency as to how it plans to manage local peaks. Lack of adequate rostering seems to be a major issue in crucial ACCs.

268 Performance in other capacity indicators was more promising as the majority of the airports achieved the targets for arrival Air Traffic Flow Management delay and Air traffic control pre-departure delay.

269 As mentioned within the introduction, Maastricht Upper Area Control Centre also contributed a significant amount of delay to Germany. This further deteriorated Germany's overall performance.

Cost-efficiency

270 In 2018, Germany met its cost-efficiency target as the actual unit cost (53.71€$_{2009}$) was lower than the determined one (60.62€$_{2009}$). The target has been achieved because of the much higher increase in actual service units (+12.8%) and the slight decrease in actual costs (-0.1%) compared to the Performance Plan.

271 The decrease in actual costs compared to the determined is a combination of several factors. According to DFS, the biggest deviations from the Performance Plan are due to: lower other operating costs (-19.6M€$_{2009}$, or -26.1%), mainly due to "a decrease in consulting fees, travel expenses, maintenance costs for buildings, electricity and heating", lower staff costs (-17.2M€$_{2009}$, or -3.2%), due to a "decline in the number of staff due to the DFS cost reduction programme"; and a higher cost of capital (+26.9M€$_{2009}$, or +47.1%), due to a "rising equity share of the average total assets".

272 In 2018, Germany underspent 41.3M€$_{2009}$ on actual CAPEX compared to the Performance Plan. This trend has been observed throughout the second Reference Period, where Germany has been consistently underspending compared to the Performance Plan. Moreover, many of the investments undertaken had no recognisable impact on the performance assessed by the Performance Review Body.

273 Germany received a penalty of 3.84M€$_{2009}$ (0.48% of the determined costs) for missing the Functional Airspace Blocks capacity performance target.

9.13 Greece

Comments from the Performance Review Body
Greece performed well in the Key Performance Areas of safety and environment. Unfortunately, the Performance Plan for the Blue Med Functional Airspace Block for the second Reference Period was only recently approved by the European Commission. Therefore, the PRB could not assess the performance against the approved plans.

Capacity in Greece worsened since 2016, a period during which Greece did not have an approved Performance Plan. Most of the capital expenditure in the submitted Performance Plan was delayed including air traffic controller recruitment.

Greece experienced a large increase in service units, which together with delayed spending on key performance activities resulted in an actual unit cost 27.7% lower than the determine unit cost. Given the Performance Plan has now been approved and due to the additional revenue from the increase in service units, Greece should ensure its full commitment to the plan to achieve the targets and return to its previously good performance.

The PRB reiterates its recommendation to the Commission made in its Annual monitoring report 2015, published in December 2016, to inspect the compliance of Greece with the performance and charging scheme. In particular, the issues raised by the PRB regarding the loan taken out by the Greek government in 2001 and the related cash flows since then should be looked into, together with other cost issues underlined by the PRB such as cost of capital and depreciation. The PRB stresses the importance to verify whether rules have been implemented correctly. |

Safety – Air Navigation Service Provider Effectiveness of Safety Management	Capacity – en route Air Traffic Flow Management delay by cause

Safety – Air Navigation Service Provider Effectiveness of Safety Management legend:
- Other MOs - Achieved
- Safety Culture - Achieved
- Target level - All other Objectives
- Other MOs - Planned
- Safety Culture - Planned
- Target level - Safety Culture
- Overall EoSM score

Capacity – en route Air Traffic Flow Management delay by cause legend:
- Capacity
- Staffing
- Disruption
- Weather
- Other non-ATC
- IFR movements Index
- Delay index
- National capacity targets

Environment – Blue Med FAB evolution of horizontal flight efficiency	Cost-Efficiency – CAPEX actual vs planned

Environment legend:
- KEA (FAB target)
- KEA (FAB Actual)
- KEP (Union-wide target)
- KEP (FAB Actual)

Cost-Efficiency legend:
- RP2 Performance Plan (M€2009)
- Actual data (M€2009)

Total economic impact for airlines

Total economic impact legend:
- Actual cost for ANS
- Net gain from charging scheme
- Cost of delay borne by airlines

Key issues (Key Performance Areas)

274 Greece is a member of the Blue Med Functional Airspace Block (Blue Med FAB). The Performance Plan of this FAB was only approved in early 2019 with changes to the capacity targets. Due to the lack of binding targets from the Performance Plan, the Performance Review Body monitored the performance of Greece based on the values assigned by the Network Manager (reference values) and did not consider previous performance targets.

Safety

275 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

276 Over the period and continuing in 2018, the State has improved its overall score of the Effectiveness of the Safety Management (EoSM) from 66 in 2015 to 74 out of 100 in 2018. Since 2016, the

State has achieved and maintained the 2019 EoSM target Level C for all five objectives. Throughout the whole monitoring period, the Safety culture objective in Greece was maintained at higher level (Level D) than the target (Level C).

277 The Air Navigation Service Provider in Greece has been maintaining the overall EoSM score at a stable level of 75 over the past three years. The ANSP target levels for EoSM were achieved in 2017 and maintained through 2018. Similarly, the Safety Culture objective has been maintained by the ANSP at Level D (target being Level C) since 2015.

278 The targets for the application of the Risk Analysis Tool were achieved for all areas in 2018.

Environment

279 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of Blue Med FAB and allocated to each Member State.

280 Blue Med FAB missed its reference value in 2018 for environmental performance, achieving an environmental performance of 2.91% compared to a target of 2.54%. The target has not been met in any year of the Reference Period.

281 Greece has maintained a KEA performance of 2.18% that, provided all other Blue Med FAB States achieve the FAB target, would have ensured the FAB met its obligations. However, performance has worsened compared to 2017.

282 In 2018, the additional taxi-out time increased at Athens airport from 1.89 minutes per flight to 2.62 minutes per flight with no explanation provided. This is the highest delay value thus far in the second Reference Period.

283 Average additional time spent in terminal airspace at Athens airport increased from 0.88 minutes per flight to 1.18 minutes per flight with no explanation provided. This was the worst performance thus far in the second Reference Period.

284 All airports subject to monitoring have established the Eurocontrol Airport Operator Data Flow.

Capacity

285 Blue Med FAB did not achieve its capacity reference value for 2018, which increased from 0.18 minutes per flight to 0.24 minutes per flight after adoption of its Performance Plan in 2019. Despite the permitted increase, Blue Med FAB is still not achieving the performance target. Air Traffic Flow Management (ATFM) delay was recorded at 0.35 minutes per flight in 2018.

286 In 2018, Greece experienced 11.1% increase in Instrument Flight Rules movements compared to 2017. Greece achieved a capacity performance that did not achieve the Functional Airspace Block reference value in 2018. Lack of air traffic controllers and increased traffic were given as reasons by Greece for the underperformance.

287 Several capacity enhancing measures that Greece was supposed to implement have been delayed (i.e. new voice communication system (VCS) and new air traffic management systems). This is consistent with the much lower actual capital expenditure spent than determined in the initial Performance Plan.

288 For each year of the Reference Period, Air Traffic Flow Management arrival delay has worsened and is 1.47 minutes per flight in 2018 compared with 0.06 minutes per flight in 2015.

289   Greece has not implemented collaborative decision making (CDM) at its airports, but has acknowledged the importance of this to coordinate on a network level and improve performance.

Cost-efficiency

290   In 2018, as for every year in the second Reference Period, Greece met its cost-efficiency target with the actual unit cost ($22.59€_{2009}$) being lower than the determined ($31.24€_{2009}$). The target has been met because of an increase in actual service units (+24.7%) and a decrease in actual costs (-9.9%) compared to the determined ones.

291   The decrease in the actual costs compared to the determined is a combination of several factors, with one of the drivers being lower staff costs ($-4.7M€_{2009}$, -4.6%). According to the additional information provided by HCAA, the Hellenic Civil Aviation Authority, this is mainly due to "lower payments of overtime and benefits". Although the actual unit costs were lower than the determined, the fact that no investments in capacity provisions were made is not a good pre-cursor for improved performance. Notably, internal state affairs communicated that Greece has been unable to recruit additional air traffic controllers since 2009.

292   In 2018, Greece underspent $20.8M€_{2009}$ on actual total CAPEX compared to the Performance Plan. This is in line with the trend visible in the second Reference Period, where Greece consistently underspent, resulting in a total actual CAPEX underspent of $80.0M€_{2009}$ (-86.1%).

293   Greece did not apply the capacity incentive scheme.

9.14 Hungary

Comments from the Performance Review Body
Hungary performed well in environment and cost-efficiency performance areas, while showing issues for safety and capacity areas.
For safety, at State level, the performance is not sufficient compared to the target and has worsened over the second Reference Period. The authorities will need additional effort to achieve the targets. The Air Navigation Service Provider (ANSP) has achieved the targets.
With respect to capacity, new problems arose and overall Air Traffic Flow Management (ATFM) delay increased drastically due to the measures taken by the Network Manager to alleviate increasing delay in Europe (4ACCs initiative), the geopolitical situation, staffing and weather. It would be beneficial for Hungary to optimise its national performance, when capacity plans are finalised, to ensure the performance does not deteriorate further.
Although the Key Environmental indicator Actual (KEA) target on Functional Airspace Block level was missed, Hungary performed consistently and contributed positively to the FAB target.
A large increase in service units helped Hungary to meet the cost-efficiency targets.

Safety – Air Navigation Service Provider Effectiveness of Safety Management	Capacity – en route Air Traffic Flow Management delay by cause

Environment – FAB CE evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines

Key issues (Key Performance Areas)

Safety

294 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

295 Over the period, the State has remained at the same (low) level on average score of the Effectiveness of the Safety Management (EoSM) at a score of 46 (out of 100) for the second Reference Period. In 2018, the State did not meet the 2019 EoSM target Level C for any of the five components, with the level for Safety Policies and Objectives dropping from C to B between 2017 and 2018.

With the lack of improvements over the Reference Period it is unlikely the State will meet the targets in 2019.

296 The Air Navigation Service Provider (ANSP) in Hungary remained at the same level for its overall EoSM score being around 78 throughout the Reference Period. The ANSP maintained the 2019 EoSM target Level D in all other Management Objectives since 2016 and exceeded the target for Safety Culture (being at Level D with the target at Level C).

297 The application of the Risk Analysis Tool was not done for Separation Minima Infringement (overall) and ATM-Specific Occurrences (overall) up to 2016. It improved in 2017, where targets in all five areas were achieved, but then dropped in 2018 with the application being below targets in Separation Minima Infringement (ground) and Runway Incursion (RI) (overall). Consequently, further improvements are needed in these two areas to achieve the targets for the second Reference Period. No explanation has been provided for the reduced application of the RAT in the two areas.

Environment

298 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of the Functional Airspace Block Central Europe (FAB CE) and allocated to each Member State.

299 The FAB CE States missed their targets for environmental performance (KEA) for the third year in a row and by a margin of 0.10% in 2018. The Functional Airspace Block target was 1.85%. Performance worsened in each year of the second Reference Period so far.

300 Hungary has maintained stable performance for the Reference Period, albeit with a degradation between 2017 and 2018 (1.38% vs. 1.46%, respectively). Nevertheless, it contributed positively towards the FAB target.

301 In 2018, the additional taxi-out time increased at Budapest airport from 1.29 minutes per flight to 1.42 minutes per flight with no explanation provided.

302 Average additional time spent in terminal airspace at Budapest airport significantly decreased during 2017 and remained stable in 2018. According to the National Supervisory Authority (NSA), new arrival procedures with significantly longer final in the approach phase have been introduced, with a positive impact in terms of additional times.

303 All airports subject to monitoring have established the Eurocontrol Airport Operator Data Flow.

Capacity

304 FAB CE has achieved its capacity target for the first three years of this Reference Period. FAB CE did not achieve its capacity target in the fourth year during this Reference Period with an Air Traffic Flow Management (ATFM) delay of 0.82 minutes per flight compared to a target of 0.28 minutes per flight.

305 In 2018, Hungary experienced 10% increase in Instrument Flight Rules movements compared to 2017. Hungary recorded a huge increase in ATFM delays contributing to worse performance than 2017, but it was also affected by the 4ACCs initiative and Ukrainian geopolitical issues. In 2018, performance was 0.39 minutes per flight of ATFM delay compared to the national capacity target of 0.04 minutes per flight, while in 2017, it was 0.01 minutes per flight with national capacity target of 0.05 minutes per flight.

306 The 2019 Network Operations Plan (NOP) is estimating a significant capacity gap for the third Reference Period compared to the current capacity plans. Whilst more than 50% of the delay was allocated to weather, Hungary is not adequately prepared to manage the increased traffic if it follows its capacity plan presented in the NOP 2019 - 2024.

307 It must be acknowledged that Hungary agreed to support the 4ACCs initiative and managed more traffic to support network performance at the expense of its own performance. The complexity of the Hungarian airspace increased as well as the shifting of traffic flows.

308 For each year of the Reference Period, arrival ATFM delay remained stable during 2017 and 2018 with a value of 0.03 minutes per flight, achieving the target of 0.05 minutes per flight.

Cost-efficiency

309 In 2018, as for every year in the second Reference Period, Hungary met its cost-efficiency target, with the actual unit cost (27.00€$_{2009}$) being lower than the determined (33.99€$_{2009}$). The target has been met because the increase in actual service units (+31.9%) was much higher than the increase in actual costs (+4.8%) compared to the determined ones.

310 The increase in the actual costs compared to the determined is a combination of several factors, but the main driver is higher other operating costs (+3.7M€$_{2009}$, +17.6%). According to the additional information provided by HungaroControl, this is mainly due to "air traffic controller training costs, to increase capacity and to be able to handle the increase in demand, and a higher cost for search and rescues".

311 In 2018, Hungary underspent 4.6M€$_{2009}$ on actual total CAPEX compared to the Performance Plan. There is no consistent trend visible in the second Reference Period, with both under- and over-investments, resulting in a total actual CAPEX overspend of 3.5M€$_{2009}$ (+6.8%).

312 A penalty of 0.42M€$_{2009}$ (0.51% of the determined costs) was applied for missing the national and Functional Airspace Block capacity performance target. This is the maximum penalty that can be applied.

9.15   Ireland

Comments from the Performance Review Body
Ireland continued to be among the leading Member States meeting all the targets with good performance in all four Key Performance Areas.

Safety improved on both State and Air Navigation Service Provider (ANSP) level and all targets were met, improving on those that were not met in 2017.

Despite improvements, environmental performance (KEA) at the Functional Airspace Block level has not been met, although Irish airspace provided a positive contribution to performance.

Ireland maintained excellent en route capacity provisions although the terminal performance struggled, particularly at Dublin airport.

Actual costs are lower than planned, to which a number of factors contributed including staffing, delayed operational expenditure due to delayed capital expenditure and procurement efficiencies. Importantly, Ireland has not invested as planned and this is worrying since it cites infrastructure issues as a cause of terminal capacity performance issues.

Safety – Air Navigation Service Provider Effectiveness of Safety Management	Capacity – en route Air Traffic Flow Management delay by cause

Environment – UK-Ireland FAB evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines

Key issues (Key Performance Areas)

Safety

313 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

314 During 2018, the State improved its average score of the Effectiveness of the Safety Management from 79 in 2015 to 86 in 2018. In 2017, the State did not meet the 2019 EoSM target Level C for one out of five components (Safety Policies and Objectives), but improved in 2018 now being at or above target for all MOs, Safety Risk Management and Safety Assurance being at level D.

315 The Air Navigation Service Provider in Ireland has improved its average EoSM score over the Reference Period from 84 in 2015 to 92 in 2018. The ANSP has remained on the 2019 EoSM target Level D in all other Management Objectives and above the target in Safety Culture (achieved Level D).

316 The application of the Risk Analysis Tool has been on or above target since 2015. For 2018, data on the application of Runway Incursion (RI) (ground) has not been provided, other areas remaining at or above targets.

Environment

317 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of the UK-Ireland Functional Airspace Block (UK-Ireland FAB) and allocated to each Member State.

318 The UK-Ireland Functional Airspace Block states missed their targets for environmental performance for the fourth year in a row with performance improving in each of those years. The target in 2018 was 3.09% and actual performance was 3.63%. Most of this was due to the United Kingdom's performance.

319 Ireland contributed positively to the FAB target with an environmental performance (for KEA) of 1.26%.

320 Additional taxi-out time increased at Dublin airport in 2018 to 7.11 minutes per flight, which is mainly due to the inefficient and complex taxiway layout and an increase in traffic of 4.5% at the airport. Prior to 2018 the performance was stable at around 5.39 minutes per flight.

321 Additional Arrival Sequencing and Metering Area (ASMA) time is slightly higher in 2018 than in 2017 both at Dublin and Cork airports (3.10 minutes per flight and 0.52 minutes per flight respectively) and have been increasing in each year of the Reference Period. The ANSP of Ireland, IAA, reports that arrival congestion is a result of the airport operating close to capacity limits for long periods of the day.

322 One out of three Irish airports that should report airport level data has not established the Eurocontrol Airport Operator Data Flow.

Capacity

323 The capacity target was not met on the Functional Airspace Block level in 2018 by a small margin of 0.02 minutes per flight of Air Traffic Flow Management (ATFM) delay. Functional Airspace Block performance seems to fluctuate, with one good year of achieving the target followed by a year where the target is slightly missed. The target in 2018 was 0.26 minutes per flight.

324 In 2018, Ireland experienced 3% increase in Instrument Flight Rules (IFR) movements compared to 2017. The Air Traffic Flow Management delay in Ireland was 0.00 minutes per flight in 2018. Ireland continues to minimise delays and shows high levels of en route capacity performance despite the traffic level being increasingly higher than forecasted (+8.7% higher in 2018).

325 The arrival ATFM delay increased at Dublin airport, from 2017 to 2018 from 0.10 minutes per flight to 0.27 minutes per flight, respectively. Delays are mainly due to bad weather conditions and the growth in traffic during constrained periods without any significant enhancements in airport infrastructure. This has led to higher congestion, particularly during adverse weather conditions (e.g. low visibility, snow, high winds, etc.).

Cost-efficiency

326 In 2018, as for all other years in the second Reference Period, Ireland met its cost-efficiency target, with the actual unit cost ($25.10€_{2009}$) being lower than the determined ($28.56€_{2009}$). The target has been met because of an increase in actual service units (+8.7%) and a decrease in actual costs (-4.4%) compared to the determined ones.

327 The increase in the actual costs compared to the determined is a combination of several factors, with one of the drivers being lower other operating costs ($-2.9M€_{2009}$, -11.5%). According to the additional information provided by Irish Aviation Authority this is mainly due to "decreases across a range of technical and administrative expenses as a result of the strong procurement and budgeting procedures with competitive quotes on significant tangible transactions".

328 In 2018, Ireland underspent $10.5M€_{2009}$ on actual total CAPEX compared to the Performance Plan. This is in line with the trend observed in the second Reference Period, where Ireland consistently underspent, resulting in a total actual CAPEX underspent of $56.2M€_{2009}$ (-63.65%).

329 The capacity incentive scheme was not activated for Ireland as the overall Functional Airspace Block was not met in 2018.

9.16   Italy

Comments from the Performance Review Body
Italy performed well in the safety, capacity and cost-efficiency Key Performance Areas, while having problems in the environmental area. Both the Italian authorities and ENAV, the Air Navigation Service Provider (ANSP) still need improvements in 2019 to meet the targets for the Effectiveness of Safety Management. It should be achievable. The environmental performance (KEA) slightly worsened with respect to 2017 and it does not contribute towards the FAB target. The Italian ANSP received a bonus for good capacity performance although this is contested since the Functional Airspace Block did not achieve its target. The Italian capacity performance in general is good and contributed positively to Functional Airspace Block performance. On the cost-efficiency aspect, Italy adopted a high traffic forecast that did not materialise. It is commendable that Italy pursued effective cost containment measures not impacting the quality of the service.

Safety – Air Navigation Service Provider Effectiveness of Safety Management	Capacity – en route Air Traffic Flow Management delay by cause

Environment – Blue Med FAB evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines

Key issues (Key Performance Areas)

330 Italy is a member of the Blue Med Functional Airspace Block (FAB). The Performance Plan of this FAB was only adopted in early 2019 with changes to the capacity targets. Due to the lack of binding targets from the Performance Plan, the Performance Review Body monitored the performance of Italy based on the values assigned by the Network Manager (reference values) and did not consider previous targets stated in the draft Performance Plan. .

Safety

331 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

332 Over the period and continuing in 2018, the State gradually improved its overall Effectiveness of the Safety Management score from 52 in 2015 to 67 in 2018. In 2017, the State achieved the 2019 EoSM target Level C for Safety Policy and Objectives, Safety Awareness and Safety Promotion while surpassing the C level in Safety Risk Management and Safety Culture. In 2018 the Safety Culture objective dropped its value two steps down to Level B.

333 The EoSM overall score of the Air Navigation Service Provider in Italy (ENAV) has dropped from a level 76 in 2017 to 72 in 2018. In 2017. The ANSP achieved and maintained the 2019 EoSM target levels for three consecutive years between 2015 and 2017. In 2018, the Safety Policy and Objectives and Safety Risk Management Objectives dropped to Level C below the target Level D.

334 The targets for the application of the Risk Analysis Tool (RAT) were achieved.

Environment

335 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of the Blue Med FAB and allocated to each Member State.

336 The Blue Med FAB missed its reference value in 2018 for environmental performance. Achieving an environmental performance of 2.91% compared to a target of 2.54%. The target has not been met in any year of the Reference Period.

337 On a national level, Italy has improved the national environmental performance from 3.50% in 2015 to 3.16% in 2018 but still does not contribute positively towards the Functional Airspace Block target.

338 Additional taxi-out time increased at all Italian airports, with Rome Fiumicino the highest amount of additional time at 7.19 minutes per flight. Venice, Malpensa and Linate airports also showed proportionally significant increases. No explanations were provided by the State about why performance had decreased at all airports.

339 Average additional time spent in terminal airspace is higher in 2018 than in 2017 for all airports with big increases for Rome Fiumicino airport (2.17 minutes per flight vs. 1.69 minutes per flight) between 2018 and 2017.

340 All airports subject to monitoring have established the Eurocontrol Airport Operator Data Flow.

Capacity

341 The Blue Med FAB did not achieve its capacity reference value for 2018, which was increased from 0.18 minutes per flight to 0.24 minutes per flight after adoption of its Performance Plan in 2019. Despite the permitted increase, Blue Med FAB is still not achieving the performance target. Air Traffic Flow Management (ATFM) delay was 0.35 minutes per flight in 2018.

342 In 2018, Italy experienced 5.3% increase in Instrument Flight Rules (IFR) movements compared to 2017. As it has been seen during the second Reference Period, Italy achieved its national capacity target by a significant margin, reaching 0.03 minutes per flight of Air Traffic Flow Management delay.

343 The arrival ATFM delay performance in Italy has been commendable with all airports either meeting or slightly exceeding the targets. At a national level the delay was 0.12 minutes per flight, a significant improvement since 2015.

Cost-efficiency

344 In 2018, Italy met its cost-efficiency target with the actual unit cost (58.90€$_{2009}$) being lower than the determined (64.61€$_{2009}$). The target has been met because the decrease in actual service units (-1.3%) has been smaller than the reduction in actual costs (-10.0%) compared to the determined ones.

345 The decrease in the actual costs compared to the determined is a combination of several factors, with one of the drivers being the lower other operating costs (-22.4M€$_{2009}$, -27.3%). According to the additional information provided by ENAV this is mainly due to "a reduction of costs for utilities and operational telecommunications, costs for rent as well as a general reduction in support activities".

346 In 2018, Italy underspent 22.9M€$_{2009}$ on actual total CAPEX compared to the Performance Plan. This is in line with the trend observed in the second Reference Period, where Italy consistently underspent, resulting in a total actual CAPEX underspent of 156.5M€$_{2009}$ (-29.18%).

347 Although Blue Med FAB did not have a unified incentive scheme, and this was only presented to the Single Sky Committee in March 2019, Italy determined a national scheme in the submission of the Performance Plan. Due to its national performance, Italy has reported it is eligible for a bonus in 2018 although there were pending compliance issues since the Functional Airspace Block reference value was missed. A bonus of 6.10M€$_{2009}$ (0.99% of the determined costs) was in the end received as a result of achieving the local capacity target.

9.17 Latvia

Comments from the Performance Review Body
Latvia achieved a good performance in most of the Key Performance Areas (KPAs).
Latvia met all safety targets on both State and Air Navigation Service Provider (ANSP) level.
In capacity, Latvia reached exactly the national capacity target after years achieving almost zero delays per flight. The reasons for the delay increase should be closely monitored in order to preserve the good performance in the capacity KPA.
The environmental performance (KEA) was missed by a small margin.
The cost-efficiency target was met, and Latvia did not receive any bonus or penalty.

Safety – Air Navigation Service Provider Effectiveness of Safety Management	Capacity – en route Air Traffic Flow Management delay by cause
Environment –NEFAB evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned
Total economic impact for airlines	
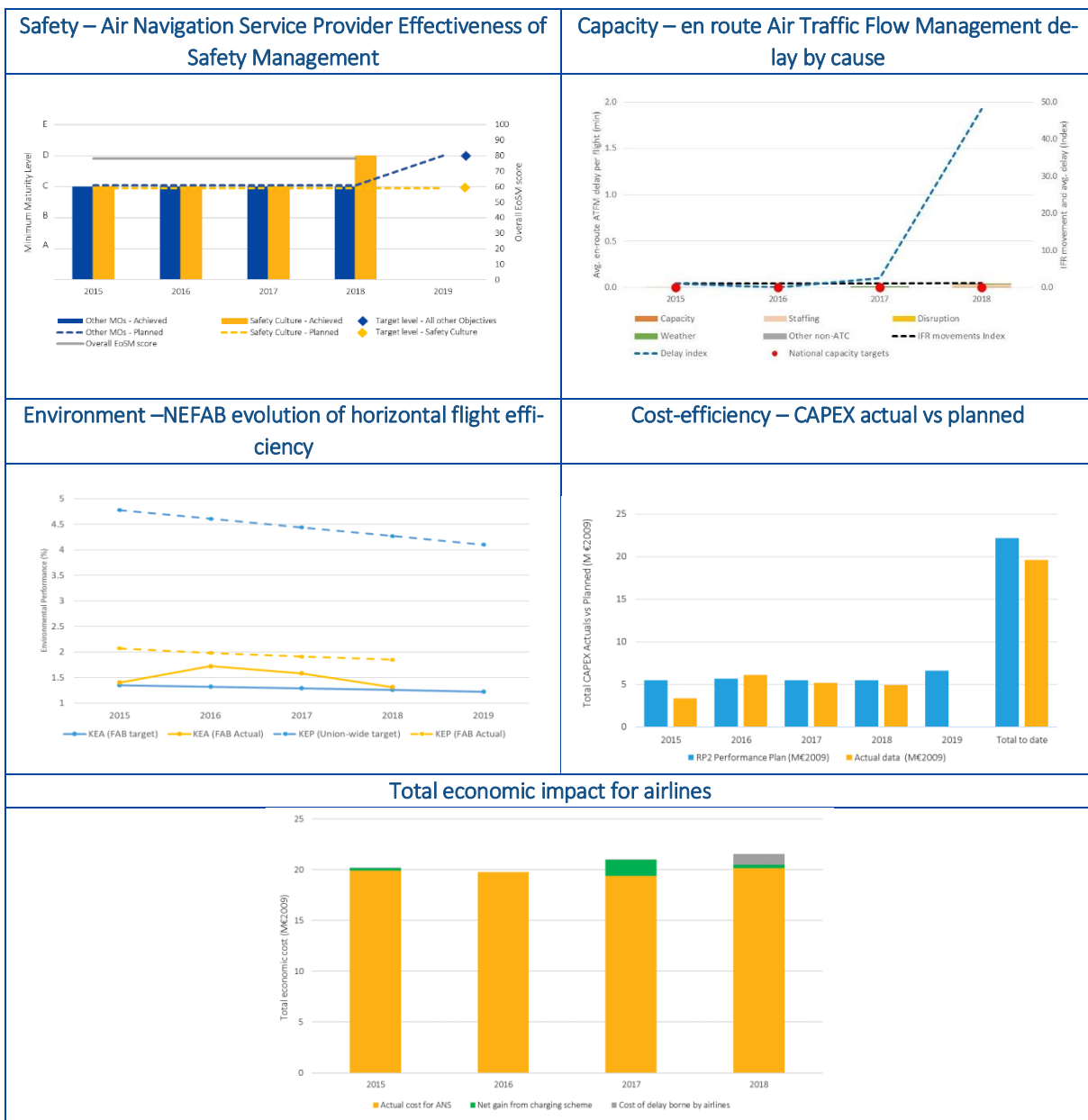
Key issues (Key Performance Areas)

Safety

348   Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

349   Over the period and continuing in 2018, the State has improved its average score of the Effectiveness of the Safety Management from 58 in 2015 to 71 in 2018. The State reached the 2019 EoSM Target C level in all components already in 2016 and improved the levels even more reaching Level D in Safety Risk Management and Safety Promotion in 2018.

350   The Air Navigation Service Provider of Latvia remained at a stable level of 78 since 2015. The ANSP achieved the 2019 EoSM target Levels D in Safety Culture in 2018.

351 The targets for the application of the Risk Analysis Tool were achieved for all areas in 2015 and 2018 as well.

Environment

352 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of the North European Functional Airspace Block (NEFAB) and allocated to each Member State.

353 In 2018, the Key Environmental indicator actual reference target for NEFAB was not achieved by 0.05% showcasing an improvement on the previous year when it was missed by considerably more (0.29%). The target in 2018 was 1.26%.

354 On a national level Latvia reported a marginally worsened KEA for 2018 but has shown generally stable environmental performance for the second Reference Period. In 2018, Latvia achieved an environmental performance of 1.28%, as a result it did not contribute positively to the FAB target.

355 A significant increase in additional taxi-out delay to 3.13 minutes per flight in 2018 was observed at Riga airport and is cited to be due to a 10% increase in airport movements and construction work on the aerodrome taxi-way.

356 Average additional time spent in terminal airspace was higher in 2018 than in 2017 at Riga airport (1.21 minutes per flight vs. 1.19 minutes per flight). Each year of the Reference Period resulted in worsening performance which Latvia believes is due to traffic and airport works.

357 Two out of three Latvian airports that should report airport level data have not established the Eurocontrol Airport Operator Data Flow.

Capacity

358 NEFAB achieved its capacity target for the fourth year in a row during this Reference Period with an Air Traffic Flow Management (ATFM) delay of 0.03 minutes per flight compared to a target of 0.13 minutes per flight.

359 In 2018, Latvia experienced 8.6% increase in Instrument Flight Rules (IFR) movements compared to 2017. Latvia achieved 0.04 minutes per flight ATFM delay in 2018 reaching exactly its national capacity target value, which is an increase from a stable value of 0.0 minutes per flight achieved during the previous years in the second Reference Period. Latvia contributed positively to the FAB performance.

360 The arrival Air Traffic Flow Management delay performance in Latvia has been commendable with all airports either meeting or slightly exceeding the targets. In 2018, at a national level the delay increased to 0.07 minutes per flight compared to a target of 0.04 minutes per flight. This was mostly driven by Riga airport's performance, which suddenly increased delays from zero to 0.07 minutes per flight. Latvia affirms this was due to increased summer traffic.

Cost-efficiency

361 In 2018, Latvia met its cost-efficiency target, with the actual unit cost (21.47€$_{2009}$) being lower than the determined (24.25€$_{2009}$). The target has been met because of an increase in actual service units (+8.2%) and a decrease in actual costs (-4.2%) compared to the determined ones.

362 The decrease in the actual costs compared to the determined is a combination of several factors. According to the additional information provided by LGS, the Air Navigation Service Provider of Latvia, the biggest deviations from the Performance Plan are due to the lower depreciation costs (-1.5M€$_{2009}$, -37.8%), resulting from "the end of useful life of several FA (fixed assets), and the LGS

increased the useful live of newly bought assets", and higher staff costs (1.6M€$_{2009}$, or 16.2%) as a result of "increased wages to keep staff".

363 In 2018, Latvia underspent 0.6M€$_{2009}$ on actual total CAPEX compared to the Performance Plan. This is in line with the trend observed in the second Reference Period, where Latvia consistently underspent with an exception in 2016, resulting in a total actual CAPEX underspent of 2.6M€$_{2009}$ (-11.71%).

364 Due to a capacity performance equalling the target, no bonus nor penalty was received according to the national incentive scheme.

9.18   Lithuania

Comments from the Performance Review Body
Lithuania achieved good performance for capacity and cost-efficiency, however there is room for improvement with regards to the environment and safety Key Performance Areas. Despite improvements, some of the safety targets remain below the target values on a State level. The Air Navigation Service Provider (ANSP) has met all safety targets for 2018. The Key Environmental indicator Actual (KEA) target for the Baltic FAB was missed. It is expected to improve as Free Route Airspace (FRA) initiatives are developed in cooperation with Poland. Lithuania achieved an excellent capacity performance despite more than 10% difference between the forecasted and actual traffic. The cost-efficiency target was met, and Lithuania received a bonus for its capacity performance. It is important for Lithuania to also focus on establishing an Airport Operator Data Flow to enable reporting of airport level data as performances in terminal areas impact the Key Performance Areas.

Safety – Air Navigation Service Provider effectiveness of safety management	Capacity – en route Air Traffic Flow Management delay by cause

Environment - Baltic FAB evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines

Key issues (Key Performance Areas)

Safety

365 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

366 Over the period, the State has improved slightly from 48 to 55 in 2017, but then improved more in 2018 reaching the overall score of the Effectiveness of the Safety Management of 61 in 2018. In 2018, Safety Culture remains below the target Level C (achieved Level B).

367 The Air Navigation Service Provider in Lithuania started the second Reference Period with an overall EoSM score of 82, which has decreased to 78 in 2018. The ANSP has however been at 2019 EoSM target Level D in all other Management Objectives and has been at the target of Level C in Safety Culture since 2015 but without any improvements in the minimum levels over the period. Oro Navigacija, the ANSP of Lithuania, achieved the 2019 targets in 2018.

368   The application of the Risk Analysis Tool in Lithuania has been erratic, starting in 2015 without ap-
       plication in any area (or without data being made available). Finally, in 2018, Lithuania achieved
       the targets in all RAT areas.

Environment

369   Under the Performance Scheme, environmental performance is measured in terms of excess
       length of the actual flight path also known as Key Environmental indicator Actual (KEA). With re-
       spect to Lithuania, the environmental targets are analysed for all Member States of the Baltic
       Functional Airspace Block (Baltic FAB) and allocated to each Member State.

370   In 2018, the environmental performance reference target for the Baltic FAB was not achieved by
       0.32%; a greater margin of underperformance compared to the previous years. The target for
       2018 was 1.40%.

371   On a national level, Lithuania decreased its environmental performance since 2017, continuing the
       trend of worsening national results for each year of the Reference Period. The current national
       performance is 1.94% which means Lithuania did not contribute positively to the Functional Air-
       space Block target.

372   The National Supervisory Authority (NSA) states that the main contributors to the degradation in
       performance is the difference between STATFOR forecast and actual traffic levels, largely influ-
       enced by flights bypassing Ukrainian airspace and a significant difference in the unit rate between
       Germany and Poland.

373   None of the four Lithuanian airports that should report airport level data have established the Eu-
       rocontrol Airport Operator Data Flow.

Capacity

374   In 2018, the Baltic FAB achieved its Air Traffic Flow Management (ATFM) delay target of 0.22
       minutes per flight exactly.

375   In 2018, Lithuania experienced 8.5% increase in Instrument Flight Rules (IFR) movements com-
       pared to 2017. On a national level, Lithuania continued to record zero delay, like in each year of
       the second Reference Period.

376   The arrival Air Traffic Flow Management delay performance in Lithuania is commendable with all
       airports achieving close to zero delay. At national level the delay was 0.01 minutes per flight com-
       pared to a target of 0.00 minutes per flight. These were caused by isolated instances of long de-
       lays due to military activity.

Cost-efficiency

377   In 2018, Lithuania met its cost-efficiency target, with the actual unit cost (31.94€$_{2009}$) being lower
       than the determined (38.28€$_{2009}$). The target has been met because of an increase in actual ser-
       vice units (+11.3%) and a decrease in actual costs (-7.2%) compared to the determined ones.

378   The decrease in the actual costs compared to the determined is a combination of several factors,
       but the main driver is lower other operating costs (-1.1M€$_{2009}$,-29.1%). According to the additional
       information provided by Oro Navigacija this is mainly due to "stricter control on spending and in-
       vestments, a revision of payments for maintenance of technical equipment and a delay in the relo-
       cation to a new building and a revision of how payments for maintenance, servicing and repairs of
       their technical equipment".

379   In 2018, Lithuania overspent 9.4M€$_{2009}$ on actual total CAPEX compared to the Performance Plan.
       This is in line with the trend visible in the second Reference Period, where Lithuania consistently

overspend with an exception in 2015, resulting in a total actual CAPEX overspent of 10.1M€$_{2009}$ (+55.49%).

380 A bonus of 0.02M€$_{2009}$ (0.10% of the determined costs) was awarded as a result of achieving the local capacity target.

9.19   Malta

Comments from the Performance Review Body
Malta performed well compared to the targets for environment and capacity, while the cost-efficiency target was not met. In addition, the safety area needs attention. Safety has been improving over the second Reference Period with the Air Navigation Service Provider (ANSP) level achieving the Effectiveness of the Safety Management (EoSM) targets. The Maltese authorities still need to focus on improvements in the area of safety promotion. Malta has contributed positively to the environmental target at Functional Airspace Block-level. Despite achieving the targets, the environmental performance (KEA) has been deteriorating since the start of the Reference Period and will need attention sooner rather than later to understand the reasons. Malta generated negligible Air Traffic Flow Management (ATFM) delay. For the first time in the second Reference Period, Malta did not meet its cost-efficiency target. This has been due to higher than determined costs. Moreover, more investments may be required to improve terminal and environmental performance which have both consistently deteriorated, particularly given Malta has underspent significantly on capital expenditure compared to the Performance Plan.

Safety – Air Navigation Service Provider effectiveness of safety management	Capacity – en route Air Traffic Flow Management delay by cause

Environment – Blue Med FAB evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines

Key issues (Key Performance Areas)

381 Malta is a member of the Blue Med Functional Airspace Block (FAB). The Performance Plan of this FAB was only adopted in early 2019 with changes to the capacity targets. Due to the lack of binding targets from the Performance Plan, the Performance Review Body monitored the performance of Malta based on the values assigned by the Network Manager (reference values) and did not consider previous Performance Plan stated targets.

Safety

382 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

383 Over the period, the State has improved significantly its overall score of the Effectiveness of the Safety Management from 50 in 2015 to 72 in 2018. In 2017, the State achieved and maintained through 2018 the 2019 EoSM target Level C for four objectives. However, the level of Safety Promotion has remained at Level B since 2015.

384 The Air Navigation Service Provider in Malta (MATS) improved marginally the overall EoSM score from 82 in 2015 up to 84 in 2018. Throughout the monitoring period, the ANSP has achieved the 2019 EoSM target Level C for Safety Culture and Level D for all remaining Management Objectives. In 2018, the ANSP improved further to achieve Level D for Safety Culture.

385 The targets for the application of the Risk Analysis Tool were achieved for all areas in 2017 and 2018.

Environment

386 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of Blue Med FAB and allocated to each Member State.

387 Blue Med FAB missed its reference value in 2018 for environmental performance, achieving an environmental performance of 2.91% compared to a target of 2.54%. The target has not been met in any year of the Reference Period.

388 On a national level, Malta has contributed positively to the FAB target. However, Malta's environmental performance deteriorated from 1.00% in 2015 to 1.29% in 2018 with each year of the Reference Period worsening compared with the previous year.

389 In 2018, the additional taxi-out time increased at Malta airport from 1.75 minutes per flight to 2.12 minutes per flight with no explanation provided.

390 Average additional time spent in terminal airspace has increased at Malta airport for each year of the Reference Period from 0.46 minutes per flight in 2015 to 0.90 minutes per flight in 2018. No explanation has been provided for this.

391 All airports subject to monitoring have established the Eurocontrol Airport Operator Data Flow.

Capacity

392 The Blue-Med FAB did not achieve its capacity reference value for 2018, which increased from 0.18 minutes per flight to 0.24 minutes per flight after adoption of its Performance Plan in March 2019. Despite the permitted increase, the Blue Med FAB is still not achieving the performance target. Air Traffic Flow Management (ATFM) delay was 0.35 minutes per flight in 2018.

393 In 2018, Malta experienced 8.2% increase in Instrument Flight Rules (IFR) movements compared to 2017. En route capacity performance in Malta in 2018 resulted in negligible Air Traffic Flow Management delay for airspace users, continuing the excellent performance from previous years and contributing positively to the Blue Med Functional Airspace Block.

394 The arrival Air Traffic Flow Management delay performance in Malta is commendable with the only reporting airport achieving close to zero delay. At a national level the delay was 0.01 minutes per flight compared to a target of 0.10 minutes per flight.

Cost-efficiency

395 In 2018, for the first time in the second Reference Period, Malta did not meet its cost-efficiency target, with the actual unit cost (20.67€$_{2009}$) being higher than the determined (19.75€$_{2009}$). The

target was missed because the increase in actual service units (+0.2%) was lower than the increase in actual costs (+4.8%) compared to the determined ones.

396 The increase in the actual costs compared to the determined is a combination of several factors, but the main driver is higher staff costs (+1.4M€$_{2009}$, +20.1%). According to the additional information provided by MATS this is mainly due to "due to unplanned overtime to cope with the additional traffic and for the necessary training on the new ATM system commissioning".

397 In 2018, Malta underspent 2.8M€$_{2009}$ on actual total CAPEX compared to the Performance Plan. This is in line with the trend observed in the second Reference Period, where Malta consistently underspent with an exception in 2015, resulting in a total actual CAPEX underspent of 15.3M€$_{2009}$ (-65.9%).

398 The capacity incentive scheme was not activated.

9.20   The Netherlands

Comments from the Performance Review Body
For the Netherlands, in 2018, capacity improved for en route services, however, there are still considerable delays in the terminal airspace – i.e. at Amsterdam airport. Most delays generated within the airspace of the Netherlands were caused by the Maastricht Upper Area Control Centre (MUAC, operated by Eurocontrol), which controls the Dutch upper airspace (above 24,500 feet). MUAC was unable to provide enough capacity in 2018 despite having the best air traffic controller productivity. Structural changes will be needed to increase the capacity of MUAC which in turn will benefit all Member States delegating part of their respective airspace to MUAC. Environmentally, the Netherlands has contributed positively to the FAB target. The Netherlands has focussed on improving its capacity performance and achieved lower delays in 2018 for the lower airspace. No delays are expected for 2019. The Netherlands should decrease the arrival delays at Amsterdam Schiphol airport and work with MUAC to increase capacity for the upper airspace. With respect to safety, while targets were not met in 2018 for the State and ANSPs, improving the minimum level in 2019 should be achievable. The costs-efficiency target was met by the Netherlands in 2018, despite higher costs than planned. This is due to an increase in service units which were 11.4% higher than planned. The Netherlands is a good example how higher revenues from increased service units are being re-invested into performance.

Safety – Air Navigation Service Provider effectiveness of safety management

Capacity – en route Air Traffic Flow Management delay by cause

Environment - FABEC evolution of horizontal flight efficiency

Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines
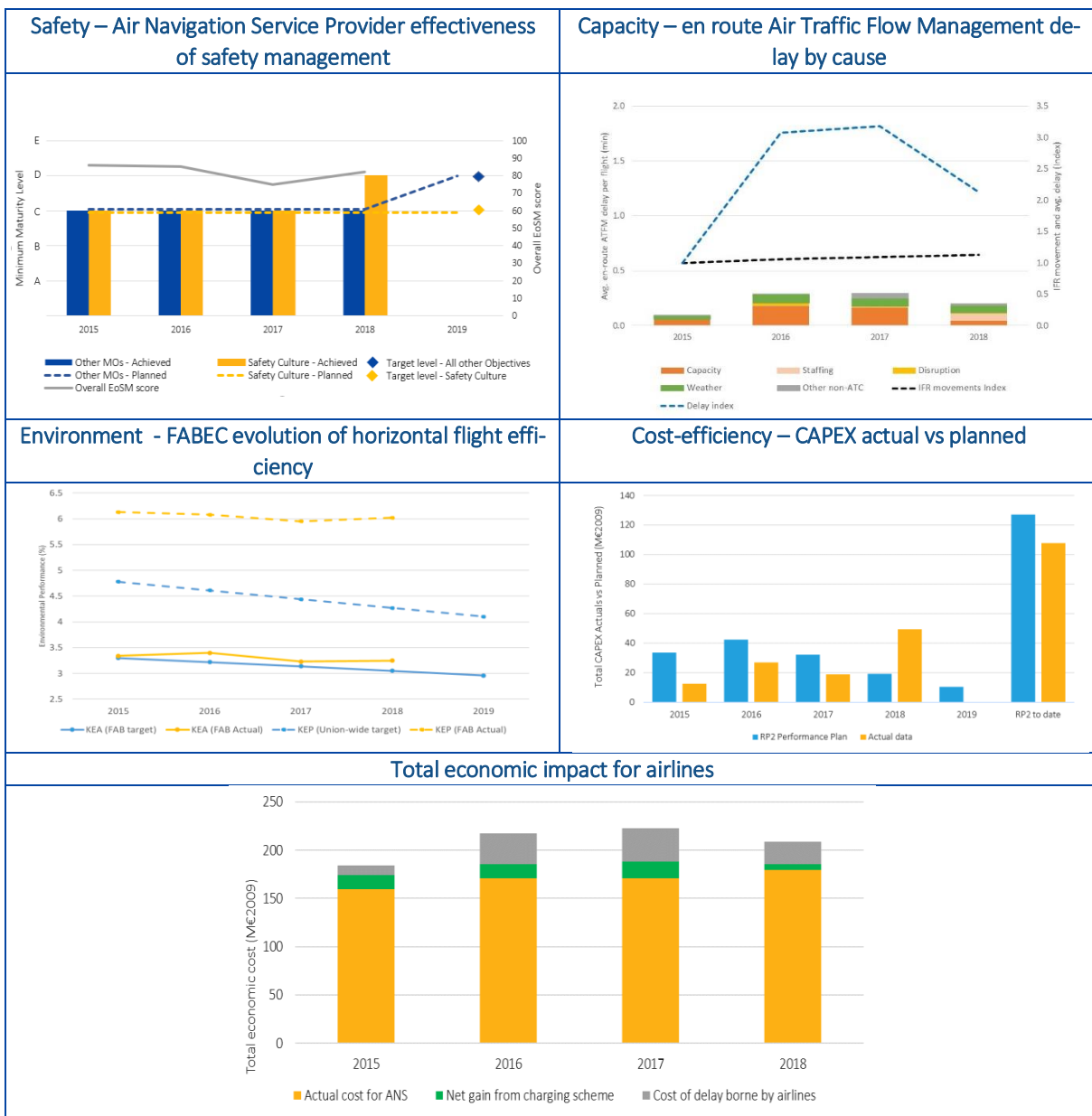
Key issues (Key Performance Areas)

Safety

399   Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

400   The Netherlands has improved its Effectiveness of the Safety Management from 56 points in 2016 to 74 points in 2018. The Netherlands in 2018 achieved the targets for Safety Policy and Objectives, Safety Promotion and Safety Culture but has to improve in the areas of Safety Risk Management and Safety Awareness that are still at Level B.

401 LVNL, the Air Navigation Service Provider of the Netherlands lowered its Effectiveness of the Safety Management score from 86 in 2015 to 82 (out of 100) in 2018. To reach the target level in 2019, LVNL has to improve its level in the area of Safety Assurance (from C to D).

402 For the applicability of the Risk Analysis Tool, the Netherlands failed to achieve the target since they did not apply the Risk Analysis Tool methodology to derive the Separation Minima Infringement occurrences. Regarding Runway Incursions, the Netherlands did not achieve the 2017 target, achieving 7% in both Runway Incursion ground and Runway Incursion overall. For ATM Specific Occurrences the 100% target was however achieved.

Environment

403 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all the Member States of the Functional Airspace Block Europe Central (FABEC) and allocated to each Member State.

404 The target of FABEC in 2018 was 3.05% on the environmental performance while 3.25% was recorded, which is the poorest performance so far in the second Reference Period.

405 In 2018, actual flight paths in the Dutch airspace were 2.97% longer than the shortest possible route which is a slight year-on-year improvement. The Netherlands contributed positively to the FAB target.

406 Additional taxi-out times at Schiphol airport decreased from 3.3 minutes per flight in 2017 to 2.94 minutes per flight in 2018, thanks to the implementation of airport collaborative decision making (A-CDM) in May 2018.

407 The additional time in terminal airspace at Amsterdam Schiphol airport remained at 2015 levels 1.52 minutes per flight, which compared to other airports of a similar size is a good result.

408 Three out of four Dutch airports that should report airport level data have not established the Eurocontrol Airport Operator Data Flow.

Capacity

409 FABEC has missed its capacity target for the fourth year in a row and the margin of underperformance has increased each year (significantly so for 2018). In 2018, an Air Traffic Flow Management (ATFM) delay of 2.14 minutes per flight meant the target was missed by 1.72 minutes per flight. FABEC's target for 2018 was 0.42 minutes per flight.

410 Between 2015 and 2016, there was a steep increase in reported delays noted in previous monitoring as due to cancelled capacity enhancement measures and other temporary restructuring issues. The focused planned and executed investment for improved flexible use of airspace through co-location with the military is thought to have contributed to less delays in 2018.

411 Performance in other capacity indicators was less convincing with arrival ATFM delay missing the target by more than 50%, the largest share of arrival delays in the Single European Sky area. This is mainly caused by the Amsterdam terminal airspace and does not affect other Dutch airports.

Cost-efficiency

412 In 2018, as in every year over second Reference Period, the Netherlands met its cost-efficiency target, with the actual unit cost (52.91€$_{2009}$) being lower than the determined (55.19€$_{2009}$). The target was met because the increase in actual service units (+11.4%) was much higher than the increase in actual costs (+6.8%) compared to the determined ones.

413   The increase in the actual costs compared to the determined is a combination of several factors, but the main driver is higher other operating costs (+13.0M€$_{2009}$, +62.6%). According to the information provided by LVNL this is mainly due to "a significant amount of external staff hired for projects".

414   In 2018 the Netherlands overspent 30.4M€$_{2009}$ on actual total CAPEX compared to the Performance Plan. This contrasts with the other years of the second Reference Period, where the Netherlands consistently underspent, resulting in a total actual CAPEX underspent of 19.0M€$_{2009}$ (-14.98%).

415   The capacity incentive scheme was not activated for LVNL as its capacity performance lay within the dead band.

9.21   Norway

Comments from the Performance Review Body
Norway performed well and met the targets for cost-efficiency and capacity but requires further improvement to the areas of safety and environment.
Safety management levels improved significantly at State level, however, Norwegian Authorities still need to focus on achieving the targets in 2019. At Air Navigation Service Provider level, the safety KPAs remained at high levels through the monitoring period.
Norway has significantly improved the Key Environmental indicator Actual (KEA) during the second Reference Period. The performance was reflected on Functional Airspace Block level as well. With further improvement Norway could help achieve the North European Functional Airspace Block target in 2019.

Safety – Air Navigation Service Provider effectiveness of safety management

Capacity – en route Air Traffic Flow Management delay by cause

Environment - NEFAB evolution of horizontal flight efficiency

Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines

Key issues (Key Performance Areas)

Safety

416 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the national authorities and for the Air Navigation Service Providers (ANSPs).

417 Over the period and continuing in 2018, the State has improved its average score of the Effectiveness of the Safety Management from 52 in 2015 to 68 in 2018. The 2018 improvement is considered as significant. The State achieved the 2019 EoSM target Level C in the Safety Risk Management, Safety Awareness and Safety Promotion already in 2016/2017 exceeding the target Level C

for Safety Awareness and Safety Promotion in 2018 reaching Level D. However, Safety Policy and Objectives and Safety Culture remained on Level B since 2015.

418 The Air Navigation Service Provider of Norway has remained stable on a constant level of 80 over the past three years on the EoSM overall score. The ANSP reached the 2019 EoSM target levels in 2018.

419 The targets for the application of the Risk Analysis Tool were not achieved for classification of ATM Specific Occurrences, however, were achieved for Separation Minima Infringement and Runway Incursion areas in 2018.

Environment

420 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of the North European Functional Airspace Block (NEFAB) and allocated to each Member State.

421 In 2018, the Key Environmental indicator Actual reference target for North European Functional Airspace Block was not achieved by 0.05% indicating an improvement on the previous year when it was missed by considerably more (0.29%). The target in 2018 was 1.26%.

422 On a national level, Norway reported a significant improvement in environmental performance for 2018 achieving 1.42% (compared to 1.95% in 2017) and carrying on an improving trend after a poor performance in 2016. Nevertheless, Norway did not contribute positively to the FAB target.

423 In 2018, there was an increase in additional taxi-out time at Oslo airport from 3.12 minutes per flight in 2017 to 3.58 minutes per flight. No reason has been provided by the National Supervisory Authority (NSA).

424 Average additional time spent in terminal airspace has improved since 2017 for all airports apart from one (which was not reported).

425 Three out of four Norwegian airports that should report airport level data have not established the Eurocontrol Airport Operator Data Flow with sufficient integrity to enable monitoring.

Capacity

426 NEFAB achieved its capacity target for the fourth year in a row during this Reference Period with an Air Traffic Flow Management (ATFM) delay of 0.03 minutes per flight compared to a target of 0.13 minutes per flight.

427 In 2018, Norway experienced 0.7% increase in Instrument Flight Rules (IFR) movements compared to 2017. Norway achieved zero minutes per flight of ATFM delay in 2018, an improvement on its performance.

428 The 2018 arrival Air Traffic Flow Management delay performance in Norway is commendable with all airports improving.

Cost-efficiency

429 In 2018, as for all other years in the Reference Period, Norway met its cost-efficiency target, with the actual unit cost (37.56€$_{2009}$) being lower than the determined (41.85€$_{2009}$). The target has been met because of an increase in actual service units (+0.9%) and a decrease in actual costs (-9.4%) compared to the determined ones.

430 The decrease in the actual costs compared to the determined is a combination of several factors, but the main driver is lower staff costs (-6.0M€$_{2009}$, -9.4%). According to the additional information

provided by Avinor, the Norwegian Air Navigation Service Provider, this is mainly due to "increased productivity and decreased overtime cost. In addition to this, pension cost is reduced due to changes in external factors such as interest rates and life expectancy".

431   In 2018 Norway underspent 9.8M€$_{2009}$ on actual total CAPEX compared to the Performance Plan. This is in line with the trend visible in the second Reference Period, where Norway consistently underspent with an exception in 2017, resulting in a total actual CAPEX underspent of 23.4M€$_{2009}$ (-23.95%).

432   A bonus of 0.93M€$_{2009}$ (0.89% of the determined costs) was awarded to Avinor in 2018 for achieving the national capacity target.

9.22   Poland

Comments from the Performance Review Body
Poland achieved good performance in 2018 for cost-efficiency only. All other Key Performance Areas require further attention.
Poland entered the second Reference Period with low Effectiveness of the Safety Management (EoSM) values at the State and Air Navigation Service Provider (ANSP) level. In 2017 and 2018, these were improved but further important measures will be required by the ANSP to achieve the 2019 targets.
Baltic FAB missed the environmental performance targets (KEA).
Increased traffic contributed to increased Air Traffic Flow Management (ATFM) delays, resulting in Poland failing to achieve the capacity target. Most delay contributors were staffing and capacity while weather played a secondary role.

<table>
<tr><td colspan="2" align="center">**Safety – Air Navigation Service Provider effectiveness of safety management**</td></tr>
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Safety – Air Navigation Service Provider effectiveness of safety management	Capacity – en route Air Traffic Flow Management delay by cause

Environment - Baltic FAB evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines
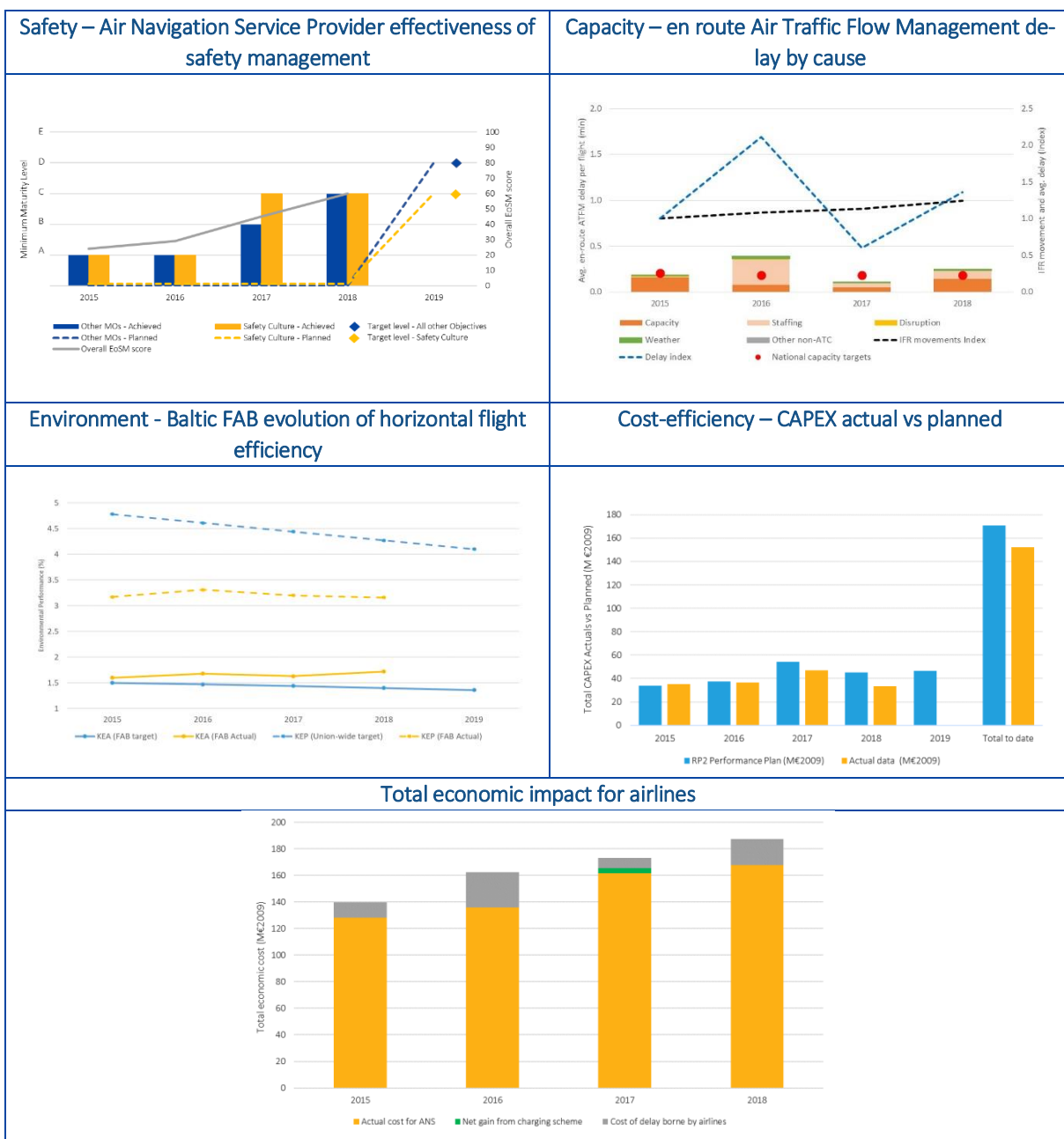
Key issues (Key Performance Areas)

Safety

433 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

434 Over the period, the State has slightly improved the overall score of the Effectiveness of the Safety Management from 56 in 2015 to 59 in 2018. The State has gradually improved its minimum EoSM level with all Management Objectives reaching the 2019 EoSM target Level C, with improvements

between 2017 and 2018 seen in Safety Risk Management (from Level B to C), in Safety Promotion (from Level A to C) and in Safety Culture (from Level B to C).

435 The Air Navigation Service Provider in Poland started the second Reference Period with a very low overall EoSM score of 24 but improved the score by reaching 60 in 2018. The levels of the EoSM remains below the 2019 EoSM target Level C in Safety Culture, and level D in all other Management Objectives. Improvements have been observed, but a significant effort on all Management Objectives except Safety Culture is needed to reach the Reference Period targets (16 out of 27). The PRB observes that the low level of maturity has been raised from the 2017 concerning levels. However, despite the improvements, it remains unlikely that the ANSP can reach to 2019 targets.

436 The application of the Risk Analysis Tool in Poland has been very erratic, best in the beginning of the period, but deteriorating over time. For 2018, Poland does achieve targets only in ATM Specific Occurrences, but not in remaining RAT areas with the degree of application being between 0% (Separation Minima Infringements (overall)) and 54% (Separation Minima Infringements (ground)). There is no available explanation for the developments seen.

Environment

437 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). With respect to Poland, the environmental targets are analysed for all member states of the Baltic Functional Airspace Block (Baltic FAB) and allocated to each member state.

438 In 2018, the environmental performance reference target for the Baltic FAB was not achieved by 0.32%; a greater margin of underperformance compared to the previous years. The target for 2018 was 1.40%.

439 On a national level, Poland recorded a KEA of 1.69% in 2018 deteriorating the environmental performance with respect to 2017 by 0.08% and therefore did not contribute positively to the FAB target.

440 The National Supervisory Authority states that the main contributors to the degradation in performance is the difference between STATFOR forecast and actual traffic levels, largely influenced due to flights by-passing Ukrainian airspace and a significant difference of the unit rate between Germany and Poland.

441 In 2018, there was a decrease in additional taxi-out time at Warsaw airport from 2.90 minutes per flight in 2017 to 2.78 minutes per flight.

442 Average additional time spent in terminal airspace has decreased at Warsaw airport from 1.70 minutes per flight in 2017 to 1.50 minutes per flight.

443 Only one out of 16 Polish airports that should report airport level data has established the Eurocontrol Airport Operator Data Flow.

Capacity

444 In 2018, the Baltic FAB achieved its Air Traffic Flow Management delay target of 0.22 minutes per flight exactly.

445 In 2018, Poland experienced 10% increase in Instrument Flight Rules (IFR) movements compared to 2017. Poland missed the capacity target (0.23 minutes per flight) by recording a delay of 0.25 minutes per flight. This was increase from 0.11 minutes per flight achieved in 2017.

446 Apart from the staffing issues, the main contributors to the increased delays included airspace affecting events such as the FIFA world championship, NATO activities and the 4ACCs initiative.

447 The arrival Air Traffic Flow Management delay performance in Poland also did not achieve the targets. At a national level the delay was 0.32 minutes per flight compared to a target of 0.04 minutes per flight although strong traffic and non-ATC related reasons are cited to be the driver of these delays i.e. runway capacity or weather.

Cost-efficiency

448 In 2018, Poland met its cost-efficiency target, with the actual unit cost (35.99€$_{2009}$) being lower than the determined (38.80€$_{2009}$). The target has been met because of an increase in actual service units (+5.6%) and a decrease in actual costs (-2.1%) compared to the determined ones.

449 The decrease in the actual costs compared to the determined is a combination of several factors, with one of the drivers being the lower other operating costs (-3.4M€$_{2009}$, -16.4%). According to the additional information provided by PANSA, the Polish Air Navigation Service Provider, this is mainly due to "the implementation of optimisation measures, savings on repair and maintenance costs, lower costs for external services and deduction of financial and other operating revenues from actual costs".

450 In 2018 Poland underspent 11.9M€$_{2009}$ on actual total CAPEX compared to the Performance Plan. This is in line with the trend visible in the second Reference Period, where Poland consistently underspent with an exception in 2015, resulting in a total actual CAPEX underspent of 18.6M€$_{2009}$ (-10.90%).

451 The capacity incentive scheme was not activated for Poland as its capacity performance lay within the dead band.

9.23 Portugal

Comments from the Performance Review Body
Portugal performed well in 2018 in the areas of capacity and environment, meeting the respective targets.
Despite Portugal's improved performance, there are some safety components under target levels and dedicated effort will be required by the Portuguese authorities to meet the targets in 2019. Safety at Air Navigation Service Provider (ANSP) level is at very high standards.
For the first time in the second Reference Period, Portugal did not meet its cost-efficiency target, even though the Commission approved a revision of its Performance Plan for 2018. It is not clear why Portugal was unable to forecast the big variation in staff costs accurately in the revised Performance Plan.

Safety – Air Navigation Service Provider effectiveness of safety management	Capacity – en route Air Traffic Flow Management delay by cause

Environment - SW FAB evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines

Key issues (Key Performance Areas)

Safety

452   Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

453   Over the period and continuing in 2018, the State improved its average score of the Effectiveness of the Safety Management from 44 in 2015 to 53 in 2018. In 2017, the State did not meet the 2019 EoSM target Level C for four out of five components (only met the target for Safety Culture).

In 2018, this improved by increasing the minimum level in Safety Risk Management to Level C (target for 2019). The remaining three Management Objectives remain under target (at Level B). Significant improvements would be required to achieve the 2019 EoSM targets.

454 The Air Navigation Service Provider in Portugal (NAV Portugal) improved its average EoSM score over the Reference Period from 91 in 2015 to 95 in 2018. Since 2016, the ANSP has remained at or above the 2019 EoSM target Level D, in 2018 reaching Level E in Safety Risk Management. The ANSP already reached Level E in Safety Culture in 2016.

455 Since applying the Risk Analysis Tool, Portugal has been above the 2019 target for Separation Minima Infringements, Runway Incursions and ATM-Specific occurrences.

Environment

456 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of the South West Functional Airspace Block (SW FAB) and allocated to each Member State.

457 The environmental performance target of 3.43% was met by the SW FAB in 2018 with an achievement of 3.36%. However, there was a significant decrease in the margin of overperformance compared to previous years.

458 Portugal contributed positively to the Functional Airspace Block target by achieving a KEA of 1.78%.

459 The average additional taxi-out time in Lisbon increased for the fourth year in a row and is one of the highest in Europe. In 2018, it was 4.01 minutes per flight. The increase can be observed during the entire year, but it is especially noteworthy in the summer months.

460 Average additional time spent in terminal airspace remained stable at 0.81 minutes per flight and 2.95 minutes per flight for Porto and Lisbon airports respectively, although both are performing considerably worse than the beginning of the second Reference Period.

461 Eight out of 10 Portuguese airports that should report airport level data have not established the Eurocontrol Airport Operator Data Flow.

Capacity

462 South West FAB did not achieve its capacity target for the fourth year in a row with a performance of 0.64 minutes per flight of Air Traffic Flow Management (ATFM) delay. The target for 2018 was 0.30 minutes per flight.

463 In 2018, Portugal experienced 3.5% increase in Instrument Flight Rules (IFR) movements compared to 2017. Portugal contributed positively to the Functional Airspace Block's target with an en route capacity performance of 0.19 minutes per flight.

464 Although above the national capacity target, Portugal continued to improve performance in the capacity KPA despite experiencing traffic growth higher than STATFOR'S high scenario forecast. The delays occurred mainly due to capacity problems, disruptions and staffing issues. The Portuguese Air Navigation Service Provider addressed the capacity shortfall by implementing Air Traffic Flow and Capacity Management (ATFCM) techniques, by improving the deployment of existing capacity (optimising sector openings and availability of air traffic controllers), by adding additional capacity through re-sectorisation, and recruiting additional air traffic controllers.

465 The traffic at monitored Portuguese airports continued to increase in 2017, as well as in 2018. At the same time, the national average arrival Air Traffic Flow Management delay for 2018, which is

driven by the delays at Porto and Lisbon has considerably increased at 2.38 minutes per flight compared with 1.08 minutes per flight the previous years.

466 Much of this increase is due to either weather (Porto) or aerodrome capacity issues (Lisbon) due to ground infrastructure limitations and traffic growth.

Cost-efficiency

467 In 2018, for the first time in the second Reference Period, Portugal did not meet its cost-efficiency target, with the actual unit cost (32.55€$_{2009}$) being higher than the determined (30.36€$_{2009}$). The target was missed because of a decrease in actual service units -1.0%) and an increase in actual costs (+6.1%) compared to the determined ones.

468 The increase in the actual costs compared to the determined is a combination of several factors, but the main driver is higher staff costs (+9.1M€$_{2009}$, +10.9%). According to the additional information provided by NAV Portugal, the Air Navigation Service Provider of Portugal, this is mainly due to "extra work carried out by air traffic controllers to mitigate the impacts of the capacity shortage and higher pension costs due to deviation in the financial markets".

469 In 2018, Portugal overspent 11.9M€$_{2009}$ on actual total CAPEX compared to the Performance Plan. This is in line with the trend visible in the second Reference Period, where Portugal consistently overspend with an exception in 2016, resulting in a total actual CAPEX overspent of 7.1M€$_{2009}$ (+18.83%).

470 The incentive mechanism was activated but the amount due to bonus/penalties is still pending given that NAV Portugal made a claim based on a safeguard clause included in the description of the Performance Plan. The application of this clause requires a number of steps including an analysis by the National Supervisory Authorities and a consultation with the airspace users, among other elements.

9.24 Romania

Comments from the Performance Review Body
Romania achieved a good performance only in cost-efficiency and that was driven mainly by a revision of its Performance Plan. Romania must do more to improve and given its new Performance Plan should be able to deliver. Safety performance on a State level fluctuated during the reference and did not meet some of the Effectiveness of the Safety Management (EoSM) targets for 2019. At the Air Navigation Service Provider (ANSP) level, 2019 safety targets were met and marginally improved during the second Reference Period. The environmental indicator (KEA) worsened in 2018. The main cause provided by the State is the political situation in Crimea. In 2018, Air Traffic Flow Management (ATFM) delay increased mainly because of summer increase of traffic.

Safety – Air Navigation Service Provider effectiveness of safety management	Capacity – en route Air Traffic Flow Management delay by cause

Environment – Danube FAB evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines

Key issues (Key Performance Areas)

Safety

471 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

472 Over the period and continuing in 2018, the State has slightly improved its average score of the Effectiveness of the Safety Management from 60 in 2015 to 61 in 2018. The State did not meet the 2019 EoSM target Level C for three out of five components (Safety Policies and Objectives, Safety Promotion and Safety Culture). No improvements were seen on the minimum EoSM level between 2017 and 2018.

473 The Air Navigation Service Provider in Romania has marginally improved its average EoSM score over the Reference Period from 82 in 2015 to 86 in 2018. The ANSP remained on the 2019 EoSM target Level D in all other Management Objectives, reaching Level D in Safety Culture (target being Level C).

474 The application of the Risk Analysis Tool shows a mixed view, with the Runway Incursion (RI) (ground) not being applied since 2015 and Separation Minima Infringements and ATM Specific Occurrences being applied satisfying the target set for 2018.

Environment

475 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of the Danube Functional Airspace Block (FAB) and are allocated to each Member State.

476 The Danube FAB missed its target for environmental performance in 2018 and the monitoring submission highlighted the impact of the geopolitical situation in Crimea, the impact of the Network Manager capacity measures and airline route preferences. The Danube Functional Airspace Block regards these circumstances to be outside the control of the Air Navigation Service Provider. The PRB agrees with the Crimea situation impacting performance but notes that other Member States subject to the Network Manager's measures and airline preferences have been able to deliver the results.

477 In 2018, the Functional Airspace Block target was not met by a margin of 0.41%, which is a deterioration of performance with respect to the beginning of the Reference Period, and followed the trend of deteriorating each year of the Reference Period. The target in 2018 was 1.41%.

478 Romania's environmental performance (KEA) was also worse than in the previous year at 1.67%. This was justified by the State as due to the geo-political situation in Crimea, Network Manager capacity measures and airline preference for longer routings. The FAB views these situations to be outside their control. Romania did not contribute positively to the FAB target.

479 Average additional taxi-out time was only available for one year (2018) at Bucharest airport where 2.43 minutes per flight was achieved.

480 Average additional time spent in terminal airspace improved to 0.95 minutes per flight at Bucharest airport and is a step change compared to performance since 2015.

481 One out of two Romanian airports that should report airport level data has not established the Eurocontrol Airport Operator Data Flow to enable full monitoring.

Capacity

482 In 2018, the Danube FAB did not achieve its capacity target for the first time during this Reference Period with an Air Traffic Flow Management (ATFM) delay of 0.08 minutes per flight compared to a target of 0.03 minutes per flight.

483 In 2018, Romania experienced 9.6% increase in Instrument Flight Rules (IFR) movements compared to 2017. Romania's en route Air Traffic Flow Management delay increased significantly from 0.01 minutes per flight in 2017 to 0.12 minutes per flight in 2018. All the delays occurred during the months of June, July, August and September. The causes for delay during summer were mainly weather, staffing and capacity problems.

484 The Air Traffic Flow Management arrival delay has decreased from 0.34 minutes per flight in 2016 to 0.31 minutes per flight in 2017 and to 0.20 minutes per flight in 2018, however it is still higher than the target, which is 0.00 minutes per arrival.

485 The Danube FAB explains in its monitoring report that the terminal target was not met in 2017 due to infrastructure issues at Bucharest airport, leading to maintenance work on runways, taxi-ways and aprons.

Cost-efficiency

486 In 2018, Romania met its cost-efficiency target, with the actual unit cost ($29.62€_{2009}$) being lower than the determined ($31.19€_{2009}$). The target has been met because of an increase in actual service units (+0.5%) and a decrease in actual costs (-4.6%) compared to the determined ones.

487 The decrease in the actual costs compared to the determined is a combination of several factors, with one of the drivers the lower other operating costs ($-4.2M€_{2009}$, -21.9%). No additional information was provided by ROMATSA, the Air Navigation Service Provider of Romania, regarding the underlying reasons for the deviation to the Performance Plan.

488 In 2018, Romania underspent $7.3M€_{2009}$ on actual total CAPEX compared to the Performance Plan. This is in line with the trend visible in the second Reference Period, where Romania consistently underspent resulting in a total CAPEX underspent of $40.5M€_{2009}$ (-55.56%).

489 The capacity incentive scheme was not activated for Romania as capacity and environment performance lay within the dead band.

9.25 Slovakia

Comments from the Performance Review Body
Slovakia requires improvements in all four Key Performance Areas.
At State level, effort is required to improve on two management objectives to reach the safety targets. The Air Navigation Service Provider (ANSP) continued to achieve a high level of performance for the safety targets.
The Key Environmental Indicator Actual (KEA) worsened and did not contribute towards the FAB target in 2018.
Unexpected traffic increases contributed to poor capacity performance, however this situation has been worsened by the considerable CAPEX underspending.
Despite meeting the cost-efficiency targets, Slovakia received a penalty for not meeting the Functional Airspace Block capacity target and the Performance Review Body considers the underspending as a direct compromise with performance rather than efficiency savings.

Safety – Air Navigation Service Provider effectiveness of safety management	Capacity – en route Air Traffic Flow Management delay by cause

Environment – FAB CE evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines

Key issues (Key Performance Areas)

Safety

490 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

491 Over the period and continuing in 2018, the State has slightly improved its overall score of the Effectiveness of the Safety Management from 56 in 2015 to 61 in 2018. In 2018, the State did not meet the 2019 EoSM target Level C for two out of five components (Safety Assurance and Safety Culture). The State exceeded the target for Safety Risk Management (achieving Level D). Beside

this improvement for Safety Risk Management, other Management Objectives remain at the same minimum level as in 2016.

492 The Air Navigation Service Provider in Slovakia remained at the same level on their overall EoSM score over the Reference Period from 88 in 2015 to 89 in 2018. The ANSP has remained on the 2019 EoSM target Level D in all other Management Objectives since 2016 and exceeded the target level for Safety Culture during the whole Reference Period (achieving Level D).

493 The application of the Risk Analysis Tool shows a mixed picture with the application being on or above the targets up to 2016. The level of application dropped for SMIs (ground) to 67% in 2017 and returned to 100% in 2018. In 2018 no data has been provided for the application of the Risk Assessment Tool for Separation Minima Infringements (Overall) Runway Incursions (RIs) as the occurrences were below Level C. Slovakia reached the targets for Separation Minima Infringements Specific occurrences.

Environment

494 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). With respect to Slovakia, the environmental targets are analysed for all Member States of the Functional Airspace Block Central Europe (FAB CE) and allocated to each Member State.

495 The FAB CE States missed their targets for environmental performance (KEA) for the third year in a row and by a margin of 0.10% in 2018. The Functional Airspace Block target was 1.85%. Performance has worsened in each year of the second Reference Period so far.

496 Slovakia did not contribute positively to the FAB target. After some improvement in 2017, Slovakia's performance marginally decreased in 2018 (2.18% in 2018 compared to 2.15% in 2017).

497 Slovakia has only identified its main airport Bratislava as subject to monitoring, however, Airport Operator Data Flow is currently not fully established but was underway for implementation in 2018.

498 The PRB expects the airport to begin reporting fully for 2019 and welcomes this development.

Capacity

499 The FAB CE States have achieved their capacity target for the first three years of this Reference Period but did not achieve the capacity target in the fourth year with an Air Traffic Flow Management delay of 0.82 minutes per flight compared to a target of 0.28 minutes per flight.

500 In 2018, Slovakia experienced 10.1% increase in Instrument Flight Rules (IFR) movements compared to 2017. Slovakia did not meet the national capacity target with a significant increase in delay to 0.21 minutes per flight of ATFM delay up from 0.03 minutes per flight in 2017. Justification was provided citing significant IFR traffic increases (10.1%), adverse weather during the summer period, ATC staff shortages and daily operational variability along with impacts of the 4ACC initiative.

501 In Slovakia, air navigation services at Bratislava are subject to monitoring. Slovakia has established a national target of 0.00 minutes per flight of arrival ATFM delay, which was met in all years of the Reference Period so far.

Cost-efficiency

502 In 2018, as for all other years in the second Reference Period, Slovakia met its cost-efficiency target, with the actual unit cost (43.59€$_{2009}$) being lower than the determined (45.82€$_{2009}$). The target

has been met because of an increase in actual service units (+3.7%) and a decrease in actual costs (-1.4%) compared to the determined ones.

503 The increase in the actual costs compared to the determined is a combination of several factors. According to the additional information provided by LPS, the Air Navigation Service Provider of Slovakia, the largest variations from the Performance Plan are lower depreciation costs (-2.0M€$_{2009}$, -28.2%) mainly due to "postponement of and delays in several projects due to procedural constraints and complexity in administrative and procurement processes" and significantly higher staff costs (4.7M€$_{2009}$, 15.1%), due to "a significant legislation change in social, health insurance and public holidays bonus reimbursement and the increase in overtime of air traffic controllers".

504 In 2018, Slovakia underspent 10.8M€$_{2009}$ on actual total CAPEX compared to the Performance Plan. This is in line with the trend visible in the second Reference Period, where Slovakia consistently underspent resulting in a total CAPEX underspent to date of 30.4M€$_{2009}$ (-33.62%).

505 A penalty of 0.27M€$_{2009}$ (0.47% of the determined costs) was incurred for missing the national and Functional Airspace Block capacity performance target. This is the maximum penalty that can be applied for FAB CE.

9.26 Slovenia

Comments from the Performance Review Body
Slovenia has shown good performance in the areas of safety, capacity, environment and cost-efficiency although the latter requires some attention.
Safety performance improved significantly at State level, all targets were met and some exceeded. At the Air Navigation Service Provider (ANSP) level, performance was high and stable.
Slovenia contributed positively to the Functional Airspace Block environmental performance, although the target on the FAB level was still missed.
Despite the traffic increase, Slovenia increased the Air Traffic Flow Management (ATFM) delay only marginally and maintained excellent performance.
The cost-efficiency targets have been met. However, the Performance Review Body highlights that delayed capital expenditure may resurface as an issue in the future.

Safety – Air Navigation Service Provider effectiveness of safety management	Capacity – en route Air Traffic Flow Management delay by cause

Environment – FAB CE evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines

Key issues (Key Performance Areas)

Safety

506 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

507 Over the period, the State has improved significantly the overall score of the Effectiveness of the Safety Management from 42 in 2015 to 75 in 2018. This improvement has been reflected in the EoSM levels with all Management Objectives reaching or exceeding the 2019 EoSM target Level C with only the Safety Policies and Objective on Level C, the four other Management Objectives being at Level D.

508　The Air Navigation Service Provider in Slovenia has only marginally improved its overall EoSM score over the Reference Period from 74 in 2015 to 77 in 2018. Over the Reference Period, the ANSP gradually improved the minimum level of the EoSM, being at the 2019 EoSM target Level D in all other Management Objectives and Safety Culture (achieving Level D).

509　The application of the Risk Analysis Tool has achieved the targets for SMIs occurrences and ATM Specific Occurrences. Considering RIs, the occurrences were below severity C, thus there was no scope for application of the Risk Analysis Tool.

Environment

510　Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of the Functional Airspace Block Central Europe (FAB CE) and allocated to each Member State.

511　The FAB CE States missed their targets for environmental performance (KEA) for the third year in a row and by a margin of 0.10% in 2018. The Functional Airspace Block target was 1.85%. Performance worsened in each year of the second Reference Period so far.

512　Slovenia achieved a similar environmental performance in 2018 (1.72%) when compared to 2017 and continued to contribute positively to the FAB target.

513　In 2018 a 35% increase in taxi-out time to 1.75 minutes per flight has been observed at Ljubljana airport. No justification is provided. The PRB expects Member States to provide justification for significant changes in performance in NSA monitoring submissions.

514　Additional time spent in terminal airspace increased each year at Ljubljana airport (0.42 minutes per flight in 2018 compared to 0.16 minutes per flight in 2015).

515　Two out of three Slovenian airports that should report airport level data have not established the Eurocontrol Airport Operator Data Flow.

Capacity

516　FAB CE has achieved its capacity target for the first three years of this Reference Period but did not achieve its capacity target in the fourth year with an Air Traffic Flow Management delay of 0.82 minutes per flight compared to a target of 0.28 minutes per flight.

517　Slovenia has shown impressive capacity performance during the second Reference Period achieving its capacity target by a significant margin with a small decrease in performance observed in 2018 (from 0.0 minutes per flight in 2017 to +0.01 minutes per flight). The performance has been achieved despite a significant traffic increase of 9.7% compared to 2017.

518　Slovenia reported zero arrival Air Traffic Flow Management delay for each year of the Reference Period thus far.

Cost-efficiency

519　In 2018, Slovenia met its cost-efficiency target, with the actual unit cost (51.42€$_{2009}$) being lower than the determined (54.65€$_{2009}$). The target has been met because the increase in actual service units (+8.0%) was much higher than the increase in actual costs (+1.6%) compared to the determined ones.

520　The increase in the actual costs compared to the determined is a combination of several factors, but the main driver is higher staff costs (+0.6M€$_{2009}$, +3.3%), although this is mainly due to a lower than planned inflation index.

521 In 2018, Slovenia underspent 1.6M€$_{2009}$ on actual total CAPEX compared to the Performance Plan. This is in line with the trend visible in the second Reference Period, where Slovenia consistently underspent with an exception in 2017, resulting in a total CAPEX underspent of 1.8M€$_{2009}$ (-25%) compared to the Performance Plan.

522 Even though Slovenia achieved the local capacity target, the capacity incentive scheme was not activated in 2018 since the overall target for the Functional Airspace Block Central Europe (FAB CE) was not met.

9.27   Spain

Comments from the Performance Review Body
In 2018, Spain was among the Member States that missed the capacity and environment targets, with good performance in the remaining Key Performance Indicators. The delays severely impacted the European network.

The 2019 safety targets for the effectiveness of safety management have already been achieved by the Air Navigation Service Provider. The State has not yet met the targets in Safety Policy and Safety Culture.

With respect to environment, the South-West Functional Airspace Block (SW FAB) has achieved its horizontal flight-efficiency target for every year since 2015, which means that excess routes for air-lines were kept at the targeted minimum. However Spain did not contribute towards this result.

Looking forward, it will be important for Spain to focus on improving the capacity of the Barcelona Area Control Centre (ACC) in order to significantly reduce en route ATFM delays. In terms of cost, actual costs in 2018 of ENAIRE, the Spanish Air Navigation Service Provider, again remained below the planned values. However, ENAIRE's capital expenditure was as planned and it is one of the few service providers in the Single European Sky area that has invested as planned. Despite this, the re-sults of 2018 indicate that investments and costs have not yet translated into enough capacity, re-sulting in delays costing airspace users 129M€$_{2009}$.

Safety – Air Navigation Service Provider effectiveness of safety management	Capacity – en route Air Traffic Flow Management delay by cause

Environment - SW FAB evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines

Key issues (Key Performance Areas)

Safety

523 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

524 Over the Reference Period, the state has improved its overall score of Effectiveness of the Safety Management from 56 points in 2016 to 64 points in 2018. The State did not meet the 2019 EoSM targets in Safety Policy and Safety Culture.

525 ENAIRE, the Spanish Air Navigation Service Provider, has improved its average Effectiveness of the Safety Management score 87 (out of 100) in 2015 to 93 in 2018 and has achieved the highest target levels, complying also with the 2019 targets.

526 Spain and ENAIRE reached the targets of the application of the Risk Analysis Tool in the area of SMIs but failed in the area of Runway Incursions and ATM-Specific occurrences.

Environment

527 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of the South West Functional Airspace Block (SW FAB) and allocated to each Member State.

528 The environmental performance target of 3.43% was met by the SW FAB in 2018 with an achievement of 3.36%. However, there was a significant decrease in the margin of overperformance compared to previous years.

529 In 2018, the environmental performance of Spain was 3.79%, therefore not contributing positively to the FAB target.

530 With respect to environmental performance related to their airport operations, the performance of Spain was worse than in previous years.

531 In four out of five airports (Malaga, Palma de Mallorca, Madrid and Barcelona), the additional taxi-out time increased impacting the overall results. This resulted in a higher national value for airports within the performance scheme, increasing from 3.53 minutes per flight in 2017 to 3.71 minutes per flight in 2018 despite the implementation of several improvements.

532 However, additional time spent in terminal airspace improved from 1.73 minutes per flight to 1.63 minute per flight, and three out of five airports contributed towards this achievement.

533 All airports subject to monitoring have established the Eurocontrol Airport Operator Data Flow.

Capacity

534 South West FAB did not achieve its capacity target for the fourth year in a row with a performance of 0.64 minutes per flight of Air Traffic Flow Management (ATFM) delay. The target for 2018 was 0.30 minutes per flight.

535 Spain did not meet the en route capacity target in 2018, similarly for all years of the second Reference Period. In 2018, Spain experienced 4.8% increase in Instrument Flight Rules (IFR) movements compared to 2017. ENAIRE stated two main causes for the increase in delays: weather (a 154% increase from 2017) and a lack of capacity (a 52% increase from 2017). In addition, ENAIRE has postponed planned actions promulgated by the Network Operational Plan (NOP) and the Local Single Sky Implementation (LSSIP) aiming at improving capacity, which negatively contributed to the delay situation.

536 ENAIRE carried out some capacity improvement measures in order to reduce the delay and will continue to do so, i.e. through updates to the Air Traffic Management system, increasing the number of controllers, redesigning interfaces between Area Control Centres (ACCs) and through improvements to the weather forecasting. These actions should help to address the current issues but will not have significant impact on the delay until 2021. This is reflected in the Network Manager's Network Operations Plan where high delay above the target is expected in Barcelona and Palma ACCs until 2020. These two ACCs are stated by ENAIRE to be the focus for performance improvements.

537 The established national target on arrival delay (0.60 minutes per arrival) was not met in 2018 with a result of 1.51 minutes per arrival, which is a considerable increase from 2017 (0.94 minute per arrival). At the airport level, the highest arrival delay occurs at Barcelona – Spain's most congested airport - where the actual performance is 2.94 minutes per arrival, 57% of which is due to weather.

Cost-efficiency

538 In 2018, as for all other years in the Reference Period, Spain met its cost-efficiency target with the actual unit cost (47.35€$_{2009}$) being lower than the determined (60.19€$_{2009}$). The target has been met because the increase in actual service units (+21.2%) and the decrease in actual costs (-4.7%) compared to the determined ones.

539 The decrease in the actual costs compared to the determined is a combination of several factors, but the main driver is lower other operating costs (-5.7M€$_{2009}$, -12.4%). According to the additional information provided by ENAIRE this is mainly due to "the impact of the modification in the VAT legislation (the indirect taxes legislation (IGIC)".

540 In 2018, Spain overspent 17.8M€$_{2009}$ on actual total CAPEX compared to the Performance Plan. This trend of overinvestments only started in 2017, resulting in an total actual CAPEX underspent of 2.6M€$_{2009}$ (-0.97%).

541 The incentive mechanism was activated but the amount due to bonus/penalties is still pending given that Spain made a claim based on a safeguard clause included in the description of the Performance Plan. The application of this clause requires taking several steps including an analysis by the NSAs and a consultation with the airspace users, among other elements. Since there has been no opportunity to take those steps prior to the 1 June 2019, considering that the claim of the ANSPs was received on the 24 May 2019, the final decision has been postponed. However, the result will be available to report the exact amount of the incentive by the 1 November 2019 deadline.

9.28   Sweden

Comments from the Performance Review Body
Sweden performed well in 2018 in the capacity Key Performance Area but requires improvements in the other areas. Safety performance at the State level still needs improvements in two components. At Air Navigation Service Provider (ANSP) level, performance slightly increased, but one component remains below the 2019 target levels. The Key Environmental indicator Actual (KEA) was not compliant with the Functional Airspace Block targets mainly due to military activities and requires effort to improve. The capacity target was achieved, without excess capacity. Sweden should ensure its capacity plans are in line with Network Manager expectations going forward to ensure the Functional Airspace Block's good performance is maintained. With respect to cost-efficiency, Sweden did not meet the target (as has happened each year since the start of the Reference Period). On a positive note, the gap between the target and the performance is narrowing.

Safety – Air Navigation Service Provider effectiveness of safety management	Capacity – en route Air Traffic Flow Management delay by cause

Environment – DK-SE FAB evolution of horizontal flight efficiency	Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines
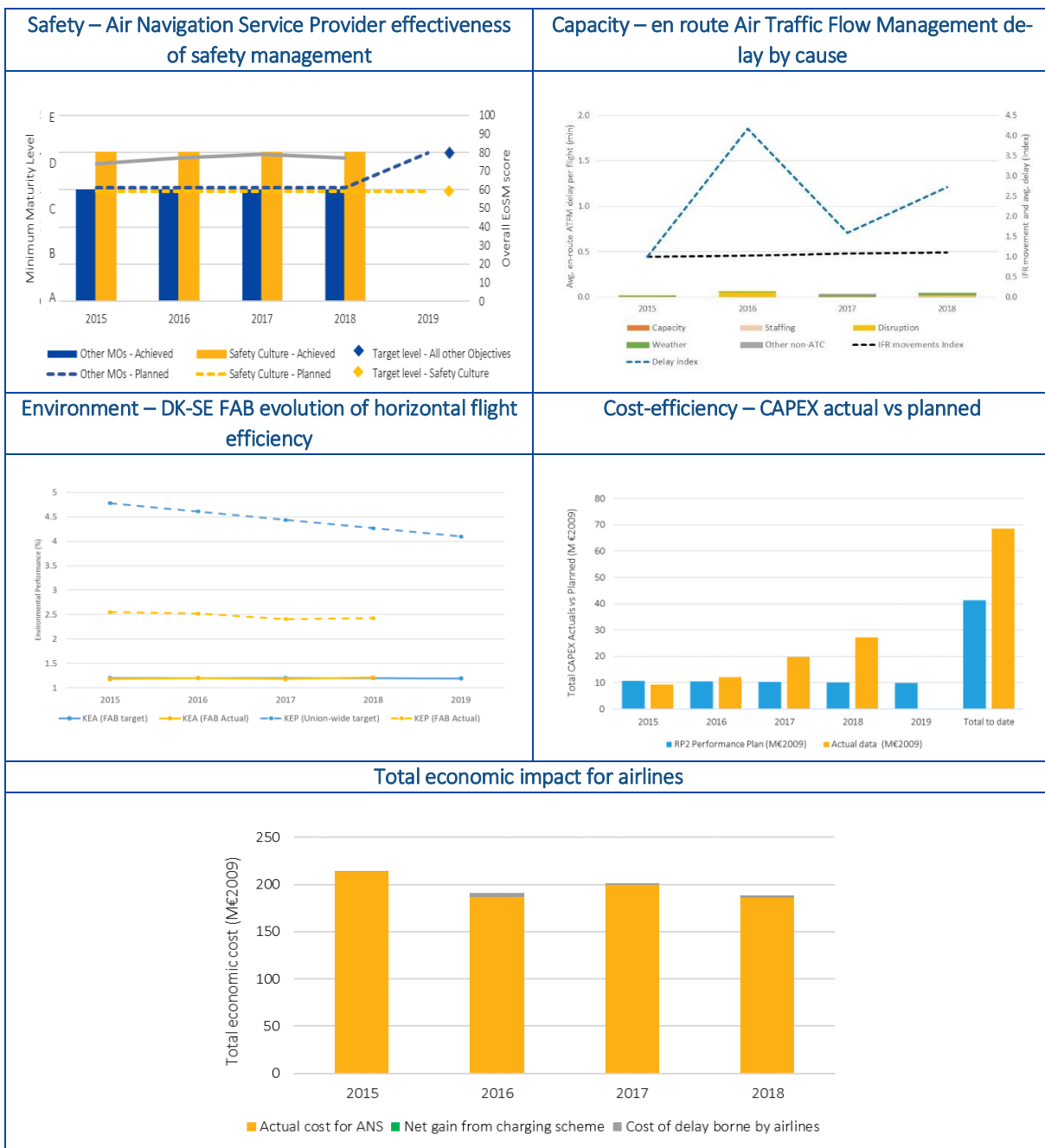
Key issues (Key Performance Areas)

Safety

542 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

543 Over the period and continuing in 2018, the State has developed its average score of the Effectiveness of the Safety Management from 54 in 2015 to 64 in 2018 with the significant drop to 50 points in 2017. Between 2016 and 2017, the EoSM levels dropped and partly recovered in 2018. In

2018, the State remained under the 2019 EoSM target Level C for two out of five components (Safety Policies and Objectives and Safety Culture).

544 The Air Navigation Service Provider in Sweden has slightly improved its overall EoSM score over the Reference Period from 74 in 2015 to 77 in 2018. The ANSP has remained below the 2019 EoSM target Level D in Safety Promotion throughout the period (achieved Level C).

545 The application of the Risk Analysis Tool has been since 2016 at or above the 2019 targets.

Environment

546 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States of the Functional Airspace Block Denmark-Sweden (FAB Denmark-Sweden) and allocated to each Member State.

547 The FAB DK-SE target was not met by a margin of 0.01% by the FAB in 2018. Military activities, regulations both within the Functional Airspace Block and the rest of Europe and bad weather were the main reasons for the FAB not meeting the target. The target was 1.20% in 2018.

548 According to the National Supervisory Authority (NSA) monitoring submissions the main reasons for the FAB not meeting the targets are military activity, regulations both in DK-SE FAB and in the rest of Europe, and bad weather.

549 Sweden did not contribute positively to the FAB target by achieving a KEA of 1.24%, which is a worse performance compared to 2017.

550 Additional taxi-out time has been increasing each year of the Reference Period. The Pilot Common Project requires Arlanda to become a collaborative decision making (CDM) airport, but it is not yet operational because of technical issues. Additional taxi-out time in 2018 was 2.66 minutes per flight. The PRB understands that collaborative decision making will help to resolve this issue and the plan to make CDM operational should be made available.

551 Additional time spent in Arlanda's terminal airspace has reduced since 2015. In 2018 the additional time spent in terminal airspace was 1.17 minutes per flight.

552 All airports subject to monitoring have established the Eurocontrol Airport Operator Data Flow.

Capacity

553 Denmark-Sweden FAB achieved its capacity target for the four years of this Reference Period with an Air Traffic Flow Management (ATFM) delay of 0.04 minutes per flight compared to a target of 0.09 minutes per flight in 2018.

554 In 2018, Sweden experienced 2.8% increase in Instrument Flight Rules (IFR) movements compared to 2017. Sweden's national achievement was 0.04 minutes per flight of Air Traffic Management delay, which is the same as the Functional Airspace Block target.

555 Arrival Air Traffic Flow Management delay has increased considerably between 2017 and 2018 resulting in missing the target by 0.06 minutes per flight. The target in 2018 was 0.35 minutes per flight. Before 2018 the target was met with some margin.

Cost-efficiency

556 In 2018, as for all other years in this Reference Period, Sweden missed its cost-efficiency target, with the actual unit cost (48.65€$_{2009}$) being higher than the determined (48.40€$_{2009}$). The target was not met because the increase in actual service units (+12.7%) was lower than the increase in actual costs (+13.3%) compared to the determined ones.

557 The increase in the actual costs compared to the determined is a combination of several factors, but the main driver is higher staff costs (+14.5M€$_{2009}$, +15.7%). According to the additional information provided by LFV, the Air Navigation Service Provider of Sweden, this is mainly due to "higher pension costs reported as costs exempt from cost sharing. This is a result of lower interest rate than assumed in the Performance Plan of the second Reference Period".

558 In 2018, Sweden overspent 17.3M€$_{2009}$ on actual total CAPEX compared to the Performance Plan. This is in line with the trend visible in the second Reference Period, where Sweden consistently overspent with an exception in 2015, resulting in total CAPEX overspend of 27.3M€$_{2009}$ (+66.10%) compared to the Performance Plan.

559 The capacity incentive scheme was not activated for Sweden.

9.29 Switzerland

Comments from the Performance Review Body
In 2018, the performance of Switzerland shows a mixed picture. Delays have increased and they remain among the most expensive service providers.
Switzerland performed well in safety at both State and Air Navigation Service Provider (ANSP) level. For the ANSP, the level in Safety Risk Management will need to be improved to reach the 2019 targets.
Despite efforts to stop the Key Environmental indicator Actual (KEA) getting worse, Switzerland missed the 2018 target by approximately 50%.
The cost-efficiency targets were met as traffic increased (more than 15% over planned values) and Skyguide, the Air Navigation Service Provider of Switzerland, could use the additional revenues received through the traffic-risk sharing mechanism to improve performance on other KPAs.

Safety – Air Navigation Service Provider effectiveness of safety management

Minimum Maturity Level / Overall EoSM score

E / 100
D / 90
C / 80
B
A

2015 2016 2017 2018 2019

- Other MOs - Achieved
- Safety Culture - Achieved
- Target level - All other Objectives
- Other MOs - Planned
- Safety Culture - Planned
- Target level - Safety Culture
- Overall EoSM score

Capacity – en route Air Traffic Flow Management delay by cause

Avg. en-route ATFM delay per flight (min) / IFR movement and avg. delay (Index)

2015 2016 2017 2018

- Capacity
- Staffing
- Disruption
- Weather
- Other non-ATC
- IFR movements Index
- Delay index
- National capacity targets

Environment – FABEC evolution of horizontal flight efficiency

Environmental Performance (%)

2015 2016 2017 2018 2019

- KEA (FAB target)
- KEA (FAB Actual)
- KEP (Union-wide target)
- KEP (FAB Actual)

Cost-efficiency – CAPEX actual vs planned

Total CAPEX Actuals vs Planned (M €2009)

2015 2016 2017 2018 2019 Total to date

- RP2 Performance Plan (M€2009)
- Actual data (M€2009)

Total economic impact for airlines

Total economic cost (M€2009)

2015 2016 2017 2018

- Actual cost for ANS
- Net gain from charging scheme
- Cost of delay borne by airlines

Key issues (Key Performance Areas)

Safety

560 Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

561 Over the period and continuing in 2018, the Swiss authorities have improved their overall score of the Effectiveness of the Safety Management from 66 in 2015 up to 77 in 2018. Since 2016, they have been achieving the 2019 EoSM target Level C for all five Management Objectives. In 2018, they improved the level of Safety promotion beyond the 2019 EoSM target Level C, achieving Level D.

562 The Air Navigation Service Provider in Switzerland, Skyguide, has further improved its initial EoSM score from 84 up to 93 over the past four years. The 2019 EoSM target levels were achieved already in 2017. In 2018, Skyguide further improved the Safety Culture beyond the target achieving level E. However, at the same time the Safety Risk Management objective dropped below the 2019 target to the Level C. Safety Risk Management would consequently need to be improved in 2019 to reach the target at the end of the second Reference Period.

563 The targets for the application of the Risk Analysis Tool were achieved for all areas in 2018.

Environment

564 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all the Member States of the Functional Airspace Block Europe Central (FABEC) and allocated to each Member State.

565 The target of FABEC in 2018 was 3.05% while 3.25% was achieved registering the worse performance compared to 2017 and the biggest margin of underperformance thus far.

566 Switzerland's KEA value was 4.48% in 2018 which is approximately 50% above the FAB target and thus does not contribute positively towards it. However, since the beginning of the second Reference Period (5.02%) the performance has improved.

567 Additional taxi-out time at Zurich airport stayed the same as 2017 at 3.59 minutes per flight and is worse than the 2.77 minutes per flight achieved in 2015. Geneva airport on the other hand has improved since 2015 from 3.12 minutes per flight to 2.83 minutes per flight.

568 Additional time spent in terminal airspace, on the other hand, revealed an improvement for Zurich airport since 2015 (2.81 minutes per flight vs. 3.12 minutes per flight) while Geneva airport improved from 2.30 minutes per flight in 2015 to 1.74 minutes per flight in 2018.

569 All airports subject to monitoring have established the Eurocontrol Airport Operator Data Flow.

Capacity

570 FABEC has missed its capacity target for the fourth year in a row and the margin of underperformance has increased each year (significantly for 2018). In 2018, an Air Traffic Flow Management (ATFM) delay of 2.14 minutes per flight meant the target was missed by 1.72 minutes per flight. FABEC's target for 2018 was 0.42 minutes per flight.

571 In 2018, Switzerland experienced 5.2% increase in Instrument Flight Rules (IFR) movements compared to 2017. Switzerland missed the national capacity target for the first time in the second Reference Period recording ATFM delay at level of 0.31 minutes per flight. Nevertheless, Switzerland continued providing capacity that positively contributed to the FABEC capacity target. Weather issues, capacity shortages, and increase in the traffic volume (still within high STATFOR scenario) were the main contributory elements to this performance trend.

572 Arrival Air Traffic Flow Management delay decreased year-on-year until 2018 when it increased but still being an improvement compared to the beginning of the Reference Period. Geneva airport registered 1.14 minutes per flight of delay and Zurich airport registered 1.80 minutes per flight and achieved the target with some margin.

Cost-efficiency

573 In 2018, Switzerland met its cost-efficiency target, with the actual unit cost (63.40€$_{2009}$) being lower than the determined (68.78€$_{2009}$). The target has been met because the increase in service

units (+15.1%) was much higher than the increase in actual costs (+6.1%) compared to the determined.

574 The increase in the actual cost compared to determined is a combination of several factors, but the main driver is higher other operating costs (+3.7M€$_{2009}$, +91.9%). According to the additional information provided by Skyguide this is mainly due to "a decrease in financing on delegated airspaces which could not been compensated by cost savings".

575 In 2018, Switzerland overspent 6M€$_{2009}$ on actual total CAPEX compared to the Performance Plan. This is in line with the trend visible in the second Reference Period, where Switzerland consistently overspent with an exception in 2015, resulting in a total CAPEX overspent of 18.4M€$_{2009}$ (+11.53%) compared to the Performance Plan.

576 The capacity incentive scheme was not activated for Switzerland.

9.30   United Kingdom

| Comments from the Performance Review Body |
|---|
| In 2018, the United Kingdom (UK) performed well in all Key Performance Areas, although the environment area requires more focus.

Excellent safety performance on both State and Air Navigation Service Provider (ANSP) level led to achieving and exceeding the targets.

Despite missing its environment target, the Performance Review Body supports the United Kingdom's application of an incentive scheme and further innovative measures to enhance the performance scheme. Nonetheless, in line with the regulation, it must be highlighted that the UK should improve environmental performance (KEA) in line with the targets.

Moreover, despite improvements to processes and systems, the UK should focus on improving terminal performance, which is challenging in the unique operational environment.

In 2018, costs were higher than planned, however, increased service units helped to achieve the target unit cost. |

Safety – Air Navigation Service Provider effectiveness of safety management

Capacity – en route Air Traffic Flow Management delay by cause

Environment – UK-Ireland FAB evolution of horizontal flight efficiency

Cost-efficiency – CAPEX actual vs planned

Total economic impact for airlines

Key issues (Key Performance Areas)

Safety

577   Under the Performance Scheme, the Effectiveness of the Safety Management (EoSM) and the application of the Risk Analysis Tool (RAT) are assessed both for the Member States and for the Air Navigation Service Providers (ANSPs).

578   Over the period and continuing in 2018, the State has improved its overall score of the Effectiveness of the Safety Management from 81 in 2015 to 88 in 2018. In 2018, the State had met the 2019 EoSM target Level C since 2016, reaching Level D for Safety Assurance and Safety Promotion) and Level E for Safety Culture.

579 The Air Navigation Service Provider (ANSP) in the UK has marginally improved its overall EoSM score over the Reference Period from 86 in 2015 to 87 in 2018. The ANSP remained on the 2019 EoSM target Level D in all other Management Objectives since 2016. For Safety Culture (target Level C), the ANSP has remained above the target during the same period (achieved level C).

580 The application of the Risk Analysis Tool (RAT) has been on or above the targets throughout the second Reference Period, except for ATM-Specific occurrences in 2018, which dropped from 100% to 68%. The UK is still investigating why the level dropped in 2018 but suggests issues of compatibility, consistency, data access and completeness of data as potential causes for the drop.

Environment

581 Under the Performance Scheme, environmental performance is measured in terms of excess length of the actual flight path also known as Key Environmental indicator Actual (KEA). The environmental targets are analysed for all Member States belonging to the UK-Ireland Functional Airspace Block (UK-Ireland FAB) and allocated to each Member State.

582 The UK-Ireland FAB missed its targets for environmental performance for the fourth year in a row. The target in 2018 was 3.09% and actual performance was 3.63%. Most of this was due to the United Kingdom's performance.

583 The United Kingdom did not contribute positively to the environmental performance. However, the UK improved environmental performance by 0.07% compared to 2017 by achieving an environmental performance of 4.07%.

584 The UK applies a holistic approach to reducing flight inefficiency, i.e. including the vertical plane which could affect the Key Performance Area.

585 Additional taxi-out time in 2018 remains a significant issue for UK airports. Gatwick, Heathrow, Luton, Stansted airports have some of the highest additional taxi-out times in Europe. All these airports recorded worse performance compared with 2017 with Heathrow breaking the 9 minutes per flight barrier for the first time in the second Reference Period.

586 The additional time spent in terminal airspace was highest at Heathrow and Gatwick while the remaining London airports achieved a similar performance to other UK airports. Heathrow and Gatwick's additional times were 7.66 minutes per flight and 3.90 minutes per flight respectively. For five out of the eight recorded airports, additional time in terminal airspace decreased in 2018 compared to 2017.

587 All airports subject to monitoring have established the Eurocontrol Airport Operator Data Flow.

Capacity

588 The capacity target was not met on the UK-Ireland Functional Airspace Block level in 2018 by a small margin of 0.02 minutes per flight of Air Traffic Flow Management (ATFM) delay (achieved value was recorded at 0.28 minutes per flight). Functional Airspace Block performance seems to see-saw with one good year of achieving the target followed by a year where the target is slightly missed. The target in 2018 was 0.26 minutes per flight.

589 In 2018, UK experienced 0.9% increase in Instrument Flight Rules (IFR) movements compared to 2017. The UK did not contribute positively during 2018 to the Functional Airspace Block target achieving 0.28 minutes per flight of Air Traffic Flow Management delay. It has to be noted that the traffic growth in 2018 for UK was higher than the STATFOR high scenario from 2014. The main causes of the higher delays included further ATM capacity, weather, and special events.

590 Although the arrival ATFM delay decreased between 2017 and 2018 it has remained significantly above the national target. The reason for this situation is the performance of Gatwick, Luton and Stansted airports. The target was 0.78 minutes per flight whilst the achieved performance was 1.24 minutes per flight.

Cost-efficiency

591 In 2018, for the first time in the second Reference Period, the United Kingdom met its cost-efficiency target, with the actual unit cost (52.17€$_{2009}$) being lower than the determined (56.84€$_{2009}$). The target has been met because the increase in actual service units (+8.2%) was much higher than the increase in actual costs (+4.1%) compared to the determined ones.

592 The increase in the actual costs compared to the determined is a combination of several factors, but the main driver is higher staff costs (+30.2M€$_{2009}$, +13.1%). According to the additional information provided by NATS, the Air Navigation Service Provider of the UK, this is mainly due to "a higher need for operations staff due to higher levels of traffic, SESAR systems implementations and a higher level of air traffic controller trainees recruitment".

593 In 2018, the United Kingdom overspent 38.7M€$_{2009}$ on actual total CAPEX compared to the Performance Plan. This is in line with the trend visible in the second Reference Period, where the United Kingdom consistently overspent with an exception in 2015, resulting in a total CAPEX overspent of 111.7M€$_{2009}$ (+24.21%) compared to the Performance Plan.

594 A penalty of 0.24M€$_{2009}$ (0.04% of the determined costs) was incurred for missing the national and Functional Airspace Block capacity performance target.